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Introduction to RWER issue 100

This journal began by accident. In the summer of 2000, I was "surfing the web" when I clicked onto a French site called Autisme-économie. It told how French students had launched a rebellion against the obsolescence of their economics curriculum. *Le Monde* and other French newspapers carried articles about the students' complaints, and France's minister of education promised to investigate.

A week later I was at a small non-mainstream economics conference in Cambridge, UK. Half the conferees were from the States, and their table conversations repeatedly turned on the increasing efforts of their economics departments to purge non-believers like themselves by eliminating from the curriculum both economic history and the history of economic thought. Twice, at different tables, I tried to insert a glimmer of hope by telling of the attention-getting success of the French students. But they were incredulous and blanked me from their conversation.

That lowered my spirits a bit. But on the final evening Geoffrey Harcourt, the after-dinner speaker, lifted them. He did so partly because he repeatedly made us laugh, and partly because he recalled the long struggle and eventual partial victory in bringing macro into economics' conceptual framework. But Harcourt wasn't boasting; he was merely pointing to his generation's success at diminishing the hold of ideology and pseudo-science on economics to encourage us to achieve the same only more so.

The next morning heading home on a train, the combination of the dining-table snubs and Harcourt's inspiring speech caused me to get out a pad of paper and, as I sometimes do, start writing for therapy. In the style of yellow journalism and with a heathen non-French economist as my imaginary reader, I wrote an account of the Autisme-économie happenings. When I got home, I translated and added some quotes from French newspapers, pretended that what I had written was the first issue of a newsletter, typed it all up, and read it a couple of times. Therapy finished.

But a few nights later, with the bottle of chianti on my desk half-empty, I got carried away. I had a list of the email addresses of the Cambridge conferees which when added to my list of economist contacts came to a total of 99. I opened an anonymous email account, stuck my therapy writing and the 99 addresses into an email and clicked SEND. A week later my fantasy had over a hundred subscribers.

Now, after 22 years and with Jamie Morgan as my co-editor, it continues. But with an enormous difference. Fears that were in the background then are now in the foreground. Natural science and the daily news inform us that the continuation of free societies, civilization, and maybe the human species are all now at risk as tipping points are neared. The same sources tell us that the cause of these rapid movements towards ultimate disasters is **THE ECONOMY**. Not economies in general, but the global economy that has been created and maintained since World War Two under the guidance of the teachings of traditional economics, i. e. Economics 101.

Just as Copernicus's description of the universe was subversive of the traditional or then mainstream view of the universe, the 19 papers I have chosen from *Real-World Economics Review* archives for this

100th issue are subversive of the traditional view of the economy. The primary basis of their subversion is that they view the economy within a **bi-directional causal context and**, compared to traditional economics, **an infinitely larger one**. Most especially, they see **a two-way interdependency running between the economy and the biosphere and between the economy and society**. Keynes' introduction of macro greatly widened the possible view of causality in economics, but his expansion of economics' conceptual framework was tiny by comparison to what is now required if **economists** are not to continue to lead humanity toward ultimate catastrophe.

Thank you, Dear Readers, for all your support through the years. And not only for your submissions, but also for spreading the word.

Edward Fullbrook

Issue no. 5, 2001

Real Science Is Pluralist

Edward Fullbrook

Introduction

Fifty years from now, when historians of ideas write about how economics turned away from scientism and toward science, they may identify the pivotal event as the appearance of Robert Solow's article in *Le Monde* (3 Jan. 2001). Most economists living today grew up with the idea, even if not always agreeing with it, that there is and should be a master theory, neoclassicalism. But the idea of a nation, the United States, claiming mastery over the theoretical core is not one that often has been publicly proclaimed. Yet that is the implied message that leaps from every paragraph of Solow's article, and whose aftershocks are, as I write, awakening economists from their slumbers.

Nevertheless, those future historians will be wrong if they hold Solow to account for more than being just an average guy who opened his mouth in the wrong place at the wrong time. Solow's article merely manifests in nationalistic form an ideology that has choked the social sciences, economics in particular, for as long as most of us can remember. Let me try to explain.

Recently I wrote a paper concerned with identifying within a theoretical context a range of economic phenomena. It focuses on categories of market behaviour which, on the one hand, are well-known, commonplace, completely respectable and increasingly dominant, but which, on the other hand, are excluded from the theoretical core of mainstream economics. One cannot easily imagine a similar dysfunctional state persisting in a natural science -- such as, for example, physics refusing to consider micro-physical phenomena because they don't observe the metaphysics of gravitational theory. But of course such states of affairs in economics are the rule rather than the exception, and it is worth considering why this is so. I am going to filter this brief inquiry though a short passage by Roy Bhaskar.

In *The Possibility of Naturalism* (1979), he writes as follows;

> one has in science a three-phase schema of development in which, in a continuing dialectic, science identifies a phenomenon (or range of phenomena) [that's phase one], constructs explanations for it and empirically tests its explanations [that's two], leading to the identification of the generative mechanism at work [that's three], which now becomes the phenomenon to be explained, and so on. [and that's the dialectic] [p. 12]

My view is that, with one notable exception, this dialectic largely failed to function in 20th-century economics, and that this breakdown resulted from the discipline's refusal to enter into Bhaskar's phase one.

Instead of identifying phenomena which it then seeks to explain, economics avoids the dialectic by only considering phenomena consistent with existing explanations. In recent decades, this upside down "science"---this choosing what one sees in order to justify a theory and its ontology, rather than using theory to understand intransitive realities, became hegemonic as economics construed support from new narratives of scientific practice, especially Thomas Kuhn's. I want to outline the negative role which I think philosophy of science, in spite of Bhaskar's work, has played in economics.

This requires me to say a few things about the philosophy of science, especially its relation to historical events. Last century's fascination with this previously obscure corner of philosophy seems to have been triggered by the acceptance of Einstein's theory of relativity. This event fits well with several narratives of scientific progress, including Bhaskar's. Unlike Bhaskar's, however, Popper's and Kuhn's narratives also fitted the meta-narrative which dominated geo-political perceptions from the 1940s onwards -- that is, that of global powers and ideologies battling it out until one gains total victory over the other. Popper indirectly, and one assumes unconsciously, brought this narrative structure into play by shifting the epistemological focus from scientific theories themselves to their dramatic encounters with tests designed to discredit them. The stylized exemplary case for Popper's narrative became the falsification and overthrow of Newtonian physics, by means of tests devised through the competing and victorious theory of the cosmos, Einsteinian physics. This story had instant appeal for an intellectual population accustomed to global conflict and submerged in Cold War mythology. It offered a simple, winners and losers storyline worthy of Hollywood, and echoed the major traumas and neuroses of the latter half of the century. So it was no wonder that by the 1960s even people who had never opened a science book could chatter about falsification.

The popularization of the putative ins and outs of scientific advance accelerated with the appearance in 1962 of Thomas Kuhn's *The Structure of Scientific Revolutions*. It was really this book that made philosophy of science box-office. It also, with its multi-faceted concept of the paradigm, provided economics with a rationalization for its worst practices, especially its head-in-the-sand approach to major kinds of economic phenomena. Recently, rereading Kuhn's book after a space of many years, it was a shock to be forced to reengage with the paranoid, bi-polar rhetoric and logic which through the 1950's and 60's shaped most public discussion in Kuhn's America. Kuhn himself is open about locating his book in this historical framework. In his Preface to the original 1962 edition, he writes, that his book was conceived and written over a period of 15 years, in other words, from the heyday of McCarthyism to the Cuban Missile Crisis and the height of the Cold War.

And it shows. The scenario which Kuhn, so skilfully, sketches regarding scientific endeavour is, in the main, the same as that which structured the more intemperate, more right-wing accounts of what was billed as the struggle between Communism and the Free World. Kuhn's book methodically transposes the Cold War narrative onto the competing-theories narrative of science. This transposition extends even to his vocabulary, with a heavy use of Cold-War buzz words and expressions like "subversive", "polarization", "crisis" and "crisis provoking", "techniques of mass persuasion", "allegiance", "commitment", "conversions", total "destruction" and "total victory", and of course "revolution". Others of Kuhn's most favoured expressions echoed then current geo-political equivalents. For example, "adherents" translates "patriots"; "incommensurability", no peaceful co-existence; "different world view", different ideology; "pre-paradigm", third-world; "rival theories", rival powers; and so on.

Kuhn also repeatedly foregrounds a parallel between paradigms and political institutions. For example, he writes, "Like the choice between competing political institutions, that between competing paradigms proves to be a choice between incompatible modes of community life." [94] It is this emotionally-charged us or them, all or nothing mentality which Kuhn's book seems to legitimate as the ethos of

science. "After the pre-paradigm period," writes Kuhn, "the assimilation of all new theories and of almost all new sorts of phenomena has in fact demanded the destruction of a prior paradigm and a consequent conflict between competing schools of scientific thought." [96] Kuhn's narrative makes the defence of one's paradigm community, through the elimination or marginalization of rival ones, the scientist's over-riding goal. And it makes the identification of new sorts of phenomena, the first phase in Bhaskar's schema, something to be avoided like nuclear war.

Kuhn's paradigmatic, that is, **anti-pluralist** science does, however, make one fundamental concession to the notion of science as a pursuit of truth. Although Kuhn condones all manner of evasions and closed-mindedness, he posits a limit beyond which empirical realities count for more than loyalty to a community of belief, where, in his words, scientists "can no longer evade anomalies that subvert the existing tradition of scientific practice," and where in consequence a scientific revolution takes place. [Kuhn, p. 6]

But in social sciences, conditions rarely, if ever, exist for a revolution in the way Kuhn describes. Here paradigm changes are more likely to result from changes in socio-political forces than through any logic of scientific discovery. Unlike natural scientists, social scientists seldom come up against reality's hard-edged recalcitrances. With rare exceptions -- like The Great Depression -- the links between the social scientist's paradigmatic beliefs and the intransitive world around him or her are both conceptually tenuous and unconnected to the possibility of objective tests. Consequently, difficulties thrown up by external reality can -- when the paradigmatic, that is, anti-pluralist, ethos prevails -- be brushed aside or charmed away by rhetorical and formalistic devices, or, -- better yet -- as with all kinds of faiths, by wilful disregard for all phenomena inconsistent with one's beliefs.

For these reasons, Kuhn's narrative becomes, in the hands of economists, a formula for an eternal status quo, for the cessation of all significant change. It excuses exclusionary devices in defence of the dominant paradigm community, and it subordinates the advancement of economic knowledge to the upholding of a system of belief tied to a vast network of patronage.

These remarks presume that Kuhn's narrative fails as a generally fair description of development in the natural sciences, that in general the natural sciences are not opposed to registering awareness of new ranges of phenomena. So a few words are needed to support this view and to explain why I believe that Bhaskar's narrative, as encapsulated in the paragraph quoted at the start, is a vastly superior account of scientific practice -- superior both as a description of actuality and as an ideal.

The competing-theories narrative of scientific advance, in its various forms, builds its case primarily on the basis of examples drawn from physics. Yet even here it is easy to show that the now traditional view both fails to account for and runs counter to major developments. This holds especially for Kuhn's version, which turns on the notion of irreversible gestalts.

For several generations, fundamental research in physics has been focused primarily on "unification". Various schemes exist for characterizing "the unification process", but all describe a state of affairs incomprehensible in terms of the traditional competing-theories, anti-pluralist narrative of scientific development. Stephen Hawking, for example, explains the quest as follows.

> Today scientists describe the universe in terms of two basic partial theories - the general theory of relativity and quantum mechanics. They are the great intellectual achievements of the first half of this century. .... Unfortunately, however, these two theories are known to be inconsistent with each other - they cannot both be correct. One of the major endeavours in physics today...is the search for a new theory that will incorporate them both - a quantum theory of gravity. [13]

Reading this passage through the competing-theories lens, as offered by Popper or Kuhn, invites total misunderstanding. Physicists perceive relativity and quantum mechanics not as competing theories championed by warring camps of physicists, but rather as different and complementary conceptual approaches to the fundamentals of physical reality. These two narratives illuminate separate ranges of phenomena in what unification physicists see as ultimately the same domain of inquiry, but which, until some more fundamental structure or generative mechanism is identified, cannot yet, if ever, be reconciled with each other. Rather than behaving paradigmatically, that is, ignoring the existence of micro phenomena because they contradicted both relativity and classical theory, 20th-century physics proceeded **pluralistically**. It got on with the difficult work of progressively identifying this range of phenomena and then constructing and testing new explanations. The physicists' dream of unification, with its implicitly deeper level of understanding than that of existing theory, arises directly out of its **pluralistic approach**. It allows for the peaceful co-existence of the two narratives, the heuristic significance of each being enhanced by the existence of the other. Physicists seek neither to discredit relativity or quantum mechanics, but rather to create, in Hawking's words, "a new theory that will incorporate them both".

Hawking's view of 20th century physics also contradicts Kuhn's narrative in another way. The central plot device in Kuhn's story of paradigmatic, anti-pluralist science is his portrayal of natural scientists as gestalt-bound, that is, as capable of thinking only within single conceptual systems. He identifies this intellectual incapacity as a sort of negative force which necessitates taking an anti-pluralist approach to science which then creates blockages to the advancement of knowledge, thereby creating pre-revolutionary states. But are scientists really so conceptually inept? Was John Stuart Mill really so wrong when he characterized the scientific imagination as the faculty for "mentally arranging known elements into new combinations"? [*System of Logic*, 433] Are scientists really incapable of shifting back and forth between seeing the world in different combinations, between, if you like, seeing the duck and seeing the rabbit?

If natural scientists were as gestalt-bound as Kuhn repeatedly alleges, then 20th-century physics could never have taken place. Shifting between narratives with radically different conceptual systems can be a daily occurrence for 20th-century physicists. For them conceptual agility -- that is, the ability to move freely between conceptual gestalts -- is imperative. Unlike theory replacement, unification of theories demands the ability to jump back and forth between conceptual systems. And even to become a physicist, one must learn to think within the conceptual frameworks of both relativity and quantum mechanics. All the rest of modern physics is derived from one or the other of these two theories whose "basic concepts", notes the physicist David Bohm, "directly contradict each other." [*Wholeness and the Implicate Order*, p. 176] General relativity conceives of matter as particulate; of physical objects as having actual properties; of all physical reality as determinate; and all events as, in principle, having a causal explanation. Quantum theory, on the other hand, conceives of matter as a wave-particle duality; of physical objects as having only potential properties within the given physical situation; of the existence of indeterminacy; and of the existence of events incapable of causal explanation. Conceptual differences and theoretical inconsistencies greater than these are scarcely imaginable. Yet, for nearly

a century, these two metaphysically dissimilar narratives have worked, not in competition, but in tandem to the produce what are arguably the greatest advances in the history of science.

Unlike Kuhn's narrative, Bhaskar's three-phase schema of scientific development sits comfortably with this history. It also suggests a way of advancing radical reform of economics. Taking Bhaskar's view of science, the question becomes how, in economics, do you kick-start the dialectic, when in the main it has been stalled for decades and when powerful institutional forces work to keep it from starting up again.

As previously indicated, my view is that the blockage of the first phase -- the identifying of phenomena -- has stalled economics. Here Bhaskar's verb "identifies" must be given a robust interpretation. Passive identification of economic phenomena not covered by existing theory is, for the reasons stated above, insufficient for getting economists to take them into account. To get from phase one to phase two -- that is, from identification to construction of explanations -- reformers must find a way through the defence mechanisms, mis-education and indifference with which, by tradition and Kuhnian anti-pluralist, ideology, the profession encases itself. This, I believe, argues for two kinds of initiative both directed at the identification of economic phenomena, but by different means.

First, economics will be resuscitated and made relevant to the urgent needs of the new century, only if roused from its ontological slumber. Wittgenstein characterized his kind of philosophy as “not a body of doctrine but an activity," whose "work consists essentially of elucidations." [*Tractatus*, 4.112] Because economic ontology has for so long been off-limits, much elucidatory activity regarding economics’ concepts and the nature of economic reality, as in the work of Lawson and Stretton, is now called for. Economists and students must be led to a practical awareness of the open nature of economic existence and of the importance of internal relations, and of how these dimensions of economic reality mean that the deductivism of traditionalist economics excludes the identification of most economic phenomena from within the context of explanation. The ontological preconceptions and methodological pieties of traditionalist economics both mask from view the larger part of economic events and block inquiry into the structures which generate them.

In economics, the first stage of Bhaskar's schema has been trumped by devotion and obedience to an obscurant metaphysics. The re-education of economists to attend to these exclusions and to the possibilities which they imply, will, it is hoped, coax the discipline into engaging with a larger range of economic reality. Such elucidations not only create an intellectual space in which members of the pluralist vanguard can operate, but also provide respectability and justification for traditionalists contemplating post-traditionalist, post-neoclassical pursuits. Such work provides ordinary economists, especially the young ones, with the conceptual means of articulating their misgivings and intuitions, and in general of liberating their repressed awareness of all those phenomena whose relevance the anti-pluralism of their elders denies..

These elucidations serve to identify economic phenomena in a broad ontological way. Through a form of applied philosophical analysis, they explain why there exist vast tracts of unexplored territory and, at the same time, the reasons behind the notorious failure of traditionalist methods. But they identify the general nature and scope of socio-economic reality, rather than particular phenomena or ranges thereof.

So a second type of initiative for the identification of economic phenomena is also required. Compared to the first, it is less glamorous. But it is at least as important. As a lure away from traditional economics, philosophical enlightenment is most likely insufficient for the rank-and-file economist. He or she must also be enticed with concrete possibilities for research. To this end, conceptual frameworks must be

developed that bring into view ranges of economic phenomena that enter strategically into economic outcomes, but that are unrecognised by traditionalist conceptualisation. That there exists a surfeit of such possibilities is self-evident to the post-traditional economist. That their successful realization – the development of effective understandings of these phenomenal realms -- are now crucial to human welfare is, outside the economics community, accepted fact.

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Issue no. 12, 2002

Is There Anything Worth Keeping in Standard Microeconomics?

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https://rwer.wordpress.com/comments-on-rwer-issue-no-100/

The French students' movement against autism in economics started with a revolt against the disproportionate importance of microeconomics in economic teaching. The students complained that nobody had really proved to them that microeconomics was of any use; what is the interest of going through "micro1", "micro2", "micro3", etc., using lots of mathematics to speak of fictitious households, fictitious enterprises and fictitious markets?[1]

Actually, when one thinks about it, it turns out that microeconomics is simply "neoclassical theory". Realizing this, I agree with the French students when they say that:

1. In a course on economic theories, neoclassical theory should be taught alongside other economic theories (classical political economy, Marxist theory, Keynesian theory, etc.) showing that it is just one among several other approaches;

2. The principal elements and assumptions of neoclassical theory (consumer and producer choice, general equilibrium existence theorems, and so on) should be taught with very little mathematics (or with none at all). The main reason being that it is essential for students to understand the economic meaning of assumptions made in mathematical language. As they study economics, and not mathematics, students must decide if these assumptions are relevant, or meaningful. But, for that, assumptions must be expressed in clear English and not in abstruse formulas. Only if assumptions, and models, are relevant, can it be of any interest to try to see what "results" or "theorems" can be deduced from them.

I am convinced that assumptions of standard microeconomics are *not at all* relevant. And I think that it is nonsense to say – as some people do (using the " as if " argument) – that relevant results can be deduced from assumptions that obviously contradict almost everything that we observe around us.

The main reason why the teaching of microeconomics (or of " micro foundations" of macroeconomics) has been called "autistic" is because it is increasingly impossible to discuss real-world economic questions with microeconomists - and with almost all neoclassical theorists. They are trapped in their system, and don't in fact care about the outside world any more. If you consult any microeconomic textbook, it is full of maths (e.g. Kreps or Mas-Colell, Whinston and Green) or of "tales" (e.g. Varian or

[1] Bernard Guerrien is the author of La Théorie des jeux (2002), Dictionnaire d'analyse économique (2002) and La théorie économique néoclassique. macroéconomie, théorie des jeux, tome 2 (1999).

Schotter), without real data (occasionally you find "examples", or "applications", with numerical examples - but they are purely fictitious, invented by the authors).

At first, French students got quite a lot of support from teachers and professors: hundreds of teachers signed petitions backing their movement – specially pleading for "pluralism" in teaching the different ways of approaching economics. But when the students proposed a precise program of studies, without "micro 1", "micro 2", "micro 3" ... , without macroeconomics "with microfoundations" or with a " representative agent " –, almost all teachers refused, considering that is was "too much" because "students must learn all these things, even with some mathematical details". When you ask them "why?", the answer usually goes something like this: "Well, even if we, personally, never use the kind of 'theory' or 'tools' taught in micoreconomics courses (since we are regulationist, evolutionist, institutionalist, conventionalist, etc.) -, surely there are people who do 'use' and 'apply' them, even if it is in an 'unrealistic', or 'excessive' way".

But when you ask those scholars who do "use these tools", especially those who do a lot of econometrics with "representative agent" models, they answer (if you insist quite a bit): "OK, I agree with you that it is nonsense to represent the whole economy by the (intertemporal) choice of one agent - consumer and producer - or by a unique household that owns a unique firm; but if you don't do that, you don't do anything !".

There are also, some microeconomists who try to prove, by experiments or by some kind of econometrics, that people act rationally. But, to do that you don't need to know envelope theorems, compensated (hicksian) demand or Slutsky matrix! Indeed, "experimental economics" has a very tenuous relation with "theory": it tests very elementary ideas (about rational choice or about markets) in very simple situations – even if, in general, people don't act as theory predicts, but that is another question.

Microeconomics: "unrealistic" or "irrelevant"?

Most of the time microeconomics is criticized because of its "lack of realism". But " lack of realism" doesn't necessarily mean *irrelevance* ; the expression is usually understood as meaning that the theory in question is "more or less distant from reality", or as giving a more or less acceptable proxy of reality (people differing about the quality of the approximation). The idea is implicitly this: "if we work hard, relaxing some assumptions and using more powerful mathematical theorems, microeconomics will progressively became more and more realistic. There are then – at least – some interesting concepts and results in microeconomics, that a healthy, post-autistic, economic theory should incorporate".

That's what Geff Harcourt implicitly says in the *post-autistic economics review*, no.11, when he writes:
Against this macroeconomic background, modern microeconomics has a bias towards
examining the behaviour of competitive markets (as set out most fully and rigorously in the Arrow-Debreu model of general equilibrium), not as reference points but as approximations to what is actually going on. Of course, departures from them are taught, increasingly by the clever application of game theory. Moreover, the deficiencies of real markets of all sorts are examined in the light of the implications, for example, of the findings of the asymmetric information theorists (three of whom - George Akerlof, Michael Spence, and Joe Stiglitz - have just (10/10/01) been awarded this year's Nobel Prize. From Amartya Sen on, the Nobel Prize electors seem to be back on track).

What is Harcourt saying? He is telling us that the Arrow-Debreu model has something to do with " the behaviour of competitive markets "; he is saying that game theory can be cleverly "applied "; he says

that there are " findings " made by Akerlof, Spence and Stiglitz. If all this is true, then students have to learn general equilibrium theory (as giving " approximations to what is actually going on"), game theory, asymmetric information theory, and so on. That means that they need micro1, micro2, micro3... courses (consumer and producer choice, perfect and imperfect competition, game theory, "market failures", etc.).

I don't agree at all with Geff Harcourt because:

1. The Arrow-Debreu model has nothing to do with competition and markets: it is a model of a "highly centralised" economy, with a benevolent auctioneer doing a lot of things, and with stupid price-taker agents;

2. Game theory cannot be " applied ": it only tells little " stories " about the possible consequences of rational individuals' choices made once and for all and simultaneously by all of them.

3. Akerlof, Spence and Stiglitz have no new "findings", they just present, in a mathematical form, some very old ideas - long known by insurance companies and by those who organize auctions and second hand markets.

4. Amartya Sen, as an economist, is a standard microeconomist (that is what he was awarded the Nobel Prize for): only the vocabulary is different ("capabilities", "functionings", etc.).

But, perhaps, all "post autistic" economists won't agree with me.

It would be good then that they give their opinion and, more generally, that we try to answer, in detail, the question: *Is there anything worth keeping in microeconomics - and in neoclassical theory? If there is, what?*

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Issue no. 18, 2003

How Reality Ate Itself: Orthodoxy, Economy & Trust

Jamie Morgan
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Quis custodiet ipsos custodies?
Who guards the guards?

An economic theory that cannot sustain its own possibility is a poor one but can also be a powerful one. A market economy may valorise the symbolism of the invisible hand but it is as equally beholden to the symbolism of the tacit handshake. The handshake is a metonym for a relation and a market economy is a set of relations inscribed in rules, tacit or otherwise. First amongst equals are trust and the means by which trust is enacted and maintained. Without trust nothing else functions and social reality would be impossible. The philosopher J. L. Austin was one of the first to recognise the importance of this.[1] There are at least two dynamics to talking about social reality. First, description where we designate things true or false by reference to them as objects or past events - the hat is black, yesterday was Wednesday and we had lunch. Second, performance, where current conduct and dialogue constitute a new conceptual element to social reality with material repercussions for future relations – the meeting of hands and *it's a deal*, or the negotiation and witnessed signing of a contract. In the immediate sense, performance is neither strictly true nor false since it is not initially a description, but a doing or making. The doing is in this first instance appropriate or inappropriate, sincere or insincere, successful or a failure. That it is done is in the second instance true or false – the contract as negotiated by two parties with the legal authority to engage in those negotiations was signed by each and entered into in good faith. The glue in this transition is the trust that binds the particular rules of appropriate interaction. The interaction may fail for a variety of reasons that cause immediate problems – an earthquake may prevent the delivery of a consignment required for a just in time production process. But these reasons are not devastating to the social institution in which they occur – the sustainability of business agreements perpetuating economic activity. However, when practices are designed to confound basic principles of transparent dealing, when rules are insincerely held, when a promise ceases to be something you intend to keep, trust dissolves and markets cease to look quite so 'spontaneously' vibrant.

[1] pp. 45-52, J. L. Austin, *How To Do Things With Words* (Oxford: Oxford University Press, 1962)

The orthodox Cheshire cat

As has often been argued, the timeless, ahistorical, institution-free fundamentals of orthodox method cannot be easily reconciled to problems of markets as rule systems. But what does it mean that trust and the rules that constitute market systems are not a central problem for orthodox economics? Orthodoxy is about the spontaneous optimality that emerges from the removal of impediments. Since the very idea of rules tends to be conflated with regulation there's nowhere left to hang the structuring of markets. This of course forgets that deregulation is itself a (demonstrably inefficient) form of regulating rule. Its inefficiency and its contradiction is that this form of regulation tends to create the conditions for abuse that undermine the trust on which the free economic activity of markets is based. The radical individualism inscribed in it provides for the belief that *freedom to* massively predominates over *freedom from*. *Freedom from*, our collective protection from the abuses that undermine the very possibility of individual action, is pushed aside. This deep ideological commitment can be heard in the words of Milton Friedman:

> What's interfering with the recovery is all this fuss about corporate governance, which, in my opinion, is being carried too far. In all these cases – Enron. Global Crossing, WorldCom – it was the collapse in the market that brought attention to them. What's happening now is that the hullabaloo, which in effect is saying that to be a CEO is to be a member of a criminal class, is very adverse for enterprise and risk.[2]

But the collapse of the market is not some natural event, it is the dynamic consequence of complex interactions, many of them unanticipated or unintended. One aspect of that is how the practices that constitute markets can undermine the trust that markets require to function. Criminalising CEOs *is* adverse for enterprise and risk but would not be occurring if their practices did not contribute to crises where they can no longer be disguised or ignored. Economists tend to forget about power, but all human systems have power asymmetries. For the powerful to be held to account indicates deep concerns. That orthodoxy cannot recognise this, still less contribute to its analysis in terms of its own theoretical tenets, indicates that it has little that is constructive to say concerning the analysis of an important cause of economic crisis.

In any case, one rarely sees far when the view is from the top, however clear the view may potentially be. In a recent speech Federal Reserve Chairman Alan Greenspan argued that both the $8 trillion dollar loss of share vale on the DOW at the start of the new century and the problems incurred as a result of Enron etc. indicated the general *health* of the financial system.[3] The basis of his argument was that technology had produced new opportunities for financial 'risk dispersion' and that 'a more flexible world economy' was spreading costs and absorbing shocks more readily. The proof? 'No major US financial institution was driven to default.' In adopting this position, Greenspan reveals himself as something of a stoic - w*hatever doesn't kill us makes us stronger*. Still, the US financial institutions are scarcely the whole body of economy. Default has quite a different meaning for those impoverished by collapsing share values and 'financial irregularities'. Risk dispersion is a rather hollow term for those unable to pay their mortgages or with no jobs to go to (US unemployment is 6% and rising). If we call the financial head healthy we must still ask ourselves how it is treating its economic body – as a temple or a trashcan? And need we call it healthy? 2001 was a record breaking year for fraud class actions (488)

[2] D. Smith, 'Feisty at 90 – Friedman Speaks Out,' *The Times Business* September 8th 2002.
[3] Text reproduced in full *The Times Business*, September 27th 2002.

in the US against firms.[4] The majority by state pension funds and union pension schemes. Around 8 to 10,000 individual cases are being filed a year at the National Association of Securities Dealers (NASD). And all of this despite a change in the law to make it *more* difficult to sue firms for compensation for irregularity - the 1995 Private Securities Litigation Act means that 'aiders and abetters' of wrongdoing in a fraud case cannot be held liable.

Practices that undermine trust

The context of the problem of trust is a finance system keyed to the unrelenting pursuit of the next profitable firm and the next growth sector. Consistent growth provides the basis of a profitable firm and a profitable bull market for the financial industry. When a firm meets its revenue forecasts it can mean a large increase in its share valuation. Analysts categorise firms as 'Market Out-performers' (MOs), 'Market Performers' (MPs) and 'Market Under-performers' (MUs). Whether a stock is rated as a 'buy' a 'neutral' or a 'sell' is, in principle, related to which direction it is tending to in terms of these categories. Conventionally, our perception of shares is based on their price-earnings ratio or P/E.[5] The lower the ratio the greater the earnings of the stock as a proportion of its price and thus the faster one recoups the initial investment. P/E therefore provides a measure of the attractiveness of stock as equity. But how reliable are the price of the share and the earnings of the firms as indicators of the decision to invest? What lurks beneath the numbers? Here, knowledge is power:

- The power to construct the firm's reported revenue stream occurs within strong pressures to place it in its best possible light. In terms of trust, one confronts the question of how far the relationship between the accountants and the firm can stretch. When does creative accounting become aggressive accounting that in turn becomes collusion in fraud?

- The power to manipulate stock prices through complex financial arrangements on the basis of information that others do not have. Here, the problem of trust comes up against the question of at what point expertise becomes self-interest to the detriment of the system from which it feeds?

This is not just an issue of legality since trust is more than a question of 'were any laws broken?' Part of the constitution of trust are the ethics that inform how law is made and how it is adhered to – in its spirit or in its letter? The grounds of trust are extremely difficult to define, but easily lost. Losing sight of the importance of trust is the downfall of the system. Its dysfunction becomes ravenous and reality begins to eats itself. Its clearest expression is a debilitating scepticism. Its immediate, though by no means final, consequence is a downward spiral of corporate valuation.

Cannibalising reality?

The past five or six years have seen numerous financial scandals. Since economy is an open system one tends to find a complex interaction of some or all of the above practices within those scandals. The dot.com bubble provided a great deal of scope for spinning (the preferential allocation of stock to favoured clients) and laddering (having investors promise to buy more stock at progressively higher

[4] J. Doran, 'After the bust, a boom in fraud suits for Wall Street's lawyers,' *The Times Business,* November 30th 2002.

[5] R. Marris, 'Have the markets reached bottom?' *The Times Business* November 7th 2002. R. Cole, 'P/e ratios indicate good value,' *The Times Business* July 20th 2002.

prices once trading begins). Though cases of spinning are alleged on the London markets, New York has been the focus of investigation.[6] New York Attorney-general Eliot Spitzer has been engaged in protracted investigation of 12 of the major financial institutions for forms of spinning. Most of the evidence is based on private e-mails and documents that contradict the public statements of investment analysts. Henry Blodget, a Merrill Lynch analyst, for example, publicly rated Infospace stock as a buy whilst privately noting, 'This stock is a powder keg… given the bad smell comments that so many institutions are bringing up.'[7] Breach of Chinese walls is also alleged against Citigroup's investment banking arm Salomon Smith Barney, which consistently rated Qwest Communications as a 'buy' up to the point of its price collapse. At the same time, Philip Anschutz, Qwest's founder, was selling Qwest shares amassing a $1.45 billion profit. Anschutz also received 57 allocations for various share issues at a personal profit of around $5 million from Salomon whilst Qwest had generated $37 million in revenue for Salomon from its transactions.[8] Fines imposed by the Securities and Exchange Commission (SEC) on the banks currently stand at $1.4 billion. $900 million of which constitutes compensation for investors, $450 million to fund independent research (to maintain Chinese walls) and $85 million for 'investor education'.[9] $400 million of the total will come from Citigroup (who have also set aside $1.5 billion to meet the costs of compensation for further investor litigation).[10]

The dot.com firms themselves and also the new telecoms were highly prone to creative accounting based on capacity swaps and barter in order to massage their revenue figures during the early phase of set-up. This and talk of new business models making money in completely new ways with extremely low long-run fixed costs sucked in masses of venture capital (over $40 billion of which is now lost).[11] At the same time, as a high growth sector, dot.coms provided (along with various high growth sectors of overseas markets) one of the initial areas of high-risk that proved extremely attractive to split capital trust (SCT) managers. The fact that some of these issues were spun, of course, meant that the estimation of risk by those managers was baseless and their vulnerability far greater than even they could imagine. Any other shock to the system, such as 9/11, could only exacerbate their vulnerability. The collapse of Aberdeen Asset Management's SCTs, contributed to the £10 billion lost by more than 50,000 private investors in this sector.[12]

The possibility that even apparently low risk investments are not what they seem also emerged. The misuse of "special purpose vehicles" and "off-balance sheet obligations" (OSOs) prevents investors relying on firm's accounts with any degree of confidence. WorldCom used OSO's to keep $4 billion off balance. In 2000 Enron was 7th in the *Fortune* top 500 with reported revenue in excess of $100 billion (a 150% increase on the previous year).[13] Its shares traded at over $60. Its chief financial officer, Andrew Fastow orchestrated several SPVs set up in the name of his children and his wife, from which he allegedly earned $30 million in fees and siphoned assets. The decline of the DOW over the turn of the millennium made the use of Enron stock to finance continued debt restructuring more difficult and on October 16th 2001 Enron posted a bombshell $1.01 billion loss. The vulnerability inherent in its revenue enhancements then kicked in in earnest. On the 17th the *Wall Street Journal* publicised

[6] In the UK see, Insight team, 'Revealed: the cosy deals that taint Goldman Sachs,' *The Sunday Times Business* November 24th 2002.
[7] See A. Rayner, 'Spitzer poised to reveal fresh evidence against 12 banks,' *The Times Business* November 22nd 2002.
[8] R. Lambert, 'Are Wall Street's Ethics Dead?' *The Times* October 8th 2002.
[9] D. Rushe, 'War is over (on Wall Street at least),' *The Sunday Times Business* December 22nd 2002.
[10] J. Doran, 'Citigroup plans $1.5bn fund for compensation,' *The Times Business* December 24th 2002. A. Rayner, 'US banks to settle with regulators,' *The Times* December 9th 2002.
[11] N. Hopkins & T. Bawden, 'Spectre of high-tech bubblelingers on,' *The Times Business* November 8th 2002.
[12] P. Durman & L. Armistead, 'Dotty, the champion of split caps,' *The Sunday Times Business* October 27th 2002.
[13] See B. Cruver, *Anatomy of Greed* (London: Hutchinson, 2002).

Fastow's SPV connections. On the 29th Moody's Investor Service, down-rated Enron's credit rating increasing the servicing costs of its newly revealed debt. By December 2001 the firm had filed for bankruptcy and it was all over. Its share price had collapsed to less than a cent. Numerous small investors who had relied on its stock for their pensions and large pension funds themselves were hit hard. State pension funds in New York, Georgia and Ohio lost over $350 million. By February 2002 the Bank of America had $231m in Enron related losses. One hundred Merrill Lynch executives lost $16 million of their own money invested in an Enron partnership.[14] Ordinary Enron employees received no severance pay. In November, however, senior staff had awarded themselves $55 million in 'retention bonuses' from the dregs of its coffers. Just prior to the October 16th loss statement 29 senior executives sold stock, over a dozen reaping in excess of $10 million. A class action suit has now been brought against them for insider trading whilst Fastow, and a number of collaborating London bankers, have been indicted for fraud.[15] Meanwhile, Enron's accountant, Arthur Andersen was indicted for obstruction of justice. Its other clients bailed out to the remaining Big Four accountancy firms and Arthur Andersen, previously the fifth largest professional services firm in the world was liquidated. The nature of Andersen's relation to Enron is suggested by the following statement from an anonymous former executive of the firm:

> Everyone makes the mistake of thinking Andersen and Enron are separate companies. There are hundreds of ex-Andersen people inside Enron, a bunch of young kids just out of college. Give those new Andersen kids a downtown loft, a new Lexus and show each one the golden path to becoming a partner. Hey learn to do things the Enron way.[16]

The initial fallout from Enron was the re-auditing of accounts previously held by Andersen. Deloitte & Touche, for example, took over the audit of MyTravel from Arthur Andersen, its re-audit took £15m off the profitability of the firm. Share prices subsequently fell by 36%.[17] With revelations concerning SPVs major news, corporations moved quickly to distance themselves from any hint of scandal. Blue-chip firms, such as Xerox, have been publicly realigning their former accounts and future forecasts. But according to the IMF, 'questions regarding the quality of reported corporate profits in the aftermath of Enron's failure continue to have an adverse impact on international and corporate bond markets.' As Mathew Wickens of ABN Amro says, part of the problem are the figures firms are posting because 'we don't really know what they mean.'[18] Presswatch ranks accountancy as the top service sector for column inches of negative publicity. People are sceptical about stock markets. In a survey by the investor group Pro-Share more than half the 450 investors questioned felt less confident in the accuracy of company accounts. 'One in three believes auditors are not independent of the companies they audit.'[19] The collapse of trust, therefore, places Friedman and Greenspan's rather blithe accounts of the $8 trillion fall in the DOW in a rather different light.

The effects of the collapse have been widespread. California, the richest state in the union with an economy of $1.3 trillion faces a $21 billion budget shortfall in 2002.[20] Some of this is due to general recession to which the collapse of the stock market has contributed. Some if it is directly attributable to that collapse. In 2000, California received $17 billion in taxes on stock market profits, mainly from

[14] D. Rushe, 'Enron Watch,' *The Sunday Times* February 3rd 2002.
[15] 78 charges have been filed so far. 'Former Enron chief to face more charges,' *The Times Business* December 27th 2002.
[16] B. Cruver, 'I had a lucrative career… but it cost me my soul,' *The Times Business* October 2nd 2002.
[17] J. Ashworth, 'Unearthing the Arthur Andersen time bombs,' *The Times Business* Thursday October 10th 2002.
[18] L. Paterson & G Duncan, 'IMF fears more shares misery,' *The Times Business* June 13th 2002.
[19] D. Wild, 'A horrible year, but at least now accountancy is sexy,' *The Times Business* December 19th 2002.
[20] C. Ayres, 'Economic woes take lustre off Golden State,' *The Times* December 11th 2002.

dot.coms, in 2002 that fell to $5 billion. Cuts in state spending of $10 billion have subsequently been announced including state worker redundancies, pay freezes and also reduced healthcare expenditure for the poorest in society. Californians were also direct victims of Enron. It has been alleged that Enron traders triggered widespread blackouts by buying huge blocks of power capacity in the state's electricity market to artificially increase the price of their own supply.[21]

What secrecy reveals

Sophisticated capitalism allows for a variety of primitive abuses. This is not simply an issue of lies and deceit. To argue this way is to reduce the problem to the agent, to the bad apple, rather than the conditions of enablement within the orchard. Analytically, this does not move one far enough away from orthodoxy and radical individualism. Deceit is the tip of the structural iceberg. The full nature of the rules of the structure and the way in which they are held needs to be considered. The US Sarbanes-Oxley Act, which now requires finance directors and CEOs of listed companies to attest to the accuracy of their accounts or risk jail, is a step forward in giving teeth to corporate governance, but it is not in itself corporate governance. Nor does it restore trust, since once rules are codified firms will seek to exploit them. What is also needed are ethics of appropriate action that mitigate the desire for such exploitation. How one might maintain them under the pressures of competitive capitalism is an open question, but it is not one that should be conflated with lying *per se*. There can be an ethical good in being economical with the truth. In macro policy it makes no sense to confirm a run on a currency or confirm some policy that relies on surprise for its effectiveness but has been leaked (such as currency devaluation). Equally, rules cannot be overly general across economy – there are good reasons why the police don't work on commission. What is certain is that orthodoxy adds nothing constructive to the debate on markets as rule systems. It does not lie, but it is false. A lie in social science, like honesty in politics, is usually found out and punished. But false knowledge has a life of its own. Ironically, one wonders, therefore, if Keynes is entirely correct in his sentiment when he argues, 'you can't convict your opponent, you can only convince him.'[22]

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[21] J. O'Donnell, 'Enron's 'tricks plunged California into darkness'', *The Sunday Times Business* October 6th 2002.
[22] Thanks to Vicky Chick for reminding me of the quote from Keynes used in the conclusion.

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What is Neoclassical Economics?

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1. Introduction

There is nothing more frustrating for critics of neoclassical economics than the argument that neoclassical economics is a figment of their imagination; that, simply, there is scientific economics and there is speculative hand-waiving (by those who have never really grasped the finer points of mainstream economic theory). In this sense, neoclassicism resembles racism: while ever present and dominant, no one claims to be guided by it. Critics must find a clear definition of neoclassicism if only in order to liberate neoclassical economists from the temptation to barricade themselves behind infantile arguments viz. the non-existence of their school of thought. Then, the good debate may begin.

In this chapter, we offer a definition of neoclassical economics which turns on three crucial axioms and which, in conjunction with one another, as we shall claim, underpin *all* (and *only*) neoclassical theory.[1] Later, we argue that these very axioms are simultaneously responsible for: (a) the difficulty mainstream economics faces when it comes to illuminating economic and social reality, and (b) the discursive success of neoclassical economics which gives it an effective (politically driven) stranglehold over alternative modes of economic reasoning.

We think our definition of neoclassical economics is important because critics are often caught off-guard by sophisticated neoclassicists (see Dasgupta, 2002) who take advantage of gaps in existing definitions in order to turn criticisms on their head. In short, the critique of neoclassical economics is bound to be as effective as sophisticated is its definition of the opposition. For instance, criticism that neoclassical economics necessarily posits hyper-rational bargain-hunters, never able to resist an act which brings them the tiniest increase in expected net returns, is apt but not telling. There are plenty of neoclassical models featuring boundedly rational agents; even utterly irrational ones (e.g. evolutionary game theory; for a critical review in the spirit of this chapter, see Hargreaves-Heap and Varoufakis, 2004). Similarly with criticism focussed on 'neoclassical features' like market-clearing, *selfish* individualism or Pareto optimality. None of these cut ice because, though these features are usually present in neoclassical modelling, they are not *necessary* features of some neoclassical model.

[1] See Aspromourgos, 1986, for a history of the term 'neoclassical economics'.

Thus, as long as critics' slings and arrows are directed against features of neoclassical economics that the latter can shed strategically, like a threatened lizard 'loses' its tail, they shall miss their target. Nevertheless, we do believe that there are at least three features of neoclassical economics that cannot be so shed; and, therefore, if the critics concentrate on them they shall, at the very least, force neoclassicists to engage in a fruitful dialogue. The single most promising prize from such a development ought to be the clarification of the origin and nature of the greatest paradox in social science: that *mainstream economics is as dominant as it is unappetising* (even to some of its own practitioners).

In this sense, our axiomatic definition of neoclassicism, rather than being an idle methodological exercise, aims at exposing the root-cause of mainstream economics' failure to say much that is helpful about the contemporary economic world. And it throws useful light on the reasons why such failure, instead of weakening neoclassicism, has reinforced its hold over the imagination of both the elites and the public at large. However, this is a longer argument which we shall only touch upon here (see Arnsperger and Varoufakis, 2005, for more).

Once upon a time, it could be argued that neoclassical economics is typified by a familiar melange of theoretical practices: positing an equilibrium in the labour market, the habitual recourse to Say's Law, the assumption that the interest rate will adjust automatically so as to equalise investment and savings, the depiction of capitalist growth *a la* Robert Solow and company, the imposition of Cobb-Doublas or CES production and utility functions etc. Nowadays, any attempt to define neoclassicism by reference to these practices is music to the neoclassical ear: For there is an endless list of mainstream models which distance themselves from some, if not all, of the above. One of two conclusions appear in front of us: Either the mainstream has moved on from neoclassicism (as neoclassical economists claim) or the definition of neoclassicism needs to be re-thought and abstracted from a list of neoclassical practices like the one above. We choose and latter. So, the remainder of this chapter concentrates primarily on the three axioms which we think lie at the heart of neoclassical economic theory, old and new alike.

2. The first axiom of neoclassical economics: methodological individualism

Unsophisticated critics often identify economic neoclassicism with models in which all agents are perfectly informed. Or fully instrumentally rational. Or excruciatingly selfish. Defining neoclassicism in this manner would perhaps be apt in the 1950s but, nowadays, it leaves almost all of modern neoclassical theory out of the definition, therefore strengthening the mainstream's rejoinders. Indeed, the last thirty years of neoclassical economics have been marked by an explosion of models in which economic actors are imperfectly informed, sometimes other-regarding, frequently irrational (or boundedly rational, as the current jargon would have it) etc. In short, *Homo Economicus* has evolved to resemble us more.

None of these brilliant theoretical advances have, however, dislodged the neoclassical vessel from its methodological anchorage. Neoclassical theory retains its roots firmly within liberal individualist social science. The method is still unbendingly of the analytic-synthetic type: the socio-economic phenomenon under scrutiny is to be analysed by focusing on the individuals whose actions brought it about; understanding *fully* their 'workings' *at the individual level*; and, finally, synthesising the knowledge derived at the individual level in order to understand the complex social phenomenon at hand. In short, neoclassical theory follows the watchmaker's method who, faced with a strange watch, studies its function by focusing on understanding, initially, the function of each of its cogs and wheels. To the neoclassical economist, the latter are the individual agents who are to be studied, like the watchmaker' cogs and wheels, independently of the social whole their actions help bring about.

So, the first feature of the 'body of theory' we think of as neoclassical is its ***methodological individualism***: the idea that socio-economic explanation must be sought at the level of the individual agent. Note two things: First, this was not the method of classical economists like Adam Smith and David Ricardo. Or, indeed, of Keynes. Or Hayek. Secondly, this proclivity is fully in tune with the mid-19th Century Anglo Celtic liberal individualism (though the opposite does not hold) as it imposes axiomatically a strict separation of structure from agency, insisting that socio-economic explanation, at any point in time, must move from agency to structure, with the latter being understood as the crystallisation of agents' past acts. We shall argue later that this strict separation is central in not only defining but also undermining the most recent claims of neoclassicism.

It is, we think, indisputable that all the new manifestations of what we term neoclassicism still subscribe to methodological individualism. While it is true that mainstream economists have, during the last few decades, acknowledged that the agent is a creature of her social context, and thus that social structure and individual agency are messily intertwined, their models retain the distinction and place the burden of explanation on the individual. Individual worker effort is nowadays often modelled as a function of sectoral unemployment (e.g. efficiency wage models), and the firms' micro-strategies reflect the macroeconomic environment. Nevertheless, and despite these interesting linkages between the micro-agent and the macro-phenomenon, the explanatory trajectory remains one that begins from the agent and maps, unidirectionally, onto the social structure.

3. The second axiom of neoclassical economics: methodological instrumentalism

We label the second feature of neoclassical economics ***methodological instrumentalism***: all behaviour is preference-driven or, more precisely, it is to be understood as a means for maximising preference-satisfaction.[2] Preference is given, current, fully determining, and strictly separate from both belief (which simply helps the agent predict uncertain future outcomes) and from the means employed. Everything we do and say is instrumental to preference-satisfaction so much so that there is no longer any philosophical room for questioning whether the agent will act on her preferences. In effect, neoclassical theory is a narrow version of consequentialism in which the only consequence that matters is the extent to which an homogeneous index of preference-satisfaction is maximised.[3]

Methodological instrumentalism's roots are traceable in David Hume's *Treatise of Human Nature* (1739/40) in which the Scottish philosopher famously divided the human decision making process in three *distinct* modules: Passions, Belief and Reason. Passions provide the destination, Reason slavishly steers a course that attempts to get us there, drawing upon a given set of Beliefs regarding the external constraints and the likely consequences of alternative actions. It is not difficult to see the lineage with standard microeconomics: the person is defined as a bundle of preferences, her beliefs reduce to a set of subjective probability density functions, which help convert her preferences into expected utilities, and, lastly, her Reason is the cold-hearted optimiser whose authority does not extend beyond maximising these utilities. However, it is a mistake to think that Hume would have approved. For his Passions are too unruly to fit neatly in some ordinal or expected utility function. It took the

[2] Not to be confused with actual, psychological satisfaction. In this sense, homo economicus may maximise his preference satisfaction while feeling suicidal.

[3] Once upon a time, we could have instead talked of *methodological rationalism* as the dominant narrative centred on agents acting rationally. But since ordinal utilitarianism took over, there is no sense in narrating behaviour in terms of agents acting rationally. Instead, rationality is reduced to the consistency of one's preference ordering which, by definition, determines that which agents will do.

combined efforts of Jeremy Bentham and the late 19th Century neoclassicists to tame the Passions sufficiently before they could initially be reduced to a unidimensional index of pleasure before turning into smooth, double differentiable utility functions.

During the tumultuous 20th Century, neoclassicists invested greatly in bleaching all psychology out of the rational agent's decision making process. All hints of a philosophical discussion regarding the rationality of *homo economicus* were thus removed. People could, and 'should', be modelled *as if* they possessed consistent preferences which guide their behaviour automatically. The question of whether all rational women and men are condemned to maximise some utility function all the time became…nonsensical. Thus, instrumentalism lost its connection to the philosophies of Hume, Bentham or Mill and became a technical move that economists made instinctively with the same nonchalance as that of an accomplished artist preparing his oils and canvass before getting down to business.

However, it is false to claim that this state of affairs, even though ubiquitous in economics departments the world over, is *essential* for neoclassical economics. The first signs that it need not be came with the literature on endogenous preferences. Neoclassical economists increasingly sought to distance themselves from the assumption that preferences are fixed and exogenous. During the past twenty five years or so, *homo economicus* has developed a capacity to adapt his preferences in response to past outcomes (see Bowles, 1998). However, while the assumption that current preferences are exogenous was dropped, they remained fully determining. Thus, instrumentalism was preserved albeit in a dynamic context.

A more recent development has taken neoclassicism, and *homo economicus*, onto higher levels of sophistication. The advent of psychological game theory (see Rabin, 1993, and Hargreaves-Heap and Varoufakis, 2004, Ch. 7) has brought on a reconsideration of the standard assumption that agents' current preferences are separate from the structure of the interaction in which they are involved. Suddenly, what one wants hinged on what she thought others expected she would do. And when these second order beliefs (her beliefs about the expectations of others) came to depend on the social structure in which the decision is embedded, the agent's very preferences could not be linked just with outcomes: they depended on the structure and history of the interaction as well.

In view of the above, there is no future in criticisms of neoclassicism based on the charge that the latter must take for granted preferences which are either exogenous or independent of the agents' socio-economic relationships. Critics toeing that line will be met with the scornful rejoinder that they criticise out of ignorance. However, our point that neoclassicism is still rooted in methodological instrumentalism cannot be so dismissed. For even in the latest reincarnation provided by endogenous preferences and psychological game theory, *homo economicus* is still exclusively motivated by a fierce means-ends instrumentalism. He may have difficulty defining his ends, without firm beliefs of what means others expect him to deploy, but he remains irreversibly ends-driven.

4. The third axiom of neoclassical economics: methodological equilibration

The third feature of neoclassical economics is, on our account, the ***axiomatic imposition of equilibrium***. The point here is that, even after methodological individualism turned into methodological instrumentalism, prediction at the macro (or social) level was seldom forthcoming. Determinacy required something more: it required that agents' instrumental behaviour is coordinated in a manner that aggregate behaviour becomes sufficiently regular to give rise to solid predictions. Thus, neoclassical theoretical exercises begin by postulating the agents' utility functions, specifying their constraints, and stating their 'information' or 'belief'. Then, and here is the crux, they pose the standard question: "What

behaviour should we expect *in equilibrium*?" The question of whether an equilibrium is likely, let alone probable, or how it might materialise, is treated as an optional extra; one that is never central to the neoclassical project.

The reason for the axiomatic imposition of equilibrium is simple: *it could not be otherwise*! By this we mean that neoclassicism cannot demonstrate that equilibrium would emerge as a natural consequence of agents' instrumentally rational choices. Thus, the second best methodological alternative for the neoclassical theorist is to *presume* that behaviour hovers around some analytically-discovered equilibrium and then ask questions on the likelihood that, once at that equilibrium, the 'system' has a propensity to stick around or drift away (what is known as 'stability analysis').

It is quite remarkable that the above has been with us since the very beginning. When A.A. Cournot constructed the first model of (oligopolistic) competition in 1838, he immediately noticed a lacuna in his explanation regarding the emergence of an equilibrium. Rather cunningly, instead of discussing this difficulty, he studied what happens when we begin from that equilibrium. Would the system have a tendency to move away from it or was the equilibrium stable? The proof of its stability secured his place in the pantheon of economic theory. Moreover, it established this interesting practice: First, one discovers an equilibrium. Second, one assumes (axiomatically) that agents (or their behaviour) will find themselves at that equilibrium. Lastly, one demonstrates that, once at that equilibrium, any small perturbations are incapable of creating centrifugal forces able to dislodge self-interested behaviour from the discovered equilibrium. This three-step theoretical move is tantamount to what we, here, describe as *methodological equilibration*.

Note that *methodological equilibration* is equivalent to avoiding (axiomatically) what ought to be the behaviourist's central question: *Will rational agents behave according to the theory's equilibrium prediction?* Instead, the question becomes: *If rational agents are behaving according to the theory's equilibrium prediction, will they have cause to stop doing so?* Note also that *methodological equilibration* has remained intact since 1838 and Cournot's first use of it. To see this, consider the two great success stories to have come out of neoclassical economics since WW2: *General Equilibrium Theory* and *Game Theory*. In neither case does the equilibrium solution spring naturally from the models' assumptions.

In *General Equilibrium Theory* its best practitioners state it quite categorically: convergence to some general equilibrium can only be proven in highly restrictive special cases. More generally, it is not just *difficult* to demonstrate that a system of theoretical markets will generate an equilibrium in each market, on the basis of rational acts on behalf of buyers and sellers; rather, it is *impossible*! (See Mantel, 1973, and Sonnenschein, 1973,1974.) In *Game Theory* the same result obtains: in the most interesting socio-economic interactions (or games) common knowledge that all players are instrumentally rational seldom yields one of the interaction's Nash equilibria. Something more is required to bring on an equilibrium. That something comes in the form of an axiom that the beliefs of all players are *consistently aligned at each stage of every game* (see Hargreaves-Heap and Varoufakis, 2004, Chapters 2&3). This assumption is, of course, yet another reincarnation of *methodological equilibration*: for once we *assume* that agents' beliefs are systematically and consistently aligned, they are *assumed* to be in a state of (Nash) equilibrium. Yet again, equilibrium is imposed axiomatically before stability analysis can test its susceptibility to perturbations. Cournot's spirit lives on…

5. Three axioms, one neoclassical economics

It is hard to imagine how any standardly trained economist could deny that her theoretical practices digress from the three methodological moves mentioned above: *Methodological individualism*,

methodological instrumentalism and *methodological equilibration*. For simplicity we shall henceforth refer to them as the *neoclassical meta-axioms*. Whether it is general equilibrium theory, evolutionary game theory, non-Walrasian equilibrium theory, social choice theory, industrial economics, economic geography, new political economy, analytical Marxism, public choice economics etc., all mainstream approaches in these fields remain loyal to the three meta-axioms above.

In fact, the meta-axioms are beginning to develop much closer, almost symbiotic, links with one another than was the case until fairly recently. Take for instance, the attempts by psychological game theorists to create a sophisticated model of men and women, capable of drawing utility not only from socio-economic outcomes but also from the means that bring them about. When *homo economicus* learns that the ends do not necessarily justify the means, he develops a welcome capacity to ponder, prior to acting, what others expect of him so that he can decide how much he values the various alternative outcomes.

For example, when deciding on whether to act bravely in defence of someone in need, his second order beliefs (i.e. his beliefs regarding what others expect of him) influence his estimate of the (psychological) cost of acting selfishly. To put it simply, his utility function cannot be defined independently of (a) the *structure* of the strategic interaction and (b) the beliefs that all participants would have *in equilibrium*. In this sense, *methodological equilibration* is no longer prior to *methodological instrumentalism* (as is the case in standard consumer or game theory): the axiomatic imposition of equilibrium is not only necessary in order to predict the interaction's outcome but it is also essential in order to define the instrumentally rational agents' preferences! (See Hargreaves-Heap and Varoufakis, 2004, Ch. 7 and Fehr and Gächter, 2000)

It is, therefore, uncontroversial to state that every aggregate phenomenon scrutinised by neoclassical minds is explained increasingly and exclusively as some axiomatically imposed equilibrium emerging from the interaction of instrumentally rational individuals who are either optimising consciously (as in rational choice or game theory) or are drawn to such behaviour through a process of 'natural selection' (as in, for instance, evolutionary game theory). The bottom line, then, is clear: despite all denials, there *is* such a thing as a body of social theory that subscribes to the three meta-axioms above and which we can legitimately, for want of a better term, label *neoclassical*.

At this juncture, there is one move open to neoclassical economists who still insist that what they are doing ought not be labelled as anything other than scientific economics: they need to persuade us that the neoclassical method, i.e. models based on the three meta-axioms, is the only proper method; which obviously implies that there is no distinctly neoclassical method after all, even once that method has been characterised as above.

Effectively, they would have to adopt a rather extremist defensive posture: to claim that the combination of the three meta-axioms above is indispensable to any economic theory worth its salt; that the neoclassical method, as founded on the triptych of individualism, instrumentalism and equilibration, is not just one possible analytical strategy but that it is somehow *uniquely and ontologically grounded in social reality*. It would amount to a claim to the effect that all other economic approaches, including for instance Adam Smith's, is not in the same scientific league as their own. Undoubtedly, many neoclassical economists think that (although few would state it in polite conversation.)

Nonetheless, the truth status of that defence must be an empirical matter rather than a methodological one, and the defender of neoclassicism has to provide hard evidence concerning the actual, material processes of (a) how preference orderings determine actions uniquely, and (b) how their reasoning skills, or social/natural selection, slice through indeterminacy to bring about an equilibrium. Needless to

say, such extreme naturalism has no chance of being empirically supported. Even sophisticated empiricists like Karl Popper rejected the idea that the joint hypothesis of individualism and equilibrium can be tested empirically; they are, he rightly claimed, *preconditions for* knowledge rather than *objects of* knowledge. Hence there is no such thing as a 'natural method'. The very thrust of the Enlightenment project rules it out of court.

The last resort of the mainstream economist, who wants to defend the presumption that the three neoclassical meta-axioms are essential to any scientific analysis of the social economy, is to argue that the neoclassical method of explanation, while not being a 'natural method', has nevertheless *evolved* historically as the *most adequate* method for studying a society of free, enlightened individuals. That it is, in short, the only non-contradictory embodiment of the Enlightenment project itself. That, just as representative liberal democracy is a bad system of government but remains the best one available, neoclassicism has evolved as the best economic analysis that is consistent with the liberal human condition.

However, such a rhetorical strategy can only work if it is accompanied with a sound evolutionary argument depicting the three meta-axioms as the unique 'attractor' of liberal social science. Unfortunately, no such argument seems to be forthcoming. Instead, mainstream economics is perpetually reproducing itself through a series of metamorphoses that Ovid would have been jealous of. The resulting models gain in complexity, expand in scope, and move into areas hitherto untainted by the economist' inquiring gaze. Nonetheless, all these models, in all their multiplying guises, share a well-hidden, and almost completely unspoken of, foundation: the three meta-axioms above. The radical absence of a debate about them is, we shall argue below, essential to the discursive power of neoclassical economics. As for the latter's aversion to pluralism, it is a natural by-product of this dance of veils whose purpose is to maintain neoclassicism's discursive edge by keeping our eyes off the theory's meta-axioms.

6. Some thoughts on neoclassicism's discursive power and its aversion to pluralism

What does an intelligently dispassionate observer of neoclassical economics see? She sees an ever expanding technical literature, most of which she cannot comprehend. She sees an almost infinite series of mathematical models that explain diverse socio-economic phenomena as part of some equilibrium scenario which posits autonomous actors bringing on the phenomenon under study, often supra-intentionally, through choices that are rational given everyone's beliefs (even when the actions are self-defeating). She sees a series of career paths that are made generously available to those who participate in this global research project. She sees economists the world over being taken seriously only to the extent that they speak this particular 'language'. She sees the powers-that-be speak this very 'language'. Finally, she sees enterprising academics in other social sciences adopting this 'language', in a transparent bid to share into neoclassicism's discursive success. In short, the onlooker sees, correctly, power oozing out of the mainstream economists' theoretical practices. There is only one thing she does *not* see: the three meta-axioms, none of which are visible to the naked eye.

Note how instrumental to the discursive power of neoclassicism is the fact that its three foundational axioms are hidden from our onlooker's view. For if they were evident, she might start asking difficult questions for which, as we argued above, neoclassicism has no real answers (except to re-phrase its axioms). This helps explain, in more than one ways, the authoritarian dynamics and the disdain shown toward pluralism of Economics Departments which have either managed to rank highly within mainstream economics or are striving to do so.

We suggest that there are two equally important types of explanation of neoclassicism's evolution into an authoritarian research project that discourages pluralism: One is a type of *intentional explanation* while the second is a *functional explanation*. The intentional explanation is simple enough and runs as follows: When an inquisitive graduate student, or academic, who has mastered neoclassical technique but has started developing doubts, starts questioning the meta-axioms, she is effectively questioning the hegemony of her profession. At best, her queries and arguments are met with sympathetic nods, at worst with a great wall of dogmatic put down lines and an avalanche of advice to the effect that these are matters that she ought to worry about after retirement. Publishing in the 'good' journals is hard enough. Publishing articles which question the meta-axioms is even harder. Indeed, it takes a foolhardy young soul to jeopardise a hard-earned career path in pursuit of the truth-status of one or more of the meta-axioms which allow the profession to flood the journals with mathematical models that are so highly regarded and so little discussed. And as is so often the case with dominant paradigms, self-censorship is the predominant vehicle for neoclassicism's unimpeded march.

The functional explanation adds an interesting twist to the same tale of intellectual authoritarianism. If phenomenon X is functionally to explain the occurrence of phenomenon Y, this explanation has merit if and only if the following four conditions are met (see Elster, 1982): (1) Y must be beneficial for some group of agents Z. (2) Members of group Z must be responsible for the practices that cause X but must not intend to bring Y about through practices that result in X; indeed, Z members must remain innocent of the causal link between X and Y. Lastly, (3) phenomenon Y, which is caused by X, must be shown to reinforce X through a feedback mechanism involving, unintentionally, members of group Z.

In our case, Y is the discursive power of neoclassical economics, X are the practices which keep neoclassicism's meta-axioms hidden, and Z is the set of neoclassical economists. Can a convincing functionalist explanation of how X causes Y be built along the lines sketched above? If it can, then we shall have an interesting (and possibly correct) explanation of why pluralism is absent from Economics Departments: its radical absence, which is guaranteed when an eerie silence engulfs the three neoclassical meta-axioms, emerges as a *prerequisite* for neoclassicism's dominance. Let us now put together the basic elements of such an explanation.

Before we proceed further, it is important to note that the merit of this functional explanation is that it is entirely consistent with a distaste for conspiracy theories. As it will transpire shortly, the offered explanation does not presume neoclassical economists in cynical pursuit of discursive power; no theorists are imagined who silence subversive voices within the profession so as to preserve the power vested in them by their models [see part (2) of the argument above which rules out such intentional cynicism]. In fact, our explanation works better when most neoclassical economists would have been (honestly) appalled at the thought that we suspect their practices as driven by anything other than scientific rigour. From experience, we can confirm that most neoclassicists believe strongly in the theoretical superiority of their models and may even have a moral commitment to pluralism. Nevertheless, even if we accept that these fine sentiments are all pervasive in the economics profession, our argument still stands.

To render coherent the functional explanation of neoclassicism's discursive power as the result of a general 'silence' regarding the three meta-axioms at the bottom of all neoclassical theory, we needed three arguments: The first [see (1) above] is that neoclassicism's power is beneficial for neoclassical economists (this is self-evident). The second [see (2)] is that neoclassical economists are innocent of the charge that they are keeping quiet on the three meta-axioms intentionally, so as to enhance their method's discursive power (we accept, therefore, their own denials that they would have conceivably done such a thing). The third piece of the jigsaw [see (3)] is the crucial one: we must now demonstrate

that “phenomenon Y, which is caused by X, reinforces X through a feedback mechanism involving, unintentionally, members of group Z”.

In other words, it must be argued convincingly that the enhancement of neoclassicism’s discursive power, which is largely due to the hidden nature of its three meta-axioms, makes it *even less likely* that neoclassical economists will be open to a pluralist debate on their meta-axioms. Anyone who has worked in an Economics Department has surely experienced such a feedback mechanism. Research funding in economics is vast compared to the trickle that finds its way to the ‘other’ social sciences. It would not be forthcoming if economists regularly experienced philosophical angst regarding the axiomatic foundations of their wares. Naturally, the bulk of the profession’s funding goes to practitioners who do not indulge in methodological debates; who simply ‘get on with the job’. No one wants to keep quite on the meta-axioms. They are just too busy building magnificent edifices on top of them, and being magnificently rewarded for it.

Nobel laureate Vernon Smith almost apologised, in a recent article (see Smith, 2002), for entering into a methodological discussion of the work he devoted an extremely productive life to. This is typical of the fear of methodological discussion instilled in the best and even the most liberal minds in the economics profession. By whom? By no one is the honest answer. The death of pluralism in economics is a crime without a criminal. It died long ago as a result of a particular dynamic within the profession which, operating behind the backs of even neoclassical economists, encourages them to produce all sorts of models (even of altruism and revolution, see Roemer, 1985) but surreptitiously penalizes any deviation from, or even explicit discussion of, the three meta-axioms.

Of course, the pressing question is: *Why are public and private funds so uncritically lavished upon what turns out to be no more than a religion with equations?* Alas, this is a question that the present chapter cannot answer within a purely methodological context. For such an explanation we need to venture into political economy (see Arnsperger and Varoufakis, 2005, for an attempt).

Epilogue

Neoclassical economics, despite its incessant metamorphoses, is well defined in terms of the same three meta-axioms on which *all* neoclassical analyses have been founded since the second quarter of the 19th Century. Moreover, its status within the social sciences, and its capacity to draw research funding and institutional prominence, is explained largely by its success in keeping these three meta-axioms well hidden. The radical lack of pluralism in mainstream economics is, on this account, not to be blamed on illiberally minded practitioners. Rather, it is to be explained in evolutionary terms, as the result of practices which reinforce the profession’s considerable success through diverting attention from the models’ axiomatic foundations to their technical complexity and diverse predictions. A pluralist economics will remain impossible as long as the social economy rewards economists in proportion to their success in keeping their models’ foundations opaque.

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A financial crisis on top of the ecological crisis: Ending the monopoly of neoclassical economics

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Introduction

A number of unsustainable trends, such as those related to climate change, biological diversity, environmental pollution, depleting fish stocks, deforestation, accumulating radioactive waste threaten people in different parts of the world and globally. In addition to this we are experiencing a financial crisis. Something appears to be seriously wrong with the mental maps of influential actors in different parts of the world. In both cases of crisis, the tendency is to blame market actors for their greediness and risk behavior or national governments for the lack of relevant regulation, or both.

I will here argue that among potential explanatory factors we also need to include ideas about the role of science in society, paradigms in economics, established political ideologies (and other ideologies) as well as institutional arrangements. This means that also science and universities are involved. It is argued that the monopoly position of neoclassical economics at university departments of economics has played a significant role by influencing the mental maps of many actors and making them more legitimate. Even the so called Nobel Prize in economics is part of this picture.

Economics as a socially constructed language

Traditionally, science has been seen as being separate from politics. Positivism as a theory of science has dominated the scene to the exclusion almost of other perspectives. Science is then about searching for the truth, and what is thought of as reliable knowledge is provided to colleagues in the scientific community, politicians and other actors in society through educational activities, books, articles, research reports etc. The positivistic tradition is one where the scholar is standing outside observing what goes on in society, formulating and testing hypotheses. The scholar is responsible mainly to the scientific community. It is a limited responsibility doctrine.

But positivism is only one of many theories of science. Brian Fay has coined the term ‘perspectivism’ (1996) to counteract the idea that only one theory of science and one disciplinary paradigm at a time represents the ‘truth’. Normally there exists more than one relevant vantage point and perspective in relation to a specific category of phenomena. Viewing reality from a second perspective often adds to the understanding offered by the first.

While objectivity is celebrated as part of positivism, the role of subjectivity and ideology is seriously considered as part of some of the alternative or complementary theories of knowledge. In hermeneutics (Ricoeur 1981), 'interpretation' is a key concept and as human beings we largely interpret the world through our languages. And languages can be regarded as objectively existing phenomena but also as being 'socially constructed' (Berger and Luckman 1966). Mainstream neoclassical economics is a standardized language that claims to be helpful in understanding the world. Standardized or not; each language points in specific directions concerning relevant objects, relationships, processes etc. to focus upon. The language is socially constructed for specific purposes, for instance to deal with specific problems in specific ways. Neoclassical economics, as an example, is specific not only in 'scientific' but also in 'ideological' terms. 'Ideology' stands for a 'means-ends philosophy' and is not limited to more or less established political ideologies like socialism, social democracy, social liberalism or neo-liberalism. In this sense, neoclassical economics clearly qualifies as an ideology and as such is more specific and precise than the political ideologies mentioned.

Neoclassical economics tells us about the relevant actors in the economy (consumers, firms and government); about how to understand markets (supply and demand of commodities and of factors of production); about decision-making (optimization) and efficiency (usually a monetary concept or at best cost-efficiency). This way of understanding economics is clearly not neutral but specific in ideological terms. Gunnar Myrdal has argued that "values are always with us" (1978 p.778) in social science research and in my understanding "economics is always political economics". This suggests that the neoclassical attempt to develop a 'pure' economics from about 1870 onwards as opposed to 'political economics' (which was the language used by classical economists) was a mistake. At issue is now whether neoclassical theory as a conceptual framework and ideological orientation is useful in dealing with the ecological crisis and/or the financial crisis.

The ideological features of neoclassical economics also suggest that it becomes relevant to inquire into the similarities between neoclassical economics as ideology and the established political ideologies referred to. Has neoclassical economics contributed, for example, to make neo-liberalism more legitimate? Alternatives to the neoclassical conceptual framework and paradigm, such as some version of institutional economics, feminist economics or ecological economics are equally specific in ideological terms but may perform better in relation to the ecological crisis and/or the financial crisis. This is – again – a matter of subjective judgment. The important thing now in economics is to open the door for pluralism and competing (or complementary) theoretical perspectives and approaches.

Normal imperatives of democracy are applicable

Understanding that economics is socially constructed and specific in ideological/political terms suggests that economics can be manipulated for specific purposes. Economists and departments of economics are part of society and specific actors and interest groups within the academia and outside it may use their power to change economics in specific directions or to support a status quo 'business-as-usual' position for the discipline. Such pressures in different directions cannot be avoided but since ideology and politics are involved, it follows that actors both within and outside universities should observe normal imperatives of democracy. If economics is political economics then democracy will inform us about the rules of the game. In a democratic society, there are normally more political parties than one and many more ideological orientations are represented among citizens than those internalized into political parties. This suggests that the conceptual and ideological pluralism that exists in society should to some extent be reflected in our ways of doing research and teaching economics.

It appears fair to argue that the present situation at university departments of economics in Western countries (and other countries as well) is far from such a desired state of affairs. Education and research is limited to one paradigm – the neoclassical one. Rather than democracy, one may speak of dictatorship where only one theoretical perspective with connected ideology is permitted. Neoclassical economists celebrate freedom of choice and are against 'protectionism' but protect their own theoretical perspective vigorously. They point in the direction of competition as good for society but paradoxically defend the neoclassical monopoly; they see the 'opportunity cost principle' as central to their message but do not want to apply this principle at the level of paradigms; When discussing portfolio investments, they repeatedly tell us that it may be unwise to put "all eggs in one basket" but have themselves neglected this wisdom. A more pluralistic economics might have saved us from some of the problems that we now experience.

Democracy is also about the responsibilities and accountability of each actor in society. The limited liability doctrine (of positivism) where economics is only about science and truth is comforting, but no longer valid. As economists we should instead be ready to admit and discuss our ideological orientations and how we can deal with them while working systematically in research and education. It turns out that the rules of democracy will supply some of the criteria for good research. A department of economics that has taken important steps in a pluralistic direction will be a stronger and more legitimate department.

Neoclassical economics and the sustainability crisis

As mentioned in the introduction, a number of unsustainable trends concerning the state of the environment can be observed and have been widely reported. The status of individuals in terms of health and poverty is another concern of sustainable development. Inequality in terms of monetary income and financial position appears to be increasing. At issue is whether or not neoclassical economics is helpful in dealing with the sustainability crisis. Hopefully some ideas from neoclassical economics are useful but what about other theoretical perspectives in economics? How can they contribute? Is the present monopoly for neoclassical economics justified?

One 'hypothesis' is that neoclassical economics is closely connected with a 'business-as- usual' attitude to development, and that present unsustainable trends are largely explained by this business-as-usual strategy and ideology. Neoclassical 'environmental economics', an extension of neoclassical theory, attempts to deal with sustainability issues by merely modifying the present political-economic system. But it seems unlikely that this is enough. In my understanding, the UN, the EU, Sweden as a nation, various regions and cities, etc. have adopted sustainable development as something new with openings for more radical changes and I will now try to point to my understanding of this newness. A number of questions that I believe are relevant for a dialogue about sustainable development will be formulated. I will point to how these issues are dealt with within the scope of neoclassical economics and then indicate a political economics approach to sustainability, so called 'sustainability economics' (Söderbaum 2008) that I believe is more useful.[27]

[27] I came across the term 'sustainability economics' for the first time as part of a project at the *Deutsches Institut für Wirtschaftsforschung*, DIW, (www.sustainabilityeconomics.de) in 2003. The German Ministry of Education and Research had turned to DIW, Berlin, a neoclassical economics research institute, arguing that neoclassical economics is inadequate for sustainable development. DIW was urged to respond to this challenge and arranged a number of workshops with ecological economists and others. It is not clear whether this project had any lasting impacts on the research work of the institute.

What are the relationships between 'economics' and 'politics'?

Neoclassical response: Economics and politics can and should be separated. A value-neutral, 'pure' economics is possible

Sustainability economics perspective: Economics is always political economics. It is an illusion that economics can be separated from politics and ideology. Each theoretical perspective in economics is specific not only in scientific but also in ideological terms. Limiting economics to one paradigm, for example the neoclassical one, is contrary to normal ideas of democracy. Since there is a diversity of ideological orientations in society, some part of this diversity should be reflected in research and education at universities. Limiting education to one paradigm at university departments of economics means that these departments acquire a role as political propaganda centres. This is essentially the situation we are facing today.

Who are the relevant actors in the economy?

Neoclassical response: 'Consumers' and 'firms' are the relevant actors and they are connected by markets for commodities and factors of production. In addition, the national government is an important actor regulating markets, raising taxes etc.

Sustainability economics perspective: The sustainability crisis concerns individuals in all their roles and not just in their role as consumer and other market-related roles. The individual is also a parent, a professional and a citizen. Firms or business organizations participate in the development dialogue but so do actors connected with universities, environmental organizations, churches. Individuals and organizations are regarded as actors participating in the economy and society where the primacy of democracy over market is observed.

What is the role of the national government in the economy and in society?

Neoclassical response: Politics and policy-making is essentially in the hands of the national government. Two categories of policy instruments are available, so called 'command-and-control' instruments and market instruments. Market instruments are generally preferred by neoclassical economists as being more flexible.

Sustainability economics perspective: The national government has a specific and important role in the economy but is only one among policy-makers. All actors in the economy are regarded as policy-makers. The individual is guided by her 'ideological orientation' and understood as a 'political-economic person' (PEP) whereas an organization (the 'firm' included) is assumed to be guided by a 'mission' and understood as a 'political economic organization' (PEO). To reflect this multiple-actor and also a multiple-level perspective (the latter referring to organizational as well as territorial aspects), the term 'governance' is used (see also Bache and Flinders 2004). Relationships between actors in the economy and internationally have to reflect the principles of democracy. Participation, responsibility and accountability are among these ideas of a functioning democracy.

How do we understand the objectives and values of actors in the economy?

Neoclassical response: The individual as consumer is assumed to choose that combination of commodities (within her monetary budget constraint) that maximizes her utility. Consumer preferences are assumed to be given and are in no way questioned by the economist who claims neutrality in this and other respects. A larger income means that the budget will allow more commodities to be bought and a higher level of utility. The organization (which is assumed to be a firm) maximizes monetary profits. The possibility of non-monetary objectives is not discussed. At the macro level, focus is on national accounting and 'economic growth' in GDP-terms and economic growth tends to be seen as the main idea of progress in society. Neoclassical economists themselves sometimes warn against the use of GDP as an indicator of welfare but have little to say about other ideas of progress.

Sustainability economics perspective: As already indicated, it is assumed that the individual is guided by her ideological orientation and the organization by its mission. Neither ideological orientation, nor mission should be understood as a mathematical objective function to be optimized. The ideological orientation is fragmented, uncertain and consists of qualitative, quantitative as well as visual elements and something similar holds for the mission of an organization.

The ideological orientation of individuals as actors and the mission of organizations cannot be dictated by science but is a matter for each actor. Ideological orientation and mission can be modified or change radically over time. The individual may for example more or less internalize the ideas of sustainable development and a business company may focus on narrow interests in terms of profits or 'shareholder value' or internalize some idea of what is now referred to as Corporate Social Responsibility (CSR). Similarly, a university may consider its University Social Responsibility (USR) in relation to the challenge of sustainable development or other demands from the larger society.

An individual is part of many 'we-categories' (Cf. 'I & We Paradigm' in Etzioni 1988) including communities and networks. Relating one's own position to that of larger groups becomes an important part of ethical and ideological considerations. An actor may as part of her ideological orientation consider GDP-growth as more or less important in relation to other ideas of progress in society. This is something to be investigated by the scholar rather than assumed to be given.

What is the role of the monetary dimension in the economy?

Neoclassical response: The consumer is limited by her monetary budget constraint and chooses among commodities characterized by their price (in monetary terms). Firms are assumed to maximize their profits in monetary terms or shareholder value, i.e. the price of company shares. Progress of the national economy is measured in monetary terms (as GDP-growth) and decision-making at the societal level is a matter of monetary calculation in the form of cost-benefit analysis (CBA). This focus on money and monetary analysis has made many individuals as actors think that "economics is about money" and little else.

Sustainability economics perspective: When looked upon from the vantage point of sustainable development, the neoclassical emphasis on the monetary dimension becomes questionable and can be referred to as 'monetary reductionism'. Instead a multidimensional perspective is preferred where the monetary dimension is only a part. The idea that all impacts can be traded against each other is abandoned. Monetary and non-monetary impacts are kept separate and analysis is carried out in profile terms rather than as one-dimensional calculation.

Shifting to a sustainability economics perspective means that non-monetary factors such as ecosystems, natural resources and human resources are as 'economic' as financial or monetary resources. Impacts on ecosystems, land-use, water resources and fish stocks are economic impacts as such (and not only through their implications in the monetary domain). Reference can be made to changes in non-monetary resource positions.

On the non-monetary side, the issues of inertia, path-dependence, irreversibility and connected uncertainties come to the fore and have to be discussed and analysed separately from monetary analysis. House construction on agricultural land is a largely irreversible process that has to be illuminated in non-monetary positional terms (Söderbaum 2008 pp. 106-107) and the same holds for depletion of fish stocks or degradation of water quality.

How is decision-making and efficiency understood?

Neoclassical response: In neoclassical economics, an assumption is made about a specific mathematical objective function to be optimized. The consumer maximizes utility in some sense; the firm maximizes its profits. Cost-benefit analysis is similarly an attempt to maximize in monetary terms at the level of society. Efficiency in neoclassical economics is closely connected with optimality in the mentioned sense. Profits in business, for example, is regarded as an indicator of efficiency.

Sustainability economics perspective: Looking for optimal solutions is a possibility (if all actors concerned agree about an objective function) but is regarded as a special case. The main idea of decision-making is one of 'matching', 'appropriateness' or 'suitability'. The decision-maker is guided by her ideological orientation and this ideological orientation is 'matched' against the expected impact profile of each alternative considered. In relation to a specific decision situation, the ideological orientation of an actor as decision-maker may be sharp or vague and the expected impacts of choosing one specific alternative may be certain or uncertain. This suggests that search activities to further articulate one's ideological orientation, or to reduce uncertainty about impacts, is always an option.

In a decision situation with more than one decision-maker, for example a political assembly, the analyst has to consider those ideological orientations that appear relevant among decision-makers and suggest conditional conclusions based on each of the ideological orientations considered. This information is then supposed to be useful for each decision-maker, for instance as part of voting in a political assembly. The politician will then be responsible for her voting behaviour and other actions.

Science can no longer dictate correct ideas of efficiency for purposes of resource allocation. There may still be some standardized ideas of efficiency such as profits in business but there are always potentially competing ideas. Efficiency within the scope of neoclassical economics is one thing and efficiency in relation to sustainable development another. Eco-efficiency, for example, may refer exclusively to non-monetary variables as in ecological footprints (Wackernagel & Rees 1996). To conclude, efficiency is a matter of the observer's ideological orientation.

How are decisions prepared at the societal level?

Neoclassical response: A distinction is made between welfare theory and applied welfare economics. Welfare theory suggests that welfare is increased if at least one person is made better off as a result of choosing an alternative while no one is losing. Applied welfare theory on the other hand claims to be more useful in practice and is connected with cost-benefit analysis in monetary terms (CBA). Some

individuals may then be losing in monetary terms if only the aggregated impacts are estimated to be positive. Neoclassical economists dictate that current market prices should be used to estimate a so called 'present value' for each alternative considered, thereby excluding other ethical or ideological standpoints. A specific market ideology is applied.

Sustainability economics perspective: A distinction can be made between approaches to societal decisions with respect to degree of aggregation and ideological closed/openness. This leaves us with four categories of approaches:

I. Highly aggregated, ideologically closed
II. Highly aggregated, ideologically open
III. Highly disaggregated, ideologically closed
IV. Highly disaggregated, ideologically open

Neoclassical economics clearly belongs to the first category. Impacts of different kinds and expected for different periods of time are summarized in monetary terms at correct market prices. Category II refers to an approach where impacts are aggregated in one-dimensional terms but prices or other values are open to the judgment of each decision-maker while category III may stand for a multidimensional approach where acceptable performance in each dimension is decided beforehand.

From the point of view of sustainability economics, category IV, highly disaggregated and ideologically open, is judged to be the most relevant and compatible with normal ideas of democracy. Although limited in scope to environmental impacts and often used late in the decision process, Environmental Impact Assessment (EIA) essentially belongs to this fourth category. A more holistic approach (in terms of scope) is 'positional analysis' (PA) which is preferred by the present author (Söderbaum 2008, Brown 2008). The purpose is to illuminate an issue for decision-makers, for example politicians, who differ among themselves with respect to ideological orientation. Actors or interested parties in relation to the issue or decision situation are identified and approached by the analyst to learn about their understanding of the problems faced and how it can be dealt with. Potentially relevant ideological orientations are articulated and alternatives systematically compared with respect to impacts in multidimensional terms. Inertia in the form of, for example irreversible impacts, are illuminated in positional terms. Also conflicts of interest are illuminated. Conclusions (in the sense of ranking alternatives) are conditional in relation to each ideological orientation articulated. As part of sustainability economics, it becomes natural to include an interpretation of sustainable development among ideological orientations.

How is the market and international trade understood?

Neoclassical perspective: A market is understood in terms of supply and demand of single commodities. Monetary costs of producing are related to the price consumers are willing to pay. The market analyst is standing outside watching what goes on. Prices and commodities exchanged are seen as objective phenomena and are never or seldom questioned from ethical points of view. According to this perspective, it does not matter if one market actor is 'successful' in monetary terms by exploiting another actor or if two market actors attempt to be fair in relation to each other in their market interactions. International trade is similarly understood in reductionist terms where one commodity is discussed at a time and where its price is the main consideration. International trade theory furthermore arrives at a conclusion that free trade is good while 'protectionism' (i.e. attempts to protect home industry through tariffs and quotas) is bad.

Sustainability economics perspective: From this point of view, market actors are understood as political economic persons and political economic organizations in their specific social, institutional and ecological context. A market transaction takes place within a social context where the ideological orientation of each market actor plays a role. Emphasis on self-interest, even greediness, is a possibility but so is also fairness or a wish to contribute to sustainability or the common good in some sense. The impacts of a market transaction is understood in multi-dimensional terms and related to activities of different groups of individuals.

A similar analysis is relevant for the international level. Impacts of different kinds can be scrutinized in each of the two trading countries as well as impacts on specific activities and thereby groups of individuals. Given such estimated impacts, it is an open issue and a matter of the observer's ideological orientation whether trade is good or bad for specific parties and for the nations involved. In each of the trading countries, there may be both winners and losers and general assertions about trade as bad or good can seldom be made. Environmental degradation or exploitation of mineral or other natural resources in one country are possible implications of trade and a person as actor may in a specific situation find good reasons to argue that protectionism is a reasonable trade strategy.

How is institutional change understood?

Neoclassical response: Institutional change is largely regarded as a matter of new laws and regulations. Special interest groups may lobby for rules that are favourable for them as suggested by neoclassical public choice theory (Mueller 1979).

Sustainability economics perspective: In general terms, a theory of science, the disciplinary paradigm in economics and more or less established ideologies may make specific institutions legitimate. Neoclassical economics has contributed to make greediness in business and focus on shareholder value legitimate. Simplistic neoclassical international trade theory has similarly made exploitation of people and natural resources legitimate and is reflected in the rules that guide the World Trade Organization (WTO) in their decisions and actions.

At a more specific level, each model used to understand or interpret specific phenomena may be part of a process where existing institutions are strengthened or new institutions emerge. At this level:

- interpretation of a phenomenon
- naming it
- other manifestations of the phenomenon
- acceptance among actors of the interpretation and its manifestations are important partial processes

The profit maximizing firm as a model in neoclassical microeconomics plays a role in making narrow ideas of the purpose of business legitimate. Also existing laws about the joint stock company become more legitimate. A stakeholder model of the business firm opens the door for new thinking in some respects (for example the admittance of tensions and conflicts of interest between individuals as stakeholders and stakeholder groups) and the same is true of the 'political economic organization'. The existence of financial management systems may make some actors realize that 'environmental management systems' (EMS) based on a similar logic is possible. In this way the ideological orientations of individuals a actors and the models they use play a key role in institutional change processes.

Conclusions about the ecological and financial crisis

Climate change is perhaps the most threatening aspect of the ecological crisis but not the only one. Reduced biological diversity, reduced water availability and deteriorating water quality in some regions exemplify other relevant dimensions. On the financial side, the 'market mechanism' has been unable to come up to expectations.

How can these problems be understood? Many factors have certainly contributed but in my judgment neoclassical economics as disciplinary paradigm and neo-liberalism as ideology are among the most important. If actors in society have failed, this can largely be attributed to the mental maps they have used for guidance and these mental maps are largely connected with dominant ideas about economics (as conceptual framework and ideology) and neo-liberalism as a dominant ideology in many circles. Thousands of students, now in professional positions, have learnt neoclassical micro- and macroeconomics over the years and have supported each other and been supported by their professors to further strengthen the neoclassical perspective.

Studying neoclassical economics would have been less of a problem if also alternative theoretical perspectives had been taught at university departments of economics. But the strategy has instead been to strengthen the neoclassical monopoly. It is up to the reader to judge whether neoclassical economics by itself and in combination with neo-liberalism explains some parts of the ecological and financial crisis that we now experience. Since neoclassical economics emphasizes the monetary dimension, one might expect that at least monetary issues are well considered in the paradigm but these days we even doubt if this is the case. Something may be missing in terms of interdisciplinary openings, including social psychology and also ethical considerations.

In any case, neoclassical economists in leading positions should be held responsible and accountable for limiting research and education to one paradigm. As I have argued previously, each paradigm is specific not only in scientific terms (with respect to conceptual framework and theory) but also in ideological terms. Limiting education in economics to one paradigm means that university departments of economics are degraded to political propaganda centres.
A way out of this is to admit that the political aspect is always part of economics and to use a political-economics approach when attempting to respond to the questions asked earlier in this article. Individuals, organizations, markets, decisions, efficiency, assessment of alternatives – all this can be approached in political economic terms.

A political economics approach means a more humble attitude to economics where it is understood and admitted from the very beginning that there are more than one approach to economics. Neoclassical economists have often used their power to eliminate competition concerning professional positions and to reduce choice for students. But outside university departments of economics, the interest in heterodox economics is proliferating. There are social economists, socio-economists, feministic economists, institutional economists, ecological economists, Green economists, even interdisciplinary economists, many of which are openly critical of the neoclassical paradigm.[28] For this reason, a pluralistic strategy at university departments of economics is the only realistic one. A move from neoclassical technocracy to a democratized economics is called for. Since neoclassical economists have become accustomed to their monopoly, such a change will not come about easily.

[28] For an overview, see Fullbrook ed. 2003, 2004, 2007, 2008.

Neoclassical economics may be useful for some purposes but in relation to the challenge of sustainable development, it is – as I have tried to show – probably among the worst possible theoretical perspectives. The emphasis on a monetary dimension is contrary to the perspectives needed to deal seriously with environmental problems. Also the tendency to emphasize the self-interest of all kinds of actors is far from a widening of horizons to also include community interests. The emphasis on markets while downplaying other relations and democracy is a third deficiency of neoclassical economics.

The power game will continue and should not only include orthodox and heterodox economists as actors. Individuals in all kinds of roles are stakeholders and although neoclassical economists often try to hide behind mathematical equations, the language of economics need not be complex. In some sense we all have experiences as economists making decisions with impacts on the future state of affairs for us and for others.

Some neoclassical economists realize that they are in trouble in relation to the present crisis situation. One strategy is to act in a 'pragmatist' or even opportunist way. The Stern Report (2006) is a case in point where the author and his team produce precise figures about the estimated monetary costs as a percentage of GDP for counteracting climate change now compared to waiting and acting at a later point in time. Most people understand that action is urgent but structuring the problem in terms of monetary GDP appears a bit desperate and as much an attempt to save and protect neoclassical theory against competing perspectives.29

I will end this article by pointing to an assumption about heterogeneity in each actor category (Söderbaum 1991). Although sharing the same paradigm, neoclassical economists are not a completely homogenous group. Some participate actively in public debate, such as Joseph Stiglitz (2002) and Paul Krugman which is a positive feature. However, very few of the leading neoclassical economists refer to their own economics as 'neoclassical' (since that would be a first step towards admitting that there may be other kinds of economics) or speak of pluralism as a step forward. Control of journals and awards is another way of protecting the status quo. The Bank of Sweden (Riksbanken) Prize in Economic Sciences in Memory of Alfred Nobel is based on positivism as a theory of science, neoclassical economics and has so far not facilitated a move towards a more pluralistic economics. The ideas of excellence in social science of those in charge of this prize are still far from the political economics perspective advocated here. But this is another story.

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[29] For a critical evaluation of the Stern report, see Spash 2007.

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U.S. "quantitative easing" is fracturing the Global Economy

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> Moreover, it may well be asked whether we can take it for granted that a return to freedom of exchanges is really a question of time. Even if the reply were in the affirmative, it is safe to assume that after a period of freedom the regime of control will be restored as a result of the next economic crisis.
>
> —Paul Einzig, *Exchange Control* (1934).[1]

Great structural changes in world trade and finance occur quickly – by quantum leaps, not by slow marginal accretions. The 1945-2010 era of relatively open trade, capital movements and foreign exchange markets is being destroyed by a predatory financial opportunism that is breaking the world economy into two spheres: a dollar sphere in which central banks in Europe, Japan and many OPEC and Third World countries hold their reserves the form of U.S. Treasury debt of declining foreign-exchange value; and a BRIC-centred sphere, led by China, India, Brazil and Russia, reaching out to include Turkey and Iran, most of Asia, and major raw materials exporters that are running trade surpluses.

What is reversing trends that seemed irreversible for the past 65 years is the manner in which the United States has dealt with its bad-debt crisis. The Federal Reserve and Treasury are seeking to inflate the economy out of debt with an explosion of bank liquidity and credit – which means yet more debt. This is occurring largely at other countries' expense, in a way that is flooding the global economy with electronic "keyboard" bank credit while the U.S. balance-of-payments deficit widens and U.S. official debt soars beyond any foreseeable means to pay. The dollar's exchange rate is plunging, and U.S. money managers themselves are leading a capital flight out of the domestic economy to buy up foreign currencies and bonds, gold and other raw materials, stocks and entire companies with cheap dollar credit.

This outflow from the dollar is not the kind of capital that takes the form of tangible investment in plant and equipment, buildings, research and development. It is not a creation of assets as much as the creation of debt, and its multiplication by mirroring, credit insurance, default swaps and an array of computerized forward trades. The global financial system has decoupled from trade and investment, taking on a life of its own.

[1] Paper presented at the Boeckler Foundation meetings in Berlin, October 30, 2010. I am indebted to Eric Janszen of i-tulip for bringing the Einzig quote to my attention.

In fact, financial conquest is seeking today what military conquest did in times past: control of land and basic infrastructure, industry and mining, banking systems and even government finances to extract the economic surplus as interest and tollbooth-type economic rent charges. U.S. officials euphemize this policy as "quantitative easing." The Federal Reserve is flooding the banking system with so much liquidity that Treasury bills now yield less than 1%, and banks can draw freely on Fed credit. Japanese banks have seen yen borrowing rates fall to 0.25%.

This policy is based on the wrong-headed idea that if the Fed provides liquidity, banks will take the opportunity to lend out credit at a markup, "earning their way out of debt" – inflating the economy in the process. And when the Fed talks about "the economy," it means asset markets – above all for real estate, as some 80% of bank loans in the United States are mortgage loans.

One-third of U.S. real estate is now reported to be in negative equity, as market prices have fallen behind mortgage debts. This is bad news not only for homeowners but also for their bankers, as the collateral for their mortgage loans does not cover the principal. Homeowners are walking away from their homes, and the real estate market is so thoroughly plagued with a decade of deception and outright criminal fraud that property titles themselves are losing security. And despite FBI findings of financial fraud in over three-quarters of the packaged mortgages they have examined, the Obama Justice Department has not sent a single bankster to jail.

Instead, the financial crooks have been placed in charge– and they are using their power over government to promote their own predatory gains, having disabled U.S. public regulatory agencies and the criminal justice system to create a new kind of centrally planned economy in the hands of banks. As Joseph Stiglitz recently observed:

> In the years prior to the breaking of the bubble, the financial industry was engaged in predatory lending practices, deceptive practices. They were optimizing not in producing mortgages that were good for the American families but in maximizing fees and exploiting and predatory lending. Going and targeting the least educated, the Americans that were most easy to prey on.
>
> We've had this well documented. And there was the tip of the iceberg that even in those years the FBI was identifying fraud. When they see fraud, it's really fraud. But beneath that surface, there were practices that really should have been outlawed if they weren't illegal.
>
> … the banks used their political power to make sure they could get away with this [and] … that they could continue engaging in these kinds of predatory behaviours. … there's no principle. It's money. It's campaign contributions, lobbying, revolving door, all of those kinds of things.
>
> … it's like theft … A good example of that might be [former Countrywide CEO] Angelo Mozillo, who recently paid tens of millions of dollars in fines, a small fraction of what he actually earned, because he earned hundreds of millions. The system is designed to actually encourage that kind of thing, even with the fines. … we fine them, and what is the big lesson? Behave badly, and the government might take 5% or 10% of what you got in your ill-gotten gains, but you're still sitting home pretty with your several hundred million dollars that you have left over after paying fines

> that look very large by ordinary standards but look small compared to the amount that you've been able to cash in.
>
> The fine is just a cost of doing business. It's like a parking fine. Sometimes you make a decision to park knowing that you might get a fine because going around the corner to the parking lot takes you too much time.

I think we ought to go do what we did in the S&L [crisis] and actually put many of these guys in prison. Absolutely. These are not just white-collar crimes or little accidents. There were victims. That's the point. There were victims all over the world. … the financial sector really brought down the global economy and if you include all of that collateral damage, it's really already in the trillions of dollars.[2]

This victimization of the international financial system is a consequence of the U.S. Government's attempt to bail out the banks by re-inflating U.S. real estate, stock and bond markets at least to their former Bubble Economy levels. This is what U.S. economic policy and even its foreign policy is now all about, including de-criminalizing financial fraud. As Treasury Secretary Tim Geithner tried to defend this policy: "Americans were rightfully angry that the same firms that helped create the economic crisis got taxpayer support to keep their doors open. But the program was essential to averting a second Great Depression, stabilizing a collapsing financial system, protecting the savings of Americans [or more to the point, he means, their indebtedness] and restoring the flow of credit that is the oxygen of the economy."[3]

Other economists might find a more fitting analogy to be carbon dioxide and debt pollution. "Restoring the flow of credit" is a euphemism for keeping today's historically high debt levels in place, and indeed adding yet more debt ("credit") to enable home buyers, stock market investors and others to bid asset prices back up to rescue the banking system from the negative equity into which it has fallen. That is what Mr. Geithner means by "stabilizing a collapsing financial system" – bailing out banks and making all the counterparties of AIG's fatal financial gambles whole at 100 cents on the dollar.

The Fed theorizes that if it provides nearly free liquidity, banks will lend it out at a markup to "reflate" the economy. The "recovery" that is envisioned is one of new debt creation. This would rescue the biggest and most risk-taking banks from their negative equity, by pulling homeowners out of *theirs*. Housing prices could begin to soar again.

But the hoped-for new borrowing is not occurring. Instead of lending more – at least, lending at home – banks have been tightening their loan standards rather than lending more to U.S. homeowners, consumers and businesses since 2007. This has obliged debtors to start paying off the debts they earlier ran up. The U.S. saving rate has risen from zero three years ago to 3% today – mainly in the form of amortization to pay down credit-card debt, mortgage debt and other bank loans.

Instead of lending domestically, banks are sending the Fed's tsunami of credit abroad, flooding world currency markets with cheap U.S. "keyboard credit." The Fed's plan is like that of the Bank of Japan after its bubble burst in 1990: The hope is that lending to speculators will enable banks to earn their way out of debt. So U.S. banks are engaging in interest-rate arbitrage (the carry trade), currency speculation, commodity speculation (driving up food and mineral prices sharply this year), and buying into companies in Asia and raw materials exporters.

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[2] "Stiglitz Calls for Jail Time for Corporate Crooks," DailyFinance: http://srph.it/aRwI4I, October 21, 2010.
[3] Tim Geithner, "Five Myths about Tarp," *Washington Post*, October 10, 2010.

By forcing up targeted currencies, this dollar outflow into foreign exchange speculation and asset buy-outs is financial aggression. And to add insult to injury, Mr. Geithner is accusing China of "competitive non-appreciation." This is a term of invective for economies seeking to maintain currency stability. It makes about as much sense as to say "aggressive self-defense." China's interest, of course, is to avoid taking a loss on its dollar holdings and export contracts denominated in dollars (as valued in its own domestic renminbi).

Countries on the receiving end of this U.S. financial conquest ("restoring stability" is how U.S. officials characterize it) understandably are seeking to protect themselves. Ultimately, the only way this serious way to do this is to erect a wall of capital controls to block foreign speculators from deranging currency and financial markets.

Changing the international financial system is by no means easy. How much of alternative do countries have, Martin Wolf recently asked. "To put it crudely," he wrote:

> the US wants to inflate the rest of the world, while the latter is trying to deflate the US. The US must win, since it has infinite ammunition: there is no limit to the dollars the Federal Reserve can create. What needs to be discussed is the terms of the world's surrender: the needed changes in nominal exchange rates and domestic policies around the world.[4]

Mr. Wolf cites New York Federal Reserve chairman William C. Dudley to the effect that Quantitative Easing is primarily an attempt to deal with the mortgage crisis that capped a decade of bad loans and financial gambles. Economic recovery, the banker explained on October 1, 2010, "has been delayed because households have been paying down their debt – a process known as deleveraging." In his view, the U.S. economy cannot recover without a renewed debt leveraging to re-inflate the housing market.

By the "U.S. economy" and "recovery," to be sure, Mr. Dudley means his own constituency the banking system, and specifically the largest banks that gambled the most on the real estate bubble of 2003-08. He acknowledges that the bubble "was fuelled by products and practices in the financial sector that led to a rapid and unsustainable build-up of leverage and an underpricing of risk during this period," and that household debt has risen "faster than income growth … since the 1950s." But this debt explosion was justified by the "surge in home prices [that] pushed up the ratio of household net worth to disposable personal income to nearly 640 percent." Instead of saving, most Americans borrowed as much as they could to buy property they expected to rise in price. For really the first time in history an entire population sought to get rich by running to debt (to buy real estate, stocks and bonds), not by staying out of it.

But now that asset prices have plunged, people are left in debt. The problem is, what to do about it. Disagreeing with critics who "argue that the decline in the household debt-to-income ratio must go much further before the deleveraging process can be complete," or who even urge "that household debt-to-income ratios must fall back to the level of the 1980s," Mr. Dudley retorts that the economy must inflate its way out of the debt corner into which it has painted itself. "First, low and declining inflation makes it harder to accomplish needed balance sheet adjustments." In other words, credit (debt) is needed to bid real estate prices back up. A lower rather than higher inflation rate would mean "slower nominal income growth. Slower nominal income growth, in turn, means that less of the needed adjustment in household debt-to-income ratios will come from rising incomes. This puts more of the adjustment burden on paying

[4] Martin Wolf, "Why America is going to win the global currency battle," *Financial Times*, October 13, 2010.

down debt." And it is debt deflation that is plaguing the economy, so the problem is how to re-inflate (asset) prices.

(1) How much would the Fed have to purchase to have a given impact on the level of long-term interest rates and economic activity, and, (2) what constraints exist in terms of limits to balance-sheet expansion, and what are the costs involved that could impede efforts to meet the dual mandate now or in the future?[5]

On October 15, 2010, Fed Chairman Ben Bernanke explained that he wanted the Fed to encourage inflation – his of program of Quantitative Easing – and acknowledged that this would drive down the dollar against foreign currencies. Flooding the U.S. banking system with liquidity will lower interest rates, increasing the capitalization rate of real estate rents and corporate income. This will re-inflate asset prices – by creating yet more debt in the process of rescue banks from negative equity by pulling homeowners out of *their* negative equity. But internationally, this policy means that foreign central banks receive less than 1% on the international reserves they hold in Treasury securities – while U.S. investors are making much higher returns by borrowing "cheap dollars" to buy Australian, Asian and European government bonds, corporate securities, and speculating in foreign exchange and commodity markets.

Mr. Bernanke proposes to solve this problem by injecting another $1 trillion of liquidity over the coming year, on top of the $2 trillion in new Federal Reserve credit already created during 2009-10. The pretence is that bailing Wall Street banks out of their losses is a precondition for reviving employment and consumer spending – as if the giveaway to the financial sector will get the economy moving again.

The working assumption is that if the Fed provides liquidity, banks will lend it out at a markup. At least this is the dream of bank loan officers. The Fed will help them keep the debt overhead in place, not write it down. But as noted above, the U.S. market is "loaned up." Borrowing by homeowners, businesses and individuals is shrinking. Unemployment is rising, stores are closing and the economy is succumbing to debt deflation. But most serious of all, the QE II program has a number of consequences that Federal Reserve policy makers have not acknowledged. For one thing, the banks have used the Federal Reserve and Treasury bailouts and liquidity to increase their profits and to continue paying high salaries and bonuses. What their lending is inflating are asset prices, not commodity prices (or output and employment). And asset-price inflation is increasing the power of property over living labor and production, elevating the FIRE sector further over the "real" economy.

These problems are topped by the international repercussions that Mr. Dudley referred to as the "limits to balance-of-payments expansion." Cheap electronic U.S. "keyboard credit" is going abroad as banks try to earn their way out of debt by financing arbitrage gambles, glutting currency markets while depreciating the U.S. dollar. So the upshot of the Fed trying save the banks from negative equity is to flood the global economy with a glut of U.S. dollar credit, destabilizing the global financial system.

Can foreign economies rescue the U.S. banking system?

The international economy's role is envisioned as a *deus ex machina* to rescue the economy. Foreign countries are to serve as markets for a resurgence of U.S. industrial exports (and at least arms sales

[5] William C. Dudley, "The Outlook, Policy Choices and Our Mandate," Remarks at the Society of American Business Editors and Writers Fall Conference, City University of New York, Graduate School of Journalism, New York City, October 1, 2010. http://www.zerohedge.com/article/why-imf-meetings-failedand-coming-capital-controls.

are taking off to India and Saudi Arabia), and most of all as financial markets for U.S. banks and speculators to make money at the expense of foreign central banks trying to stabilize their currencies.

The Fed believes that debt levels can rise and become more solvent if U.S. employment increases by producing more exports. The way to achieve this is presumably to depreciate the dollar – the kind of "beggar-my-neighbour" policy that marked the 1930s. Devaluation will be achieved by flooding currency markets with dollars, providing the kind of zigzagging opportunities that are heaven-sent for computerized currency trading, short selling and kindred financial options.

Such speculation is a zero-sum game. Someone must lose. If Quantitative Easing is to help U.S. banks earn their way out of negative equity, by definition their gains must be at the expense of foreigners. This is what makes QE II is a form of financial aggression.

This is destructive of the global currency stability that is a precondition for stable long-term trade relationships. Its underlying assumptions also happen to be based on Junk Economics. For starters, it assumes that international prices are based on relative price levels for goods and services. But only about a third of U.S. wages are spent on commodities. Most is spent on payments to the finance, insurance and real estate (FIRE) sector and on taxes. Housing and debt service typically absorb 40% and 15% of wage income respectively. FICA Wage withholding for Social Security and Medicare taxes absorb 11%, and income and sales taxes another 15 to 20%. So before take-home pay is available for consumer spending on goods and services, these FIRE-sector charges make the cost of living so high as to render American industrial labor uncompetitive in world markets. No wonder the U.S. economy faces a chronic trade deficit!

The FIRE sector overhead has become structural, not merely a marginal problem. To restore its competitive industrial position, the United States would have to devalue by much more than the 40% that it did back in 1933. Trying to "inflate its way out of debt" may help bank balance sheets recover, but as long as the economy remains locked in debt deflation it will be unable to produce the traditional form of economic surplus needed for genuine recovery. A debt write-down would be preferable to the policy of keeping the debts on the books and distorting the U.S. economy with inflation – and engaging in financial aggression against foreign economies. The political problem, of course, is that the financial sector has taken control of U.S. economic planning – in its own self-interest, not that of the economy at large. A debt write-down would threaten the financial sector's creditor power over the economy.

So it is up to foreign economies to enable U.S. banks to earn their way out of negative equity. For starters, there is the carry trade based on interest-rate arbitrage – to borrow at 1%, lend at a higher interest rate, and pocket the margin (after hedging the currency shift). Most of this financial outflow is going to China and other Asian countries, and to raw materials exporters. Australia, for example, has been raising its interest rates in order to slow its own real estate bubble. Rather than slowing speculation in its large cities by fiscal policy – a land tax – its central bank is operating on the principle that a property is worth whatever a bank will lend against it. Raising interest rates to the present 4.5% reduces the capitalization rate for property rents – and hence shrinks the supply of mortgage credit that has been bidding up Australian property prices.

This interest-rate policy has two unfortunate side effects for Australia – but a free lunch for foreign speculators. First of all, high interest rates raise the cost of borrowing across the board for doing business and for consumer finances. Second – even more important for the present discussion – high rates attract foreign "hot money" as speculators borrow at low interest in the United States (or Japan, for that matter) and buy high-yielding Australian government bonds.

The effect is to increase the Australian dollar's exchange rate, which recently has achieved parity with the U.S. dollar. This upward valuation makes its industrial sector less competitive, and also squeezes profits in its mining sector. So on top of Australia's rising raw materials exports, its policy to counter its real estate bubble is attracting foreign financial inflows, providing a free ride for international arbitrageurs. Over and above their interest-rate arbitrage gains is the foreign currency play – rising exchange rates in Australia and many Asian countries as the U.S. dollar glut swamps the ability of central banks to keep their exchange rates stable.

This foreign-currency play is where most of the speculative action is today as speculators watching these purchases have turned the currencies and bonds of other raw materials exporters into speculative vehicles. This currency speculation is the most aggressive, predatory and destructive aspect of U.S. financial behavior. Its focus is now shifting to the major nation that has resisted U.S. attempts to force its currency up: China. The potentially largest prize for U.S. and foreign speculators would be an upward revaluation of its renminbi.

The House Ways and Means Committee recently insisted that China raise its exchange rate by the 20 percent that the Treasury and Federal Reserve have suggested. Suppose that China would obey this demand. This would mean a bonanza for U.S. speculators. A revaluation of this magnitude would enable them to put down 1% equity – say, $1 million to borrow $99 million – and buy Chinese renminbi forward. The revaluation being demanded would produce a 2000% profit of $20 million by turning the $100 million bet (and just $1 million "serious money") into $120 million. Banks can trade on much larger, nearly infinitely leveraged margins.

Can U.S. banks create enough electronic "keyboard credit" to buy up the whole world?

The Fed's QE II policy poses a logical question: Why can't U.S. credit buy out the entire world economy – all the real estate, companies and mineral rights yielding over 1%, with banks and their major customers pocketing the difference?

Under current arrangements the dollars being pumped into the global economy are recycled back into U.S. Treasury IOUs. When foreign sellers turn over their dollar receipts to their banks for domestic currency, these banks turn the payment over to the central bank – which then faces a Hobson's Choice: either to sell the dollars on the foreign exchange market (pushing up their currency against the dollar), or avoid doing this by buying more U.S. Treasury securities and thus keeping the dollar payment within the U.S. economy. Why can't this go on *ad infinitum*?

What makes these speculative capital inflows so unwelcome abroad is that they do not contribute to tangible capital formation or employment. Their effect is simply to push up foreign currencies against the dollar, threatening to price exporters out of global markets, disrupting domestic employment as well as trade patterns.

These financial gambles are setting today's exchange rates, not basic production costs. In terms of relative rates of return, foreign central banks earn 1% on their U.S. Treasury bonds, while U.S. investors buy up the world's assets. In effect, U.S. diplomats are demanding that other nations relinquish their trade surpluses, private savings and general economic surplus to U.S. investors, creditors, bankers, speculators, arbitrageurs and vulture funds in exchange for this 1% return on U.S. dollar reserves of depreciating value – and indeed, in amounts already far beyond the foreseeable ability of the U.S. economy to generate a balance-of-payments surplus to pay this debt to foreign governments.

The global economy is being turned into a tributary system, achieving what military conquest sought in times past. This turns out to be implicit in QE II. Arbitrageurs and speculators are swamping Asian and Third World currency markets with low-priced U.S. dollar credit to make predatory trading profits at the expense of foreign central banks trying to stabilize their exchange rates by selling their currency for dollar-denominated securities – under conditions where the United States and Canada are blocking reciprocal direct investment (*e.g.*, Potash Corp. of Saskatchewan in Canada and Unocal in the United States.).

The road to capital controls

Hardly by surprise, other countries are taking defensive measures against this speculation, and against "free credit" takeovers using inexpensive U.S. electronic "keyboard bank credit." For the past few decades they have stabilized their exchange rates by recycling dollar inflows and other foreign currency build-ups into U.S. Treasury securities. The Bank of Japan, for instance, recently lowered its interest rate to just 0.1% in an attempt to induce its banks to lend back abroad the foreign exchange that is now coming in as its banks are being repaid on their own carry-trade loans. It also offset the repayment of past carry-trade loans extended by its own banks in yen by selling $60 billion of yen and buying U.S. Treasury securities, of which it now owns over $1 trillion.

Foreign economies are now taking more active steps to shape "the market" in which international speculation occurs. The most modest move is to impose a withholding tax on interest payments to foreign investors. Just before the IMF meetings on October 9-10, 2010, Brazil doubled the tax on foreign investment in its government bond to 4%. Thailand acted along similar lines a week later. It stopped exempting foreign investors from having to pay the 15% interest-withholding tax on their purchases of its government bonds. Finance Minister Korn Chatikavinij warned that more serious measures are likely if "excessive" speculative inflows keep pushing up the baht. "We need to consider the rationality of capital inflows, whether they are for speculative purposes and how much they generate volatility in the baht," he explained. But the currency continues to rise.

Such tax withholding discourages interest-rate arbitrage via the bond market, but leaves the foreign-currency play intact – and that is where the serious action is today. In the 1997 Asian Crisis, Malaysia blocked foreign purchases of its currency to prevent short-sellers from covering their bets by buying the ringgit at a lower price later, after having emptied out its central bank reserves. The blocks worked, and other countries are now reviewing how to impose such controls.

Longer-term institutional changes to more radically restructure the global financial system may include dual exchange rates such as were prevalent from the 1930 through the early 1960s, one (low and stable) for trade and at least one other (usually higher and more fluctuating) for capital movements. But the most decisive counter-strategy to U.S. QE II policy is to create a full-fledged BRIC-centred currency bloc that would minimize use of the dollar.

China has negotiated currency-swap agreements with Russia, India, Turkey and Nigeria. These swap agreements may require exchange-rate guarantees to make central bank holders "whole" if a counterpart currency depreciates. But at least initially, these agreements are being used for bilateral trade. This saves exporters from having to hedge their payments through forward purchases on global exchange markets.

A BRIC-centred system would reverse the policy of open and unprotected capital markets put in place after World War II. This trend has been in the making since the BRIC countries met last year in

Yekaterinburg, Russia, to discuss such an international payments system based on their own currencies rather than the dollar, sterling or euro. In September, China supported a Russian proposal to start direct trading using the yuan and the ruble rather than pricing their trade or taking payment in U.S. dollars or other foreign currencies. China then negotiated a similar deal with Brazil. And on the eve of the IMF meetings in Washington on Friday, Premier Wen stopped off in Istanbul to reach agreement with Turkish Prime Minister Erdogan to use their own currencies in a planned tripling Turkish-Chinese trade to $50 billion over the next five years, effectively excluding the dollar.

China cannot make its currency a world reserve currency, because it is not running a deficit and therefore cannot supply large sums of renminbi to other countries via trade. So it is negotiating currency-swap agreements with other countries, while using its enormous dollar reserves to buy up natural resources in Australia, Africa and South America.

This has reversed the dynamics that led speculators to gang up and cause the 1997 Asia crisis. At that time the great speculative play was against the "Asian Tigers." Speculators swamped their markets with sell orders, emptying out the central bank reserves of countries that tried (in vain) to keep their exchange rates stable in the face of enormous U.S. bank credit extended to George Soros and other hedge fund managers and the vulture funds that followed in their wake. The IMF and U.S. banks then stepped in and offered to "rescue" these economies if they agreed to sell off their best companies and resources to U.S. and European buyers.

This was a major reason why so many countries have tried to free themselves from the IMF and its neoliberal austerity programs, euphemized as "stabilization" plans rather than the economic poison of chronic dependency and instability programs. Left with only Turkey as a customer by 2008, the IMF was a seemingly anachronistic institution whose only hope for survival lay in future crises. So that of 2009-10 proved to be a godsend. At least the IMF found neoliberal Latvia and Greece willing to subject themselves to its precepts. Today its destructive financial austerity doctrine is applied mainly by Europe's "failed economies."

This has changed the equation between industrial-nation creditors and Third World debtors. Many dollar-strapped countries have been subject to repeated raids on their central banks – followed by IMF austerity programs that have shrunk their domestic markets and made them yet more dependent on imports and foreign investments, reduced to selling off their public infrastructure to raise the money to pay their debts. This has raised their cost of living and doing business, shrinking the economy all the more and creating new budget squeezes driving them even further into debt. But China's long-term trade and investment deals – to be paid in raw materials, denominated in renminbi rather than dollars – is alleviating their debt pressures to the point where currency traders are jumping on the bandwagon, pushing up their exchange rates. The major international economic question today is how such national economies can achieve greater stability by insulating themselves from these predatory financial movements.

Summary

The 1945-2010 world economic dynamic has ended, and a new international system is emerging – one that was not anticipated as recently as just five years ago.

From the 1960s through 1980s, the international economy was polarizing between indebted raw-materials producers in Africa, Latin America and large parts of Asia – "the South" – and the industrialized North, led by North America, Europe and Japan. Economists analyzing this polarization focused (1) on the terms of trade for raw materials as compared to industrial goods, (2) on the failure of World Bank programs to help "the South" cure its food dependency and other import dependency, and (3) on the failure of IMF austerity programs to stabilize the balance of payments. The IMF-World Bank model promoted austerity, low wage standards, trade dependency, and deepening foreign debt. It was applauded as a success story in the creditor-investor nations.

Today's world is dividing along quite different lines. The main actor is still "the North" composed of the United States and Europe. But the counterpart economic bloc that is emerging is growing less dependent and indebted. It is led by a rapidly growing China, India, Brazil and even Russia (the BRIC countries), joined by the strongest Middle Eastern economies (Turkey and potentially Iran) and Asian economies such as Korea, Taiwan, Malaysia and Singapore. This "BRIC bloc" and its allies are in payment surplus, not deficit. It is now the U.S. and European governments that find themselves debt-ridden beyond their ability to pay, especially when it comes to paying foreign governments, central banks and bondholders.

Yet the world is now seeing a race to convert electronic ("paper") credit creation from these already debt-ridden economies into asset ownership before governments in the payments-surplus economies to erect protective walls. Easy credit in the United States and Japan is fuelling speculation in economies that are not so heavily loaded down with debt. This flight out of the U.S. dollar into Asian and Third World currencies is changing the global economy's orientation – in such a way as to restore financial dominance to nations running balance-of-payments surpluses, whose currencies promise to rise (or at least remain stable) rather than to fall along with the dollar.

As the U.S. and European domestic markets shrink in response to debt deflation, Asian countries and raw-materials exporters from Australia to Africa have recovered mainly because of China's growth. As in 1997, the problem they face is how to keep predatory U.S. and allied financial speculation at bay. This makes these countries the most likely to find capital controls attractive. But this time around, they are trying to keep speculators from buying into their assets and currencies, not selling them. Targeted economies are ones that are strong, not ones that are weak.

Since the mid-19th century, central banks raised interest rates to hold their currencies stable when trade moved into deficit. The universal aim was to gain financial reserves. In the 1930s, money and credit systems were still based on gold. Protective tariffs and trade subsidies aimed at running trade and balance-of-payments surpluses in order to gain financial reserves. But today's problem is too *much* liquidity, in the form of keyboard bank credit that can be created without limit.

This has turned the world of half a century ago upside-down. National economies in the United States, Japan leading nations are lowering their rates to 1% or less, encouraging capital outflows rather than payments surpluses, while their banks and investors are seeking to gain more by financial speculation than by trade.

Conclusion

The American economy may be viewed as a tragic drama. Its tragic flaw was planted and flowered in the 1980s: a combination of deregulation leading to financial fraud so deep as to turn the banking system into a predatory gang, while shifting the tax burden off real estate and the higher tax brackets onto wage earners and sales taxes. This increased the economy's cost of doing business in two ways. First, taxes on employees (including FICA withholding for Social Security and Medicare) and on business profits increase the cost of doing business for American industry.

Second, untaxing the site value of land (and most "capital gains" are actually landvalue gains) has "freed" rental income to be pledged to banks for yet higher mortgage loans. This obliged new homebuyers to take on more and more debt as taxes were shifted off property. So homeowners working for a living did not really gain from low property taxes. What the tax collector relinquished ended up being paid to banks as interest on the loans that were bidding up housing prices, creating a real estate bubble. Meanwhile, governments had to make up the property-tax cuts by taxing employees and employers all the more. So the United States became a high-cost economy.

It didn't have to be this way – and that is the tragedy of the U.S. economy over the past thirty years. It was a fiscal and financial tragedy, with the tragic flaw being the propensity for the financial sector to engage in wholesale fraud and "junk economics." A flawed tax policy was endorsed by a failure of economic thought to explain the costs entailed in trying to get rich by running into debt. What Alan Greenspan famously called "wealth creation" during his tenure as Federal Reserve Chairman sponsoring asset-price inflation turned out simply to be debt leveraging – that is, debt creation when the dust settled and prices fell back into negative equity territory.

To rescue the increasingly irresponsible financial sector from its mortgage-debt gambles, the United States is taking a path that is losing its international position, ending the long epoch of what was actually a free lunch – the U.S. Treasury-bill standard of international finance. All that U.S. diplomats can do at this point is play for time, hoping to prolong the existing double standard favorable to the United States and its Treasury-debt a bit further, to permit U.S. bankers to get just one more year of enormous bonuses, in keeping with the American motto, "You only need to make a fortune once."

What no doubt will amaze to future historians is why the rest of the U.S. economy has let the banking sector get away with this! Apart from the Soviet Union's self-destruction in 1990-91, it is hard to find a similar blunder in economic diplomacy. It reflects the banking system's success in shifting economic planning out of the hands of government into those of finance-sector lobbyists.

U.S. officials always have waged American foreign trade and financial policy in reference to their own domestic economic interests without much regard for foreigners. The history of U.S. protective tariffs, dollar policy and interest-rate policy has been to look only at home. Other countries have had to raise interest rates when their balance of trade and payments move into deficit, above all, for military adventures. The United States alone is immune – thanks to the legacy of the dollar being "as good as gold" during the decades when it was running a surplus.

To quote Joseph Stiglitz once again:

> [T]he irony is that money that was intended to rekindle the American economy is causing havoc all over the world. Those elsewhere in the world say, what the United States is trying to do is the twenty-first century version of 'beggar thy neighbour'

> policies that were part of the Great Depression: you strengthen yourself by hurting the others.[6]

It is natural enough for the United States to shape its international policy with regard to its own interests, to be sure. The self-interest principle is a foundation assumption of political theory as it is economic logic. What is less understandable is why other countries have not acted more effectively in their own interests – and why U.S. diplomats and economic officials should be so upset today when other nations in fact begin to do so.

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[6] Joseph Stiglitz: "Foreclosure Moratorium, Government Stimulus Needed to Revive US Economy", *Democracy Now*, Oct. 21, 2010.

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Capitalism and the destruction of life on Earth: Six theses on saving the humans

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Sleepwalking to extinction

When, on May 10th, scientists at Mauna Loa Observatory on the big island of Hawaii announced that global CO_2 emissions had crossed a threshold at 400 parts per million (ppm) for the first time in millions of years, a sense of dread spread around the world and not only among climate scientists. CO_2 emissions have been relentlessly climbing since Charles David Keeling first set up his tracking station near the summit of Mauna Loa Observatory in 1958 to monitor average daily global CO_2 levels. At that time, CO_2 concentrations registered 315ppm. CO_2 emissions and atmospheric concentrations have been relentlessly climbing ever since and, as the records show, temperatures rises will follow. For all the climate summits, the promises of "voluntary restraint," the carbon trading and carbon taxes, the growth of CO_2 emissions and atmospheric concentrations has not just been relentless, it has been *accelerating* in what scientists have dubbed the "Keeling Curve". In the early 1960s, CO_2ppm concentrations in the atmosphere grew by 0.7ppm per year. In recent decades, especially as China has industrialized, the growth rate has tripled to 2.1ppm per year. In just the first 17 weeks of 2013, CO_2 levels jumped by 2.74ppm compared to last year -- "the biggest increase since benchmark monitoring stations high on the Hawaiian volcano of Mauna Loa began taking measurements in 1958."[1] Carbon concentrations have not been this high since the Pliocene period, between 3m and 5m years ago, when global average temperatures were 3 or 4C hotter than today, the Arctic was ice-free, sea levels were about 40m higher, jungles covered northern Canada, while Florida was under water, along with coastal locations we now call New York city, London, Shanghai, Hong Kong, Sydney and many others. Crossing this threshold has fuelled fears that we are fast approaching "tipping points" – melting of the subarctic tundra or thawing and releasing the vast quantities of methane in the Arctic sea bottom – that will accelerate global warming beyond any human capacity to stop it: "I wish it weren't true, but it looks like the world is going to blow through the 400-ppm level without losing a beat," said Scripps Institute geochemist Ralph Keeling whose father Charles Keeling set up the first monitoring stations in 1958: "At this pace, we'll hit 450

[1] Tom Bawden, "Carbon dioxide in atmosphere at highest level for 5 million years," *The Independent*, May 10th, 2013 at http://www.independent.co.uk/news/uk/home-news/carbon-dioxide-in-atmosphere-at-highest-level-for-5-million-years-8611673.html.

ppm within a few decades." "It feels like the inevitable march toward disaster," said Maureen E. Raymo, a scientist at the Lamont-Doherty Earth Observatory, a unit of Columbia University.[2]

Why are we marching to disaster, "sleepwalking to extinction" as the *Guardian*'s George Monbiot once put it? Why can't we slam on the brakes before we ride off the cliff to collapse? I'm going to argue here that the problem is rooted in the requirements of capitalist reproduction, that large corporations are destroying life on earth, that they can't help themselves, they can't change or change very much, that so long as we live under this system we have little choice but to go along in this destruction, to keep pouring on the gas instead of slamming on the brakes, and that the only alternative -- impossible as this may seem right now -- is to overthrow this global economic system and all of the governments of the 1% that prop it up, and replace them with a global economic democracy, a radical bottom-up political democracy, an *ecosocialist civilization*. I argue that, although we are fast approaching the precipice of ecological collapse, the means to derail this trainwreck are in the making as, around the world we are witnessing a near simultaneous global mass democratic "awakening" as the Brazilians call it, almost a global uprising from Tahir Square to Zacotti Park, from Athens to Istanbul to Beijing and beyond such as the world has never seen. To be sure, like Occupy Wall Street, these movements are still inchoate, are still mainly protesting what's wrong rather than fighting for an alternative social order. Like Occupy, they have yet to clearly and robustly answer that crucial question, "Don't like capitalism, what's your alternative?" Yet they are working on it, and they are all instinctively and radically democratic and in this lies our hope. I'm going to make my case in the form of six theses:

1. Capitalism is, overwhelmingly, the main driver of planetary ecological collapse

From climate change to resource overconsumption to pollution, the engine that has powered three centuries of accelerating economic development revolutionizing technology, science, culture, and human life itself is, today, a roaring out-of-control locomotive mowing down continents of forests, sweeping oceans of life, clawing out mountains of minerals, drilling, pumping out lakes of fuels, devouring the planet's last accessible resources to turn them all into "product" while destroying fragile global ecologies built up over eons of time. Between 1950 and 2000 the global human population more than doubled from 2.5 to 6 billion, but in these same decades consumption of major natural resources soared more than 6 fold on average, some much more. Natural gas consumption grew nearly 12 fold, bauxite (aluminum ore) 15 fold. And so on.[3] At current rates, Harvard biologist E.O Wilson says that "half the world's great forests have already been levelled and half the world's plant and animal species may be gone by the end of this century." Corporations aren't necessarily evil, though plenty are diabolically evil, but they can't help themselves. They're just doing what they're supposed to do for the benefit of their shareholders. Shell Oil can't help but loot Nigeria and the Arctic and cook the climate. That's what shareholders demand.[4] BHP Billiton, Rio Tinto and other mining giants

[2] Justin Gillis, "Heat-trapping gas passes milestone, raising fears," *New York Times*, May 10, 2013. Scripps Institution of Oceanography, *Scripps News*, April 23, 2013 at http://scrippsnews.ucsd.edu/Releases/?releaseID=1347.

[3] Michael T. Klare, *The Race for What's Left* (New York: Picador 2012), p. 24 Table 1.1. Jeffrey Sachs calculates that in value terms, between 1950 and 2008 the global human population rose from 2.5 to 7 billion, so less than tripled, while global GDP multiplied 8 times. *Common Wealth: Economics for a Crowded Planet* (New York: Penguin Books, 2008), p. 19.

[4] On Shell's impact on Africa see Nimo Bassey, *To Cook a Continent: Destructive Extraction and the Climate Crisis in Africa* (Cape Town: Pambazuka Press 2012).

can't resist mining Australia's abundant coal and exporting it to China and India. Mining accounts for 19% of Australia's GDP and substantial employment even as coal combustion is the single worst driver of global warming. IKEA can't help but level the forests of Siberia and Malaysia to feed the Chinese mills building its flimsy disposable furniture (IKEA is the *third largest consumer of lumber in the world*). Apple can't help it if the cost of extracting the "rare earths" it needs to make millions of new iThings each year is the destruction of the eastern Congo – violence, rape, slavery, forced induction of child soldiers, along with poisoning local waterways.[5] Monsanto and DuPont and Syngenta and Bayer Crop Science have no choice but to wipe out bees, butterflies, birds, small farmers and extinguish crop diversity to secure their grip on the world's food supply while drenching the planet with their Roundups and Atrazines and neonicotinoids.[6] This is how giant corporations are wiping out life on earth in the course of a routine business day. And the bigger the corporations grow, the worse the problems become.

In Adam Smith's day, when the first factories and mills produced hat pins and iron tools and rolls of cloth by the thousands, capitalist freedom to make whatever they wanted didn't much matter because they didn't have much impact on the global environment. But today, when everything is produced in the millions and billions, then trashed today and reproduced all over again tomorrow, when the planet is looted and polluted to support all this frantic and senseless growth, it matters – a lot.

The world's climate scientists tell us we're facing a *planetary emergency*. They've been telling us since the 1990s that if we don't cut global fossil fuel greenhouse gas emissions by 80-90% below 1990 levels by 2050 we will cross critical tipping points and global warming will accelerate beyond any human power to contain it. Yet despite all the ringing alarm bells, no corporation and no government can oppose growth and, instead, every capitalist government in the world is putting pedal to the metal to accelerate growth, to drive us full throttle off the cliff to collapse. Marxists have never had a better argument against capitalism than this inescapable and apocalyptic "contradiction".

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[5] Delly Mawazo Sesete of Change.org, writing in the *Guardian* newspaper says, "I am originally from the North Kivu province in the eastern region of the Democratic Republic of the Congo, where a deadly conflict has been raging for over 15 years. While that conflict began as a war over ethnic tension, land rights and politics, it has increasingly turned to being a war of profit, with various armed groups fighting one another for control of strategic mineral reserves. Near the area where I grew up, there are mines with vast amounts of tungsten, tantalum, tin, and gold – minerals that make most consumer electronics in the world function. These minerals are part of *your* daily life. They keep your computer running so you can surf the internet. They save your high score on your PlayStation. They make your cell phone vibrate when someone calls you. While minerals from the Congo have enriched your life, they have often brought violence, rape and instability to my home country. That's because those armed groups fighting for control of these mineral resources use murder, extortion and mass rape as a deliberate strategy to intimidate and control local populations, which helps them secure control of mines, trading routes and other strategic areas. Living in the Congo, I saw many of these atrocities firsthand. I documented the child slaves who are forced to work in the mines in dangerous conditions. I witnessed the deadly chemicals dumped into the local environment. I saw the use of rape as a weapon. And despite receiving multiple death threats for my work, I've continued to call for peace, development and dignity in Congo's minerals trade." "Apple: time to make a conflict-free iPhone," *Guardian*, December 30, 2011 at http://www.guardian.co.uk/commentisfree/cifamerica/2011/dec/30/apple-time-make-conflict-free-iphone. For more detail see conflictminerals.org. See also: Peter Eichstaedt, *Consuming the Congo: War and Conflict Minerals in the World's Deadliest Place* (Chicago: Lawrence Hill, 2011).

[6] Lauren McCauley, "Herbicides for GM0s driving monarch butterfly populations to 'ominous' brink," *Common Dreams,* March 14, 2013 at http://www.commondreams.org/headline/2013/03/14-3.

2. Solutions to the ecological crisis are blindingly obvious but we can't take the necessary steps to prevent ecological collapse because, so long as we live under capitalism, economic growth has to take priority over ecological concerns or the economy will collapse and mass unemployment will be the result.

We all know what we have to do: suppress greenhouse gas emissions. Stop over-consuming natural resources. Stop the senseless pollution of the earth, waters, and atmosphere with toxic chemicals. Stop producing waste that can't be recycled by nature. Stop the destruction of biological diversity and insure the rights of other species to flourish. We don't need any new technological breakthroughs to solve these problems. Mostly, we *just stop doing what we're doing*. But we can't stop because *we're all locked into* an economic system in which companies have to grow to compete and reward their shareholders and because *we all need the jobs.*

Take climate change:

James Hansen, the world's preeminent climate scientist, has argued that to save the humans:

> "Coal emissions must be phased out as rapidly as possible or global climate disasters will be a dead certainty. . . Yes, [coal, oil, gas] most of the fossil fuels must be left in the ground. That is the explicit message that the science provides.
>
> Humanity treads today on a slippery slope. As we continue to pump greenhouse gases in the air, we move onto a steeper, even more slippery incline. We seem oblivious to the danger – unaware of how close we may be to a situation in which a catastrophic slip becomes practically unavoidable, a slip where we suddenly lose all control and are pulled into a torrential stream that hurls us over a precipice to our demise." (James Hansen, 2009) [7]

But how can we do this under capitalism? After his climate negotiators stonewalled calls for binding limits on CO_2 emissions at Copenhagen, Cancun, Cape Town and Doha, President Obama is now trying to salvage his environmental "legacy" by ordering his EPA to impose "tough" new emissions limits on existing power plants, especially coal-fired plants.[8] But this won't salvage his legacy or, more importantly, his daughters' future because how much difference would it make, really, if every coal-fired power plant in the U.S. shut down tomorrow *when U.S. coal producers are free to export their coal to China*, which they are doing, and when China is building another coal-fired power plant every week? The atmosphere doesn't care where the coal is burned. It only cares how much is burned. Yet how could Obama tell American mining companies *to stop mining coal*? This would be tantamount to socialism. But if we *do not stop* mining and burning coal, capitalist freedom and private property is the least we'll have to worry about.

Same with Obama's "tough" new fuel economy standards. In August 2012 Obama boasted that his new Corporate Average Fuel Economy (CAFE) standards would "double fuel efficiency"

[7] James Hansen, *Storms of My Grandchildren* (New York: Bloomsbury 2009), pp. 70, 172-173,
[8] John M. Broder, "Obama readying emissions limits on power plants," *New York Times*, June 20, 2013.

over the next 13 years to 54.5 miles per gallon by 2025, up from 28.6 mpg at present – cutting vehicle CO_2 emissions in half, so helping enormously to "save the planet." But as the Center for Biological Diversity and other critics have noted, Obama was lying. First, his so-called "tough" new CAFE standards were so full of loopholes, negotiated with Detroit, that they actually encourage *more gas-guzzling, not less.*[9] That's because the standards are based on a sliding scale according to "vehicle footprints" – the bigger the car, the less mileage it has to get to meet its "standard." So in fact Obama's "tough" standards are (surprise) custom designed to promote what Detroit does best – produce giant Sequoias, mountainous Denalis, Sierras, Yukons, Tundras and Ticonderogas, Ram Chargers and Ford F series luxury trucks, grossly obese Cadillac Escalades, soccer kid hauler Suburbans, even 8,000 (!) pound Ford Excursions – and let these gross gas hogs meet the "fleet standard". Many of these ridiculously oversized and over-accessorized behemoths are *more than twice the weight of cars and pickup trucks in the 1950s*.[10] These cars and "light" trucks are among the biggest selling vehicles in America today (GM's Sierra is #1) and they get worse gas mileage than American cars *half a century ago.* Cadillac's current Escalade gets worse mileage than its chrome bedecked tail fin-festooned land yachts of the mid-1950s! [11] Little wonder Detroit applauded Obama's new CAFE standards instead of damning them as usual. Secondly, what would it matter even if Obama's new CAFE standards actually *did* double fleet mileage – when American and global vehicle fleets are *growing exponentially?* In 1950 Americans had one car for every three people. Today we have 1.2 cars for every American. In 1950 when there were about 2.6 billion humans on the planet, there were 53 million cars on the world's roads – about one for every 50 persons. Today, there are 7 billion people but more than 1 billion cars and industry forecasters expect there will be 2 to 2.5 billion cars on the world's roads by mid-century. China alone is expected to have a billion.[12] So, at the end of the day, incremental half measures like CAFE standards can't stop rising GHG missions. Barring some technical miracle, the only way to cut vehicle emissions is to just *stop making them* -- *drastically suppress vehicle production*, especially of the worst gas hogs. In theory, Obama could simply order GM to stop building its humongous gas guzzlers

[9] Center for Biological Diversity, "New mileage standards out of step with worsening climate crisis," press release, August 28, 2012 athttp://www.biologicaldiversity.org/news/press_releases/2012/vehicle-emissions-08-28-2012.html. Also, Common Dreams staff, "New mileage standards encourage more gas-guzzling, not less: report," *Common Dreams,* August 28, 2012 at https://www.commondreams.org/headline/2012/08/28-8.

[10] A full-size 1955 Chevrolet Bel Air weighed 3,100 pounds. A '55 Ford F-100 pickup truck also weighed 3100 (3300 with the optional V-8 motor). Even a 1955 Cadillac El Dorado, icon of fifties conspicuous consumption, only weighed 5050 pounds -- chrome bullets, tail fins and all. By comparison, today even a compact Toyota Prius weighs 3274 pounds (could it be the batteries?) while your typical full size Ford Taurus weighs more than 4,300 pounds, pickup trucks and big SUVs start at around 6,000 pounds and go up from there to 7-8000 pounds. Even though the occasional honest driver will concede he/she doesn't really "need" all this bulk and horsepower to load up at the mall, as a cheerful Texas Ford salesman noted: "We haven't found a ceiling to this luxury truck market." Joseph B. White, "Luxury pickups stray off the ranch," *Wall Street Journal*, March 21, 2012.

[11] Your typical 4,428 pound 1955 Cadillac Coupe DeVille got 12.9 mpg in city driving according to *Motor Trend Magazine* whereas your typical 2013 Cadillac Escalade gets 10mpg in the city (12mpg "combined" city and highway). Your typical 2013 Chevrolet Silverado K15 truck gets just 9 mpg hauling those heavy bags of groceries home from the mall. This is after *six decades* of Detroit fuel economy "improvements" – and Obama says Detroit is going to "double its fleet mileage in 20 years". Good luck on that. Mileage figures for the Cadillac are from *Cadillac History 1955* at http://www.100megsfree4.com/cadillac/cad1950/cad55s.htm. For the Silverado at www.fuel economy.gov.

[12] For forecasts of China's vehicle fleet and its implications see Craig Simons, *The Devouring Dragon* (New York: St. Martin's Press, 2013), p. 200.

and switch to producing small economy cars. After all, the federal government *owns the company*! But of course, how could he do any such thing? Detroit lives by the mantra "big car big profit, small car small profit." Since Detroit has never been able to compete against the Japanese and Germans in the small car market, which is already glutted and nearly profitless everywhere, such an order would only doom GM to failure, if not bankruptcy (again), throw masses of workers onto the unemployment lines (and devalue the GM stock in the feds' portfolio). So given capitalism, Obama is in fact, powerless. He's locked in to promoting the endless growth of vehicle production, even of the worst polluters – and lying about it all to the public to try to patch up his pathetic "legacy." And yet, if we don't suppress vehicle production, how can we stop rising CO_2 emissions?

In the wake of the failure of climate negotiators from Kyoto to Doha to agree on binding limits on GHG emissions, exasperated British climate scientists Kevin Anderson and Alice Bows at the Tyndall Centre, Britain's leading climate change research centre, wrote in September 2012 that we need an entirely "new paradigm": government policies must "radically change" if "dangerous" climate change is to be avoided:

> We urgently need to acknowledge that the development needs of many countries leave the rich western nations with little choice but to *immediately and severely curb their greenhouse gas emissions*... [The] misguided belief that commitments to avoid warming of 2 degrees C can still be realized with incremental adjustments to economic incentives. A carbon tax here, a little emissions trading there and the odd voluntary agreement thrown in for good measure will not be sufficient... Long-term end-point targets (for example, 80% by 2050) have no scientific basis. What governs future global temperatures and other adverse climate impacts are the emissions from yesterday, today, and those released in the next few years (emphasis added).[13]

And not just scientists. In its latest world energy forecast released on November 12, 2012, the International Energy Agency (IEA) warns that despite the bonanza of fossil fuels now made possible by fracking, horizontal and deepwater drilling, *we can't consume them if we want to save the humans*: "the climate goal of limiting global warming to 2 degrees Centigrade is becoming more difficult and costly with each year that passes... No more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 degree C goal..." [14] Of course the science could be wrong about this. But so far climate scientists have consistently *underestimated* the speed and ferocity of global warming, and even prominent climate change deniers have folded their cards.[15]

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[13] "A new paradigm for climate change," *Nature Climate Change*, Vol. 2 September 2012, pp. 639-640

[14] IEA, *World Energy Outlook 2012* Executive Summary (November 12, 2012), p. 3 at https://www.iea.org/publications/freepublications/publication/English.pdf.

[15] For a recent summary of the peer-reviewed literature see Glenn Scherer and DailyClimate.org, "Climate science predictions prove too conservative," *Scientific American December* 6, 2012 online at http://www.scientificamerican.com/article.cfm?id=climate-science-predictions-prove-too-conservative. Prominent ex-denier Richard A. Muller published his mea culpa on the Op-Ed page of the *New York Times:* "The conversion of a climate-change skeptic," July 28, 2012.

Emergency contraction or global ecological collapse?

Still, it's one thing for James Hansen or Bill McKibben of 350.org to say we need to *"leave the coal in the hole, the oil in the soil, the gas under the grass,"* to call for "severe curbs" in GHG emissions – in the abstract. *But think about what this means in our capitalist economy.* Most of us, even passionate environmental activists, don't really want to face up to the economic implications of the science we defend. That's why, if you listen to environmentalists like Bill McKibben, for example, you will get the impression that global warming is mainly driven by fossil fuel-powered electric power plants, so if we just "switch to renewables" this will solve the main problem and we can carry on with life more or less as we do now. Indeed, "green capitalism" enthusiasts like Thomas Friedman and the union-backed "green jobs" lobby look to renewable energy, electric cars and such as "*the next great engine of industrial growth*" – the perfect win-win solution. This is a not a solution. This is a delusion: because greenhouse gasses are produced *across the economy* not just by or even mainly by power plants. Globally, fossil fuel-powered electricity generation accounts for 17% of GHG emissions, heating accounts for 5%, miscellaneous "other" fuel combustion 8.6%, industry 14.7%, industrial processes another 4.3%, transportation 14.3%, agriculture 13.6%, land use changes (mainly deforestation) 12.2%.[16] This means, for a start, that *even if we immediately replaced every fossil fuel powered electric generating plant on the planet with 100% renewable solar, wind and water power*, *this would only reduce global GHG emissions by around 17%.* What *this* means is that, far from launching a new green energy-powered "industrial growth" boom, barring some tech-fix miracle, the only way to impose "immediate and severe curbs" on fossil fuel production/consumption would be to impose an *EMERGENCY CONTRACTION in the industrialized countries:* drastically retrench and in some cases shut down industries, even entire sectors, across the economy and around the planet – not just fossil fuel producers but all the industries that consume them and produce GHG emissions – autos, trucking, aircraft, airlines, shipping and cruise lines, construction, chemicals, plastics, synthetic fabrics, cosmetics, synthetic fibre and fabrics, synthetic fertilizer and agribusiness CAFO operations, and many more. Of course, no one wants to hear this because, given capitalism, this would unavoidably mean mass bankruptcies, global economic collapse, depression and mass unemployment around the world. That's why in April 2013, in laying the political groundwork for his approval of the XL pipeline in some form, President Obama said "The politics of this are tough." The earth's temperature probably isn't the "number one concern" for workers who haven't seen a raise in a decade; have an underwater mortgage; are spending $40 to fill their gas tank, can't afford a hybrid car, and face other challenges."[17] Obama wants to save the planet but *given capitalism* his "number one concern" has to be growing the economy, growing jobs. Given capitalism, today, tomorrow, next year and every year, economic growth will *always* be the overriding priority – till we barrel right off the cliff to collapse.

The necessity of denial and delusion

There's no *technical* solution to this problem and no *market* solution either. In a very few cases – electricity generation is the main one – a broad shift to renewables could indeed sharply reduce fossil fuel emissions in that sector. But if we just use "clean" "green" energy to power

[16] World Resources Institute, *WRI Navigating the Numbers*, Table 1. pp. 4-5, at http://pdf.wri.org/navigating_numbers.pdf.

[17] The Hill blog http://thehill.com/blogs/e2-wire/e2-wire/291787-obama-on-climate-change-the-politics-of-this-are-tough.

more growth, consume ever more natural resources, then we solve nothing and would still be headed to collapse. Agriculture is another sector in which reliance on fossil fuels could be sharply reduced – by abandoning synthetic fertilizers and pesticides and switching to organic farming. And there's no downside there – just the resistance of the agribusiness industrial complex. But for the rest of the economy – mining, manufacturing, transportation, chemicals, most services (e.g. construction, tourism, advertising, etc.), there are no such easy substitutes. Take transportation. There are no solar powered ships or airplanes or trains on anyone's drawing boards. Producing millions of electric cars instead of millions of gasoline-powered cars, as I explained elsewhere, would be just as ecologically destructive and polluting, if in somewhat different ways, even if they were all run on solar power.[18] Substituting biofuels for fossil fuels in transportation just creates different but no less environmentally destructive problems: converting farm land to raise biofuel feedstock pits food production against fuels. Converting rainforests, peatlands, savannas or grasslands to produce biofuels releases more CO_2 into the atmosphere than the fossil fuels they replace and accelerates species extinction.[19] More industrial farming means more demand for water, synthetic fertilizers and pesticides. And so on. *Cap and trade* schemes can't cut fossil fuel emissions because, as I also explained elsewhere[20] business understands, even if some environmentalists do not, that "dematerialization" is a fantasy, that there's no win-win tech solution, that capping emissions means cutting growth. Since cutting growth is unacceptable to business, labor, and governments, cap and trade has been abandoned everywhere.[21] *Carbon taxes* can't stop global warming either because they *do not* cap emissions. That's why fossil fuel execs like Rex Tillerson, CEO of ExxonMobil (the largest private oil company in the world) and Paul Anderson, CEO of Duke Energy (the largest electric utility in the U.S.) *support* carbon taxes. They understand that carbon taxes would add something to the cost of doing business, like other taxes, but they pose no limit, no "cap" on growth.[22] Exxon predicts that, carbon tax or no carbon tax, by 2040 global demand for energy is going to grow by 35%, 65% in the developing world and nearly all of this is going to be supplied by fossil fuels. ExxonMobil is not looking to "leave the oil in the soil" as a favour to Bill McKibben and the humans. ExxonMobil is looking to pump it and burn it all as fast as possible to enrich its shareholders.[23]

James Hansen, Bill McKibben, Barack Obama – and most of us really, don't want to face up to the economic implications of the need to put the brakes on growth and fossil fuel-based overconsumption. We all "need" to live in denial, and believe in delusions that carbon taxes or some tech fix will save us because we all know that capitalism has to grow or we'll all be out of work. And the thought of replacing capitalism seems so impossible, especially given the powers arrayed against change. But what's the alternative? In the not-so-distant future, this is all going to come to a screeching halt one way or another – either we seize hold of this out-of-control locomotive and wrench down this overproduction of fossil fuels, or we ride this train right off the cliff to collapse.

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[18] See my "Green capitalism," op cit. pp. 131-133.

[19] E.g. David Biello, "The false promise of biofuels," *Scientific American*, August 2011, pp. 59-65.

[20] Smith, "Green capitalism," op cit. pp. 117-122.

[21] Ibid.

[22] Ibid.

[23] ExxonMobil, *The Outlook for Energy: A View to 2040* (December 2012) at http://exxonmobil.com/corporate/files/news_pub_eo2013.pdf. See also, Jon Queally, "BP's Big Plan: Burn it. Burn it all," *Common Dreams*, January 17, 2013 at https://www.commondreams.org/headline/2013/01/17.

Same with resource depletion:

We in the industrialized "consumer economies" are not just over-consuming fossil fuels. We're over-consuming *everything.* From fish to forests, minerals to metals, oil to fresh water, we're consuming the planet like there's no tomorrow.[24] Ecological "footprint" scientists tell us that we in the industrialized nations are now consuming resources and sinks at the rate of 1.5 planets per year, that is, we're using natural resources like fish, forests, water, farmland, and so on at half-again the rate that nature can replenish them.[25] According to the World Bank, the wealthiest 10% of the world's people account for almost 60% of consumption expenditures and the top 20% account for more than 76% of global consumption whereas the bottom 40% of the world's population account for just 5%. Even the bottom 70% of the world's population account for barely 15.3% of global consumption expenditures.[26] Needless to say, those 70% want and deserve a higher material standard of living. Yet if the whole world were to achieve this *by consuming like Americans*, we would need something like five more planets worth of natural resources and sinks for all of that.[27] *Think what this means.*

Take the case of China. Columbia University's Earth Policy Institute predicts that if China keeps growing by around 8% per year, its current rate, Chinese average *per capita* consumption will reach current U.S. level by around 2035. But to provide the natural resources for China's 1.3+ billion consume like America's 330 million, the Chinese, roughly 20% of the world's population, will consume as much oil *as the entire world* consumes today, they will consume 69% of current world grain production, 62% of the current world meat production, 63% of current world coal consumption, 35% of current world steel consumption, 84% of current world paper consumption. (See Table 1.) Well, where on earth are the Chinese going to find the resources (not to mention sinks) to support all this consumption? China certainly doesn't have the resources. That's why the Chinese are buying up the planet. And that's just China. What about the other four-fifths of humanity? What are *they* going to consume in 2035?

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[24] E.g. John Parnell, "World on course to run out of water, warns Ban Ki-moon," *Guardian*, May 22, 22013. Gaia Vince, "How the world's oceans could be running out of fish," *BBC News Online*, September 12, 2012 at http://www.bbc.com/future/story/20120920-are-we-running-out-of-fish. And as tropical forests, biodiversity is being sacrificed even in nominally protected areas at an alarming rate. See William F. Laurance et al. "Averting biodiversity collapse in tropical forest protected areas," *Nature*, no. 489 September 12, 2012 pp. 290-294. "Widespread local 'extinctions' in tropical forest 'remnants'" Also, *ScienceDaily*, August 14, 2012 at http://www.sciencedaily.com/releases/2012/08/120814213404.htm. On minerals and oil see Michael T. Klare, *The Race for What's Left* (New York: Picador 2012).

[25] Ecological "footprint" studies show that today humanity uses the equivalent of 1.5 planets to provide the resources we use and absorb our waste. This means it now takes the Earth one year and six months to regenerate what we use in a year. Moderate UN scenarios suggest that if current population and consumption trends continue, by the 2030s, we will need the equivalent of two Earths to support us. And of course, we only have one. Turning resources into waste faster than waste can be turned back into resources puts us in global ecological "overshoot" depleting the very resources on which human life and biodiversity depend. See the Global Footprint Network at http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/.

[26] World Bank, *2008 World Development Indicators*, p. 4 Table 1J at http://data.worldbank.org/sites/default/files/wdi08.pdf.

[27] Worldwatch Institute, *2010 State of the World: Transforming Cultures From Consumerism to Sustainability* (New York: Norton, 2010) pp. 3-7ff. Also Alan Durning, *How Much is Enough?* (New York: Norton 1992). Avatar.

Table 1:
Annual consumption of key resources in China and U.S., latest year, with projections for China to 2035, compared to current world production

		Consumption		Projected Consumption*	Production
		Latest Year		2035	Latest Year
Commodity	Unit	U.S.	China	China	World
Grain	Million Tons	338	424	1,505	2,191
Meat	Million Tons	37	73	166	270
Oil	Million Barrels per Day	19	9	85	86
Coal	Million Tons of Oil Equiv.	525	1,714	2,335	3,731
Steel	Million Tons	102	453	456	1,329
Fertilizer	Million Tons	20	49	91	214
Paper	Million Tons	74	97	331	394

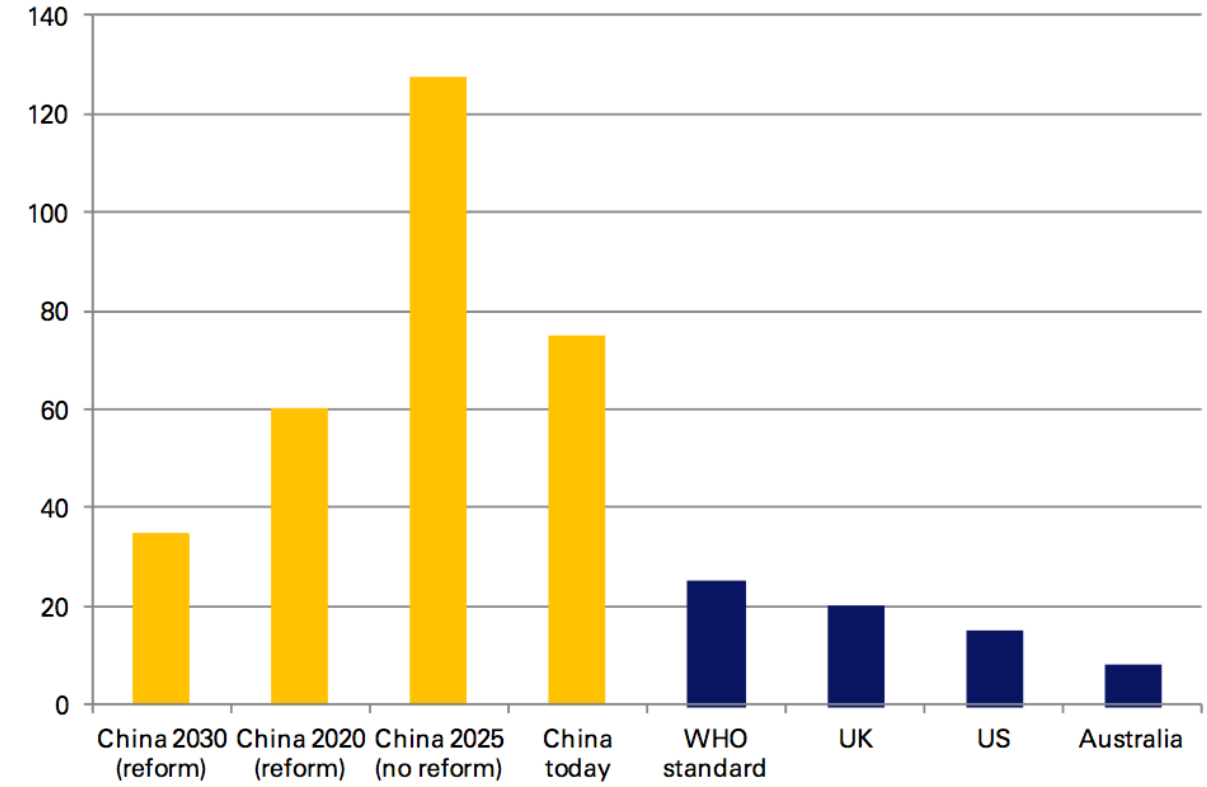
*Projected Chinese consumption in 2035 is calculated assuming per-capita consumption will be equal to the current U.S. level, based on projected GDP growth of 8 percent annually. Latest year figures for grain, oil, coal, fertilizer and paper are from 2008. Latest year figures for meat and steel are from 2010.

Source: Earth Policy Institute

China's capitalist environmental nightmare

As Beijing has been choking on smog this year, Deutsche Bank analysts gloomily conclude that, barring extreme reforms, Chinese coal consumption and increased car ownership will push pollution (http://chinadigitaltimes.net/china/pollution/) levels 70% higher by 2025. They say that even if China's economy slowed to 5% growth each year, its annual coal consumption would still rise to 6 billion tons (5.4 tonnes) by 2022, from the current 3.8 billion tons. Car ownership is expected to increase over the years to 400 million in 2030 from the current 90 million. With those two figures, it will be very difficult for the government to reduce the national average of PM2.5, or air pollution that is small enough to enter the bloodstream. The current national average is 75 micrograms per cubic meter. In January, PM2.5 levels in Beijing reached 900 micrograms per cubic meter.

Figure 1: Without reform, China's air pollution could worsen by another 70%: our forecast of PM2.5 levels



Source: Deutsche Bank estimates, WHO, NASA

Already, as resource analyst Michael Klare reviews in his latest book *The Race for What's Left*, around the world existing reserves of oil, minerals and other resources "are being depleted at a terrifying pace and will be largely exhausted in the not-too-distant future." This is driving miners and drillers to the ends of the earth, the bottom of oceans, to the arctic. We're running out of planet to plunder so fast that serious people like Google's Larry Page and Eric Schmidt have partnered with film director James Cameron to make life imitate art, to explore the possibility of mining asteroids and near planets. *Avatar* – the perfect capitalist solution to resource exhaustion (but the Marines will be Chinese). [28]

"Wild facts" and unquestioned assumptions

In mainstream discourse it is taken as an absolutely *unquestioned given* by scientists like James Hansen, environmentalists like George Monbiot, not to mention CEOs and presidents, that demand for everything must *grow infinitely,* that economies must grow *forever.* That's why

[28] Michael T. Klare, *The Race for What's Left*, p. 12 (my italics). AP, "Tech tycoons in asteroid mining venture," *Guardian*, April 20, 2012.

Hansen, Monbiot, James Lovelock and others tell us that, Fukishima notwithstanding, we "have to" *go nuclear* for energy production. In their view, the human population is headed for 9 billion, all these billions want to consume like Americans so we will need more power for their washing machines, air conditioners, iPads, TVs and (electric) SUVs, we can't burn more fossil fuels to produce this power because it will cook the planet, renewables are great but can't reliably and everywhere meet relentlessly growing "base load" demand for electricity 24/7 – *therefore* they tell us, we have "no choice" but to turn to nuclear power (Besides, what could go wrong with the "newest" "safest" "fourth generation" reactors? What indeed?).[29] But not one of these people stops to ask the obvious question, which is *where are all the resources going to come from to support insatiable consumption on a global scale?* In the capitalist lexicon there is no concept of "too much." The word "overconsumption" cannot be found in Econ. 101 text books except as a temporary market aberration, soon to be erased as "perfect competition" matches supply to demand and shortages and surpluses vanish down the gullet of the consumer. The fact that we live on one small planet with finite resources and sinks is just beyond the capitalist imagination *because,* as Herman Daly used to say, the "wild facts" of environmental reality demolish their underlying premise of the viability of endless growth on a finite planet. So inconvenient facts must be *denied*, suppressed or ignored. And they are. When, on May 10th 2013, climate scientists announced the latest "wild fact" that the level of heat-trapping CO_2 concentrations in the atmosphere had passed the long-feared milestone of 400ppm, an event fraught with ominous consequences for us all, this was met with total silence from the world's economic and political elites. President Obama was busy preparing his own announcement -- that he was clearing the way for *accelerated natural-gas exports* by approving a huge new $10 billion Freeport LNG facility in Texas. Obama's Dept. of Energy gave Freeport LNG the green light because it "found the prospective benefits from exporting energy outweighed concerns about possible downsides." No surprise there. Freeport LNG chief Michael Smith wasn't anticipating downsides or any change in Obama's priorities. He said: "I hope this means that more facilities will get approval in due time, sooner than later. The country needs these exports for jobs, for trade, and for geopolitical reasons..."[30] That's why, even though, at some repressed level, most Americans understand that fracking the planet is disastrous, even suicidal for their own children in the long run, yet still *for the present* they have to make the mortgage payments, fill the gas tank, and so they have little choice but to live in denial and support fracking.[31] And so we go, down the slippery slope.

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[29] Hansen, *Storms*, chapter 9. Independent Voices: "James Lovelock: Nuclear power is the only green solution," *Independent*, May 24, 2004 at http://www.independent.co.uk/voices/commentators/james-lovelock-nuclear-power-is-the-only-green-solution-6169341.html. George Monbiot the Guardian columnist has argued this in many venues but see in particular his blog piece: "The moral case for nuclear power," August 8, 2011 at http://www.monbiot.com/2011/08/08/the-moral-case-for-nuclear-power/. Also, Ted Nordhaus and Michael Shellenberger, "Going green? Then go nuclear," *Wall Street Journal* op-ed, May 23, 2013.

[30] Keith Johnson and Ben Lefebvre, "U.S. approves expanded gas exports," *Wall Street Journal*, May 18th, 2013.

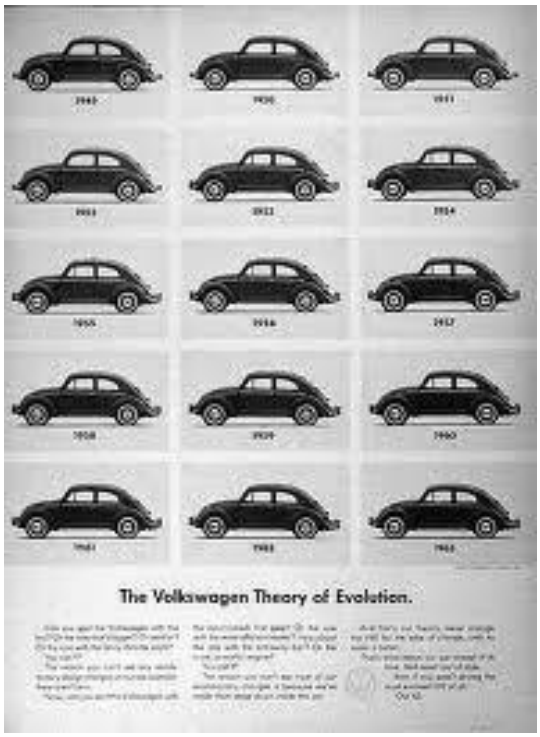
[31] John Vogel, "Methane gas 'fracking': 3 polls show public leaning to toward yes," *American Agriculturalist*, April 9, 2013 at http://farmprogress.com/story-methane-gas-fracking-3-polls-show-public-leaning-toward-yes-9-96948. Karen DeWitt, "Poll shows increased support for fracking," *North Country Public Radio*, September 13, 2012 at http://www.northcountrypublicradio.org/news/story/20474/20120913/poll-shows-increased-support-for-fracking.

No one stops to ask "what's it all for?" Why do we "need" all this energy? Why do we "need" all the stuff we produce with all this energy? It's high time we start asking this question. Economists tell us that two-thirds of America's own economy is geared to producing "consumer" goods and services. To be sure, we need food, clothing, housing, transportation, and energy to run all this. But as Vance Packard astutely observed half a century ago, most of what corporations produce today is produced not for the needs of people but *for the needs of corporations to sell to people.* From the ever-more obscene and pointless vanities of ruling class consumption – the Bentleys and Maseratis, the Bergdorf Goodman designer collections, the penthouses and resorts and estates and yachts and jets, to the endless waste stream of designed-in obsolescence-driven mass market fashions, cosmetics, furniture, cars, "consumer electronics," the obese 1000 calorie Big Macs with fries, the obese and over-accessorized SUVs and "light trucks," the obese and ever-growing McMansions for ever-smaller middle class families, the whole-house central air conditioning, flat screen TVs in every room, iThings in every hand, H&M disposable "fast fashion" too cheap to bother to clean,[32] the frivolous and astonishingly polluting jet and cruise ship vacations everywhere (even *Nation* magazine cruises with Naomi Klein!), and all the retail malls, office complexes, the packaging, shipping industries, the junk mail/magazine/catalogue sales companies, the advertising, banking and credit card "industries" that keep this perpetual consumption machine humming along, not to mention the appalling waste of the arms industry, which is just total deliberate waste and destruction, the vast majority – I would guess *at least three quarters* of all the goods and services we produce today *just do not need to be produced at all. It's all just a resource-hogging, polluting* waste. My parents lived passably comfortable working class lives in the 1940s and 50s without half this stuff and they weren't living in caves. We could all live happier, better, more meaningful lives without all this junk – and we *do not* need ever-more energy, solar or otherwise, to produce it. We could shut down all the coal-powered electric generators around the world, most of which, especially in China, are currently dedicated to powering the production of superfluous and disposable junk we don't need and replace them with – *nothing.* How's *that* for a sustainable solution? Same with nuclear. Since the 1960s, Japan built 54 nuclear power plants. But these were built not so much to provide electricity for the Japanese (their population is falling) as to power Japan's mighty manufacturing export engine producing all those disposable Gameboys and TVs and Toyotas and Hondas the world does not need and can no longer afford to "consume".

[32] Clothing designer Eliza Starbuck says of ultra-cheap producers like H&M "It's throwaway fashion or 'trashion.' If their prices are that cheap that people are throwing their disposable income at them – only to find that the clothes fall apart on the hangers after a wash or two – they're just creating garbage. . . It takes such a huge amount of human energy and textile fibers, dyes, and chemicals to create even poor quality clothes. They may be offering fashions at a price anyone can afford in an economic crunch, but they're being irresponsible about what happens to the goods after the consumers purchase them." Jasmin Malik Chua, "Is H&M's new lower-priced clothing encouraging disposable fashion?" *ecouterre*, September 28, 2010 at http://www.ecouterre.com/is-h-m-new-lower-priced-clothing-encouraging-disposable-fashion/2/. And H&M takes "disposable" literally. As the *New York Times* reported in 2012, H&M's employees systematically slash and rip perfectly good unsold clothes before tossing them in dumpsters at the back of the chain's 34th St. store in Manhattan – to make sure they can't be sold but thus adding pointlessly to landfills rather than donating them to charity. *It is little remarked that capitalism is the first economic system in which perfectly serviceable, even brand new goods from clothes to automobiles (recall the "cash for clunkers" rebates) are deliberately destroyed so as to promote production of their replacements.* I'll explore this interesting theme further elsewhere. See Jim Dwyer, "A clothing clearance where more than just the prices are slashed," *New York Times,* January 5, 2010. Also, Ann Zimmerman and Neil Shah, "Taste for cheap clothes fed Bangladesh boom," *Wall Street Journal*, May 13, 2013.

Endless growth or repair, rebuild, upgrade, recycle?

So, for example, at the risk of sounding ridiculous, we don't really *need* a global automobile industry. At least we don't need an industry cranking out hundreds of millions of new cars every year because the industry is built on the principle of designed-in obsolescence, on insatiable repetitive consumption, on advertising and "cash for clunkers" programs to push you to crush your perfectly good present car for a "new" "improved" "bigger" "more luxurious" model that is, in reality, trivially different, sometimes even inferior to the one you just junked. What we need is a different approach to transportation. To build a sustainable transportation system, we would have to divert most resources from auto production to public transportation, trains, busses, and bicycling. But of course bikes and public transport aren't feasible everywhere and for every task, particularly for those who live in the suburbs or the country or in the mostly rural developing world. So we would still need some cars and trucks – but many fewer if we "degrow" the economy to produce just what we need instead of for profit. As the VW ads below point out, properly designed and engineered cars can be sturdy but simple, economical to drive, easily, even DIY serviceable and repairable, *perpetually rebuildable and upgradable as needed*. I'm not suggesting an ecosocialist society should produce *this particular* "peoples' car." We need something with modern safety features. But to the extent that we would need cars in a sustainable society, we could save immense resources and GHG emissions by producing massively fewer cars and keep them running for decades if not practically forever. Reducing global car production to something like, say 10 percent of current production – *and sharing those* – would not only save vast resources and eliminate massive pollution but also free up labor and resources for other uses, let us shorten the working day – and take longer vacations!



VW ads from the sixties

Apple could easily build you iPhones and iMacs, in classic timeless designs that could last for decades, that could be easily be upgraded. This would save mountains of resources not to mention the lives Congolese kids and Foxconn assembly workers. But how much profit is there in that? Apple could never justify such a humane and environmentally rational approach to its shareholders because shareholders (who are several stages removed from the "sourcing" process and don't really care to know about it) are capitalist rationally looking to maximize returns on their portfolios, not to maximize the lifespan of the company's products, let alone the lifespan of Congolese or Chinese. So to this end, you have to be convinced that your G4 phone is not *good enough*, that you "need" an iPhone5 because you need a phone that streams movies, that talks to you and more, and next year you will need an iPhone6. And even if you own an iPad3 you will soon "need" an iPad4, plus an iPad Mini, and how will you live without iTV? This incessant, exponentially growing demand for the latest model of disposable electronic gadgets is destroying societies and the environment from Congo to China and beyond.

Miners near village of Kobu in north-eastern Congo

Picture credit:
Finbarr O'Reilly/Reuters, in the *New York Times* March 20, 2012.

IKEA could easily manufacture beautifully designed, high quality, sturdy and durable furniture that could last a lifetime, that could be handed down to your children or passed on friends or antique shops for others. That would save a Siberia's worth of trees, lakes of toxic dyes and finishes, and vast quantities of other resources. But why would they do that? IKEA is not in business to make furniture or save the planet. IKEA is in the business to make money. As Ingvar Kamprad, founder and CEO of IKEA, long ago discovered, the way to maximize profits (besides employing semi-slave forced labor in Stalinist regimes and moving his "Swedish" company from high-tax Sweden to low-tax Holland and Switzerland)[33] is to relentlessly cheapen production by, among other tactics, building flat pack disposable particleboard furniture in accordance with the IRON LAW OF MARKETING to sell "the cheapest construction for the briefest interval the buying public will tolerate" so IKEA can chop down more Siberian birch trees and sell you the same shoddy $59 bookcase all over again that will last you as long as the first one did – perhaps a bit longer this time if you don't actually load many books of those flimsy shelves. As an IKEA commercial, directed by Spike Jonze, tells us: "an old lamp (or bookcase or table) doesn't have any feelings; any piece of furniture can and should be replaced at any time." The ad, and the whole IKEA approach, suggests that objects have no lasting meaning or value. They're disposable; when we tire of them, we should just throw them out.[34]

[33] Juan O. Tamayo, "STASI records show Cuba deal included IKEA furniture, antiques, rum and guns," *McClatchy Newspapers*, May 9, 2012. James Angelos, "IKEA regrets use of East German prisoners," *Wall Street Journal*, November 16, 2012.

[34] I am quoting here from Stephanie Zacharek's excellent "IKEA is as bad as Wal-Mart," *Salon.com*, July 12, 2009: 12:11PM at http://www.salon.com/2009/07/12/cheap/singleton reviewing Ellen Ruppel Shell, *Cheap: The High cost of Discount Culture* (New York: Penguin, 2009), chapter 6.

This is how IKEA got to be the third largest consumer of wood in the world, most of it from East Europe and the Russian Siberia where, according to the World Bank, half of all logging is illegal even by the Russian kleptocracy's standards of legality. IKEA's wholly-owned Swedish subsidiary **Swedwood** has even been condemned by Russian nature conservancy organizations and the Global Forest Coalition for clear-cutting 1,400 acres a year of 200–600 year old old-growth forest near the Finnish border, a process that "is having deep ramifications on invaluable forest ecosystems."[35] This is how IKEA's business plan based on endless "repetitive consumption" is wiping out life on earth. Here again, the capitalist freedom to make such junk wouldn't matter – if it weren't costing the earth.[36]

Siberia's forests on their way via China to an IKEA store near you.

Picture credit:
BBC News Online (EIA picture) at http://news.bbc.co.uk/2/hi/8376206.stm

Given capitalism, there's no way to "incentivize" GM to stop producing new cars every year, IKEA to stop making its disposable furniture, Apple to stop pushing you to lose your iPhone 4 and buy a 5. That's what they're invested in. Companies can't change, or change much, because it's too costly, too risky, shareholders won't allow it. And given capitalism, most workers, most of the time, have no choice but to support all this suicidal overconsumption because if we all stop shopping to save the planet today, we'd all be out of work tomorrow. Ask your nearest six-year old what's wrong with this picture.

Capitalism and délastage in the richest country of poor people in the world

Yet even as corporations are plundering the planet to overproduce stuff we don't need, huge social, economic and ecological needs – housing, schools, infrastructure, health care, environmental remediation – go unmet, even in the industrialized world, while most of third world lacks even basic sanitation, clean water, schools, health care, ecological restoration, not to mention jobs.[37] After 300 years of capitalist "development" the gap between rich and poor has never been wider: today, almost half the world, more than 3 billion people, live on less than $2.50 a day, 80% of humanity lives on less than $10 a day. This while the world's richest 1%

[35] Ida Karisson, "IKEA products made from 600-year old trees," Inter Press Service, May 29, 2012 Common Dreams.org at https://www.commondreams.org/headline/2012/05/29-1.
[36] E.g. Fred Pearce, "Ikea—you can't build a green reputation with a flatpack DIY manual, *Guardian,* April 2, 2009. Also: Greenpeace, *Slaughtering the Amazon*, July 2009 at http://www.greenpeace.org/international/en/publications/reports/slaughtering-the-amazon/.
Alfonso Daniels, "Battling Siberia's devastating illegal logging trade," *BBC news online*, November 27, 2009.
[37] Michael Davis, *Planet of Slums* (London: Verso 2006).

own 40% of the world's wealth. The richest 10% own 85% of total global assets and half the world barely owns 1% of global wealth. And these gaps have only widened over time.[38] Tell me again where Karl Marx was wrong? In Congo, one of the lushest, most fertile countries on the planet, with untold natural wealth in minerals, lumber, tropical crops and more, its resources are plundered every day to support gross overconsumption in the north while poverty, hunger and malnutrition are so widespread that Congo is now listed dead last on the 2011 Global Hunger Index, a measure of malnutrition and child nutrition compiled by the International Food Policy Research Institute. While European and American corporations loot its copper and cobalt and coltran for iPhones and such, *half the population eats only once a day and a quarter less than that.* Things have reached such a state that in places like the capital Kinshasha parents can only afford to feed their children *every other day*. Congolese call it "*délastage*" – an ironic take-off on the rolling electrical blackouts that routinely hit first one neighbourhood then the next. In this context it means "Today we eat! Tomorrow we don't." "On some days," one citizen told a *New York Times* reporter, "some children eat, others do not. On other days, all the children eat, and the adults do not. Or vice versa." [39] This, in the 21st century, in one of the resource-richest countries on earth.

Contraction or collapse

If there's no market mechanism to stop plundering the planet then, again, what alternative is there but to impose an *emergency contraction* on resource consumption? This doesn't mean we would have to de-industrialize and go back to riding horses and living in log cabins. But it does mean that we would have to abandon the "consumer economy" – shut down all kinds of unnecessary, wasteful, and polluting industries from junk food to cruise ships, disposable Pampers to disposable H&M clothes, disposable IKEA furniture, endless new model cars, phones, electronic games, the lot. Plus all the banking, advertising, junk mail, most retail, etc. We would have completely redesign production to replace "fast junk food" with healthy, nutritious, fresh "slow food," replace "fast fashion" with "slow fashion," bring back mending, alterations, and local tailors and shoe repairmen. We would have to completely redesign production of appliances, electronics, housewares, furniture and so on to be durable and long-lived as possible. Bring back appliance repairmen and such. We would have to abolish the throwaway disposables industries, the packaging and plastic bag industrial complex, bring back refillable bottles and the like. We would have to design and build housing to last for centuries, to be as energy efficient as possible, to be reconfigurable, and shareable. We would have to vastly expand public transportation to curb vehicle use but also build those we do need to last and be shareable like Zipcar or Paris's municipally-owned "Autolib" shared electric cars. *These are the sorts of things we would have to do to if we really want to stop overconsumption and save the world.* All these changes are simple, self-evident, no great technical challenge. They just require a completely different kind of economy, an economy geared to producing what we

[38] World Bank Development Indicators 2008, cited in Anup Shah, Poverty and stats, *Global Issues* January 7, 2013 at http://www.globalissues.org/article/26/poverty-facts-and-stats#src1. World Institute for Development Economics Research of the UN cited in James Randerson, "World's richest 1% own 40% of all wealth, UN report discovers," *Guardian*, December 6, 2006. As for trends, in 1979 the richest 1% in the U.S. earned 33.1% more than the bottom 20%. In 2000 the wealthiest 1% made 88.5% more than the poorest 20%. In the Third World, polarization has grown even worse, especially in China which in 1978 had the world's most equal incomes while today, it has the most unequal incomes of any large society. Who says capitalism doesn't work?!

[39] Adam Nossiter, "For Congo children, food today means none tomorrow," *New York Times*, January 3, 2012.

need while conserving resources for future generations of humans and for other species with which we share this planet.

3. If capitalism can't help but destroy the world, then what alternative is there but to nationalize and socialize most of the economy and plan it directly, even plan most of the global industrial economy?

With 7 billion of us humans crowded on one small planet running out of resources, with cities disappearing under vast clouds of pollution, with the glaciers and ice caps melting, and species going extinct by the hour, we desperately need a PLAN to avert ecological collapse. We need a comprehensive *global plan*, a number of *national or regional plans*, and *a multitude of local plans* – and we need to coordinate them all. When climate scientists call on governments to cut CO_2 emissions to stay within a global "carbon budget" if we want to keep a liveable planet, isn't that in effect calling for "planning," indeed, planning on a global scale? When governments pump money into research projects like nuclear power or biotech or the internet or clean energy projects, isn't that planning? When scientists say that we need to massively reduce and limit consumption of oil, coal, trees, fish, all kinds of scarce resources, or stop dumping chemicals in the world's oceans – isn't that in effect physical planning and rationing? And don't we want that? Indeed, since we all breathe the same air, live in the same biosphere, don't we really want and need something like a "one-world government" at least on environmental issues? How else can we regulate humanity's collective impact on the global biosphere? How else can we reorganize and reprioritize the economy in the common interest and environmental rationality except in a mostly planned and mostly publicly owned economy?

What would we have to do to save the humans?

If we want a sustainable economy, one that "meets the needs of present generations without compromising the ability of future generations to meet their needs," then we would have to do *at least some or all of the following:*

1. Put the brakes on out-of-control growth in the global North – retrench or shut down unnecessary, resource-hogging, wasteful, polluting industries like fossil fuels, autos, aircraft and airlines, shipping, chemicals, bottled water, processed foods, unnecessary pharmaceuticals, and so on. Abolish luxury goods production, the fashions, jewelry, handbags, mansions, Bentleys, yachts, private jets etc. Abolish the manufacture of disposable, throw away and "repetitive consumption" products. All these consume resources we're running out of, resources which other people on the planet desperately need, and which our children and theirs will need.

2. Discontinue harmful industrial processes like industrial agriculture, industrial fishing, logging, mining and so on.

3. Close down many services – the banking industry, Wall Street, the credit card, retail, PR and advertising "industries" built to underwrite and promote all this overconsumption. I'm sure most of the people working in these so-called industries would rather be doing something else, something useful, creative and interesting and personally rewarding with their lives. They deserve that chance.

4. Abolish the military-surveillance-police state industrial complex, and all its manufactures as this is just a total waste whose only purpose is global domination, terrorism and destruction abroad and repression at home. We can't build decent societies anywhere when so much of social surplus is squandered on such waste.

5. Reorganize, restructure, reprioritize production and build the products we do need to be as durable *and shareable* as possible.

6. Steer investments into things society *does* need like renewable energy, organic farming, public transportation, public water systems, ecological remediation, public health, quality schools and other currently unmet needs.

7. De-globalize trade to produce what can be produced locally, trade what can't be produced locally, to reduce transportation pollution and revive local producers.

8. Equalize development the world over by shifting resources out of useless and harmful production in the North and into developing the South, building basic infrastructure, sanitation systems, public schools, health care, and so on.

9. Devise a rational approach to eliminate and/or control waste and toxins as much as possible.

10. Provide equivalent jobs for workers displaced by the retrenchment or closure of unnecessary or harmful industries, not just the unemployment line, not just because otherwise, workers cannot support the industrial we and they need to save ourselves.

"Necessary", "unnecessary" and who's the "decider"?

Now we might all agree that we have to cut "overconsumption" to save the humans. But who's to say what's "necessary" and "unnecessary?" How do we decide what to cut? And who's to decide? Under capitalism goods and services are rationed by the market. But that's not sustainable because the market can't restrain consumption, the market can only accelerate consumption. So we need a non-market approach. I don't claim to have all the answers. This is a big question and I'm sure there are others better qualified than me to figure out solutions. But I would think the short answer has to be a combination of *planning, rationing, and democracy.* I don't see why that's so hard. The U.S. government planned significant parts of the U.S. economy during World War II and rationed many goods and services. And we managed just fine. Actually, far from suffering unduly, Americans took pride in conservation and sharing. Besides, what's the alternative? What other choice do we have? There are only so many ways to organize a modern industrial economy.

The challenges of physically planning the world economy in the interests of the 99% instead of for the 1% – reorganizing and reprioritizing the world economy to provide every person sufficient, nutritious, safe and delicious food, providing every human with high quality, pleasurable, and aesthetically appealing housing, consolidating our cities to maximize the feasibility of public transportation, building great schools to enable every student to reach her or his fullest potential, providing top-notch health care for everyone on the planet, reorganizing and reprioritizing work so that everyone can find constructive, enjoyable, interesting,

challenging and rewarding work, work that's rewarding in many ways beyond simple remuneration, providing fun, enlightening and inspiring entertainment, reducing the workday so people can actually have time to enjoy themselves and pursue other pleasures, while, not least, how to limit our collective human impact on the planet so as to leave space and resources to all the other wonderful life forms with which we have the pleasure of sharing this unique and amazing planet – all these are no doubt big challenges. They're very big *political* challenges. But they're not an *economic* challenge. This is not Soviet Russia in 1917. I'm not proposing Maoist austerity. Today, there's more than enough wealth and productive capacity to provide every person on earth a *very satisfactory material standard of living*. Even more than half a century ago, Gandhi was right to say then that "there's more than enough wealth for man's need but never enough for some men's greed." I doubt that it would even be much of a *technical* challenge. Google's Larry Page predicts that the virtually everyone in the world will have access to the internet by 2020. Quantifying human needs, global resources, and global agricultural and industrial capacities is, I would think, a fairly pedestrian task for today's computers, with all their algorithms.

Planning can't work?

Right-wing economists like Milton Friedman denied the very possibility of planning any economy, equating all planning with Stalinism. I don't buy that. The question is, planning by whom, for whom? Stalinist central planning was planning from the top down, *by and for* a totalitarian bureaucracy. It completely shut out workers and the rest of society from the planning process. So it's hardly surprising that planning didn't work so well in the USSR. But I don't see what that tells us about the potentials of planning from the bottom up, of democratic planning. Besides, capitalists *indirectly* plan the national and global economies all the time. They meet every year at Davos to shape the world market for their benefit. They conspire to privatize medicine, schools, public transportation, force us to buy "their" water or eat GMO foods. They use the IMF and World Bank to shackle countries with debt, then open them up to U.S. corporate takeover. They've been using their states for centuries to expropriate peasants and tribes, even to exterminate them when necessary as in the Americas, to steal and privatize common lands, break up pre-capitalist societies, re-organize, re-plan whole continents to set up the right "business climate" for capital accumulation. Late developers like Japan and South Korea used their state-backed MITIs and Chaebols to hothouse their own industries, protect them, and strategically plan their integration into the world market. Capitalists are *very good* at planning – for their own interests. So why can't we plan the economy for *our own interests?*

Government "can't pick winners?"

Disingenuous capitalist apologists like the *Wall Street Journal* are quick to condemn any perceived government funded "failures" like the recent bankruptcy of solar start-up Solyndra Corporation bankrolled by the Obama administration as proof that "government can't pick winners." But Solyndra didn't fail because solar is a losing technology. It failed because, ironically, capitalist Solyndra could not compete against lower-cost state-owned, state-directed, and state-subsidized competitors in *China*. Besides, since when do capitalists have a crystal ball? CEOs and corporate boards bet on "loser" technologies and products all the time. Look at the recent collapse of electric car start-up Fisker Automotive, or Better Place, the Israeli electric

vehicle charging/battery swapping stations venture.[40] These join a long list of misplaced private bets from Sony's Betamax to Polaroid, Ford's Edsel, Tucker Automobile, DeLorean Motor Company and all the way back to White Star Lines Titanic and the Tulip Mania. CEOs and boards not only pick losing technology and products, they also lose money for their shareholders and even drive perfectly successful companies into bankruptcy every day: Jamie Dimon at JP Morgan, Lehman Brothers, Washington Mutual, Enron, World Com, Pan Am, SwissAir and on and on. Who knows if Facebook or Zipcar or Tesla Motors will ever make money? Government-backed Solyndra lost $500 million. But when Jamie Dimon lost $12 *billion* for JP Morgan, I don't recall the *Journal* howling that capitalists "can't pick winners". When Enron collapsed I don't recall hearing any blanket condemnation of the "inevitable incompetence" of the private sector. Hypocrisy is stock and trade of capitalists, lazy media, and fact averse capitalist economists who want to make the facts fit their simple-minded model no matter the truth. That's why it's entirely in character that the *Wall Street Journal* has never bothered to applaud government when it picked *indisputable winners:* when government-funded, government-directed applied research produced nuclear weapons, nuclear energy, radar, rockets, the jet engine, the transistor, the microchip, the internet, GPS, crucial breakthroughs in biotechnology, when government scientists and government industries launched the Apollo space crafts that put men on the moon, when government-developed and produced ballistic missiles terrorized the Soviets and government-designed and operated bombers bombed the Reds in Korea and Vietnam to "contain communism" and secure American dominance of the Free World for corporate subscribers of the *Wall Street Journal* to exploit -- where then was the *cri de coeur* that "government can't pick winners?" And what about those government-run drones? Anti-government big mouth Rand Paul filibustered for a whole day against the threat of swarms of government drones over American cities but I didn't hear him complain that government drones *don't work.* That wasn't his problem. And when, after an *eight-year long* mind-bogglingly difficult, complex and risky 150 *million-mile* journey, NASA's government-built *Curiosity* space ship landed a (government-built) state of the art science lab the size of a Mini Cooper within a mile and a half of its target on the surface of *Mars*, and then immediately set off to explore its new neighbourhood, even the Ayn Rand-loving government-hating Republicans in Congress were awed into silence. As David Sirota's headline in *Salon.com* read on August 13, 2012 just after *Curiosity* set down on the red planet: "Lesson from Mars: Government works!" And right now, as I'm writing this in April 2013, most of a year later, that government-run Mars explorer is happily roving around drilling core samples to find out if there is now or used to be, water and possibly even life on Mars – this while back home, Shell Oil's private capitalist-run arctic drilling platform ran aground in an arctic storm and is now being towed away to Asia for repairs while Shell Oil's shareholders are having second thoughts about their CEO's wisdom in "picking winners" by squandering $5 billion on this fools' errand of drilling for oil under Artic ice.[41]

[40] Isabel Kershner, "Israeli venture meant to serve electric cars ending its run," *New York Times,* May 27, 2013. Ronald D. White, "One owner, low miles, will finance: sellers try to unload Fiskers," *Los Angeles Times*, April 26, 2013. Rachel Feintzeig, "Electric-car maker Coda files for bankruptcy*," Wall Street Journal*, May 1, 2013.

[41] Kenneth Chang, "Mars could have supported life long ago, NASA says," *New York Times*, March 12, 2013. And Shell Oil isn't the only company having second thoughts about what it's brilliant CEO thought was a sure thing: Clifford Krauss, "ConocoPhilips suspends its Arctic drilling plans, *New York Times*, April 11, 2013.

One planet, one people, one economy for the common good

For better or worse, we are well into what scientists call the "Anthropocene". Nature doesn't run Earth anymore. We do. So if we are, after all, just "one people on one planet," it's time we begin to make conscious *and collective* decisions about how our economic activity affects the natural world – and I don't mean "geo-engineering" the planet by wrapping glaciers in tin foil to slow their melting while capitalism goes right on cooking and pillaging the planet. Since the rise of capitalism 300 years ago, more and more of the world has come to be run on the principle of *market anarchy*, on Adam Smith's maxim that every individual should just maximize his/her own interest – "look out for No. 1" – and the "public interest," the "common good," would take care of itself. Well, that hasn't worked out so well. It was always a dumb theory but it's worked OK for the 1% who could mostly manage without the commons. For the rest of us, the more capitalism, the more the common good gets trashed. And now globalized market anarchy is destroying not just humanity and society – but even life on earth.[42] The problem with Smith's theory is that the aggregate of private interests don't add up to the public interest. The problems we face with respect to the planetary environment and ecology can't be solved by individual choice in the marketplace. They require *collective democratic control over the economy to prioritize the needs of society, the environment, other species, and future generations*. This *requires local, national and global economic planning to reorganize the world economy and redeploy labor and resources to these ends.* And it requires an economy of *guaranteed full employment* because if we would have to shut down ExxonMobil and GM and Monsanto[43] and Walmart and so on to save the world, then we have to provide equal or better jobs for all those laid off workers because otherwise they won't support what we all need to do to save ourselves.

Ecosocialism and the salvation of small businesses

This does *not at all* mean that we would have to nationalize local restaurants, family farms, farmers markets, artisans, groceries, bakeries, repair shops, workers co-ops and the like. Small-scale self-managed producers based on simple reproduction are not destroying the world. Large-scale capitalist investor-owned corporations based on insatiable accumulation *are* destroying the world. So they would have to be nationalized, many closed down, others scaled back, others repurposed. But an ecosocialist society would rescue and promote small-scale, local self-managed businesses because we would need them, indeed, we would want many more of them whereas, today, capitalism is driving them out of business everywhere.

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[42] Citing a recent study by an international team of researchers in *Nature Climate Change* in May 2013, the BBC reports that if "rapid action" is not taken to curb greenhouse gases, some 34% of animals and 57% of plants will lose more than half of their current habitat ranges. Dr. Rachel Warren, the lead scientist of the study said that "Our research predicts that climate change will greatly reduce the diversity of even very common species found in most parts of the world. This loss of global-scale biodiversity would significantly impoverish the biosphere and the ecosystem services it provides. There will also be a knock-on effect for humans because these species are important for things like water and air purification, flood control, nutrient cycling, and eco-tourism." Matt McGrath, "'Dramatic decline' warning for plants and animals," *BBC News Online*, May 12, 2013 at http://www.bbc.co.uk/news/science-environment-22500673.

[43] On the existential threat Monsanto Corporation poses to humanity and the planet, see the Green Shadow Cabinet: "What must be done about Monsanto corporation, and why." May 23, 2013 at http://greenshadowcabinet.us/statements/ecology-what-must-be-done-about-monsanto-corporation-and-why.

4. Rational planning requires democracy: voting the big questions

Solar or coal? Frack the planet or work our way off fossil fuels? Drench the world's farms in toxic pesticides or return to organic agriculture. Public transportation or private cars as the mainstay? Let's put the big questions up for a vote. Shouldn't everyone have a say in decisions that affect them all? Isn't that the essential idea of democracy? The problem with capitalism is that the economy isn't up for a vote. But it needs to be. Again, in Adam Smith's day it mattered less, at least for the environment, because private decisions had so little impact on the planet. But today, huge decisions that affect all of us, other species, and even the fate of life on earth, *are all still private decisions,* made by corporate boards on behalf of self-interested investors. Polls show that 57% of Chinese feel that protecting the environment should be given priority, even at the expense of economic growth, and only 21% prioritize the economy over the environment.[44] But, obviously, the Chinese don't get to vote on that or anything else. Polls show Americans opposed to GMO foods outnumber supporters nearly two to one and 82% of Americans favour labelling of GMO foods.[45] But Americans don't get to vote on whether we get GMOs in our food or get told about it. Well, why not? Corporate boards vote to put GMOs and all kinds of toxic chemicals in our food. We're the ones who consume this stuff. We can't avoid GMOs simply by refusing to purchase them – the "market solution" – because they're everywhere, they're in 80% of the foods we consume, and Monsanto and the rest of the GMO industrial complex bribe politicians and regulators with campaign contributions and lucrative revolving-door jobs to make sure you don't know what foods to avoid.[46] Well, why should we accept this? Why shouldn't we have a say in these decisions? We don't have to be experts; corporate boards aren't composed of experts. They're mainly comprised of major investors. They discuss and vote on what they want to do, then hire experts to figure out how to implement their decisions. Why can't we do that – for humanity's interests?

Every cook can govern

From Tunisa to Tahir Square, Zacotti Park to Gezi Park, Madison Wisconsin to Kunming Yunnan, Songjian Shanghai, Shifang Sichuan, Guangzhou and thousands of sites and cities and towns all over China, ordinary citizens demonstrate remarkably rational environmental sense against the profit-driven environmental irrationality and irresponsibility of their rulers. [47] In Turkey, "Sultan" Erdogan's decree to tear up Istanbul's last major park to replace it with an Ottoman-style shopping mall provoked mass outrage. Protestors complained, as one put it: "When were we asked what we wanted? We have three times as many mosques as we do schools. Yet they are building new mosques. There are eight shopping malls in the vicinity of Taksim, yet they want to build another… Where are the opera houses? The theatres? The culture and youth centres? What about those? They only choose what will bring them the most profit without considering what we need."[48] When, in a bid to mollify the protestors, a

[44] Gallup, June 8, 2012 at http://www.gallup.com/poll/155102/majority-chinese-prioritize-environment-economy.aspx.

[45] *Huffington Post*, "GMO poll finds huge majority say foods should be labeled," March 4, 2013 at http://www.huffingtonpost.com/2013/03/04/gmo-poll_n_2807595.html.

[46] See again, Green Shadow Cabinet, "What must be done about Monsanto, and why?" op cit.

[47] E.g. Jennifer Duggan, "Kunming pollution is the tip of rising Chinese environmental activism," *Guardian* blog post May 16, 2013 at 11.59EDT at http://www.guardian.co.uk/environment/chinas-choice/2013/may/16/kunming-pollution-protest-chinese-environmental-activism.

[48] Tim Arango and Ceylan Yeginsu, "Peaceful protest over Istanbul park turns violent as police crack down," *New York Times*, May 31, 2013.

spokesman for the ruling Justice and Development Party (AKP) floated the excellent idea of a public referendum on the issue saying "We might put it to a referendum... In democracies on the will of the people counts" Erdogan considered this option for a moment but when protestors doubted his sincerity, he proved them right by calling in his riot squads to crush the protests instead.[49] In Brazil, on the heels of the Turkish protests, mass protests erupted over announced bus fare hikes but soon morphed into more sweeping social protest as hundreds of thousands of Brazilians turned out in cities across the country to denounce the irresponsible waste of public funds on extravagant soccer stadiums in the run-up to the World Cup in 2014 when schools, public transportation, hospitals, health care and other public services are neglected: "People are going hungry and the government builds stadiums," said Eleuntina Scuilgaro, a pensioner. "I love soccer, but we need schools" said Evaldir Cardoso, a firemen at a protest with his seven-month-old son. "These protests are in favour of common sense", argued protestor Roberta da Matta, "We pay an absurd amount of taxes in Brazil, and now more people are questioning what they are getting in return."[50]

If corporations and capitalist governments can't align production with the common good and ecological rationality, what other choice is there but for society to collectively and democratically organize, plan and manage most production themselves? To do this we would have to establish democratic institutions to plan and manage our social economy. We would have to set up planning boards at local, regional, national/continental and international levels. Those would have to include not just workers, the direct producers, but entire communities, consumers, farmers, peasants, everyone. We have models: the Paris Commune, Russian soviets, Brazil's participatory planning, La Via Campesina, and others. Direct democracy at the base, delegated authority with right of recall for higher level planning boards. What's so difficult about that?

As Greg Palast, Jarrold Oppenheim, and Theo MacGregor described in *Democracy and Regulation: How the Public Can Govern Essential Services* (2003), it is a curious and ironic fact that the United States, foremost protagonist of the free market, possesses a large and indispensable sector of the economy that is not governed by the free market but instead, democratically, by public oversight – and that is utilities: the provision of electricity, heating fuel, water and sewerage, and local telephone service. Not only that, but these are the most efficient and cheapest utility systems in the world. The authors note that British residents pay 44 percent more for electricity than do American consumers, 85 percent more for local telephone service and 26 percent more for natural gas. Europeans pay even more, Latin Americans more than Europeans. They write that "Americans pay astonishingly little for high-quality public services, yet low charges do not suppress wages: American utility workers are the nation's industrial elite, with a higher concentration of union membership than in any other private industry." Palast, Oppenheim and MacGregor attribute this to the fact that, unlike Britain and most of the rest of the world, utilities are not unregulated free market corporations like ExxonMobil or Monsanto or Rio Light or British Water. Instead, they are tightly regulated industries, mostly privately owned, but many publicly owned by local municipalities. Yet even when utilities are privately owned like Con Edison in New York or Green Mountain Power in Vermont or Florida Power and Light (to take some east coast examples), it's really hard to call this "capitalism." It's more like state capitalism, even quasi-socialism. Either way, public or investor owned, they are highly regulated, subject to public oversight, involvement and control:

[49] "Turkish government moots referendum on Gezi Park," *Deutsche Welle,* June 12, 2013 at http://www.dw.de/turkish-government-moots-referendum-on-gezi-park/a-16877383.
[50] Simon Romero, "Protests grow as Brazilians blame leaders," *New York Times*, June 19, 2013.

> "Unique in the world (with the exception of Canada), every aspect of US regulation is wide open to the public. There are no secret meetings, no secret documents. Any and all citizens and groups are invited to take part: individuals, industrial customers, government agencies, consumer groups, trade unions, the utility itself, even its competitors. *Everyone affected by the outcome has a right to make their case openly, to ask questions of government and utilities, to read all financial and operating records in detail.* In public forums, with all information open to all citizens, the principles of social dialogue and transparency come to life. It is an extra-ordinary exercise in democracy – and it works... Another little known fact is that, despite the recent experiments with markets in electricity [the authors published this book in 2003, just three years after the Enron privatization debacle], the US holds to the strictest, most elaborate and detailed system of regulation anywhere: private utilities' profits are capped, investments directed or vetoed by public agencies. Privately owned utilities are directed to reduce prices for the poor, fund environmentally friendly physical and financial inspection… Americans, while strongly attached to private property and ownership, demand stern and exacting government control over vital utility services."[51] (Greg Palast, Jerrold Oppenheim, and Theo MacGregor 2003 – emphasis added)

The authors are careful to note that this is "no regulatory Garden of Eden." It has many failings: regulation is constantly under attack by promoters of market pricing, the public interest and the profit motive of investor-owned utilities often conflict with negative consequences for the public, and so on.[52] But even so, this long-established and indisputably successful example of

[51] Greg Palast, Jerrold Oppenheim, and Theo MacGregor, *Democracy and Regulation: How the Public can Govern Essential Services* (London: Pluto, 2003) pp. 2-4. The authors point out yet another irony of this system of public regulation, namely that it was created by *private companies* as the lesser evil to fend off the threat of nationalization: "Modern US utility regulation is pretty much the invention of American Telephone & Telegraph Company (AT&T) and the National Electric Light Association (NELA) – the investor-owned telephone and electric industries at the turn of the twentieth century. They saw regulation as protection against Populist and Progressive movements that, since the economic panic of 1873 and later disruptions, had galvanized anti-corporate farmer and labor organizations. By the turn of the twentieth century, these movements had galvanized considerable public support for governmental ownership of utilities… " p. 98.

[52] In the case of nuclear power plants, local public regulation has often been subverted and overridden by the federal government in its zealous drive to push nuclear power even against the wishes of the local public. Thus in the aftermath of the Three Mile Island nuclear accident in 1979, social scientists Raymond Goldsteen and John Schorr interviewed residents around Three Mile Island about the history of the power plant, why it was built, what voice they had in the decision to build it, and about the decision to restart the plant after the accident. It turns out that, as one resident, a Mrs. Kelsey put it, they had no choice. They were virtually forced to accept it: "They [Met Ed the utility, and the Nuclear Regulatory Commission] keep saying we need this nuclear. They keep pounding that into our heads with the news and everything. We need it. We need it. We can't do without it." Residents told Goldstein and Schorr that the surrounding communities petitioned against restarting the plant after the accident but lost again. Another resident, Mrs. Boswell, said" We don't want to be guinea pigs . . I still think that we should have a say, too, in what goes on. I really do, because we're the victims." Mrs. Brown: "The company just wants [to reopen the plant for] the money …" Mrs. Carmen: "No, they're going to do what they want . . . I don't think [community feelings] would bother them at all." Mrs. Hemmingway: "I feel very angry about it really, because I just feel that there is so much incompetence on the part of the utility, on the part of the NRC, on the part of the local governments…" Residents said that if they had been honestly informed about the risks, and if they had had a choice, they would have investigated other technologies, and chosen differently. Mrs. Hemingway

democratic public regulation of large-scale industries offers us a real-world practical example of something like a "proto-socialism". I see no obvious reason something like this model of democracy and transparency could not be extended, expanded, fully socialized, and replicated to encompass the entire large-scale industrial economy. Of course, as I argued above, to save the humans, we would have to do much more than just "regulate" industries. We would have to completely reorganize and reprioritize the whole economy, indeed the whole global industrial economy. This means not just regulating but retrenching and closing down resource-consuming and polluting industries, shifting resources out of them, starting up new industries, and so on. Those are huge tasks, beyond the scope of even the biggest corporations, even many governments. So who else could do this but self-organized masses of citizens, the whole society acting in concert, democratically? Obviously, many issues can be decided at local levels. Others like closing down the coal industry or repurposing the auto industry, require large scale planning at national if not international levels. Some, like global warming, ocean acidification, deforestation, would require extensive international coordination, virtually global planning. I don't see why that's not doable. We have the UN Climate Convention which meets annually and is charged with regulating GHG emissions. It fails to do so only because it lacks enforcement powers. We need to give it enforcement powers.

5. Democracy can only work in context of rough socio-economic equality and social guarantees.

When in the midst of the Great Depression, the great "people's jurist" Supreme Court Justice Louis Brandeis said "We can either have democracy in this country or we can have great wealth concentrated in the hands of a few, but we can't have both" he was more right than he knew. Today we have by far the greatest concentration of wealth in history. So it's hardly surprising that we have the weakest and most corrupt democracies since the Gilded Age. If we want democracy, we would have to abolish "the great wealth concentrated in the hands of the few." That means abolishing not just private property in the means of production, but also extremes of income, exorbitant salaries, great property, and inheritance. Because *the only way to prevent corruption of democracy is to make it impossible to materially gain by doing so* -- by creating a society with neither rich nor poor, a society of basic economic equality.

Does that mean we would all have to dress in blue Mao suits and dine in communal mess halls? Hardly. Lots of studies (Wilkinson and Pickett's *Spirit Level*, the UK's *New Economics Foundation* studies, and others) have shown that people are happier, there's less crime and

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again: "It just seems to me there are so many alternatives we could explore . . . We obviously need alternate energy sources, but solar could provide heating for houses and water [and so on]." Residents said they would have preferred other choices even if it meant giving up certain conveniences: Mrs. Caspar: "I don't really mind conserving all that much. If people can conserve gas [for cars] why can't they conserve energy? Now I don't mean I want to go back to the scrubboard . . . But I don't dry my clothes in the dryer. I hang them . . . on the line. . . and I do try to conserve as far as that goes." (pp. 181-183,212). One of the most interesting results of this study, which is well worth reading in full, is that it illustrates how ordinary citizens, given the chance, would make more rational decisions about technology, safety, and the environment than the "experts" at the utility, Met Ed, and the Nuclear Regulatory Commission. It's not that they were more knowledgeable about the technology than the experts but that the experts were not impartial. They were representing the industry and profits and the NRC, not the public, *so they could not help but systematically make wrong decisions*, decisions that in this case not only violated the public trust and but put huge numbers of lives in danger. Raymond L. Goldsteen and John K. Schorr, *Demanding Democracy After Three Mile Island* (Gainsville: University of Florida Press 1991).

violence and fewer mental health problems in societies where income differences are small and where concentrated wealth is limited. We don't have five planets to provide the resources for the whole world to live the "American Dream" of endless consumerism. But we have more than enough wealth to provide every human being on the planet with a basic income, with a good job at pay sufficient to lead a dignified life, with safe water and sanitation, quality food, housing, education and healthcare, with public transportation -- all the *authentic* necessities we really need. These should all be guaranteed *as a matter of right*, as indeed most of these were already declared as such in the Universal Declaration of Human Rights of 1948.

Freeing ourselves from the toil of producing unnecessary and/or harmful commodities – *the three quarters of current U.S. production that's a waste* – would free us to shorten the work day, to enjoy the leisure promised but never delivered by capitalism, to *redefine the meaning of the standard of living to connote a way of life that is actually richer, while consuming less,* to realize our fullest human potential instead of wasting our lives in mindless drudgery and shopping. This is the emancipatory promise of ecosocialism.

6. This is crazy, utopian, impossible, never happen

Perhaps. But what's the alternative? The spectre of planet-wide ecological collapse and the collapse of civilization into some kind of Bladerunner dystopia is not as hypothetical as it once seemed. Ask the Chinese. China's "capitalist miracle" has already driven that country off the cliff into headlong ecological collapse that threatens to take the whole planet down with it. With virtually all its rivers and lakes polluted and many depleted, with 70% of its croplands contaminated with heavy metals and other toxins, with undrinkable water, inedible food, unbreathable air that kills more than a million Chinese a year, with "cancer villages" metastasizing over the rural landscape and cancer the leading cause of death in Beijing,[53] China's rulers face hundreds of mass protests, often violent, around the country every day, more than a hundred thousand protest a year, and even with all their police-state instruments of repression, they know they can't keep the lid on forever (indeed, hundreds of thousands of Communist Party kleptocrats can see the writing on the wall through the smog and are moving their families, their money and themselves out of the country before it's too late). Today the Chinese and we need a socialist revolution not just to abolish exploitation and alienation, but to derail the capitalist train wreck of ecological collapse before it takes us all over the edge. As China itself demonstrates, revolutions come and go. Economic systems come and go. Capitalism has had a 300 year run. The question is: will humanity stand by and let the world be destroyed to save the profit system?

The spectre of eco-democratic revolution

That outcome depends to a great extent on whether we on the left can answer that question "what's your alternative?" with a compelling and plausible vision of an eco-socialist civilization – and figure out how to get there. We have our work cut out for us. But what gives the growing global eco-socialist movement an edge in this ideological struggle is that capitalism has *no solution to the ecological* crisis*, no way to put the brakes on collapse*, because its only answer to every problem is more of the same growth that's killing us. "History" was supposed to have

[53] Edward Wong, "Air pollution linked to 1.2 million premature deaths in China," *New York Times*. April 1, 2013. Johnathan Kaiman, "Inside China's 'cancer villages,'" *Guardian*, June 4, 2012.

"ended" with the fall of communism and the triumph of capitalism two decades ago. Yet today, history is very much alive and it is, ironically, capitalism itself which is being challenged more broadly than ever and found wanting for solutions. Today, we are very much living in one of those pivotal world-changing moments in history, indeed it is no exaggeration to say that this is *the* most critical moment in human history. We may be fast approaching the precipice of ecological collapse, but the means to derail this trainwreck are in the making as, around the world, struggles against the destruction of nature, against dams, against pollution, against overdevelopment, against the siting of chemical plants and power plants, against predatory resource extraction, against the imposition of GMOs, against privatization of remaining common lands, water and public services, against capitalist unemployment and precarité are growing and building momentum. Today we're riding a swelling wave of near simultaneous global mass democratic "awakening," almost global mass uprising. This global insurrection is still in its infancy, still unsure of its future, but its radical democratic instincts are, I believe, humanity's last best hope. Let's make history!

Photo: *The Independent*, May 10, 2013.

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Secular stagnation and endogenous money

Steve Keen

The crisis of 2007/08 has generated many anomalies for conventional economic theory, not the least that it happened in the first place. Though mainstream economic thought has many channels, the common belief before this crisis was that either crises cannot occur (Edward C. Prescott, 1999), or that the odds of such events had either been reduced (Ben Bernanke, 2002) or eliminated (Robert E. Lucas, Jr., 2003) courtesy of the scientific understanding of the economy that mainstream theory had developed.

This anomaly remains unresolved, but time has added another that is more pressing: the fact that the downturn has persisted for so long after the crisis. Recently Larry Summers suggested a feasible explanation in a speech at the IMF. "Secular stagnation", Summers suggested, was the real explanation for the continuing slump, and it had been with us for long before this crisis began. Its visibility was obscured by the Subprime Bubble, but once that burst, it was evident.

This hypothesis asserts, in effect, that the crisis itself was a second-order event: the main event was a tendency to inadequate private sector demand which may have existed for decades, and has only been masked by a sequence of bubbles. The policy implication of this hypothesis is that generating adequate demand to ensure full employment in the future may require a permanent stimulus from the government – meaning both the Congress and the Fed – and perhaps the regular creation of asset market bubbles.

What could be causing the secular stagnation – if it exists? Krugman (Paul Krugman, 2013b) noted a couple of factors: a slowdown in population growth (which is obviously happening: see Figure 1); and "a Bob Gordonesque decline in innovation" (which is rather more conjectural).

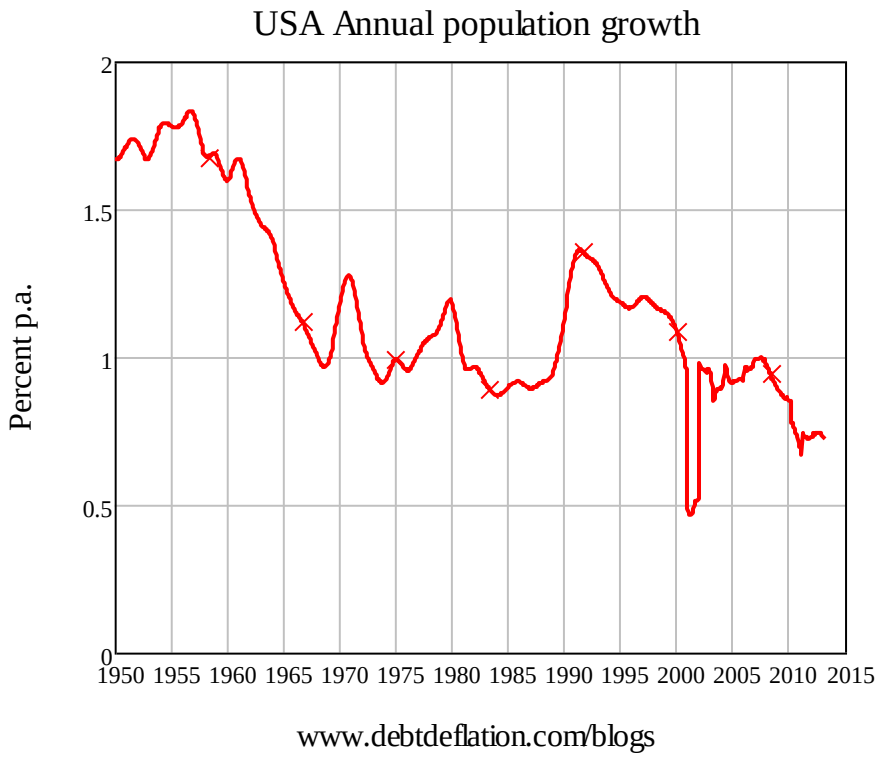
Though Summers' thesis has its mainstream critics, there's a chorus of New Keynesian support for the "secular stagnation" argument, which implies it will soon become the conventional explanation for the persistence of this slump long after the initial financial crisis has passed.

Krugman's change of tune here is representative. His most recent book-length foray into what caused the crisis – and what policy would get us out of it – was entitled *End This Depression NOW!*. The title, as well as the book's contents, proclaimed that this crisis could be ended "in the blink of an eye". All it would take, Krugman then proposed, was a sufficiently large fiscal stimulus to help us escape the "Zero Lower Bound":

The sources of our suffering are relatively trivial in the scheme of things, and could be fixed quickly and fairly easily if enough people in positions of power understood the realities…

One main theme of this book has been that in a deeply depressed economy, in which the interest rates that the monetary authorities can control are near zero, we need more, not less, government spending. A burst of federal spending is what ended the Great Depression, and we desperately need something similar today. (Paul Krugman, 2012, pp. 23, 231)

Figure 1: Population growth rates are slowing



Post-Summers, Krugman is suggesting that a short, sharp burst of government spending will **not** be enough to restore "the old normal". Instead, to achieve pre-crisis rates of growth in future – and pre-crisis levels of unemployment – permanent government deficits, and permanent Federal Reserve spiking of the asset market punch via QE and the like, may be required.

Not only that, but past apparent growth successes – such as *The Period Previously Known as The Great Moderation* – may simply have been above-stagnation rates of growth motivated by bubbles:

> So how can you reconcile repeated bubbles with an economy showing no sign of inflationary pressures? Summers's answer is that we may be an economy that needs bubbles just to achieve something near full employment – that in the absence of bubbles the economy has a negative natural rate of interest. And this hasn't just been true since the 2008 financial crisis; it has arguably been true, although perhaps with increasing severity, since the 1980s. (Paul Krugman, 2013b)

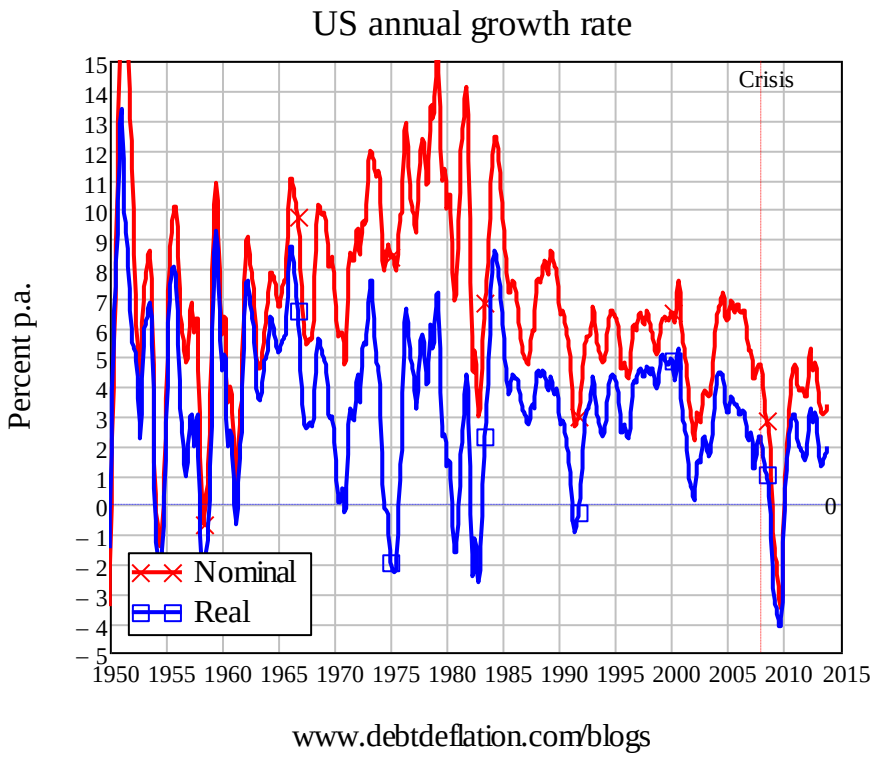
This argument elevates the "Zero Lower Bound" from being merely an explanation for the Great Recession to a General Theory of Macroeconomics: if the ZLB is a permanent state of affairs given secular stagnation, then permanent government stimulus and permanent bubbles may be needed to overcome it:

> One way to get there would be to reconstruct our whole monetary system – say, eliminate paper money and pay negative interest rates on deposits. Another way would be to take advantage of the next boom – whether it's a bubble or driven by expansionary fiscal policy – to push inflation substantially higher, and keep it there. Or maybe, possibly, we could go the Krugman 1998/Abe 2013 route of pushing up inflation through the sheer power of self-fulfilling expectations. (Paul Krugman, 2013b)

So is secular stagnation ***the*** answer to the puzzle of why the economy hasn't recovered post the crisis? And is permanently blowing bubbles (as well as permanent fiscal deficits) the solution?

Firstly there is ample evidence for a slowdown in the rate of economic growth over time – as well as its precipitate fall during and after the crisis.

Figure 2: A secular slowdown in growth caused by a secular trend to stagnation?



The growth rate was as high as 4.4% p.a. on average from 1950-1970, but fell to about 3.2% p.a. from 1970-2000 and was only 2.7% in the Noughties prior to the crisis – after which it has plunged to an average of just 0.9% p.a. (see Table 1).

Table 1: US Real growth rates per annum by decade

Start	End	Growth rate p.y. for decade	Growth rate since 1950
1950	1960	4.2	4.2
1960	1970	4.6	4.4
1970	1980	3.2	4
1980	1990	3.1	3.8
1990	2000	3.2	3.7
2000	2008	2.7	3.5
2008	Now	0.9	3.3

So the sustained growth rate of the US economy ***is*** lower now than it was in the 1950s–1970s, and the undoubted demographic trend that Krugman nominates is clearly one factor in this decline.

Another factor that Krugman alludes to in his post is the rise in household debt during 1980-2010 – which at first glance is incompatible with the "Loanable Funds" model of lending to which he subscribes.[1] In the Loanable Funds model, the aggregate level of debt (and changes in that level) are irrelevant to macroeconomics – only the distribution of debt can have significance:

> Ignoring the foreign component, or looking at the world as a whole, we see that the overall level of debt makes no difference to aggregate net worth – one person's liability is another person's asset. It follows that the level of debt matters only if the distribution of net worth matters, if highly indebted players face different constraints from players with low debt. (Paul Krugman, 2012a, p. 146)

Furthermore, the distribution of debt can only have macroeconomic significance at peculiar times, when the market mechanism is unable to function because the "natural rate of interest" – the real interest rate that will clear the market for Loanable Funds, and lead to zero inflation with other markets (including labor) in equilibrium – is negative.

Prior to Summers' thesis, Krugman had argued that this peculiar period began in 2008 when the economy entered a "Liquidity Trap". Private debt matters during a Liquidity Trap because lenders, worried about the capacity of borrowers to repay, impose a limit on debt that forces borrowers to repay their debt and spend less. To maintain the full-employment equilibrium, people who were once lenders have to spend more to compensate for the fall in spending by now debt-constrained borrowers.

But lenders are patient people, who by definition have a lower rate of time preference than borrowers, who are impatient people:

[1] I won't consider other potential causes here. These range from the rather more dubious suggestion of a decline in innovation made by Krugman, to factors that Neoclassical economists like Krugman dismiss but others have proposed as major factors – such as the relocation of production from the USA to low wage countries – to factors on which there is more agreement, such as the rise in inequality.

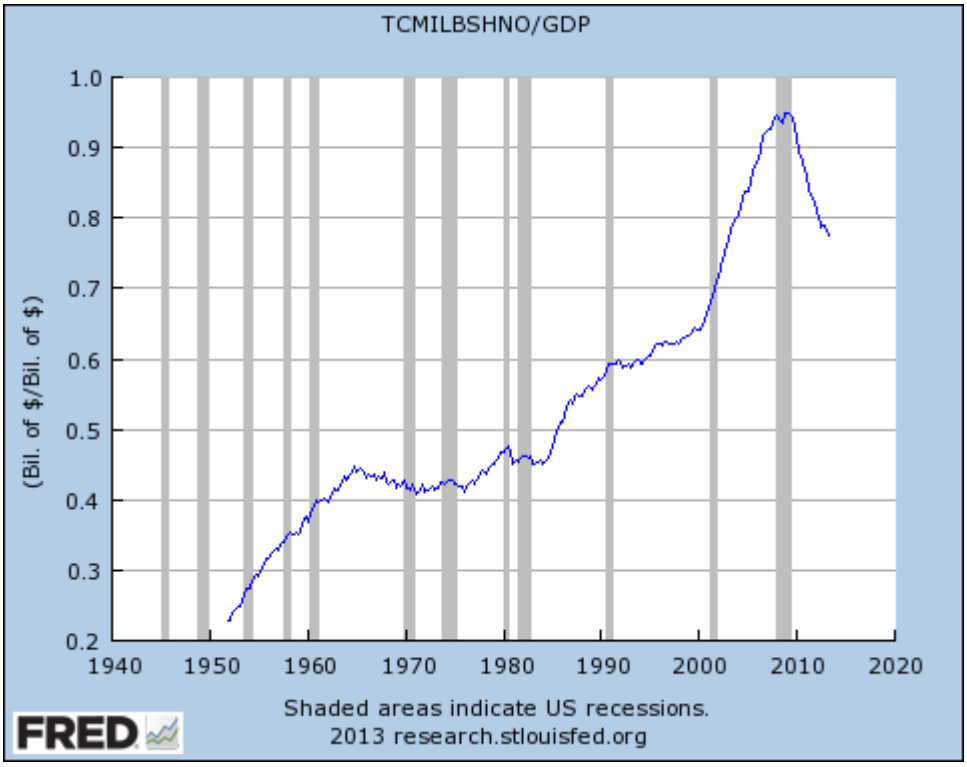
> Now, if people are borrowing, other people must be lending. What induced the necessary lending? Higher real interest rates, which encouraged "patient" economic agents to spend less than their incomes while the impatient spent more. (Krugman, "Deleveraging and the Depression Gang")

The problem in a Liquidity Trap is that rates can't go low enough to encourage patient agents to spend enough to compensate for the decline in spending by now debt-constrained impatient agents.

> You might think that the process would be symmetric: debtors pay down their debt, while creditors are correspondingly induced to spend more by low real interest rates. And it would be symmetric if the shock were small enough. In fact, however, the deleveraging shock has been so large that we're hard up against the zero lower bound; interest rates can't go low enough. And so we have a persistent excess of desired saving over desired investment, which is to say persistently inadequate demand, which is to say a depression. (Krugman, "Deleveraging and the Depression Gang")

After Summers, Krugman started to surmise that the economy may have been experiencing secular stagnation since 1985, and that only the rise in household debt masked this phenomenon. Consequently the level and rate of change of private debt could have been macroeconomically significant not merely since 2008, but since as long ago as 1985.

Figure 3: Ratio of household debt to GDP



Commenting on the data (Figure 3, sourced from the St Louis Fed's excellent FRED database, is taken from Krugman's post), Krugman noted that perhaps the increase in debt from 1985 on masked the tendency to secular stagnation. Crucially, he proposed that the "natural rate of interest" was negative perhaps since 1985, and only the demand from borrowers kept actual rates positive. This in turn implied that, absent bubbles in the stock and housing markets, the economy would have been in a liquidity trap since 1985:

> There was a sharp increase in the ratio after World War II, but from a low base, as families moved to the suburbs and all that. Then there were about 25 years of rough stability, from 1960 to around 1985. After that, however, household debt rose rapidly and inexorably, until the crisis struck.
>
> So with all that household borrowing, you might have expected the period 1985-2007 to be one of strong inflationary pressure, high interest rates, or both. In fact, you see neither – this was the era of the Great Moderation, a time of low inflation and generally low interest rates. Without all that increase in household debt, interest rates would presumably have to have been considerably lower – maybe negative. In other words, you can argue that our economy has been trying to get into the liquidity trap for a number of years, and that it only avoided the trap for a while thanks to successive bubbles.

In general, the Loanable Funds model denies that private debt matters macroeconomically, as Krugman put it emphatically in a series of blog posts in 2012:

> Keen then goes on to assert that lending is, by definition (at least as I understand it), an addition to aggregate demand. I guess I don't get that at all. *If I decide to cut back on my spending and stash the funds in a bank, which lends them out to someone else, this doesn't have to represent a net increase in demand*. Yes, in some (many) cases lending is associated with higher demand, because resources are being transferred to people with a higher propensity to spend; but Keen seems to be saying something else, and I'm not sure what. I think it has something to do with the notion that creating money = creating demand, but again that isn't right in any model I understand. (Paul Krugman, 2012b. Emphasis added).

However, the Summers conjecture provides a means by which private debt could assume macroeconomic significance since 1985 within the Loanable Funds model. Once secular stagnation commenced – driven, in this conjecture, by the actual drop in the rate of growth of population and a hypothesized decline in innovation – the economy was effectively in a liquidity trap, and somehow rising debt hid it from view.

That is the broad brush, but I expect that explaining this while remaining true to the Loanable Funds model will not be an easy task—since, like a Liquidity Trap itself, the Loanable Funds model is not symmetric. Whereas Krugman was able to explain how private debt causes aggregate demand to fall when debt is falling and remain true to the Loanable Funds model (in which banks are mere intermediaries and both banks and money can be ignored – see Gauti B. Eggertsson and Paul Krugman, 2012), it will be much harder to explain how debt adds to aggregate demand when it is rising. This case is easily made in an Endogenous Money model in which banks create new spending power, but it fundamentally clashes with Loanable Funds

in which lending simply redistributes existing spending power from lenders to borrowers. Nonetheless, Krugman has made such a statement in a post-Summers blog:

> Debt was rising by around 2 percent of GDP annually; that's not going to happen in future, which a naïve calculation suggests means a reduction in demand, other things equal, of around 2 percent of GDP. (Paul Krugman, 2013a)

If he manages to produce such a model, and if it still maintains the Loanable Funds framework, then the model will need to show that private debt affects aggregate demand only during a period of either secular stagnation or a liquidity slump – otherwise the secular-stagnation-augmented Loanable Funds model will be a capitulation in all but name to the Endogenous Money camp (Nick Rowe, 2013).[2] Assuming that this is what Krugman will attempt, I want to consider the empirical evidence on the relevance of private debt to macroeconomics. If it is indeed true that private debt only mattered post-1985, then this is compatible with a secular-stagnation-augmented Loanable Funds model – whatever that may turn out to be. But if private debt matters before 1985, when secular stagnation was clearly not an issue, then this points in the direction of Endogenous Money being the empirically correct model.

I will consider two indicators: the correlation between change in aggregate private nonfinancial sector debt and unemployment, and the correlation between the acceleration of aggregate private nonfinancial sector debt[3] and the change in unemployment. I am also using two much longer time series for debt and unemployment. Figure 4 extends Krugman's FRED chart by including business sector debt as well (click here to see how this data was compiled – and a longer term estimate for US debt that extends back to 1834: the data is downloadable from here). The unemployment data shown in Figure 5 is compiled from BLS and NBER statistics and Lebergott's estimates (Stanley Lebergott, 1986, 1954, Christina Romer, 1986) and extends back to 1890.

[2] Nick Rowe has shown how my oft-repeated shorthand that aggregate demand is income plus the change in debt can be expressed in a Neoclassical manner, so long as one acknowledges the Endogenous Money case that bank lending creates new money: "Aggregate actual nominal income equals aggregate expected nominal income plus amount of new money created by the banking system minus increase in the stock of money demanded." However as well as abandoning Loanable Funds, this perspective requires abandoning equilibrium analysis as well: "We are talking about a Hayekian process in which individuals' plans and expectations are mutually inconsistent in aggregate. We are talking about a disequilibrium process in which people's plans and expectations get revised in the light of the surprises that occur because of that mutual inconsistency." I see both these as positive developments, but the habitual methods of Neoclassical economics may mean that these developments will not last.

[3] Defined as the change in the change in debt over a year (to crudely smooth the extremely volatile monthly data) divided by nominal GDP at the midpoint of the year.

Figure 4: Long term series on American private debt

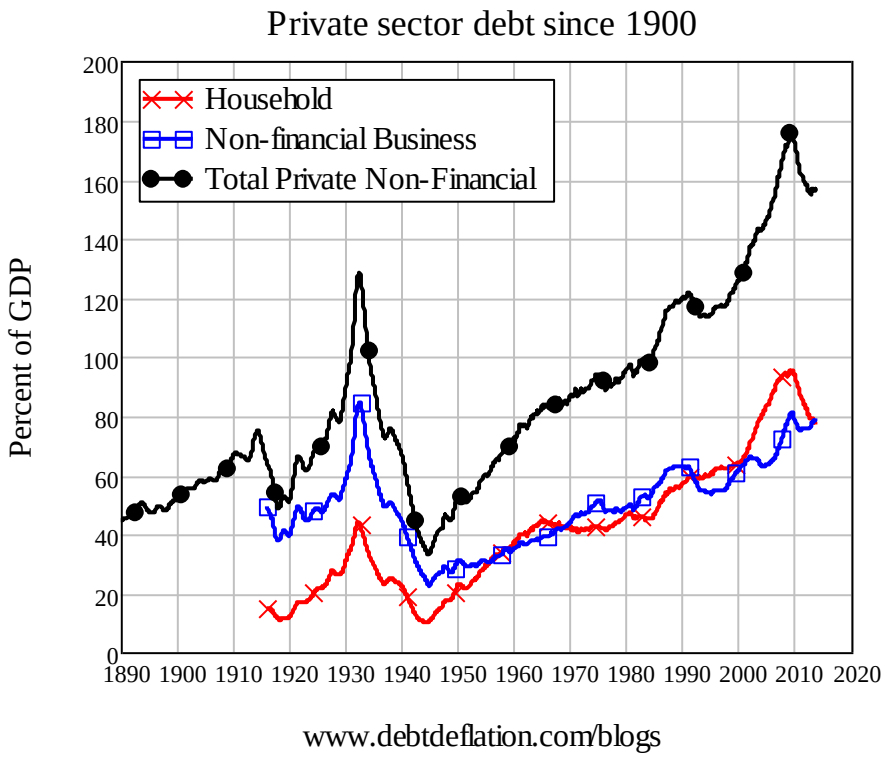
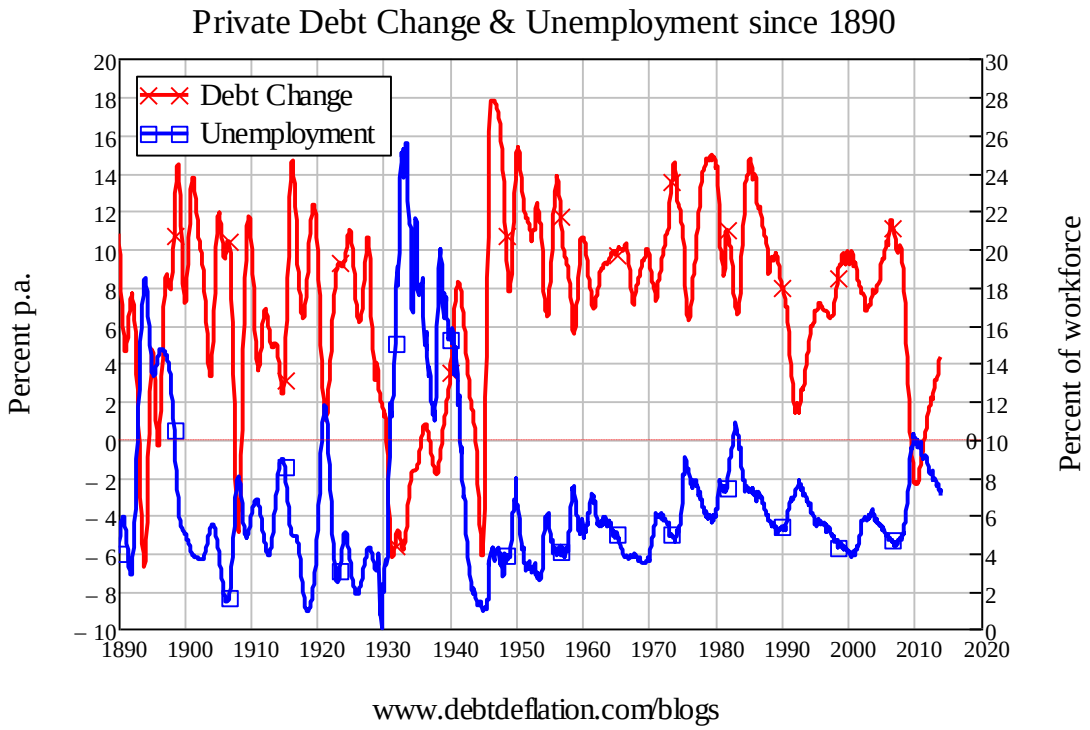


Figure 5: Correlation of change in aggregate private debt with unemployment



Correlation is not causation as the cliché goes, but a correlation coefficient of -0.57 over almost 125 years implies that the change in debt has macroeconomic significance at all times – and not just during either secular stagnation or liquidity traps.

Table 2: Correlation of change in aggregate private debt with unemployment by decade

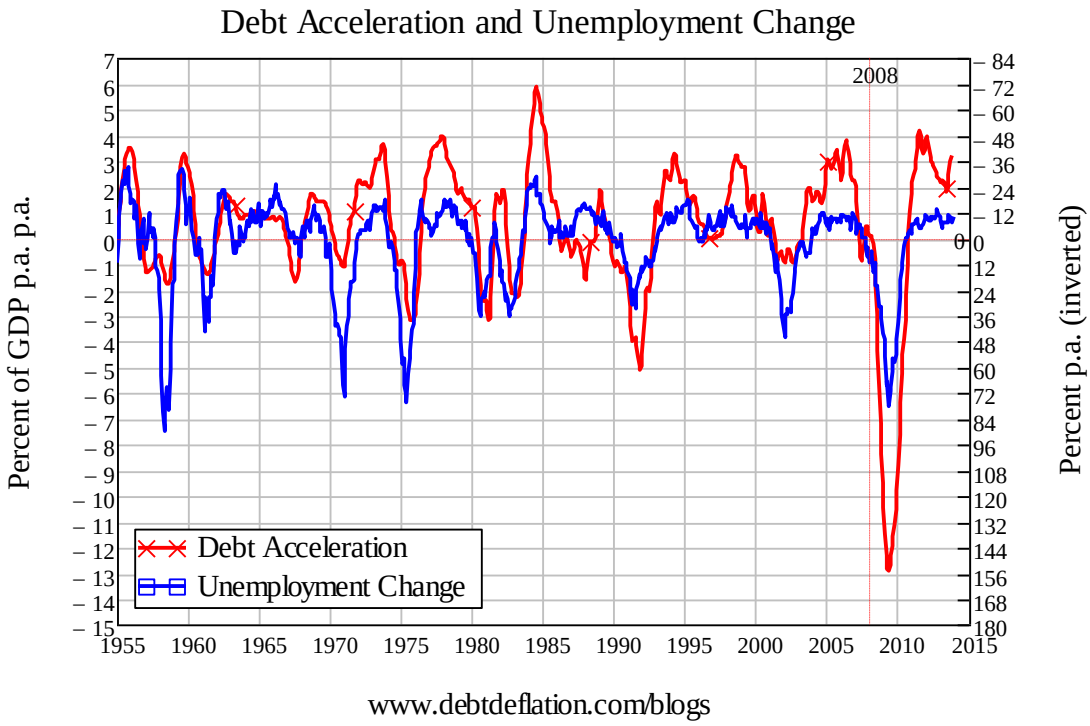
		Correlation with level of unemployment	
Start	**End**	**Percentage change**	**Change as percent of GDP**
1890	2013	-0.57	-0.51
1890	1930	-0.59	-0.6
1930	1940	-0.36	-0.38
1940	1950	0.15	0.32
1950	1960	-0.48	-0.28
1960	1970	-0.33	-0.58
1970	1980	-0.41	-0.37
1980	1990	-0.27	-0.55
1990	2000	-0.95	-0.95
2000	2013	-0.97	-0.95

Shorter time spans emphasize the point that neither secular stagnation nor liquidity traps can be invoked to explain why changes in the level of private debt have macroeconomic significance. Secular stagnation surely didn't apply between 1890 and 1930, yet the correlation is-0.6; neither secular stagnation nor a liquidity trap applied in the period from 1950 till 1970, yet the correlation is substantial in those years as well.

The correlation clearly jumps dramatically in the period after the Stock Market Crash of 1987, but that is more comfortably consistent with the basic Endogenous Money case that I have been making – that new private debt created by the banking sector adds to aggregate demand – than it will be with any secular-stagnation-augmented Loanable Funds model.

The debt acceleration data (Michael Biggs and Thomas Mayer, 2010, Michael Biggs et al., 2010) hammers this point even further. Figure 6 shows the acceleration of aggregate private sector debt and change in unemployment from 1955 (three years after quarterly data on debt first became available) till now. The correlation between the two series is -0.69.

Figure 6: Correlation of acceleration in aggregate private debt with change in unemployment



As with the change in debt and unemployment correlation, shorter time spans underline the message that private debt matters at all times. Though the correlation is strikingly higher since 1987 – a date I emphasize because I believe that Greenspan's actions in rescuing that bubble then led to the Ponzi economy that America has since become – it is high throughout, including in times when neither "secular stagnation" nor a "liquidity trap" can be invoked.

Table 3: Correlation of acceleration in aggregate private debt with change in unemployment by decade

Start	End	Correlation
1950	2013	-0.6
1950	1960	-0.53
1960	1970	-0.61
1970	1980	-0.79
1980	1990	-0.6
1990	2000	-0.86
2000	2013	-0.89

I await the IS-LM or New Keynesian DSGE model that Krugman will presumably produce to provide an explanation for the persistence of the crisis in terms that, however tortured, emanate from conventional economic logic in which banks and money are ignored (though private debt is finally considered), and in which everything happens in equilibrium. But however clever it might be, it will not be consistent with the data.

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Piketty and the resurgence of patrimonial capitalism

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The wave of media enthusiasm and academic interest that has surrounded the publication of Thomas Piketty's massive tome reflects a wider resurgence of public interest in and concern with inequality. Over the last few years in particular, a significant and growing number of reports of international organizations[1], academic treatises[2] and more popularly oriented books[3] have dealt with this subject, at global, regional and national levels. The greater attention that Piketty's work has received may have come as a surprise to some, but it is certainly nonetheless greatly to be welcomed, as everything that draws highlights and gives prominence to this critical recent trend of growing inequality across most economies is important.

The empirical work of Piketty (together with others such as Emmanuel Saez and others using the Global Top Income Database that they have developed) has already been a resource of much value for both academics and policy makers for some time now. The book brings together much of this work, but also adds to it by seeking to provide an explanation of the broad trends uncovered by the empirical study.

The recognition that broad measures of inequality such as the Gini coefficient relying on periodic surveys of income or consumption provide at best a limited and sometimes even misleading idea of true inequality is an important insight. The creative use of tax returns to derive income shares of total national income across the population, particularly at the top, is another major contribution of this work. The focus on the shares received by top incomes – of the top percentile and on occasion the top 0.1 per cent – generates significant and even startling conclusions that support in often dramatic fashion the popular perceptions of the "Occupy" and similar movements. The spotlight on asset inequality, and particularly on the role of inheritance, is revealing. The insights on the competing claims of "patrimonial" versus "meritocratic" sources of inequality are rewarding.

The ambition and effort required to unearth such data over a longer historical sweep, in some cases several centuries using whatever different sources can be put together, is also of major interest and provides a longer term perspective on these issues that is often lost in an

[1]For example, UN (2013); UNCTAD (2011); UNICEF and UN Women (2013); OECD (2008); World Bank (2006); ILO (2008); even IMF (2007).
[2] To name just a few, Milanovic (2005, 2011); Cornia (2011, 2013); Galbraith (2012); Khan (2012); Lim (2013).
[3] Such as Wilkinson and Pickett (2010), Cohen (2008).

examination of just the past few decades, even if in some cases the consequent generalizations are somewhat too sweeping and therefore problematic. And of course the book (even in English translation) is very well-written and absorbing, with many literary references (dominantly Jane Austen and Balzac, but also bits of popular culture like the television series "Mad Men") thrown in for added interest and to drive certain points home in a telling way.

The historical/empirical points made by Piketty are both striking and persuasively presented. They are most conveniently summarized in the now-famous U-shaped curves that he describes for the income and asset shares of the top decile and the top percentile of the population (and even the top 0.1 per cent in some instances) in developed capitalist economies. These indicate relatively high inequality (expressed as high shares of these top income groups in total national income) in the early part of the 20th century, followed by a period of decline particularly during and after the second World War, and then a surge in inequality from around 1980 to the present, in some instances far surpassing even the high inequality observed in the late 19th/early 20th centuries.

The main contribution of the book – beyond the body of impressive historical and empirical research that has been published by Piketty and his colleagues in several articles – is the attempt to explain these observed patterns through a broad theory of long run capitalist development that is then also used to explain tendencies in contemporary capitalism. This is an ambitious task indeed, especially when it is evident that Piketty's conceptual framework is implicitly confined by a limited and ultimately ahistorical neoclassical approach towards the distribution of income shares.

Piketty is clearly conscious of the complexity of the various forces that determine economic inequality. He notes (p. 20)[4] that "one should be wary of any economic determinism in regard to inequalities of wealth and income" since this has always been deeply political. He also notes that "the dynamics of wealth distribution reveal powerful mechanisms pushing alternately toward convergence and divergence", and "there is no natural, spontaneous process to prevent destabilizing, inegalitarian forces from prevailing permanently". Notwithstanding these warnings, he then proceeds to make a very economically deterministic generalization about a basic tendency of capitalism, which he posits as "the fundamental force for divergence".

This is the argument that $r > g$, where r is the annual rate of return on capital expressed as a percentage of its total value, and g is the (presumably real) rate of growth of national income. He notes (much in the spirit of Evsey Domar) that "when the rate of return on capital significantly exceeds the growth rate of the economy… then it logically follows that inherited wealth grows faster than output and income" (p. 26). Furthermore, this tendency is then reinforced by other mechanisms, such as the savings ratio of the economy increasing as wealth increases. Since "the share of capital in national income is equal to the product of the return on capital and the capital/income ratio" and "the capital/income ratio is equal in the long run to the savings rate divided by the growth rate" (p. 33), we effectively get a steady growth path in which both the capital/income ratio and the income share of those who own capital and receive a return from it keep increasing. Implicit in this argument is a theoretical model in which capital and labour are factors of production that are paid their marginal products.

The question obviously arises: what explains this supposed "law" of capitalist development? Piketty argues that growth rates of the economy tend to decrease particularly as population

[4] All page numbers for Piketty relate to the Kindle edition of the book.

growth slows (thereby implicitly assuming some sort of full employment growth path in which exogenously determined population growth forms the "natural" rate of growth) but there is no equivalent decline in the rate of return on capital. This is a problematic argument for many reasons. For example it assumes that full employment prevails on this growth path (at least in a long run sense) and that labour supply is exogenous, unlike the historical experience that has shown us that capitalism has always generated a supply of labour to adjust to demand, whether through migration or the changing work participation of women and children, or other means. Indeed, this formulation, relying on the ultimate determination of growth through exogenously given population growth and exogenous technological progress, is rejected by almost all modern growth theory, as Patnaik (2014) has pointed out in a very insightful critique.

This treatment of capital also ignores all the problems associated with the measurement of capital, which were highlighted by Piero Sraffa (1966) and others. Piketty himself seems blissfully unaware of the fundamental analytical challenge posed by this position, which pointed out that when capital is seen as a sum of values, the determination of these values or prices requires that distribution (including the profit rate) is already known. Therefore any attempt to determine profit as a marginal product of capital is circular and invalid (Bharadwaj, 1968). Simply put, you cannot explain something in terms of itself. Instead of recognising this basic critique, Piketty blithely describes the Cambridge controversies on capital as the result of the mistaken belief of economists in Cambridge England (such as Joan Robinson, Nicholas Kaldor and Luigi Pasinetti) that the Solow model argued that growth is always perfectly balanced. This is a completely wrong interpretation of their position that leaves out their basic argument. Piketty further states that by the 1970s, "Solow's so-called neoclassical growth model definitively carried the day" (p. 231). But indeed, Solow himself conceded the theoretical battle in the late 1960s, and most serious growth theorists today, especially those using endogenous growth theories, do not use the Solow model. And in any case, just because the mainstream profession has chosen to ignore this logical problem does not mean that it no longer exists.

On a steady growth path, Piketty's claim for the continuous increase in the capital/income ratio requires that the income elasticity of substitution of capital for labour is greater than unity – and indeed Piketty argues that it has historically been between 1.3 and 1.6. However, it has been pointed out that this assumption is questionable and furthermore is not actually supported empirically (Rowthorn, 2014; Semeniuk, 2014). Even more crucially, Patnaik (2014) has shown that a stable steady state trajectory, where the growth rate equals the sum of the exogenous rate of growth of the workforce and the exogenous rate of growth of labour productivity *does not exist* when the elasticity of substitution between capital and labour exceeds unity.

Neither is there strong evidence for the statement that the capital/income ratio continuously rises, since this also depends crucially on how capital is valued. Rowthorn (2014) has correctly argued that this is probably the result of a valuation effect reflecting a disproportionate increase in the market value of certain real assets, especially housing and real estate. Indeed it could be noted that the very fact that Piketty provides a U-shaped curve also for the capital/income ratio undermines his own argument, for at least on the downward slope of the U curve there was clearly a period (a fairly prolonged period of more than half a century, as it happens) when the capital/income ratio declined!

Piketty's own explanation for the downward-sloping portion of the curves (the period when the incomes shares of the top decile or percentile came down, or when the estimated ration of capital to income declined) is less than satisfactory. He sees the downward movement as something of a historical aberration from the opposite long-term trend, the result of the collapse

of capital values (related to both the destruction of physical equipment and the decline in prices of financial assets) because of wars, depression and socio-political changes after the Second World War. But this explanation is both partial and unconvincing: as Galbraith (2014) has pointed out, physical and price changes are indeed very different and cannot be treated as aspects of the same thing. Further, the post-war improvements in labour shares of income in many developed capitalist economies were due to significant social and political changes, reflecting Piketty's own more nuanced formulation in an earlier chapter, that income and asset distributions reflect more than material forces but also political and cultural forces in society. And the prolonged period of the downward part of the curve does undermine the notion that – at least as expressed empirically in historically observed patterns – this is a necessary aspect of capitalist growth.

But what exactly is capital for Piketty, and what is the rate of return that he is talking about? Piketty uses the terms "capital" and "wealth" interchangeably, and defines them very broadly: "the sum total of nonhuman assets that can be owned and exchanged on some market. Capital includes all forms of real property (including residential real estate) as well as financial and professional capital (plants, infrastructure, machinery, patents and so on) used by firms and government agencies" (p. 45). So it includes "all forms of wealth that individuals (or groups of individuals) can own and that can be transferred or traded through the market on a permanent basis. … Capital is not an immutable concept: it reflects the state of development and prevailing social relations of each society" (p. 46).

This brings to mind Marx's conception of capital as a social relation, though such a comparison would no doubt horrify the author. Capital here is also defined as including patents and other forms of intellectual property and similar "immaterial" forms such as stock market valuation, which therefore incorporates the changing valuations of both physical and financial assets by markets. But treating capital in this manner as a sum of prevailing values that reflect prevailing social relations sits very uneasily with the idea of the return on capital being in some sense its "marginal product", which is the underlying conceptual basis for his theoretical formulation. In particular, the very notion of the marginal product of changes in, say, stock market valuation or housing prices, is analytically absurd.

And there is a further twist, when Piketty clarifies that the returns are simply the rents on capital, defined as "the income on capital, whether in the form of rent, interest, dividends, profits, royalties or any other legal category of revenue, provided that such income is simply remuneration for ownership of the asset, independent of any labour" (p. 422). How can this motley combination reflect a marginal product of an equally motley combination of tangible and intangible "assets", especially when problems of valuation are so extreme?

It takes a while for the reader to figure out that, despite the implicit requirement for a marginal productivity theory of distribution to provide some logical consistency to this supposed "law" of capitalist development, Piketty himself does not rely on this. It is not until page 361 that we finally get a clear statement of his admittedly slippery position on this most fundamental issue:

> "The inequality r > g should be analysed as a historical reality dependent on a variety of mechanisms and *not as an absolute logical necessity*. It is the result of a confluence of forces, each largely independent of the others … g tends to be structurally low (generally not more than 1 per cent a year once the demographic transition is complete and the country reaches the world technological frontier, where the pace of innovation is fairly slow). … *r*

> *depends on many technological, psychological, social and cultural factors*, which together seem to result in a return of roughly 4-5 per cent (at any rate distinctly greater than 1 per cent)" (p. 361, emphases added).

At this point, the reader who has ploughed through the material in the vain hope of getting at a theoretical basis for this "law of capitalism" can be forgiven for thinking: WHAT???!!! All this fancy footwork, only to result in a vague and sweeping historical generalisation that makes no claims to logic, identifies no mechanisms of causation, but is only based on supposed "fact" – and is anyway disproved for prolonged periods not just by the disparate experience of some capitalist countries but by the author's own data for different countries? With this bizarre (and surprisingly delayed) admission, Piketty may have sidestepped some of the criticism of the logical fallacies exposed by Patnaik, Rowthorn and others, but he does so at the cost of accepting that there is in fact no logic to his argument!

Supposing then, we forget about Piketty's theoretical claims (which now indeed appear to be rather brazen) and focus instead on the empirical and historical insights that he does provide. Of course there is scope for some disagreement about long run historical trends, especially when data on such issues for the very long run exist only for a handful of countries. But the aspect relating to the latter part of the past century up to the present is of particular interest: the rapid rise of the top income shares across several developed economies, albeit to different degrees (with the US and the UK providing the most extreme examples). This is corroborated by other careful empirical work (e.g. Stockhammer 2012, 2013) on the declining shares of wages in national income, as well as work (Cornia 2012, 2013) pointing to increases in wage inequality driven by incomes at the top of the spectrum that are really managerial in nature.

The decline in wage shares of national income, and the associated rise of "surplus" in various forms (which Piketty broadly refers to as returns to capital) has been explained along a variety of lines: the expansion of the "global" labour supply through greater trade integration and cross-border mobility of capital that have together dramatically reduced the bargaining power of labour; the labour-saving technological shifts that have had a similar effect; the dominance of finance or "financialisation" that have put inordinate power in the hands of financial players and influenced their ability to affect economic policies in their own favour. As Taylor (2014) notes, "the recent rise of the rentier has been supported by politics and policy marshalled to drive up the share of income going to profits."

In this context, Piketty's discussion of the significance of inheritance in driving the resurgence of "patrimonial capitalism" is indeed interesting and makes some insightful points. He points out that two competing determinants of inequality drive society's attitude towards it: the "meritocratic" notion that creates a society with superstar achievers or managers; and the "patrimonial" notion that is essentially based on inheritance. The two can coexist, and indeed there is a large grey area in between, even to the point that entrepreneurs (say Bill Gates) can turn into rentiers within a generation. But this also creates a basis for greater social acceptance of inequality. "If inequalities are seen as justified, say because they seem a consequence of choice by the rich to work harder or more efficiently than the poor, or because preventing the rich from earning more would inevitably harm the worst-off members of society, then it is perfectly possible for the concentration of income to set new historical records" (p. 263).

The much greater social acceptability of inequality in the US, for example, is probably based on this and results in extraordinarily high shares of the top 1 per cent, even when compared to otherwise similar economies in Western Europe. Yet despite this supposed justification, the US

and other western economies are in reality all turning into more patrimonial societies, in which inherited wealth plays an ever growing role in determining the opportunities and future incomes of individuals, and concentration is aided not only by easier tax regimes but by exploitation by the rich of tax havens and similar loopholes.

To prevent or reduce this resurgence of patrimonial capitalism, Piketty calls for global and national taxes of wealth (earned but especially inherited) and on income from wealth. This is clearly a welcome call. It is true that the political conditions for such a goal to be realised are currently far from fertile. However, it is also the case that a number of developing countries (that are only cursorily dealt with in Piketty's enormous book) in Latin America and a handful in Asia and Africa have in recent years been able to reduce top income shares and increase wage shares of national income, for example through land redistribution, raising and enforcing minimum wages and improving the conditions for workers' associations that improve their bargaining power. The secondary distribution of income in several of these countries has improved even more, through a combination of fiscal strategies and policies towards control over natural resources that increase public revenues that can then be spent on social infrastructure and services as well as social protection. All this points to the possibility of several other strategies, including macroeconomic and industrial policies as well as other more structural policies.

So it is not impossible for country strategies to change, if the social consensus shifts decisively in favour of policies to reduce inequalities. But such political conditions will never be in place without wider support for such demands from not just academics but the wider public. It is essentially for that reason that the discussions around Piketty's book and other work that highlights the different dimensions of growing inequality are timely, important and even absolutely necessary.

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Capital and capital: the second most fundamental confusion

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The meaning of "capital"

There is a centuries-old tradition in economics of using in the same work, often in the same paragraph and sometimes even in the same sentence, the symbol "capital" to signify two (and sometimes three) fundamentally different things. Inevitably, given the centrality of these things to the domain of inquiry, it has been and continues to be a source of elementary confusion. Piketty's great book would be even greater if it had not been conceived, at least in part, within this tradition.

Given the historical persistence of this confusion, it is worth spelling out the general principle at stake. It is the elementary one of the distinction between *an object or family of objects* (material or not) and some *property* (quantifiable or not) of those objects, such as their sweetness, temperature, weight, linear dimensions, age, density, beauty or market-value. For example, to define "pear" as the fruit from a tree belonging to the genus *Pyrus*, and to define "pear" as the weight of fruits from trees belonging to *Pyrus*, and to define "pear" as the market value of fruits from trees belonging to *Pyrus* are three fundamentally different definitions.

Economics traditionally uses "capital" to signify both a set of objects (material and immaterial) and quantities of a *property* of those objects, market-value. Such double-loading of a symbol does not necessarily lead to confusion, but it certainly invites it, and in economics very often realizes it. Piketty's book is a case in point.

Its first chapter includes a short section titled "What is Capital?". It begins promisingly.

> To simplify the text, I use the words "capital" and "wealth" interchangeably, as if they were perfectly synonymous. By some definitions, it would be better to reserve the word "capital" to describe forms of wealth accumulated by human beings (buildings, machinery, infrastructure, etc.) and therefore to exclude land and natural resources, with which humans have been endowed without having to accumulate them [p. 47].

In other words, Piketty is saying that in his book "capital" will signify a set of objects which he then goes on to specify more exactly. But before he has finished the paragraph "value" slips in, and on the following page after he has confirmed the meaning of "capital" as "both a store of value and a factor of production" he writes:

> To summarize, I define "national wealth" or "national capital" as the total *market value* of everything owned by the residents and government of a given country at a given point in time, provided that it can be traded on some market [emphasis added, p. 48].

The meaning of "capital" is absolutely central to Piketty's or anyone's attempts to theorize about the meaning of the amazing body of empirical data that he and his associates have accumulated. So confusions between the two fundamentally different meanings (which one are we thinking about now?) that Piketty introduces at his book's beginning doom the theoretical side of his project. Piketty leads us into a similar confusion with his use of the symbol "income". Sometimes he uses "income" to signify a set of objects as when he writes "Income is ... the quantity of goods produced and distributed in a given period" (p. 50), but most times it signifies the market-value of those goods

Henceforth the paper you are reading will signify "capital" and "income" in the sense of a set of objects with "capital-1" and "income-1" and signify "capital" and "income" in the sense of the market value of those sets with "capital-2" and "income-2". (Similarly with "wealth" which as we have seen Piketty defines as meaning for him exactly what capital means.) As in Piketty's book, capital-2 and income-2, rather than capital-1 and income-1, are this paper's primary interest. When we eliminate the double-loading of "capital" and "income", the focal point of both Piketty's book and this paper is the capital-2 / income-2 ratio which he labels β.

A ridiculous question?

Capital's chapter five, "The Capital/Income Raito over the Long Run", which is attracting the most theoretical attention, features what Piketty pretentiously dubs "the second fundamental law of capitalism"[1], β = s/g, where s = the saving rate and g = the growth rate. But despite the fact that his "law" is about capital-2 and income-2, the argumentation that he offers on its behalf (pp. 166-170) vacillates between using "capital" to signify capital-1 and using it to signify capital-2, and in some cases leaves this reader undecided as to which one, if either, Piketty thought he was referring. His key verb for explaining how the variables of his "law" change is "accumulate". In the space of four pages he uses "accumulate", "accumulated" and "accumulation" a total of eleven times, each with relation to "capital". Can "capital" be accumulated?

Obviously it can in the case of capital-1. It is also obvious that individuals and groups can accumulate capital-2, George Soros and the Citigroup being famous recent cases in point. But Piketty's argument depends on the possibility of closed economies or the global economy as wholes accumulating capital-2. *Is this kind of accumulation possible?* Is this a ridiculous question? Please read on.

Every quantitative order has a formal structure that can be described with abstract algebra. And not every quantitative order has the same structure. What is the formal or metrical structure of market-value?

[1] Piketty's "first fundamental law of capitalism" α =r x β is purely definitional and thus not what in the context of science is called a "law".

To begin, how does the metrical structure of market-value (call it what you want: exchange-value, money-value, dollar-value, euro-value, etc.) compare with those of other quantitative orders? Consider some possibilities that we are all familiar with: length, weight, angle, temperature, probability. You will be immediately aware, whether you can describe them or not, that these quantitative orders have different formal properties. You will also be immediately aware that what one can legitimately do with their numbers differs radically between the orders. We can add and subtract weights and lengths but not temperatures. A joke credited to Diderot illustrates the point: "How many snowballs would be required to heat an oven?" [Duhem, 1905, p.112] We can also add and subtract probabilities and angles but only in limited contexts. Might it not be a good idea if we as economists became cognizant of the structure of the quantitative order with which our discipline, including Piketty's book, is foremostly concerned?

A thought experiment

Physics' concepts of length measurement numbers and mass measurement numbers emerge from comparative concepts, pairs of empirically defined relations, one equivalence, the other precedence, which have been shown to hold between pairs of physical objects.[2] Can market-values also be identified as originating with or shown to be reducible to a concept of comparative market-value in the sense of a set of relations between a pair of economic objects? We can conduct a thought experiment to find out.

Here is a simple formulation of the principle of comparative market-values.

> For pairs of commodities, there is the market-value of each commodity *relative to the other*, in the sense that quantities of the two commodities are said to be equal in market-value if they exchange for each other and to change in market-value if there is a change in the pair's market-clearing exchange ratio.

Although this statement appears to be logically coherent, the Twentieth Century taught us that the logical relations of statements are not always what they appear to be. So we are going to test the stated notion of comparative market-value against the general principle that, between any two magnitudes of the same empirical order, an equality relation either holds or does not. Consider two commodities ***X*** and ***Y***, and whose units are ***x*** and ***y***. Let ***a***, ***b***, and ***σ*** be rational positive numbers.

Assume that the initial market-clearing ratio of ***ax:by*** changes to ***ax:σby***. Then, according to the concept of comparative market-value, the market-values of quantities of *X* relative to *Y* have changed. Any two quantities of the same order are either equal or not equal. Therefore, the market-value of ***σby*** relative to units of *X* at the new exchange ratio **is either equal or not equal** to the market-value of ***by*** at the old exchange ratio.

First assume that it is equal, i.e. ***σby = by***. Then, because at the old ratio the market-values of *ax* and ***by*** were equal and at the new ratio the market-values of ***ax*** and ***σby*** are equal, it follows that the market-value of ***ax*** is unchanged. This contradicts the assumption that the market-values of quantities of *X* relative to *Y* have changed, and so one must conclude that this case cannot obtain.

[2] For a very accessible account of these fundamentals see Carnap, 1966, pp. 51-124.

Assume the other possibility: the market-value of ***σby*** at the new exchange ratio is not equal to the market-value of ***by*** at the old exchange ratio. If, relative to *X*, ***by*** and ***σby*** are not equal in market-value, then by the concept of comparative market-value they do not exchange for the same number of units of *X*. However, by assumption they do exchange for the same number of units of *X*. Therefore, this case also cannot hold. And this exhausts the logical possibilities.

The concept of comparative market-value generates paradoxes because it is circular. It defines a commodity's market-value in terms of the market-value of a second commodity whose market-value is defined in terms of the market-value of the first. In technical terms, this constitutes "vicious circularity" which renders the definition impredicative.

This simple but unexpected outcome of the test for logical coherence shows that, as a quantitative order, market-value has unexpected properties.

A false similarity

Confusions, like the one unearthed in the previous section, come easily when thinking about market-value because in two respects it bears a false similarity to familiar physical magnitudes.

First, the notion of market-value as a relation between two commodities exhibits a superficial resemblance to comparative concepts of mass and length. These physical concepts, however, are not predicated as relations between individual masses and lengths. *It is only their measurement numbers that are conceived in this way.* Instead, Newtonian physics predicates mass and extension as properties possessed by bodies independently of their relations to other bodies. This independence saves concepts of comparative length and mass from impredicativeness [Carnap, 1966, pp. 51-61].

Second, and related to the first, although market-value numbers are expressed on a ratio scale like mass and length numbers, they are generated in a profoundly different manner. Physical measurement numbers refer to physical phenomena, called concrete quantities, which have been found to have a structure isomorphic to the system of units and numbers (abstract quantities) by which they are represented. A cardinal point is that these concrete physical quantities do not come into being as the result of humankind's invention of processes of numerically representing them. If a means of numerically representing the weight of your body had never been invented, you would experience its weight all the same. The existence of the properties of extension and mass are independent of the processes by which they are measured or compared. In contrast, the quantitative order of market-value does not exist independently of the process which assigns market-value numbers. Without market exchange there is no exchange or market-value. *Market exchange, in other words, is the process by which the market-value order, not just the numbers which describe it, comes into being.*

The fact that the process that determines concrete market-values also assigns numbers to represent them invites conflation of concrete market-values and market-value numbers. The latter, stripped of their units, belong to *R*, the set of positive reals which defines a Euclidean space. Thus the conflation of concrete and abstract market-values leads smoothly to the unsupported conclusion that a "price space" is a Euclidean space [Debreu, 1986, p. 1261].

It is on the basis of this presumed "fit of the mathematical form to the economic content" [Debreu, 1986, p. 1259] that the whole neoclassical edifice, not just general equilibrium theory, has been constructed. At every point it presumes – through the convenience of its conflation – that a system of exchange- or market-values has the same structural properties, i.e. Euclidean, as do the numbers that represent them. But this subconscious presumption, the most fundamental *hypothesis* of neoclassicalism, is easily tested when the conflation between concrete and abstract quantities is avoided.

A purely empirical question

Diderot's jest quoted above, illustrates three verities of quantitative science:

1. profound structural differences exist between various quantitative orders;

2. their structures may diverge radically from that of everyday arithmetic; and, most important,

3. the structures of empirical quantitative orders are autonomous vis à vis human will and imagination.

In a more positive vein but to a similar purpose, Bertrand Russell identified the principle by which science applies mathematics to empirical phenomena.

> "Whenever two sets of terms have mutual relations of the same type, the same form of deduction will apply to both." [Russell, 1937, p. 7]

Application of arithmetical addition to mass, length and time are familiar examples. Yet, in such cases, where one set of terms is logical or mathematical and the other set is not, the existence of a homomorphism between the two sets is, as Diderot's jest illustrates, *a purely empirical matter*. It presumes the discovery of a set of extra-mathematical relations which repeated testing, not a set of axioms, shows to be structurally analogous to the arithmetical ones of =, <, > and +.

Elsewhere, using abstract algebra but offering a full verbal explication as well, the metrical structure of market-value has been investigated at length and found to be, as would you if you were to investigate it, Boolean rather than Euclidean. [Fullbrook, 2002. This paper can be downloaded for free here.]

Counter-intuitive

The Boolean conclusion is of course counter-intuitive, a way of thinking that we economists are even more adverse to than were physicists prior to the Twentieth Century. It is counter-intuitive because on the micro level of consumerism and business that we experience every day of our lives, market-values are Euclidean phenomena. But it is a characteristic of Boolean metrical structures that at a defined micro level, such as adding the probabilities of drawing individual cards from a given deck of cards, that they may include Euclidean characteristics.

To bring the metrical issues into focus it may help to very briefly compare two well-known quantitative orders, mass and probability. The property of mass is understood as a function of micromasses, whose existences are independent of the larger mass with which they are grouped. A body's mass is the totality of the masses of that body's parts, and its mass will increase if more parts are added to it. With quantitative properties of this type, each magnitude is *the aggregate of its parts*, the direction of determination running exclusively from the micro to the macro level.

But quantitative properties are not always of this type. Theoretical probability provides a relevant example. Certainty not only defines an upper bound for magnitudes of probability, but also serves as a *whole* in relation to which the probabilities of events in the probability space are conceived as *parts*. In other words, certainty, or the certain event, provides a *unique* standard of measurement for probability, with all other probabilities in the space being defined as *parts of that "whole" probability*. Furthermore, because of its Boolean structure, to increase in a given space the probability of one event decreases the probability of one or more others and vice versa. Likewise for market-value. Every market-value exists only as a part of an integral and interdependent system of market-values.

Although our everyday metrical perceptions of market-value are dominated by phenomena consistent with Euclidean structure, there is one Boolean market-value phenomenon with which we are all familiar both professionally and otherwise – inflation. Increasing the number of standard weights used in weighing operations does not decrease the mass of those weights. But increasing the quantity of money exchanged, that is, the number of standards of market-value used in measuring the market-value of the component sets of the aggregate endowment, not only decreases the market-value of existing money tokens, it also decreases each one's value by the same proportion. This alone shows that as a quantitative order market-value has a metrical structure radically different from mass, length and arithmetical addition.

Mesoeconomics

Our thought experiment has shown us that the concept of market-value is impredicative when defined as a relative concept *in the sense of a set of relations between a pair of objects.* But on the other hand we are aware that unlike mass and extension – quantitative properties possessed by objects independently of their relations to other objects – that the market-values of objects exist only relative to the market-values of other objects. So we are, despite the negative result of our thought experiment, still committed to the belief that market-value is a relative phenomenon. But if not pairs of objects, *what are the ultimate terms of the market-value relation?* It is, strangely, the relation upon which Piketty's great book turns.

Generally it is only when considering market-values at meso and macro levels, as with inflation, and as Piketty does in considering distributions of wealth and income, that market-value's Boolean structure comes strategically into play.[3] In Piketty's analysis it is almost visible, and it takes only a rearrangement of his simple equations to bring it into view.

We are working with the following symbols:

[3] It is, however, the Boolean structure of market-value that makes all demand curves ultimately downward-sloping. See Fullbrook 2002.

K' = capital-2 stated in currency units
Y' = income-2 stated in currency units
Γ' = K' + Y'
K = K'/Γ'
Y = Y'/Γ' so that
Γ = K + Y = 1
β = capital-2' / income-2' = K'/Y' = K/Y
α = capital-2's share of income-2,
r = rate of return on capital-2
s = savings rate
g = growth rate (of income-2)

Piketty's capital-2 / income-2 ratio is one way of comparing two quantities of market-value. But given that market-values only exist relative to other market-values, these two quantities, capital-2 and income-2, when considered together have a special metrical property that remains hidden when they are expressed as a ratio. Capital-2 + income-2, that is, Γ' and Γ on their different scales, comprise *all* the market-value that exists in the economy in a given year. Therefore, metrically Γ is the equivalent of certainty with respect to theoretical probability. As is the convention with probability's certain event, we can assign to Γ the value 1.

So that given β = K/Y and Γ = K + Y, we can write
K = β / β +1 and Y = β – (β – 1) / β +1], so that
K + Y = Γ = 1

For example, if β = 8, then K + Y = 8/9 + 1/9 = 1.

K + Y = 1 is the fundamental relation that underlies the market economy.[4] It is the relation that intriguingly lies behind Piketty's data but which he, blinded by Euclidian preconceptions, fails to unveil. In the Piketty context, the most profound revelation of this unveiling is that *any increase in the market-value of either K or Y decreases by an equal amount the market-value of the other and vice versa*. That is why it is a profound error to speak, as does Piketty, of accumulating or of the macro accumulation of capital-2, i.e. of K or K' where K + Y = 1 or K' + Y' = Γ'. It is not an accumulation that takes place when capital-2 increases, but rather an *appropriation.* More about this in a minute. The theoretical implications of market-value's Boolean structure for understanding Piketty's data are profound, but here there is space only for very brief considerations.

Upper limits

Piketty speculates about relations between β, r, s and g and fancies that by writing β = s/g he has discovered a fundamental law. There is in fact a law to be discovered here although it is not quite fundamental. The law is that *for any K there is a maximum value for r, the rate of return on capital-2, and vice versa.* Why? Because the return on capital-2 comes out of income-2, and the greater K the smaller Y and the greater r the less Y there is for labour. Where α = capital-2's share of income-2, this law may be written:

α + rα ≤ 1

[4] The Boolean discovery reveals that value and distribution are the same thing.

Consider a numerical example. Pretend that K is .9 and r is .12. Then K + rK = .9 + .108 = 1.008. But a K of 1.008 in the real world is no less impossible than it is for a body to travel faster than the speed of light.

In the real world the absolute outer limits of the *distributional variables* will never be reached, instead we can expect movement toward those limits to slow as approached and maybe reverse suddenly. These limits exist through all of history and so provide a universal basis for framing the economy's future.[5]

Two kinds of saving

In talking about the savings rate and the growth rate, Piketty is not comparing to like to like. His **s** refers to a *portion* of the *market-value* of a country's output. His **g** on the other hand refers to *two levels of real output* compared on the basis of what their market-values would be if the market-value of money had remained constant.

Assuming 2% growth and 12% saving, and that all of the 12% goes into investing in *existing* assets, then Piketty's reasoning is broadly correct, because there will be asset inflation. But if all of the 12% goes into investing in new real assets, then the story is quite different from the one Piketty describes. In that case, the effect of the 12% savings on capital-1 market-values depends on the elasticities of demand for various capital goods. With real investment (i.e. in new capital-1) of the 12%, a decrease in the market-value of capital-1 relative to the market-value of income-1, or in Piketty's terms, a decrease in the capital/income ratio, is highly plausible. And of course an increase in the **g** would also become a possibility.

g, **s** and **β** are interconnected but not in the way that Piketty's acute confusion regarding "capital" and "capital" has led him to believe. The missing relevant quantities are:

s_v = the percent of savings going into existing assets,
s_r = the percent of savings going into new assets, where
$s_v + s_r = s$.

It is $\mathbf{s_v}$ that inflates assets prices and leads to an increase in **β**, whereas $\mathbf{s_r}$ is likely to have the opposite effect.

Plutonomy economics

These days some, and maybe even the lion's share, of the most influential theorizing about the economy takes place in secret. And when you stop to think about it, it is difficult to image how it could it be otherwise. Aristotle's motivation for studying economies may have been purely intellectual, but historically the dominant motivation has been to learn how to make economies function better for us humans. But your palace is not my palace, and "therein lies the rub". It is

[5] From the Boolean structure of market-value it follows that market economies as a whole have to be continuously changing since any change in the market-value or quantity of anything bought and sold changes the market-value of everything else. In short, barring a total price and quantity freeze by a totalitarian government, equilibrium is an impossible condition.

nice to increase the size of the pie, but some people find it even nicer to increase the size of their slice. And just as economics can sometimes be used to increase capital-1 and income-1, economics can also be used – and it is happening with great effectiveness this very minute – to increase and maintain a group's portion of capital- 2 plus income-2.

In recent years there have been a few leakages of the applied economic theorizing carried on behind locked doors on behalf of the-one-percent, some of which, despite frantic efforts to have them suppressed, remain available.[6] What is noteworthy, in the present context, is that, although the economists of the-one-percent are not so unworldly as to ponder algebraic structures, they appear in some degree to implicitly understand the Boolean structure of capital-2 plus income-2. Before looking at one of these one-percenter contributions which was inspired by the appearance of Piketty's great book, we need to introduce both the reality and the idea of *meso inflation*.

Whereas the symbol "capital" is used sometimes to mean this and sometimes that and sometimes something else, all of them of course legitimate, but which without explicit clarification lead to acute theoretical confusion, the symbol "inflation" has, in the main been used to designate only a subset of price level increases. In recent years the term "asset inflation" has become quasi-common, but "inflation" by itself is still perceived by most humans as referring only to the inflation of income-2. Let us, at least momentarily, break with that tradition and *define "inflation" as including both income-2 inflation and capital-2 inflation*. Metrically and in terms of the measurement unit, say euros, they refer to the same phenomenon: an increase in the number of euros it takes to buy a given basket or briefcase of market exchangeables. Because traditionally economics has terminologically blanked capital-2 inflation, the economy's *overall inflation rate* and its relative *meso inflation rates* have with rare exceptions gone unobserved.[7] But with our new definition we can speak of the inflation rate for the whole economy, that is including both asset markets and goods and services markets. We can also speak of the income-2 inflation rate *relative* to the capital-2 inflation rate. Once we have these simple ideas at our command we have a means of understanding and describing in part *the causality* behind shifts of the capital-2 / income-2 ratio that are less mystical than Piketty's semi-traditional one.

Changes in capital-1 and income-1 are not required to bring about large changes in the capital-2 / income-2 ratio. Instead all that is needed is to exploit the Boolean structure of market-value by changing the captial-2 inflation rate relative to the income-2 inflation rate. The leaked documents from the one-percent's economists show that they see the manipulation of this structure as the primary means by which their paymasters' fortunes can be maintained and increased. For carrying out this manipulation they identify two primary sets of tactics.

One, much discussed by Michael Hudson, Steve Keen, Dean Baker, Ann Pettifor, James Galbraith and others, is to channel huge amounts of credit for the buying of particular categories of existing capital-1, thereby causing capital-2 inflation and causing it in chosen segments of the capital-1 market. Given the Boolean structure of market-value, *creating the possibility of* redistributing capital-2 and income-2 in this way is not a matter of pondering $\beta = s / g$, but of manipulating political decision making. For the last forty years, the one-percent's

[6] Three are currently available here: http://delong.typepad.com/plutonomy-1.pdf, http://delong.typepad.com/plutonomy-2.pdf, http://delong.typepad.com/plutonomy-3.pdf.

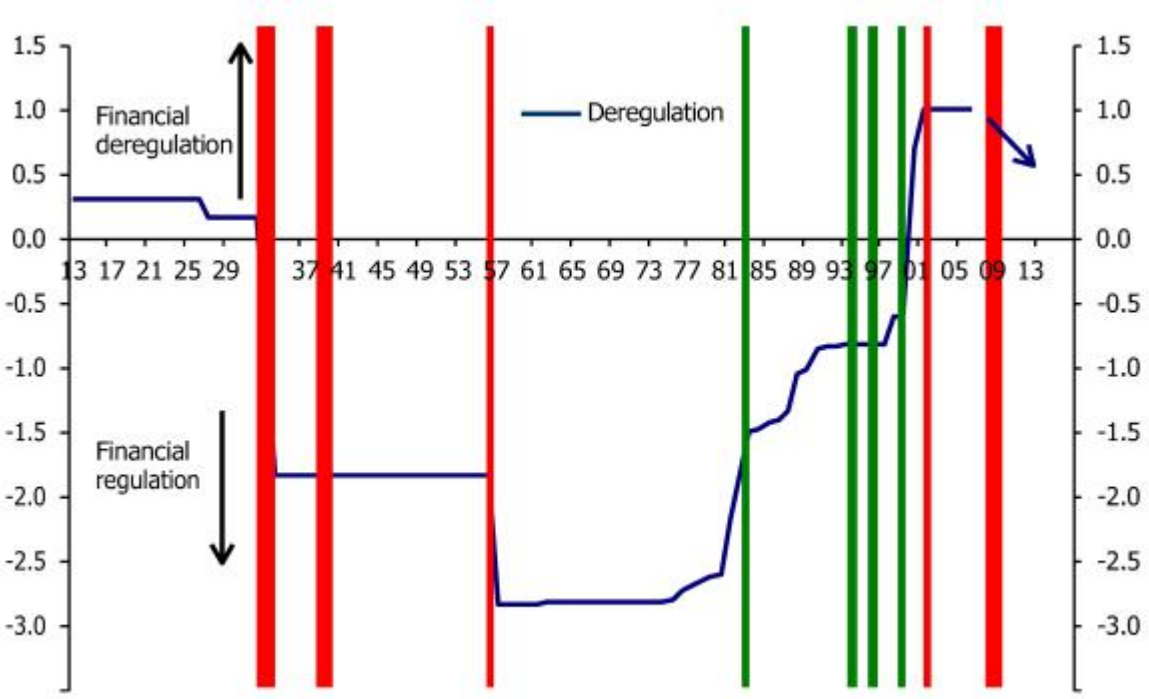
[7] For example, what was the overall inflation rate the US economy in 2010? Quite computable no doubt, but never or almost never stated.

informed manipulation of political systems, "democracies" and otherwise, has taken place and continues to take place at both administrative and legislative levels.

The aftermath of the Global Financial Collapse of 2007 is a good example of the former. In the United States and elsewhere historically unprecedented extensions of credit were almost exclusively directed toward the inflation of capital-2 rather than toward income-2 or toward increasing capital-1 or income-1. These decisions took place even in the face of the USA's decayed infrastructure.

But since 1980, the-one-percent has also excelled at bringing about changes in the law, some aimed at reducing labour's direct claim on income-2, others to enable the-one-percent to raise the capital / income ratio through engineered meso inflations. Recently there briefly leaked a new report by Bank of America-Merrill Lynch entitled "Piketty and Plutonomy: The Revenge of Inequality".[8] When it comes to Picketty's theoretical explanation, the plutonomists are laughing all the way to the bank. A chart and its introduction exhibit how they in private account for changes in the capital-2 / income-2 ratio.

> Drawing on our earlier work, and the research of Thomas Philippon and Ariell Reshef we highlight *the importance of financial de-regulation in engendering plutonomy.* Figure 42 delineates the history of financial regulation in the USA [emphasis added].

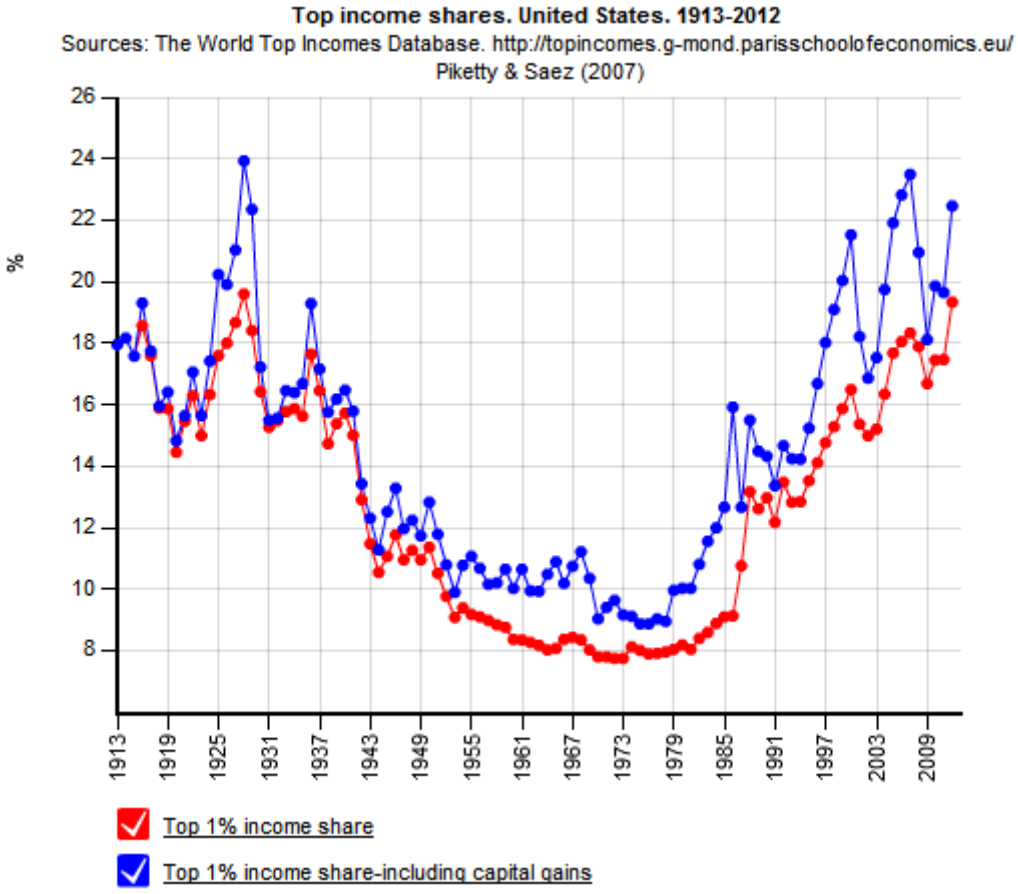


[8] http://www.businessinsider.com/bofa-merrill-lynch-backs-piketty-2014-5 This is one of many articles published a few months ago about the Bank of America report, but the report itself, as is often the case with one-percenter research, has now disappeared from the web.

Regulatory legislation	Deregulatory legislation	Regulatory legislation
1933 Glass-Steagall Act	1982 Garn-St. Germain Depository Institutions Act	2002 Sarbanes-Oxley Act
1933 Securities Act	1994 Riegle-Neal Interstate Banking & Branching Efficiency Act	2008 Economic Stimulus Act
1934 Securities Exchange Act	(repeals parts of Bank Holding Co. Act)	2008 Housing and Economic Recovery Act
1939 Trust Indenture Act	1996 Investment Advisers Act amended	2009 American Recovery and Reinvestment Act
1940 Investment Advisers Act	1999 Graham-Leach-Steagall & parts of Bank Holding Co. Act	2010 Dodd–Frank Wall Street Reform & Consumer Protection Act
1956 Banking Holding Company Act		

Source: BofA Merrill Lynch Global Research,
Philippon and Reshef (approximation) (http://pages.stern.nyu.edu/~tphilipp/papers/jr_rev15.pdf), WSJ

Note how well the legislation curve above fits the redistribution curve of income including capital gains for the-one-percent shown below.



For better or for worse

Today in many high-income countries and most English speaking ones, governments maintain two sets of interconnected policies: one designed to deflate labour's share of income-2, the other to inflate capital-2 and capital's share of income-2. The political feasibility of this dominant and general plutonomist policy of increasing and maintaining high capital-2 / income-2 ratios is greatly enhanced by the economics profession's almost exclusive use of models that exclude *the central Boolean dimension of market economies* and thereby hide not only from the economist's view but also, and more importantly, from the public's view the dominant economic dynamic of our age. As Michael Hudson notes, the traditional and prevailing models fail:

> … to distinguish between creating money to spend on employment, production and consumption in the "real" economy (affecting consumer prices, commodity prices and wages) as compared to creating credit (or simply Treasury debt) to give to banks to buy or lend against assets in the hope that this will bolster prices for real estate, stocks and bonds. The latter policy inflates asset prices but deflates current spending.
>
> The $13 trillion increase in U.S. Treasury debt in the post-2008 financial meltdown was not spent in product markets or employment in the "real" economy. It was balance-sheet help. Likewise for the ECB in 2011 ... [where] new money and debt creation has little interface with the "real" production-and-consumption economy, except to burden taxpayers [Hudson, 2011].

In writing *Capital in the Twenty-First Century,* Thomas Piketty has done humanity an enormous favour. He has achieved what many of us have tried and failed to achieve for years, in some cases decades: to place the huge upward redistributions of capital and wealth into public consciousness and to make it socially acceptable to talk about them.[9] Achieving this was always to be the first and most difficult step in de-accelerating and eventually stopping the global predations of a tiny minority. It is now done.

But Piketty's attempt to offer theoretical explanation of his empirical findings are rooted in the axiomatic mysticisms of economics' past. Consequently there is the serious danger that his book's ultimate effect will be to tighten the Euclidian blindfold that makes invisible the hands that engineer and maintain our plutonomy economies. It is only when the profession takes off that blindfold that it will have readily at hand the understanding that the world so desperately needs.

[9] The conclusion of Fullbrook 2002 points to the paper's usefulness:

> . . . for understanding two significant current problems.
>
> One is the need to bring ecological considerations into economic decision-making. . . . .
>
> The second problem is the redistribution of income and wealth from the poor and middle-classes to the rich and super-rich now taking place both intra- and internationally at a rate and on a scale unprecedented in human history. No adequate theory exists to explain and thereby to enable us to curtail, stop or reverse this radical change in the human condition. Of course it has something to do with globalization. But why should globalization have this redistributive effect? And how can the process be managed so that humans will control the direction and magnitude of the redistribution? This paper provides a theoretical framework in which to think about the problem.

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Deductivism – the fundamental flaw of mainstream economics

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> "Confusion of sign and object is original sin coeval with the word"
> W. v. O. Quine

Introduction

In science one could argue that there basically are three kinds of argumentation patterns / schemes / methods / strategies available – deduction, induction and abduction.

In this paper it will be argued that the failings of the mainstream modelling strategy are related to how mainstream economics (mis)uses the first two of these three modes of inference and – with severe negative analytical consequences – to a large degree disregard the third one.

Fixation on constructing models showing the certainty of logical entailment – *realiter* simply collapsing the necessary ontological gap between model and reality – has been detrimental to the development of a relevant and realist economics. Insisting on formalistic (mathematical) modelling forces the economist to give upon on realism and substitute axiomatics for real world relevance. The price for rigour and precision is far too high for anyone who is ultimately interested in using economics to pose and (hopefully) answer real world questions and problems.

The deductivist orientation is the main reason behind the difficulty that mainstream economics has in terms of understanding, explaining and predicting what takes place in our societies. But it has also given mainstream economics much of its discursive power – at least as long as no one starts asking tough questions on the veracity of – and justification for – the assumptions on which the deductivist foundation is erected. Asking these questions is an important ingredient in a sustained critical effort at showing how nonsensical is the embellishing of a smorgasbord of models founded on wanting (often hidden) methodological foundations.

The mathematical-deductivist straitjacket used in mainstream economics presupposes atomistic closed-systems – i.e., something that we find very little of in the real world, a world significantly at odds with an (implicitly) assumed logic world where deductive entailment rules the roost. Ultimately then, the failings of modern mainstream economics has its root in a

deficient ontology. The kind of formal-analytical and axiomatic-deductive mathematical modelling that makes up the core of mainstream economics is hard to make compatible with a real-world ontology. It is also the reason why so many critics find mainstream economic analysis patently and utterly unrealistic and irrelevant.

Although there has been a clearly discernible increase and focus on "empirical" economics in recent decades, the results in these research fields have not fundamentally challenged the main deductivist direction of mainstream economics. They are still mainly framed and interpreted within the core "axiomatic" assumptions of individualism, instrumentalism and equilibrium (cf. Arnsperger and Varoufakis (2006)) that make up even the "new" mainstream economics. Although, perhaps, a sign of an increasing – but highly path-dependent – theoretical pluralism, mainstream economics is still, from a methodological point of view, mainly a deductive project erected on a foundation of empty formalism.

If we want theories and models to confront reality there are obvious limits to what can be said "rigorously" in economics. For although it is generally a good aspiration to search for scientific claims that are both rigorous and precise, we have to accept that the chosen level of precision and rigour must be relative to the subject matter studied. An economics that is relevant to the world in which we live can never achieve the same degree of rigour and precision as in logic, mathematics or the natural sciences. Collapsing the gap between model and reality in that way will never give anything else than empty formalist economics.

In mainstream economics, with its addiction to the deductivist approach of formal mathematical modeling, model consistency trumps coherence with the real world. That is sure getting the priorities wrong. Creating models for their own sake is not an acceptable scientific aspiration – impressive-looking formal-deductive (mathematical) models should never be mistaken for truth.

- **Deduction**

> Premise 1: All Chicago economists believe in REH
> Premise 2: Robert Lucas is a Chicago economist
> ———————————————-
> Conclusion: Robert Lucas believes in REH

Here we have an example of *a logically* valid deductive inference (and, following Quine, whenever logic is used in this essay, "logic" refers to deductive/analytical logic).

In a hypothetico-deductive reasoning – hypothetico-deductive *confirmation* in this case – we would use the conclusion to test the law-like hypothesis in premise 1 (according to the hypothetico-deductive model, a hypothesis is confirmed by evidence if the evidence is deducible from the hypothesis). If Robert Lucas does not believe in REH we have gained some warranted reason for non-acceptance of the hypothesis (an obvious shortcoming here being that further information beyond that given in the explicit premises might have given another conclusion).

The hypothetico-deductive method (in case we treat the hypothesis as absolutely sure/true, we rather talk of an *axiomatic-deductive* method) basically means that we

- Posit a hypothesis

- Infer empirically testable propositions (consequences) from it
- Test the propositions through observation or experiment
- Depending on the testing results either find the hypothesis corroborated or falsified.

However, in science we regularly use a kind of "practical" argumentation where there is little room for applying the restricted logical "formal transformations" view of validity and inference. Most people would probably accept the following argument as a "valid" reasoning even though it from a strictly logical point of view is non-valid:

> Premise 1: Robert Lucas is a Chicago economist
> Premise 2: The recorded proportion of Keynesian Chicago economists is zero
> ———————————————————
> Conclusion: So, certainly, Robert Lucas is not a Keynesian economist

How come? Well I guess one reason is that in science, contrary to what you find in most logic text-books, not very many argumentations are settled by showing that "All Xs are Ys". In scientific practice we instead present other-than-analytical explicit warrants and backings – data, experience, evidence, theories, models – for our inferences. As long as we can show that our "deductions" or "inferences" are justifiable and have well-backed warrants, other scientists will listen to us. That our scientific "deductions" or "inferences" are logical non-entailments simply is not a problem. To think otherwise is committing the fallacy of misapplying formal-analytical logic categories to areas where they are pretty much irrelevant or simply beside the point.

Scientific arguments are not analytical arguments, where validity is solely a question of formal properties. Scientific arguments are *substantial* arguments. If Robert Lucas is a Keynesian or not, is nothing we can decide on formal properties of statements/propositions. We have to check out what the guy has actually been writing and saying to check if the hypothesis that he is a Keynesian is true or not.

In a *deductive-nomological* explanation – also known as a *covering law explanation* – we would try to explain why Robert Lucas believes in REH with the help of the two premises (in this case actually giving an explanation with very little explanatory value). These kinds of explanations – both in their *deterministic* and *statistic/probabilistic* versions – rely heavily on deductive entailment from assumed to be true premises. But they have preciously little to say on where these assumed to be true premises come from.

Deductive logic of confirmation and explanation may work well – given that they are used in deterministic closed models! In mathematics, the deductive-axiomatic method has worked just fine. But science is not mathematics. Conflating those two domains of knowledge has been one of the most fundamental mistakes made in the science of economics. Applying the deductive-axiomatic method to real world systems, however, immediately proves it to be excessively narrow and hopelessly irrelevant. Both the confirmatory and explanatory ilk of hypothetico-deductive reasoning fails since there is no way you can relevantly analyze confirmation or explanation as a purely logical relation between hypothesis and evidence or between law-like rules and explananda. In science we argue and try to substantiate our beliefs and hypotheses with reliable evidence – propositional and predicate deductive logic, on the other hand, is not about *reliability*, but the *validity* of the conclusions *given* that the premises are true.

Deduction – and the inferences that go with it – is an example of "explicative reasoning", where the conclusions we make are already included in the premises. Deductive inferences are purely *analytical* and it is this truth-preserving nature of deduction that makes it different from all other kinds of reasoning. But it is also its limitation, since truth in the deductive context does not refer to a real world ontology (only relating propositions as true or false within a formal-logic system) and as an argument scheme, deduction is totally non-ampliative – the output of the analysis is nothing else than the input.

Just to give an economics example, consider the following rather typical, but also uninformative and tautological, deductive inference:

> Premise 1: The firm seeks to maximize its profits
> Premise 2: The firm maximizes its profits when marginal cost equals marginal income
> ———————————————
> Conclusion: The firm will operate its business at the equilibrium where marginal cost equals marginal income

This is as empty as deductive-nomological explanations of singular facts building on simple generalizations:

> Premise 1: All humans are less than 20 feet tall
> Premise 2: Robert Lucas is a human
> ———————————————
> Conclusion: Robert Lucas is less than 20 feet tall

Although a logically valid inference, this is not much of an explanation (since we would still probably want to know why *all* humans are less than 20 feet tall).

Deductive-nomological explanations also often suffer from a kind of emptiness that emanates from a lack of real (causal) connection between premises and conclusions:

> Premise 1: All humans that take birth control pills do not get pregnant
> Premise 2: Lars Syll took birth control pills
> ———————————————
> Conclusion: Lars Syll did not get pregnant

I guess most people would agree that this is not much of a real explanation.

Learning new things about reality demands something else than a reasoning where the knowledge is already embedded in the premises. These other kinds of reasoning may give *good* – but not *conclusive* – reasons. That is the price we have to pay if we want to have something substantial and interesting to say about the real world.

- **Induction**

> Premise 1: This is a randomly selected large set of economists from Chicago
> Premise 2: These randomly selected economists all believe in REH

Conclusion: All Chicago economists believes in REH

In this inductive inference we have an example of a logically non-valid inference that we would have to supply with strong empirical evidence to really warrant. And that is no simple matter at all, as Keynes (1973 (1921): 468f) noticed:

> "In my judgment, the practical usefulness of those modes of inference, here termed Universal and Statistical Induction, on the validity of which the boasted knowledge of modern science depends, can only exist—and I do not now pause to inquire again whether such an argument must be circular—if the universe of phenomena does in fact present those peculiar characteristics of atomism and limited variety which appear more and more clearly as the ultimate result to which material science is tending...
>
> The physicists of the nineteenth century have reduced matter to the collisions and arrangements of particles, between which the ultimate qualitative differences are very few...
>
> The validity of some current modes of inference may depend on the assumption that it is to material of this kind that we are applying them... Professors of probability have been often and justly derided for arguing as if nature were an urn containing black and white balls in fixed proportions. Quetelet once declared in so many words— 'l'urne que nous interrogeons, c'est la nature'. But again in the history of science the methods of astrology may prove useful to the astronomer; and it may turn out to be true—reversing Quetelet's expression—that 'La nature que nous interrogeons, c'est une urne'."

But even though induction is more demanding in terms of justification than deduction, we should not draw the conclusion that it is no inference at all:

> "Now it might be charged that moving from such facts as that F's have always been followed by C's, to the claim that F's obtaining is a good reason for expecting C, – that this is not an inference at all; not when one's only defence consists in citing more facts, namely the specific meteorological, botanical, and biological data which support the general claim that F has regularly preceded C. Entailment it may not be, granted. But inference it certainly is, as must be every case of drawing reasonable conclusions from evidence." N. R. Hanson (1971:242)

Justified inductions presupposes a *resemblance* of sort between what we have experienced and know, and what we have not yet experienced and do not yet know. Just to exemplify this problem of induction let me take two examples.

Let's start with this one. Assume you're a Bayesian turkey and hold a nonzero probability belief in the hypothesis H that "people are nice vegetarians that do not eat turkeys and that every day I see the sun rise confirms my belief." For every day you survive, you update your belief according to Bayes' Rule

P(H|e) = [P(e|H)P(H)]/P(e)],

where evidence e stands for "not being eaten" and P(e|H) = 1. Given that there do exist other hypotheses than H, P(e) is less than 1 and a fortiori P(H|e) is greater than P(H). Every day you survive increases your probability belief that you will not be eaten. This is totally rational according to the Bayesian definition of rationality. Unfortunately – as Bertrand Russell famously noticed – for every day that goes by, the traditional Christmas dinner also gets closer and closer…

Or take the case of macroeconomic forecasting, which perhaps better than anything else illustrates the problem of induction in economics. As a rule macroeconomic forecasts tend to be little better than intelligent guesswork. Or in other words – macroeconomic mathematical-statistical forecasting models, and the inductive logic upon which they ultimately build, are as a rule far from successful. The empirical and theoretical evidence is clear. Predictions and forecasts are inherently difficult to make in a socio-economic domain where genuine uncertainty and unknown unknowns often rule the roost. The real processes underlying the time series that economists use to make their predictions and forecasts do not confirm with the inductive assumptions made in the applied statistical and econometric models. The forecasting models fail to a large extent because the kind of uncertainty that faces humans and societies actually makes the models strictly seen inapplicable. The future is inherently unknowable – and using statistics and econometrics does not in the least overcome this ontological fact. The economic future is not something that we normally can predict in advance. Better then to accept that as a rule "we simply do not know".

Induction is sometimes a good guide for evaluating hypotheses. But for the creative generation of plausible and relevant hypotheses it is conspicuously silent. For that we need, as noted already by Peirce (1931:§145), another – non-algorithmic and ampliative – kind of reasoning.

- **Abduction**

Premise 1: All Chicago economists believe in REH
Premise 2: These economists believe in REH
————————————————————-
Conclusion: These economists are from Chicago

In this case, again, we have an example of a logically non-valid inference – *the fallacy of affirming the consequent*:

p => q
q
———
p

or, in instantiated form

∀x (Gx => Px)
Pa
———
Ga

But it is nonetheless an inference that may be a strongly warranted and *truth-producing* – in contradistinction to *truth-preserving* deductions – reasoning, following the general pattern

Evidence => Explanation => Inference.

Here we infer something based on what would be the best explanation given the law-like rule (premise 1) and an observation (premise 2). The truth of the conclusion (explanation) is nothing that is *logically* given, but something we have to justify, argue for, and test in different ways to possibly establish with any certainty or degree. And as always when we deal with explanations, what is considered best is relative to what we know of the world. In the real world all evidence has an irreducible holistic aspect. We never conclude that evidence follows from hypothesis *simpliciter*, but always given some more or less explicitly stated contextual background assumptions. All non-deductive inferences and explanations are *a fortiori* context dependent.

If extending the abductive scheme to incorporate the demand that the explanation has to be the *best* among a set of *plausible* competing/rival/contrasting potential and satisfactory explanations, we have what is nowadays usually referred to as *inference to the best explanation* (IBE). In this way IBE is a refinement of the original (Peircean) concept of abduction by making the background knowledge requirement more explicit.

In abduction we start with a body of (purported) data/facts/evidence and search for explanations that can account for these data/facts/evidence. Having the best explanation means that you, given the context-dependent background assumptions, have a satisfactory explanation that can explain the fact/evidence better than any other competing explanation – and so it is *reasonable* to consider/believe the hypothesis to be true. Even if we do not (inevitably) have deductive certainty, our abductive reasoning gives us a license to consider our belief in the hypothesis as reasonable. The model of inference to the best explanation is, as Peter Lipton (2000:184) writes,

> "…designed to give a partial account of many inductive inferences, both in science and in ordinary life... Its governing idea is that explanatory considerations are a guide to inference, that scientists infer from the available evidence to the hypothesis which would, if correct, best explain that evidence. Many inferences are naturally described in this way... When a detective infers that it was Moriarty who committed the crime, he does so because this hypothesis would best explain the fingerprints, blood stains and other forensic evidence. Sherlock Holmes to the contrary, this is not a matter of deduction. The evidence will not entail that Moriarty is to blame, since it always remains possible that someone else was the perpetrator. Nevertheless, Holmes is right to make his inference, since Moriarty's guilt would provide a better explanation of the evidence than would anyone else's.
>
> Inference to the Best Explanation can be seen as an extension of the idea of 'self-evidencing' explanations, where the phenomenon that is explained in turn provides an essential part of the reason for believing the explanation is correct... According to Inference to the Best Explanation, this is a common situation in science: hypotheses are supported by the very observations

> they are supposed to explain. Moreover, on this model, the observations support the hypothesis precisely because it would explain them."

Accepting a hypothesis means that you consider it to explain the available evidence better than any other competing hypothesis. The acceptability warrant comes from the explanatory power of the hypothesis, and the conscious act of trying to rule out the possible competing potential explanations in itself increases the plausibility of the preferred explanation. Knowing that we – after having earnestly considered and analysed the other available potential explanations – have been able to *eliminate* the competing potential explanations, warrants and enhances the confidence we have that our preferred explanation is the best – "loveliest" – explanation, i.e., the explanation that provides us with the greatest understanding (given it is correct). As Sherlock Holmes had it (in *The Sign of Four*): "Eliminate the impossible, and whatever remains, however improbable, must be the truth". Subsequent confirmation of our hypothesis – by observations, experiments or other future evidence – makes it even more well-confirmed (and underlines that all explanations are incomplete, and that the models and theories that we as scientists use, cannot only be assessed by the extent of their fit with experimental or observational data, but also need to take into account their explanatory power).

This, of course, does not in any way mean that we cannot be wrong. Of course we can. But as Alan Musgrave (2010:94) writes:

> "Quite so – and so what? It goes without saying that any explanation might be false, in the sense that it is not necessarily true. It is absurd to suppose that the only things we can reasonably believe are necessary truths.
>
> What if the best explanation not only might be false, but actually is false. Can it ever be reasonable to believe a falsehood? Of course it can... What we find out is that what we believed was wrong, not that it was wrong or unreasonable for us to have believed it.
>
> People object that being the best available explanation of a fact does not prove something to be true or even probable. Quite so – and again, so what? The explanationist principle – 'It is reasonable to believe that the best available explanation of any fact is true' – means that it is reasonable to believe or think true things that have not been shown to be true or probable, more likely true than not."

Abductions are *fallible* inferences – since the premises do not logically entail the conclusion – so from a *logical* point of view, abduction is a weak mode of inference. But if the abductive arguments put forward are strong enough, they can be warranted and give us justified true belief, and hence, knowledge, even though they are fallible inferences. As scientists we sometimes – much like Sherlock Holmes and other detectives that use abductive reasoning – experience disillusion. We thought that we had reached a strong abductive conclusion by ruling out the alternatives in the set of contrasting explanations. But – what we thought was true turned out to be false. But that does not necessarily mean that we had no good reasons for believing what we believed. If we cannot live with that contingency and uncertainty, well, then we're in the wrong business. If it is deductive certainty you are after, rather than the *ampliative* and *defeasible* reasoning in abduction – well, then get in to math or logic, not science.

What makes the works of people like Galileo, Marx, or Keynes, truly interesting is not that they describe new empirical facts. No, the truly seminal and pioneering aspects of their works is that they managed to find out and analyse what makes empirical phenomena possible. What are the fundamental physical forces that make heavy objects fall the way they do? Why do people get unemployed? Why are market societies haunted by economic crises? Starting from well known facts these scientists discovered the mechanisms and structures that made these empirical facts possible.

> "Newton pressed on; Einstein, DeBroglie, Schrödinger, Heisenberg and Dirac pressed on – for explanations, which no amount of statistical repetition or deductive ingenuity could ever supply … From the observed properties of phenomena the physicist reasons his way towards a keystone idea from which the properties are explicable as a matter of course. The physicist seeks not a set of possible objects, but a set of possible explanations" N. R. Hanson (1965:88).

The works of these scientists are good illustrations of the fact that in science we are usually not only interested in observable facts and phenomena. Since structures, powers, institutions, relations, etc., are not *directly* observable, we need to use theories and models to *indirectly* obtain knowledge of them (and to be able to *recontextualize* and *redescribe* observables to discover new and (perhaps) hitherto unknown dimensions of the world around us). Deduction and induction do not give us access to these kinds of entities. They are things that to a large extent have to be *discovered*. Discovery processes presupposes creativity and imagination, virtues that are not very prominent in inductive analysis (statistics and econometrics) or deductive-logical reasoning. We need another mode of inference. We need inference to the best explanation.

Inference to the best explanation is a (non-demonstrative) ampliative method of reasoning that makes it possible for us to gain new insights and come up with – and evaluate – theories and hypotheses that – in contradistinction to the entailments that deduction provide us with – *transcend* the epistemological content of the evidence that brought about them. And instead of only delivering inductive generalizations from the evidence at hand – as the inductive scheme – it typically opens up for conceptual novelties and *retroduction*, where we from analysis of empirical data and observation reconstruct the ontological conditions for their being what they are. As scientists we do not only want to be able to deal with observables. We try to make the world more intelligible by finding ways to understand the fundamental processes and structures that rule the world we live in. Science should help us penetrate to these processes and structures behind facts and events we observe. We should look out for causal relations, processes and structures, but models – mathematical, econometric, or what have you – can never be more than a starting point in that endeavour. There is always the possibility that there are other (non-quantifiable) variables – of vital importance and although perhaps unobservable and non-additive not necessarily epistemologically inaccessible – that were not considered for the formalized mathematical model. The content-enhancing aspect of inference to the best explanation gives us the possibility of acquiring new and warranted knowledge and understanding of things beyond empirical sense data. Arguably, realism in its different guises ultimately rests on inference to the best explanation to found the existence of such unobservable entities.

Outside mathematics and logic, scientific methods do not deliver absolute certainty or prove things. However, many economists are still in pursuit of absolute certainty. But there will always

be a great number of theories and models that are compatible / consistent with facts, and no logic makes it possible to select one as the right one. The search for absolute certainty can never be anything else but disappointing since all scientific knowledge is more or less uncertain. That is a fact of the way the world is, and we just have to learn to live with that inescapable limitation of scientific knowledge.

> "Traditionally, philosophers have focused mostly on the logical template of inference. The paradigm-case has been deductive inference, which is topic neutral and context-insensitive. The study of deductive rules has engendered the search for the Holy Grail: syntactic and topic-neutral accounts of all prima facie reasonable inferential rules. The search has hoped to find rules that are transparent and algorithmic, and whose following will just be a matter of grasping their logical form. Part of the search for the Holy Grail has been to show that the so-called scientific method can be formalised in a topic-neutral way. We are all familiar with Carnap's inductive logic, or Popper's deductivism or the Bayesian account of scientific method.
>
> There is no Holy Grail to be found. There are many reasons for this pessimistic conclusion. First, it is questionable that deductive rules are rules of inference. Second, deductive logic is about updating one's belief corpus in a consistent manner and not about what one has reasons to believe simpliciter. Third, as Duhem was the first to note, the so-called scientific method is far from algorithmic and logically transparent. Fourth, all attempts to advance coherent and counterexample-free abstract accounts of scientific method have failed. All competing accounts seem to capture some facets of scientific method, but none can tell the full story. Fifth, though the new Dogma, Bayesianism, aims to offer a logical template (Bayes's theorem plus conditionalisation on the evidence) that captures the essential features of non-deductive inference, it is betrayed by its topic-neutrality. It supplements deductive coherence with the logical demand for probabilistic coherence among one's degrees of belief. But this extended sense of coherence is (almost) silent on what an agent must infer or believe" (Psillos (2007:441)).

Explanations are *per se* not deductive proofs. And deductive proofs often do not explain at all, since validly deducing X from Y does not *per se* explain *why* X is a fact, because it does not say anything at all about *how* being Y is connected to being X. Explanations do not necessarily have to *entail* the things they explain. But they can nevertheless confer warrants for the conclusions we reach using inference to the best explanation. The evidential force of inference to the best explanation is consistent with having less than certain belief.

Explanation is prior to inference. Inferring means that you come to believe something and have (evidential) reasons for believing so. As economists we entertain different hypotheses on inflation, unemployment, growth, wealth inequality, and so on. From the available evidence and our context-dependent background knowledge we evaluate how well the different hypotheses would explain these evidence and which of them qualifies for being the best accepted hypothesis. Given the information available, we base our inferences on explanatory considerations (noting this, of course, does not exclude that there exist other, nonexplanatory, factors that may influence our choices and rankings of explanations and hypotheses).

Where did economics go wrong?

If only mainstream economists also understood these basics. But most of them do not. Why? Because in mainstream economics it is not inference to the best explanation that rules the methodological-inferential roost, but deductive reasoning based on logical inference from a set of axioms. Although – under specific and restrictive assumptions – deductive methods may be usable tools, insisting that economic theories and models ultimately have to be built on a deductive-axiomatic foundation to count as being economic theories and models, will only make economics irrelevant for solving real world economic problems. Modern deductive axiomatic mainstream economics is sure very rigorous – but if it's rigorously wrong, who cares?

Instead of making formal logical argumentation based on deductive-axiomatic models the message, we are better served by economists who more than anything else try to contribute to solving real problems – and in that endeavour inference to the best explanation is much more relevant than formal logic.

> "The weaknesses of social-scientific normativism are obvious. The basic assumptions refer to idealized action under pure maxims; no empirically substantive law-like hypotheses can be derived from them. Either it is a question of analytic statements recast in deductive form or the conditions under which the hypotheses derived could be definitively falsified are excluded under ceteris paribus stipulations. Despite their reference to reality, the laws stated by pure economics have little, if any, information content. To the extent that theories of rational choice lay claim to empirical-analytic knowledge, they are open to the charge of Platonism (Modellplatonismus). Hans Albert has summarized these arguments: The central point is the confusion of logical presuppositions with empirical conditions. The maxims of action introduced are treated not as verifiable hypotheses but as assumptions about actions by economic subjects that are in principle possible. The theorist limits himself to formal deductions of implications in the unfounded expectation that he will nevertheless arrive at propositions with empirical content. Albert's critique is directed primarily against tautological procedures and the immunizing role of qualifying or 'alibi' formulas. This critique of normative-analytic methods argues that general theories of rational action are achieved at too great a cost when they sacrifice empirically verifiable and descriptively meaningful information" (Habermas (1988:48)).

Science is made possible by the fact that there are structures that are durable and are independent of our knowledge or beliefs about them. There exists a reality beyond our theories and concepts of it. It is this independent reality that our theories in some way deal with. Contrary to positivism, the main task of science is arguably not to detect event regularities between observed facts, but rather, to identify the underlying structure and forces that produce the observed events.

From that point of view, it could be argued that the generalizations we look for (often with statistical and econometric methods) when using inductive methods (to say anything about a population based on a given sample) are abductions. From the premise "all *observed* real-world markets are non-perfect" we conclude "all real-world markets are non-perfect". If we have tested all the other potential hypotheses and found that, e.g., there is no reason to believe that the

sampling process has been biased and that we are dealing with a nonrepresentative non-random sample, we could, given relevant background beliefs / assumptions, say that we have justified belief in treating our conclusion as warranted. Being able to eliminate / refute contesting / contrastive hypotheses – using both observational *and* non-observational evidence – confers an increased certainty in the hypothesis believed to be "the loveliest".

Instead of building models based on logic-axiomatic, topic-neutral, context-insensitive and non-ampliative deductive reasoning – as in mainstream economic theory – it would be more fruitful and relevant to apply inference to the best explanation, given that what we are looking for is to be able to explain what's going on in the world we live in. The world in which we live is – as argued by e.g. Keynes and Shackle – genuinely uncertain. By using abductive inferences we can nonetheless gain knowledge about it. Although inevitably defeasible, abduction is also our only source of scientific discovery.

Most mainstream economic models build on a theory that is abstract, unrealistic and presenting mostly non-testable hypotheses. One important rational behind this kind of model building is the quest for rigour, and more precisely, *logical* rigour. Formalization of economics has been going on for more than a century and with time it has become obvious that the preferred kind of formalization is the one that rigorously follows the rules of formal logic. As in mathematics, this has gone hand in hand with a growing emphasis on axiomatics. Instead of basically trying to establish a connection between empirical data and assumptions, "truth" has come to be reduced to, a question of fulfilling internal consistency demands between conclusion and premises, instead of showing a "congruence" between model assumptions and reality. This has, of course, severely restricted the applicability of economic theory and models.

Unpacking premises and relationships within a consistent model is not enough in empirical sciences. In empirical sciences we do also have to be concerned with the truth-status of the premises and conclusions *re* the world in which we live.

In their search for the Holy Grail of *deductivism* – an idea originating in physics and maintaining the feasibility and relevance of describing an entire science as (more or less) a self-contained axiomatic-deductive system – mainstream economists are forced to make assumptions with often preciously little resemblance to reality. When applying this deductivist thinking to economics, mainstream economists usually set up "as if" models based on a set of tight axiomatic assumptions from which consistent and precise inferences are made. The beauty of this procedure is of course that if the axiomatic premises are true, the conclusions *necessarily* follow. The snag is that if the models are to be relevant, we also have to argue that their precision and rigour still holds when they are applied to real-world situations. They (almost) never do. In the positivist (Hempelian, deductive-nomological) tradition, explanation is basically seen as deduction from general laws. In social sciences these laws are non-existent, and so, *a fortiori*, are the deductivist explanations. When addressing real economies, the idealizations necessary for the deductivist machinery to work simply don't hold.

> "The thrust of this realist rhetoric is the same both at the scientific and at the meta-scientific levels. It is that explanatory virtues need not be evidential virtues. It is that you should feel cheated by 'The world is as if T were true', in the same way as you should feel cheated by 'The stars move as if they were fixed on a rotating sphere'. Realists do feel cheated in both cases" Musgrave (1999:68).

The one-eyed focus on validity and consistency makes much of mainstream economics irrelevant, since its insistence on deductive-axiomatic foundations does not earnestly consider the fact that its formal logical reasoning, inferences and arguments show an amazingly weak relationship to their everyday real world equivalents. Searching in vain for absolute and deductive knowledge and "truth", these economists forgo the opportunity of getting more relevant and better (defeasible) knowledge. For although the formal logic focus may deepen our insights into the notion of validity, the rigour and precision has a devastatingly important trade-off: the higher the level of rigour and precision, the smaller is the range of real world applications. Consistency does not take us very far. As scientists we can not only be concerned with the consistency of our universe of discourse. We also have to investigate how consistent our models and theories are with the universe in which we happen to live.

To understand and explain relations between different entities in the real economy the predominant strategy is to build models and make things happen in these "analogue-economy models" rather than engineering things happening in real economies. This formalistic deductive modeling strategy certainly impresses some people, but the one-sided, almost religious, insistence on axiomatic-deductivist modeling as the only scientific activity worthy of pursuing in economics, forgets that in the realm of science it ought to be considered of little or no value to simply make claims about the model and lose sight of reality. Although the formalistic tractability of deductivist mathematical modeling method makes conclusions follow with certainty from given assumptions, that should be of little interest to scientists, since what happens with certainty in a model world is no warrant for the same to hold in real world economies.

> "Mathematics, especially through the work of David Hilbert, became increasingly viewed as a discipline properly concerned with providing a pool of frameworks for possible realities...
>
> This emergence of the axiomatic method removed at a stroke various hitherto insurmountable constraints facing those who would mathematise the discipline of economics. Researchers involved with mathematical projects in economics could, for the time being at least, postpone the day of interpreting their preferred axioms and assumptions. There was no longer any need to seek the blessing of mathematicians and physicists or of other economists who might insist that the relevance of metaphors and analogies be established at the outset. In particular it was no longer regarded as necessary, or even relevant, to economic model construction to consider the nature of social reality, at least for the time being...
>
> The result was that in due course deductivism in economics, through morphing into mathematical deductivism on the back of developments within the discipline of mathematics, came to acquire a new lease of life, with practitioners (once more) potentially oblivious to any inconsistency between the ontological presuppositions of adopting a mathematical modelling emphasis and the nature of social reality. The consequent rise of mathematical deductivism has culminated in the situation we find today" Lawson (2015:84).

Theories and models being "coherent" or "consistent" with data do not make the theories and models success stories. To have valid evidence is not enough. What economics needs is *sound* evidence. The premises of a valid argument do not have to be true, but a sound argument, on

the other hand, is not only valid, but builds on premises that are true. Aiming only for validity, without soundness, is setting the economics aspirations level too low for developing a realist and relevant science.

In science, nothing of substance has ever been decided by just putting things in the right logical form. Those scientific matters that can be dealt with in a purely formal-analytical matter are only of second-order interest. The absurdity of trying to analyse and explain (necessarily "non-Laplacian") real world systems equipped with analytical rather than substantial scientific arguments, becomes clear as soon as we become aware that this is fundamentally a denial of the *field-dependent* character of all science. What counts as a justified inference in economics is not necessarily equivalent to what counts in sociology, physics, or biology. They address different problems and questions, and – *a fortiori* – what is considered absolutely necessary in one field, may be considered totally irrelevant in another. In the case of substantial arguments there is, as Toulmin (2003:163) notes,

> "…no question of data and backing taken together entailing the conclusion, or failing to entail it: just because the steps involved are substantial ones, it is no use either looking for entailments or being disappointed if we do not find them. Their absence does not spring from a lamentable weakness in the arguments, but from the nature of the problems with which they are designed to deal. When we have to set about assessing the real merits of any substantial argument, analytical criteria such as entailment are, accordingly, simply irrelevant ... 'Strictly speaking' means, to them, *analytically* speaking; although in the case of substantial arguments to appeal to analytic criteria is not so much strict as beside the point ... There is no justification for applying analytic criteria in all fields of argument indiscriminately, and doing so consistently will lead one (as Hume found) into a state of philosophical delirium."

Bayesianism

Bayesian statistics has during the last couple of decades led a substantial school in the philosophy of science to identify Bayesian inference with inductive inference as such. However, there is really very little to warrant that belief.

Neoclassical economics nowadays usually assumes that agents that have to make choices under conditions of uncertainty behave according to Bayesian rules (preferably the ones axiomatized by Ramsey (1931), de Finetti (1937) or Savage (1954)) – that is, they maximize expected utility with respect to some subjective probability measure that is continually updated according to Bayes theorem. If not, they are supposed to be irrational, and ultimately – via some "Dutch book" or "money pump" argument – susceptible to being ruined by some clever "bookie".

Bayesianism reduces questions of rationality to questions of internal consistency (coherence) of beliefs, but - even granted this questionable reductionism - do rational agents really have to be Bayesian? Actually, there is no strong warrant for believing so.

The "problem of induction" is usually described as a problem of how we can learn things about a population from knowledge of a sample (spatial version) or how the past may give us information and help us to decide what to believe about the future (temporal version). In both

cases Bayesians think they solve the problem through application of probabilistic calculus (especially with the help of Bayes Theorem).

This is however wrong, since from a Bayesian point of view *any* prior probability distribution is "as good as any other", which means that the probability calculus actually does not rule out anything. Anything goes. The sample does not tell us anything about the population. And the past does not – as argued by e.g. Max Albert (2009:55) – tell us anything about the future:

> "Keeping to the Bayesian recipe, then, cannot, by and in itself, help us make better decisions. It just burdens us with a lot of calculations... From a Bayesian point of view, any beliefs, and consequently, any decisions are as rational or irrational as any other, no matter what our goals and experiences are. Bayesian rationality is just a probabilistic version of irrationalism... Any conclusions result from the choice of the prior probability distribution, but Bayesianism does not help us in choosing this distribution."

In many of the situations that are relevant to economics one could argue that there is simply not enough of adequate and relevant information to ground beliefs of a probabilistic kind, and that in those situations it is not really possible, in any relevant way, to represent an individual's beliefs in a single probability measure.

Say you have come to learn (based on own experience and tons of data) that the probability of you becoming unemployed in the US is 10%. Having moved to another country (where you have no own experience and no data) you have no information on unemployment and a fortiori nothing to help you construct any probability estimate on. A Bayesian would, however, argue that you would have to assign probabilities to the mutually exclusive alternative outcomes and that these have to add up to 1, if you are rational. That is, in this case – and based on symmetry – a rational individual would have to assign probability 10% to becoming unemployed and 90% of becoming employed.

That feels intuitively wrong though, and I guess most people would agree. Bayesianism cannot distinguish between symmetry-based probabilities from information and symmetry based probabilities from an absence of information. In these kinds of situations most of us would rather say that it is simply irrational to be a Bayesian and better instead to admit that we "simply do not know" or that we feel ambiguous and undecided. Arbitrary an ungrounded probability claims are more irrational than being undecided in face of genuine uncertainty, so if there is not sufficient information to ground a probability distribution, it is better to acknowledge that simpliciter, rather than pretending to possess a certitude that we simply do not possess.

I think this critique of Bayesianism is in accordance with the views of Keynes, *A Treatise on Probability* (1921) and *General Theory* (1936). According to Keynes we live in a world permeated by unmeasurable uncertainty – not quantifiable stochastic risk – which often forces us to make decisions based on anything but rational expectations. Sometimes we "simply do not know". Keynes would not have accepted the view of Bayesian economists, according to whom expectations "tend to be distributed, for the same information set, about the prediction of the theory". Keynes, rather, thinks that we base our expectations on the confidence or "weight" we put on different events and alternatives. To Keynes expectations are a question of weighing probabilities by "degrees of belief", beliefs that have preciously little to do with the kind of stochastic probabilistic calculations made by the rational agents modelled by Bayesian economists.

There is also a kind of bias toward the superficial in Bayesian thought, which to Richard Miller (1987:325) is an example of:

> "…real harm done in contemporary social science by a roughly Bayesian paradigm of statistical inference as the epitome of empirical argument. For instance the dominant attitude toward the sources of black-white differential in United States unemployment rates (routinely the rates are in a two to one ratio) is 'phenomenological.' The employment differences are traced to correlates in education, locale, occupational structure, and family background. The attitude toward further, underlying causes of those correlations is agnostic... Yet on reflection, common sense dictates that racist attitudes and institutional racism *must* play an important causal role. People do have beliefs that blacks are inferior in intelligence and morality, and they are surely influenced by these beliefs in hiring decisions... Thus, an overemphasis on Bayesian success in statistical inference discourages the elaboration of a type of account of racial disadvantages that almost certainly provides a large part of their explanation."

And as Henry E. Kyburg (1968:56) writes (emphasis added) in perhaps the ultimate takedown of Bayesian hubris:

> "From the point of view of the 'logic of consistency' (which for Ramsey includes the probability calculus), no set of beliefs is more rational than any other, so long as they both satisfy the quantitative relationships expressed by the fundamental laws of probability...
>
> *Now this seems patently absurd*. It is to suppose that even the most simple statistical inferences have no logical weight where my beliefs are concerned. It is perfectly compatible with these laws that I should have a degree of belief equal to 1/4 that this coin will land heads when next I toss it; and that I should then perform a long series of tosses (say, 1000), of which 3/4 should result in heads; and then that on the 1001st toss, my belief in heads should be unchanged at 1/4. It could increase to correspond to the relative frequency in the observed sample, or it could even, by the agency of some curious maturity-of-odds belief of mine, decrease to 1/8. *I think we would all, or almost all, agree that anyone who altered his beliefs in the last-mentioned way should be regarded as irrational.*"

The standard view in statistics – and the axiomatic probability theory underlying it – is to a large extent based on the rather simplistic idea that "more is better". But as Keynes argues in *A Treatise on Probability* – "more of the same" is not what is important when making inductive inferences. It's rather a question of "more but different".

Variation, not replication, is at the core of induction. Finding that p(x|y) = p(x|y & w) doesn't make w "irrelevant". Knowing that the probability is unchanged when w is present gives p(x|y & w) another evidential weight ("weight of argument"). Running 10 replicative experiments do not make you as "sure" of your inductions as when running 10,000 varied experiments – even if the probability values happen to be the same.

Keynes argued that it was inadmissible to project history on the future. Consequently we cannot presuppose that what has worked before, will continue to do so in the future. That statistical models can get hold of correlations between different "variables" is not enough. If they cannot get at the causal structure that generated the data, they are not really "identified".

> "A major, and notorious, problem with this approach, at least in the domain of science, concerns how to ascribe objective prior probabilities to hypotheses. What seems to be necessary is that we list all the possible hypotheses in some domain and distribute probabilities among them, perhaps ascribing the same probability to each employing the principal of indifference. But where is such a list to come from? It might well be thought that the number of possible hypotheses in any domain is infinite, which would yield zero for the probability of each and the Bayesian game cannot get started. All theories have zero probability and Popper wins the day. How is some finite list of hypotheses enabling some objective distribution of nonzero prior probabilities to be arrived at? My own view is that this problem is insuperable, and I also get the impression from the current literature that most Bayesians are themselves coming around to this point of view" Alan Chalmers (2013:165).

Econometrics and randomized experiments

Bayesianism has its root in statistics – and within economics, more specifically, in the statistical application of inductive reasoning in the form of econometrics.

Firmly stuck in an empiricist tradition, econometrics is only concerned with the measurable aspects of reality, But there is always the possibility that there are other variables – of vital importance and although perhaps unobservable and non-additive not necessarily epistemologically inaccessible – that were not considered for the model. Those who were can hence never be guaranteed to be more than potential causes, and not real causes.

When causal mechanisms operate in real world social systems they only do it in everchanging and unstable combinations where the whole is more than a mechanical sum of parts. If economic regularities obtain they do it (as a rule) only because we engineered them for that purpose. Outside man-made "nomological machines" they are rare, or even non-existent. Unfortunately that also makes most of the achievements of econometric forecasting rather useless.

The increasing use of natural and quasi-natural experiments in economics during the last couple of decades has led some economists to triumphantly declare it as a major step on a recent path toward empirics, where instead of being a deductive philosophy, economics is now increasingly becoming an inductive science.

In defence of this view, the works of Joshua Angrist and Jörn-Steffen Pischke are often apostrophized, so let us start with one of their later books and see if there is any real reason to share the optimism on this 'empirical turn' in economics. In *Mastering Metrics,* Angrist and Pischke (2014:xiii) write:

> "Our first line of attack on the causality problem is a randomized experiment, often called a randomized trial. In a randomized trial, researchers change the causal variables of interest... for a group selected using something like a coin toss. By changing circumstances randomly, we make it highly likely that the variable of interest is unrelated to the many other factors determining the outcomes we want to study. Random assignment isn't the same as holding everything else fixed, but it has the same effect. Random manipulation makes *other things equal* hold on average across the groups that did and did not experience manipulation. As we explain... 'on average' is usually good enough."

Angrist and Pischke may "dream of the trials we'd like to do" and consider "the notion of an ideal experiment" something that "disciplines our approach to econometric research", but to maintain that "on average" is "usually good enough" is an allegation that is rather unwarranted, and for many reasons.

> "RCTs… fail to demonstrate any form of universal causality. They show us that by the use of the law of large numbers, we can describe the average characteristics of a large population and changes over time, by appropriately studying a small sample drawn from the population. RCTs do this extremely well, though even here one should add the reminder that average characteristics are not the only pertinent features of populations" Basu (2014:461).

It amounts to nothing but hand waving to *simpliciter* assume, without argumentation, that it is tenable to treat social agents and relations as homogeneous and interchangeable entities. When Joshua Angrist and Jörn-Steffen Pischke in an earlier article of theirs (Angrist & Pischke (2010:23)) say that "anyone who makes a living out of data analysis probably believes that heterogeneity is limited enough that the well-understood past can be informative about the future," I really think they underestimate the heterogeneity problem. It does not just turn up as an *external* validity problem when trying to "export" regression results to different times or different target populations. It is also often an *internal* problem to the millions of regression estimates that economists produce every year.

> "Like us, you want evidence that a policy will work here, where you are. Randomized controlled trials (RCTs) do not tell you that. They do not even tell you that a policy works. What they tell you is that a policy worked there, where the trial was carried out, in that population. Our argument is that the changes in tense – from 'worked' to 'work' – are not just a matter of grammatical detail. To move from one to the other requires hard intellectual and practical effort. The fact that it worked there is indeed fact. But for that fact to be evidence that it will work here, it needs to be relevant to that conclusion. To make RCTs relevant you need a lot more information and of a very different kind" Cartwright & Hardie (2014:ix).

It is hard to share the enthusiasm and optimism on the value of (quasi)natural experiments and all the statistical-econometric machinery that comes with it. Guess we are still waiting for the export-warrant.

In econometrics one often gets the feeling that many of its practitioners think of it as a kind of automatic inferential machine that solves the problem of induction: input data and out comes casual knowledge. This is like pulling a rabbit from a hat. Great – but first you have to put the rabbit in the hat. And this is where assumptions come in to the picture.

As social scientists – and economists – we have to confront the all-important question of how to handle uncertainty and randomness. Should we equate randomness with probability? If we do, we have to accept that to speak of randomness we also have to presuppose the existence of nomological probability machines, since probabilities cannot be spoken of – and actually, to be strict, do not at all exist – without specifying such system-contexts.

In his book *Statistical Models and Causal Inference: A Dialogue with the Social Sciences* David Freedman (2010:14) touches on this fundamental problem, arising when you try to apply statistical models outside overly simple nomological machines like coin tossing and roulette wheels:

> "Regression models are widely used by social scientists to make causal inferences; such models are now almost a routine way of demonstrating counterfactuals. *However, the 'demonstrations' generally turn out to depend on a series of untested, even unarticulated, technical assumptions.* Under the circumstances, reliance on model outputs may be quite unjustified. Making the ideas of validation somewhat more precise is a serious problem in the philosophy of science. That models should correspond to reality is, after all, a useful but not totally straightforward idea – with some history to it. Developing appropriate models is a serious problem in statistics; testing the connection to the phenomena is even more serious...
>
> In our days, serious arguments have been made from data. Beautiful, delicate theorems have been proved, although the connection with data analysis often remains to be established. And *an enormous amount of fiction has been produced, masquerading as rigorous science."*

Making outlandish statistical assumptions does not provide a solid ground for doing relevant social science.

A popular idea in quantitative social sciences is to think of a cause (C) as something that increases the probability of its effect or outcome (O). That is:

$$P(O|C) > P(O|-C)$$

However, as is also well-known, a correlation between two variables, say A and B, does not necessarily imply that that one is a cause of the other, or the other way around, since they may both be an effect of a common cause, C.

In statistics and econometrics we usually solve this "confounder" problem by "controlling for" C, i.e. by holding C fixed. This means that we actually look at different "populations" – those in which C occurs in every case, and those in which C doesn't occur at all. This means that knowing the value of A does not influence the probability of C [P(C|A) = P(C)]. So if there then still exist a correlation between A and B in either of these populations, there has to be some other cause operating. But if *all* other possible causes have been "controlled for" too, and there

is still a correlation between A and B, we may safely conclude that A is a cause of B, since by "controlling for" all other possible causes, the correlation between the putative cause A and all the other possible causes (D, E, F, …) is broken.

This is of course a very demanding prerequisite, since we may never actually be sure to have identified *all* putative causes (cf. Basu (2014:460)). Even in scientific experiments may the number of uncontrolled causes be innumerable. Since nothing less will do, we do all understand how hard it is to actually get from correlation to causality. This also means that *only* relying on statistics or econometrics is not enough to deduce causes from correlations.

> "If the assumptions of a model are not derived from theory, and if predictions are not tested against reality, then deductions from the model must be quite shaky...
>
> In my view, regression models are not a particularly good way of doing empirical work in the social sciences today, because the technique depends on knowledge that we do not have. Investigators who use the technique are not paying adequate attention to the connection – if any – between the models and the phenomena they are studying...
>
> Causal inference from observational data presents may difficulties, especially when underlying mechanisms are poorly understood. There is a natural desire to substitute intellectual capital for labor, and an equally natural preference for system and rigor over methods that seem more haphazard. These are possible explanations for the current popularity of statistical models.
>
> Indeed, far-reaching claims have been made for the superiority of a quantitative template that depends on modeling – by those who manage to ignore the far-reaching assumptions behind the models. However, the assumptions often turn out to be unsupported by the data. If so, the rigor of advanced quantitative methods is a matter of appearance rather than substance" David Freedman (2010:56).

Conclusion

Abduction and inference to the best explanation show the inherent limits of formal logical reasoning in science. No new ideas or hypotheses in science originate by deduction or induction. In order to come up with new ideas or hypotheses and explain what happens in our world, scientists *have to* use inference to the best explanation. All scientific explanations inescapably relies on a reasoning that is, from a *logical* point of view, fallacious. Thus – in order to explain what happens in our world, we have to use a reasoning that *logically* is a fallacy. There is no way around this – unless you want to follow the barren way that mainstream economics has been following for more than half a century now – retreating into the world of thought experimental "as if" axiomatic-deductive-mathematical models.

The purported strength of modern mainstream economics is that it ultimately has a firm anchorage in "rigorous" and "precise" deductive reasoning in mathematical models. To some of us, however, this "strength" has come at too high a price. Perhaps more than anywhere else

can this be seen in macroeconomics, where an almost quasi-religious insistence that economics has to have microfoundations – without ever presenting neither ontological nor epistemological justifications for this patently invalid claim – has put a blind eye to the weakness of the whole enterprise of trying to depict a complex economy based on an all-embracing representative actor equipped with superhuman knowledge, forecasting abilities and forward-looking rational expectations. How can we be sure the lessons learned in these models have external validity, when based on a set of highly specific assumptions with an enormous descriptive deficit? To have a deductive warrant for things happening in a closed model is no guarantee for them being preserved when applied to the real world.

The urge to view all inferences as more or less deductive and equating good arguments with logical entailment of the "All Xs are Ys" kind, has led mainstream economics down the wrong path. The more mainstream economists insist on formal logic validity, the less they have to say about the real world. And real progress in economics, as in all sciences, presupposes real world involvement, not only self-referential deductive reasoning within formal-analytical mathematical models.

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Radical paradigm shifts

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The methodology and ideology of modern economics are built into the frameworks of educational methods, and absorbed by students without any explicit discussion. In particular, the logical positivist philosophy is a deadly poison which I ingested during my Ph.D. training at the Economics Department in Stanford in the late 1970s. It took me years and years to undo these effects. Positivism uses clever arguments to make you deny what you feel in your bones to be true, and make you believe what your heart says must be false – for example our supposed knowledge of subjective probabilities of unknown events.

The roots of the problem go back to the famous Cartesian argument that "I think therefore I am". Although it is clever piece of logic, it has a deadly effect. I know that I am alive because I can feel the blood flowing in my veins, the tingling of my skin, and a thousand other bodily sensations. "I feel therefore I am". Denying this experience as a valid source of knowledge reduces me to a brain floating in a vat, which is exactly what logical positivism entails. In fact, despite Descartes, it is impossible to *reason* our way to certainty. We can only create an illusion of certainty. Descartes' argument is deeply flawed, and illustrates the weakness of human reason. When we formulate the concept of "I", isn't existence automatically part of this? Did I not exist when I was a baby, and was unable to formulate these thoughts? Do I blink out of existence when I go to sleep? If someone has a hard time grasping philosophical concepts, is his existence thereby of a lesser quality? This and many other difficulties make this argument incoherent.

Modern economics is much like this. It starts by making assumptions which are dramatically in conflict with everything we know about human behavior (and firm behavior) and applies mathematical reasoning to situations where it cannot be applied, quantifying the unquantifiable and coming to completely absurd and ridiculous conclusions. *Nonetheless*, speaking from personal experience, the brainwashing is powerful and effective. It is a slow and painful process to undo. I have often thought about launching a "Positivists Anonymous" club, to help others attempting the same transition, of unlearning positivism.[1]

[1] For those who want a little help, I recommend my article on Logical Positivism and Islamic Economics. This provides a detailed analysis of the flaws of positivism, and also why, despite these flaws, it came to be widely accepted.

Based on my own experiences and difficulties in unlearning, and also the experiences of Keynes and many others who have unsuccessfully battered the gates of the citadel of neoclassical economics, I have come to the conclusion that this is a hopeless task. We do not expect to be able to convert the economists. This revolution will not be televised. Our only hope is to work on an external revolution – take the message to outsiders, not to economists. [Recent surveys show that despite the collapse and rejection of positivism in philosophy, economists continue to think in positivist terms.] Even among non-economists, the collateral damage done by positivism and by neo-liberal thinking, is immense.[2] This article is a *preliminary* examination of the difficulties in making a paradigm shift; that is, I will not discuss the major second step of what an alternative paradigm could be, and how we could create and promote it. Awareness of these difficulties is necessary for those who attempt to launch a revolution, since we need to create converts to a new paradigm. Economists are hopeless as a target audience, but even non-economists will be tough nuts to crack if our message is radical. This is because economic frameworks have become widely accepted – witness the popularity of Freakonomics. Nonetheless, it seems necessary to make the effort to save humankind from impending catastrophe, not just on the environmental front, but on many others as well.

The necessity and difficulty of shifting our economic paradigms:

In the wake of the Global Financial Crisis, the failure of economic theories, and of economists, to provide any warnings, analysis, or remedies, became glaringly obvious to all. The Queen of England went to the London School of Economics to ask "Why did no one see it coming?". The US Congress constituted a committee to investigate why "economics, a field that *aspires to be a science*… (but)… generally accepted economic models inclined the Nation's policy makers to *dismiss the notion that a crisis was possible*." General discontent with economics has been captured in books too numerous to list; as a small sample chosen at random, consider Steve Keen's Debunking Economics: The Naked Emperor of the Social Sciences, Joe Earle, Cahal Moran and Zach Ward-Perkins: The Econocracy: The Perils of Leaving Economics to the Experts, and Phillip Pilkington: The Reformation in Economics: A Deconstruction and Reconstruction of Economic Theory.

Many leading economists have expressed serious dis-satisfaction with the profession as a whole. John Cassidy's article "After the Blowup…" in *The New Yorker* describes his interviews with apostates from the Chicago creed. Krugman wrote that the "Profession as a whole went astray because they mistook the beauty of mathematics for truth." David Romer wrote that economists' "dismissal of fact goes… (so)… far beyond post-modern irony" that it should be called "post-real". He wrote that the profession has been moving backwards, losing precious insights gained. Olivier Blanchard, Chief Economist at IMF writes that DSGE models make "assumptions profoundly at odds with what we know about consumers and firms". This is just a small sampler; we can easily find many other similar statements from leading economists, and practitioners intimately involved with finance and central banks on a global level.[3]

Despite widespread dis-satisfaction, the vast majority of dissidents argue that no paradigm shift is required. Instead of a complete overhaul, we just need to patch-up the problem areas. All of the dissidents have their own favourite culprits – like the DSGE models, rational expectations,

[2] Julie Nelson has correctly characterized the situation as "Poisoning the Well: How Economic Theory Damages Moral Imagination".

[3] For a selection of choice quotes, see: Quotes Critical of Economics.

ARCH/GARCH methodology for risk assessments, failure to include the finance sector, etc. etc. etc. In contrast to this reformation, I would like to argue for a revolution. We need to re-think the whole project of economics from scratch.[4] Just like modern astronomy was created by rejecting the concept of the heavenly spheres on which the stars rotated around the earth, so creating a viable economics for the 21st century requires rejecting the entire edifice of modern economics. The process by which a paradigm shift can be created differs radically from normal science, which involves looking at problems within existing theory and patchwork modifications. As opponents point out errors and difficulties with the maximization/equilibrium methodology, proponents can find ways to patch up the conventional framework to deal with new challenges. This is how Ptolemaic astronomy evolved. If the original spheres did not suffice, then new spheres were added, and if the second did not suffice to match observational evidence, a third sphere was added. Rethinking the whole framework from scratch cannot be done in a piecemeal way.

In "The Structure of Scientific Revolutions", historical studies by Kuhn show that there are two distinct phases in the progress of scientific knowledge. In the phase he calls "normal science", a fixed paradigm is applied to solve problems of explaining phenomena and manipulating the world via experiments. However, sometimes progress in knowledge occurs through a second type of event called "scientific revolution", when an existing paradigm is overthrown, and replaced by a new and different paradigm. Paradigms represent ways of looking at the world, with frameworks, concepts, axioms, and methods. Different paradigms are incommensurable – terms in one paradigm are meaningless in another. For example, while the term "just price" was meaningful to scholastics, it has no meaning within a neoclassical framework. One cannot achieve paradigm shifts by arguments, since concepts and terms of a new paradigm make no sense in terms of the old paradigm. Instead, what is required is to put aside one way of looking at the world, and attempt to understand another way of looking at the same world. It is this putting aside – unlearning the old ways – which creates the greater part of the difficulty in achieving paradigm shifts. In the familiar picture above, when the person looking at the young woman describes the old lady's eye as an "ear", those fixated on the old paradigm consider this as crazy. As Keynes put it, "The difficulty lies, not in the new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds." It is only by laying aside one coherent way of looking at the world that it becomes possible to visualize alternatives.

[4] See my "Questioning ALL of Economics?"

Even though Keynes succeeded in escaping from the old ideas, most of his contemporaries and followers never did. Phenomena which were central to Keynesian analysis in his "General Theory" were never understood by mainstream economists, trapped by the mindset created by conventional economic training. As noted by many, the Samuelson-Hicks interpretation of Keynes in terms of the IS-LM analysis has very little in common with the ideas of Keynes.[5] This mis-interpretation of Keynes which is widely known as Keynesian economics today, rejects at least three of the central insights of Keynes. Briefly, these are the failure of neutrality of money, genuine uncertainty about the future (as opposed to risk), and the consequent essential role of un-anchored expectations in driving the economy.[6] That is why Keynes said that "I am not a Keynesian". He expressed his frustration at the inability of his fellow economists to follow him: "The classical theorists resemble Euclidean geometers in a non-Euclidean world who, discovering that in experience straight lines apparently parallel often meet, rebuke the lines for not keeping straight as the only remedy for the unfortunate collisions which are occurring. Yet, in truth, there is no remedy except to throw over the axiom of parallels and to work out a non-Euclidean geometry."

In order to progress, it is necessary to pay more attention to WHY it is so difficult to make the transition from a Euclidean world to a non-Euclidean world. To understand this difficulty, we have to first unlearn a widely believed mistaken conception of logical positivists about observations and facts. The Logical positivists, building on a widely accepted Western philosophical tradition, regarded "observations" of what is out there as facts of experience, objective, free of doubt and ambiguity, equally available to all, and verifiable by all. Obviously, this fails if what we *observe* is due to an interaction between the objective and unique reality out there, and our subjective frameworks which we use for perception of this reality. As the Heisenberg Uncertainty Principle states, and as amazing modern physics establishes beyond doubt, the act of observation affects the behavior of that which is observed. But to take an easy to understand example, whether we see the young lady or the old lady – note that we can only see one of the two at any one time – is clearly determined by our subjective framework, and is not part of the picture.

Even though the point is almost trivial, it is of vital importance for what follows, so let me amplify and explain further. When a baby is born into the world, his eyes and ears are assaulted by a rich range of sensory impressions, which make no sense and have no meaning. Exactly the same sensory impressions become very meaningful and clear as learning takes place, which allows him to parse sounds, and to process visual data in images of three dimensional objects. Obviously, our internal processing equipment is of central importance in the process of assembling observations into a three dimensional image of the world around us. Another way to think about the same thing is to consider the problem of computer vision. All a computer camera sees is a flat bit stream of coloured points. This binary matrix of data on visual sensory input, must be resolved into a three-dimensional image. A HUGE amount of programming, which relies on knowledge of the environment, is required to be able to process this data and convert it into an image. The child learns to see objects and hear and parse sounds on the basis of experience, which constantly rewards correct parsings and punishes failure to visually comprehend the environment. A famous Stanford experiment showed cats brought up in a vertically striped world were unable to see horizontal stripes. Similarly, children brought up with

[5] See my "Understanding Macro"
[6] For an accessible and readable introduction, see Paul Davidson: "The Keynes Solution: The Path to Global Prosperity".

languages with unusual sounds learn to discriminate and hear intonations and consonants which can never be heard by others in different linguistic environments, where such sounds are not present. This shows that our experiences can fix the frameworks we use to see the world beyond the possibility of change.

The outcome of all this discussion can be summarized metaphorically by saying that we all use glasses to see the world. The direct world out there is a jumble of sensations – a matrix of points – which makes no sense by itself, and must be interpreted using our own frameworks, represented by the glasses. This means that ALL observations are tinged with subjectivity, and interpreted within the frameworks created by our past experiences, successes and failures, in viewing the world.

A paradigm shift occurs if we remove the glasses we use to view the world, and instead put on a different pair of glasses. A famous experiment conducted by Professor Theodor Erismann, of the University of Innsbruck put reversing glasses on his student and assistant Ivo Kohler. It caused extreme disorientation and discomfort at first, but after about a week of stumbling around, he adapted to this new way of seeing the world. His subjective interpretative equipment learned to interpret the reversed image by performing an additional reversal within the brain to arrive at a correct image of the world. Now, when the glasses were removed, the world appeared to be upside down to Ivo. On a much larger scale, this is what happened in Europe due to the Great Transformation[7] which transformed traditional society to a market society, where everything is viewed a commodity for sale. Later, these ways of thinking were spread throughout the world by colonization and Western education. We learned to value everything according to its market price, and forgot that the most precious things cannot be purchased. Then it became easy to kill a million children, and destroy entire nations, for corporate profits.

We can now understand the extreme difficulty of creating a paradigm shift. For those who have spent lifetimes learning to see the world with a specific pair of glasses, these glasses become melded into the flesh, and are impossible to remove. After failing to convince his contemporaries about his Quantum theory, Max Planck disappointedly realized that science progresses one funeral at a time. Thomas Kuhn also noted that paradigm shifts do not occur by converting those faithful to the old paradigm, but by inducting the young into the new worldview. Unlike the older generation, for younger and more flexible minds, it is possible to take off glasses manufactured in the Euclidean factory, and put on non-Euclidean glasses. Nonetheless, it is still a disconcerting and uncomfortable experience, which will not be undertaken unless there is some expectation of a great reward for this struggle and sacrifice. The costs of paradigm shift must be paid upfront – one loses the ability to talk to the mainstream when one describes the world using an alien framework. The rewards are in the future, and highly speculative and uncertain. Nonetheless, for reasons explained elsewhere,[8] it seems essential to make the effort – the survival of humanity is at stake.

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[7] See my "Summary of *The Great Transformation* by Polanyi"
[8] See Evaluating the Costs of Growth or Ecological Suicide.

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Growthism: its ecological, economic and ethical limits

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We have many problems – poverty, unemployment, environmental destruction, climate change, financial instability, etc. – but only one solution for everything, namely economic growth. We believe that growth is the costless, win-win solution to all problems, or at least the necessary precondition for any solution. This is growthism. It now creates more problems than it solves.

A journey of no return, not a circular economy

The economic process is not a mechanical analogue that can be run forward and backward, nor a circular process that can return to any previous state. Rather it is an irreversible and irrevocable process moving in the direction of time's arrow of increasing entropy.[1] Finitude and entropy guarantee that the economic life of our species will be a journey of no return. Therefore even a stationary economy, in the classical sense of constant population and constant capital stock, is ultimately a journey of no return, because the metabolic throughput of matter and energy required to maintain constant stocks of people and physical capital, in the face of depreciation and death, is an entropic flow from ever less concentrated sources to ever filling sinks – and both sources and sinks are finite. Consequently, technology must change qualitatively to adapt to entropy increase, to depletion and pollution of the environment, even in the stationary, or "steady-state economy" as it has been more recently called. Relative to the growth economy the steady-state economy is a *slower* journey of no return, one that values longevity with sufficiency, and seeks qualitative improvement rather than quantitative increase. The many advantages of a slower journey were emphasized by John Stuart Mill, the champion of the classical stationary state:[2]

> "I know not why it should be a matter of congratulation that persons who are already richer than anyone needs to be, should have doubled their means of consuming things which give little or no pleasure except as representative of wealth…."

[1] Nicholas Georgescu-Roegen (1972)*The Entropy Law and the Economic Process*, Harvard University Press.
[2] John Stuart Mill (1857) *Principles of Political Economy*, vol. 2 (London: John W. Parker), pp. 320-326, with omissions.

> "The density of population necessary to enable mankind to obtain in the greatest degree, all the advantages both of cooperation and of social intercourse, has, in all the most populous countries been attained…."
>
> "It is scarcely necessary to remark that a stationary condition of capital and population implies no stationary state of human improvement. There would be as much scope as ever for all kinds of mental culture, and moral and social progress; as much room for improving the Art of Living and much more likelihood of its being improved, when minds cease to be engrossed by the art of getting on."

In contrast to Mill's vision of the steady state, the reality of today's growthist economy is one of harried drivenness, of frantic adaptation to the unforeseen, unwilled, and out of control consequences of maximized, subsidized growth, pushed by ever larger scale and more dangerous technologies. Such growth is now threatening the capacity of earth to support life.

Many are not content with a slower more careful journey of no return. They want a so-called "circular economy" that can presumably live, and continue to grow, by ingesting only its own waste products. They assume that what they consider desirable must therefore be possible.

For anyone who has taken the first course in economics the recently revived term "circular economy" calls to mind the famous diagram of the circular flow of exchange value between firms and households found in the first pages of the standard textbooks. That diagram shows goods and factors of production flowing in a closed circle between firms and households with money flowing in the opposite direction. The economy is represented as an *isolated system* – nothing enters from the outside, nothing exits to the outside. There are no natural resources entering from the ecosphere, no wastes exiting back to the ecosphere. Indeed there is no ecosphere, no containing and constraining environment of any kind. This abstract vision is useful for studying exchange (supply, demand, prices, and national income), but worthless for studying environmental costs of economic growth because there is no finite environment to constrain growth.

This picture however is *not* what most advocates today mean by "circular economy", but it has a similar name of long standing, and is a source of confusion. By "circular economy" they mean an economy that recycles material natural resources to a high degree, and increases product lifetimes, and uses mainly renewable resources – all good policies, but destined to fall short of their goal of "sustainable growth". It might better have been called a "recycling economy" or an economy that maximizes natural resource productivity rather than labor or capital productivity. Increased resource efficiency is also referred to as "decoupling" as in disconnecting the output of goods and services from the throughput of resources. In the limit a totally "decoupled economy" would take us back to the neo classical circular flow representation of the economy as an isolated system. For this reason I prefer to avoid this reborn notion of "circular economy," and the related term "decoupling" because" they greatly overstate the degree of separability of production from resource throughput, further encouraging the unrealistic quest for "sustainable growth" in physical scale of the economic subsystem relative to the biosphere.

The heavy emphasis on circularity casts a deep shadow over the more basic fact that the metabolic throughput is fundamentally a linear one-way entropic flow. Yes, the overall linear flow can contain important counter currents and reverse eddies of recycling, and it is important to take advantage of that. But the river itself flows from the mountains to the sea, and never

backwards True, the hydrologic cycle powered by the sun, can evaporate the water to rain again in the mountains, but that happens in the ecosphere, *outside the economy*. If the "circular economy" relies on *natural* biophysical cycles powered by the sun, and does not grow in scale beyond the regenerative and absorptive capacities of the containing biosphere, then it approximates a steady-state economy – not a sustainable growth economy. In addition to a circulatory subsystem (recognized since the Physiocrats' analogy with blood circulation) the economy also has a digestive tract that ties it to its environment at both ends. That second more basic metabolic analogy has been neglected in economic theory.

Recycling is limited, first because it costs energy to carry out the recycle of materials; and second because energy itself is not subject to recycling (entropy means that it always takes more energy to effect the recycle than the amount of energy recycled – regardless of the price of energy!). The extra energy for the recycling also requires material instruments, trucks etc. So materials can be reduced, but at the cost of an increase in energy (and material) throughput, which after some number of cycles (how many?) becomes prohibitive, as remaining materials are ever more dispersed. Even expensive metals like gold, silver, and copper are currently only about one-third recycled and two-thirds newly depleted. Writers who expound the circular economy seem to be aware of this fact, but do not give it sufficient emphasis. Also it is important to distinguish prompt materials recycling that is internal to the economic subsystem, from long run external recycling through the containing ecosphere. While increased reliance on renewable resources is a good feature of the "circular economy", one must remember that, when exploited beyond sustainable yield, renewable resources effectively become non-renewable. There is always a scale limit to a sustainable economic subsystem, beyond which growth, even in a "circular" economy, breaks down and sustainability requires a steady-state economy.

The basic issue of limits to growth that the Club of Rome did so much to emphasize in the early 1970s needs to remain front and centre, with recycling considered as a useful accommodation to that limit, but not a path by which the growth economy can continue. Well before becoming physically impossible the growth of the economic subsystem becomes *uneconomic* in the sense that it costs more in terms of sacrificed ecosystem services than it is worth in terms of extra production. That richer is better than poorer is a truism. No dispute there. But is growth in GDP in wealthy countries really making us richer by any inclusive measure of wealth? That is the question. I think it is likely making us poorer by increasing unmeasured "illth" faster than measured wealth. Even a steady-state economy can be too big relative to the ecosphere. The neoclassical circular flow picture can never be too big by virtue of its being an isolated system. However, neoclassical economists do recognize that the economy can grow *too fast* (over-allocation of resources to investment relative to consumption), even though its scale can never be *too big*.

Inevitably national growth economies reach a point where many citizens begin to suspect that growth is no longer worth the cost of excessively rapid adaptation to an accelerating economy of no return – that so-called *economic* growth has in reality become *uneconomic* growth. John Stuart Mill recognized that long ago. Why have not more recognized it? Why is growth still the *summum bonum* of economists and politicians? Probably because growth is our substitute for sharing as a cure for poverty. And because our national accounts (GDP) are incapable of even registering uneconomic growth because they count only value added by labor and capital, and omit entirely the cost of using up that to which value is added, namely the entropic flow of natural resources, the very sap of life and wealth.

Globalization as an extension of growthism

Those of us old enough to remember the Cold War know that it was basically a contest between Socialism and Capitalism to see who could grow faster, and thereby accumulate more wealth and military power. The audience was the uncommitted countries of the world who would supposedly adopt the economic system of the winner of the growth race. What happened? Basically, Socialism collapsed, and Capitalism won by default. The losers (Russia, China, Eastern Europe) got back in the growth race by adopting State Capitalism, and China has become the growth champion. The present system of world growthism, in the broadly capitalist mode, is triumphant. But growthism itself has turned out to be a false god because growth in our finite and entropic world now increases ecological and social costs faster than production benefits, making us poorer, not richer (except for the top few percent). Recognition of this reversal is obscured by the fact that our national accounts (GDP), do not subtract the costs of growth, but effectively add them by counting the expenditures incurred to defend ourselves from the un-subtracted costs of growth. Even more egregiously, GDP counts the consumption of natural capital as income. Growthism is consuming the life support capacity of the biosphere for the benefit of a small minority of the present generation, while shifting the real but uncounted costs on to the poor, future generations, and other species.[3]

As national economies confront limits to their growth aspirations imposed by the carrying capacity of their territory and the extent of their national markets, they strive, by globalization, to grow into the ecological and economic space of all other countries, as well as into the remaining global commons. While this certainly provides extra degrees of freedom for individual nations to continue growing for a while, it does not remove global limits. It simply ensures that those limits will be met more simultaneously and less sequentially. Consequently there will be less opportunity for one country to learn from the experience of others in adapting to limits. Furthermore, the ability of nations to enact independent policies for coming to terms with limits is undercut, because the net result of globalization is to convert many difficult, but tractable, national problems into one simultaneous intractable global problem, by speeding up and generalizing the economic journey of no return. At the same time, however, increasing energy costs will raise the cost of transport which acts as a general tariff on international trade and will promote national and local production, thereby weakening somewhat long distance trade and globalization.

The key to understanding globalization, I believe, is to clearly distinguish it from internationalization:

Internationalization refers to the increasing importance of relations between nations: international trade, international treaties, alliances, protocols, etc. The basic unit of community and policy remains the nation, even as relations among nations, and among individuals in different nations, become increasingly necessary and important.

Globalization refers to global economic integration of many formerly national economies into one global economy, by free trade, especially by free capital mobility, and also more recently by easy or uncontrolled migration. *Globalization is the effective erasure of national boundaries for economic purposes*. National boundaries become totally porous with respect to goods and capital, and increasingly porous with respect to people, viewed in this context as cheap labor, or in some cases cheap human capital.

[3] For more see www.greattransition.org/publication/economics-for-a-full-world.

In sum, globalization is the economic integration of the globe. But exactly what is "integration"? The word derives from "integer", meaning one, complete, or whole. Integration means much more than "interdependence" – it is the act of combining separate albeit related units into a single whole. Interdependence is to integration as friendship is to marriage. Since there can be only one whole, only one unity with reference to which parts are integrated, it follows that global economic integration logically implies national economic *dis*integration – parts are torn out of their national context (dis-integrated), presumably to be re-integrated into the new whole, the globalized economy. As the saying goes, to make an omelette you have to break some eggs. The disintegration of the national egg is necessary to integrate the global omelette. The benefits of global integration are extolled while the costs of national disintegration are neglected.

Of course globalization is far from complete, but the tendency is well advanced. What we have now is a collection of disintegrating national economies whose policies regarding international trade, capital mobility, and migration are taken over by monopoly global corporations, giant international banks, and a free-for-all of illegal migration of both cheap labor and human capital.

All that I have just said was expressed with admirable clarity, honesty, and brevity by Renato Ruggiero[4], former director-general of WTO: "We are no longer writing the rules of interaction among separate national economies. We are writing the constitution of a single global economy." This is a clear affirmation of globalization and rejection of internationalization as just defined. It is also a radical subversion of the Bretton Woods Charter. Internationalization is what the Bretton Woods Institutions were designed for, not globalization.

Everyone recognizes the desirability of community for the world as a whole-- but we have two very different models of world community: (1) a federated community of real national communities (internationalization), versus (2) a cosmopolitan direct membership of individuals in a single global abstract community (globalization).

If the IMF-WB-WTO are no longer serving the interests of their member nations as per their charter, then whose interests are they serving? The interests of the integrated "global economy" we are told. But what concrete reality lies behind that grand abstraction? Not real individual workers, peasants, or small businessmen, but rather giant pseudo-individuals, the transnational corporations.

Consequences of growth-driven globalization

Consider a few pattern-changing consequences of globalization, of the erasure of national boundaries for economic purposes. Briefly, they include: (1) standards-lowering competition to externalize social and environmental costs to achieve a competitive price advantage--a race to the bottom in terms of both efficiency in cost accounting and equity in income distribution; (2) increased tolerance of mergers and monopoly power in domestic markets in order to be big enough to compete internationally; (3) more intense national (regional) specialization according to the dictates of competitive advantage, with the consequence of reducing the range of choice of ways to earn a livelihood, and increasing dependence on other countries. Free trade and intense specialization negate the freedom not to trade; (4) world-wide enforcement of a muddled and self-serving doctrine of "trade-related intellectual property rights" in direct

[4] From a speech to the United Nations Conference on Trade and Development (UNCTAD) October, 1996.

contradiction to Thomas Jefferson's dictum that "knowledge is the common property of mankind". Let us look at each of these in a bit more detail.

1. Standards lowering competition

The country that does the poorest job of internalizing all social and environmental costs of production into its prices gets a competitive advantage in international trade. More of world production shifts to countries that do the poorest job of counting costs-- a sure recipe for reducing the efficiency of global production. As uncounted, externalized costs increase, the positive correlation between GDP growth and welfare disappears, or even becomes negative.

Another dimension of the race to the bottom is the increasing inequality in the distribution of income in high-wage countries, such as the US, fostered by globalization. In the US there has been an implicit social contract established to ameliorate industrial strife between labor and capital. Specifically, a just distribution of income between labor and capital has been taken to be one that is more equal within the US than it is for the world as a whole. Global integration of markets necessarily abrogates that social contract. US wages will fall drastically because labor is relatively much more abundant globally than nationally. It also means that returns to capital in the US will increase because capital is relatively scarcer globally than nationally. US distribution of income then tends to the more unequal global distribution, thus breaking the implicit social contract.

Free trade, and by extension globalization, is often defended by appeal to Ricardian comparative advantage. The logic of comparative advantage assumes that factors of production, especially capital, are immobile between nations. Only products are traded.[5] With capital mobility now the major defining feature of globalization we have left the world of *comparative* advantage and entered a regime of *absolute* advantage, which guarantees gains from trade *to the world as a whole*, but does not guarantee that *each nation* will share in those gains, as was the case under comparative advantage. Global gains under absolute advantage are theoretically greater than under comparative advantage, but there is no reason to expect these gains to be shared by all trading partners. Mutual gain could be restored under absolute advantage by redistributing some of the global gains from trade. But I have never heard that idea discussed by globalization advocates. Often they appeal, quite illogically, to the doctrine of comparative advantage as a guarantee of mutual benefit, conveniently forgetting that the logic of comparative advantage requires immobile capital, and that capital is not immobile.[6] Indeed, some even argue for free capital mobility by extension of the comparative advantage argument – if free trade in goods is mutually beneficial then why not also have free trade in capital? However, one cannot use the conclusion of an argument to abolish one of the premises upon which the argument is based! Similar illogical arguments are made in defence of free labor mobility between nations.

[5] For a discussion see Chapter 18 in H. Daly and J. Farley (2011) *Ecological Economics,* Second Edition, Island Press, Washington D. C.

[6] To be clear, this refers primarily to the financial sense of capital; capital in the sense of already existing produced means of production can be highly immobile and is often destroyed by mobile "capital" (as the problems of the American rustbelt illustrate).

2. Tolerance of corporate power

Fostering global competitive advantage is used as an excuse for tolerance of corporate mergers and monopoly in national markets so that domestic firms are big enough to compete globally (we now depend on international trade as a substitute for domestic trust busting to maintain competition). It is ironic that this is done in name of deregulation and the free market. Chicago School economist and Nobel laureate Ronald Coase[7] said " – *Firms are islands of central planning in a sea of market relationships".* The islands of central planning become larger and larger relative to the remaining sea of market relationships as a result of merger. More and more resources are allocated by within-firm central planning, and less by between firm market relationships. And this is hailed as a victory for markets! It is no such thing. It is a victory for corporations relative to national governments, which are no longer strong enough to regulate corporate capital and maintain competitive markets in the public interest. Of the 100 largest economic organizations roughly 52 are corporations and 48 are nations. Approximately one-third of the commerce that crosses national boundaries does not cross a corporate boundary, i.e. is an intra-firm, non-market transfer. The distribution of income within these centrally planned corporations has become much more concentrated. The ratio of salary of the Chief Executive Officer to low-level employees has passed 500 on its way to infinity--what else can we expect when central planners set their own salaries!

3. Intensified specialization

Free trade and free capital mobility increase pressures for specialization according to both comparative and absolute advantage. Therefore the range of choice of ways to earn a livelihood becomes greatly narrowed. In Uruguay, for example, everyone would have to be either a shepherd or a cowboy in conformity with the specialization dictated by competitive advantage in the global market. Everything else should be imported in exchange for beef, mutton, wool, and leather. Any Uruguayan who wants to play in a symphony orchestra or be an airline pilot should emigrate. Uruguayans have sensibly resisted such excessive specialization.

Most people derive as much satisfaction from how they earn their income as from how they spend it. Narrowing that range of choice is a welfare loss uncounted by trade theorists. Globalization assumes either that emigration and immigration are costless, or that narrowing the range of occupational choice within a nation is costless. Both assumptions are false.

While trade theorists ignore the range of choice in *earning* one's income, the range of choice in *spending* one's income receives exaggerated emphasis. For example, the US imports Danish butter cookies and Denmark imports US butter cookies. The cookies cross each other somewhere over the North Atlantic. Although the gains from trading such similar commodities cannot be great, trade theorists insist that expanding the range of consumer choice to the limit increases the welfare of cookie connoisseurs. Perhaps, but could not those gains be had more cheaply by simply trading recipes? One might think so, but *recipes* (trade related intellectual property rights) are the thing that free traders most want to protect.

[7] Ronald Coase (1937) "The Nature of the Firm", *Economica*, 4(16), pp. 386-405.

4. The inconsistencies of intellectual property

Of all things knowledge is that which should be most freely shared, because in sharing it is multiplied rather than divided. Knowledge is a non-rival good and should be also non excludable. Yet, as already noted, our trade theorists have rejected Thomas Jefferson's dictum that *"Knowledge is the common property of mankind"* in exchange for a muddled doctrine of "trade related intellectual property rights" by which they are willing to grant private corporations monopoly ownership of the very basis of life itself--patents to seeds (including the patent-protecting, life-denying terminator gene) and to knowledge of basic genetic structures.

The argument offered to support this enclosure of the knowledge commons is that, unless we provide the economic incentive of monopoly ownership for a significant period of time, little new knowledge and innovation will be forthcoming. Yet, as far as I know, James Watson and Francis Crick, who discovered the structure of DNA, do not share in the patent royalties reaped by the second rate gene-jockeys who are profiting from their monumental discovery.

Nor of course did Gregor Mendel get any royalties – but then he was a monk motivated by mere curiosity about how Creation works! Nor did Jonas Salk try to patent the polio vaccine. He thought it would be like trying to patent the sun.

Once knowledge exists, its proper allocative price is the marginal opportunity cost of sharing it, which is close to zero, since nothing is lost by sharing it. Yes, of course you do lose the *monopoly* on the knowledge, but then economists have traditionally argued that monopoly is inefficient as well as unjust because it creates an artificial scarcity of the monopolized item. Furthermore, the main input to the production of new knowledge is existing knowledge, and keeping the latter artificially expensive is bound to slow down the production of the former.

Of course the cost of production of new knowledge is not zero, even though the cost of sharing it is. This allows biotech corporations to claim that they deserve a fifteen or twenty year monopoly for the expenses they incur in research and development, even though they spend more on advertising than research. Of course they deserve a profit on their efforts, but not on Watson and Crick's contribution without which they could do nothing, nor on the contributions of Gregor Mendel, and all the great scientists of the past who made the fundamental discoveries.[8] As economist Joseph Schumpeter emphasized, being the first with an innovation already gives one a temporary monopoly. In his view these recurring temporary monopolies were the source of profit in a competitive economy whose theoretical tendency is to compete excess profits down to zero.

As the great Swiss economist, Sismondi, argued long ago, not all new knowledge is a benefit to mankind. We need a social and ethical filter to select out the beneficial knowledge. Motivating the search for knowledge by the purpose of benefiting mankind rather than by securing monopoly profit provides a better filter. Perhaps the greatest virtue of the steady state economy is that because it is a slow rather than a fast journey of no return, we would have time to evaluate

[8] Similarly, it radically under-estimates the role of the state; its many contributions become invisible in much of mainstream economic theory; see the *Real-World Economics Review* special issue number 84: "The public economy and a new public economics"
http://www.paecon.net/PAEReview/issue84/whole84.pdf

and experiment with new technologies, rather than blindly accepting anything in order to keep growth from slowing.

This is not to say that we should abolish all intellectual property rights – that would create more problems than it would solve. But we should certainly begin restricting the domain and length of patent monopolies rather than increasing them so rapidly and recklessly. And we should become much more willing to share knowledge. Shared knowledge increases the productivity of all labor, capital, and resources. International development aid should consist far more of freely shared knowledge, and far less of foreign investment and interest-bearing loans.

John Maynard Keynes,[9] one of the founders of the recently subverted Bretton Woods Institutions, recommended the following pattern for our international economy:[9]

> "I sympathize therefore, with those who would minimize, rather than those who would maximize, economic entanglement between nations. Ideas, knowledge, art, hospitality, travel – these are the things which should of their nature be international. But let goods be homespun whenever it is reasonably and conveniently possible; and, above all, let finance be primarily national."

Growth-driven globalization will maximize economic entanglement between nations in pursuit of trading advantage, of monopoly power, of privatizing the remaining commons, especially that of knowledge, and of concentrating income to an extreme degree. These are the patterns that growthism solves for by way of globalization. Globalism is not the realization of world community. Rather it is individualism writ large – corporate feudalism in a global open-access commons.

On the importance of boundaries in life and logic

John Lennon asked us to imagine a world without boundaries, singing wistfully "imagine there's no countries", and we all know what he meant – a world of human solidarity, peace, and cooperation. Conflicts and war usually involve disputes over borders. So why not just get rid of these troublesome boundaries? Let's have globalization – deregulated trade, capital mobility, and migration – only let's bless them each with the adjective "free" rather than "deregulated".

Neoclassical economists assure us that this will lead to peace and prosperity among rational utility-maximizing individuals, minimally governed by a benevolent World Democracy, dedicated to the post-modern values of scientific materialism, eloquently communicated in Esperanto. This vision has its serious appeal to many, but not so much to me, as the reader will by now have guessed.

Economic and political boundaries are necessary to achieve both national community, and a global federation of national communities living in peace and ecological sustainability. Boundaries are both biologically and logically necessary. Skin and membranes are organic boundaries. Within-skin versus outside-skin is a basic boundary condition for life. The skin boundary must be permeable, but not too permeable. If nothing enters or exits the organism it

[9] J. M. Keynes (1933) "National Self-Sufficiency", in D. Muggeridge , ed., *The Collected Writings of John Maynard Keynes*, vol. 21, London: Macmillan and Cambridge University Press.

will soon die. If everything enters and exits, then the organism is already dead and decaying. Life requires boundaries that are neither completely closed nor completely open. A nation's borders are in many ways very different from the skin of an organism, yet neither permits complete closure or complete openness. Both must be qualitatively and quantitatively selective in what they admit and expel, if their separate existence is to continue rather than be dissolved into entropic equilibrium with its environment.

Logically boundaries imply both inclusion and exclusion. A world without boundaries includes everything and is often therefore thought to be warm and friendly. But “everything” must include the cold and the unfriendly as well, or it is not everything. Also, without boundaries, B can be both A and non-A, which makes definition, contradiction, and analytical reasoning impossible. So both life and logical thinking require boundaries. While “a world without boundaries” may be a poetic expression of a desired unity, and while it is possible to reason dialectically with overlapping boundaries, it is a major delusion to think that boundaries are not necessary.

It is understandable, yet ironic, that the most fundamental and dramatic boundary of all – that separating the earth from outer space – made clear in the iconic photo of the earth from the moon – seems to have led to a reaction against the very concept of boundaries on our spherical planet, since it is so obviously one whole and unified thing. Yet that beautiful and powerful vision of overall unity hides a world of diversity and difference. And we live on the earth, within that complex living diversity, not on the dead moon with no need for life-defining boundaries.

The illth of nations and the weakness of policy

Our traditional economic problems (poverty, overpopulation, unemployment, unjust distribution) have all been thought to have a common solution – namely an increase in wealth. All problems are easier if we are richer. The way to get richer has been thought to be by economic growth, usually as measured by GDP. I do not here question the first proposition that richer is better than poorer, other things equal. But I do question whether what we persuasively label “economic growth” is any longer making us richer. I suggest that physical throughput growth is, at the present margin and in the aggregate, increasing illth faster than wealth, thus making us poorer rather than richer. Consequently our traditional economic problems become more difficult with further growth. The correlation between throughput growth and GDP growth is sufficiently strong historically so that in the absence of countervailing policies even GDP growth increases illth faster than wealth.

What we conventionally call “economic growth” in the sense of “growth of the economy” has ironically become “uneconomic growth” in the literal sense of growth that increases costs by more than it increases benefits. I am thinking here of the North rather than the South, because in many poor countries where the majority lives close to subsistence the benefits of production growth, even if badly distributed, justify incurring large costs. But since the South is striving, with encouragement from the IMF and World Bank, to become like the North, I am not really neglecting the South by focusing on the North, but rather raising a caution for the South.

One will surely ask how do I know that growth has become uneconomic for many Northern countries? Some empirical evidence is referenced below.[10] But more convincing to me is the

[10] For critical discussion and the latest revision of the ISEW, see, Clifford W. Cobb and John B. Cobb, Jr., et al., *The Green National Product*, University Press of America, New York, 1994. For a presentation of

simple argument that as the scale of the human subsystem (the economy) expands relative to the fixed dimensions of the containing and sustaining ecosphere, we necessarily encroach upon that system and must pay the opportunity cost of lost ecosystem services as we enjoy the extra benefit of increased human scale. As rational beings we presumably satisfy our most pressing wants first, so that each increase in scale yields a diminishing marginal benefit. Likewise, we presumably would sequence our takeovers of the ecosystem so as to sacrifice first the least important natural services. Obviously we have not yet begun to do this because we are just now recognizing that natural services are scarce. But let me credit us with capacity to learn. Even so, that means that increasing marginal costs and decreasing marginal benefits will accompany increasing human scale. The optimum scale, from the human perspective, occurs when marginal cost equals marginal benefit. Beyond that point growth becomes uneconomic in the literal sense of costing more than it is worth.

It is interesting to know empirically if we have reached that point (I think we have, both globally and in many countries), but even if we have not, it is obvious that continued growth of a dependent subsystem relative to a finite sustaining total system will inevitably reach such an optimal scale. If we add to the limit of finitude of the total system the additional limits of entropy and complexity of ecological interdependence, then it is clear that the optimal scale will be encountered sooner rather than later. Additionally, if we expand our anthropocentric view of the optimum scale to a more biocentric view, by which I mean one that attributes not only instrumental but also intrinsic value to other species, then it is clear that the scale of the human presence should be further limited by the duty to reserve a place in the sun for other species, even beyond what they "pay for" in terms of their instrumental value to us. And of course the whole idea of "sustainability" is that the optimal scale should exist for a very long time, not just a few generations. Clearly a sustainable scale will be smaller than an unsustainable scale. For all these reasons I think that for policy purposes we do not need exact empirical measures of the optimal scale. If one jumps from an airplane it may be nice to have an altimeter, but what one really needs is a parachute.

So what policies constitute a parachute? Briefly, they are policies that limit aggregate throughput, while allowing the market to allocate that limited throughput – assuming the market is competitive and confined to some limited degree of inequality in the distribution of wealth and income. Such policy instruments are evolving now – e.g., cap-auction-trade systems for extraction rights, pollution emission rights, fishing rights, etc. Also ecological tax reform limits throughput by making it more expensive. It shifts the tax base from value added (something we want more of) on to "that to which value is added", namely the resource throughput (something we want to use less of). In differing ways each of the above "parachutes" would limit throughput and expansion of the scale of the economy into the ecosystem, and also provide public

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the ISEW see Appendix of *For the Common Good*, H. Daly and J. Cobb, Boston: Beacon Press, 1989; second edition 1994. See also Clifford W. Cobb, et al., "If the GDP is Up, Why is America Down?, *Atlantic Monthly*, October, 1995. See also Manfred Max-Neef, Economic Growth and Quality of Life: A Threshold Hypothesis, *Ecological Economics*, 15, (1995), pp. 115-118. More recently the Lancet medical journal (NYT, Oct. 19, 2017) finds that the financial costs from pollution are some $4.6 trillion annually, about 6.2% of the global economy. If annual growth in Gross World Product is around 2.2%, and cost due to pollution is 6.2%, then with reasonable accounting we would have a net financial decline of some 4% annually. If that financial decline represents welfare loss, and it surely does since we are talking about reduced health and life expectancy, then the benefits of production growth are being more than cancelled out by the costs of the pollution generated by that growth. In other words, so-called "economic" growth has become uneconomic. That seems to have escaped the notice of economists.

revenue. I will not discuss their relative merits, having to do with price versus quantity interventions in the market, but rather emphasize the advantage that both have over the currently favoured strategy. The currently favoured strategy might be called “efficiency first” in distinction to the “frugality first” principle embodied in both of the throughput-limiting mechanisms mentioned above, but more stringently in the second.

“Efficiency first” sounds good, especially when referred to as “win-win” strategies, or more picturesquely as “picking the low-hanging fruit”. But the problem of “efficiency first” is with what comes second. An improvement in efficiency by itself is equivalent to having a larger supply of the factor whose efficiency increased. The price of that factor will decline. More uses for the now cheaper factor will be found. We may end up consuming more of the resource than before, albeit more efficiently. Scale continues to grow. This is sometimes called the “Jevons effect”. A policy of “frugality first”, however, induces efficiency as a secondary consequence; “efficiency first” does not induce frugality – it makes frugality less necessary, nor does it give rise to a scarcity rent that can be captured and redistributed by tax or auction.

So far I have briefly outlined what I take to be the problem of the “illth of nations” (apologies to both Adam Smith and John Ruskin), and indicated some policy guidelines for avoiding the uneconomic growth that increases illth faster than wealth. These views do not find favour with mainstream economists. The concepts of throughput, of entropy, and even of optimal scale of the macroeconomy are foreign to them. The last is especially odd since in microeconomics the concept of the optimal scale of each micro activity is central. Yet the sum of all micro activities, the macro economy, is not thought to have an optimal scale relative to its sustaining ecosystem. Probably this is because macroeconomists think of the macroeconomy as the Whole, not as a Part of some larger Whole. For them nature is not a containing envelope, but just a sector of the macroeconomy – mines, wells, croplands, pastures, and fisheries. When the Whole grows it expands into the Void encroaching on nothing and incurring no opportunity cost. But of course the real economy is a Part and it grows not into the Void, but into the rest of the biosphere, and really does incur opportunity costs. I have long considered this Whole versus Part difference to reflect different pre-analytic visions (Schumpeter) or different paradigms (Kuhn). Different pre-analytic visions cannot, of course, be reconciled by further analysis, and they have different policy implications.

Presuppositions of policy

Even if we could agree on the right pre-analytic vision of the basic way the world is, would we then be able to enact and follow effective policies? So far, our capacity to enact policies of “frugality first” seems very weak. Indeed, even “efficiency first” policies are still resisted. So let us turn our attention to the question of policy in general, and policy fecklessness in particular.

What are the presuppositions we must make before we can reasonably and seriously discuss policy – policy of any kind? There are two that I can see.

First we must believe that there are real alternatives among which to choose. If there are no alternatives, if everything is determined, then it hardly makes sense to discuss policy--what will be will be. No options, no responsibility, no need to think.

Second, even if there were real alternatives, policy dialogue would still make no sense unless there was a real criterion of value by which to choose from among the alternatives. Unless we

can distinguish better from worse states of the world then it makes no sense to try to achieve one state of the world rather than another. No value criterion, no responsibility, no need to think.

In sum, serious policy must presuppose: (1) *nondeterminism* – that the world is not totally determined, that there is an element of freedom which offers us real alternatives; and (2) *non-nihilism* – that there is a real criterion of value to guide our choices, however vaguely we may perceive it.
To be sure, not every conceivable alternative is a real alternative. Many things really are impossible. But the number of viable possibilities permitted by physical law and past history is seldom reduced to only one. Through our choices, value and purpose lure the physical world in one direction rather than the other. *Purpose is independently causative in the world*.

This seems pretty obvious to common sense – so what is the point of stating the obvious? The point is that many members of the intelligentsia deny one or both presuppositions, and yet want to engage in policy dialogue. I don't mean that we disagree on exactly what our alternatives are in a particular instance, or about just what our value criterion implies for a concrete case. That is part of the reasonable policy dialogue. I mean that determinists who deny the effective existence of alternatives, and nihilists or relativists who deny the existence of value beyond the level of subjective personal tastes, have no right to engage in policy dialogue – and yet they do! This is my cordial invitation to them to shut up – at least about policy.

Who are these people? In the sciences I am thinking about the materialist neo-Darwinists and socio-biologists; in the humanities, the post-modern deconstructionists; and in the social sciences, those economists who reduce value to subjective individual tastes any one of which is as good as another.

No one can in practice live by the creed of determinism or nihilism. In this sense no one takes them seriously, so we tend to discount any effect on policy of these doctrines. We tend to dismiss them as academic posturings. However, we may halfway suspect that the many learned people who publicly proclaim these frequently unopposed views might be right--and that is sometimes enough to enfeeble policy. For example, many people tell me that globalization is inevitable; any attempt to counter global economic integration is futile, or "on the wrong side of history", etc. If I manage to convince them that globalization is the result of past policy choices, and therefore might not be inevitable, the next line of defence is, how do we know that globalization will be any worse than the alternative? We cannot tell, we don't really know that globalization won't be good for us (because we don't know what is good in the first place), so there is no point in opposing it. Either it is inevitable, or if not then we can have no reason to believe that any alternative would be better. Forget policy, go back to sleep.

Perhaps I can clarify this controversial point by distinguishing four categories based on acceptance or non-acceptance of each of the two presuppositions identified.

(1) **The traditional Judeo-Christian view** – there exist real alternatives from which to choose by reference to objective criteria of value.

(2) **Criterionless choice** – alternatives are real options, but there is no objective criterion for choosing among them. (Existentialist angst)

(3) **Providential determinism** – there are no real options, but there is an objective criterion of value by which to choose, if only we had a choice. Fortunately providence

has chosen for us according to the objective criterion, which we would not be wise or good enough to have followed on our own. (Theological predestination; technological providentialism)

(4) **Criterionless determinism** – there are no real alternatives to choose from, and even if there were, there is no objective criterion of value by which to choose. All is mechanism – random variation and natural selection, as claimed by the neo-Darwinist materialists.

People engaged in policy, yet holding to positions (2), (3), or (4) are in the grip of a severe and debilitating inconsistency. Their participation in policy dialogue should be subject to the injunction of "estoppel" – a legal restraint to prevent witnesses from contradicting their own testimony. It should be applied in academia as well as in the courtroom!

Some conclusions

Avoiding the uneconomic growth that is increasing the illth of nations will require clear and forceful policy to limit growth. All policy, especially such a radical one, requires a belief in both objective value and real alternatives. The fact that many people engaged in discussing and making policy reject one or both of these presuppositions is, in A. N. Whitehead's term,[11] "the lurking inconsistency", a contradiction at the basis of the modern worldview which enfeebles thought and renders action feckless. If we even halfway believe that purpose is an illusion foisted on us by our genes to somehow make us more efficient at procreation, or that one state of the world is, for all we can tell, as good as another, then it is hard to get serious about policy. Whitehead noted, "Scientists animated by the purpose of proving that they are purposeless constitute an interesting subject for study". He went on to say that, "It is not popular to dwell on the absolute contradiction here involved".

I think, 85 years later, that it is high time we dwelt on this absolute contradiction. We pay a price for ignoring contradictions – in this case the price is feebleness of purpose and half-heartedness in policy. Citizens really must affirm that the world offers more than one possibility to choose from, and that some choices really are better than others. Determinists and nihilists have a right to exist, but an obligation to remain silent on policy!

This wilful neglect has allowed the lurking inconsistency to metastasize into the marrow of modernity. The Enlightenment, with its rejection of teleology, certainly illuminated some hidden recesses of superstition in the so-called Dark Ages. But the angle of its cold light has also cast a deep shadow forward into the modern world, obscuring the reality of purpose. To conserve Creation we will first have to reclaim purpose from that darkness. I say Creation with a capital "C" advisedly, and certainly not in denial of the established facts of evolution. If our world and our lives are not in some sense a Creation, but just a purposeless happenstance – a random statistical fluke of multiplying infinitesimal probabilities by an infinite number of trials – then it is hard to see from where we will get the will and inspiration to care for it.

Indeed, our decision-making elites may already tacitly understand that growth has become uneconomic. But apparently they have also figured out how to keep the dwindling extra benefits for themselves, while "sharing" the exploding extra costs with the poor, the future, and other

[11] A.N. Whitehead, *The Function of Reason*, Princeton, N.J.: Princeton University Press, 1929, p.12.

species. Why not, if it is all just a purposeless happenstance? The elite-owned media, the corporate-funded think tanks, the kept economists of high academia, and the World Bank – not to mention Goldman-Sachs and Wall Street – all sing hymns to growth in harmony with class interest and greed. The public is bamboozled by technical obfuscation, and by the false promise of growthism that one day we will all be rich. Intellectual confusion is real, but moral nihilism, abetted by naturalistic scientism, is the more basic problem. Such nihilism is hard to counter without strong appeal to the idea of purpose, of telos, and without raising its cosmic and religious implications. Many policies are being offered. But until the presuppositions of policy have been met they will remain just academic exercises.

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Producing ecological economy

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Introduction: Georgescu-Roegen unheeded

Economic analyses and conclusions are intimately bound up with judgements regarding the human condition. They are concerned with the study of what Marshall (1947, p. 1) referred to as "[hu]mankind in the ordinary business of life," and dedicated to examine "that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing," (Ibid.). In that respect, economics is, from first principles, a normative enterprise.

While the idea that wellbeing and monetary wealth are so tightly correlated that the latter may be used as a proxy for the former was not an original premise of the early versions of economic analysis in European academic circles, and is today, increasingly brought into question not only from without but also from within mainstream economics, the presumption continues to influence the analytical apparatus used at all times by most, and at least sometimes by almost all scholars who understand themselves to be aligned with this field of enquiry. This is, as Georgescu-Roegen (1971) has noted, closely related to methodological choices made by some of the most important founding thinkers of this modern, eurodescendent, discipline: not least among them Pareto, Walras and Marshall himself. He argues (Georgescu-Roegen, 1971, Introduction) that their aspiration to secure economics a place at the table of the "hard sciences", led them to adopt an analytical approach of arithmetic fetishism (my words, not his) that leaves unattended the qualitative aspects of purposiveness and biodynamic transformation that lie at the heart of economic process: ignoring, thereby, aspects central to defining what constitutes the material requisites of wellbeing and to identifying viable means on the basis of which these may be attained and effectively used.

Notwithstanding the notable contributions of Herman Daly, an early student of his, and consistent engagement within the trans-discipline of ecological economics, Georgescu Roegen's life work, like that of other heterodox economists, while taken up in part, within a variety of discourses, has generally been marginal to mainstream economics in the 20th and 21st Centuries. While the general disposition toward heterodox economics arguments has warmed considerably since the 2008 international financial crisis, adoption of radically distinct modelling approaches, such as those proposed by Georgescu-Roegen (1971) has not been forthcoming. The response has been, instead, mainly one of tweaks, focused either on correcting failures in the construction of GDP measures, through satellite accounts, the addition of compensatory sector variables or, in perhaps its most extreme form, the reactionary discourse on degrowth or, as in the case of post-Keynesianisms and much of behavioural and

evolutionary economics, on the introduction of recalibrations, additional variables, reconfigurations and the incorporation of non-linearities into models that remain, nonetheless, at their core, closely aligned with the conventional structures of Walrasean analyses.

Georgescu-Roegen's response to this, which he calls "wholesale arithmetization" (Georgescu-Roegen, 1971, p. 15), constructed through the elaboration of a wide range of arguments, over a period of decades (Georgescu-Roegen, 1960; 1965a; 1965b; 1966; 1968; 1969; 1975; 1976; 1977; 1981; 1986; 1988; 1999[1971]), includes detailed attention to two interrelated points:

1. That economic processes are essentially biological in character.

2. That institutions constitute a core and critical aspect of human biology.

These provide, in my view, an excellent reference structure for considering all three questions that have been posed for this brief intervention:

1. How and to what degree is the economy changing the ecosystem?

2. How must economics change if it is to become a force for leading us away from catastrophe rather than toward it?

3. How can the global economy be changed so as avoid ecological collapse?

How and to what degree is the economy changing the ecosystem?

I would argue that our ability, from within an economics based approach, merely to grasp the information required to address this question is severely constrained, precisely by the two limitations observed by Georgescu-Roegen. That is to say, this question cannot be answered without structured reference to the biophysical characteristics of economic process and due attention to the role played, within those processes, by the human characteristic of using institutions to organise economic activity.

Again, with reference to the complexity of the problem, here, I think it is also important to distinguish, before proceeding, between different economies and different ecosystems. Some ecosystems, such as sustainably harvested temperate forests, are in quite good condition, in spite of having been changed dramatically by human economic processes; others, such as the tropical belt of mangrove forests, are in grave condition, in part due to changes caused by humans, but also in part due to their unfortunate positioning, at the mouths of rivers, where the ecological stress of upstream changes is concentrated and amplified. Similarly, not all economies are changing ecosystems in the same ways, and finally, not all changes are reified in the immediate surroundings of the economies that are causing them to occur. This give rise to a plethora of related social justice questions which fall not within the remit of the economist but of the social theorist and the body politic proper and cannot be addressed in an appropriate way here. Nonetheless, they should not be overlooked. Happily, there are a growing number of examples across the world of economic activity leading to ecological recuperation, not only to destruction. That said, destruction is clearly still the norm.

Taking then, rather a broad view, and working from within a social, historical frame of reference, I would suggest, following on from arguments presented in the late 1970s by the German

Democratic Republic dissident Rudolf Bahro (1977; 1987), that the most far reaching and deeply seated way in which the contemporary global, late-industrial economy is changing the ecosystems within which it is embedded is by systematically and collectively ignoring its biological and social relationships to them. Following Faber *et al*. (1995; 1996), we might refer to this as an extreme deficiency in what they refer to as the third *tele* of living organisms: service. The label "third *tele*" is based on a teleological taxonomy, borrowed from biology, which they employ to help make sense of the blatant disregard that industrialised humans seem to have for the negative ecological impacts they cause, while going about the "ordinary business of life." Drawing on the Aristotelean concept of *entelecheia*, which means, literally, to have one's *telos* (or final cause) as a characteristic of one's self (e.g. it is in the *entelecheia* of a bird to fly), they propose "a teleological terminology to characterise living beings (i.e., organisms)… [which enables them] - to emphasise the uniqueness of a living being; - to consider the relationship of a living being to its species; - to represent its integration into the oneness of Nature" (Faber et al., 1996, p. 45). They propose that the fulfilment of purpose of a living organism, and by association, with a few logical degrees of differentiation, of a biological species, can be described through reference to the internalizing of three basic *tele* (plural of *telos*), which pertain to "What aims (tele) can we ascribe to a living being?" (Ibid.):

1. Self-maintenance, development and self-realisation;

2. Replication and renewal;

3. Service to other species and or the whole of nature.

They then go on to argue, much in keeping with Bahro (1977), that deficiency in the third *telos* – service – is a basic a feature of industrial societies, which have become disassociated from the biological systems that surround them, leading to ecological imbalance, as the ecological impacts of industrialised humans fail to contribute toward the flourishing of the ecological systems of which they form a part. One clear example of this is the excessive entropy production of the industrial economy. A necessary correlate to the massive production rate exhibited during the 20th and now 21st centuries, this implies a problem of system overload, where the entropy production associated with human activity has exceeded the entropy processing capacity of the ecosystems upon which we are dependant. Resolving this will require more than improved efficiency, which would carry with it yet more entropy production. It will require that we are able to understand and improve our relationships with the entropy processing systems of the planet (Mayumi, 1995; Tsuchida and Murota, 1985) and perhaps that we discover new ways of processing entropy and/or rediscover ones that industrialised humans have ceased to practice.

The lack of attention to the contribution that human actions make toward maintaining or diminishing the wellbeing of our non-human neighbours is bound up with the logic and history of industrialisation. The aim to liberate man, and I do mean man, from the caprices of nature, implies that the whims of nature can thus be ignored. While such disregard could be maintained for some time, during the early stages of industrialisation, as both ecosystems and human populations adjusted to the changes in their relationship, the now accelerating cascade of global impacts (Steffens et al., 2018) illustrates the temporary character of that charmed position. On an optimistic note, if one of the main problems is our lack of attention to impacts, this would seem to imply that increased awareness, combined with moral motivation to act appropriately, might help to address the problem. Unfortunately, awareness, in humans, is a

rather complicated affair, which implies engaging with everything from public education, to the business models of Google and Facebook.

On the question of degree, I am inclined to demure, referring the reader instead to the myriad of documentation, which, sadly, is readily available, concerning the extent to which human economic activity is compromising the viability of many forms of life across the planet earth, including, all too often, human life. That said, the simple answer would seem to me to be: to an unacceptable degree. However, bearing in mind that humans, like our biological companion species, the rat, the pigeon, the dog and the cockroach, are remarkably versatile, we should take into account that "unacceptable to humans" might well be a degree of change far beyond the level of contamination and habitat destruction that other species can support.

So, I would settle here then on the following: wildly beyond that which the ecosystems of the planet can reasonably support while continuing to generate habitat suitable for humans.

How must economics change if it is to become a force for leading us away from catastrophe rather than toward it?

Georgescu-Roegen's call, echoed by many of his contemporaries, and today paid lip service to by most, if not all economist, was to give serious analytical attention to representing the role of biological dynamics in economic process. It was expressed in large part through his detailed and repeated reference to the second law of thermodynamics, which served as the basis for his proposal to radically reconfigure the mathematical foundations of economic analysis: because economic process is *intended* to bring about qualitative change, which is frequently irreversible and which "eludes arithmomorphic schematization" (Georgescu-Roegen, 1971, p. 63). This means that accurate representation of the *dynamics* of economic process must include theory that addresses the structure of the *relationship between* qualitative and quantitative elements. While there is not sufficient space to unpack the point here in detail, that position, which includes postulates regarding the relationship between time, space and human intentionality, is closely linked to a second position that underpins his elaboration of an alternative analytical economics methodology – the flow-fund theory.

Using flow-fund theory, which replaces the stock, flow, fund distinction used in conventional economic analysis, with a flow-fund distinction that depends on the spatial and temporal boundaries of the economic process in question (Farrell and Mayumi, 2009; Silva-Macher and Farrell, 2014; Farrell and Silva Macher, 2017), makes it possible to construct complex, functional analyses that continue to represent the basic features of economic process, while making explicit the role of intentionality in their delimitation and also providing a means to include ecological elements and dynamics, which cannot be accurately represented in monetary units. The two propositions at the heart of Georgescu-Roegen's flow-fund theory, to make analytical space: 1) for the representation of biodynamics and 2) for the role of purpose in delimiting the boundaries of an economic process, rest at the core of what he referred to as "bioeconomics", (Georgescu-Roegen, 1986; Mayumi and Gowdy, 1999). Mayumi (2009, p. 1237) describes this as "a new style of scientific thought… that combines elements of evolutionary biology, institutional economics and biophysical analysis associated with energy and mineral resources." At a most basic level, I would say, the work of Georgescu-Roegen needs to be taken far more seriously by mainstream and conventional heterodox economists than it has been to date. Precisely because it implies the need for a radical break with convention, it has been left to the side or cherry picked. It is well past time for that to change.

More generally, following on from these observations, a further suggestion, regarding how economics must change, if it is to become a force for leading us away from catastrophe, rather than toward it, is that arithmetic fetishism must be jettisoned, and way made for the development of completely new types of inter-and transdisciplinary models, in which economic analysis is subordinated to a larger goal: representing the social-ecological and biophysical complexity of the human driven biological processes currently wreaking havoc across the planet earth.

While it has become fashionable to blame economic growth for the current ecological woes of the planet, and there is, of course, much evidence to support that position, I believe the problem is not so simple. Growth is a natural biological process, employed by all living organisms on the planet earth in order to resist the inevitable and constant deterioration that is implied by their inherently entropic nature (Schroedinger, 1944). It comes in many forms, from maturation, to regeneration to cancer, which are distinguishable through reference to their qualitative differences. It seems illogical to me to propose that growth, in itself, is inherently a problem and irresponsible to attempt to analyse economic processes without having a plausible theory regarding the role and function of growth within them. Rather it is the pursuit of growth for growth's sake, and the associated construction of models that presume the realization of growth to be a suitable measure of utility, that seem to me to be the problem. This implies a need to redesign economic models in a way that situates growth as *one among multiple economic phenomena* involved in regulating the viability of an economy: others being, for example, ecological impact and social acceptability. Taken as an end in itself, as opposed to being treated as a means to a more humane end, growth serves growth, not society (Raine et al., 2006). Considered in the absence of attention to the associated phenomena of waste production and death, analyses focused only on the quantity, as opposed to also including attention also to the *quality* of growth *and* deterioration, are incomplete.

While Georgescu-Roegen's work is discussed at present, more often than not, in the context of the contemporary discourse on degrowth, which claims him as a founding thinker, his position on the question was arguably more conservative than is often assumed and is perhaps better described as advocacy of "agrowth" (Missemer, 2017) or balanced development (Georgescu-Roegen, 1965b). His position can be understood in terms of the simple matter of resource allocation trade-offs, where economic actors, in choosing what economic process(es) they undertake, are situated somewhere along a kinky, multidimensional, production possibility frontier, where the allocation and distribution of available resources may be configured to produce final goods and services, productive capacity or some combination of the two (Georgescu-Roegen, 1965b; 1999[1971], pp. 239-240 and 274275; Scheidel and Farrell, 2015, p. 231).

By retaining reference to both the purpose of the economic actors in question and the limiting factor of resource availability, the preceding conceptualisation of growth can include, for example, recovery and transformation, both of which would imply a shift deep into the domain of producing productive capacity but not necessarily an increase in the quantity of deterioration or in the quality of an economy's ecological impact. Linking that position directly to his flow-fund theory, Georgescu-Roegen (1968) would appear to have been most concerned with identifying the conditions required to ensure *balanced growth* of living economic processes, i.e. *to develop theory that would make it possible to explicitly link the rate of growth and productivity of an economy to the rate of growth and productivity of the biological systems upon which an economy's own productivity is inevitably, if only ultimately, dependent* (O'Hara, 1999; 2016).

This, I would posit, is another aspect of how economics must change: a more nuanced and contextualised approach to growth is required on both sides of the growth/degrowth divide.

Taking up the idea of pursing balanced, ecologically viable, embedded growth, which implies also taking into account deterioration and death, we can speak of a two strand research agenda which I would propose to call producing ecological economy:

1. Identifying local, regional and international modes of production, consumption, sharing and exchange that are both economically and ecologically viable;

2. Changing local, regional and international regulations and practices to facilitate the development and maintenance of these types of economic activity.

Both strands imply a need for economic research to open up to what Max-Neef (2005) calls strong inter-disciplinarity, where multiple disciplines are involved not only in the execution but also in the configuration of analyses and in the specification of analytical problems to be addressed. This, I believe, may be the most pressing and most challenging change that needs to be brought about in economics. In contrast to subsuming knowledge from other disciplines to serve the ends and means of conventional modern economic analysis, as is done, for example, in the fields of neuro- and behavioural economics, this implies situating economics as a contributor toward the collaborative project of developing multi-dimensional, complex representations of the social-ecological relationships and processes that both underlie and are impacted by late-industrial economic activity.

Producing ecological economy has both a descriptive and a normative aspect, regarding, in the first instance, the identification of social and material criteria suitable for establishing ecologically beneficial economic activities across the entire planet and in the second, the specification of means for realizing their operationalisation under humane and ethical terms, across cultures and social-ecological contexts. Much of that work is of a political, rather than a scientific nature. And although I will address here only the latter, it should be noted that the former is also of vital importance for achieving lasting social change of any sort, not least such as might serve to halt the steady march through calamity in which humanity would appear to be engaged at present. The multiple statuses of politics in this process - within and across inter-disciplinary teams and between research teams and their clients, in some instances the public - must be taken into account when developing comprehensive models and analyses. This too implies a radical reconfiguration of the analytical basis upon which economic models are constructed.

Farrell and Silva Macher (2017, p. 167) have described attention to this contextualised and relational character of economic process as work focused on the ecological economic *Gestalt*: i.e. on the relationship *between* ecological and economic systems. Such work requires effective integration of insights deriving from a myriad of disciplines and applied to contextualised research questions related to the ordinary lives of many different types of economic and ecological communities. Here there is some ground for optimism, as there are a growing number of examples of such work (Bischi, 2018; Farrell and Silva Macher, 2017; Farley and Malghan, 2016; Moreau et al., 2017; Rincón Ruiz, et al., 2018; Wilson and Kirman, 2016). Nonetheless, this is still a project in the early stages of development and much of the attention of environmental and ecological economists continues to be dedicated to identifying ways to estimate the “real” costs and benefits of environmental externalities and to develop strategies to internalize them into price based decision processes. The persistence of such work illustrates

the momentum of arithmetic fetishism, in which processes that do not easily lend themselves to quantification are arithmetized for the purpose of forcing them into the existing, quantitative analytical rubric. It is, I would posit, largely a waste of time and resources, as the resulting data are not only meaningless but also distracting (Farrell, 2007).

Work reaching beyond that fetishism, into the conceptual domain of the ecological economic *Gestalt*, has tended, up to now, to be in the area of institutional economics, where there is more openness to structural critiques of conventional modelling approaches. In the case of Mayumi (1995; 2001; 2009; 2017), Georgescu-Roegen's last student, the focus has been on questions of epistemology and mathematical formalisation. Both Gowdy (1994; Gowdy and Mesner, 1998; Mayumi and Gowdy, 1999), picking up on Georgescu-Roegen's attention to the exosomatic evolutionary dynamics of technological and institutional change, and O'Hara (1997; 1999; 2016), picking up on his attention to the relationship between economic process and both social and ecological context, have developed interpretations of his work that can be linked with contemporary institutional economics and I would suggest that this is an important way forward for changing economics. Here the early work of Nobel Laureate Elinor Ostrom (1990) and more recent works by Vatn (2005) and Hodgson (2015) provide quite a comprehensive, environment-oriented, complement to the existing body of Classical Institutional Economics contributions, suggesting a promising route for developing the situated economic theory that is needed.

How can the global economy be changed so as avoid ecological collapse?

This question, I think is basically impossible to answer I find it decidedly uncomfortable to even attempt to answer such a general and far reaching question directly and so will proceed through reference to a metaphor. Many years ago, in conversation with a colleague, at a conference, we imagined the following image to represent this challenge: what would it imply, to transform a jet airliner, full of passengers, into a flock of birds, in mid-flight? That is to say, to transform, while running, a mechanical system, dependant on inputs of fossil fuel and an individualist based organising principle, into a biological one, employing biodynamic energy sources and structured around an organising principle of cooperation and attention to one's relations to others. The level of coordination required to avoid a catastrophic collapse of the system, in-full-flight, is, on its own, daunting: not to mention the massive amount of diverse technical expertise that would be required to realize such a transformation. Then there is the magical element, of realising some form of biomechanical metamorphosis, transforming human beings using machine, into birds.

Taken lightly, for illustrative purposes, our metaphor suggests a few concrete criteria that might be applied to address this final question. First, handle with care. The chances of a misstep leading to a total system collapse are high. Looking into the specifics, we could say that there is a clear need to effectively manage the transition from a mechanically based to a biologically based operating system. This implies holding on to the knowledge that is presently available regarding how the mechanical system (i.e. the industrial, accumulation driven economy) functions and working with that knowledge, to identify ways of coupling that systems with a biologically based one, in order to maintain momentum and avoid system failure. It also implies, as has been mentioned above, a need for the coordinated effort of diverse inter-disciplinary teams, comprised of experts in everything from human behaviour to fluid dynamics, so once again, strong-interdisciplinarity. And finally, it implies a need to adopt a posture of humility in front of the life-giving capacity of the natural world, which modern industrial science has yet, for all its achievements, to replicate.

While I do not agree with all the propositions contained therein, I believe one would be hard pressed to find a more succinct and coherent articulation concerning how the global economy not only could but indeed, must, be changed if humanity is to even hope to be able achieve the transformation to an ecological economy, than the following statement, issued at Rio +20, by a coalition of leaders of indigenous communities from across the Americas and the world:

> Mother Earth is the source of life which needs to be protected, not a resource to be exploited and commodified as a "natural capital". We have our place and our responsibilities within Creation's sacred order. We feel the sustaining joy as things occur in harmony with the Earth and with all life that it creates and sustains. We feel the pain of disharmony when we witness the dishonour of the natural order of Creation and the continued economic colonization and degradation of Mother Earth and all life upon her. Until Indigenous Peoples rights are observed and respected, sustainable development and the eradication of poverty will not be achieved (Kari Oca II Declaration, 2012).

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Economism and the Econocene: a coevolutionary interpretation

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We live in the era of Economism. Human consciousness is deeply etched by economistic beliefs in individualism, materialism, property, markets, economic growth, and freedom as consumer choice. These beliefs are necessary to sustain the system that supports us. But the economy we have is unlikely to support our grandchildren. Natural scientists argue that we are in a new geologic era, the Anthropocene, where people have become the major force in changing the geosphere: the atmosphere, oceans, and land. But it is the economistic beliefs that describe the cosmos of most people, bind people together, support their particular behavior, and sustain the economic system. Economism is altering the physical processes of the geosphere and collapsing the diversity of the biosphere. Econocene is a more appropriate term for the new geologic era. Fossil fuels and their technologies have transformed agricultural and industrial processes, the mobility of goods and people, and the geographies of cities and rural areas. People's values, ways of understanding, and social organization have coevolved with fossil fuels and their technologies, but it is economism[1] that binds people together and girds the economic system we have. We need a new "ism", a new human consciousness, to support a new relationship with Earth and its other inhabitants.

Economistic beliefs are not detrimental because they are mere beliefs. People need a belief system to live together. Yuval Harari develops this argument around the following statement.

> "Any large-scale human cooperation – whether a modern state, a medieval church, an ancient city, or an archaic tribe – is rooted in common myths that exist only in people's collective imagination" (Yuval Harari, 2014, p. 30)

Many critiques of the recent neoliberal economy make the same point that neoliberalism survives on a set of necessary public beliefs, but most critics imply that those who profit from the system orchestrate the beliefs. While not denying that those who most benefit from

[1] Bottomore (1991) describes the diverse ways Lenin, Gramsci, and other Marxists have used the term. Kwak (2017) uses the term to emphasize the unrealistic nature of the ideology of neoliberal economists. Cobb (1999) used the term to designate an era during which economic beliefs organize humanity. My use incorporates Cobb while building on Knight (1932) with respect to how economistic beliefs are necessary, indeed need to be religious in nature, to satisfy the needs of people as well as to keep the economy running.

particular beliefs have helped push them on the masses, the process by which beliefs come to be held and sustained is more complex than this. People need beliefs to explain the system in which they live, and they need beliefs to rationalize their decisions and those of others. Furthermore, people are able to choose between alternative beliefs and rationalizations being pushed by religious organizations, interest groups, and social commentators. The dominant choice of Europeans and North Americans switched during the 20th century from Judaeo-Christian explanations to neoliberal economism. And the rest of the world also made this shift on their own time scales starting from their own religious bases.

The early Chicago economist, Frank Knight, argued in the 1930s that economics must be included among the beliefs in people's collective imagination. Except Knight used the term "principles", a term that plays an important role in science, but then immediately argues that the "principles" must be essentially religious.

> "The point is that the 'principles' by which a society or a group lives in tolerable harmony are essentially religious. The essential nature of a religious principle is that not merely is it immoral to oppose it, but to ask what it is, is morally identical with denial and attack.
>
> There must be ultimates, and they must be religious, in economics as anywhere else, if one has anything to say touching conduct or social policy in a practical way. Man is a believing animal and too few, if any, is it given to criticize the foundations of belief 'intelligently'.
>
> To inquire into the ultimates behind accepted group values is obscene and sacrilegious: objective inquiry is an attempt to uncover the nakedness of man, his soul as well as his body, his deeds, his culture, and his very gods" (Knight, 1932, p. 448–9).
>
> "Certainly the large general [economics] courses should be prevented from raising any question about objectivity, but should assume the objectivity of the slogans they inculcate, as a sacred feature of the system" (Knight, 1932, p. 455).

Note that Frank Knight argued that economists, mostly unbeknownst even to themselves, should be the surreptitious purveyors of economistic beliefs as religion. Or, to paraphrase and mix Marx with Knight, economists need to be pushers of the opiate to the masses where now religion is economistic beliefs. And yet economists are portrayed to be and think of themselves as objective scientists dedicated to reason and reason alone.[2]

Let me be more specific. Economism consists of the shared beliefs that support the market order and capitalist growth upon which most of humanity is currently absolutely dependent. Laborers, white collar "technocrats", entrepreneurs, capitalists, financiers, and specialized

[2] While acknowledging Milton Friedman's theoretical and empirical accomplishments, the most important role he played was as a public spokesman for market religion through popular books, a television show, and numerous public appearances. Friedman pushed economistic beliefs as religion in accordance with the argument above of Frank Knight, one of his mentors.

scientists including economists work together in amazing synchrony through shared economic beliefs that:

a) Explain and rationalize one's place in the economic system,

b) Rationalize the dominant way in which people interact with each other as a process of free choice,

c) Rationalize how "greed is good" in opposition to earlier religious/secularly-based moral teachings with respect to care for others,

d) Divide nature into property that can be owned and traded,

e) Rationalize growth of GDP as progress,

f) Explain the nature, including the emergence, of the economic system,

g) Rationalize transcendence through consumption, the meaning of life is to consume more and more, the mandate of nations is to grow.

Note that as listed here, the belief system is "complete" in that it includes everything that a religion would include: an explanation of the cosmos, of one's place in it, and how to behave. While most people hold other beliefs as well as economistic beliefs, increasingly since mid-20th century, economism has displaced earlier religious beliefs or become syncretic with religious beliefs as in Christian prosperity gospel (Bowler, 2013).

The belief systems that have organized people have changed over time. The beliefs that supported hunter-gathers were different from those that supported agricultural societies that were different from those that have supported industrial societies. This gives us hope for another change that will support people and planet. Yet, paraphrasing Albert Einstein, we cannot get out of the crisis we have created through economic thinking by using economic thinking. A coevolutionary framework for thinking about history and possible futures is an alternative that provides insights.

A coevolutionary framework

Over nearly four decades, I have argued for a coevolutionary framing of people's historical and current relations to nature (Norgaard, 1981; 1994). Others have also found this perspective insightful.[3] Coevolution in biology is a process where two species select on each other (Ehrlich and Raven 1964). Evolution is typically explained in terms of a single species being selected upon by physical conditions of the environment. Tortoises, for example, evolved to be better and better adapted to dry environments through competition for resources and the natural selection of those tortoises more fit for dryness. The Western idea of progress (Bury, 1920; Nisbet, 1980; Lacsh, 1991) easily aligns with the idea of the tortoise becoming more and more fit. Social Darwinists starting in the late 19th century falsely adapted the idea of the survival of

[3] The "economic" literature on coevolution is surveyed in Kallis and Norgaard, 2010.

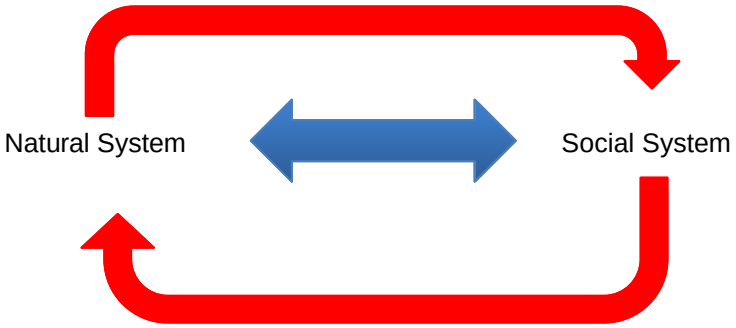
the fittest to justify, under a banner of progress, how superior people were outcompeting inferior in the newly emerging corporate industrial capitalist economy (Hofstadter, 1944).

While physical environments are important in the selection process, so are how each species interacts with other species leading to species selecting on the characteristics of each other. More broadly, coevolution is the sum of evolutionary changes of interrelated entities selecting on the characteristics of each other. Each entity in a coevolutionary relationship exerts selective pressures on the others, whereby each affects each other's evolution. Note that with coevolution, there is no equivalent to the concept of progress. The characteristics of species simply change in response to each other's changes.

The concept of coevolution has been extended to the interactions of systems and how they select on the characteristics of each other. [4] A process of social and natural system coevolution is portrayed in Figure 1. The blue arrows portray the direct cause and effect feedbacks between the two systems illustrating how people typically think of how nature affects us and we affect nature. The red arrows in Figure 1, however, also suggests how the two systems can be understood as *coevolving* together with features of the social system favouring the more effective reproduction and survival of particular features in the natural system and *vice versa*.

In *Development Betrayed* (Norgaard, 1994), I break the social system into four subsystems: values, knowledge, organization, and technology shown in Figure 2. I envisioned a process wherein each subsystem interacts with the others in direct (mechanical) ways while they also coevolve together through selecting on the characteristics of each other while also interacting and coevolving with the natural system. The distribution of characteristics in each subsystem also changes by innovations and introductions from other areas.[5]

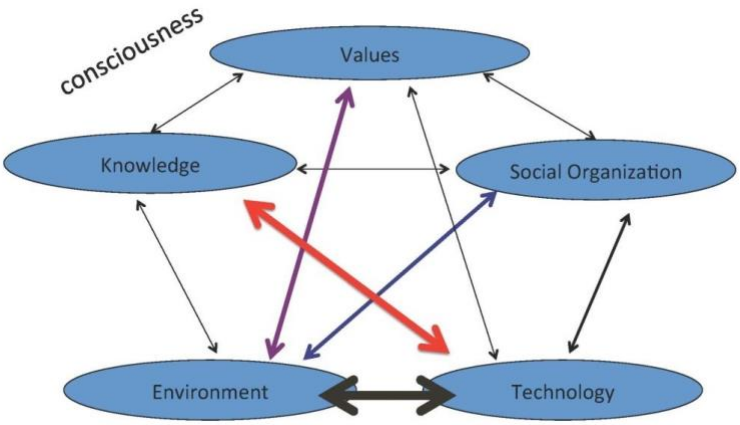
Figure 1: The coevolution between nature and society



[4] Lumsden and Wilson, 1981, respond to the cultural critique of Wilson's sociobiology by including cultural systems in the coevolutionary process. Peter Corning, 1983 also provides an independent systems response that is constructive.

[5] This framing is different from the dominant framing within ecological economics of the economy being within, and a subsystem of, the environment (Daly, 1973; Daly and Farley, 2011). Readers may find my portrayal of the environmental system as no larger than any subsystem of the social system rather off-putting. This is a different framework emphasizing a parallel framing of processes rather than of magnitudes of stocks and flows. Note that the social system selects on characteristics of nature, not on the characteristics of natural laws like gravity or thermodynamics.

Figure 2: The coevolution of social subsystems with the environmental system



Note that I have put the word "consciousness" between and above the knowledge and value subsystems to indicate that when I use this word, I am thinking of it as a combination of the two. The coevolutionary framing of human interactions, mechanical and evolutionary, with the environment has some special features that are critical to the overall argument of this paper.

First, as in the coevolution between species, things just change in response to each other. There is no presumption of progress. Indeed any criteria for progress are within the value subsystem that is itself coevolving in response to the changes in the other subsystems. And this provides a direct insight into how the nature of progress changed from moral progress during the 17th century to include material progress beginning in the latter 18th century, to become economic progress during the 20th century, and then since 1980 or so to become simply "growing the economy" or GDP growth. Values coevolved with increasingly dominant economic understandings within the knowledge subsystem as well as with the increasingly dominant market organization of the social system. As values became more economistic, the criteria of what constitutes progress changed accordingly.

Second, as the previous paragraph clearly suggests, the coevolutionary framework explains path dependence or "lock in" very easily. This characteristic of the framework does not offer much hope for humanity getting out of the current crisis. And yet, coevolution also explains how wholly new features can arise, giving us hope. The environment is changing because of climate change, forcing new direct interactions as well as selecting on the characteristics of the social subsystems. While the lock in was sustained for a decade and a half, especially strongly in the United States, there is now clear evidence that climate change is influencing the consciousness of people around the world.

Third, the mechanical processes also illustrated in this coevolutionary framework suggest how human consciousness, the sum of understandings in the knowledge subsystem and beliefs in the value subsystem, sustains the social organization and technological subsystems that exist. Many authors have noted that particular values and understandings among the people are

necessary to sustain a particular economic system.[6] The coevolutionary framing, when the arrows are viewed as cause and effect relationships, illustrates this.

Fourth, the coevolutionary framework illustrates how environmental, organizational, and technological realities coevolve with people's consciousness, how people understand and value things within the reality they are simultaneously changing. This framework is constructionist, and explicitly so. In this framing, understanding, for example, is recursive, incorporating how prior understanding effected actions taken and the selection processes that changed society and nature. For example, historically we understood soils mostly as physical and then later as chemical systems. While we now understand soils more as biological systems, or biogeochemical systems, our understanding of the agricultural soils that exist today is more complete, and thus better, when we incorporate how we had historically transformed these biogeochemistry systems through ploughing and the application of fertilizers based on our earlier, dominantly physical and chemical, understanding of soils.

Understanding how past thinking has created the world "out there" is important for understanding agricultural soils, but it is even more important for understanding our economy. The economy and the problems we have today reflect our past understandings that have been dominated by neoliberal beliefs about markets as self-regulating, about the superiority of markets to government, and about how economic growth supposedly advances well-being and even brings about environmental protection too. People, with the help of the economics profession, have come to worship markets and condemn the supposed inefficiency of governmental "command and control". Yet we ignore the phenomenal rise of the large corporations that employ us and provide us with our daily goods and services. Corporations large, many larger than nation-states, as well as small are organized and supposedly run efficiently by command and control. Somehow, the economics profession fails to teach this, nor do people choose to notice the anomaly either. It is easier to ignore realities that question values, at least for a while. Indeed, as I will try to show, a false consciousness is partly necessary.

Within this framing, let me explain how we reached the crisis we are in.

A coevolutionary history

There have already been 3 substantial transformations in human consciences that have accompanied major organizational changes in societies: 1) from hunter-gatherer societies to agricultural societies, 2) from agricultural societies to nation-building societies, and 3) from building nations to economism (Harari, 2015; Cobb, 1999). A fourth change in consciousness driving and coevolving with other changes, perhaps an Earthism or ecologism, is needed to assure environmental sustainability, social justice, and meaningful lives.

[6] For a recent example with respect to neoliberalism that also reviews the prior literature, see Streeck, 2017.

From hunter-gather to agricultural societies.

Being smart, especially since the emergence of Homo sapiens a quarter of a million years ago or so, people learned that they could hunt more successfully by hunting together. It also made sense to share what they caught, for some hunting parties were more successful one day, others the next. And young children and elders, best left in camp, needed food too. Sharing was good for the success of all. Working together and sharing made productive and reproductive sense. Cooperation works best when there are expectations that people can be trusted to meet such expectations, and trust tended to formalize into moral rules. Hence, from the earliest of times, the processes of production and distribution and the human qualities of being trustful and moral, or what we now think of as the separate realms of economics and religion, have been tightly fused.

Religions provide more than simply moral guidance. Hunting, as well as the gathering of nuts, fruits, and vegetables, entailed working with the intricacies of nature. People had practical questions about the timing of events in nature, many of which were important to their material success. For these, people slowly contrived through experience and passed between generations through survival of the fittest increasingly good enough arguments that they composed into stories to document how to work with nature. Some of these stories improved hunting and gathering techniques, partly by cause and effect, partly by selecting on each other. These earthly queries intermixed with larger questions about the heavens and earth, the cosmos, for which existential myths evolved. The ethics of accessing nature and sharing became intertwined in these earthly and existential stories as well.

For the vast majority of human history, people lived in tribes of 50-200 people. The small size of tribes facilitated, though did not guarantee, an organizational structure with information sharing and something close to collective decision-making. People's environmental impacts were largely local and temporary, though people did drive some species to extinction. Most importantly, when a tribe's environment deteriorated, whether by their own doing or an act of nature, there were possibilities of moving to new territory, for population levels overall were low.

From agricultural societies to nation building societies.

After many millennia, grazing and farming started gradually within hunting and gathering communities. Dominantly agricultural societies arouse as the effectiveness of agriculture increased and perhaps also as population levels demanded. Agriculture vastly increased people's ability to capture the sun's energy and transform it into food. There were modest increases in well-being, especially for those at the top of the hierarchical societies made possible by an agricultural surplus. But most of the productivity gains were absorbed by population growth. Farming facilitated an estimated 225fold increase in human population during the 12 centuries prior to the rise of industry in 1800, as shown in Table 1.

Cultures largely based on hunting and gathering coexisted with agricultural societies, but they were pushed into mountainous, desert, and other less desirable landscapes. Agricultural societies began having new and larger direct impacts on the environment and put new selective pressures on other species. People in different regions transferred a few seeds, plants, and animals, exchanged ideas about the origins of the universe and the meaning of life, and even

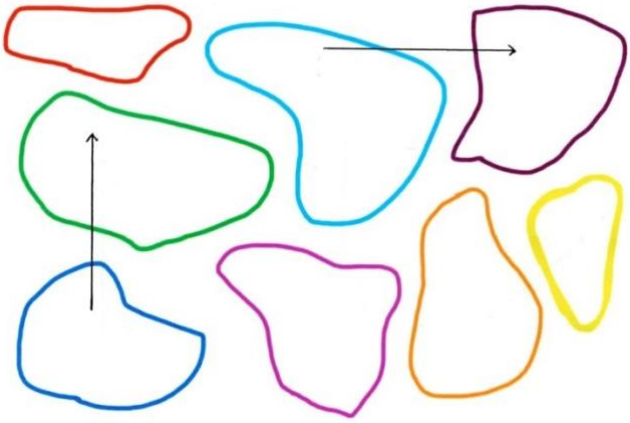
traded a few practical items, such as salt and spices, over considerable distances. Yet overall, interconnections between societies were relatively few compared to later times, and thus cultural diversity between the patches was considerable. Such a world might be sketched as in Figure 3, with the coevolutionary processes shown in Figure 2 taking place in each patch. With low interconnectivity, the failure of one culture did not reverberate through and take down societies around the globe.

Table 1: Population and global gross product through history

Date	Population billions	Global Market Activity in trillions 1990 world dollars
2000	6.3	41
1975	4.1	15
1950	2.5	04
1900	1.6	01.1
1850	1.2	00.036
1800	0.90	00.018
1600	0.55	00.0077
0	0.17	0.0018
-10000	0.004	0.000037

Estimates by J. Bradford DeLong 2008

Figure 3: A cultural patchwork quilt with an occasional transfer of a plant or technology



Agriculture, however, was not simply a magnificent human advance through new technology and social organization as conventionally portrayed. There were dramatic transformations, and clearly not all were favorable, in people's consciousness of nature, of their values and knowledge systems, in the process of becoming agricultural societies (Harari, 2014). The tedium of working the soil and harvesting but a few crops rather than dynamically interacting over a wide landscape with a diversity of plants and animals selected against the larger consciousness of nature possessed by hunters and gatherers. Consciousness coevolved toward new, simpler ideas fit for farm laborers. People's social consciousness also needed to be civilized. New rationalizations evolved to support living in larger groups and working as field

laborers rather than at a higher level, and vice versa, in the newly formed social hierarchies. Formal religions arose as specialists took on the task of developing, maintaining, and conveying moral principles and origin narratives. Knowledge, values and social organization changed through coevolutionary processes in ways that complemented the changes in farming technology. All of this constitutes the very nature of agri*culture*, the outcome of the agricultural coevolutionary process.

For 10 to 15 thousand years, most peoples lived in multiple, fairly distinct, predominantly agricultural, societies. A millennium ago, the people who were to eventually think of themselves as Europeans were organized around the Catholic Church. Christian beliefs rationalized and supported the feudal social order for centuries. It was an age of Christianism even as Protestantism challenged Catholicism (Cobb, 1999). It was traditional religions that also organized people in agricultural societies pretty much around the world. In the last centuries of agricultural societies, however, knowledge, values, technology, and social organization began to coevolve in new ways.

European intellectuals' sense of the world and their place in it began to change with the Renaissance beginning in 1300. The emergence of modern science proved critical to how people interpreted nature. In the Abrahamic tradition, a single designer created the heavens, sun, planets, and Earth and creatures, plants and people as a whole with Earth at the centre of the universe. People, formed in the creator's image and being most favoured, had dominion over, yet responsibility for the care of, nature. Modern science succeeded by studying the components of nature separately, it reordered the sun, planets, and Earth, and it ever so slowly set people free from Christian and other religious dogma about nature, though that process is still ongoing. People's sense of dominion began to coevolve with science and technology into the hubris of control of a spiritless world.[7] The new ideas of modern science in Europe coevolved with social organization, specifically the authority of the Catholic Church, over centuries and spread slowly through the population.

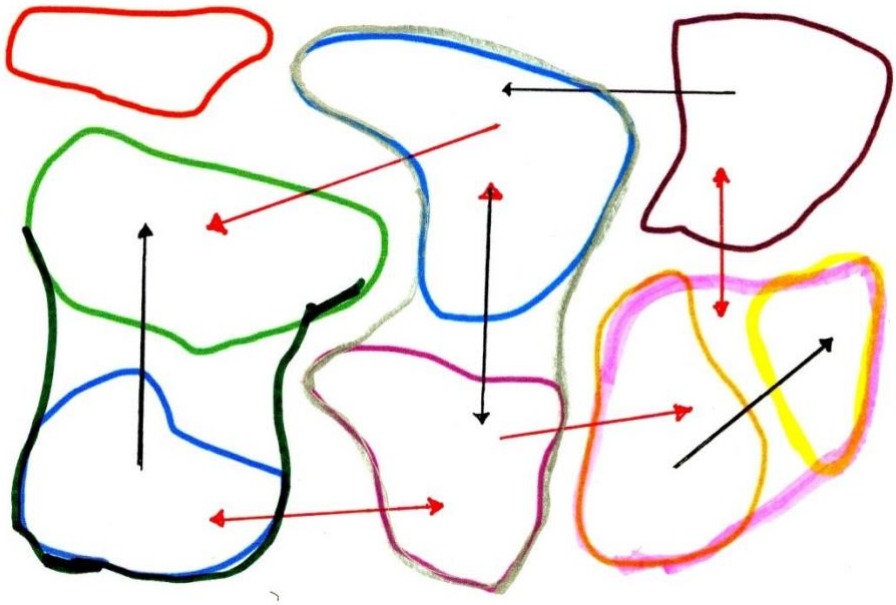
Again, taking a European perspective, there were also more and new interactions with other parts of the world, with people of other cultures. Beginning about 500 years ago, Europeans carried plants, animals, and diseases to and from the New World. Soon after the movement of people and goods over the great oceans began to more tightly connect what were separately coevolving patches of social and environmental systems. This created a smaller number of larger patches, beginning the process of reducing the diversity between cultures as well as natures (Crosby, 1973; 1986; Mann, 2011).

Changes in European perceptions of themselves, both with respect to nature and social organization, also coevolved around very important new ideas about individualism that coevolved with the rise in atomism in natural philosophy. Martin Luther's call for reform of the Catholic Church stressed that individuals were responsible for their own salvation through their own reading of the Bible, the only true source for coming to know Christ and God. Luther's call awakened individualism, expanded education to the masses so people could read, unintentionally further separated church and state, and ignited multiple intellectual Enlightenments: English, Scottish, French and eventually in the Catholic Church and feeding

[7] Lynn White (1967) set off an extensive debate about the role of Judeo-Christian teaching and responsibility for the environmental crisis in a famous article in Science. I provided an overview of the responses to White in (Norgaard, 2002), but of course that literature has continued since.

back on Protestantism too (Ryrie, 2017). The natural theology that evolved into natural history and then into natural science was increasingly built on atomism and the assumption that the parts of nature could be understood apart from each other. As a result, modern science split into disciplines with each discipline learning about particular parts of nature. No one needed to understand the whole because it was thought that the parts would naturally unify into the whole. Millgram (2015) characterizes the coevolution of knowledge with technology and social organization since the Enlightenment as the Great Endarkenment. People today, scientists included, are far less conscious of the environmental system in which they live than were hunter-gatherers. The Enlightenments' strong move toward individualism in social thinking and atomism in natural thinking became traits of modern beliefs that are at the core of today's crisis.

Figure 4: A coevolving patchwork quilt of cultures with more connections



From agricultural societies to nationalism.

A period of nation building arose after the Treaty of Westphalia in 1648 that ended the Thirty Years War between the shifting allegiances of royalty to Protestantism and Catholicism. Social philosophers sustained by a new wealth apart from the Catholic Church introduced disruptive ideas about the legitimacy of the power of those in authority to rule over other people, arguing instead that the people should only be ruled by their own consent. The authority bestowed by the Catholic Church on the authority of rulers was already breaking down, and these new ideas further selected against religious authority. Later, there were arguments not only for democratic election of rulers but also for democratic involvement in decision making generally. As Europeans coevolved into nation-states, nationalism became the dominant belief system. It was nationalism that organized the new nations of the new world in the 18th and 19th centuries as well as the breakdown of European colonialism and the rise of nationhood in Africa and Asia during the mid-20th century. Wars in the age of Nationalism were common because nationalist beliefs stressed imaginary ethnic identities, boundaries, and loyalty foremost though modes of governance were also important. Religious influences were still important too, but no longer ruling.

The liberal social thinkers of the Enlightenments who favoured independent, free individuals realized that one cannot be free without property. Without one's own land or capital, one can only be someone else's labourer. And if employer's freedom includes letting laborers go, a freedom soon to be derived from market thinking, than freedom certainly requires all individuals to possess property. Around the same time, increased trade changed relative prices of farm products selected for an acceleration of the enclosure movement that started in England and spread to France as well. The transition from feudal societies to market societies separated large numbers of people from the land, causing great misery and great losses of freedom for the masses. The development and spread of liberal philosophy coevolved with the rise in the institution of private property for the few, selecting against the institution of common property with shared responsibilities. The individualism of liberal philosophy selected for individualism over cooperation and care in social organization and rationalized the demise of common property and responsibility under feudalism (Polanyi, 1957).

The demise of land stewardship and the rise of the idea of private property coevolved with notions of atomism in science, the idea that nature could be separated into parts. A new understanding of nature as complex interconnectedness, the science of ecology, would not evolve for another century. In the meantime, the myth that nature could be divided up into parts, without connections remaining, and owned by separate people became not only a part of human consciousness but a key condition of liberal society. The economic concept of environmental externalities has the story backwards. Environmental connections are denied in the concept of private land ownership and were made external in economic thinking from the start.

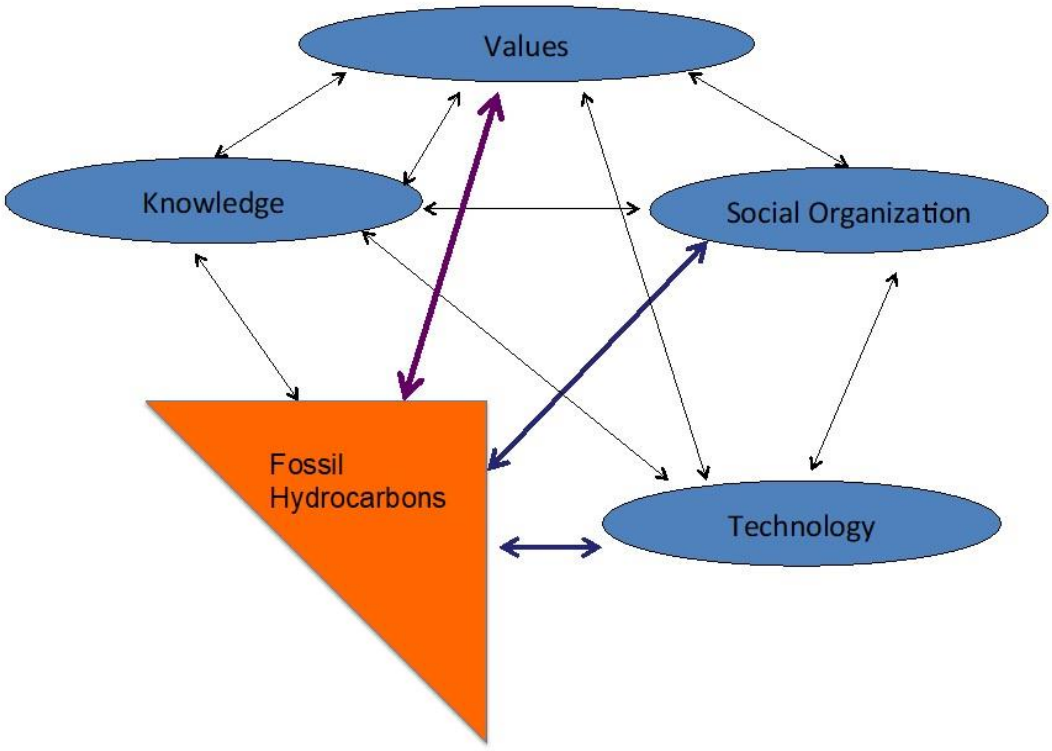
From nationalism to economism.

The changes in how people perceived nature and organized themselves became clearly noticeable in practice around 1800. Europeans, at least those with sufficient property, began to equate freedom with individual choice, sensed a control over nature through technology, the idea of progress began losing its moral base and switched toward the possibility of material abundance for all. These changes coevolved with a dramatic increase in access to energy through the mining and combustion of coal followed by petroleum in the next century. Rather than coevolving with the environment, our social organization, technologies, and even the balance of the ways people understood began to coevolve around fossil fuels.

The economy began to coevolve around fossil hydrocarbons and their associated industrial and transportation technologies beginning with coal in the late 18th century and then petroleum beginning in the latter 19th century. In 1901, Svante Arrhenius documented that carbon in the atmosphere from the combustion of fossil fuels would increase the natural greenhouse effect that keeps the planet reasonably comfortable and warm it further. His calculations of when the warming would become dangerous was grossly in error because he had no way to foresee how rapidly fossil fuel technologies would dominate others and find new niches as well. While this error proved critical, it is important to realize that Arrhenius was making a serious effort to understand the impact of people on the geosphere. The vast majority of theoretical scientists were busily digging deeper, narrower strands of knowledge that occasionally other more applied but still specialized scientists and engineers were turning into technologies that were profitably introduced into human and natural environments with little if any concern for their larger consequences. How could they be concerned given their fragmented training and lives

in specialized organizations of specialists who also were oblivious of larger systems? The fragmentation of knowledge and how that coevolved with social organization is a central part of this coevolutionary history of humanity's predicament.

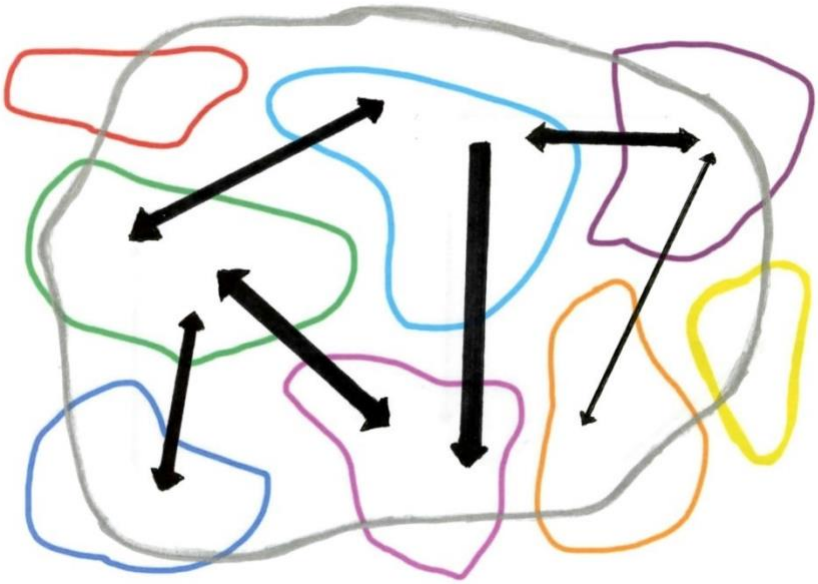
Figure 5: Social system coevolving with fossil fuels



The uniformity across geographies of fossil hydrocarbons and their technologies and the economies of scale of fossil hydrocarbon technologies selected for the corporate industrial order we know today. These direct changes, along with the coevolutionary processes of selection, freed people from coevolving with the complexities of the natural environment. This in turn gave rise to modern economism that pays no heed to nature. With our cosmos being the modern industrial order, economism emerged as the dominant secular religion, an eclectic package of beliefs that explain our place in the economic system, our relation to other people and nature, and how we should live what has been deemed a meaningful life.

Belief in markets spread, indeed was carried around the world, even forcefully so, to counter the rise of the Soviet Union in the Cold War, through efforts to "free" trade globally, and through the implementation of the idea of development. By the second half of the 20th century, much of the world was beginning to look like the market world assumed in economic models. In the late 20th century, the globalization of capital began and the interconnections between the patches of Figure 3 began to look more like Figure 6.

Figure 6: A globalized former patchwork of cultures

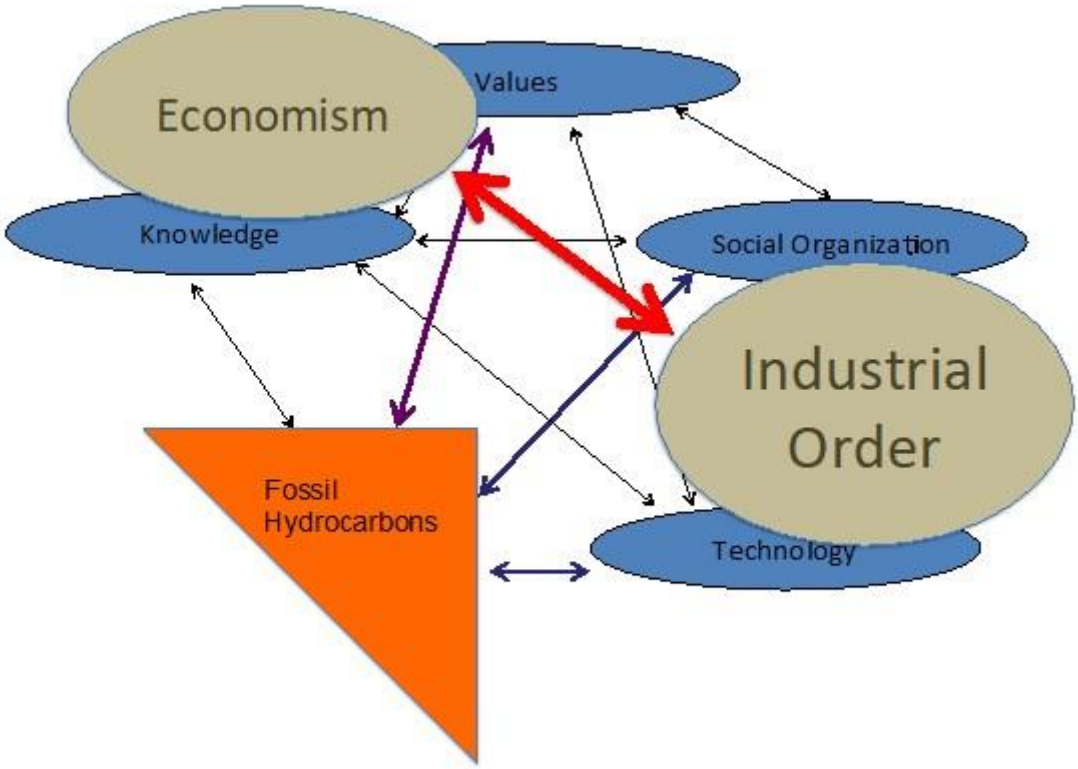


People performing specialized tasks are now so interdependent through markets that if people do not believe in markets and their larger purpose, all markets would collapse, as financial markets nearly have periodically, most recently in 2008. If markets collapse most of our population of 7.7 billion people would very quickly starve. Economism is necessary to sustain the economic cosmos in which people live.

Economism, however, has also become the dominant form of reasoning and the source of metaphors and utopias used in public communication. With the shrinkage of other ways of thinking about systems, economistic terminology has even become critical to how conservation biologists explain nature to the public. Nature, like other forms of wealth, can be thought of as capital that pays dividends in the form of ecosystem services. Saving nature has become a process of designing economic incentives for individual actors to invest in nature in order to reap her ecosystem services. In turn, conservation biologists now frame their research around market terminology to back up the ecosystem market programs they have helped facilitate. Biology is becoming economism.

The industrial order sustained by economism is not sustainable itself. We are in the Econocene maintained and coevolving with economism. Any new social organizational system that is sustainable, socially just, and provides meaningful lives will also need its “ism” to keep it going. This raises a key question. How can we have new system of beliefs/values, ways of thinking, and social organization emerge, a new ism, without crashing the current economic system, with economism maintaining it, on which we depend during the transition?

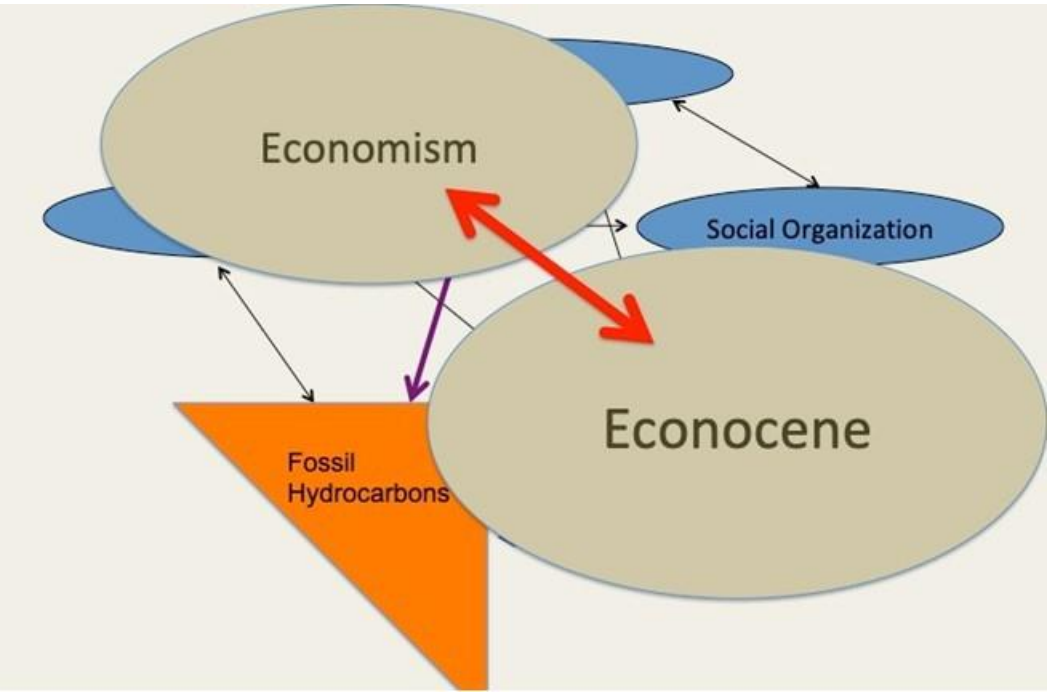
Figure 7: The coevolution to economism and the industrial order



During the 20th century economistic beliefs have supported diverse and coevolving capitalisms as we know them and resulted in spectacular changes. Human population roughly quadrupled from about 1.6 billion people to 6.3 billion people. Global market economic activity during this period increased by nearly a factor of 40, or about 10-fold per capita. This rise of market activity entailed a parallel rise in specialization in work and associated knowledge. We went from a 19th century world in which the vast majority of people on the globe were pretty closely tied to the land and performing a similar mix of comparable agricultural and domestic activities to a 21st century world in which most people are performing specialized tasks using task specific knowledge. People are tied to bureaucratic structures, both public and private, while being globally interconnected by markets.[8] This new system has proved extremely effective at producing material goods while also presenting unprecedented social and environmental challenges. It is this transformation into what I will call the Econocene that must be understood in order to find our way out.

[8] I have skipped over the deliberate role of economists in supporting the most important and global economism of all, neoliberalism. The role of the Mount Pelerin Society and the Chicago School is very well documented. I am also skipping over the role if international institutions established after WWII and their role, in the midst of the Cold War, in establishing a neoliberal economic order that led to economism coevolving with the Econocene.

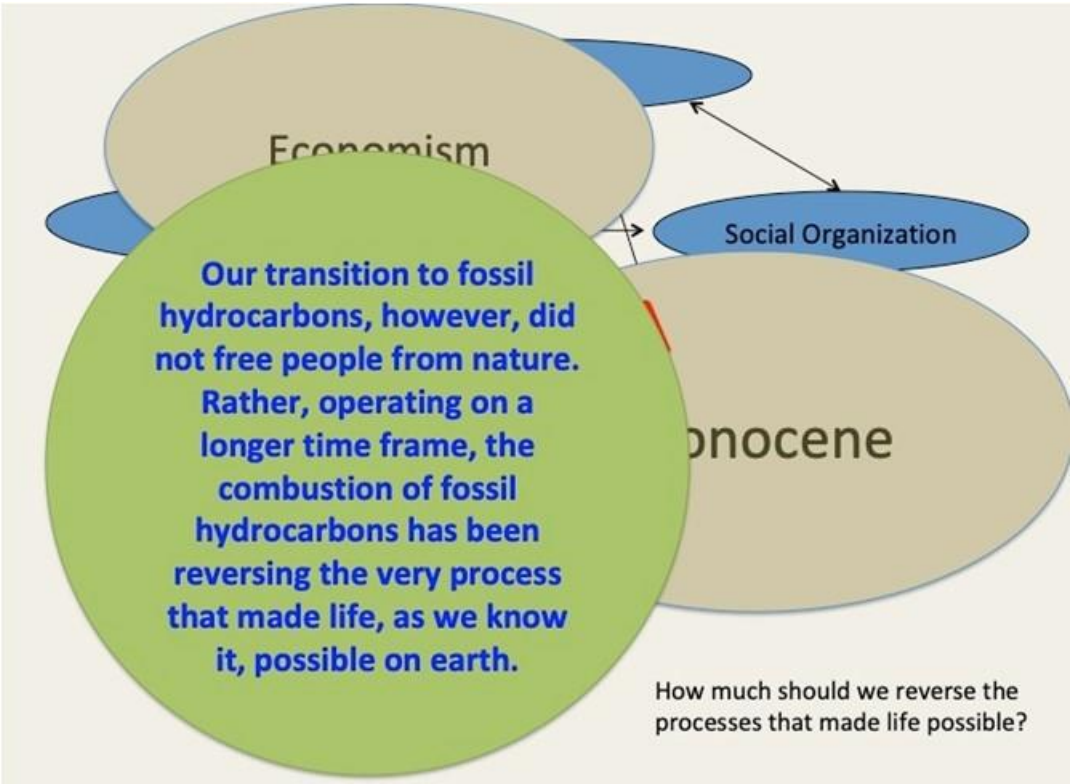
Figure 8: Economism coevolving with the Econocene



While social organization, knowledge, and values were coevolving around fossil hydrocarbons and their technologies, however, the geosphere and biosphere systems were operating on a different time scale, accumulating the CO_2 and other greenhouse gases that are now resulting in climate change, sea level rise, and a further quickening of the extinction of species.

The Econocene is a period of rapid transition of the geosphere and collapse of the biosphere. The transition to sustainability, social justice, and meaningful lives will not occur simply through the use of market mechanism to reduce carbon in the atmosphere. The economy has become our cosmos. We awake to stock market reports from financial capitals several time zones to our East, work in command and control hierarchical corporate structures while praising free markets, and are absolutely dependent on others in distant places working for the global economic machine. City lights and polluted air curtain us from the starry heavens, few are even aware of the phase of the moon. Reality is on the screens at our desks and on our cell phones in our hands, we share hearts through social media rather than in person. To face the reality we are in, our consciousness needs to become much more closely aligned with how nature and people function in a rapidly changing interaction. The economism that drives and coevolves with the Econocene must be replaced with a new “ism” that is environmentally sustainable, socially just, and supports meaningful lives.

Figure 9: Economism and the Econocene challenged by the reality of climate change



Humanity, fortunately, has been through multiple major transitions before. But now all of humanity is absolutely dependent on a tightly coevolved system of beliefs and social order. If people did not believe in markets, if economism were not equivalent to a religion that frames each person's very existence and *modus operandi*, all markets would collapse, as financial markets have, and 7.7 billion people would starve. How can we change to a new consciousness, to new systems of values, of knowledge, of social organization, and of technology that will coevolve without crashing during the transition and be sustainable thereafter?

Fortunately, capitalist economic order has proven pretty malleable, indeed significantly reconfiguring every quarter century or so. Evolutionary and coevolutionary processes also can occur rapidly. Counter to our mechanical intuition, coevolution explains change, including the evolution/emergence of wholly new properties, even while it explains "interlockedness". This is the good news. The bad news is that the story of progress through conquering nature through better science and technology has been strong for several centuries. While capitalism has indeed changed, it has continually increased specialization and material and energy consumption while also increasing the separation of people, and their knowledge, from each other and nature.

Conscious consciousness changes for survival

The coevolutionary history provided in this article suggests at least the following four ways in which humanity's consciousness needs to shift.

From material progress to holistic survival and morality.

The coevolution of economism with the Econocene has led humanity to the brink of disaster. Faith in progress has long been a part of the problem. Actions to stave off climate change have been trimmed and delayed on the presumption that countering environmental destruction has the opportunity cost of foregone human wellbeing through further investments in technology that further increase the production or provide novel forms of material goods. And yet studies show that wellbeing increases little, if at all, with further material assets after basic needs are met. Shifting from faith in progress toward a consciousness of holistic survival would be more appropriate given the challenges of climate change. I include the word holistic to remind us that we need to be more fully conscious of all peoples and other species too.

Most of the questions we face today are moral questions. We have neither fully faced our moral responsibilities to future generations raised by past environmental destruction nor faced climate change over the past three decades. Economists have avoided addressing moral issues in order to meet legislators' and the public's expectations and need for so-called "objective" answers. Hence economists talk of economic efficiency when moral issues are at stake. This shrivelling of economists' ability to think and discuss moral issues is the essence of economism.[9] Economics, in theory, cannot say what is moral, but if political processes determine what is moral, economics can talk about alternative efficient economies that meet moral obligations and paths to them. It is past time for economics to work with moral reasoning and political decision-making rather than falsely standing in for them.

From knowledge hubris to knowledge humility.

We need to become much more humble with respect to how smart we are. If we were so smart, we would not be in this dire predicament. Science and the scientific community can become part of the solution, but we also need to acknowledge how science has been a part of the problem. Western hubris allowed technologies based on new findings in particular fields of science to be implemented in and spread through whole natural and social systems. Because we had scant knowledge of the whole, specialized innovations transformed the geosphere and biosphere as well as the sociosphere in unexpected ways. Those in denial of climate change are partly caught in the hubris of Western knowledge past. The environmental sciences still evoke a nature that is "out there" and slowly changing at most rather than a nature undergoing rapid change driven by our economy sustained by our beliefs. Science education, research, and participation in management and policy need to shift from the hubris of scientists as agents

[9] Richard Howarth and I used an overlapping generations model to show that if we care about future generations by assuring them environmental rights, for example climate rights, then the efficient solution for future resource allocations changes, the rate of interest goes down, and environmental values go up (Howarth and Norgaard, 1992). In response, Resources for the Future organized a workshop, without inviting us to participate, where participants questioned the need for switching to a model that actually provides the option of addressing intergenerational equity and published the resulting papers in a book (Portney and Weyant, 2000).

of material progress through specialization to scientists as humble seekers of understanding of whole and rapidly changing systems.

Given the limited nature of current knowledge, more experimentation in how we interact with nature, with quick corrective steps taken when experiments go wrong, would provide opportunities to learn through experience. Introductions of innovations need to be limited in general until our understanding is sufficient to develop criteria. There will be advantages to de-globalizing. Differentiation in our future economies will allow lessons to be drawn with respect to what might work better. The idea that we can design one best way to transition and sustain a better world is an extension of Western hubris.

From individualism to cooperation and care.

Adam Smith wrote two books. We have neglected his first, *The Theory of Moral Sentiments*. Economists found the logic of markets in *The Wealth of* Nations compelling while wealthy converts with political traction spread selected messages. We need a significant shift towards the messages of Smith's first book. It still provides important insights into how empathy can build trust, responsibility, and care that are key to rethinking meaningful lives and social organization. And while Smith did not emphasize care across generations, we now need to care ahead.

From private property to global commons.

The belief that land could be owned by a private individual and used however its land-owner saw fit gained traction in the west only centuries ago, an extremely short time in human history. Throughout history, what an individual could do with land has been restrained, but in America in particular, the idea of land ownership as sacred and any restraint considered a deep imposition on liberty and freedom. The interconnectivity of natural systems assured that private land ownership, especially when connected to markets ever more distant, would result in environmental disaster, and it has. The common threads between land need to be managed as a commons, and with today's technologies and markets, those threads have become global. Shifting consciousness in this direction will be difficult but necessary.

Just as a coevolutionary framework helps explain how humanity has come to the brink of social and planetary disaster, it can help us see how we might back off and set out anew. The framing is systemic and evolutionary, it incorporates ecological interactions and the selective processes of evolution, showing how things tightly fit together while also changing. It incorporates the best of postmodernist understanding. Social organization, technology, values, and even science, are "socially constructed", indeed even nature is increasingly being socially constructed, but none are *only* "socially" constructed. The "economy" is important, but to understand how to escape the coevolution of economism and the Econocene, it will be important to concentrate on how other aspects of life besides the material contribute to individual and collective wellbeing and can guide us into the future. We need to both concentrate on survival and consciously expand our consciousness.

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Inequality challenge in pursued economies[1]

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Abstract
Inequality in a society depends on, among other things, which stage of economic development it is in. This paper identifies three stages, an urbanization phase when the labor supply curve is flat, a maturing phase when the labor supply curve is upward sloping, and a "pursued phase" when the labor demand curve is flat because the return on capital is higher in emerging economies than at home. While standard theories in economics are based on the assumption that the economy is in a maturing phase, most advanced countries today are already in a pursued phase. Because the bargaining position of labor changes as the economy goes through different stages, polices to address inequality must also change with the stage of economic development.

Keywords inequality, pursued economies, stages of economic development, labor market, return on capital

Income inequality has become one of the hottest and most controversial issues in economics not only in the developed world but also in China and elsewhere as well. Many are growing increasingly uncomfortable with the divide between the haves and the have-nots, especially after Thomas Piketty's *Capital in the 21st Century*[2] sparked a fresh debate on the optimal distribution of wealth, an issue that had been largely overlooked by the economics profession.

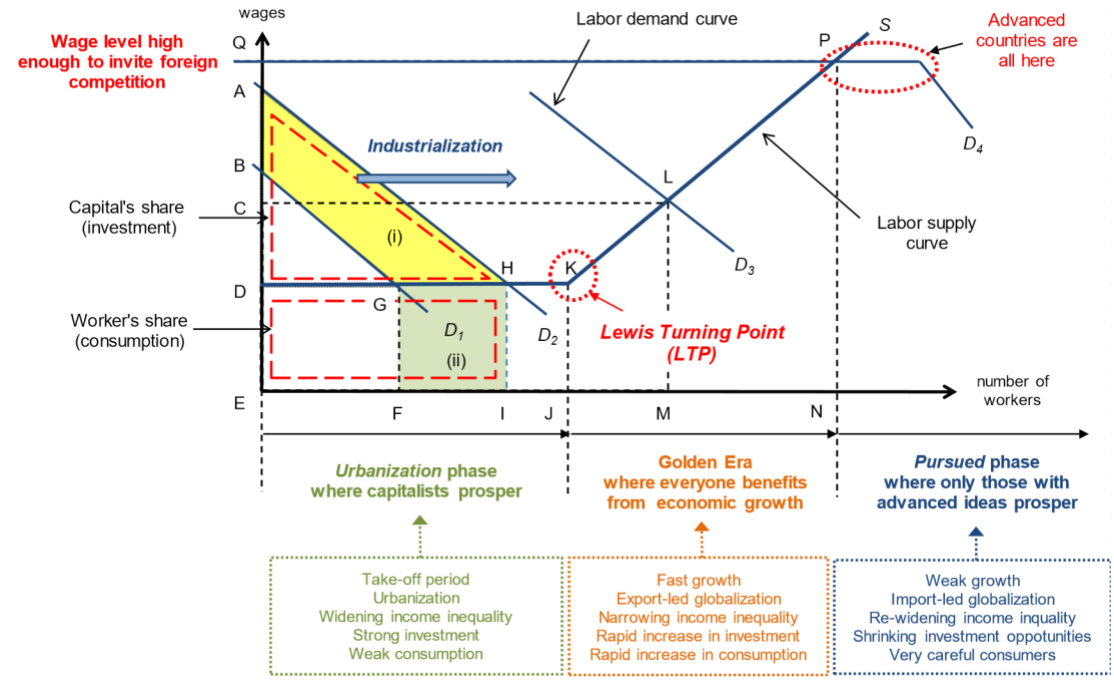
This paper argues that the determinants of income inequality changes depending on the stage of economic development. The three stages of industrialization identified for this purpose are: urbanizing era, when the economy has yet to reach the Lewis Turning Point (LTP), post-LTP maturing or golden era when the economy moves along an upward sloping labor supply curve, and pursued era, when the return on capital is higher abroad in emerging economies than at home. The LTP refers to the point at which urban factories have finally absorbed all the surplus rural labor. (In this essay, the term LTP is used only because it is a well-known expression for a specific point in a nation's economic development; the use of this term does not refer to the model of economic growth proposed by Sir Arthur Lewis.)

[1] This paper draws heavily from Chapters 3, 4 and 5 of the author's *The Other Half of Macroeconomics and the Fate of Globalization* published in 2018 by John Wiley but is reorganized with a focus on inequality.
[2] Piketty, Thomas. (2014) *Capital in the Twenty-First Century*. Belknap Press

At the advent of industrialization, most people are living in rural areas. Only the educated elite, who are very few in number, have the technical knowledge needed to produce and market goods. Families whose ancestors have lived on depressed farms for centuries have no such knowledge. Most of the gains during the initial stage of industrialization therefore go to the educated few, while the rest of the population simply provides labor for the industrialists. And with so many surplus workers in the countryside, worker wages remain depressed for decades until the LTP is reached.

Exhibit 1 illustrates this from the perspective of labor supply and demand. The labor supply curve is almost horizontal (DHK) until the Lewis turning point (K) is reached because there is an essentially unlimited supply of rural laborers seeking to work in the cities. A business owner can attract any number of such laborers simply by paying the going wage (DE).

Exhibit 1: Three Phases of Industrialization/Globalization



Source: Nomura Research Institute

In this graph, capital's share is represented by the area of the triangle formed by the vertical axis on the left, the labor demand curve, and the labor supply curve, while labour's share is represented by the rectangle below the labor supply curve. At labor demand curve D_1, capital's share is the triangle BDG and labour's share is the rectangle DEFG. During this phase of industrialization, the capital share BDG may be shared by only a few persons or families, whereas the labor share DEFG may be shared by millions of workers.

Successful businesses continue investing in an attempt to make even more money. That raises the demand for labor, causing the labor demand curve to shift steadily to the right (from D_1 to D_2) even as the labor supply curve remains flat. As the labor demand curve shifts to the right, total wages received by labor increase from the area of the rectangle DEFG at time D_1 to the area of the rectangle DEIH at time D_2 as the length of the rectangle below the labor supply curve grows. However, the growth is linear. The share of capital, meanwhile, is likely to increase

at more than a linear rate as the labor demand curve shifts to the right, expanding from the area of the triangle BDG at D_1 to the area of the triangle ADH at D_2.

Growth exacerbates income inequality in pre-LTP stage

Accordingly, the portion of GDP that accrues to the capitalists is likely to increase with GDP growth until the LTP is reached, exacerbating income inequalities. A key reason why a handful of families and business groups in Europe a century ago and the zaibatsu in Japan prior to World War II were able to accumulate such massive wealth is that they faced an essentially flat labor supply curve (wealth accumulation in North America and Oceania was not quite as extreme because these economies were characterized by a shortage of labor). Some in post-1978 China became extremely rich for the same reason.

During this phase, income inequality, symbolized by the gap between rich and poor, widens sharply as capitalists' share of income (the triangle) often increases faster than labour's share (the rectangle). Because capitalists are profiting handsomely, they continue to re-invest profits in a bid to make even more money. Sustained high investment rates mean domestic capital accumulation and urbanization also proceed rapidly. This is the take-off period for a nation's economic growth.

Until the economy reaches the Lewis Turning Point, however, low wages mean most people still lead hard lives, even though the move from the countryside to the cities may improve their situations modestly. For typical workers this was no easy transition, with 14-hour factory workdays not at all uncommon until the end of the 19th century. According to the OECD, the annual working time in Western countries averaged around 2,950 hours in 1870 or double the current level of 1,450 hours[3]. Business owners, however, were able to accumulate tremendous wealth during this period.

Stage II of industrialization: the post-LTP maturing economy

As business owners continue to generate profits and expand investment, the economy eventually reaches the LTP. Once that happens, urbanization is largely finished and the total wages of labor – which had grown only linearly until then – start to increase much faster because any additional demand for labor pushes wages higher. In other words, the post-LTP labor supply curve takes on a significant positive slope.

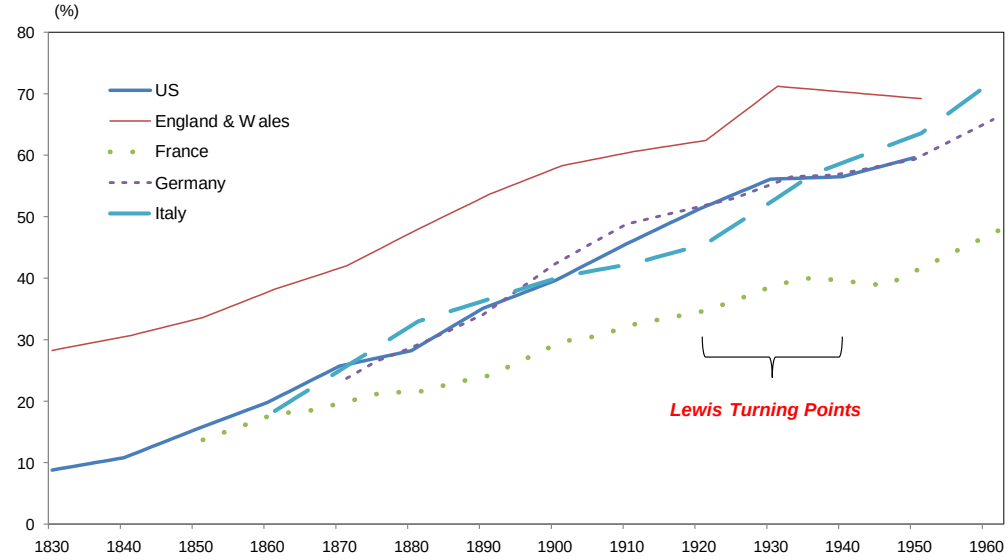
Even if labor demand increases only modestly in Exhibit 1, from D_2 to D_3, total wages accruing to labor will rise dramatically, from the area of rectangle DEJK to the area of rectangle CEML. This means labour's share of output is likely to be expanding relative to capital's share. It is at this point that the income inequality problem begins to correct itself.

Once the LTP is reached, labor also gains the bargaining power to demand higher wages for the first time in history, which reduces the share of output accruing to business owners. But businesses will continue to invest as long as they are achieving good returns, leading to further tightness in the labor market.

[3] Maddison, Angus, (2006), The World Economy: A Millennial Perspective (Vol. 1), Historical Statistics (Vol. 2). OECD, Paris, p. 347.

A significant portion of the US and European populations still lived in rural areas until World War I, as shown in Exhibit 2. Even in the US, where – unlike in Europe – workers were always in short supply, nearly half the population was living on farms as late as the 1930s. Continued industrialization as well as the mobilizations for two world wars then pushed these economies beyond the LTP, and the standard of living for the average worker began to improve dramatically.

Exhibit 2: Western Urbanization* Continued Until 1960s



* Percentage of population living in urban areas with 20,000 people or more in England & Wales, 10,000 or more in Italy and France, 5,000 or more in Germany and 2,500 or more in the US.
Sources: U.S. Census Bureau (2012), *2010 Census*, Peter Flora, Franz Kraus and Winfried Pfenning ed, (1987), *State, Economy and Society in Western Europe 1815-1975*

As labour's share increases, consumption's share of GDP will increase at the expense of investment. At the same time, the explosive increase in the purchasing power of ordinary citizens means most businesses can increase profits simply by expanding existing productive capacity. Consequently, both consumption and investment will increase rapidly.

From that point onward the economy begins to "normalize" in the sense in which the term is used today. Inequality also diminishes as workers' share of output increases relative to that of capital. In the US, that led to the so-called Golden Sixties where everyone benefitted from economic growth. With incomes rising and inequality falling, this post-LTP maturing phase may be called the *golden era* of economic growth.

Once the economy reaches the LTP and wages start growing rapidly, workers begin to utilize their newfound bargaining power. The numerous strikes experienced by many Western countries from the 1950s to the 1970s reflects this development.

Capitalists initially respond to labor movements with union busters and strike busters. But as workers grow increasingly scarce and expensive, the capitalists must back down and begin accepting some of labour's demands if they want to keep their factories running. After 20 years or so of such struggles, a new political order is established as both employers and employees

begin to understand what can be reasonably expected from the other side. The political order in the West and Japan until recently, which was dominated by centre-left and centre-right political parties, reflected this learning process.

Higher wages force businesses to look harder for profitable investment opportunities. On the other hand, the explosive increase in the purchasing power of ordinary workers who are paid ever-higher wages creates major investment opportunities. This prompts businesses to invest for two reasons.

First, they seek to increase worker productivity so that they can pay ever-higher wages.
Second, they want to expand capacity to address workers' increasing purchasing power. Both productivity- and capacity-enhancing investments increase demand for labor and capital that add to economic growth. In this phase, business investment increases workers' productivity even if their skill level remains unchanged.

With rapid improvements in the living standards of most workers, the post-LTP golden era is characterized by broadly distributed benefits from economic growth. Even those with limited skills are able to make a good living, especially if they belong to a strong union. Government tax receipts also increase rapidly during this period, allowing the government to offer an ever-expanding range of public services. That, in turn, further reduces the sense of inequality among the population. This golden era lasted into the 1970s in the West.

Stage III of industrialization: the pursued era

This golden era does not last forever. At some point, wages reach a level where foreign competition can gain a foothold. The first signs of a serious threat to Western economic growth appeared when businesses in the US and Europe encountered Japanese competition in the 1970s.

Many in the West were shocked to find that Japanese cars required so little maintenance and so few repairs. The Germans may have invented the automobile, and the Americans may have established the process by which it could be manufactured cheaply, but it was the Japanese who developed cars that did not break down. The arrival of Nikon F camera also came as a huge shock to the German camera industry in the 1960s because it was so much more rugged, adaptable, easy to use and serviceable than German Leicas and Exaktas, and professional photographers around the world quickly switched to the Japanese brand. For the first time since the industrial revolution, the West found itself being pursued by a formidable competitor from the East.

Once a country is being chased by a technologically savvy competitor, often with a younger and less expensive labor force, it has entered the third or "pursued" phase of economic development. In this phase, it becomes far more challenging for businesses to find attractive investment opportunities at home because it often makes more sense for them to buy directly from the "chaser" or to invest in that country themselves.

Businesses in the pursued country no longer have the same incentive to invest in productivity- or capacity-enhancing equipment at home because there is now a viable alternative – investing in or buying directly from lower-cost production facilities abroad. In this phase, capital invested

abroad, especially in manufacturing, earns a higher return than capital invested at home. With constant pressure from shareholders to improve the return on capital, firms are forced to shift investments to locations with a higher return on capital.

Once this stage is reached, productivity gains at home from investment in productivity enhancing equipment slow significantly. According to US Bureau of Labor Statistics data compiled by Stanley Fischer at the Fed[4], productivity growth in the non-farm business sector averaged 3.0 percent from 1952 to 1973, before falling to 2.1 percent for the 1974 to 2007 period and 1.2 percent for 2008–2015. These numbers not only confirm the trend mentioned above, but also suggest that worker productivity in the future will depend increasingly on the efforts of individual workers to improve their skills instead of on corporate investment in productivity-enhancing equipment.

In a pursued economy, labor demand curve (D_4 in Exhibit 1) becomes largely horizontal at wage level EQ, where outsourcing to foreign production sites becomes a viable alternative. This means real wage growth will be minimal from this point onward, except for those workers with abilities that are not easily replicated abroad. It should be noted that the level of EQ depends not just on domestic wage inflation, but also on foreign productivity gains. For example, if the Japanese products in the 1970s were not so competitive, EQ for the West would have been much higher.

With domestic investment opportunities shrinking, economic growth also slows in the pursued countries. This is very much the reality facing most advanced countries today, while a steadily increasing number of emerging countries are joining the rank of chasers.

Some of the pain workers in advanced countries felt was naturally offset by the fact that, as consumers, they benefited from cheaper imports from emerging economies. Businesses with advanced technology continued to do well, but it was no longer the case that everyone in society was benefiting from economic growth. Those whose jobs could be transferred to lower-cost locations abroad saw their living standards stagnate or even fall.

Inequality worsens in pursued stage

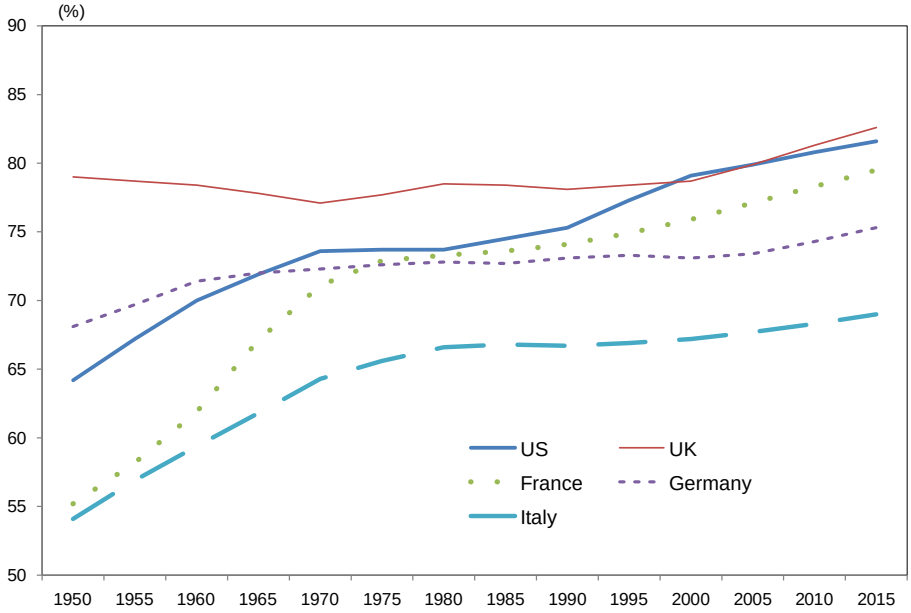
Exhibit 3-4 shows the real income of the lowest quintile of US families from 1947 to 2015. Even in this group, incomes grew rapidly in the post-LTP golden era that lasted until around 1970. But income growth subsequently stagnated as the country entered the pursued phase. Exhibit 5, which illustrates the income growth of other quintiles relative to the lowest 20 percent, demonstrates that the ratios remain remarkably stable until 1970 but diverge thereafter.

Exhibit 3-6 shows annualized income growth by income quintile in the post-LTP golden era from 1947 to 1970 and the pursued phase from 1970 to 2015. It shows that the lowest 60 percent actually enjoyed slightly faster income growth than those at the top before 1970,

[4] Fischer, Stanley (2016) "Reflections on Macroeconomics Then and Now," remarks at "Policy and Challenges in an Interconnected World" 32 Annual National Association for Business Economics Economic Policy Conference, Washington D.C., March 7, 2016. https://www.federalreserve.gov/newsevents/speech/fischer20160307a.htm

indicating a reduction in income inequality. This was indeed a golden era for the US economy in which everyone was becoming richer and enjoying the fruits of economic growth.

Exhibit 3: Western Urbanization Slowed in 1970s

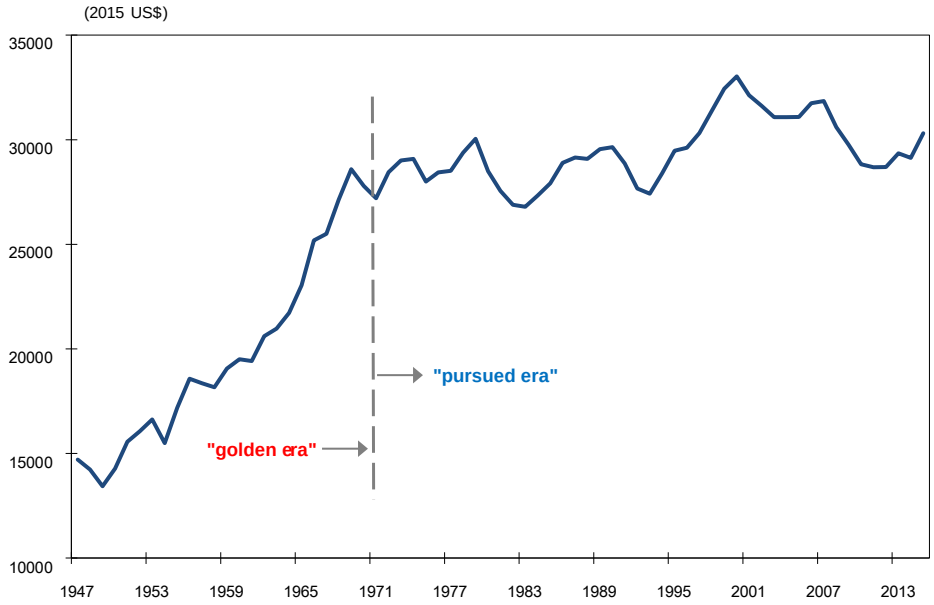


Source: United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision, custom data acquired via website.

The situation changed drastically, however, once Japan started chasing the US. Exhibit 4 shows that income growth for the lowest quintile has been stagnant ever since. Exhibits 5 and 6 show that income growth for other groups was only slightly better – except for the top 5 percent, which continued to experience significant income gains even after 1970. This group probably includes those who were at the forefront of innovation along with those who were able to take advantage of Japan's emergence.

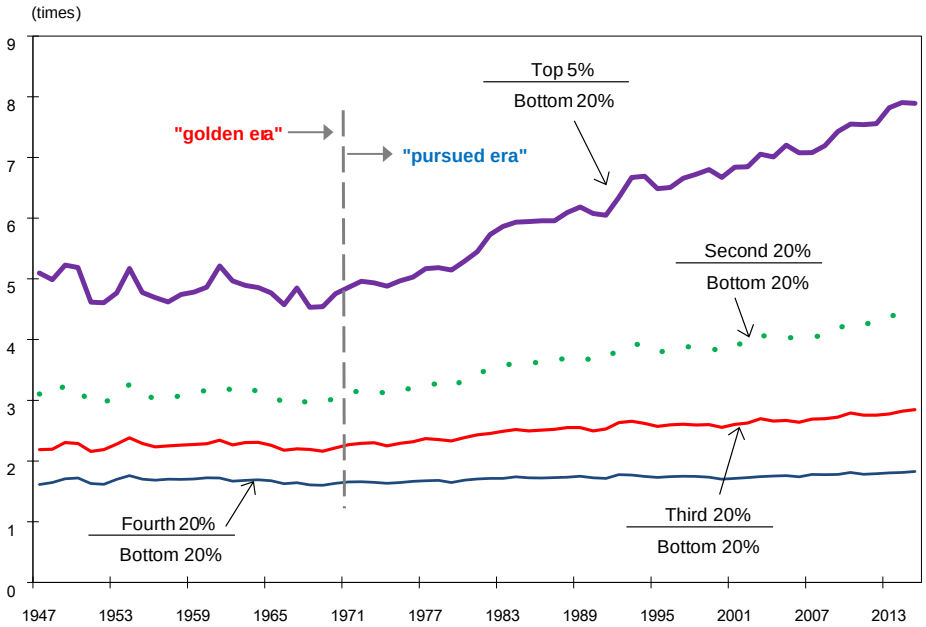
Exhibit 6 demonstrates that income growth for different income quintiles was quite similar during the golden era but began to diverge significantly once the US became a pursued economy. Income growth for the top five percent dropped from 2.50 percent per year during the golden age to just 1.30 percent during the pursued phase, but that is still seven times the rate for the lowest 20 percent.

Exhibit 4: Incomes of lowest 20% of US families shot up until 1970 but stagnated thereafter
Income Upper Limits for Lowest Fifth of Families: 2015 US dollars



Source: US Census Bureau, Current Population Survey, 2016 Annual Social and Economic (ASEC) Supplement

Exhibit 5: US income inequality began to worsen after 1970
Income of various groups as a multiple of the lowest 20%



Source: Nomura Research Institute, based on the data from US Census Bureau's Current Population Survey, 2016 Annual Social and Economic (ASEC) Supplement

Exhibit 6: Annualized growth rates of US family income by income quintile

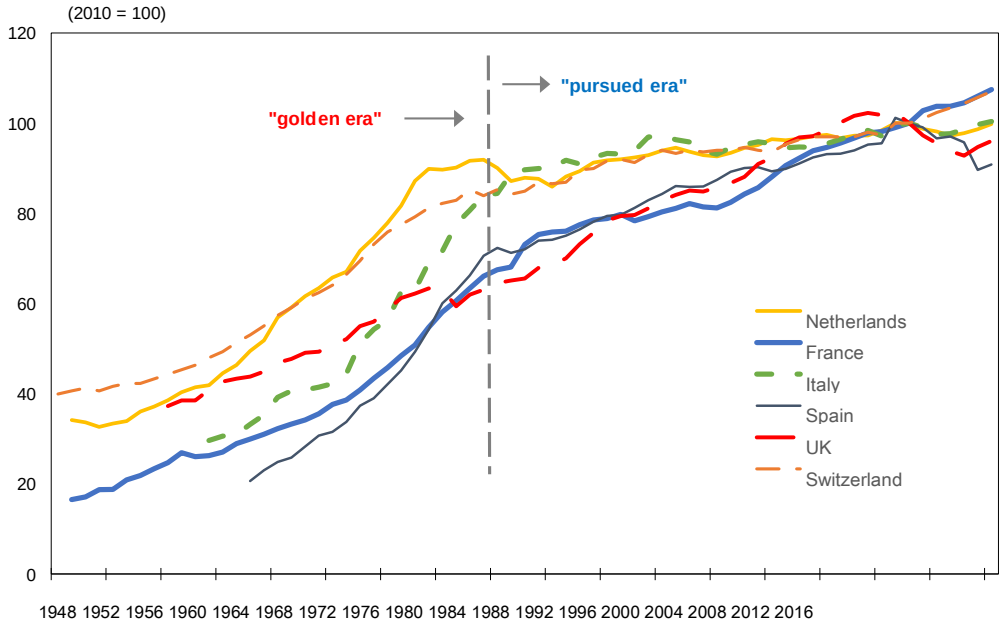
(annualized, %)

	lowest 20%	second 20%	third 20%	fourth 20%	top 5%
Post-LTP maturing phase 1947-1970	2.805	2.854	2.861	2.719	2.496
Post-LTP pursued phase 1970-2015	0.189	0.436	0.737	0.996	1.298

Source: Nomura Research Institute, based on the data from US Census Bureau's Current Population Survey, 2016 Annual Social and Economic (ASEC) Supplement

Similar developments were observed in Europe. Exhibit 7 shows real wages in six European countries. With the possible exception of the UK, all of these countries experienced rapid wage growth until the 1970s followed by significantly slower growth thereafter.

Exhibit 7: Real wages in six European countries after WWII
Real wage indices (national currency base)

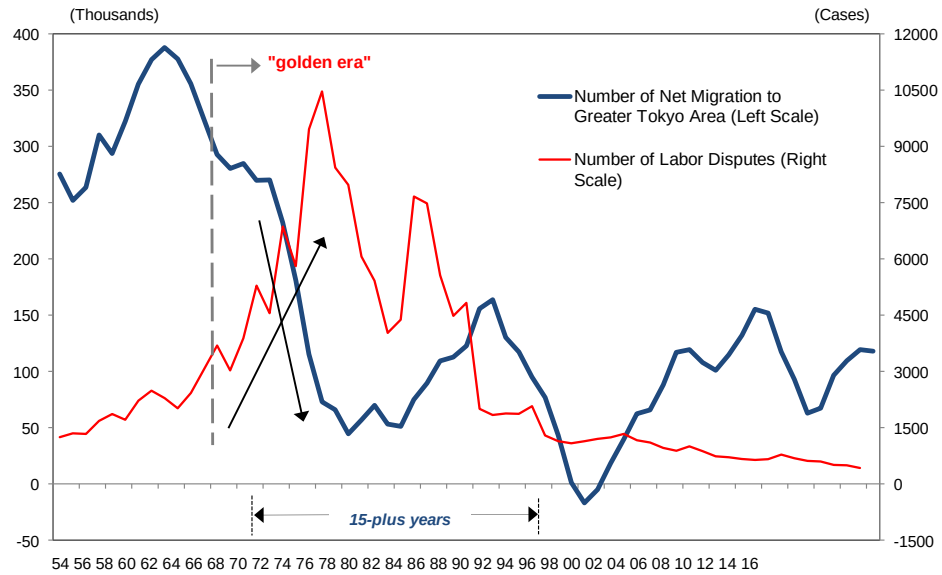


Source: Nomura Research Institute, based on the data from IMF, *International Financial Statistics* Office for National Statistics, UK, *Analysis of Real Earnings*, and Swiss Federal Statistical Office, *Swiss Wage Index*

The three stages of industrialization in pursued countries

Japan reached the LTP in the mid-1960s, when the mass migration of rural graduates to urban factories and offices, known in Japanese as *shudan shushoku,* finally came to an end. Once Japan reached that point, the number of labor disputes skyrocketed, as shown in Exhibit 8, and Japanese wages started to increase sharply as shown in Exhibit 9. In other words, Japan was entering the post-LTP golden era that the West had experienced 40 years earlier.

Exhibit 8: Demand from labor surges once Lewis Turning Point is passed (1): Japan

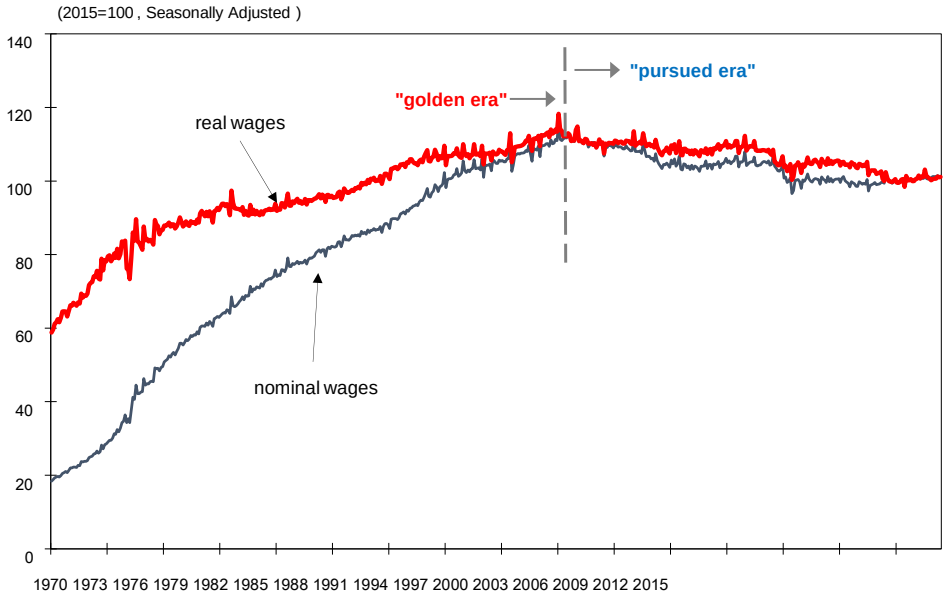


Note: Greater Tokyo Area consists of Tokyo Metropolis, Kanagawa prefecture, Saitama prefecture and Chiba prefecture. Sources: Ministry of Internal Affairs and Communications, *Report on Internal Migration in Japan*, and Ministry of Health, Labour and Welfare, *Survey on Labour Disputes*

Japan was fortunate in that it was not being pursued at the time, enabling it to focus on catching up with the West. Wages were rising rapidly, but Japanese companies invested heavily at home to boost workforce productivity. Japan's golden era of strong growth and prosperity could continue as long as productivity rose faster than wages.

Labour's share of profits rose along with wages, and Japan came to be known as the country of the middle class, with more than 90 percent of the population identifying itself as such. The Japanese were proud of the fact that their country had virtually no inequality. Some even quipped in those days that Japan was how Communism was *supposed* to work.

Exhibit 9 Japanese wages peaked in 1997 when country entered pursued phase



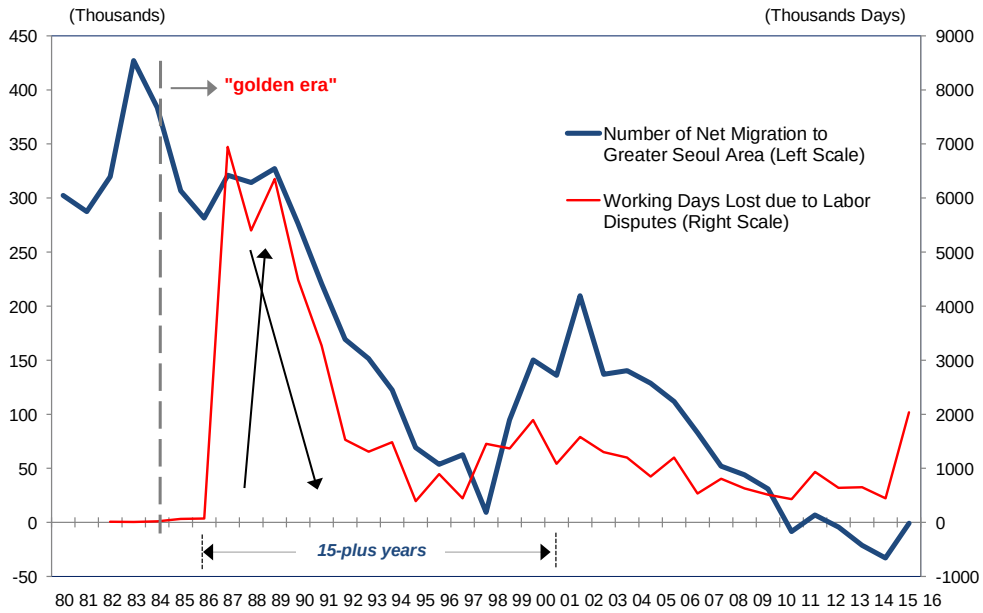
Source: Ministry of Health, Labour and Welfare, Japan, Monthly Labour Survey

The happy days for Japan lasted until the mid-1990s, when Taiwan, South Korea and China emerged as serious competitors. By then, Japanese wages were high enough to attract pursuers, and the country entered its pursued phase. As shown in Exhibit 9, Japanese wages stopped growing in 1997 and then stagnated or fell.

Today the Japanese are worried about income inequality as highly paid manufacturing jobs have migrated to lower-cost countries. They are also concerned about the emergence of the so-called working poor who were once employed in manufacturing but have now been forced to take low-end service jobs. Some estimate that as many as 20 million out of a total population of 130 million are now living in poverty[5]. Their suffering, however, has been eased somewhat by a flood of inexpensive imports that has substantially reduced the cost of living. This means Japan is reliving the West's experience when it was being chased by Japan.

[5] *Nikkei Business* (2015) Tokushu: Nisen Mannin-no Hinkon ("20 million Japanese in poverty"), in Japanese, Nikkei BP, Tokyo, March 23, 2015, pp. 24-43.

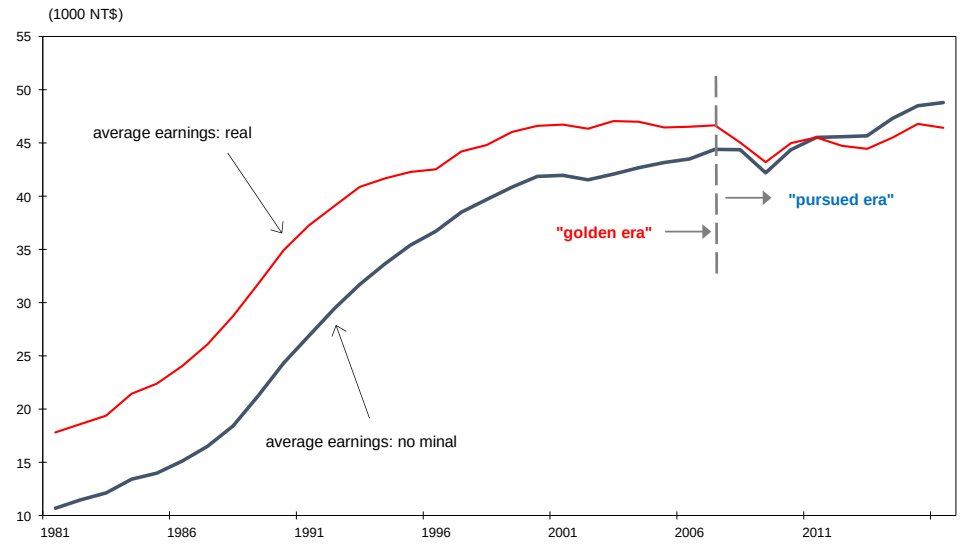
Exhibit 10: Demand from labor surges once Lewis Turning Point is passed (2): South Korea



Note: Greater Seoul Area consists of Seoul city, Incheon city and Gyeonggi-do. Sources: Ministry of Employment and Labor, *Strikes Statistics*, Statistics Korea, *Internal Migration Statistics* and *Korea Statistical Year Book*

Similar concerns are being voiced in Taiwan and South Korea as they experience the same migration of factories to China and other even lower-cost locations in Southeast Asia. These two countries passed their LTPs around 1985 and entered a golden age that lasted perhaps until 2005. The frequency of Korean labor disputes also shot up during this period (Exhibit 10) as workers gained bargaining power for the first time and won large wage concessions. In Taiwan, wages climbed sharply during the post-LTP golden era but peaked around 2005 and stagnated thereafter (Exhibit 11). Both countries are now feeling the pinch as China steadily takes over the industries that were responsible for so much of their past growth.

Exhibit 11: Taiwanese wages peaked around 2005 when country entered pursued phase



Source: Nomura Research Institute, based on the data from Directorate General of Budget, Accounting and Statistics (DGBAS), the Executive
Yuan, Taiwan, *Consumer Price Indices* and *Average Monthly Earnings*

China is not immune from this process of globalization either. Even though China's per capita GDP has grown 30 times since 1978 when the country opened its economy to the outside world, higher wages in China are now prompting both Chinese and foreign businesses to move factories to lower-wage countries such as Vietnam and Bangladesh. This is increasing fears in China that the country will get stuck in the middle-income trap.

This trap arises from the fact that once a country loses its distinction as the lowest-cost producer, many factories may leave for lower-cost destinations, resulting in less investment and less growth. In effect, the laws of globalization and free trade that benefitted China when it was the lowest-cost producer are now posing real challenges for the country.

If China hopes to maintain economic growth in the face of rising wages (and a shrinking workforce), it needs to increase incentives for the businesses to continue investing at home. This means supply-side reforms such as deregulation and tax cuts to increase return on capital at home are needed. But these policies are likely to worsen income inequality as experienced in other countries. These are precisely the challenge advanced countries faced when they were pursued by China and other emerging economies in earlier decades.

Manufacturing and happiness of nations

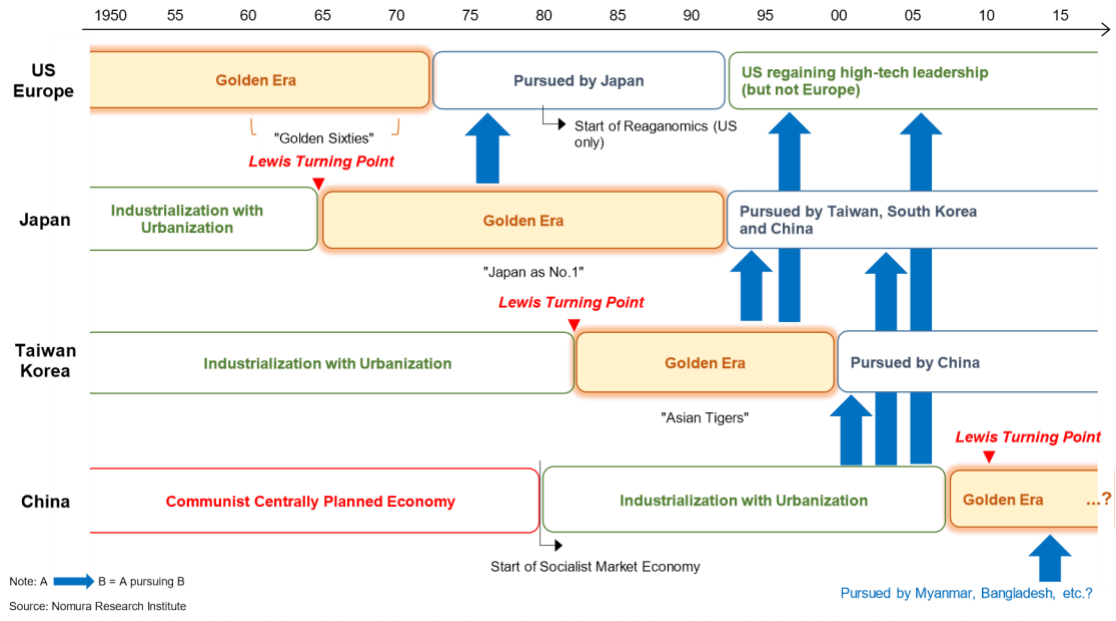
If a nation's happiness can be measured by (1) how quickly inequality is disappearing and (2) how fast the economy is growing, then the post-LTP golden era would qualify as the period when a nation is at its happiest. During this period, strong demand for workers from a rapidly expanding manufacturing sector forces all other sectors to offer comparable wages to retain workers. Since manufacturing jobs do not require advanced education, the whole of society benefits when the economic growth is propelled by manufacturing as wages rise for everybody. People are hopeful for the future, and inequality shrinks rapidly.

In this sense manufacturing is a great social equalizer: when manufacturing industries are prospering, those without advanced (and expensive) education can still earn a decent living. When manufacturing is driving job creation, it raises the wages of even the least skilled. That, in turn, raises wages in all other sectors.

US manufacturing employment peaked in 1979 at 19.6 million, with the bulk of the increase taking place from 1946 (12.7 million) to 1969 (18.8 million). This timeframe coincides with the period of shrinking income inequality in the US as noted above. Manufacturing employment has now fallen to 12.4 million, or just 8.5 percent of total nonfarm employment. The corresponding figure in 1946 was 32 percent[6]. A similar loss of manufacturing jobs has been observed in all advanced countries.

[6] These figures are calculated with the data from U.S. Bureau of Labor Statistics.

Exhibit 12: Growth, happiness and maturity of nations



Manufacturing is also where the greatest productivity gains can be expected. The above rise and fall of manufacturing employment in the US are consistent with the productivity growth numbers for the US from Stanley Fisher as noted earlier. Income inequality begins to worsen once manufacturers start migrating to lower-cost countries, and only those with advanced education and skills can keep up with the changes and continue to do well.

Disappointment with post-industrial society

The concept of "post-industrial society" popularized by authors such as Daniel Bell and the present concept of pursued era are both referring to the same period in history. When the former concept was first introduced in the 1970s, people were excited about the prospect of societies becoming cleaner and more humane as knowledge-based businesses become more dominant in the economy. This contrasts with the age of industrialization where pollution problems were pervasive, and people had to work long hours in dirty and oily factory floors.

Today, most advanced countries are indeed enjoying cleaner air with fewer factories operating inside their borders. But for a large part of the population, the rosy and humane scenario promised by the proponents of post-industrial society never materialized. Instead, many are feeling more insecure and less hopeful now than they felt in the manufacturing dominated golden era.

The rosy and humane scenarios of post-industrialization never came true because for that scenario to come true, highly paid knowledge-based jobs must be increasing so rapidly that they are taking workers away from the manufacturing industries. If that were the case, manufacturers would be forced to leave the country because they cannot compete for workers when knowledge-based businesses are paying such high wages.

What actually happened, however, was that advanced countries were *forced* to deindustrialize because the wages were lower and the return on capital was higher abroad than at home. In this case, the society will suffer from a slower growth in productivity and wages as well as widening income inequality because only those with advanced degrees needed for knowledge-based jobs will do well.

Although knowledge-based businesses are expanding in most societies, their expansions are far from enough to offset the loss of jobs in manufacturing industries. The result is the slow growth and increased inequality advanced countries face today. Since these developments are not positive for a large part of the society, the author coined the term "pursued era" instead of using the term “post-industrial society” to convey the sense of urgency that is needed to address the difficulty posed by the inferior return on capital at home.

Labour’s progression during three stages of economic development

In formulating the policy response to this predicament, it is important to know where the problem unique to the pursued economy originates. It was already noted that when the economy is in the pre-LTP urbanizing phase, capitalists can take advantage of workers because there are so many of them in rural areas who are willing to work for the going wage in urban factories. Workers also have no bargaining power prior to reaching the LTP. During this phase, the limited opportunities for education and vocational training in rural areas mean most workers are neither well-educated nor highly skilled when they migrate to the cities. And with so many of them competing for a limited number of urban jobs, there is little job security.

Once the economy passes the LTP, however, the tables are turned completely in favour of the workers. The supply of surplus workers in rural areas is exhausted and the labor supply curve takes on a significant positive slope. As long as some businesses seek to increase their workforce, all businesses will be forced to pay ever-higher wages. At this stage, businesses also have plenty of reasons to expand because workers’ purchasing power is growing rapidly. Expansion here means *domestic* expansion: firms have little of the experience or know-how needed for overseas production, and as long as domestic wages are below EQ, they are likely to be competitive.

To satisfy increasing demand while paying ever-higher wages, businesses invest in both productivity- and capacity-enhancing equipment. Investments in additional equipment effectively raise the productivity of employees even if the workers themselves are no more skilled or educated than before the country reached its LTP.

With wages rising rapidly, job security for workers also improves significantly as businesses try to hold on to their employees. Lifetime employment and seniority-based remuneration systems become more common. Working conditions improve as businesses offer safer, cleaner working environments to attract and retain workers. The emerging power of unions also forces employers to enhance job security. In contrast to the pre-LTP period, when businesses were effectively exploiting workers because there were so many of them, businesses in the post-LTP golden era “pamper” their employees with productivity-enhancing equipment so they can afford to pay them more.

Workers are on their own in pursued phase

At some point, however, wages reach point EQ in Exhibit 1, and businesses are forced to look for alternative production sites abroad because domestic manufacturing is no longer competitive. It is at this point that firms realize that capital invested abroad earns higher returns than capital invested at home.

In the new pursued era, the way businesses perceive workers changes once again because they now have the option of tapping overseas labor resources. With capital going much further abroad than when invested at home in labour-saving equipment, businesses have fewer incentives to undertake domestic investment. As investment slows, growth in labor productivity, which shot up during the golden era, also starts to decelerate, a trend that has been observed for some time now in most advanced countries.

It is at this point that the ability of *individual* workers begins to matter for the first time because only those able to do things that overseas workers cannot will continue to prosper. This stands in sharp contrast to the previous two stages, where wages were determined largely by macro factors such as labor supply/demand and institutional factors such as union membership, both of which had little to do with individual skills. Once the supply constraint is removed by the option of producing abroad or engaging in outright outsourcing, the only reason a company will pay a higher wage at home is because a particular employee can do something that cannot be easily replicated by a cheaper foreign worker.

If workers were “exploited” during the pre-LTP urbanization era and “pampered” during the post-LTP golden era, they are entirely “on their own” in the pursued era because businesses are much less willing to invest in labour-saving equipment to increase the productivity of the domestic workforce. Workers must invest in *themselves* to enhance their productivity and marketability.

In this pursued phase, job security and seniority-based wages become increasingly rare in industries that must become more agile and flexible to fend off pursuers. It is no accident that lifetime employment and seniority-based wages, which were common in the US until the 1970s, disappeared once Japanese competition appeared. The same thing happened to the Japanese labor market with an increased use of “non-regular” workers after China emerged as a competitor in the mid-1990s. Achieving a more flexible labor market has also been a major social and political issue in Europe.

Workers who take the time and effort to acquire skills that are in demand will continue to do well, while those without such skills will end up earning close to minimum wage. Those who benefited from union membership during the post-LTP golden era will find the benefits of membership in the new pursued era are not what they used to be. Income inequality will increase again, even though *when adjusted for skill levels* it may not change all that much.

Workers who want to maintain or improve their living standards in a pursued economy must therefore think hard about their individual prospects and the skills they should acquire in the new environment. To the extent that the answer to this question differs for each individual, workers are truly on their own. The “good old days,” when businesses invested to increase worker productivity so they could pay employees more, are gone for good. In some sense this

is only fair, since it means workers who put in the time and effort to improve their productivity will be rewarded more generously than those who do not.

Increased importance of education in pursued era

The fact that workers are on their own and most good jobs in de-industrializing pursued economies are in "knowledge-based sectors" means that the importance of education is far greater in the pursued era than in the golden era. This means any attempt to reduce inequality in the pursued era must start with the provision of equal access to quality education. If it is difficult to ensure equality of income in a pursued era, the least the policy makers can do is to ensure equality of access to quality education.

President Ronald Reagan, in the face of Japanese onslaught, pushed hard to increase return on capital at home by cutting taxes and deregulating the economy. Although such supply-side reforms are necessary in pursued economies, he did the opposite with expenditure on education. As Peter Temin pointed out, this is one of the key reasons why the inequality and social divide have grown so large in the US three decades later[7]. Although President Donald Trump's effort to help manufacturers in the country is laudable, he is also making exactly the same mistake Reagan made in cutting budget on education.

The government in a pursued economy should be increasing resources for education so that everyone who wants to study has access to quality education. As workers are entirely "on their own" in the pursued era, access to quality education is where the battle to contain inequality should be fought.

Inequality and social choice

The above also suggested that there is an economic reason for inequality to increase in a pursued era. But even within the pursued economies, the degree of inequality differs greatly which suggests that policy choices can have an influence on the degree of inequality even if the direction toward a greater inequality cannot be changed. Those policy choices, in turn, have a lot to do with societal choices.

The US is considered one of the most un-equal countries in the developed world, where the top few percent owns a large share of the assets in the country. But when one looks at who is at the very top, they are mostly founders of new companies (Exhibit 13) that literally transformed the way people live and work all around the world. In other words, except for Warren Buffet who made money investing in the stock market, all others became rich because they took the risk and brought something completely new and useful to the world.

[7] Temin, Peter, (2017), *The Vanishing Middle Class: Prejudice and Power in a Dual Society,* Cambridge, MA: MIT Press, p.22 and Chapter 10.

Exhibit 13 Richest persons in the United States

Rank	Name	Industry	Net wealth
1	Jeff Bezos	founder Amazon	$114 B
2	Bill Gates	founder Microsoft	$106 B
3	Warren Buffett	Berkshire Hathaway	$80.8 B
4	Mark Zuckerberg	founder Facebook	$69.6 B
5	Larry Ellison	founder Oracle	$65 B
6	Larry Page	founder Google	$55.5 B
7	Sergey Brin	co-founder Google	$53.5 B
8	Michael Bloomberg	founder Bloomberg LP	$53.4 B

Source: Forbes, "The Forbes 400: The Definitive Ranking Of The Wealthiest Americans," October 2, 2019, Edited by Luisa Kroll and Kerry A. Dolan, https://www.forbes.com/forbes-400/#45b49a177e2f

There are those further down the list who made money in largely zero-sum finance/real estate investments or through established companies and inheritance. But no other country in the world has the top ranks of the wealthiest people dominated by those with transformative technology. The fact that seven out of eight at the very top are self-made individuals with transformative ideas suggests that the implication of US inequality is different from those of the other countries where the top ranks are mostly filled with more traditional and established types.

This may have a lot to do with the transparency of the US economy where the people (and products) are valued for what they can do, not where they come from. That, in turn, may have a lot to do with the fact that the US is an immigrant society in comparison to traditional societies of Japan and Europe with their attendant baggage. In those traditional societies, someone like Steve Jobs, a college drop out with a humble background, would have faced a far greater resistance to realizing his ideas than in the US.

Another frequently raised inequality issue in the US is the high cost of medical care. This is important because most Americans, who are brought up in the pioneering spirit of self-reliance, really do *not* want to talk about inequality as long as they are earning a living wage and have a dignified life.

Their rugged sense of self-reliance, however, could be shattered overnight with a catastrophic medical bill. Indeed, a huge share of personal bankruptcies filed in the US is due to this cause. Even for those who are lucky enough to be healthy and have good health insurance, the fear that they might lose one or both at any time is undermining their faith in the system.

There is a huge room for improvement in the US medical industry, especially in comparison to those available in Japan and some other countries. For example, an appendicitis operation in the US can easily cost 20,000 dollars when the same operation in Japan can be done with only

3,000 dollars[8]. Although Japanese doctors frequently complain that they are not paid enough, this one-to-seven difference in cost is adding to the sense of inequality and insecurity among many people in the US. In other words, if an average American faced Japanese medical bills, his or her sense of inequality would be far less.

At the same time, it is said that almost all new drugs that are brought to the market in the world today are developed in the US. This is because the US does not impose a cap on drug prices the way it is imposed in very many other countries including Japan. As a result, drug companies can recoup the enormous cost of developing a new drug *only* in the US. This is indeed one of the reasons why the medical cost in the US is so high.

If the US imposed a cap just like the one in Japan, chances are high that the research and development on new drugs will come to a standstill which it almost did when Hillary Clinton tried to devise a national health insurance with a cap on drug prices when her husband was the President of the US. Some would argue that such a stoppage in medical research would be against the interest of humanity.

This American preference on growth and progress instead of on redistribution served the country well during its golden era because its strong manufacturing-led growth improved the life of everybody and reduced inequality, as noted earlier. The question is whether the same trade-off is appropriate in a pursued economy where inequality is destined to rise with highly undesirable social consequences.

It has been reported, for example, that among the young people in the US today, the word socialism does not have the same bad connotation which it had with the earlier generations who fought the cold war. Wall Street Journal for January 17, 2020, for example, wrote "Fifty percent of adults under 38 told the Harris Poll last year that they would 'prefer living in a socialist country'. That outlook recurs in many more surveys and far surpasses figures from even the radical hey days of the '60s and '70s'.[9] [10] This fifty percent is probably feeling that with a huge student loan burden, high housing costs and prohibitive medical bills, the present system is working only for the old and the rich, that the deck is stacked against them.

The continued popularity of leftist politicians such as Bernie Sanders and Elizabeth Warren also reflect this dissatisfaction. This means some re-balancing of priorities in the US are imminent not only because the economy is in a pursued phase but also because the weight of those younger voters will only grow in the future.

Although some shifts in priorities are imminent, those shifts must be in correct direction to be beneficial to the public. This is because the pursued era imposes its own constraints and dynamics on the economy that did not exist during the golden era. In particular, the return on

[8] Wakakura, Masato, (2006), "Kokusai Hikaku: Nihon-no Iryo-hi ha Yasusugiru (International Comparison: Japan's Medical Costs are too Inexpensive.)," *Voice*, June 2006, Tokyo, PHP Institute, p.159

[9] Ukueberuwa, Mene, (2020), "Boomer Socialism Led to Bernie Sanders," *Wall Street Journal*, January 2020.

[10] https://www.wsj.com/articles/boomer-socialism-led-to-bernie-sandershttps://www.wsj.com/articles/boomer-socialism-led-to-bernie-sanders-11579304307?mod=searchresults&page=2&pos=611579304307?mod=searchresults&page=2&pos=6

capital must be raised so that more investment and jobs are created at home. That means *lower*, not higher taxes on those who are making investment decisions. This is the opposite of the traditional leftist agenda pursued by the above two politicians.

For example, the US was able to win back the high-tech leadership from Japan in the late 80s thanks to the Reaganomics which drastically reduced taxes and deregulated the economy. Those policy changes encouraged those with ideas to try harder, and all those with transformative technology in Exhibit 13 realized their ideas during this period. But the same policy also increased income inequality.

In contrast, the Japanese and Europeans, who shied away from such drastic supply-side reforms, fell behind on the high-tech race and experienced slower job growth and investments. It is indeed ironic that all those young people who are complaining about inequality and espousing socialism are also the most avid users of devises and services pioneered by those who are at the top of the list of richest persons in America.

Right kind of supply side reform needed

Moreover, overzealous effort to correct inequality can have big negative consequence on growth. Japan's inheritance tax, for example, kicks in with a very low deductible and its marginal rate increases to 55 percent very quickly. As a result, there is a huge industry in Japan on how to reduce this tax liability, and many successful business people are wasting their time on such tax-reduction activities instead of using their time on what they do best, i.e., pursue their dreams by expanding their businesses. Some have moved out of Japan altogether.

Forcing people with a track record of success to waste their time renting apartment houses, which anybody can do, or leave the country altogether constitute a huge misallocation of entrepreneurial resources in the country. After all it is these people who create new jobs and industries, not academics or bureaucrats. For Japan, which has one of the lowest rates of new business formation among advanced countries, such a loss of talent is nothing short of suicidal.

The key question, therefore, is that of balance. The policy makers must constantly fine-tune the tax structure so that it will result in most investments at home while securing sufficient tax revenue to maintain necessary government services including education.

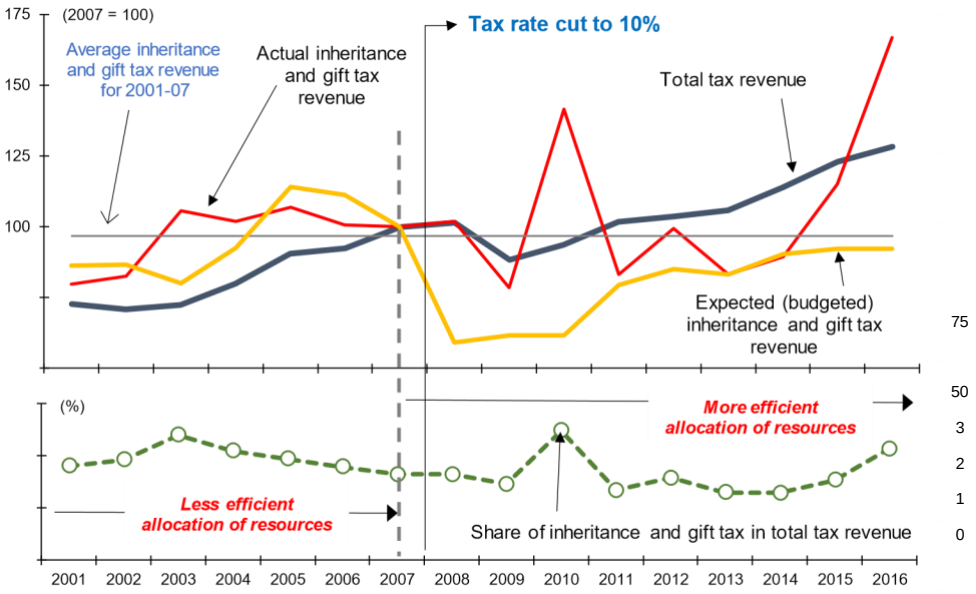
In 2008, the Taiwanese government drastically reduced its tax rate on inheritance and gifts to 10 percent so that Taiwan's pool of entrepreneurial resources will not be wasted on efforts to reduce this tax liability. In doing so the government fully expected the revenue from these taxes to fall and that was reflected in their budget for the following year (Exhibit 14).

The actual tax receipts, however, did not fall at all. This is because many people simply decided to pay the tax so that they don't have to waste time crafting elaborate schemes to minimize the tax liability.

This is an example of supply side reform implemented correctly. It encouraged talented people to concentrate their effort on what they do best while maintaining the tax revenue for those who need help. Although such reforms will increase relative inequality, it will help the economy to grow which should help those who are not so talented.

The policy makers who are concerned about the slowdown in growth and an increase in inequality in pursued economies should be concentrating their efforts in devising such tax structures. They should also explain to the public why the golden era tax regime, which looked fair and worked well when there was a surfeit of attractive domestic investment opportunities, is not necessarily the best for the economies in the pursued era, when a conscious effort is needed to encourage businesses to increase investment at home.

Exhibit 14 Taiwan's inheritance and gift tax cuts enhanced efficiency of resource allocation, and tax revenues did not fall



Source: Nomura research Institute, based on the data from Ministry of Finance R. O. C.

Real source of Thomas Piketty's inequality

The analysis presented here contradicts one of the key historical points Piketty makes. Namely, he claims that the extreme inequality that existed prior to World War I was corrected by the wealth destruction of two world wars and the Great Depression. He then goes on to argue that the retreat of progressive taxation in the developed world starting in the late 1970s ended up creating a level of inequality that approaches that seen prior to World War I.

Although he has ample data to back his assertions, his pre-World War I results may also be due to the fact that those industrializing countries were all in the pre-LTP urbanization era, which is characterized by a rapid increase in inequality. His post-World War I findings may also be attributable to the West's entering the post-LTP golden era where a rapidly expanding manufacturing sector allowed everyone to enjoy the fruits of economic growth accompanied by shrinking inequality. Piketty attributes this to the destruction of wealth brought about by two world wars and the introduction of progressive income taxes, but this period was also characterized by an end to rapid urbanization in most of these countries. For Western

economies, the four decades through 1970 was their golden era as their manufacturers were ahead of everyone else and were being chased by no one.

Finally, Piketty's post-1970 results may be due to the fact that Western economies entered their pursued era as Japan and other countries began chasing them. For Western capitalists able to utilize Asian manufacturing resources, this was a golden money-making opportunity.
But it was not a welcome development for a large number of Western factory workers who had to compete with competitively priced imports.

This also suggests that the favorable income distributions observed by Piketty in the West before 1970 and in Japan until 1990 were *transitory* phenomena. These countries enjoyed growing incomes and shrinking inequality not because they had the right kind of tax regime but because they were in a golden era when manufacturing prospered. And manufacturing prospered because the global economic environment was one in which these countries were either ahead of everyone else or chasing others but were not being pursued, i.e., the return on capital was the highest at home.

Just because such a desirable state of affairs was observed once does not mean it can be maintained or replicated. Any attempt to preserve that equality in the face of fierce international competition would have required massive and continuous investment in both human and physical capital combined with trade protectionism, something that most countries are not ready to implement.

It is not even certain whether such investments constitute the best use of resources, since businesses may still find that the return on capital is higher elsewhere. To the extent that businesses are under pressure from shareholders to invest in countries offering the highest returns, forcing them to invest at home is no easy task.

Conclusion

In a pursued economy which is characterized by a paucity of domestic investment opportunities, the government must implement a two-pronged approach to address the challenges of slow growth and increased inequality. First, the government must push for supply-side reforms to increase return on capital at home in order to encourage businesses to invest more at home. Even though such business-friendly measures may increase the sense of inequality among some groups, they are needed in the pursued era to accelerate growth and create jobs.

Second, because workers in a pursued era are largely on their own, the government should help them improve their skills by providing affordable access to quality education. Furthermore, because good jobs in a de-industrializing pursued era are likely to be in knowledge-intensive sectors where the level of educational attainment matters a lot, the government should push for improved access to education at all levels. This is where the battle to contain inequality should be fought in a pursued economy. And for the US, a more affordable healthcare system would be of great help in reducing the sense of vulnerability and inequality felt by a large part of the society. Perhaps the recent disaster with the COVID-19 pandemic will finally push the country to address this long-overdue issue.

Unfortunately, there has been virtually no macroeconomic theories or models that address the policy implications of capital earning higher returns abroad than at home, and very little of the policy debate in advanced countries is couched in these terms. On the contrary, economist's continued emphasis on the efficacy of monetary policy and disdain for fiscal policy are all based on the assumption that the economy is still in a golden era where the private sector is faced with a surfeit of attractive domestic investment opportunities.

In the golden era, the choice between supply side reforms such as tax cut and increased expenditures on social programs such as education was a matter of preference. In the present pursued era, when businesses are hard pressed to find attractive domestic investment opportunities and inequality is increasing amid slow growth, both supply-side reforms *and* increased expenditure on education are needed to hold the country together.

Since the former requires a lower tax rates while the latter requires higher tax revenue, a carefully calibrated tax structure is needed to achieve both. All of this suggests that economic management in the pursued era is far more demanding than in the golden era. Although many people are still longing for the return of the golden era while others are espousing socialism, none of them will be able to improve people's lives until they recognize the reality of the pursued economies in a global context.

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What is economics? A policy discipline for the real world

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Abstract
Economics is a policy discipline. It is engaged with the problems, large and small, of social organization and the general good. As such it co-evolves with circumstances. It is historically contingent. The application of economic ideas to specific problems under specific circumstances may succeed or fail, and in the latter case, people with different ideas normally rise to prominence.

Capitalism is an economic system whose characteristics and problems have preoccupied economists since the 18th century. It is not the only such system; there were economists before capitalism going back to Aristotle. And there have been economists under competing systems: socialism and communism had economists of their own. Today it is common to speak of "varieties of capitalism"; these too foster economists of differing views and perspectives. Economists and economic theories are a by-product of the social order that spawns them.

The world to which economic policies are ultimately addressed is a complex system. Yet economists seeking to develop appropriate policies are necessarily guided by simplifications and heuristics. The question before the discipline is to decide what sort of simplification is best suited to the task. In the spirit of modern science, this paper argues that appropriate generalizations, simplifications, heuristics and principles are to be derived from a study of the actual world. While these may deploy mathematical tools and draw on insights from the behavior of mathematical systems, the latter by themselves are inadequate, especially where they start from the dead dogmas of the neoclassical mainstream: *ex nihilo nihil fit.*

"Kepler undertook to draw a curve through the places of Mars, and his greatest service to science was in impressing on men's minds that this was the thing to be done if they wished to improve astronomy; that they were not to content themselves

[1] James K. Galbraith holds the Lloyd M. Bentsen Jr Chair in Government/Business Relations at the Lyndon B. Johnson School of Public Affairs, The University of Texas at Austin, and is an elected member of the *Accademia Nazionale dei Lincei*. A version of this essay will appear in P. Chen, W. W. Elsner and A. Pyka, eds., *A Handbook of Complexity* Economics, in preparation for Routledge and used there with permission of the World Economic Association. I thank Jerri-Lyn Scofield and Polly Cleveland for having the kindness to read and comment an earlier draft. This essay is dedicated to the memory of Eugenia Correa Vasquez (1954-2021), a distinguished policy economist in the real world.

> with inquiring whether one system of epicycles was better than another, but that they were to sit down to the figures and find out what the curve, in truth was" (Charles Sanders Peirce, 1877).

Introduction

Economics is a policy discipline. It is engaged with the problems, large and small, of social organization and the general good. As such it co-evolves with circumstances. It is historically contingent. The application of economic ideas to specific problems under specific circumstances may succeed or fail, and in the latter case, people with different ideas normally rise to prominence.

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The world to which economic policies are ultimately addressed is a complex system. Yet economists seeking to develop appropriate policies are necessarily guided by simplifications and heuristics. The question before the discipline – and the challenge of this volume – is to decide *what sort* of simplification is best suited to the task. In the spirit of C.S. Peirce and of modern science, this paper argues that appropriate generalizations, simplifications, heuristics and principles are to be derived from a study of the actual world. While these may deploy mathematical tools and draw on insights from the behavior of mathematical systems, the latter by themselves are inadequate, especially where they start from the dead dogmas of the neoclassical mainstream: *ex nihilo nihil fit.* Later in this paper, we will sketch out elements of research strategies that seem suited to a complex economic world. Before reaching that point, we must first draw the critical distinction between the practice of economics in the sense meant here, and the academic discipline that presently describes itself as economics.

Neoclassical dogma

Contemporary academic economics – orthodox, mainstream, neoclassical – was born in reaction to a panoply of radical turns in the second half of the 19th century. These included: a) the left turn of classical political economy from David Ricardo to Karl Marx in the logical extension of the labor theory of value; b) Henry George's application of Ricardo's single-tax doctrine to American land, naturally opposed by American landowners; and c) the easy-credit, bimetallist, free-silver campaigns of the Populist movement in the 1880s and 1890s, naturally opposed by bankers (Frank, 2020). Behind all of these economic and political movements lay an even more profound shift in the nature of thought, namely the emergence of evolutionary materialism and the frightening realization that the entire majestic and terrible apparatus of Nature is the product of self-organizing complex systems governed by a small number of indefeasible physical and biological laws, including most notably natural selection and the second law of thermodynamics (Georgescu-Roegen, 1971).

Against this horror of incessant change, irreversible time and potential upheaval, against the awful thought that human institutions are man-made, mutable and subject in principle to democratic control, neoclassical economics created a temple to Nature's God, conveniently domesticated in the guise of an all-knowing, self-regulating and benign market. In this happy mirage, the ancient Chinese notions of celestial harmony, appropriated to economics by François Quesnay (Davis, 1983), morphed into Alfred Marshall's scissors of supply-and-demand, and were generalized by Léon Walras to the case of *n* commodities in perfectly competitive markets, each equilibrated by flexible prices through the workings of an invisible auctioneer. Eventually Paul Samuelson (1947) cast the pall of J. Willard Gibbs over economic formalization, and misappropriated Adam Smith's metaphor of the Invisible Hand, which was altogether too apt to be left to the partly-prosaic use Smith actually made of it.[2] With the Arrow-Debreu (1954) model of general equilibrium the system was nearly complete, give or take the introduction of rational expectations and the representative agent, leading ultimately to computable general equilibrium (Scarf, 1973) and the Dynamic Stochastic General Equilibrium model.

The appeal of the neoclassical system was two-fold. First, it resonated with the urge of all societies to justify themselves in terms of some higher purpose: the Will of God, *la mission civilisatrice,* Manifest Destiny, and so on. Such a need becomes acute when the actual organizing principle of a commercial culture is as crass as money-making for its own sake, or the pleasures of material consumption. Second, the dogma provided a robust ideological response first to Georgism (Gaffney, 2007) and later to Marxism in the fetid intellectual climate of the Cold War. And so, it became the entry portal to a host of academic sinecures from which deviants were rigorously barred – even though the practical work of making economic policy continued to be done, in most Western countries, by a relative handful of non-neoclassical non-Marxists, mostly the otherwise-ostracized followers of John Maynard Keynes.

From the standpoint of intellectual hegemony, what was most important was the *framework.* In defiance of Joseph Schumpeter's (1942) dictum that capitalism is an evolutionary system, neoclassical economics fixed the taxonomic structures and concepts of the field once and for all: rational self-interest, representative agents, firms and households, capital and labor, prices and quantities, profits and wages, neutral money, natural rates of interest and unemployment, general equilibrium. Any deviation from this framework simply stepped out of bounds; it was by definition not economics. The theory was pure, and as the pure theory applied to nothing, it could not evolve.

Mainstream orthodox economics was thus hitched to Professor Pangloss and his timeless dogma of everything for the best in the best of all possible worlds, except when there are distortions such as interdependent preferences, Giffen goods, Veblen goods, monopoly, externalities, public goods, public spending or taxation, let alone any form of uncertainty not reducible to a probability distribution with finite variance. In short, modern academic economics

[2] "*By preferring the support of domestic to that of foreign industry*, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention..." (Smith, 1776). Roncaglia (2019, p. 177) notes that there are two other references to the phrase in Smith's work, neither of which support the meaning commonly attributed to the expression. [2]

"For my military knowledge, though I'm plucky and Adventury/ Has only been brought down to the beginning of the Century/ But still, in matters vegetable, animal, and mineral/ I am the very model of a modern Major-General..."

adopted the "model of a modern Major General" in Gilbert and Sullivan's *Pirates of Penzance.*[2] Its range extends to all conceivable situations, except those that matter in the real world.

In the real world, with the disappearance of state socialist systems in the USSR and Eastern Europe – though not in China – neoclassical doctrines enjoyed a brief period of actual hegemony, famously captured in the phrase "the end of history" (Fukuyama, 1992). In policy, efforts to make social realities appear to correspond to the underlying suppositions of the ideal type had been underway already for a decade, and these accelerated in an atmosphere of triumphalism. Deregulation, privatization, low taxes, small government, free trade and sound money were the watchwords of this era, denoted as neoliberalism. In a remarkably short time they brought on deindustrialization, stagnation, inequality, and precarity (Azmanova, 2020) With the Great Financial Crisis of 2007-09 the dogmas stood exposed and embarrassed: how could a theory that took no account of money or credit, that indeed had no banking sector and lacked any concept of fraud (Black, 2005), explain the greatest financial catastrophe of all time? But inertia and tenure carried neoclassical economics forward to the pandemic of 2020, at which moment a – possibly definitive – further collapse occurred (Galbraith, 2020).

Behavioural economics and complexity economics

What is to take the place of neoclassical economics and its neoliberal policy offshoot? There is no shortage of candidates, grouped under the broad banner of economic heterodoxy. Some of these successor doctrines – behavioural economics and complexity economics are examples of note – take the neoclassical orthodoxies as a point of departure. They therefore continue to define themselves in relation to those orthodoxies. Others avoided the gravitational pull altogether – or, as in the exceptional case of Keynes, made a "long struggle to escape".

The behaviourists depart from neoclassicism by giving up strict assumptions of rational and maximizing behavior. Complexity theorists explore the dynamics of interacting agents and recursive functions. Both achieve a measure of academic reputability by remaining in close dialog with the orthodox mainstream. Neither pays more than a glancing tribute to earlier generations or other canons (Reinert, Ghosh and Kattel, 2016) of economic thought. The model is that of neoclassical offshoots – New Institutionalism, New Classical Economics, New Keynesianism – that make a vampire practice of colonizing older words and draining them of their previous meaning.

The dilemma of these offshoots lies in having accepted the false premise of the orthodoxy to which it proposes to serve as the alternative. The conceit is of a dispassionate search for timeless truth, once again pursued by "relaxing restrictive assumptions" in the interest of "greater realism". Thus, for example, in complexity theories agents follow simple rules and end up generating intricate and unpredictable patterns, nonlinear recursive functions give the same result, the variance of returns turns out to be non-normal, and so forth. But once the starting point is taken to be the neoclassical competitive general equilibrium model, these exercises are largely drained of insight and relevance. The behaviourists can tell us that real people do not appear to fit well into the portrait of autonomous, selfish, commodity-obsessed pleasure-seekers that is "economic man". The complexity theorists can tell us, as Arthur (2021) does, is

that a system constructed from confections of interacting agents may be unstable. These things, even the dimmest observer of real-existing capitalism already knew.[3]

Evolutionary and biophysical economics

The evolutionary and biophysical approach to economic phenomena is not a new thing, and actually long predates the neoclassical orthodoxy from which some believe it now springs. It began with the intellectual interplay of Malthus and Darwin, developed through Marx and Henry Carey and (to a degree) in the work of the German Historical School, brewed and fermented in the pragmatic and pluralist effervescence of late 19th century American philosophy, and achieved a first full articulation in the hands of Thorstein Veblen (1898). It thereafter developed in the Institutionalist tradition of John R. Commons (1934) and Clarence E. Ayres (1944), among many others, and emerged as the dominant intellectual force in American economics under the New Deal.

The Keynesian and Institutionalist traditions then merged again in North America in the hands of John Kenneth Galbraith (Carter, 2020), and the line of work known as Post Keynesian was pursued by Robert Eisner, Hyman Minsky, Paul Davidson and Wynne Godley; it has now been popularized by William Mitchell, Randall Wray (2006), Stephanie Kelton (2020), Pavlina Tcherneva (2020) and others as Modern Monetary Theory. In Britain the Keynesian cause was carried forward by Richard Kahn, Nicholas Kaldor (1985), Joan Robinson, and others, with close ties to an Italian strain led by Luigi Pasinetti, Pierangelo Garegnani, Mario Nuti and others. The calamity of the great financial crisis is treated in many books and articles, a notable example being Varoufakis, Halevi and Theocarakis (2011). Specific attention to the problem of resource quality originates with Jevons, was developed in the modern era by Meadows et al. (1972) and is advanced today by the biophysical school (Hall and Klitgaard, 2018), (Chen and Galbraith, 2009). A further branch of the Institutionalist approach, with roots in Marx and Keynes, occurred in Development Economics, epitomized by such figures as Albert Hirschman, Raoul Prebisch, Samir Amin and many others, and carried forward still today by (among others) Ha-Joon Chang and Ilene Grabel (2014), Jayati Ghosh, and Luiz Carlos Bresser Pereira (2010). One might further identify a branch of transition-economy and
China studies, in which the New Pragmatism of Grzegorz Kolodko (2020) figures, along with Isabella Weber's (2021) path-breaking history of Chinese policy-making. There are many more; applications will vary according to problems.

The useful economist

The common characteristic of almost all of this work, excepting a few who preoccupied themselves with logical skirmishes with the neoclassical orthodoxy – e.g., the Cambridge controversies over the theory of capital (Robinson, 1956; Sraffa, 1960; Harcourt, 1972), or in microeconomics (Keen, 2011) – is that the protagonists were concerned, in the first place, with

[3] It is true enough that the application of statistical physics to finance (Yakovenko and Rosser, 2021) reduces orthodox finance theory to rubble. But what does that really add to the experience of Long Term Capital Management (Galbraith, 2000), the Asian crisis, the NASDAQ bust, the Great Financial Crisis or even *The Great Crash, 1929* (Galbraith, 2009)? What, in particular, do these new theories suggest that we *do?* An economist concerned with the effective regulation of a banking system gains little from mathematical statements of commonplace experience.

the practical questions of policy facing their governments or the international community of which they were a part. Whether reformist or revolutionary, their economics was (and still is) the elucidation of problems and the means of dealing with them. The purpose of economic reasoning is to inform and buttress political and social choices. It is not merely to create a simulation that kinda-sorta emulates some run of economic data.

The useful economist is one who engages in the quest for solutions. A truly useful economist does so in an open-minded, informed way, aware of underlying principles but not hypnotized by them, and independent of financial gain and personal ambitions, whether political or for status and celebrity among economists. The behavior of bankers and speculators, the emissions of factories and transport networks, the withdrawal of critical resources from a finite reserve in the crust of the earth, the level and distribution of wages, profits and rents, fair and effective taxation, how to achieve the willing cooperation of free citizens in pursuit of the common good – all these are part of what a useful economist may study. The person who stands outside and aloof from such questions, who purports merely to "model the system" is, for most purposes, an idler, not so much a scientist as a hobbyist.

Thus: Adam Smith's objective was to promote the interests and welfare of the trading community of which he was part, by expounding the virtues of large markets and the division of labor. David Ricardo sought to shift the burden of taxation from profits to rent, and Henry George sought to shift them from wages to rent, in both cases so that taxes would fall on the idle and unproductive landholding classes. Karl Marx wrote *Capital* as a theoretical foundation for the expropriation of capitalists. John Maynard Keynes sought to save and reform Britain and the bourgeois democratic order by advancing a practical cure for mass unemployment. John Kenneth Galbraith (1958, 1967) turned the attention of his readers to the economic problems of abundance: public squalor, pollution, residual poverty, the cultural and aesthetic wasteland, and corporate power. Hyman Minsky described the phase transitions of financial instability – hedge, speculative, Ponzi – and the need for Big Government and a Big Central Bank as stabilizing devices. Milton Friedman, an engaged conservative, co-wrote a monetary history to support a case for monetary rules (Friedman and Schwartz, 1963). In brief, the notion that any significant economist of any century has stood aside from the policy questions of their time is purest pretence.

Economic research

Economic research as it should be, is therefore a matter of trying to understand *how* the particular complex system in which we happen to live functions – or malfunctions – at any particular time, and to what sort of forces, pressures and policies it responds. Here one illuminating example is P. Chen's (2021) demonstration, from real data, that exchange-rate crises "can only be caused by financial oligarchs". Another was Mandelbrot's (1999) showing that the movement of capital asset prices is well-modelled by a multifractal generator, hence open to intrinsically unpredictable crashes. Such findings have the property that they are drawn from, or compared directly to, the phenomena of the real-existing economy in such a way as to motivate political and social choices. They do not consist in deriving policy from first principles, nor in exploring the properties of mathematical systems that – however interesting in themselves – map poorly or not at all to the complex economy in which we live. Again, examples of good work can be multiplied; the problem is not that research on the real world is lacking among economists and (especially) physical scientists turning their attention to economic

questions. It is rather that such research lacks the standing it deserves, because it cannot be integrated into the dominant theory.

The next section of the paper argues that for further progress, an economics for the post neoliberal era needs to develop *empirical* research methods adapted to the evolutionary perspective, thus permitting the worlds of the academy and those of practical policy to again be associated in a useful way. As Peirce wrote of Kepler, *this* is what is to be done if economics is to be improved. The paper presents some approaches drawn from projects carried out by this author over five decades. They are presented here partly in a spirit of *apologia pro vita sua,* but also in the hope that they may usefully illuminate a methodological argument.

The problem of economic taxonomy

A characteristic problem in the analysis of complex systems is the construction of an efficient taxonomy. Here the example of botany is instructive. In the hands of Linnaeus, a beautiful system was crafted, truly a work of art, but not science in the modern sense. Today the Linnaean classification is no longer in use. Instead, biological taxonomy is rooted in consanguinity at the molecular level, and reflects the divergences of an evolutionary process over time. Similar principles apply to classification in any complex system, including chemistry, engineering, and anthropology, and have been applied to the history of technology (Basalla, 1989). Such evolutionary trees are fundamental to scientific inquiry in respect of any complex field.

Economics in both its academic incarnation and in its practical work remains largely innocent of this prerequisite to understanding. “Purely theoretical” economics is characterized by taxonomies of only the most primitive and ideological kind, largely reflecting the recognized class divisions in Europe several centuries back (landlords, capitalists, workers) or their denatured replacements (capital and labor, households and firms). Practical macroeconomics relies on the taxonomic structure of the national income and product accounts, which is behavioural only insofar as Keynes (1936), Simon Kuznets, Richard Stone and other architects of the system saw fit to distinguish household consumption, business investment and government spending, as well as exports and imports, as behaviourally distinct categories. Nearly a century later it is by no means clear that the distinctions remain valid. For example, household consumption is comprised of non-durables, durables, and services. But while non-durables consumption closely tracks services (up until the pandemic), durables and business investment share characteristics. A model of behavior might therefore usefully reclassify household durables as a form of investment. More generally, a parsimonious and efficient analysis of aggregate expenditure should be preceded by a reclassification exercise, so that the taxonomic categories are not blurred by massively overlapping behavioural patterns, nor kept distinct artificially by force of habit. But such preliminary and behavioural reclassifications of given category schemes are rare, if not absent, in the literature.

Microeconomic analysis *per contra* tends to rely on survey data, usually that undertaken by a national government in pursuit of some ancillary obligation, such as a decennial census or the Current Population Survey in the United States. Such surveys are rarely identical or coordinated across countries (with limited exceptions in modern Europe) and so making them compatible for the purpose of transnational comparison is a major scientific task, undertaken in recent years over a limited range of mostly rich countries by the Luxembourg Income Study. But there

is a deeper difficulty, which is that the information collected is limited by the mandate of the survey taker, and this typically runs to such personal characteristics as gender, age, ethnicity (as legally defined in the country), years of schooling and so forth. The result is a vast literature on the economics of race, gender, and education, but far less attention to issues (such as industrial change) that do not so easily fit the template or register as characteristics of individuals and households.

In a similar vein, Thomas Piketty and his colleagues (Alverado et al., 2017) have mined income tax records to construct historical accounts of the income distribution in a range of countries over periods extending to more than a century in a few cases. The approach has advantages over surveys insofar as tax records cover a large number of individuals and households and ostensibly capture better information from the upper tail of the distribution. But, as with survey questions or even more so, the information reported is nationally-specific, since taxable income is a legal fact of the national tax code, and tax codes vary widely from one nation to the next. And the overall reach is limited by sparse record-keeping, tax avoidance, and the fact that many countries do not collect income taxes (Galbraith, 2019b). Even in the case of the United States, care is essential; tax filers and households are not synonymous categories (Rose, 2018), and changes in tax law and in filing incentives may have serious adverse effects on data comparability over time.

Another type of economic statistic relates to employers, establishments, industries and sectors, often collated by geographical subdivisions, such as states, provinces, counties, townships and so forth. Such data are a reservoir of information about what P. Chen (2021) following Walt Rostow, terms the *meso-economy,* otherwise known as the industrial structure or level of economic development. However, these measures are characteristically bibliographic and Linnaean; industries and sectors are grouped according to a wide and confused variety of criteria, including product type, process type, stage of the production process and others. From time to time new industries emerge and new categories are added or old ones subdivided. The classification scheme is typically hierarchical, in the manner of geographic subdivisions categories are divided and subdivided in layers of decreasing group size and increasing detail. But the industries and sectors so specified are intrinsically arbitrary to a degree; underlying similarities of genealogy or behavior do not rule, and so any given group structure will contain units whose organic similarity to, or difference from, each other will vary widely. As with almost every other source of data, economists working on policy issues rarely trouble to acknowledge the reification of category structure, which accepting a prior taxonomy constructed by non-economists for unrelated purposes necessarily implies. A similar story holds for budget categories in the analysis of public spending; expenditure categories constructed for legal and political reasons are not necessarily informative for social and policy analysis.

Efficient evolutionary classification

An evolutionary approach to taxonomy was worked out for the federal budget of the United States by this author in a PhD dissertation (Galbraith, 1981), later developed by Berner (2005). A parallel approach was developed and applied to US industries in Galbraith (1998), Ferguson and Galbraith (1999) and various papers in Galbraith and Berner (2001). The essence in all cases is to find a suitable, unit-free criterion variable to measure the behavioural similarities across and between taxonomic categories. In the case of budget categories, the variable is simply the percentage change in nominal expenditure from one period (usually a

year) to the next. Each category therefore has a vector of characteristics of length T-1 where T is the total number of time periods in the data set. A simple Euclidean distance in (T-1) space then gives a measure of the *behavioural* similarity, from which clusters minimizing within group variance can be constructed, with the number of clusters determined by a criterion of information loss as stepwise agglomeration proceeds.

In the case of industrial data, the concept of industry-specific labor rents (Katz and Summers, 1989) establishes a case to use changes in annual average wages (technically, payroll per employee) as the criterion variable. Underlying categories can be a single hierarchical data set by industry or region, or a hybrid of categories, including sector, region, gender and others, provided the categories are mutually exclusive (non-overlapping). The resulting classification tree provides an efficient summary of divergences through time, as entities within clusters do not diverge (or diverge less) than entities separated at the different branching levels of the tree. The cluster tree is thus a map of the evolution of elements within a complex system. A suitable group structure is then chosen by means of a stopping rule: groups are preserved as distinct entities, rather than being added together at later stages in the clustering, when the information lost by agglomeration exceeds a previously-specified threshold.

Extracting information from evolutionary group structures

Once a suitable clustering is achieved, a further step is the calculation of discriminant functions that account for the largest proportion of variation between groups. These functions are a vector of weighting coefficients (eigenvectors) of the matrix of time-series vectors underpinning the now-constructed evolutionary category scheme. The resulting eigenvectors are themselves synthetic time-series variables, capturing forces that move the variation between groups. The corresponding eigenvalues give the relative weight or importance of each force in accounting for between-group variations. Plots of the resulting cross-products illustrate the closeness and distance of the underlying elements along the various dimensions. As a final step, each eigenvector can be matched to historical time-series so as to identify the economic, political and social forces at play. For a full presentation of the technique, see Galbraith and Lu (1999).

In this way, Ferguson and Galbraith (1999) demonstrated that relative wage changes in the years 1920 to 1946 in the United States were driven by changes in (a) effective demand, (b) labor organization and strike activity, and (c) exchange rate movements, in that order of importance, together accounting for 90 percent of the significant differential effects. This analysis thus obviated the hypothetical effects of education levels, demand for skills, new technologies and so forth, that were commonly advanced in the mainstream literature, largely on *a priori* grounds (Goldin and Katz, 2010). Galbraith (1998) performed a similar analysis on the United States for the years 1958 to 1992, which identified variations in business investment, consumption spending, trade protections and war as four forces accounting for about 59 percent of inter-industry variation in wages.

The technique is thus non-parametric and atheoretic, yet capable of tracking changing conditions in a complex economic system with high precision and in a fashion that elucidates the impact of policies, mass mobilizations, external markets and environmental conditions on distributive outcomes.

Exploiting complexity for policy-relevant patterns: the case of inequalities

Real-existing economic systems have properties that are illuminated by the behavior of simple recursive non-linear functions; in particular they exhibit phase transitions – Minsky's trichotomy of hedge, speculative and Ponzi financial positions being an example (Minsky 2008) – and the characteristics of systems produced by multifractal generators, in particular distributions of asset price changes with infinite variance and a tendency to sudden and unforeseen collapse. These are useful heuristics, pointing in particular to the utility of trading limits, circuit breakers, price controls (Galbraith, 1952) and storage-release systems (Graham, 1997) for key commodities. Such policies have since ancient times been deployed to stabilize unstable economies (Weber, 2021).

The fractal and self-similar properties of actual economies present another opportunity for policy-relevant research. That is to exploit what is visible and recorded to measure what is partly invisible and unrecorded. It is characteristic of administrative data sets – again by sector, industry or region – that they are collected routinely, in stable format, on a regular basis, compiling a consistent record over time and space. They are of course biased in their coverage – informal work is not covered; services and agriculture are often covered poorly. But self-similarity suggests, and in many instances even dictates, that fluctuations observed between the categories and groups whose size and mean incomes are measured in the data will bear a normally-consistent relationship to unobserved sectors of the complex economy.

Thus, the evolution of a between-groups measure of *inequality*, typically the between-groups component of Theil's T-statistic (Theil 1972, Galbraith, 2014), will capture the principal movements of inequality in the economy as a whole. For a full discussion of the theory, see Conçeicão et al. (2001). And a compilation of such measures permits the creation of dense, consistent measures of inequality across countries and regions covering extended historical periods, along with precise detail as to which groups (regions, sectors, industries) are driving change in the overall measures (Galbraith and Kum, 2005). In this way a new accounting for complex structural change becomes possible. For further details on global inequality data sets, their quality and uses, see Galbraith, Halbach et al. (2016) and Galbraith, Choi et al. (2016).

Once an appropriately dense and consistent panel of inequality measures has been created, the simple application of a two-way fixed-effects regression to the panel permits a bidimensional decomposition, yielding both a consistent ranking of inequalities across countries (or other geographic units) and the mapping of a common pattern of change through time (Galbraith and Choi, 2020). Thus, there emerges a *macroeconomics of inequalities* at the global level (Galbraith 2007; 2019), The patterns of change in these data for the period since the early 1960s reveal clear turning points that correspond to the global financial crisis of the early 1980s, and to the peak of the credit boom in 2000/2001, thus bringing out forcefully the roles of debt, interest rates and financial crises as drivers of economic inequalities in the world economy. This in turn, once again, points directly toward relevant policies at global scale.

The integration of distributive outcomes with forces affecting the economy as a whole illuminate the need to break yet another bad but deeply-entrenched taxonomic habit: the distinction between "macro" and "micro" economics. This distinction arose as a political compromise in American economics departments after World War II, between temporarily ascendant Keynesians and the large strata of "determined little- thinkers" (Solow, 1967) trained in Marshallian supply-and-demand analytics and neither capable of nor willing to make the leap

from neoclassical Newtonian mechanics to Keynes' invocation of Einstein's relativity as the basis for an integrated theory of economics-as-a-whole (Galbraith, 1996). But a showing that *as an empirical matter* changes in distribution – the major ostensible object of microeconomic analysis – are driven by a small number of large forces acting on the whole economy through time is dispositive in favour of a change of theory.

Similarly, the demonstration *as an empirical matter* that national economies are closely linked – and not merely in Europe where *de facto* political integration is well-advanced – makes the case for an integrated global economic analysis *as the point of departure* for economic thought. The fact that statistical services operate mainly at other levels is an inconvenience but not an excuse.

Regulation as the general policy challenge for real economies

That complexity arises in open, dissipative systems (P. Chen, 2021) as part of the development of the life process is not itself economics. It is a universal insight drawing on physics, and illuminating biological, mechanical and social systems alike. A common feature of all such systems is regulation; the mechanics of survival require that the forces passing through the system be contained – in terms of temperature, pressure, volume – within the capacity of the materials from which the system is built to withstand them (J. Chen and Galbraith, 2011; 2012a; 2012b). A proper post-neoliberal economics is the art of applying this principle to the workings of economic life. Sometimes this involves lifting restrictions that are no longer necessary; sometimes it involves creating and imposing regulations and standards so as to foster stability, sustainability, and resilience.

In particular, financial instability, underpinned by a strong tendency of free financial markets to degenerate into waves of financial fraud, is a key driving force behind crisis, collapse and rising inequalities, and at the global level. The problem for the policy economist is therefore defined: how to stabilize the worldwide financial sector? The problem is not new; it was most forcefully addressed in the United States in the early 1930s through the Emergency Banking Act, the creation of the Securities and Exchange Commission, the separation of investment and commercial banking and the introduction of federal deposit insurance. Further it becomes apparent that the *deregulation* of the financial sector, pursued in the United States from the late 1970s and emulated around the world, has been the enabler of the resurgence of instability and ultimate crisis. Attention therefore focuses on how to achieve an appropriate *reregulation* and a reassertion of stabilizing control, without at the same time extinguishing the legitimate functions of credit and debt.

The problem of appropriate, effective and autonomous financial regulation at global scale is one of the most difficult facing the policy economist at the present time, but its purpose here is to illustrate *one case* of the *general policy problem:* how best to regulate the economic system. In their need for regulation, economic systems are no different from biological or mechanical systems; without regulation and maintenance and rules-of-the-road they invariably fail in a short period of time. In understanding the nature and purpose of regulation, we come to a very basic difference between real economists and their mainstream, orthodox, model-driven academic simulacra.

In the mainstream view, the *pure economy* is a self-regulating world; the only requirement for equilibrium at the maximum of social welfare is that all property rights be allocated and that the price system be allowed full freedom to adjust. Any impediments to the optimal result are due to externalities, distortions and interventions, and the function of the economist is to try to remove these so far as possible. This frame of mind helps to account, for example, for the enthusiasm of some economists for small business, for their hostility to unions and to taxes, and for the recurrent references to competition as a device to ensure better economic performance. Regulation is therefore a second-best approach, to be treated as having costs as well as benefits, and to be imposed only to the minimum degree necessary to offset such impediments to optimality as cannot be removed.

To the economist operating on policy in the real world, regulation is not an add-on. It is rather a necessary condition for the emergence of complex structures in the first place. Regulation is the complex of laws, rules, norms and habits that make the sustained functioning of complex systems possible. Only the Robinson Crusoe economy, lacking any actual society, can do without it, and then only in the absence of resource or environmental constraints, affecting the sustainability of even Robinson Crusoe on his island over time. In the real world, without economic regulation there would be no long production chains, no stable lines of credit, no trust in supermarkets or electric appliances or medicine, no air travel, no mass market for automobiles or any other complex device. Indeed, one can reasonably define the process of economic development as the achievement of regulatory standards that permit complex economic activities to emerge and to be carried out on a large scale and to be sustained over time. Rich countries have these standards and – if they wish to remain rich – they enforce them.

Conclusion

That the world economy is a complex system is beyond doubt. The issue for economists is how best to come to grips with this reality. One popular approach is to begin from the premodern simplicities of the neoclassical model, showing that fundamental differences in the behavior of the model occur when the most elementary assumptions are relaxed. This is progress of a most limited sort, providing some sense of intellectual achievement but no real guidance to the economist, whose task is to assist society in moving from the present into the future.

The alternative, advocated and described in this paper, is to exploit the methods of evolutionary science and some properties of complex systems to classify, measure, analyze and understand the forces driving significant economic change at the global, continental, national and local levels. This is the sort of knowledge that can then be turned to the practical work of economic governance, in the pursuit of common values for society as a whole: security, sustainability, prosperity and freedom. While methods will evolve with circumstance, this is broadly the approach taken by every economist in history whose name is likely to be remembered.

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Consumerism and the denial of values in economics[1]

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1. Introduction

Twentieth-century economics pretended to be a value-free science. Among the values in fact adhered to and promulgated are two that turn out to be especially problematic: the goal of economic growth, and the elevation of consumerism. Growth is a macroeconomic issue, while consumerism plays out on the micro scale of individual motives, choices, and actions. Mediating between these are business enterprises, especially corporations. These are the actors whose interests are served by the promotion of consumerism and the belief that economic growth is good – indeed necessary – for everyone.

This paper will begin with brief comments on why the values of 20th-century economics – especially the elevation of consumption as a goal, and consumerism as the way to achieve it – are dangerous in today's context. Next will be a glance at the history of consumerism, along with the counter history of industrialization in the Marxist inspired world of the Soviet Union.

Economics, as a system of theory, beliefs and practices is not responsible for all the woes of today's world, but it is deeply entangled with many of them. Subsequent sections (5-8) will look again at the embeddedness of consumerism in the U.S. economy, and then consider some of the ways consumer-related – and other – values are learned: through morality passed on informally and through formal education; how they are embedded in, and promulgated through, business practices; and some critical roles for government. Discussions of business will include the possibility for new forms (industrial ecology will be emphasized) to move in more wholesome directions.

Dramatic changes in our economy are needed if it is to shift onto a path of social equity and environmental sustainability – to dodge the worst possibilities of climate change – and to cope with the damages that cannot be dodged. System change requires value change. The paper will conclude, in section 9, with suggestions for values that could be adopted in place of those of 20th-century economics, and ideas for how such values can change the field of economics.

[1] Sections 3 and 4 in this paper draw heavily on a 2004 unpublished manuscript by my late husband, the MIT historian Bruce Mazlish. I am grateful to Mark Hoffman and James Aronson for helpful comments on this paper.

2. The dangers in consumerist values, and in the "value-free" claim of 20th century economics

A culture of consumerism[2] is one in which individual identity, self-respect and social position are strongly tied to the purchase of marketed goods; spending money is seen as a pleasurable and desirable end in itself; and there is encouragement for the belief that the purchase and use of high-end goods, in particular, will bring happiness. In the modern culture of consumerism, emanating from the United States but spreading widely throughout the world, the motivation for firms to sell what they produce has become a –perhaps *the* – great driver of economic behavior. There are two major problems with a culture of consumerism. One is that such a culture appears to detract from overall well-being (see section 5, below). The other is that it is hard to restrict growth in a culture oriented toward purchasing.

Economists often say – and the rest of the world has believed them – that the only alternative to economic growth is economic collapse. As an example, growth was seen as so essential that, in order to sustain the consumption bubble of the 1990s and the early 21st century, Federal Reserve Chairman Alan Greenspan felt it necessary to lower federal interest rates nearly to zero. Consumers were encouraged to borrow money on the basis of inflated house values, so as to be able to spend beyond their incomes. It became evident that that consumption bubble was unsustainable when it turned out that the value of many capital assets was to a considerable extent fictional.[3]

In contrast to the economic assumptions and promotion of ever-increasing growth and consumption, another discipline – ecology – teaches us that, in a contest between finite nature and endless economic expansion, humanity will inevitably be the loser. The reality of climate change is beginning to force a recognition that many aspects of our existing economic system are unsustainable. The most obvious is an energy system built on fossil fuels – coal, petroleum and natural gas. Some of the other unsustainable contemporary human systems include many aspects of how we use natural resources (soil, water, biota), as well as the economic-cultural system employed to keep raising output and consumption – the activities generally used to define economic growth.

Environmentalists have had at least one positive effect on mainstream economists, emphasizing the need to internalize the costs of economic activity that have been externalized to the natural world. However, other *meta-externalities*[4] – unwanted side effects of the whole economic system on its physical and social contexts – continue to be invisible to the theory. Critical meta-externalities show up in the impact of the economic system on the social context. ("The economic system" as just cited is a large concept; it includes not only all the economic activities of production, distribution, consumption, and maintenance of productive resources, but also the ways that ideas about the economy flow back and forth between economic actors and those who teach and theorize economics.) This impact is closely connected to the values embedded in 20th century economics.

[2] For an overview of this topic see Goodwin, Ackerman and Kiron, eds., 1997 *The Consumer Society*. Washington, DC., Island Press

[3] These capital assets included home values as well as many far less tangible "values" (derivatives and other sorts of bundled, etiolated or overleveraged assets) that were bought and sold on stock exchanges.

[4] I believe this term originated with me.

These values include the ideas that only selfish maximizing is rational; that work is essentially always a bad; that the goal of an economic system is to grow by perpetually maximizing output and consumption; and that markets are virtually always superior to governments in achieving economic goals, because markets are, in the ways that count in economic theory, more efficient.

Economists may point out that the literature in 20th-century economics includes many refinements – that the summary of the values embedded in 20th century economics just offered is far too simplistic. I would respond that the values cited here are, in fact, the ones that have been carried away from high school, undergraduate and graduate classes in economics, and they are the values often applied by decision makers, whether for personal or business decisions, or in public policy. These values are not only promulgated in classrooms; they have sunk deep and wide into a global culture to which very few societies in the world are immune.

Contemporary media, operating largely in the interests of business, have taken off from economic theory to promote a set of ideas about what is desirable and admirable. From the sales point of view, the self-interest of business is served by a culture of instant gratification and simplified thinking that urges material purchase as the answer to any discomfort. This is not the culture needed for the 21st century, when it is more than ever important that citizens and politicians care about the long run, and are able and willing to address intelligently the myriad highly complex issues that face modern societies.

3. The creation of the consumer society

Consumerism is closely allied with capitalism. It began as a Western phenomenon, becoming global with the global spread of capitalism. An overview of the historical aspects that appear to have been necessary for this huge shift include: a social revolution in the West, replacing feudalism with capitalism, and replacing a dominant aristocracy with a hegemonic bourgeois; the existence of a commercial revolution, which is pre-requisite for the institutional and productive arrangements required to supply an emerging consumer society; accelerating advances in science and technology; an urban-industrial expansion, shifting a large part of the growing population from a subsistence rural sector to a wage-paying factory locus; the spread of an ethos justifying both capitalism and the increased wealth of the ordinary worker; the encouragement of status ambitions and conspicuous consumption in both the middle and the working classes; and the development of institutions, such as advertising, to awaken and channel newly promoted wants.

Resting on this history, two 19th -20th century economic developments were critical in allowing mass consumption to come into being and to grow as the force supporting ever-increasing production. One development was the rise in price of human labor, relative to the prices of energy and raw materials – hence spreading purchasing power. The second development was that a growing proportion of the average household budget was liberated from purchasing necessities, and made available for "extras" – starting with pottery dishes and machine-loomed fabrics; moving on to bicycles and oil lamps; through Keyfitz's "standard package" of electric lighting, refrigerators, televisions and automobiles;. to computer gadgets, cell phones, jet skis and $5,000 barbecue grills.[5]

[5] Keyfitz, Nathan, 1998. “Consumption and Population” In *Ethics of Consumption: The Good Life, Justice, and Global Stewardship.* Lanham, MD: Rowman and Littlefield

Although consumerism took root in the eighteenth century, it took some time before it fully blossomed. At the dawn of industrialization, it was not at all clear that workers would become consumers. Early British industrialists complained that their employees would work only until they had earned their traditional weekly income and then stop until the next week. Leisure, it appeared, was more valuable to the workers than increased income. This attitude, widespread in preindustrial societies, was incompatible with mass production and mass consumption. It could be changed in either of two ways.

Initially employers in England, where industrialization essentially began, responded by lowering wages and imposing strict discipline on workers to force them to work longer hours.

Over time, however, organized workers, political reformers, and humanitarian groups pressured for better wages, hours, and working conditions, while rising productivity made businesses more open to meeting some of these demands. Thus a second response to the preindustrial work ethic gradually evolved: As workers came to see themselves as consumers, they would no longer choose to stop work early and enjoy more leisure. Instead, they preferred to work full time, or even overtime, in order to earn and spend more. In the United States, the “worker as consumer” view was fully entrenched by the 1920s, when the labor movement stopped advocating a shorter workweek and instead focused on better wages and working conditions.

By now consumer spending accounts for about 70% of the U.S. economy.[6] The economy that we have inherited from the nineteenth century’s combination of technological, managerial, social, and psychological innovations is one that appears to be dangerously threatened by depression or recession whenever consumer demand falters. To bring this point home, consider the need to build in automobile obsolescence, through changing fashions as well as by production of vehicles with a life expectancy shorter than technologically possible. What, it is worth asking, would happen to the U.S. economy if all buyers kept their cars for thirty years? Or what if we could keep using the same computers or cell phones for several decades?

In the twentieth century advertising came into being as a specialized profession whose task was to awaken desire for a product, not to provide information for one that was already in the buyer's mind. Advertising, especially after the advent of TV, became a force rivalling that of religion and education in shaping public aspirations. Here is an example. In the 1880s, cigarette smoking was only beginning to catch on, with most tobacco use being in the form of pipe smoking, chewing tobacco, or cigars. What cigarette users there were, rolled their own (as any good cowboy picture would show). James Bonsack, an inventor, patented in 1881 a cigarette-making machine that could turn out 120,000 a day (a skilled hand worker might produce 3,000 a day). No existing market, however, could absorb anything like that output. Enter James Buchanan Duke. In 1884, he installed two Bonsack machines. As the machines allowed the price to be cut drastically, Duke needed a mass market. He created it by engaging in a national advertising campaign, coupled to an extensive sales organization whose aim was to promote the consumption of cigarettes all across the country and eventually the world. Duke created the "want" for cigarettes, awakening in large numbers of people a desire to consume his mass-produced item. Camels and eventually Marlboro men entered the cultural landscape. In this prototypical experience, mass consumption is on its way to becoming mass culture as well.

[6] Federal Reserve Bank of St. Louis, 2020.

4. The Marxist alternative

We may look to the old Soviet Union for evidence that consumerism is not the only problem; industrialization according to a different ideology can also operate with cruel indifference to social and environmental externalities. Marx himself had paid little attention to the consumer, or even to the specialized production worker, simply assuming that goods will be "mechanically" produced without the push or pull of human desires. This was the theory at the time of the Bolshevik Revolution; however Lenin had to respond to different circumstances.

Russia had not gone through the stage of developed capitalism, with its accompanying consumption features – 90% of the population, for example, was still rural in 1917 – and could hardly assume an abundance of goods. Lenin's task, then, was to industrialize Russia by means of communism, or state planning. In pursuit of his goal he was even willing to import capitalist methods, under communist control, including the Taylor method of scientific management, and in 1929 the Ford Motor Company signed an agreement to produce cars in the Soviet Union.[7] All emphasis was on production and on the accumulation of capital. Consumption was a bourgeois, degenerate habit.

Stalin continued the process, only more brutally. Enormous leaps of heavy industry production occurred. The natural resources of Siberia, already plundered under the Tsar by Cossacks and trappers, was now exploited in the most blatant industrial fashion. Rich in raw materials, such as gold, coal and iron, this great undeveloped region became the source of over half of the Union's gross domestic product. The devastation of the environment matched the worst features of early capitalist depredations, and are still with the post-Soviet Union today.[8]

Marxian theory emphasizes the well-being of people in their roles as workers. This has been an important counterweight to the implication in much neoclassical writing that economists' prime concern should be with the well-being of people in their roles as consumers. It would be nice if the places in the world where Marxist economics are taken most seriously were leading in a move against consumerism, but unfortunately there is an overriding goal that continues to embrace both Soviet industrialization and consumerism in the West; the goal of economic growth. Moreover, as the countries in question have evolved since the tacit acceptance of Western (or at least more Western) economics in the 1990s, the behaviours of both producers and consumers have veered towards the culture of consumerism as described above.[9] Capitalism as we know it appears to come in a package that includes both consumerism and growthism.

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[7] https://www.history.com/this-day-in-history/ford-signs-agreement-with-soviet-union "Ford's assistance in establishing motor vehicle production facilities in the USSR would greatly impact the course of world events, as the ability to produce these vehicles helped the Soviets defeat Germany on the Eastern Front during World War II."

[8] See W. Bruce Lincoln, 1993, *The Conquest of a Continent. Siberia and the Russians* (N.Y.: Random House.

[9] This has seemed more evident in China, where the conversion to capitalist systems of production and distribution started a decade earlier and took place over a longer time; indeed, it is sometimes argued that for many centuries there were aspects of both capitalism and consumerism in China (though not widely distributed among the population), while these ways of living and working are more foreign to Russian history and culture. It remains to be seen whether there will be lasting effects from a recent youth rebellion against the emphasis on economic growth, consumerism, and the 996 (working 9 to 9, 6 days a week) system.

5. Cultural and psychological aspects of value shaping

Societies living by consumerist values are producing a huge quantity of goods and services, but a large proportion of these do not contribute to well-being, while many well-being needs continue to go unmet. An example of perverse production is an agricultural system that contributes to ill-health; the unmet need here is for nutritious foods produced without inputs that sicken both land and people. For another example, we would on the whole be better off if we could keep our household appliances, clothes, and other products for much longer than is now permitted by fashion, planned obsolescence, and "keeping up with the Joneses."

Because so much of the culture of consumerism in its modern form took shape in the U.S., it is worth looking at the cultural roots specific to this country. Historically American values have included a duality, between admirable thrift and ingenuity in the use of time and resources, vs. admiration of extravagant spending. The values cited in preceding sections of this paper have tilted very much towards extravagance. The possibility exists, however, for some eco- efficiency measures to be taken out of the frame of "low-class penny-pinching" and put into the frame of "smart business practices that also serve a noble purpose". New value contextualization may be required to move in this direction. This can only come about through iterative, mutually reinforcing changes taking place in many parts of society. Obviously the discipline of economics is only one among many areas where value change is needed, but I believe it is an area of great significance. As I sketch out the broader landscape of value- shaping I will try to suggest where economic theory and education may fit in.

A major portion of value-learning occurs in childhood and youth. However values can be revealed and strengthened at a later age, and can also be concretized and contextualized; for example, when people become aware that concern for our children and grandchildren must imply concern for the biosphere. It often seems, and perhaps it is the case, that the most important single arena for the shaping of values is formal. However, next to every modern, formal education system there exists a parallel one that is not generally recognized as such. In the United States, for example, the total US expenditure on advertisement in 2019 amounted to over $242 billion.[10] By comparison, this total is more than one-third the size of all public – federal, state and local – expenditures on education, which in 2019 totalled about $721 billion.[11] State funded education covers an immensely broad range of subjects and goals, while advertising has essentially a single goal: to promote consumption. And many children spend much more time in front of television sets than they spend in school.[12]

[10] https://www.statista.com/statistics/429036/advertising-expenditure-in-north-america/

[11] https://educationdata.org/public-education-spending-statistics

[12] Data for 2007-2008 show that the average American child spends 6 hours and 45 minutes in school (National Center for Education Statistics. 'Schools and Staffing Survey'. https://nces.ed.gov/surveys/sass/tables/sass0708_035_s1s.asp). By comparison, in 2019, the average screen time for 8-12 year old children was 4 hours and 44 minutes, while the average for teenagers was 7 hours and 22 minutes, not including time spent using screens for school work (this was before Covid put children into virtual school, skewing all data.) (Siegel, Rachel. 2019. 'Tweens, teens and Screens: The average time kids spend watching online videos has doubled in 4 years' *Washington Post.* https://www.washingtonpost.com/technology/2019/10/29/survey-average-time-young-people-spend-watching-videos-mostly-youtube-has-doubled-since/)

Obvious loci for value-shaping are:

- In the lives of children, teens and adults at home or in societies at large: among family and friends; through leaders, commentators, and influencers who are seen on the news as well as other TV shows; the arts; formal, obvious advertising; and the informal promotion of various values through social media.

- At school: from peers; through examples given by admired people, including teachers; in the "fashions of thought" that percolate through textbooks and other curricular materials.

- Through action: we come to believe in, and give value to, what we do; even while what we do is, in turn, shaped by our beliefs and values.

The force of morality runs across all of these arenas. Religions, parents, schools and ethically oriented organizations can and do offer a variety of alternative moral beliefs to the widely held economic tenet that "only selfishness is rational; everything else is either irrational of just pretend".[13] It is unfortunate that in the United States the ideology of capitalism and free markets, notably spearheaded by Milton Friedman, has been heavily politicized. It was adopted by President Reagan, used as a rallying cry during the Cold War, and has become a part of the political polarization of the 21st century. Thus the elevation of selfishness, which was first proposed as a tenet of economics in Mandeville's 1705 *Fable of the Bees*[14], was refined for modern purposes and is now a central tenet for the powerful monied interests that are defending their privilege against forces seeking to diminish inequality and address environmental crises.

Morality is often seen as in a contest with pleasure. The young field that calls itself hedonic psychology[15] (other people know it as happiness studies), sets out to clarify what actually contributes to happiness – an important question in a social/cultural/economic context where consumption is promoted as *the* way to happiness. Hedonic psychology has established strong evidence for a set of propositions that to some may sound like simple common sense, but that are directly opposed to basic assumptions in standard economics:

- Human well-being – the ultimate purpose of any economy – is not only tied to what people *have,* but also to how they feel about it and what they do with it. Leisure to enjoy the riches that advanced economies have accumulated in the last centuries is becoming one of the most significant scarce resources; for many, well-being will be

[13] To be sure, at any time and place in human history it would be possible to find sociopaths guiding their lives exclusively by this cynical belief, and there have probably been societies other than our own wherein it became dominant; but the survival of the human species has required many contrary impulses to be built into our genetic as well as our cultural makeup. There is no longer much debate between "the selfish gene" and "group survival" among those who follow science. Both are understood to be relevant drivers of human, animal and even plant behavior.

[14] First published in England in 1705, this predated the development of economics in any form now recognizable. Adam Smith did not make as much use of it as is sometimes claimed by 20th century economists who wished to cite Smith as the origin of this anti-moral stance.

[15] See, e.g., E. Diener and E. M. Suh, 2000, ed *Subjective Well-Being across Cultures,* Cambridge, MA: MIT Press; and Kahneman, Daniel, Ed Diener and Norbert Schwarz, eds., 1999. *Well-Being: The Foundations of Hedonic Psychology*. New York: Russell Sage Foundation

better served by more *time* than by more *products.* This gives credibility to a scenario in which some systems of production and consumption could be modified to produce less output (thereby mitigating climate change and other environmental burdens) but more well-being.

- Individual increases in material wealth do not raise the happiness of the whole society; indeed, evidence from Japan and the US, where the standard of living has risen greatly since the 1950s, shows no increase – if anything a decline – in the happiness of the population as a whole.

- Wealth very much beyond basic needs, when it belongs to and is spent on behalf of individuals, operates within a zero-sum game wherein success by a few creates, among the rest, hopeless wishes for emulation, and overall well-being is not increased. By contrast, wealth that belongs to, and is spent on behalf of, a whole society can be used to promote public goods such as environmental protection and ecological restoration, for the well-being of present and future generations. More equal societies are better able to cope with emergencies; moreover, if a cultural norm of equality promotes more use of resources for public goods, less for private status consumption, they will be happier.

The last point was vigorously made by John Kenneth Galbraith; however he did not have access to the supporting data assembled in the 21st century by the exponents of hedonic psychology. More recently Robert Frank has effectively re-examined the psychological factors that make people feel deprived when they observe others living at a "higher" (more expensive) standard than theirs[16]. This line of thinking can be turned on its head in regards to the common association of morality with sacrifice. The critical element is the question of community. If an individual reduces their expenditures for environmental or other moral reasons, the enjoyment of virtue must contend with constant reminders of what they are missing. If an entire society sets out to consume less it is possible that much can be done without a feeling of cut- to-the-bone sacrifice.

6. Corporations, governments, and business education

Who decides what will be produced, how and for whom? These are, of course, the essential questions put forth by standard economics – except that the first two words – "who decides" are generally not included. The economic actors to whom this decision-making role has been effectively given in the capitalist world over the last half century are the large corporations, including banks and other financial entities. The ideological choice, to *let the market decide what to do, because it is always more efficient,* is in fact a choice to leave the decisions to the large corporations.

The discipline of economics could play an especially helpful role in rethinking growth in new terms, including industrial ecology (briefly discussed below). There is a need for the best theorists to address the question – on both the micro and the macro levels (i.e., both for firms and for societies) – of how economic health can be compatible with a cessation, a reduction,

[16] See for example Robert Frank, 1999. *Luxury Fever: Money and Happiness in an Era of Excess*. Princeton, NJ: Princeton University Press

or at least a dramatic redefinition of growth. Such a basic reconceptualization must revisit a question that lies only partly within the domain of economics: which are the societal decisions that should be made by markets, and which should be made by other parts of the social structure?

Just to take one example, among many, of where this issue shows up, consider the deployment of financial capital, in the form of investments. Growth in the gross value of the stock market is generally considered necessary for pension funds, for university and philanthropic endowments, as well as the personal income of the investing class. In some other parts of the economy the necessity of growth is not quite so obvious; indeed, with the shrinking in the total human population that is expected to begin by 2050, if not sooner, an observer from another planet might wonder why we could not reasonably support a shrinkage in the size of the global economy. From the ecological point of view, that appears indeed quite appealing. Can it occur in ways that are not harmful for human well-being?

In a preferred world, as described, for example, by economists at the Next System Project of the Democracy Collaborative,[17] small businesses are started and run by individuals in the communities where they live. Their production decisions are shaped by their perceptions of gaps or needs that need filling, and by their perceptions of their own competencies and the available resources. This alternative world is fast slipping away, as more and more production is monopolized, while the monopolists expand their power to direct the activities of the smaller businesses.[18]

It is not realistic simply to suggest that small businesses *should* be the principal makers of production decisions. A countervailing power is needed. When Galbraith used that term, he assumed that organized labor, i.e., labor unions, would be the countervailing power – but corporate power, with government allies, has broken the backs of the unions in the United States, and greatly reduced their power in some other parts of the world as well. Government is all the more needed – not to make the production decisions, but to change the system, countering power with power.

These are critical issues today. The terrifying reality that has emerged in the US during the Trump regime is the extent to which democracy can be subverted, to make it ever harder even for proposals that have wide popularity among the people (such as higher taxes on rich people and corporations) to be enacted into law. It is clear that there is corporate control of large parts of government in the US, including federal and state lawmakers, and the agencies that are

[17] See https://thenextsystem.org/ and James Gustave Speth and Kathleen Courrier, eds, 2021, *The New Systems Reader*; New York, Taylor and Francis

[18] As examples, as of 2015 CVS controls 58 percent of the drug store business; Walgreens controls 31 percent; and Rite Aid controls 10 percent. (See https://www.openmarketsinstitute.org/learn/monopoly- by-the-numbers "Monopoly by the Numbers" Open Markets.) In the airline industry four companies—American, Delta, Southwest and United— control over 80 percent of the US market. (Koenig, Daving and Scott, Mayerowitz (2015). 'Analysis: Consolidation of the U.S. Airline Industry Radically Reducing Competition'. https://skift.com/2015/07/14/analysis-consolidation-of-u-s-airline-industry-radically-reducing- competition/). The internet advertising space also exhibits significant concentration, with Google and Facebook earning 64% of all online advertising revenue in the U.S. (Gjorgievska, Aleksandra (2016). "Google and Facebook Lead Digital Ad Industry to Revenue Record.") https://www.bloomberg.com/news/articles/2016-04-22/google-and-facebook-lead-digital-ad-industry-to-revenue-record.) For a general discussion see Goodwin et al, 2020, *Microeconomics in Context*, Fourth Edition, Pg. 559

supposed to control corporate activity. This is especially obvious in the continuing subsidies for fossil fuels by many governments around the world.[19] If solar energy technologies had received anything like the money that has gone into R and D for fossil fuel (let alone nuclear) technologies, the development of sustainable energy systems would be far ahead of where they are today. Unfortunately the fossil fuel producers still possess great political power, through lobbying and other kinds of suasion of government officials.

A realignment of government, toward the good of the whole society instead of the benefit of the segment aligning with corporate profits, will be made easier when there are other pressures for change in corporate behavior. Some investors do seem to be lining up more on the side of "environmental, social and governance" (ESG) values in business. Consumers, too, can have leverage, when they direct their purchasing away from companies that have especially bad reputations for environmental or social abuses. But if government continues to align with the interests of big business, those two forces together are almost unbeatable.

There is an important public education job here – to raise the level of societal awareness about the places where government actions, paid for by the taxpayers, are doing harm, and where they could do more good. That education should not be restricted to economics classes; however it has an important place there, in the reintroduction of the concept of political and economic power, which was removed from the neoclassical version of this discipline when the decision was made to canonize Adam Smith, but shorn of any ideas – such as power – that overlap with the work of Karl Marx.

Business ideologies and neoclassical economics have a more than half-century history of affecting and reinforcing one another. The values promulgated and practiced by the business sector will be much harder to change if change does not simultaneously occur in the content of formal education – economics, especially including the use of economic theory in business schools. For deep value recontextualization to occur, however, changes in business and in economic theory must be joined by systemic change supported by iterative and mutually supportive shifts in norms, occurring throughout all parts of society.

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[19] Public dollars flow to fossil fuel companies in many ways, including but not limited to:

- Special giveaways that exempt oil and gas companies from paying taxes on much of their foreign income and allow inappropriate deductions for fossil fuel development, exploration, and production costs.
- Research and development tax credits that encourage expansion of fossil fuel infrastructure.
- Lax financial requirements for cleanup of oil and gas wells that leave the public with the bill (if the wells get cleaned up at all).
- Below-market leasing rates, royalties, and fees that encourage further oil and gas development and exploit our public lands.

The International Monetary Fund has estimated the global total of a particular type of fossil fuel subsidies for 2017 – specifically "fuel consumption times the gap between existing and efficient prices (i.e., prices warranted by supply costs, environmental costs, and revenue considerations)" – at $5.2 trillion (an astonishing 6.5 percent of global GDP), noting that "Efficient fossil fuel pricing in 2015 would have lowered global carbon emissions by 28 percent and fossil fuel air pollution deaths by 46 percent, and increased government revenue by 3.8 percent of GDP" (Working Paper no. 19/89 downloaded 6-23-2021 at https://www.imf.org/en/Publications/WP/Issues/%202019/05/02/%20Global-Fossil-Fuel-Subsidies-Remain-Large-An-Update-Based-on-Country-Level-Estimates-46509)

7. Economic theory and possible futures

Returning to the ideology of economic growth, we should not dismiss it as always immoral or irresponsible; it can be a noble goal when it aims to lift people out of severe poverty. But, as ecologists have pointed out, you cannot indefinitely expand a subsystem (economic activity, in this case) within a non-growing super-system (the natural world). In other words, global economic growth cannot continue forever; if, in today's world, which has already reached and surpassed ecological limits,[20] it is desirable for some economies to grow, others must shrink.[21] We cannot continue, let alone expand, the consumption and lifestyle patterns of the richest 15 per cent of the world's people.

If we nevertheless wish to preserve the idea of GDP growth within an over-full world, one possibility is for the content of GDP to be radically redefined and reorganized[22]. The money-flows represented in this measure need to represent an ever-larger proportion of intangibles, and proportionately (perhaps absolutely) less flows of material. That implies a continuation and acceleration of the strong, 100-year trend toward production of services, along with trends toward recycling, reuse and extended use. The goal here is to reduce extraction of raw materials as well as the absolute amount of material moving through the economic system.

If this scenario is considered without some additional trends (mentioned below), the result will be a higher labor content in most of what is purchased: services are generally more labor-intensive than goods (relative to the inputs of energy and materials), and recycling and reuse (with an implication of greater attention to repair and maintenance) imply increased inputs of labor into every item over the course of its (much increased) useful life.

The paycheck-effects of a shift toward more labor-intensive production could be lessened by a move to tax consumption, energy, and some raw materials, in place of taxing labor. This would also hasten the substitution of labor and intelligence for materials and energy. However, there are some thorns in this rosy picture. If production methods and/or the composition of output are indeed altered to raise the labor input in proportion to energy and materials, an inescapable corollary is that the relative price of labor must decline. This is precisely the opposite to the most dramatic and important price trends that have held constant for most of the period since the Industrial Revolution, when the price of labor rose because it was paired with increasing inputs of energy and raw materials.

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[20] "Humans use as much ecological resources as if we lived on 1.6 Earths." The Ecological Footprint compares the resource demand of individuals, governments, and businesses against Earth's capacity for biological regeneration. See https://www.footprintnetwork.org/

[21] Only a few economists have looked at the global economy with this in mind; one, from the early 1990s, was Alan Durning, with *How Much is Enough?* More recently Tom Athenasiou has written extensively on this subject. See for example EcoEquity: Global economic justice as the key to emergency climate mobilization downloaded 6-27-21 at https://www.ecoequity.org/2021/04/the-us-fair- shares-pledge-the-ndc-of-our-dreams/

[22] Writings on this topic sometimes refer to "green GDP". See, for example, Harris, Jonathan and Brian Roach, Environmental and Natural Resource Economics – Global Development And Environment Institute (tufts.edu); and Stjepanović, Saša, Daniel Tomić, and Marinko Škare. 2019. "Green GDP: An Analysis for Developing and Developed Countries." *E+M*: *Ekonomie a Management*, 22(4):4-17. Also Jackson, Tim, and Peter Victor. 2020. "The Transition to a Sustainable Prosperity-A Stock-Flow-Consistent Ecological Macroeconomic Model for Canada." *Ecological Economics*, 17:106787. doi.org/10.1016/j.ecolecon.2020.106787.

Here it is necessary to remember some other trends, e.g., towards reducing demand for human labor via automation; this used to be less true in the service sector, but a growing trend toward automation even here was accelerated during the Covid19 pandemic.[23] The overall trajectory of these combined trends could be one in which the quantity of output is ever less dependent on the amount of all inputs except for *embodied information*. This an aspect of manufactured capital which refers to the fact that all manufactured capital is not equal: a fifth-generation personal computer can vastly outperform a first-generation PC, with reduced inputs of many kinds in both production and operation; a high-tech windmill can similarly be compared to an older model. The increase in productivity in these examples is not due to more inputs but to better design – i.e., information embodied in the physical thing.

This combination of trends could lead to reduction in environmental harms, but it could bring about a dystopia in which huge numbers of people are left destitute when economic survival depends on a paycheck from work, and there is not enough work. Since in this section I have been playing with relative proportions among types of "capital" (manufactured capital; natural capital; and human capital, as translated into labor) I will add one other: *systems capital*, which refers to the relationships among economic actors[24]. This term is appropriately applied to the quite new field of industrial ecology which attempts to put producers (and to some extent consumers) into relationships (e.g., through physical proximity) that will allow economic systems to imitate ecological systems.[25] It also refers to the relationships between ecological systems and systems of economic production. Thus, in an application of industrial ecology, energy and materials are used with maximum efficiency; waste is minimized; the end of one economic process is the beginning of another; waste-products of one process are inputs to

[23] A striking example is the system whereby restaurant customers use their cell phones to place their orders and also to pay their bill. As wait persons are then only needed to bring the food this wipes out myriad jobs that have been the stable recourse for young people in college, working in the arts, etc.

[24] I believe that this term is used for the first time here. The definitions offered in the text are purely in the economic context; the idea of systems capital could have other meanings if applied in fields such as sociology, anthropology, or possibly ecology, given recently observed synergies among communities of plants and microorganisms.

[25] This field took off quickly with the establishment of the *Journal of Industrial Ecology* in 1997; the journal *Progress in Industrial Ecology* (2004); and the International Society for Industrial Ecology (started in 2001). Here are a few examples of the concept in practice:

a) Kalundborg Eco Industrial Park in Denmark has existed for over 40 years. It was created by nine companies that decided to apply "a circular approach to production, in which one manufacturer's residual waste provides resources to another." See https://journeys.dartmouth.edu/envs3abinder/sample-page/kalundborg-eco-industrial-park/

b) The Rizhao eco- Industrial Park in China, established in 1991, is similar to that in Denmark, above. In 2011, "through a combination of symbiosis and cleaner production practices, 98 percent of the industrial solid waste in the park was recycled." https://www.greenbiz.com/article/lessons-chinas- industrial-symbiosis-leadership.

c) The Blue Marble Biomaterials and Anheuser-Busch Brewery partnership was announced in 2012. Blue Marble is a company that makes biochemical products, specifically targeting "high value flavoring and fragrance industries, which are ingredients in products such as bubblegum and shampoo." The two companies signed a memorandum, agreeing that Blue Marble would "convert spent grains and biogas from the brewing process into green chemicals that can be used in other applications, such as food, cosmetics and personal care products." See https://www.forbes.com/sites/ericagies/2012/02/22/anheuser-busch-to-join-industrial-ecosystem/?sh=3420209a4153

others. As a field of study, industrial ecology pulls in a multidisciplinary combination of engineering, sociology, economics, toxicology, ecology and other natural sciences.

Industrial ecology affords the opportunity to reconsider the balance between competition and cooperation in a healthy market system. As opposed to the standard picture of capitalism, as a system that works through the individual, unrelated efforts of each firm to maximize its own profits, industrial ecology depends upon the insight that many economic activities can be coordinated in a synergistic manner, so that the result is better than the result of uncoordinated action. In fact, such synergies have always existed in the relations between, for example, producers of final consumption goods and producers of intermediate goods. As multinational firms have become behemoths of size, it has been observed that they operate like whole cities of cooperation toward the goal of maximizing the firm's profits, whether this is achieved by setting units within the whole to compete against one another, or to be truly cooperative. The importance of social capital is recognized as it supports relationships of trust, in reducing transactions costs in these relationships. In a setting of industrial ecology the addition of physical/chemical/engineering possibilities to the list of synergistic relationships among economic actors adds a significant weight on the cooperative side in the balance between cooperation and competition.

The ability to realize large (no one knows yet how large) agglomerates of economic activities interrelated through the principles of industrial ecology may be a social function that will require public inputs. It may also require some new social capital, in the form of a changed perception (i.e., changed norms and recontextualized values) regarding competition, cooperation, and the goals and the responsibilities of business.

Change in what we produce and consume is one aspect of the necessary future; as noted, the other aspect will probably entail revision in how, and how much, we work. In addition to issues of labor productivity, another issue of great importance – many centuries overdue for consideration – is the kinds of work that are most essential for human survival and well-being. These include: raising children; producing food; providing education to assist people to develop, exercise and explore their mental, physical and spiritual potentials; providing home environments that are pleasant, comfortable and sanitary, and that support self-actualization; supporting and maintaining physical and mental health in children and adults; providing care for those who are sick, old or otherwise unable to care for themselves; and maintaining and restoring the health of the earth's ecosystems.

There are (at least) three striking characteristics of the foregoing list: these activities already have a high labor content, in proportion to other inputs; they have generally been among the least well-paid (often unpaid) categories of work; and women have been the predominant workers in most of the activities named here.

The question was raised, above, about how to provide resources to individuals who may be left out of highly productive systems that reduce most inputs except the intangible ones of social capital, systems capital, and embodied information. Put another way, this is a question about how to share among all members of society the output (or the money) produced in such a system. For people interested in the care economy – or for most women – this is not a new question.

The discussion in this section has dealt with the delicate balance that is likely to be required between applications of new definitions of efficiency, including dramatic reduction in

environmental harms; production of what is needed for a good society (including the essential work listed above); a fair distribution of the burdens of fulfilling essential needs; and fair, humane sharing of the output of a sustainable economy. The contribution of this paper is not a blueprint for how to achieve this balance, but a statement of the need for it, a discussion of some value shifts that seem required in order to move toward it, and a focus on what the discipline of economics can contribute toward such shifts. It is to this topic that I will now turn.

8. Values in economics?

A little semantics may be useful to start with.

- **Norms** are widely accepted assumptions that make it unnecessary for each individual to think through, in every instance, which contexts require the application of which values.

- One definition of **values** is the association of the ideas of *good or bad* – and the spectrum between them – that occur automatically to people when confronted with ideas, realities, behaviours, etc. In this discussion *good and bad* are best understand as *positive or negative*, not necessarily moral in connotation; they may concern what I perceive to be good for me, or in a context of achieving some particular (not necessarily moral) aim.

- The term, **ethics**, is often used to mean a collection of values in which good and bad do have a specifically moral tone.

- An **ethic** (in the singular), however, may be likened to a world-view; it summarizes a set of values and norms to serve as the magnetic north for a compass by which to set the overall course for an individual life, or for a society.

We are in global, social and environmental circumstances that call for a new ethic. Fortunately, at the same time, our current circumstances provide the foundation for such an ethic. The need lies in the fact that human actions are increasingly known to have consequences which affect others beyond the actors; metaphorically, we are all poisoning our neighbour's well, and we are all drinking our neighbour's water. The ethical foundations that arise in conjunction with this need will be illustrated here by the statement of several rules, many of which will appear familiar, or intuitively obvious, or both.

One aspect of the intersection between ecology and economics – bringing together both evolutionary and moral imperatives – is the simple **Budgetary Rule**:

> *In the long run, all economic and ecological actors must live within budget constraints; these include the communal planetary budget constraint, as well as those faced by each individual.*

In principle, nothing in economics denies the budgetary rule. However, it may be found to be in conflict with another economic imperative – an **Investment Rule** that may be stated as follows:

> *It only makes sense to invest in activities where the present value of the payoff is at least as great as the present value of the resources invested.*

When this investment rule is applied to environmental issues where the payoff (e.g., the benefit of retaining the protective ozone layer, of preserving productive soils, etc.) is often far out in the future, we run into the fact that the economic approach to investment involves discounting over time. In this procedure economically calculated costs and benefits are reduced by ever larger proportions as they are projected further into the future. Thus an event of fifty years hence, of almost any magnitude, is discounted down to insignificance in present calculations – while present costs are relatively easy to ascertain. At the beginning of this century some neoclassical economists, looking at the figures, concluded that it was not worthwhile to do much to avert global warming; the present discounted value of whatever happens in the year 2050 just did not warrant it. Now, of course, we are not only two decades closer to mid-century; we are also much, much closer to – already well into – the disasters of climate change.

One of the functions of ethics is to codify practical realities that are too subtle or complex to be thought through afresh in each individual instance. The practical reality to be addressed here is the fact that the future of the human race – including the fate not only of my grandchildren, but of his, and hers, and also yours – is bound up with the health of something much larger than any one of us; something which can be named the Earth's ecosystem. (Some people prefer a personification, and call it Gaia.) Increasing awareness of this ecological interconnectedness suggests that it is often inappropriate to apply the economic Investment Rule to issues involving ecosystem health.

Rather than inventing something completely new, I propose that we find a way of uniting two old rules that may, on the face of it, appear unrelated. The first is a simplified **Evolutionary Rule**:

> *Survival is the first objective.*

The second is Christianity's familiar **Golden Rule**:

> *Do unto others as you wish that they would do unto you.*

When "others" include Gaia, these meet in an **Environmental Rule** which says:

> *Do what is necessary to preserve the health of the ecosystem, for your own survival and wellbeing depends on it.*

It is a nice coincidence that everyone else's survival depends upon the same thing.

It is not enough to have a new ethic, or new "rules"; it is necessary to assist people to shift their understanding of which value contexts fit which social issues. This is not so much a matter of learning new values as of learning new ways of applying them. There is, in fact, more likelihood of many interlocking changes in mental models taking place than of just one occurring in isolation.

9. Coda: an alternative economic theory

The question is not whether economics should be value-free; if, as is increasingly recognized, not even the most "hard" sciences are completely value-free, then economics, a science whose entire subject is human beings – their wants and their activities – can hardly be expected to be free from the values of the theorists in the field as well as of the human subjects. And, in fact, throughout the twentieth century the discipline of economics has played a major role in shaping values. As noted at the outset, economics education has provided mental models that ignore issues of power and powerlessness, elevate selfishness, denigrate government in favour of markets, disregard any intrinsic values in work, and agree that consumption is the primary goal for individuals, to be reached by constant growth in macroeconomic output.

20th century economics did not have to move so far away from both ethics and realism. When we look back we can see the voices of dissident economists raised again and again, and consistently squelched, as the discipline turned away from relevance and toward a narrow conception of rigor. Increasingly, the incentive and reward system of mainstream economics departments selected, for graduate training, individuals whose chief strength is in mathematics, while broader interests in the implications and applications of the field had, if anything, a negative effect on the student's chances for successful completion of an economics doctorate. Each year the graduates of these programs are, on the whole, narrower in their interests and their knowledge than the existing practitioners in the field. As the narrowest of them are, in turn, the ones likely to be selected for academic promotion and tenure, mainstream economics has progressively turned its back on subjects that other people think should be important to the field.

Here is where the neoclassical insistence upon claiming value neutrality is most evidently harmful to the evolution of the discipline. Economists who feel free to admit to values as critical elements in their work have a strong link to relevance: they can ask such questions as, "What is the purpose of an economy? By what standards do we judge a better versus a worse economy?" As economists drawn to such questioning have been removed from the mainstream there has been a growing "outer circle" of economists who have been denied the more desirable opportunities to teach and do research or who have voluntarily declared themselves as outsiders because they simply could not agree with some essential mainstream tenets.[26]

Starting in the early 1990s I have worked with a number of great colleagues to develop a full alternative that we call *contextual economics*[27]. The name comes from our conviction that an economic system can only be understood when it is seen to operate within a social/psychological context that includes values, ethics, norms, motivations, culture, politics, institutions, and history; and a biophysical context that includes the natural world as well as the built environment.

[26] See N. Goodwin, 2008 "From Outer Circle to Center Stage: The Maturation of Heterodox Economics" in *Future Directions in Heterodox Economics,* Eds., John Harvey and Rob Garnett, University of Michigan Press. Available at http://www.bu.edu/eci/files/2021/01/Goodwin_Mat_Het.pdf

[27] See Goodwin et al, 2020, *Microeconomics in Context*, Fourth Edition; *Macroeconomics in Context*, Third Edition; *Principles of Economics in Context*, 2nd Edition; and *Essentials of Economics in Context*. Also Sebastian Dullien et al, *Macroeconomics in Context: A European Perspective*. Related teaching materials may be found at http://www.bu.edu/eci/education-materials/

The starting point for our contextual economics textbooks is an inquiry into goals: What are the appropriate goals for an economy? And, relatedly: What are the appropriate goals for the discipline of economics? Contextual economics emphasizes that most traditionally understood economic goals – efficiency, maximizing production or consumption, earning money – are best understood as intermediate goals, that is, means to other ends. The relevant final goals might include, for example, the satisfaction of basic physical needs (e.g., for food, water and temperature regulation; happiness (including a good balance of comfort and stimulation); self-respect and the respect of others; self-actualization and a sense of meaning; fairness in the distribution of life possibilities; freedom; democracy and participation; and a natural environment that supports healthy human life. These may be summarized as *well-being*. The scope of consideration is all humans, in the present and in the future, and regardless of the extent of their involvement in market transactions.

In defining the economy contextual economics adds to the traditional trio of "production, consumption and exchange" a critical fourth function: *resource maintenance*. This includes upkeep of manufactured capital, maintenance and enhancement of a healthy stock of natural capital, and many of the kinds of work listed above as most essential for human survival and well-being. It may be that it was because this work is so often performed by women that resource maintenance has not previously been included in the list of essential economic functions; indeed, it was a leading feminist economist, Julie Nelson, who, as a collaborator on contextual economics textbooks, introduced this concept.

A focus on caring labor and on the nonmonetized, cooperative economies of households and communities inspired in contextual economics a structure that organizes discussion of a modern economy in three spheres:

- The **business sphere** is composed of profit-oriented firms, which, however, contain other important motivating forces beside the drive to maximize profits. It is worth noting that corporate charters were at one time granted on the assumption that corporate activities would promote human well-being. This concept is often forgotten, but the potential remains for it to be revived.

- The **public purpose sphere** is composed of governments and non-governmental organizations (NGOs). Like firms, they use money as the principal (though not the only) medium of exchange for procuring labor. Unlike firms, they have an announced goal of advancing the well-being of some defined portion of society, and do not have shareholders or owners to whom they must return a profit.

- The **core sphere** is composed of households and communities. Their principal use of money is for exchanges with the other two spheres. The motive for economic behavior in the core is the survival and well-being of individuals: self, family, and other community members. The resource-maintenance activities of the core sphere include the work that develops and maintains human capital. For children, that means nurturing, nutrition, basic education, and socialization; and for those already in the workforce, it means the refreshment of mind and body and spirit for enhanced health and vigour.

A balance is required between simplifications imposed for the purpose of making sense of the economy, and attempts to recognize the actual complexity of the world. Contextual economics

aims to pull this balance somewhat away from methodologies that require extreme simplification, towards a richer understanding of the nature of economic actors and economic activity. This has required a broader conception of "the economy," to include economic activity that occurs not only in the business sector, but also within households and communities, and in governments and other public purpose organizations.

Such a broader conception, accompanied by appropriate value shifts, is essential in an era when climate change, as well as shortages of clean water, fertile soil and other natural resources, make it evident that if our economies continue in the direction they are going we are headed for catastrophe. There is a clear need to move away from the currently dominant mental models, towards new ones that give primacy to human well-being and the health of the Earth's ecosystems as the ends to which wealth is only one of many means – and may not always be a desirable means.

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Of Copernican revolutions – and the suddenly-marginal marginal mind at the dawn of the Anthropocene

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It used to be thought that Copernicus initiated an intellectual revolution – indeed Thomas Kuhn called his first book *The Copernican Revolution* (1957). But in this Kuhn was mistaken. Throughout Europe astronomers took a keen interest in what Copernicus had to say, but, with only a very few exceptions, they took it for granted that his account of a moving Earth was simply wrong. If the earth moved, we would be aware of it; you would feel the wind in your face. If you dropped an object from a tall tower, it would fall toward the west… Since none of these things happened, all the leading astronomers – Erasmus Reinhold, Michael Maestlin, Tycho Brahe, Christoph Clavius and Giovanni Magini were confident that Copernicus was wrong. Still, they were fascinated by the simplicity of his techniques for calculation…They liked Copernicanism as a mathematical device; they had no time for it as scientific truth.

David Wootton, The Invention of Science[1]

As we push on through this second year of our global pandemic – what an acquaintance, one hopes too grimly, calls "the start of The Covid Decade" – the 10,000,000-plus lives claimed so far[2] (and the millions more still to join them) place a burden on how you or I can honestly talk to one another about "economics", "neoliberalism", and "post-neoliberal economics".

My wife and son were both infected with the COVID virus last spring, before masks were required or the habits of daily work and social life had been fully upended through mass shutdowns of offices, schools, and retail street life. They both thankfully survived – though only after what for us were harrowing days.

In the year since, like many of you, I have lost friends – two directly to COVID, three to complications the virus added. Six others have also died, losses still deeply felt by those of us

[1] Wootton, *Invention of Science*, 145

[2] *The Economist* estimated that COVID's global death toll by May 2021 exceeded 10 million: https://www-economist-com.ezp-prod1.hul.harvard.edu/leaders/2021/05/15/ten-million-reasons-tohttps://www-economist-com.ezp-prod1.hul.harvard.edu/leaders/2021/05/15/ten-million-reasons-to-vaccinate-the-worldvaccinate-the-world

who love them even now, yet because we've all been hemmed in by our fears and our mandated isolation, deaths which have left us without ability to gather and mourn.

Too narrowly conceived, issues of "economics" thus haven't felt to me of surpassing importance in this moment – and yet they are.

Nothing about this global health pandemic has escaped simultaneous reference back to, or framing in, terms of "economics" – most immediately for most people (who aren't economists), measured by a combination of the unprecedented trillions that powerful governments and their central banks have poured into their economies; by the exorbitant costs for the crash development, production, and successful distribution of vaccines; by the massive financial losses imposed by the shutdown or curtailment of businesses; by the physical shortages caused by disruptions to what is anodynely called "the global supply chain"; and by the abrupt disappearance or curtailment of millions of jobs worldwide – and with those jobs, the personal income that purchased food, paid for homes and cars and clothing, indeed supplied all the variegated necessities and luxuries we has grown accustomed to assuming were always simply there.

The scale of all this disruption has clearly shaken many economists' complacencies about what our leading colleagues at the start of this century benignly termed the "Great Moderation" of the increasingly global economy, an ever-more unified world that was being brought about by the super-human monetary skills of "The Maestro" Alan Greenspan, by Robert Rubin's and Larry Summer's inspired deregulation of finance, and the emergence of a truly "global market". It was a "market" that was governed by an almost-natural set of market "laws" – laws that had been discovered in a two-century-long development of thought by – this bears noting, for reasons to which I'll return – mostly Western, mostly bourgeois (or if you prefer, upper-middle-and-middle-class), and almost always male, academics whose careers had been spent refining (again the anodyne phrasing) "market economic" theory – or more simply, "economics".

So there's reason to pause here and ask what has happened because of COVID. I mean that, first, in terms of the self-evidently massive global dislocations[3] that a microscopic virus (and now its variants), a virus indifferent to our vocabulary of markets, market rules, and economic theory, has imposed. Secondly, I mean it in terms of the societally-organized responses our little species (one among so very many with whom we share our tiny planet), has so far produced, intentionally and haphazardly, through its state-bordered subdivisions and regnant governance theories.

Let me lay down quickly now how I mean to take up COVID's impact on "economics" – and then how I'll tie my views to the charge that Professor Fullbrook set out in his invitation:

> There are signs [he wrote me some months ago] that neoliberalism as a dominant ideology is in decline. Given that most of its dogmas are grounded in the axioms of traditional economics and given that those axioms are increasingly and ever more dangerously at odds with reality, it could be that economics is approaching its Copernican moment.

[3] Again, a word not robust enough for what needs to be understood.

But what, I quizzically asked myself as I sat down to outline this paper, *would* such a PostNeoliberal Economics look like? Replying to him initially, I had asserted a certain confidence about what I would answer – but now in honesty I still find questions nagging. This essay is my attempt to puzzle out some answers that still contain what remains for me unanswered.

I've taught at Harvard for nearly 30 years, am nearly 75, and have witnessed many once bold-seeming experiments in our profession's attempts at theorizing, rise and then fall: input output, the Phillips Curve (and NAIRU), game theory, supply side, monetarism, New, Neo-, and Post-Keynesianism, random walks, New Classical and New Growth theories (two among the many growth models from Harrod-Domar, the first I learned, to the various current flavours of DSGE), the Real Business Cycle, rational expectations, Taylor rules, MRI-based behavioural economics, the Washington Consensus, shock therapy, the new empiricism, and so far, it already appears, a good deal of behavioural economics and large-scale data manipulation. I can still also clearly recall reading the AEA's scholarly COGEE report on the state of American economics some 30 years ago, the one that found over 60% of graduate-level faculty agreeing that economics "overemphasizes mathematical and statistical tools at the expense of substance" and the report worrying aloud that the profession was producing a generation of "idiot savants".[4]

Here at Harvard over the years, I've also certainly seen an ascent of what one might well call "neoliberalism" not just in economics but political science and political philosophy – and (this is not unimportant or unrelated), in both the university's administration and in students' assumptions about "the real world" they'll enter after graduation (about which I'll say more later). Today, after the Great Recession and still in the COVID Crisis, while I'm not sure I'm seeing neoliberalism's fall, I know I am looking at a far more confused and confusing landscape of fragmented ideas. It's a fragmentation one of you might argue that's a mutation or neoliberal variant (COVID inspires thoughts of neoliberalism as a virus) – but it's also, I think a landscape that nonetheless contains possibilities for real change.

Contexts (economic and political) we ignore at our peril

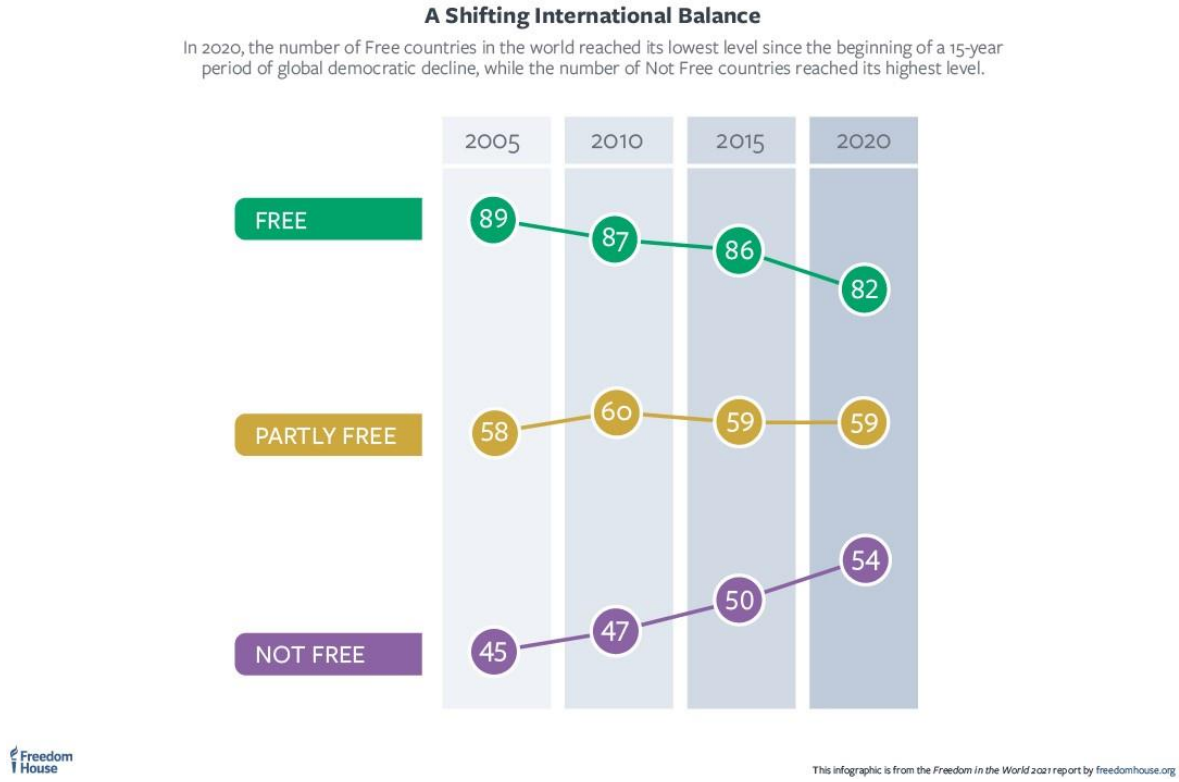
First, context-setting: it's clear that "neoliberalism" – at best, a very loosely-bounded school of "economic" and "political" thought – *is* under assault intellectually and institutionally (though there's much to parse here). This assault is rather new – but "neoliberalism" as a descriptive term (it's not just an epithet) is itself rather new, at best about 30-40 years old, and seems to have arisen associated with the seeming "death of Keynesianism" in economics during the Reagan-Thatcher years and the subsequent rise of leaders such as Clinton and Blair (and Obama?), so its sudden fall must be set against its sudden rise.[5]

[4] I wrote about the AEA's COGEE Report a decade after it appeared in the JEL in 1991 in Parker, "Can Economists Save Economics?", *American Prospect*, December 19, 2001. For my troubles, Robert Solow wrote the *Prospect*'s editor privately to bitterly complain that I was "washing our dirty laundry in public."

[5] Jamie Peck, *Constructions of Neoliberal Reason*, is a useful introduction; for those so inclined, a more radical reading is David Harvey, *A Brief History of Neoliberalism*. My Harvard colleague Dani Rodrik has a succinct view, worth quoting here: "As even its harshest critics concede, neoliberalism is hard to pin down. In broad terms, it denotes a preference for markets over government, economic incentives over social or cultural norms, and private entrepreneurship over collective or community action…Today it is reviled routinely as a short-hand for the ideas and the practices that have produced growing economic

Second point: worryingly, outside our cloistered universities, right-wing "populism" – a term some critics equate with an equally loosely-defined "neo-authoritarianism" – is on the rise, with figures such as Trump, Modi, Bolsonaro, Orban, Duterte, et al. the representative political indicators of this trend. (Whether Putin and Xi, or Middle East figures like MBS, or any number of African, Latin American and Asian heads of state fit this "neo-authoritarian" definition – or are simply old-fashioned authoritarians – for me adds complexities about the scope and history of "neoliberalism".) What most concerns me, though, about this emergent neo-authoritarianism is captured in two charts I've put here.

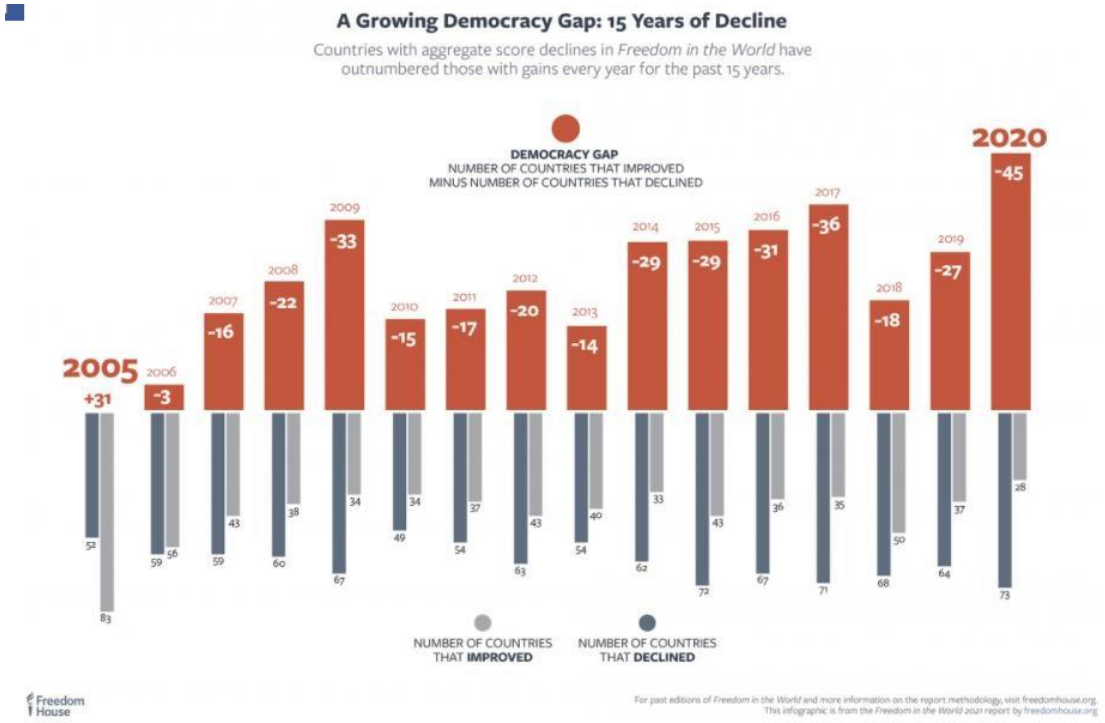
The first aggregates 21st century governance systems (set aside their economic systems for a moment) in the roughly 200 nations of the world. Its message is the reminder that *democratic* governments are not a majority – and are (we also know) a novelty in human history, one that has become meaningfully extensive only in the last half-century, a flicker of time since the late Neolithic dawn of early states.[6]



insecurity and inequality, led to the loss of our political values and ideals, and even precipitated our current populist backlash." Dani Rodrik, "Rescuing Economics from Neoliberalism," *Boston Review*, November 6, 2017. Also worth reading is Zack Carter on Friedman and neoliberalism, "The End of Friedmanomics", *The New Republic*, June 17, 2021: https://newrepublic.com/article/162623/milton-friedman-legacy-biden-government-spending

[6] James Scott, *Against the Grain*, is especially insightful here, especially when read in conjunction with his *Seeing Like a State*, with its indictments of the sort of top-down planning that development economics and multilateral institutions, long before "neoliberalism", began celebrating and still view as the necessary path to "modernization".

The second chart, slightly more detailed, here tells more about the "democracy trend line"[7] for those past 15 years – for this paper's purposes roughly what we might think of as *the era of neoliberalism's decline*:



I'm concerned, in short, as I set out here about what might socially, culturally and politically be coming next – if this is indeed the start of a "post-neoliberal" era. You and I may have our own dreams about that next world – and certainly should talk about and debate them – but we're not guaranteed that *our* dreams will define the future. Democracies and democratic rights are not so well-established that we can presume their ongoing continuity, let alone their inevitable spread or strengthening; in fact, the risks right now are the opposite. What I'll say next about "neoliberalism" is deeply grounded in that alertness to what I fear *could* come next.

Conceiving a post-neoliberal economics is for me thus only one part of imagining and then constructing a much larger, more *progressive* post-neoliberal world – and how to redesign the standard-form "economics" taught in most universities is only one colourful problem thread among many in that tapestry we must reweave.

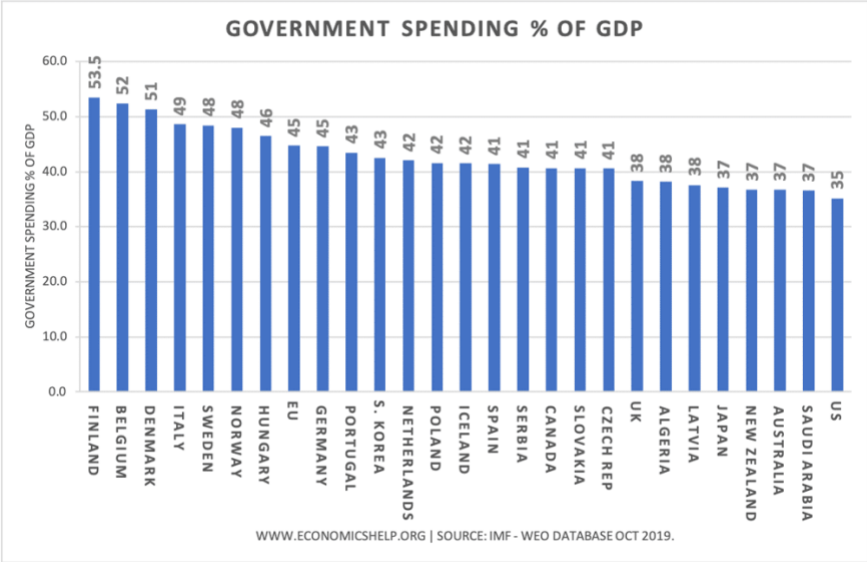
[7] The source of this table – Freedom House's annual survey of state governance systems – this year is headlined "Democracy Under Siege": https://freedomhouse.org/report/freedom-world/2021/democracyhttps://freedomhouse.org/report/freedom-world/2021/democracy-under-siegeunder-siege.

A first-order claim

At the start, let me assert a core to my argument: seeking to repair blackboard economic theory by, for example, somehow re-centralizing and re-legitimizing "the state" and its right to lead markets is simply not enough. This "re-centring" was the essence of the Keynesian Revolution in the mid-20th century, and in complicated ways it seems to be at the heart of the Biden Moment we're in here in America. It's also the apparent desire of many of my more liberal-than-progressive colleagues.

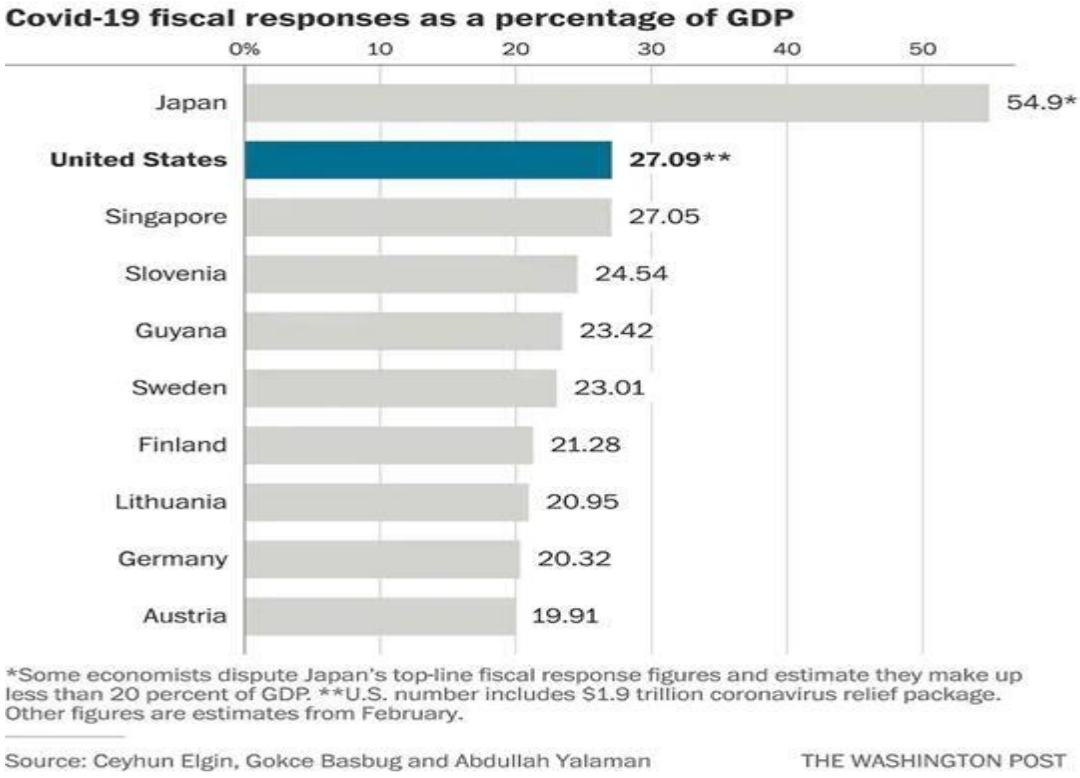
What we need, however, is a much broader vision, not just for a new "textbook economics" but the uses to which we put our intelligence as men and women, and not simply economists. That vision must fit into a much larger and ongoing argument about being human and about living into a truly democratic, much more egalitarian, and environmentally sustainable world. Here I'll nod to our profession's jargon but point past it at the same time: it's a vision that would seek to grow what I'll call, borrowing from John Dewey and Richard Rorty, "democratic efficiency". On that, more to come.

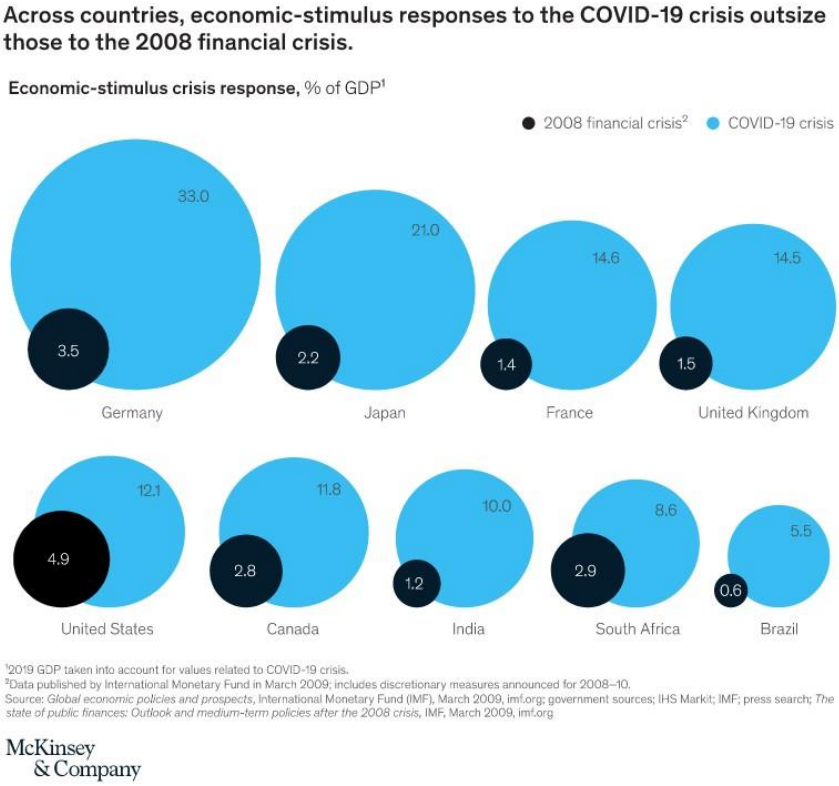
I realize that a good many of our more cautious colleagues think that neoliberal models can be overturned by somehow "rebalancing" mainstream economics' stylized concepts of "markets" and "states" and their separate spheres. But that, in my view, ignores something obvious: the US and its OECD partners are not accurately describable as "markets first and states second" systems – and haven't been for quite some time. The average share of government in the developed world's GDP is over 40%, often closer to 50% – and if one adds the GDP shares of the non-profit sector, the hybridized for-profit "public-private partnership" world, and the increasingly-vast landscape of private contractors and consultants to governments (whether it's McKinsey, Lockheed, or Blackstone, and whether it's in defence, health care, IT, toll roads or garbage collection), the percentage is even higher. Here are some percentage comparisons – familiar to most of you – for the narrow, "government-only" share of the mis-named "market economies" we inhabit:



There is nothing today, in short, about "the state" (that haunted "other", the *xenia* in our most essential portrayals of "the economy" as an extant thing) that makes it exogenous or ancillary or unimportant to "the real economy". They are separate spheres in our imaginings, not in the world around us.

Beyond recognizing the collective enormity of these well-established "non-market" sectors in our "market economies", we can also surely point right now to those states' massive "economic" responses to The Great Recession a decade ago. More immediately we can also simply note the Great-Recession-dwarfing scale of the work by states, their central banks, and the multilateral institutions to COVID since early last year. For illustration of the scale, these two charts:





One can see in these charts just how *powerfully and permanently immanent* governments have become (supremely in the big OECD countries but also in China, the current global growth poster child). No American economist I know would have predicted "the non-market's" extraordinary multi-trillion-dollar interventions into "markets" of all kinds – of goods and services, of finance, of construction, health care, housing, income, etc. No American economist would have predicted the trillion-dollar follow-through proposals of the Biden administration – repeat, the Biden, not the Sanders, administration – that are before us today, awaiting Congressional action.

I will leave for another paper detailed discussion of three points these charts raises for me. First, how – and why – the scale of governments, their contractors, and the non-profit sectors grew in terms of GDP to these new quantum levels beginning after World War II. Second, how the citizenry of OECD countries prospered at least during *les trente glorieuse*s despite the fact that nearly half their economies routinely passed through the state and its collateral non-market institutions.[8] These simple facts-on-the-ground seem to be the most embarrassing and comprehensive refutation of neoliberalism's claims for the desirable (and ever-to-be-desired) supremacy of "markets" in all matters economic (or at least refutation of the "freshwater" Chicago view – and before that, the Austrians' ur-text "road-to-serfdom" alarums).

[8] I might there mention, no doubt, that in the US, where the GOP has long considered itself "the party of fiscal responsibility" and used marginalist arguments to damn public deficits, that the last Republican President to balance a budget was Dwight Eisenhower; but I digress.)

Why we feel marginalized by marginalism

But that raises the question why so many self-described "progressive economists" today feel "marginalized" in the world of marginalist economics and its varied offspring, including the "neoliberalism" that I've been invited to refute and transcend.

To address that, let me quickly sketch a "longue duree" history: "economics" as most academic economists practice it is a societally-organized way of seeing the world that has long relied, institutionally, on three pillars. The first is the emergence of the modern university. The second is the idea that the university can be divided into departments that proximately represent relatively autonomous modes of thought.

The third pillar, most important here, is the ubiquity, now global, of the products of the first two. By this I mean not goods and services but the hundreds of thousands of men (and finally a growing but still small number of women) across the globe, in touch with one another in ever-denser ways courtesy of the various digital and internet technologies unfolding around us. They've been university-trained primarily for occupations that manage and grow the world economy, and with it the economic and political bureaucracies of the world. But among them also are those – many embedded in those bureaucracies, some existing on their margins – who shape the public conversations meant to uphold the society's definitions of who we are, were, and might become – and not just as representative agents in an elegantly-styled economic model or as individuals in an equally-stylized (and in recent years mathematicised) political science or sociological model.[9]
Those men and women include you and me. However, those conversations – meant to uphold existing orders of all kinds – are what's central to my concerns here because they also contain the possibility of conversations that could overturn that order and model what it would mean to become not just better economic agents but full citizens in a richly democratic and sustainable world.[10]

The modern university, however, depends on two 19th and early 20th century claims that limit such possibilities.

The first is that its then-new "social sciences" would be not just "social" but "scientific" – and hence free not just of the prejudices and passions "science" thought it was escaping by leaving

[9] On the many and deep problems of academic disciplines and the central ideas underpinning the social sciences especially – and how in the last quarter of the 20th century, they spilled out to produce the breaks we associate with "neoliberalism", Daniel Rogers, *The Age of Fracture* makes a great contribution. "What precipitates breaks and interruptions in social argument are not raw changes in social experience, which never translate automatically into mind", he notes, "What matters are the processes by which the flux and tensions of experience are shaped into the mental frames and pictures that, in the end, come to seem themselves natural and inevitable: ingrained in the very logic of things."

[10] One of the enduring attractions of Keynes to me has always been that his "economic" imagination encompassed that conversation of possibilities: "The master-economist must possess a rare combination of gifts. He must reach a high standard in several different directions and must combine talents not often found together. He must be mathematician, historian, statesman, philosopher - in some degree. He must understand symbols and speak in words. He must contemplate the particular in terms of the general and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purposes of the future." Zack Carter's recent *The Price of Peace: Money, Democracy, and the Life of John Maynard Keynes*, is much worth reading in this regard.

religion behind but also free of "politics" in the disorderly, dishonest and often-violent sense of that word when we talk about how power and power's rewards are socially arranged. "Social scientists" would henceforth concentrate their coolly reflective intelligence on matters of "theory" and, in contribution to the larger world, on coolly-designed "policy". The vulgar but necessary quotidian of "politics" – matters of power, of conflict between interests, and the negotiations that would apply useful "policy" to the lived world would remain outside the university.

The second foundational claim was that the university's modern subdivision into departments would concentrate specialization in each department's forms of knowing. The promise here was that through such subdivision the university thereby could produce new ways of more general knowing that would vastly improve the world – in brief, would give rise to an equally modern idea called "progress".[11]

We too often forget how new – and how weakly tested – these claims were when they midwifed our higher education system. Universities, which are not modern, hadn't started that way.

The first European universities in the late Middle Ages and early Renaissance had in a sense been backward, not forward, looking. They took root and then thrived on what amounted to their re-discovery of "classical" knowledge – Greek and Roman mainly, albeit with incursions from Egyptian, and later Arab and some Indian, thought (especially, in the case of the latter two, through the ideas of mathematics and the application of mathematics to social-situational realities from art and architecture to hydraulics and sailing.) But to be "scientific" or exist to produce "progress" as we understand that was not consciously part of their agenda.[12][13]

The slow invention of "science" over the last five hundred years or so came about as curiosity about "classical" truths (in astronomy and cosmology especially) led to new observations that disagreed with what the universities had taught, relying on Aristotle et al. As an "objectifying" and "empiricizing", and therefore radically challenging, way of seeing the world that refuted superstition, this was of course huge. (To the Church's alarm, along with superstition, religiously-validated imaginings about causation and justification also soon came under relentless fire). All this placed on antique and ecclesiastical verities (and hence too on their

[11] One should note that China and India both pioneered what one might call the proto-university system 3000 years before the European university emerged on the back of classical Greek and Roman learning. China's Shang Yang-era "higher school" training of the empire's administrators was established during the Yu period (2257-2208 BC) and the Imperial Central School dates from the Zhou Dynasty (1046-249 BC). Because the early Chinese state consciously depended upon literate, educated officials to administer the empire, a meritocratic imperial examination was formally established by the Sui Dynasty (581–618) to identify talent in the general populace regardless of social rank. As for early Indian precedents, Takshashila University was established in present-day Pakistan in the 7th century BC and Nalanda University – of Buddhist scholarship that drew students and scholars from East, Central, and South-East Asia (including China).

[12] University studies were organized by the faculty of arts, which taught the seven liberal arts: arithmetic, geometry, astronomy, music theory, grammar, logic, and rhetoric. All this was taught in Latin, in which students had to converse. The curriculum also eventually incorporated Aristotle's three forms of knowing: physics, metaphysics and moral philosophy.

[13] Ben Friedman's *Religion and the Rise of Capitalism* (2021) is the latest addition to this important cross-disciplinary literature. Robert Nelson, *Economics as Religion: From Samuelson to Chicago and Beyond* is a wonderfully polemical, wonderfully challenging (but too often libertarian) jeremiad meant to force economists to confront the nature of their foundational beliefs.

contemporaries' derived explanations) of "why" and "how" the duty of consistent replication and perhaps more important, of coherence – and the predecessors increasingly fell away.

> Much of this falling away was, curious to most of us today, born out of arguments about "religion" – which seems so very far away from arguments about today's "economics" but isn't. "Religion" – by which I mean a cobweb of beliefs about ontology, epistemology, and ethics centred on the authority of transcendent extra-human power had for several thousand years, but especially in the last thousand or two thousand years, been the established means by which to "explain reality".

The struggles of all sorts – some military, some economic and political, some profoundly philosophical about the nature of being, society and humankind – that Europe endured and exported globally through its empires, the sword, and the printed word from the 1500s onward all contributed to the dethroning of religion and the desacralization of the world, without which the "modern world" (and the Industrial Revolution, capitalism and "economics") would be impossible.[14] These were, I hasten to stress, not just struggles over the consequences of the Scientific Revolution but of the Protestant Reformation, the Enlightenment, and of Europeans' transatlantic, then global Imperial Conquests.

How the past allows us to imagine – and see the future

Let me now try to connect this little synoptic "*longue duree*" to the present and to the matter before us: neoliberalism and what might succeed it. We live in the early 21st century and the conventional economics we've inherited has now arrived at a moment when once-novel Victorian-era ideas seem not just inadequate but irrelevant.

A similar moment seemed, to many, to have arrived before, back in the 1930s. But apostles of marginalism such as Lionel Robbins or Mies or Hayek – faced with what they saw as the socialist implications of Rooseveltian politics and Keynesian ideas about states and economies – insisted on the singular "efficiency" purpose of "economics" as theory, and theory's realization in the modern market world around them. For these men, the matter was supremely "intellectual" and "scientific", not a story of competing classes in capitalist societies. Robbins' magisterial dictum that economics was "the science which studies human behavior as a relationship between ends and scarce means which have alternative uses" was in fact by the 1930s already, well, Victorian.

Let me be blunt here: the Marginalist Revolution is still today, just as in the 1930s, what it was first – the best attempt by a group of late-Victorian and Edwardian thinkers, confronting the 19th century's emerging capitalist system and its "logic", to "explain" (and thereby, in "scientific" terms, to justify) the emergence of that particular early stage of capitalism through "scientific reason", mathematics (mostly geometry and simple algebra at first, then the calculus) and

[14] Peter Berger, *The Sacred and the Profane* usefully encapsulates and analyzes the inter-penetration of science, religious reform, enlightenment secularity, empire and de-sacralization. Eugene McCarraher, *The Enchantments of Mammon: How Capitalism Became the Religion of Modernity* argues from a different strategy: that the modern world has not been de-sacralized at all; instead the logic of capitalism and its economistic "invisible hands" forces – omniscient, omnipresent, and omnipotent, in Durkheim's terms – have displaced our older notions of gods.

specifically-abstracted "models"[15] mathematically arranged to solve the question of "right price" – first of the transactional exchange of physical goods, then of labor, capital (fixed and financial) and natural resources.[16] Those thinkers moreover did so in ways they meant to consciously refute their Catholic theological ancestors and their moral basis for "just price" and "just wage" debates[17], as well as their Protestant social-democratic and their secular-socialist (especially Marxist) contemporaries on the implications – not just economic but moral and political – of this novel capitalism's societal distribution of "surplus profit", and with it, the ownership rights to the means of producing goods and organizing a great deal of social life.

From the start, there was disquiet within early academic departments about what they were doing. Alfred Marshall, the law-giving Moses of marginalism, himself warned,

> In my view every economic fact whether or not it is of such a nature as to be expressed in numbers, stands in relation as cause and effect to many other facts, and since it *never* happens that all of them can be expressed in numbers, the application of exact mathematical methods to those which can is nearly always a waste of time, while in the large majority of cases it is positively misleading; and the world would have been further on its way forward if the work had never been done at all.[18]

Then, lest he be misunderstood or gainsaid, Marshall added this prescriptive injunction:

> (1) Use mathematics as shorthand language, rather than as an engine of inquiry. (2) Keep to them till you have done. (3) Translate into English. (4) Then illustrate by examples that are important in real life. (5) Burn the mathematics. (6) If you can't succeed in 4, burn 3. This I do often.[19]

In America, the founding of the American Economic Association in 1885 launched a battle between Progressive Era reformers, who dominated the early AEA, and their conservative and pro-business, often Social-Darwinian, opponents. The battle would go on continuously – simplified in later retelling as between Institutionalists and Marginalists. What followed were fights over tenure, publication, and funding for research that were relentless – until shortly after World War II, when the Depression-era Keynesianism and New Deal reformism were transformed into the Cold War's Military Keynesianism and anti-communist liberalism. In short

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[15] See Keith Thomas, *Religion and the Decline of Magic* and David Wootton, *The Invention of Science*. The fact that one can earn a PhD in economics today without slightest acquaintance with that history goes a long way for me in explaining why too many economists today behave more or less as "idiots" in the classical Greek sense of "idiotes", as those who fail to understand where they came from, so do not take an active part in the life of the polis, and hence offer little wisdom the polis's citizens can use.

[16] Phillip Mirowski, *More Heat Than Light: Economics as Social Physics, Physics as Nature's Economics* handily covers economics' "scientific" ambitions related to pre-Einsteinian physics. For the role of biology – especially the corruptions of Social Darwinism – Dorothy Ross, *The Origins of American Social Science* is a useful starting place, as well as for her handling of the rise of "departmentalism" and economics' segregation from history, political science, law, philosophy and sociology.

[17] On the still-relevant questions the Middle Ages raised about "just price", Hamouda and Price, "The justice of the just price", *European Journal of the History of Economic Thought*, v.4, no.2 (1997).

[18] For this, Hans Jensen. "Alfred Marshall as a Social Economist", *Review of Social Economy*, v.45, no.1 (April 1987).

[19] Alfred Marshall, *Principles of Economics,* citied in Stanley Brue, *The Evolution of Economic Thought*, 5th ed., pg. 294.

order, academic economists embraced a mathematicised macroeconomics called "the Neoclassical Synthesis" that validated specific ways states could "intervene" in economies but eschewed any questioning of the "military" in "Military Keynesianism". Paul Samuelson was the dean of that "Neoclassical Synthesis", which sought to "resolve" the profession's inherited battles from the 1880s through the 1940s by wedding a mostly Keynesian "macroeconomics" through a shotgun marriage to a Marginalist "microeconomics". Late in his life, he spoke of just how carefully he had written and repeatedly edited his legendary textbook to meet the Cold War's anti-communist requirements about the sanctity of capitalism's essentials: private property and its control through concentrated private ownership, while legitimating government's role as macromanager of aggregate demand. Meliorative in prescription, academic economics could thereafter be; more than that, it could not and would not be allowed to consider becoming.

Long before "neoliberalism" arose, in other words, the separate and legitimate sphering of "economics" and "politics" – not just by university departments, but in the larger world, in the imaginations of policy makers, politicians, journalists and the talking classes generally, the right and natural hegemony of "markets" over "states" was established. It is a history that critics who consider "neoliberalism" a relatively new problem would do well to revisit and understand.[20]

Some thoughts on a post-neoliberal project

So then what might a project for a Post-Neoliberal Economics entail? Since I think "neoliberalism" as concept and practice represents one more of an ongoing series of ultimately ad hoc justifications for the hierarchic structuring of human societies, and think that the larger concept of "capitalism" contains already many visibly differentiated stages of its own in that long story of hierarchies, here are several modest ideas I'd propose.

First, to confront what we don't like about "neoliberalism", we should start by recognizing what we are facing, which is not just a methodenstreit problem in academic economics.

The World Economic Forum – what a waggish journalist friend, from direct experience, slyly dubbed "neoliberalism's favourite ski resort" – has for several years now declared *climate change* and *economic inequality* the two greatest issues facing humankind. This is not the language of neoliberalism, circa 1978-2008, at least in its diagnosis. Davos has then gone on, as prescription, in ways that ignore mainstream economics' ideas about the centrality to "economic life" based in the logic of competitively efficient choices for individuals and firms, and neoliberals' "markets-lead-states" conceit, to call for cultivation of "cooperation" and "coordination" across firms, industries, societies, governments and international organizations in order to address the challenges climate change and inequality pose for us all.[21] It talks of moving the world past carbon, of state-assisted redistribution of income and wealth, of globalized tax policies, of the errors made in the name of free trade, and of the primacy of moral and cultural values that undergird community but are rarely taken up by economists directly or frankly. They do so, moreover, in ways that partially erase the border walls between markets

[20] Binyamin Appelbaum, *The Economists' Hour,* offers a readable Cook's Tour of this postwar history
[21] See Davos' latest 2021 report, "The Great Reset": https://www.weforum.org/great-reset/

and states.[22] One can of course dismiss all this as merely "Davos Talk" – as a calculated rhetorical evolution, not a refutation, of neoliberalism – but its concessions contain what amounts to what I think is a rare epochal opening with opportunities that should be taken up by the rest of us.

It also reminds us of something important: that, like the rest of us, capital-owners and their senior managers form hypotheses and conclusions about our species not just from a narrow definition of self-interest but from their assessment of what they understand signals risks and opportunities of several kinds. A more orthodox economist than I might try (and certainly Chicago economists have tried) to subsume such changes entirely or almost-entirely within "market" economic models but without (and this seems to me to be why neoliberalism is in trouble) real or lasting persuasive success beyond Hyde Park itself.

Climate change, in those sorts of conventional economics terms, even now is still considered an "externalities" problem, to be modelled and solved by "correcting" price signals tied to the production and use of fossil-fuel energy. What that explanation doesn't do – among its several weaknesses – is forthrightly ask how "the market system", whose apex defence is of allocating resources "efficiently", could have gotten resource extraction costs, goods- producing costs from those resources, and the climate-costs of final consumer prices for those goods so wrong for so long that we now face this crisis. [23]

Explanations are of course offered – but they almost always seem still to turn on the "failure" of institutions and behaviours "outside" the core market-efficiency axioms at the heart of neoclassical thought.

In the matter of "economic inequality", the issue is somewhat different, and to me is decomposable, nationally and internationally, into three separate but deeply connected subjects that elude useful capture in conventional "economic" terms: the persistence of poverty *and the reasons why*; the *utility* for societies as a whole of income and wealth concentration in the 1% – *not in any narrow "economic utility" sense but in what I've earlier called "democratic efficiency" terms*; and finally, the pressing and increasingly politically charged questions about *the future of "the middle majority*" (at least in the OECD) who find themselves stretched insecurely between poverty and wealth, questions that are not just about a current membership in the middle quintiles in blackboard terms, but the means – individually and societally – of joining it, the ways of remaining in it, and how to secure its benefits beyond the material.

In all this, there are now two 21st century landmarks, one empirical, one conceptual. The first is recognition of China's quite extraordinary growth achievements since the Cultural Revolution, the second, the arrival of Thomas Piketty and *Capital*, his allies, their charts and data and their conceptual focus. Together, they have visibly moved the public conversation (not just in the West) from preoccupation with aggregate growth alone to the challenge of growth's disaggregated distribution.

[22] I think a critic of Davos might attack along a couple of lines. One would be to compare Davos corporatism to the medieval Catholic Church's organicism; another would be to sketch the ways German ordo-liberalism lies hidden in the Davos analysis and its prescriptions. I leave that to others.

[23] See, for example, Oswald and Stern, "Why are economists letting down the world on climate change?", *VoxEU*. Sept. 17, 2019. For a harsher view of estimation problems, Steve Keen, "The appallingly bad neoclassical economics of climate change", *Globalizations*, Sept. 1, 2020.

What the unexpectedness of "China" and "Piketty" – forgive my shorthand – signal at least to me now given, I'd add, America's chaotic disarray, is this: that neoliberalism and the larger neoclassical assumptions on which it stands have been overtaken both by the real world and the re-imagined. If true, then our profession's enduring habit of recasting ontological, epistemic, social-organizational and moral questions into its methodenstreit debates – whether between orthodox marginalists and Keynesians, neo-Keynesians and Rat Exers, Monetarists and Fiscalists, New Classical and New Growth models, etc. – is simply not what's really before us now.[24]

Second, since we're not in a methodenstreit moment, we need what amounts to new academic programs

In the university, we need to open up and reorganize our antiquated departmental structures to recognize what's been happening outside traditional economics departments. Well before "neoliberalism's" ascent in the 1970s, mid-century academic economics had largely purged their departmental curriculum of cross-disciplinary topics that it had inherited from 19th and early 20th century "political economy": for example, the close study of legal systems, social relations and institutions, geography and demography, political systems and ideology, and history. Here or there individual courses might be offered on one or another of these subjects (often by faculty approaching retirement), but in its rush to consolidate the essence of neoclassical assumptions and translate them into a structured "model" that is supposed to be mathematically testable (and in positivist terms, refutable), "economics" after World War II recreated itself into the form we encounter today – impoverished by its lack of attention to those topics and their useful place in economics.

What's notable today, after the serial disappointments of that post-war economic project, is this: "political economy" is being revived as a legitimate academic discipline, often with its own faculty, research facilities, graduate and undergraduate degrees, and journals. In the US, Princeton, Harvard, Columbia, Berkeley, Stanford, Duke, Georgetown (and even Jerry Falwell's evangelical Liberty University) – to name just a few of the best-known – now offer undergraduate and/or graduate programs in "political economy". Most, I'd note, exist *outside* university economics departments – in government or political science or international relations departments, in public policy, law, and business schools or programs, and sociology and history faculties.[25] (The sheer number and range of such programs can be glimpsed by typing "political economy" and "syllabus" or "program" in any online search engine.)

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[24] On this, Heilbroner and Milberg, *The Crisis of Vision in Modern Economic Thought*, which I reviewed when it appeared for the *New York Times* here: https://www.nytimes.com/1996/01/28/books/thehttps://www.nytimes.com/1996/01/28/books/the-momentary-science.htmlmomentary-science.html

[25] A colleague in Harvard's Government department tells me "political economy" is the largest area focus of its doctoral students. Here is a sample listing of their thesis topics: https://dash.harvard.edu/handle/1/4927603/browse?value=Political%20Economy%20and%20Government&type=department. For a listing of some of these programs, one site tailored to students is: https://www.collegehippo.com/graduate-school/programs/top-ranked-masters-degree-political-economy. A list of master's programs in political economy is: https://www.masterstudies.com/Mastershttps://www.masterstudies.com/Masters-Degree/Political-Economy/Degree/Political-Economy/

The degree to which these modern "political economy" programs diverge from economics departments varies. That said, their brightest faculty and best students are clearly up to something like a nascent Protestant rebellion against an ailing but still-regnant Marginalist Church, itself visibly wedded to not just the ideas but the institutions of capitalist economies and their governing elites and structures. Here for example are Neil Fligstein and Steven Vogel, senior faculty in Berkeley's Political Economy program, writing a month before Donald Trump's electoral defeat last November, describing what they see as what these new programs offer:

> …we are facing a particularly horrifying moment, defined by the triple shock of the Trump presidency, the pandemic, and the economic disasters that followed from it. Perhaps these – if combined with a change in power in the upcoming election – could offer a historic window of opportunity. Perhaps. But seizing the opportunity will require a new kind of political-economic thinking. Instead of starting from a stylized view of how the world ought to work, we should consider what policies have proved effective in different societies experiencing similar challenges. This comparative way of thinking increases the menu of options and may suggest novel solutions to our problems that lie outside the narrow theoretical assumptions of market fundamentalist neoliberalism.
>
> We know about these possibilities from the work of economic sociologists, who stress the political, cultural, and social embedding of real-world markets. From work in comparative political economy, demonstrating how the relationships between government and industry and among firms, banks, and unions vary from one country to another. From political and economic geographers, who place regional economies in their spatial contexts and natural environments. From economic historians, who explore the transformation of the institutions of capitalism over time. From an emergent Law and Political Economy (LPE) movement that aspires to shift priorities from efficiency to power, from neutrality to equality, and from apolitical governance to democracy. And from economists – often villainized as the agents of neoliberalism – who are exploring novel approaches to the problem of inequality and the slowdown in productivity, and show renewed concern with the economic dominance of a few large firms. The challenge is to bring these insights together.[26]

What I find refreshing, reading these Berkeley professors, are three clear assumptions. First is the insistence that we approach inescapably-complex "economic" problems by situating them in actual societies embedded in equally-complex histories, with the contingencies of the moment fully on display. Second is the frank willingness to cross the university's departmental boundaries – boundaries, I'd hasten to add, that are barely a century old – to look for answers. Third is the absence of anxious talk about "heterodoxy" – a term that to my ear too often sounds self-defensive, even self-apologetic, rather than brave. Better at this point, it seems to me – if we truly mean to overcome "neoliberalism" – is to act like Luther rather than Erasmus here, and

[26] Fligstein and Vogel, "Political Economy After Neoliberalism", *The Boston Review*. October 6, 2020: https://bostonreview.net/class-inequality/neil-fligstein-steven-vogel-political-economy-after-neoliberalism

treat "political economy" as what it could be: a modern-day Protestant rebellion rather than a half-way reform of the One True and Holy Marginalist Church.

My colleagues' caveats

I realize this may be going too far for some. I have great admiration, for example, for my Harvard colleague Dani Rodrik, whose own deeply-considered views nowadays reflect his meticulously-calibrated evolution intellectually from a once mildly-voiced disquiet about the profession's ills in the 1990s to quite deep and sharp-edged critique these days of neoliberal policies and much about their uses of neoclassical theory.

Nonetheless Dani at times seems anxious to hold on to core features of the marginalist model, which he sees as "evolving" by responding to the current moment. "Economics," he does ruefully admit, "is still somewhat insular within the social sciences because of its methodological individualism, model-based abstraction, and mathematical and statistical formalism." He then draws hope from what he sees changing:

> But in recent decades, economists have reached out to other disciplines, incorporating many of their insights. Economic history is experiencing a revival, behavioural economics has put *homo economicus* on the defensive, and the study of culture has become mainstream. At the centre of the discipline, distributional considerations are making a comeback. And economists have been playing an important role in studying the growing concentration of wealth, the costs of climate change, the concentration of important markets, the stagnation of income for the working class, and the changing patterns in social mobility.[27]

What Dani lists is *true*, in the sense that you or I, counting up the number of papers, books, and theses being produced nowadays, would find that more on all these topics than 30 years ago – but, taken together, does that constitute change?

Although many Americans might call them "justice issues" at this George Floyd-inspired moment of racial reckoning in America, I certainly agree with Dani that "distributional issues" are getting more attention from economists, and that the number of empirically-grounded – rather than purely theoretical – articles published in leading economic journals has increased.[28] What I find missing from Rodrik's argument is a persuasive claim for the intellectual *integration* and *ordering* of those approaches: there are, here and there, many interesting things going on in economic history, behavioural economics, climate economics, and massive data set manipulation, etc., to be sure – but signs that these individual explorations are being woven into a larger, more unified narrative theory that moves past marginalist paradigms, in my view, is still elusive. Pearls do not a necklace make.

Development economics, for example, is Rodrik's specialty – so he knows as I do that it has always operated at an oblique, sometimes orthogonal, angle to mainstream economics views.

[27] Naidu, Rodrik and Zucman, "Economics After Neoliberalism", *The Boston Review*, February 15, 2019: http://bostonreview.net/forum/suresh-naidu-dani-rodrik-gabriel-zucman-economics-after-neoliberalism

[28] I commend to readers here "Economics for an Inclusive Prosperity", the group Rodrik has cofounded with Gabriel Zucman and Suresh Naidu, to be found here: https://econfip.org/

Not least that's because so many of its projects have been designed, financed and evaluated on a state-to-state basis. Consequently – and not surprisingly – a great deal of attention was paid to institutions and to empirical data that could measure "success" as understood by the bureaucratic administrators and funders involved. But rare were the critiques within the profession (though not outside it, in an ever-growing number of NGOs, major segments of the press, and a few universities and foundations) of the complex and often deeply corrupt bureaucratic and political interests of those same administrators and funders and their designated recipients. That all remained subordinated to, if not invisible in, most mainstream economic evaluations of the projects.

One could, I suppose, ask then why so many development economists embraced the Washington Consensus and its essential "markets-lead-states" models? Although the adoption by multilateral institutions of the Millennium Development Goals at the end of the last century (and since then, the Sustainable Development Goals) represents a turn away from that essentialism (that's even included a measure of apology for imposing Consensus rules)[29], I'd argue that the field has never deeply examined how or why it made the turn toward Consensus essentialism in the first place.

Joseph Stiglitz floated the question succinctly, if a bit backhandedly, in reviewing what he insightfully dubbed "the post Washington Consensus consensus" in 2005:

> If there is a consensus today about what strategies are most likely to promote the development of the poorest countries in the world, it is this: there is no consensus except that the Washington consensus did not provide the answer. Its recipes were neither necessary nor sufficient for successful growth, though each of its policies made sense for particular countries at particular times.[30]

But how to get beyond agreement on what didn't work? To do that requires not just more "empiricism" but well-structured arguments grounded in documentable decisions and changes taken by political and corporate institutions – lenses which have rarely made their way into economists' models. Let me give an example of what I mean: to explain modern fossil-fuel energy pricing, I wouldn't start with the neoclassical economics of energy pricing and matching abstracted supply and demand. Instead I'd begin by explaining the concerns of leading European statesmen, bankers, and big businessmen in the late 19th century about the mining of coal and refining of oil. The questions weren't just "economic" in a mainstream way; at issue

[29] Larry Elliot, "The World Bank and IMF Won't Admit Their Policies Are the Problem," *The Guardian*, Oct. 9, 2016: https://www.theguardian.com/business/2016/oct/09/the-world-bank-and-the-imf-wonthttps://www.theguardian.com/business/2016/oct/09/the-world-bank-and-the-imf-wont-admit-their-policies-are-the-problemadmit-their-policies-are-the-problem. On whether the Washington Consensus – and neoliberalism – have in fact receded is taken up in Babb and Kentikalinis, "People have long predicted the collapse of the Washington Consensus. It keeps reappearing under new guises", Washington Post, April 16, 2021: https://www.washingtonpost.com/politics/2021/04/16/people-have-long-predicted-collapse-washingtonhttps://www.washingtonpost.com/politics/2021/04/16/people-have-long-predicted-collapse-washington-consensus-it-keeps-reappearing-under-new-guises/consensus-it-keeps-reappearing-under-new-guises//

[30] Joseph Stiglitz, "The Post Washington Consensus Consensus", Institute for Policy Dialogue, Columbia University, 2005 at http://policydialogue.org/files/events/Stiglitz_Post_Washington_Consensus_Paper.pdf

was their unnerving likely impact on the technologies of war. War-making and its proffered and perceived threat are central functions of all states that economists almost never consider.

I'd then trace petroleum's roles in both world wars, sketch how and why the US emerged a victor after both, and why after the second war (but not the first) it adopted hegemonic roles best described as "imperial", albeit with lots of comparative qualifiers. I'd go on to describe the post-war petroleum management system of production and import quotas, taxes, and constrained technological innovation – part government, part industry – and how it seemed to offer the industry and the country stable and predictable growth for a time. I'd explain then how America's multi-faceted crises in the 1960s led to Nixon's election in 1968 and his destruction of the Bretton Woods system three years later.

I'd argue, for example, that the destruction of Bretton Woods led to OPEC's massive spike of oil prices in 1973 and then again in 1979, why the West hadn't then forced those prices back down, how petrodollars were recycled to New York and London banks which then lent them out to Third World governments and companies the banks had ignored for years, how the financing fuelled a brief growth spurt in the developing world, how the Volcker Recession crushed that spurt, why the crushing created a crisis in banking, how states responded to that financial crisis by lifting regulations, which ushered in the neo-conservatism of Reagan and Thatcher, which in turn laid the ground for the neoliberalism of Clinton and Blair, their further deregulation of finance and its explosive growth ever since, and then the Great Recession.

One can write such an analytic political-economy history narratively – but I don't know successful examples of doing it mathematically, using only highly-stylized and abstracted representative agents without names for those agents, individually or in small groups, or their positions or affiliate institutions that might help us understand how their decisions were made, how those decisions intersected others, and how conflicts between decisions were adjudicated and why.

That leaves me to make my third and final point: that we need to boldly take up what we think are the large social, political and moral projects of our time – and use not just our discipline's conventional "economics toolkit" but our ability to think about, and argue for, human freedom and equality not just within but across borders, and moreover situated in production consumptions that are cognizant of the planet's carrying capacities, in a radically more committed way.

Here Davos is right: "climate change" (shorthand in my mind for the total impact of the Anthropocene on the planet) and "economic inequality" (measured for me not just in income and wealth distribution terms but the legal, institutional and customary means by which property is defined and its rights allocated) *are the issues we're facing*. But addressing them in ways beneficial to the many rather than the few requires of us a vast reimagining and rebuilding of what we are doing, for which our economistic toolkits alone are utterly inadequate.

The several challenges of Piketty

A decade ago, Thomas Piketty's publication of *Capital* helped ignite not just a professional discussion by economists, nor even just a "public debate" – of which there are too many in this social-media-saturated world of ours – but a sudden and far-reaching mobilization of political

energies among millions around issues of wealth and income distribution. What to me is almost breathtakingly remarkable is that it has a good chance of matching the impact that Keynes' *General Theory* had long ago on the issues of aggregate growth and macro-intervention by government in the Roosevelt era, an enduring impact that in our own time justified the world's massive fiscal and monetary response to the Great Recession a decade ago and is doing so again in the COVID crisis now.

Capital exemplifies many of the innovative "stylistic" or "methodological" features that, as I earlier noted, Dani Rodrik sees as recent hopeful signs for economics as a profession: in place of mathematical abstraction, Piketty demonstrates his deep commitment to empiricism, his affinity for the construction and manipulation of large-scale data sets, and his willingness to "do economics" in a narrative prose structure that names many of its actors individually, contextualizes their historical moment, and explains to us their roles and effects institutionally rather than, for the purposes of parsimonious modeling, aggregating those lives into the abstract representative "agents" of high mathematical theory.

More important, Piketty in his more recent *Capital and Ideology*, has gone beyond the massive empiricism of *Capital* to sketch out his admittedly-preliminary arguments for not just a new way of "doing economics" but of situating economic thinking in *a larger vision of what I at the beginning of this paper chose to call – since I'm writing to fellow economists – "democratic efficiency"*.[31]

For Piketty, this requires economists to consider first the question "what is a just society?"[32] His "necessarily imperfect" answer is that it is

> One that allows all of its members access to the widest possible range of fundamental goods. Fundamental goods include education, health, the right to vote, and more generally to participate as fully as possible in the various forms of social, cultural, economic, civic, and political life. A just society organizes socioeconomic relations, property rights, and the distribution of income and wealth in such a way as to all its least advantaged members to enjoy the highest possible life conditions. A just society in no way requires absolute uniformity or equality. To the extent that income and wealth inequalities are the result of different aspirations and distinct life choices…they may be considered just. But this must be demonstrated, not assumed… That is why deliberation is both an end and a means.[33]

[31] Piketty's term is "participatory socialism", which I find possibly understandable in French but too freighted and twisted in the American context. I'm writing this at a moment, after all, when the GOP talks, in echo of their best McCarthyite timbre, about Joe Biden being "a socialist president".

[32] I would add that concern for "a just society" is not a concern only of progressive economists such as Piketty. Chicago's Robert Fogel's *The Fourth Great Awakening: the Future of Egalitarianism* takes up the issue quite boldly, insists like Piketty on situating economics in a broader historical and ethical context, eschews mathematical models for narrative prose – and, in a way I find fascinating, frames his argument in the successive history of religious struggles that help define the American public landscape. Concerned like Piketty about providing more equal access to education, health care, income security, Fogel (a Nobel laureate for his work in cliometrics) raises the "immaterial" issues of both individual and collective meaning and purpose, which he associates with religion, to the fore.

[33] Piketty, *Capitalism and Ideology*, 968.

In sum, what we need to rediscover about doing economics?

How then to summarize and close here, since I'm keenly aware that I've raised questions that I've not answered? Let me do that by pointing to the Forgotten Keynes – not Maynard, author of *The General Theory* (and so much more), but his father, Neville.

Neville Keynes lived a distinguished and useful life as an academic administrator of Cambridge University. He was also an admirer and in a way an apostle of Alfred Marshall, the Moses of Marginalism. Nearing the close of the 19th century, he took up Marshall's great *Principles of Economics* in order to carry its theoretical implications into the practical world of Victorian Britain's global economy.

To do so, he drew what I still count as a valuable distinction. Because "economics" – the sort of new "scientific economics" the Victorians thought they'd discovered (or designed, the difference never entirely clear since it was not clear in their own minds). This new "economics" thus was not meant to be a textbook or blackboard exercise of the academic mind whose lessons could then be translated (albeit with a guaranteed net loss of intellectual qualities) into "policy" – a process by which they imagined (as so many of our colleagues still do) the transformation that yields the great and incontestable good of "Progress".

Keynes instead proposed a tripartite division he thought should define the work of the "new economics". The three parts were these:

1. "positive economics" (the study of what is, and the way the economy works),
2. "normative economics" (the study of what the economy should be), and
3. "applied economics" (the art of economics, or economic policy). [34]

Read carefully, one can recognize the effects of this trinitarianism on his son in *The General Theory*, even more (and in some ways more famously) in *The Economic Consequences of the Peace*, and then scattered throughout the hundreds of articles Maynard Keynes wrote for newspapers and magazines and their popular audiences – perhaps most relevant to us here, "Economic Possibilities for Our Grandchildren".[35] The key is to grasp the distinction of the second – the study of what the economy should be – and to recognize what the Keynes, father and son, understood: that doing "normative economics" *necessarily* entails incorporation of values that lie beyond the "positive economics" of blackboard work – not because such "normative" economics is inferior to "positive" economics (a claim Milton Friedman popularized for Cold War colleagues in "The Methodology of Positive Economics")[36] but because only through the "normative" consolidation can "positive" theorizing hope to exercise purchase on "the art and craft of policy-making" in the real world.

[34] For a thoughtful though slightly forlorn engagement with the three ways of doing economics – and the failures of much of modern economics to heed Neville Keynes' foresight, David Colander, "Retrospectives: The Lost Art of Economics," *Journal of Economic Perspectives*, V6, No. 3 (Summer, 1992).

[35] http://www.econ.yale.edu/smith/econ116a/keynes1.pdf

[36] Milton Friedman, "The Methodology of Positive Economics", to be found in his *Essays on Positive Economics* (1953).

At a moment in American history when the neo-authoritarian flames ignited by the Trump presidency are still smouldering – and fully capable of reigniting – economists who want to affect "policy" *and* are willing to embrace the messy necessities of "politics" in order, in the words of Martin Luther King, to "bend the arc of the moral universe toward justice", these are promising times. A post-neoliberal world that could echo far beyond the classroom, textbook, and journal world in which so many of us live is being played out, boldly but awkwardly, in Washington right now. The contribution I think we could make is to open a new chapter in "teaching economics" to cross-disciplinary, empirical, and normative work that places a premium on engaging us and our students in the conversations that will push economies into pursuit of a democratic equality that can be experienced in day-to-day life (and not in our quadrennial visits to the voting booth) and toward a sustainable balance in our encounters with this tiny speck of a planet on which we have been given the gift of existence only briefly.

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Postscript: RWER is for everyone and no one

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Real-World Economics Review was first published as a newsletter in September 2000. As Edward recounts in the *Journal of Australian Political Economy* (Fullbrook 2002), the idea arose out of conversation at the World Congress of Social Economics at Cambridge in the UK in August 2000.[2] Formalism and a version of "neoclassical" economics – read as a set of fundamental commitments or assumptions that underpinned economics and which constituted a core of the mainstream – dominated the field.[3] Discontent was widespread regarding the state of economics and yet there was little institutional unity between heterodox schools and little attempt as yet to make use of the potential for communication and organization offered by the Internet to support and disseminate alternative thinking.[4]

Edward didn't set out to change the situation but that is eventually what he did – albeit not alone – Jamie Galbraith, Joseph Halevi, and Gilles Raveaud were early sources of encouragement and support and there have been many others since.[5] The background will be familiar to older readers, a global movement had begun in June of that year in France with a "modest" student initiative, of which few at the conference in Cambridge seemed aware. Students were fed up. Economics was mainly taught in uncreative ways via textbooks that presented the discipline as a universal toolkit of concepts, while conflating indoctrination with "thinking like an economist". This leant itself to tedious didacticism, all the more irritating since students were being asked to absorb a way of viewing the world which seemed divorced from reality and which, claims to the contrary notwithstanding, left little room for critical and reflective thought. Student dissatisfaction had reached boiling point in France and a petition had been organized to effect change in the curriculum. Its headings were:[6]

1. We need to escape from imaginary worlds!
2. We oppose the uncontrolled use of mathematics!
3. We are for a pluralism of approaches in economics!
4. Call to teachers: Wake up before it is too late!

Protest quickly spread. The newsletter began as a way to popularise and comment on materials produced via the students' website, "*Autisme-economie*", but quickly took on a life of its own.

[1] J.a.morgan@leedsbeckett.ac.uk
[2] For more material on this see also Fullbrook (2003).
[3] Classically summarized Arnsperger and Varoufakis (2006) and questioned as a useful term of reference by Lawson (2013).
[4] Heterodox is not a term Edward is particularly keen on; see interview "Edward Fullbrook" 52-61 in Mearman et al., (2019).
[5] Not least Kyla Rushman who provided editorial support and formatting and copyediting until late 2021.
[6]This is summarized from Issue 2 October 2000.

In November 2000 www.paecon.net was launched and here we are 100 issues later.[7] More than twenty years have now past since the early newsletters and for about half of those years Edward was sole editor of *RWER*. I have been assisting him for over a decade now.

In 2008 the global financial crisis created new opportunities for and added new impetus to the overall goal of transforming economics from its parlous state and Edward started thinking about "How to bring economics into the 3rd millennium" (Fullbrook 2010).[8] In 2011 the World Economics Association (WEA) was born. The aim was to start to build an alternative set of institutions to the mainstream, working across the full panoply of ways in which economics is powerful in the world.[9] The intent was not to compete with all the subcategories of alternative economics but rather to provide a pluralistic organization in order to build a new mainstream, however long that takes… Today *RWER* is just one of several journals published via the WEA platforms and journal publication is just a part of what "we" (volunteers) do.[10]

Has economics been transformed? No. Its teaching has changed in some ways and there are many new teaching initiatives, such as CORE, and organizations to promote them.[11] But the textbook format remains at heart little altered, and the notion that "thinking like an economist" reduces to a toolkit of concepts retains a powerful hold on the profession. In 2000 students wrote, "We do not ask for the impossible, but only that good sense may prevail – we hope, therefore, to be heard very soon." Those students have now long since moved on, but the discipline is still waiting for major change in its curriculum and pedagogy; the WEA is still working towards that change.[12]

Formalism, meanwhile, has given way to the "empirical turn" and the mainstream has become more diverse but not pluralistic. The grip of "neoclassical" economics (if one is using that term in its narrow sense) is looser, but economics is still more scientistic than it is scientific. A brief perusal of mainstream journals reveals a remarkable range of (overlapping) approaches: behavioural economics, game-theoretic economics, information-theoretic economics, experimental economics, neuro-economics… And a vast array of subjects, from the frivolous to what are ostensibly *matters of significant contemporary concern*: the effects of Covid-19 on all aspects of economy, the current drivers of inflation, participation rates, employment and unemployment, drivers of corporate debt, (de)globalization, rising wealth inequality, artificial intelligence, new digital money and fin-tech, carbon emissions their consequences and mitigation potentials…

Behind the apparent diversity, however, is a dominant set of processes and practices, propagating a subversion of knowledge that favours style over substance: modellers identify

[7] Early interventions included Robert Solow, Olivier Blanchard, Jamie Galbraith and Steve Keen. Reflecting potential inadvertent offence that might be caused by using a category of the differently-abled as a point of critique, *Post-Autistic* was dropped and the journal subsequently renamed the *Real-World Economics Review* (*RWER*) in 2008. https://en.wikipedia.org/wiki/Post-autistic_economics

[8] For a sense of the global reach of dissatisfaction see the later open letter from the International Student Initiative for Pluralism in Economics (ISIPE): http://www.isipe.net/open-letter

[9] The nearest equivalent albeit with a more overtly academic rather than public understanding focus is the European Association for Evolutionary Political Economy (EAEPE): https://eaepe.org

[10] Visit: https://www.worldeconomicsassociation.org/wea/general-information/
Visit: http://www.paecon.net/PAEReview/

[11] Visit: https://www.core-econ.org and for example, INET: https://www.ineteconomics.org

[12] For example: https://weapedagogy.wordpress.com

an easily available dataset (or build one from some simple experiments), apply a readily available model format (adjusting the "variables of interest" to suit the dataset), formulate a "research question" to justify running the data through the model and then apply tests of statistical significance of "findings". Throw in a literature review and discussion of limits of the methods and prospects for future research and you have a paper publishable everywhere from *Quarterly Journal of Economics* to *Journal of Economic Behaviour and Organization*, and insofar as economists have colonised every available subject, infecting journals across the social sciences, publishable across an ever increasing range of journals in receipt of ABS ranking, from *Technological Forecasting and Social Change* to *Journal of Cleaner Production* and even *Ecological Economics*.

One might say a superficial empirics now reigns. What we don't have, according to this process and the associated practices, is detailed and developed discussion of how things come about in the world – the relevant explanatory mechanisms that underpin tendencies and give meaning to direction of travel, to difference, to consequence and to what might be done (the important if tedious work of making sense of what is going on, rather than merely seizing on counts and measures). Using the latest statistical packages, the papers produced look fabulously sophisticated and yet say almost nothing about the world that isn't either banal (once decoded) or spurious in its (quantitative) precision. Throw in an attitude that suggests that there is "a model for every eventuality" and you have a licence to expand or iterate ad infinitum.

In the meantime the world has observably deteriorated, neoliberalism seems to be eating itself and climate crisis has transitioned from unwanted future to current state of emergency. So, whatever Diane Coyle, Dani Rodrik and similar may argue, mainstream economics is in no healthier state than capitalism at large. And unfortunately, many heterodox economists face pressures to participate in this perverted publication process. It is with this in mind that *RWER* has served an important role. This role is all the more important when one considers that commercial publishers have monetised academic labour to the nth degree and have exploited the growing pressure to publish that academics now experience. *RWER* has by contrast remained independent – it is for everyone and no one. Its guiding ethos has always been pluralism – not a purposeless tolerance of every opinion, but rather an open-minded and critical commitment to real world relevance. As Edward has always maintained, successful sciences do not supress difference or equate stultifying conformity with apparent "successful" consensus – they are purposeful and progressive.[13] They are for "sanity, humanity and science".

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