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# “Stock” and “throughput” in Herman Daly’s steady-state economy in the light of an unpublished paper

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[Former Manager of the Bank of Italy]

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## Introduction

Herman Daly was a pioneer of ecological economics<sup>2</sup>. He argued that to avoid the ecological collapse the impact of economic activity on the biosphere must be minimized by stabilizing the scale of the economic system. According to Daly, the economy may continue to develop qualitatively without growing quantitatively, just as the biosphere does. To achieve this goal, Daly proposed the steady-state economy (SSE).

Daly defined the SSE in many articles and essays. These definitions have varied somewhat over time, but the core concept remained unchanged: the SSE is the economy in which the population and the stock of physical wealth are held constant at a low level of matter and energy consumption, i.e. at a low level of throughput.

Many years ago, when I first read Herman Daly’s book *Steady-State Economics* (Daly, 1977), I found it groundbreaking and very interesting. Nevertheless, one aspect of Daly’s SSE did not seem convincing to me: I thought that the stock expressed in physical terms was a magnitude impossible to build up and manage, because of the logical impossibility to aggregate different artifacts like tables, buildings, cars and so on (“we can’t add apples and oranges”). Several years later, I asked Professor Daly for clarification on this point, receiving, as a response, an interesting unpublished paper.

In this article, after recalling the basics of Herman Daly’s SSE, I analyse the concepts of stock and throughput and the possible problems connected with the definition of an SSE based on these magnitudes. Then, on the basis of an insight contained in the aforementioned Daly’s unpublished paper, I propose a brief reflection on the fact that mainstream economists (and sometimes all of us) are usually demanding about the coherence and the logical soundness of new or heterodox economic ideas, while they often fail to notice the flaws in prevailing economic theories.

## The Basics of Daly’s SSE

Classical economists thought that in the long run capital accumulation would slow down until it reached a stationary state (Daly, 1996, p. 3; Kerschner, 2010, p. 545). They regarded that state negatively,

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<sup>2</sup> For a comprehensive overview of Daly’s life and thought see Victor (2022). For a concise but rigorous introduction to Daly’s work see Farley and Luzzati (2023).

considering it to be the end of progress<sup>3</sup>. On the contrary, John Stuart Mill was «inclined to believe that it [the stationary state] would be, on the whole, a very considerable improvement on our present condition» (Mill, 1965, p. 754). Mill's approach was taken up by Herman Daly, who since the early 1970s stated that the environmental degradation caused by the growth of economic activity and population was so serious that the stationary state would be both necessary and desirable (Daly, 1971a; Daly, 1971b). However, in 1972 Daly decided to rename that state of the economy "steady-state" (Daly, 1993, pp. 365-6).

In 1973 Daly gave the following definition of SSE (Daly, 1973, p. 152):

an economy in which the total population and the total stock of physical wealth are maintained constant at some desired levels by a "minimal" rate of maintenance throughput (i.e., by birth and death rates that are equal at the lowest feasible level, and by physical production and consumption rates that are equal at the lowest feasible level).

Some years later, in the book *Steady-State Economics*, Daly gave a substantially equivalent definition (Daly, 1977, p. 17, italics in the original):

*an economy with constant stocks of people and artifacts, maintained at some desired, sufficient levels by low rates of maintenance "throughput" that is, by the lowest feasible flows of matter and energy from the first stage of production (depletion of low-entropy materials from the environment) to the last stage of consumption (pollution of the environment with high-entropy wastes and exotic materials).*

This definition, as the ecological economist Daniel O'Neill wrote, «gives a high level view of what would be held steady in a steady-state economy, but it also leaves many questions unanswered» (O'Neill, 2015a, p. 552). Therefore, an analysis of Daly's definitions of SSE appears to be interesting.

The most appropriate starting point is the concept of "stock", defined by Daly as «the total inventory of producers' goods, consumers' goods, and human bodies. It corresponds to [Irving] Fisher definition of capital» (Daly, 1977, p. 35)<sup>4</sup>. On the basis of this definition, the stock can be divided into two parts: the stock of human bodies (or population) and the stock of artifacts, i. e. the set of consumers' goods and producers' goods<sup>5</sup>. Very importantly, Daly considered these goods in physical terms, as «It should be continually remembered that the SSE is a *physical* concept» (ibid., p. 17).

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<sup>3</sup> In "*The Wealth of Nations*" Adam Smith wrote: «The progressive state is in reality the cheerful and the hearty state to all the different orders of the society. The stationary is dull; the declining, melancholy» (Smith, 1976, p. 99). After about forty-five years, David Ricardo hoped that the British economy was still far from the stationary state (Ricardo, 1908, p. 86).

<sup>4</sup> In Daly (1996, p. 110) «the total inventory of producers' goods, consumers' goods, and human bodies» (or "capital" in Irving Fisher's sense) was defined "accumulation", while "stock" was considered only a part of "accumulation": «Accumulation takes two forms: a *fund* or a *stock*. A *stock* is an unstructured inventory of like things or of a homogeneous substance, which gets used a little at a time –that is, some gets totally used up before the rest is affected at all (for example, gasoline). A *fund* is a structured organic whole, all parts of which must participate together, and which depreciates as a whole (for example, an automobile). Stocks get "used up", funds get "worn out". Both require replacement». On the concept of stock see Daly and Farley (2011, pp. 71-2).

<sup>5</sup> O'Neill (2015a) pointed out that there are actually three components of stocks: people, built capital and domesticated animals (i.e. livestock).

The “throughput” mentioned in the above definitions is the entropic flow of matter-energy that «begins with depletion of nature’s sources of useful low entropy and ends with the pollution of nature's sinks with high-entropy waste» (ibid., p. 16)<sup>6</sup>. The throughput «is necessary for the maintenance and renewal of the stocks» (ibid., p. 36). For this reason throughput represents the ultimate cost of economic activity. Also throughput was considered by Daly in physical terms (ibid., p. 36).

According to Daly, the stock provides «the satisfaction experienced when wants are satisfied», which he defined “service”. Thus, service is «the final benefit of economic activity» (ibid., pp. 35-6). As the stock is composed of “dissipative structures” (Daly, 2018b; Daly and Morgan, 2019, p. 139), it is able to yield service only if it is continuously “powered” by throughput (Daly, 1977, p. 36):

The throughput flow does not yield services directly; it must first be accumulated and fashioned into a stock of useful artifacts (capital). All services are yielded by stocks not flows... Capital stocks are intermediate magnitudes, accumulated throughput temporarily frozen in ordered structures. which on the one hand yield services and on the other hand require continued throughput for physical maintenance and replacement.

The relationships between the above mentioned magnitudes are expressed by the following identity:

$$\frac{\text{service}}{\text{throughput}} \equiv \frac{\text{service}}{\text{stock}} \times \frac{\text{stock}}{\text{throughput}}$$

(1)                      (2)                      (3)

«Ratio 1 represents the final service efficiency of the throughput —final benefit over final cost. Ratio 2 is the service efficiency of the stock, ratio 3 the stock-maintenance efficiency of the throughput» (ibid., p. 37)<sup>7</sup>.

As I mentioned earlier, in an SSE the magnitude that must be kept constant is the stock, while «throughput is to be *minimized*, subject of the maintenance of the constant stocks» (ibid., p. 37). It follows that throughput is not constant<sup>8</sup>. The model is characterized by the constancy of capital in physical terms, as well as of population; the size of these two magnitudes determines the *scale* of the economy.

Note that natural capital, i. e. «the stock that yields the flow of natural resources» (Daly, 1996, p. 80), is the source of throughput and then is essential for the maintenance and renewal of population and stock of artifacts. Nevertheless, Daly did not include natural capital in the definition of SSE, while he placed this concept at the heart of the definition of “strong sustainability” (Daly, 1990; Daly, 1996, p.

<sup>6</sup> The concept of throughput is covered in detail in Daly and Morgan (2019).

<sup>7</sup> On the basis of the identity above, Daly made a distinction between “growth” and “development”: «Growth consists of increasing service by increasing the size of stocks, but with no increase (and possibly a decrease) in the efficiency ratios 2 and 3» (Daly, 1977, p. 37). Ultimately, with economic growth the increase of service is obtained by an increase of throughput, i.e. with more depletion and pollution. “Development”, instead, refers to a situation in which the efficiency ratios increases, for example when more service is obtained from the same throughput. In other words, «development is qualitative improvement in the capacity of a given throughput to provide for the maintenance and enjoyment of life in community» (Daly, 2014d, p. 71).

<sup>8</sup> In an article issued in 1974 Daly stated this point explicitly: «Thus a steady-state economy, as here defined, does not imply constant throughput» (Daly, 1974, p. 16).

76). Thus, he did not provide a unified definition of a “strong sustainable SSE”, i.e. of an SSE that meets the strong sustainability criteria; but it is quite clear that he believed that an SSE at a low level of throughput would automatically satisfy these criteria<sup>9</sup>.

### **The institution for stabilizing the stock of physical artifacts**

According to Daly, to set up and manage an SSE three institutions are necessary: (1) an institution for stabilizing population, (2) an institution for stabilizing the stock in physical terms and keeping throughput below ecological limits, and (3) an institution limiting inequality in the distribution of the constant stocks among population (Daly, 1977, pp. 53ss).

Let's focus on the institution for stabilizing the stock. According to Daly, that institution is represented by the *cap-auction-trade systems* for basic resources, or *depletion quota auctions* (ibid., pp. 61-75; Daly, 2014c, pp. 78-9). The system requires, first of all, a social decision concerning the scale of the economic system (Daly, 1992, p. 188), which must be set at an environmentally sustainable level<sup>10</sup>. The sustainable scale corresponds to a certain desired constant stock of artifacts, which in turn corresponds to a certain throughput, necessary for the physical maintenance and replacement of that stock. Then, government must determine the annual flow of matter and energy to be taken from the environment to achieve the SSE. The amount of each basic resource to exploit is then divided in “quota-rights” which are sold at auction; the successful bidders may extract the resource directly on the basis of the quotas allotted, or may sell them on secondary market.

This system would lead to higher prices for the auctioned resources, and these prices «would compel more efficient and frugal use of resources by both producers and consumers» (Daly, 1977, p. 63), also encouraging the recycling of materials. Moreover, «The revenues go to the treasury and are used to replace regressive taxes, such as the payroll tax, and to reduce income tax on the lowest incomes» (Daly, 2014c, p. 79).

As I wrote, this system requires, first of all, a decision on the level of stock to be reached. In this respect, Daly did not give a specific quantitative indication, merely suggesting that the stock must be «sufficient for an abundant life for the present generation and ecologically sustainable for a long (but not infinite) future» (Daly, 1979, p. 82; see also 2014b, p. 4). This indeterminacy, according to Daly, is necessary since «it is very difficult, probably impossible» to define the optimal level at which to keep the stock, and therefore the best strategy is to learn «to be stable at existing or nearby levels», and «later we can chase the optimum» (Daly, 1977, p. 52; see also Daly, 1973, pp. 154-5).

### **The (alleged) problem of defining the stock of capital**

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<sup>9</sup> Daly stated that «*Sustainable scale* is defined by a population and a per capita stock of wealth maintained by a metabolic throughput that is within nature's capacity for waste absorption and resource regeneration» (Daly and Morgan, 2019, p. 149). Thus, once you add the word “constant (over time)” after the word “maintained”, the definition of “sustainable scale” becomes essentially the same definition of the SSE.

<sup>10</sup> According to Daly the decision concerning the scale of the economy cannot be left to the market, but should be a social decision, based on ethical, political and ecological criteria: «The social decision that determines the aggregate rate of depletion through depletion quotas can be regarded as the correction of the failure of the market to bring an end to overexploitation» (Daly, 1973, p. 161). The ecological economist Richard Norgaard (2024) reported: «In the 1970s I asked him [H. Daly] at what level should an economy be when in a steady state. He replied that this would be determined by scientists who understood the limits of the natural system».

Even accepting the idea that it is better not to quantify *a priori* the optimal level of stock, to learn «to be stable at existing or nearby levels» one should know with a certain approximation what the existing level is, first to manage its maintenance and later to move towards the optimum level. The capital stock should therefore be quantified. In other words, the SSE requires the knowledge of the current level of the stock of physical capital as well as the size of population: if we do not know these two magnitudes, we do not know if they are constant over time and then we do not know if we are in an SSE. But, as the ecological economist and Daly's biographer Peter Victor wrote, «Counting people is easy; we do it on a regular basis through the census... Counting artefacts is an altogether different matter» (Victor, 2022, p. 178). The difficulty in quantifying the stock of capital stems from the fact that, as I previously mentioned, Daly considered the stock of artifacts in physical terms. Thus, we do not deal with "the stock" as a homogeneous magnitude, but rather with different "stocks" of heterogeneous things: tables, warehouses, cars and so on. Many years ago, when I first read Herman Daly's book *Steady-State Economics* (Daly, 1977), I thought it was not possible to aggregate these different components of wealth, and therefore that it was not possible to quantify the stock as a physical magnitude. Then I thought that the government would not be able to set the depletion quotas of each resource corresponding to the desired level of stock. I concluded that Daly's model of SSE was very interesting for the insights it provided, but logically flawed and impossible to apply in practice.

### **The Daly's approach to the problem in an unpublished writing**

In 2018 I was studying Herman Daly's work to write the *Introduction* (Scarpelli, 2023) to an Italian anthology of his essays and articles edited by me (Daly, 2023). So, I revisited the logical difficulty of determining an aggregate measure of the stock in physical terms. I carefully read Daly's books and articles, but I did not find a discussion on this topic<sup>11</sup>. Therefore, I sent an e-mail to Professor Daly (with whom I was in contact), asking him for some explanation. With his incredible kindness and helpfulness he answered in a couple of days by sending me an unpublished paper, entitled "Draft notes - *Stock versus Throughput Definitions of a Steady-State Economy: Aggregation, Theoretical Clarity, and Operational Difficulty*" (Daly, 2018a)<sup>12</sup>.

In the first paragraph of this paper ("*In the Abstract*"), after an introduction on the entropic nature of the economic process and on the concept of stock, Daly wrote that at a high level of abstraction the stock can be considered a homogeneous aggregate. This approach, according to Daly, is useful to get to the "core" of the SSE (Daly, 2018a):

the vast heterogeneity among parts of the stock of wealth have been left behind in order to aggregate the parts in terms of what they all have in common –namely they are all physical structures that require an entropic maintenance throughput. Into this category we could even include living bodies as part of the stock. At this level of abstraction it makes sense to define a steady state economy as a constant stock maintained by a minimized throughput, without concern for the vast heterogeneity of

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<sup>11</sup> The topic was touched on only in a footnote of the book *Steady-State Economics*, in which Daly wrote: «The capital stock is an aggregate of unlike things and to speak of it as constant in the aggregate, yet variable in composition, implies some coefficients of equivalence among the various unlike things. This problem haunts standard economics as well» (Daly, 1977, p. 17n).

<sup>12</sup> The paper is four pages, Cambria font. I do not know if it was written especially for me, but I think so. This personal experience of mine confirms what Joshua Farley and Tommaso Luzzati wrote: «Herman was an exceptional human being whose moral values, respectfulness, humility, warmth, kindness, and caring nature made a deep impact on those who knew him» (Farley and Luzzati, 2023, p. 1).

the parts of the stock. because we have considered all elements of the stock only in terms of one physical characteristic –their common need for an entropic maintenance throughput from the biosphere in order to continuing existing.

This high level of abstraction gives us some important insights that get lost among the more concrete jumble of differences among things.

So, Daly explained what these “important insights” are: the dependence of the economy (and of life in general) on the ecosphere, the fundamental role of low entropy matter-energy for our life, the fact that the current scale of human economy exceeds the finite capacities of the earth to sustain it.

Daly, however, acknowledged that the implementation of the SSE in the real world requires a less abstract approach (ibid.):

Abstraction is powerful. We cannot really think without abstraction. But there is surely a problem of coming back down to earth to apply our abstract conclusions, to which we should now turn. How can insights gained from our flight of abstraction (Whitehead) land back on earth without crashing into the concrete things that we abstracted from?<sup>13</sup>

### **The definition of SSE in terms of constant throughput**

The second paragraph of the unpublished paper (“*Towards Operational Concreteness*”) began by acknowledging that «Capital stock is a gross aggregate of very different things» (Daly, 2018a). So, «What do all these things have in common in terms of which they could be aggregated?» (ibid.). A possible answer is that all the different things that make up the stock have in common the dependence on an entropic throughput. But this is not the only possible answer: the elements of the stock have in common that they satisfy human wants. Thus, as the satisfaction of wants is traditionally measured on the basis of prices, neoclassical economists aggregate producers’ goods and consumers’ goods in monetary value.

On the contrary, Daly rejected the solution of aggregating the stock by measuring it in monetary terms<sup>14</sup>, and proposed a different definition of SSE (ibid.):

In an attempt to make the concept of a SSE more operational we might shift the definition a bit--from constant stocks with minimized throughput flow to constant throughput with stocks allowed to be whatever that fixed throughput can maintain. It is the throughput that damages the ecosphere, so holding it constant seems a near equivalent definition of the SSE.

It is important to note that the definition of the SSE in terms of constant throughput had been proposed by Daly several years earlier. In a footnote of the book *Steady-State Economics* (the same footnote mentioned in note 11 of this article), Daly stated that «we do not really need an operational measure of the aggregate stock. We can control throughput and let the stock grow to whatever maximum size

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<sup>13</sup> Daly here made an implicit reference to the concept of “fallacy of misplaced concreteness” proposed by the philosopher Alfred N. Whitehead and covered many times by Daly. See e.g. Daly (1987); see also Victor (2022, pp. 144-5).

<sup>14</sup> «Money is an artificial common denominator and reflects utility imperfectly, and entropy and physical limits even less. The physical dimension is abstracted from by neoclassical economists...» (Daly, 2018a).

can be supported by the limited throughput» (Daly, 1977, p. 17n). Some years later, in a conference Daly stated: «A steady-state economy is one whose *throughput remains constant* at a level that neither depletes the environment beyond its regenerative capacity, nor pollutes it beyond its absorptive capacity» (Daly, 2003, my italics). In the following years Daly often repeated that alternative definition (see e.g. Daly, 1996, pp. 31-2), and in 2008 he wrote (Daly, 2008):

Following Mill we might define a SSE as an economy with constant population and constant stock of capital, maintained by a low rate of throughput that is within the regenerative and assimilative capacities of the ecosystem. ... Alternatively, and more operationally, we might define the SSE in terms of a constant flow of throughput at a sustainable (low) level, with population and capital stock free to adjust to whatever size can be maintained by the constant throughput that begins with depletion of low entropy resources and ends with pollution by high-entropy wastes.

The alternative definition did not replace the original one, which Daly continued to use (see, e.g. Daly, 2015, Daly, 2017, p. 100), since he considered it fundamental to understand the concept of an SSE. According to Peter Victor (2023, pp. 182-3),

An advantage of the second definition is that it avoids the practical problem of determining when the total stock of capital in an economy is constant in physical terms and the associated problem of what is to be included as capital for this purpose... It also has the advantage of focusing attention on material and energy throughput which, through extraction and disposal, are the main connections between the economy and the biosphere. Overshoot is largely attributable to throughput...

However, the definition of SSE in terms of constant throughput, assuming it was more operationally manageable, did not seem better to me from a logical point of view, because even the throughput is made up of “objects” (matter and energy) of different nature. In the unpublished paper he sent me, Daly recognized that even throughput aggregation raises problems (Daly, 2018a):

[But] we then have to face the problem that throughput too is an aggregate. If there is to be an operational gain in the redefinition then it must be easier to aggregate throughput than stock. Is it? Probably it is.

### **The measurement of throughput and stock in physical terms**

Even after reading the paper that Daly had sent me, I kept thinking that the problem of aggregation in Daly’s definition of SSE was unresolved. This belief was due to the fact that I was not familiar with the extensive literature on the measurement in physical terms of resources available for the economy and on consumption of materials (see e. g. Krausmann et al, 2017). In this literature, physical stocks and flows are aggregated by mass, or by volume or energy content. I also learned that there are official surveys: as Peter Victor wrote (Victor, 2022, p. 179),

EuroStat, the statistical office of the European Union (EU), now reports the annual throughput of materials in total and by category and the accumulation of artefacts (but

not humans) both measured in tonnes for the EU in total and for individual member countries<sup>15</sup>.

These statistical surveys are carried out within the framework of the “Economy-wide material flow accounts (EW-MFA)”, «a statistical accounting framework describing the physical interaction of the economy with the natural environment and the rest of the world economy in terms of flows of materials»<sup>16</sup>.

I must admit that, at first, the aggregation of throughput and stock in terms of mass left me puzzled, because different materials and products have extraction methods, economic values and environmental impacts that can be very different: a ton of sand is in no way equivalent to a ton of cobalt. On the other hand, I acknowledged that the research and statistical methodologies in this field are well established and therefore I had to put aside my perplexity. Moreover, on second thought, even the aggregation of different goods in terms of monetary value, usually made by economists and statisticians, poses problems that are not too different: a million euros (or dollars) of sand has the same monetary value of a million euros (or dollars) of cobalt, but it's quite different in all other respects. Precisely in the unpublished paper I mentioned before, Daly wrote (Daly, 2018a):

However, aggregation is still a big problem, as it is for all forms of macroeconomics. Monetary GDP is a monster aggregate, and real GDP faces the index number problem as well as the aggregation problem. So while SSE has no good solution, neither does standard macroeconomics. Aggregates are inherently approximate, imprecise magnitudes with vague boundaries, more suited to dialectical than analytical reasoning.

### **The “pre-analytic vision” trap**

The passage quoted at the end of the previous paragraph should make us think. I questioned the logic of Daly's SSE for the aggregation of stock in physical terms because that model was too groundbreaking for my economic background. Something similar happens to mainstream economists: they are usually demanding of new or heterodox economic ideas, while they often take for granted the coherence and the logical soundness of the prevailing theories, even though these theories sometimes are based on weak hypotheses, have logical flaws and/or fail to satisfy basic requirements of scientific practice (see e.g. Keen, 2022; Zaman, 2023; Diesendorf et al, 2024). Yet, few economists seem to be aware of this. A good example is represented by the neoclassical aggregate production function, which was criticized precisely by Nicholas Georgescu-Roegen and Herman Daly because it is not into conformity with biophysical laws (Georgescu-Roegen, 1971, pp. 234ss; Georgescu-Roegen, 1984; Daly, 1999), as well as by other heterodox economists for serious logical deficiencies (Pasinetti, 2000). Although these criticisms are well founded, the neoclassical aggregate production function is widely

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<sup>15</sup> However, Daly seemed to use the term “throughput” to mean a magnitude partially different from that considered by Eurostat: see O'Neill (2015a).

<sup>16</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Economy-wide\\_material\\_flow\\_accounts](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Economy-wide_material_flow_accounts). In particular, Direct Material Input (DMI) «measures the direct and actual input of materials into a given national economy originating from the natural environment or from the rest of the world. It includes the total amount of materials (excluding bulk material flows such as water and air) which are of economic value and are available for the national economy's production system. DMI represents the total material throughput or material scale of an economy» ([https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Direct\\_material\\_input\\_\(DMI\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Direct_material_input_(DMI))).

and smoothly used by almost all mainstream economists (Scarpelli, 2022). The reason of that “nonchalance” is quite clear: economists have absorbed mainstream ideas at university and read them every day in economic reviews and newspapers. Those ideas, as Daly wrote, constitute their Kuhnian paradigm or their Schumpeterian “pre-analytic vision” (Daly, 1977, p. 14; Daly, 2014c, pp. 39-40; Pasinetti, 2000, p. 412), which prevents these economists from seeing that certain assumptions and conclusions are unrealistic and/or in conflict with scientific laws.

### **Throughput, GDP and the SSE**

As I showed previously, Herman Daly’s SSE is not logically flawed for the reason I had thought in the past<sup>17</sup>. In fact, stock and throughput in physical terms, the two basic magnitudes that, together with population, define an SSE, can be aggregated in terms of mass. Despite this, several scholars who have addressed the issue of SSE gave definitions based not on stock and throughput, but on GDP or other macroeconomic aggregates, like consumption and production, then in monetary terms; this is shown by the list of definitions of SSE I reported in the Appendix<sup>18</sup>.

SSE definitions in terms of GDP (or in terms of other macroeconomic aggregates) do not seem to be consistent with Daly’s thought, because he stressed that «an SSE is not defined in terms of gross national product. It is not to be thought of as “zero growth in GNP”» (Daly, 1996, pp. 32). Then, he made a clear distinction between an SSE and a “zero growth” (or “failed growth”) economy. According to him, the identification of an SSE with a “zero growth” economy was one of the most common misconceptions of the SSE (Daly, 1993, pp. 373-4). In an essay published in 1979 he wrote: «The concept of an SSE is independent of GNP, and what happens to GNP in the SSE simply does not matter. The best thing to do with GNP is to forget it» (Daly, 1979, p. 84; see also Daly, 1977, p. 126). This statement must be interpreted in the sense that in an SSE GDP growth would no longer be the main objective of the economy (Daly, 1977, p. 18). Recently many “post growth scholars” expressed a similar belief. Lukas Hardt and Daniel O’Neill (2017, p. 198) wrote that the goal of the “post growth approaches”

is not zero (or declining) GDP growth. The goal is to reduce and then stabilise material and energy use within ecological limits ... Due to the high degree of coupling between resource use and economic activity ... the result may be a stabilisation (or decline) in GDP, but this is not the goal per se. It is, however, a consequence that post-growth economics needs to be able to deal with.

On turn, Peter Victor wrote that «Escape from overshoot is about reducing the physical scale of the economy. What happens to GDP is of secondary importance» (Victor, 2023, p. 242)<sup>19</sup>. More recently the same concept was reaffirmed by a group of leading “post-growth economists” (among others Giorgos Kallis, Jason Hickel, Daniel O’Neill, Tim Jackson, Peter A. Victor and Kate Raworth) (Kallis et al, 2025, p. e62).

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<sup>17</sup> Nevertheless a SSE is difficult to implement in reality for many reasons, including the data availability (O’Neill, 2015b).

<sup>18</sup> The list is brief and largely incomplete, but significant.

<sup>19</sup> The quoted passage is referred to the analysis made by Victor by means of LowGrow SFC, a system dynamics model developed in collaboration with Tim Jackson (Jackson and Victor, 2020). Victor and Jackson simulated sustainable prosperity scenarios for the Canadian economy out to 2067 and in the “*Escape scenario*” «the priority ... is to reduce the physical scale of the economy as measured by its material flows and its ecological footprint, and to do so in a fair and equitable manner» (Victor, 2023, p. 238).

But the fact that in an SSE (and in general in a sustainable economy) GDP growth would no longer be an objective, does not imply that GDP in these economies can be “forgotten”. In fact, Daly himself stated that GDP is an index of throughput (Daly, 1977, p. 17; Daly, 1996, p. 41). Moreover, he stated that even if GDP and throughput are not perfectly correlated, a certain positive correlation between these two quantities nevertheless exists (Daly, 2015) and that this correlation is «very strong» (Daly, 2014e, p. 143) or «quite high» (Daly, 2017, p. 88). If this is true (I think it is <sup>20</sup>), the diversity between the “zero growth economy” and the SSE, stressed by Daly, tends to blur, because in an SSE GDP could be used as a sort of operational target to control throughput. While the current GDP maximization policies imply the maximization of throughput (depletion and pollution), as Daly argued, a policy to stabilize GDP would stabilize throughput. In any case, even without adopting such a policy, the throughput-GDP correlation means that GDP is relevant also in an SSE, as some definitions reported in the Appendix seem to highlight.

## Conclusions

Herman Daly’s contributions were mostly ignored by the «economists of high academia» (Daly, 2014b, p. 5), although in several occasions Daly had academic controversies with leading economists (Victor, 2024). These debates covered various topics, like the neoclassical production function, the consumption of resources, the free trade and so on. Significantly, instead, there has been no debate on the technicalities of the SSE, as the mere idea of a stationary economy was enough to keep mainstream economists away. They identified the SSE with a “zero growth economy” and therefore rejected it, considering GDP growth possible and desirable. They did not dwell on the fact that Daly defined the SSE in terms of physical wealth, not in terms of GDP.

A completely different criticism to SSE was formulated by Nicholas Georgescu-Roegen, Daly’s professor and mentor. As is well known, Georgescu-Roegen, recalling his entropic interpretation of the economic process (Georgescu-Roegen, 1971), wrote that the SSE cannot be the solution for the ecological problem of mankind because also an economy with constant population and capital consumes matter and energy, and in any case «a steady state may exist in fact only in an approximated manner and over a finite duration» (Georgescu-Roegen, 1975, p. 367; see also Georgescu-Roegen, 1977; Victor, 2024, pp. 100-1).

According to Daly, the aforementioned criticisms of the SSE were based on confusions and misunderstandings (Daly, 1993, pp. 373-4, 378-81; Daly, 2014a, pp. *viii-ix*).

More recently, several heterodox economists criticized Daly’s SSE: eco-socialists (see e.g. Smith R., 2010a; Smith R., 2010b), degrowth supporters (e. g. Schneider, Kallis and Martinez-Alier, 2010, p. 513) and social ecological economists (Spash and Smith T., 2019; Spash, 2023). These economists have stressed that SSE would not be effective or sufficient to tackle the ecological and social crisis, without dwelling on technical details of Daly’s model. This was done, instead, by ecological economists close to Daly’s position, such as Peter Victor and Daniel O’Neill.<sup>21</sup> Among these details, there is the

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<sup>20</sup> The degree of correlation GDP-throughput implies a larger or smaller decoupling: see Victor (2023, pp. 153ss).

<sup>21</sup> Anyway, both these economists consider the SSE insufficient to achieve sustainability. Peter Victor drew attention to the fact that the mere stabilization of throughput (i.e. of the scale of economic system) could be too reductive a policy (Victor, 2019, p. 319), and Daniel O’Neill (2015a) wrote that Daly’s SSE should be considered as a necessary, but not sufficient, condition for sustainability. A similar criticism was expressed by Clive Spash and Tone Smith: «Scale, while important, fails to address the issues highlighted in our coverage of ecosystems

logical feasibility of aggregating the stock in physical terms. As I reported above, Daly himself did not examine that problem in his works. Precisely for this reason, in 2018 I asked professor Daly for guidance, receiving, in response, an unpublished paper. In this writing he reaffirmed the validity of his approach at a high level of abstraction, and proposed again the alternative definition of SSE in which the throughput is constant and the stocks of population and artifacts, free to adapt, become variables. This definition is in principle operationally usable, as statistics of throughput measured in terms of mass are now available, at least in Europe.

Moreover, reading the Daly's unpublished paper made me reflect on the fact that economists often judge harshly small flaws of new and heterodox theories, or see flaws in these theories even when there are none; on the contrary, they usually take for granted the soundness of prevailing economic theories, even though these theories are sometimes based on unrealistic assumptions and do not take into account biophysical laws.

I then received a further teaching from Professor Daly: we should strive to adopt the same yardstick for both the prevailing theories that are familiar to us and for new and heterodox ones. As John Maynard Keynes wrote: «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» (Keynes, 2008, p. vii).

Lastly, let me say that when I received "*Stock versus Throughput Definitions of a Steady-State Economy [...]*" I asked Professor Daly if he intended to publish it. He replied that it was just a draft and that perhaps he would have worked on it further to publish it. This evidently did not happen. Therefore, I believe it is right that this paper remains unpublished to respect the will of its Author.<sup>22</sup>

### **Appendix: Brief Review of Steady-State Economy Definitions**

- «[the SSE is] an economy with constant population and constant stock of capital [*in physical terms* -Ed.), maintained by a low rate of throughput that is within the regenerative and assimilative capacities of the ecosystem... Alternatively, and more operationally, we might define the SSE in terms of a constant flow of throughput at a sustainable (low) level, with population and capital stock free to adjust to whatever size can be maintained by the constant throughput beginning with depletion and ending with pollution» (Daly, 2008);
- «"steady state economy" typically refers to a national economy of stable size...It connotes constant populations of people (and, therefore, "stocks" of labor) and constant stocks of capital. It also has a constant rate of throughput; i.e., energy and materials used to produce goods and services» (B. Czech - Center for the Advancement of the Steady State Economy – CASSE, 2006);
- «At its simplest, a steady state economy is an economy that aims to maintain a stable level of resource consumption and a stable population. It is an economy where energy and resource use are kept within ecological limits, and where the goal of maximising GDP is replaced by the goal of maximising quality of life» (O'Neill and Dietz, 2010, p. 34);
- «A steady state economy is a physically nongrowing economy where the production of new goods essentially matches the consumption and physical depreciation of existing goods. Also constant in a steady-state economy is the population of human beings. Quite deliberately, the

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or the qualitative properties of pollutants (e.g. toxic waste, radiation, plastics, hormones)» (Spash and Smith T., 2019, p. 224).

<sup>22</sup> Apart, of course, from the few passages I have quoted.

physical scale of a steady-state economy is one where its continued maintenance requires a rate of resource throughput that is no greater than the regenerative and waste assimilative capacities of the supporting ecosphere» (Lawn, 2011, p. 2).

- «[the SSE is] an economy with stable (or mildly fluctuating) population, production, consumption, and therefore GDP» (Czech, 2013, p. 119);
- «[the SSE] may be defined as an economy where the main biophysical stocks and flows are stabilised, and where material and energy flows are kept within ecological limits» (O'Neill, 2015b, p. 1214).
- «A stable human population and a constant rate of throughput characterize a steady state economy» (Farley, 2015);
- «A steady state economy is based on a steady sustainable population and a minimized throughput of resources» (Kopnina, 2016, p. 71);
- «... it's an economy with three key features: •A stable and ecologically sustainable population, •A low use of resources, •Equitable distribution of wealth» (Washington, 2017, p. 25);
- «A steady state economy is a dynamic market economy that efficiently allocates goods and services but uses the lowest feasible rates of natural capital depletion to achieve a high quality of life» (Magnus-Johnston, 2017, p. 100);
- «A Steady State Economy (SSE) is an economy that is stable and at 'equilibrium'. That means that factors like demand, supply, and production are relatively constant and sustainable. Further, there is stable population size» (Cheruparambil, 2022);
- «The central idea of a steady-state economy includes the following three conditions: a) constant production from period to period, i.e. constant product (GDP) over time, b) constant population size and c) ecological balance [which] «is achieved when the ecological footprint (EF) is equal to or less than the biocapacity (BC) of the planet» (Lianos, 2024, Ch. 10, App. A1, A4).

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# Addressing the climate and inequality crises: Some results at the country level

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A previous paper (Buzaglo and Buzaglo Olofsgård 2024) discussed a model of global control of greenhouse gas emissions based on the allowance of personal emission quotas, tradable on an ad hoc global Carbon Exchange. In the model, the carbon price is determined by the supplies of low-emission individuals and the demands of high-emission individuals. That is, high-income/emission individuals, emitting more than their allotted quota, are buyers of emission rights (demand), while low-income/emission individuals, who emit less than their allotted quota, are sellers of emission rights (supply). The role of the Carbon Exchange is to find the price at which demand equals supply.

Allotted individual quotas diminish over time, following the (1,5 degrees) sustainability path put forward by the IPCC scientific panel (IPCC 2023). Quotas also decrease according to expected world population growth. Assuming that the quota system is carefully and effectively implemented, emissions will follow the global sustainable path.

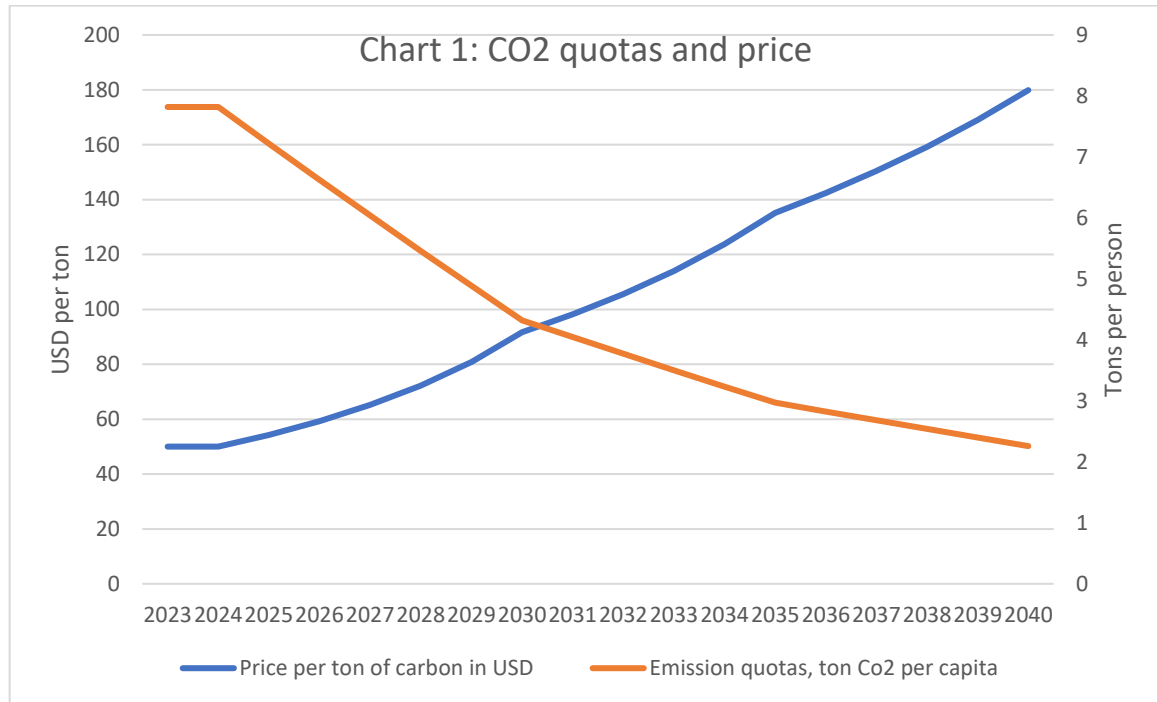
A simulation of this scheme produces significant effects on the global income distribution. Model simulation for 2024-2040 showed a 36 percent decline in the Gini coefficient of global inequality, which reflects a decline from a Gini level close to that of the most income-unequal among countries to that of the country-average level of inequality.

The simulation in the previous paper focused on the potential effects of the scheme at the global level, for the top 10 percent, middle 40 percent, and bottom 50 percent of the world's income distribution. At the world level, as mentioned, the resulting reduction of inequality was an important 36 percent. However, at the level of individual countries, one can expect a wide dispersion of effects, as differences in income levels and their distribution across countries are enormous.

The *World Inequality Report 2022* (Chancel et al. 2022) provides the necessary additional data for a quantitative approximation of the potential effects of the scheme in 26 representative countries that make up an important part of the world's population. For each of these countries, the report includes data on national income and greenhouse gas emissions, and their distribution among population groups (the top 10 percent, middle 40 percent, and bottom 50 percent). These data allow us to calculate the potential effects of the global quota scheme on the trade balances of our sample countries. The aim is to determine each country's net imports or exports of emission rights and their importance relative to GDP. The simulation also produces results on the potential redistributive effects of the scheme at the country level.

### The rationale of the calculation

The 26 different country models follow the same structure as the world model outlined in Buzaglo and Buzaglo Olofsgård (2024). However, in the country models, net trade in quotas adds to national income, and the carbon price is exogenously determined. For each country in the global economy, the relevant price is the world price, set in the global Carbon Exchange, as explained in Buzaglo and Buzaglo Olofsgård (2024). The world carbon price begins at a plausible exogenous level of 50 USD in 2024 and endogenously increases to 180 USD in 2040 (a cumulative growth rate of 8,3 percent per year). (See Chart 1; the CO2 quota evolution is also shown.)



The redistributive process in each country proceeds as follows: for each income group, the (positive or negative) surplus of emissions over quotas, multiplied by the current carbon price, is either subtracted from or added to the incomes of the group.

The Appendix details exogenous data, initial (2024) values, and simulation parameters.

### Exports and imports of emission rights

The total CO2 emissions by the residents of a country may be greater or smaller than the quotas allotted to them. If emissions are greater, the excess of emissions over quotas defines the volume of CO2 emission rights imported. The volume of the emission rights imported, multiplied by the current carbon price, defines the country's imports of emission rights. If a country's emissions are smaller than the allotted quotas, the excess of quotas over emissions — multiplied by the current price — is the country's exports of emissions rights.

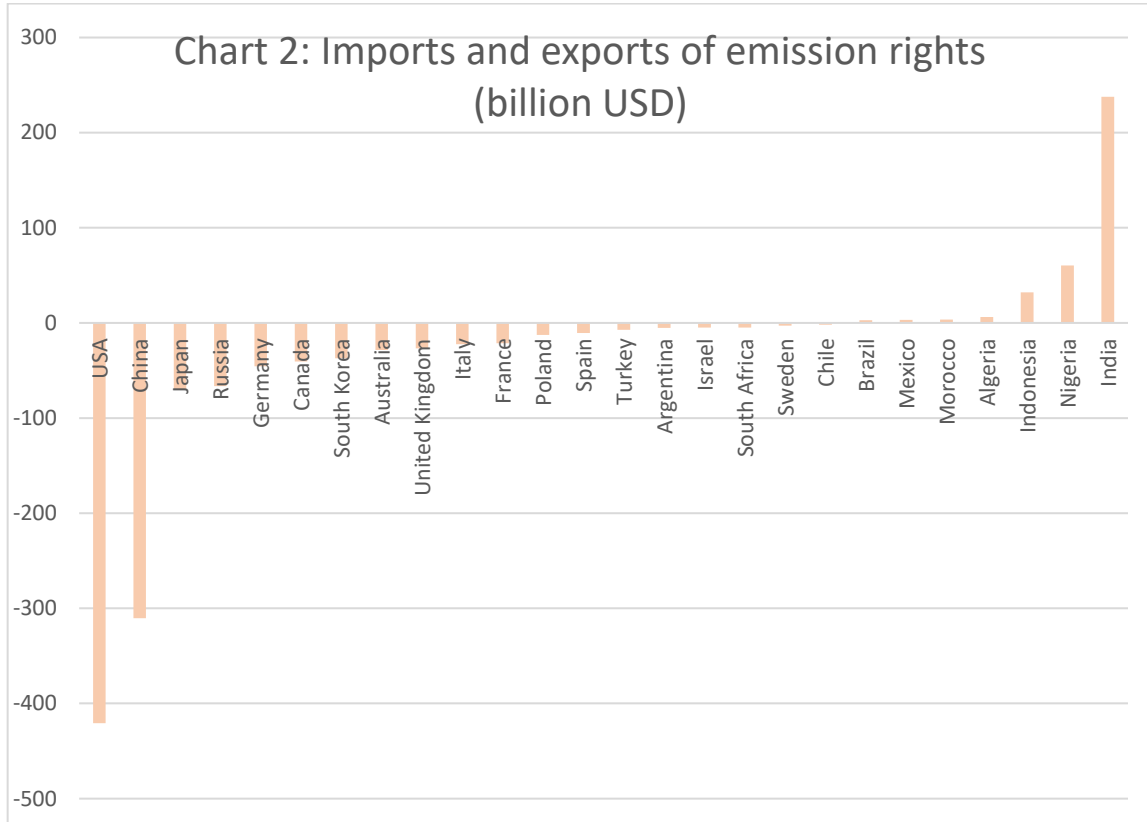


Chart 2 shows the simulated emission rights balances for the 26 countries in the *World Inequality Report 2022* (Chancel et al. 2022). Negative values represent imports of emission rights (i.e., the excess of country emissions over country quotas). Positive values represent exports (i.e. the excess of quotas over emissions). The plotted values represent average annual imports and exports over the simulation period 2024-2040.

The importance of the external trade impact may greatly differ among countries according to the size of the economy, its external trade structure, and degree of openness. Large emission rights importers, such as the US or China, or large exporters such as Nigeria or India, differ greatly in terms of GDP and external trade balances. However, for countries such as the US, which already have large, permanent trade deficits, any viable global climate control system would require efforts to improve production and trade structures. The US has had permanent negative trade balances since the late 1970s. In 2024, the US trade deficit was 918,4 billion USD, to which would be added the imports of emission rights of about 421 USD billion, as shown by the simulation.<sup>1</sup> Permanent trade deficits since the 1970s have also resulted in the accumulation of significant external debt, amounting to 26,9 trillion USD (as of September 2024, according to the US Treasury), i.e. about 100 percent of GDP.

In contrast, China, with a long series of large positive trade balances (306 billion USD on average from 2014 to 2023), should have little difficulty accommodating potentially sizable imports of emission rights (310 billion USD on average, according to the simulation). China has also accumulated a large net

<sup>1</sup> Data from Bureau of Economic Analysis (<https://www.bea.gov/news/2025/us-international-trade-goods-and-services-december-and-annual-2024>).

stock of international assets — it has a positive international investment position (i.e., international assets minus international liabilities) of 2.9 trillion USD in 2023.<sup>2</sup>

Japan, Russia, and Germany follow in importance as potential importers of emission rights, though at much lower levels than the US or China. All of these countries enjoyed a long period of permanent surpluses in their current accounts. These surpluses are much larger than the expected increase in imports that would result from the introduction of the quota scheme. In Germany's case, a particularly successful exporter, quota imports would represent about one-sixth of its (2014-2023) average trade surplus.

The external trade balances of most other, lesser importers of emission rights are not significantly affected, as these countries' positive trade balances largely cover their quota imports.

Lower-income countries with high poverty rates are typically low emitters of greenhouse gases and tend to be emission rights exporters. India, with a large population (1,45 billion) and a high poverty rate, is potentially a significant exporter of emission rights — 238 billion USD in average exports, according to the simulation. Like many developing countries, India has had a persistent trade deficit, with an average trade balance of -38 billion USD over the past 10 years. The substantial currency inflow from the sales of emission rights would enable India to overcome its balance of payments constraint on development. Potential average exports of emission rights represent about three-quarters of India's average exports between 2014 and 2023. This increase in import capacity — especially the ability to significantly increase imports of investment goods — could lead to a substantial boost in investment, growth, and poverty alleviation. Similar effects should be expected in other low-income economies in Southeast Asia, excluding Indonesia.

For Indonesia, a middle-income economy, the effects on the external sector are less pronounced. Higher average incomes and a less unequal income distribution result in lower surpluses of emission rights. Potential exports of emission rights would represent about one-quarter of Indonesia's average exports from 2014 to 2024.

The quota scheme would dramatically enhance Nigeria's import capacity. Exports of emission rights (averaging 61 billion USD) would more than double Nigeria's import capacity — its actual exports averaged 58 billion USD between 2014 and 2023. The effects of the quota scheme on Nigeria's external sector are likely representative of many lower-income Sub-Saharan economies, which are typically highly indebted and constrained in their capacity to invest and grow.

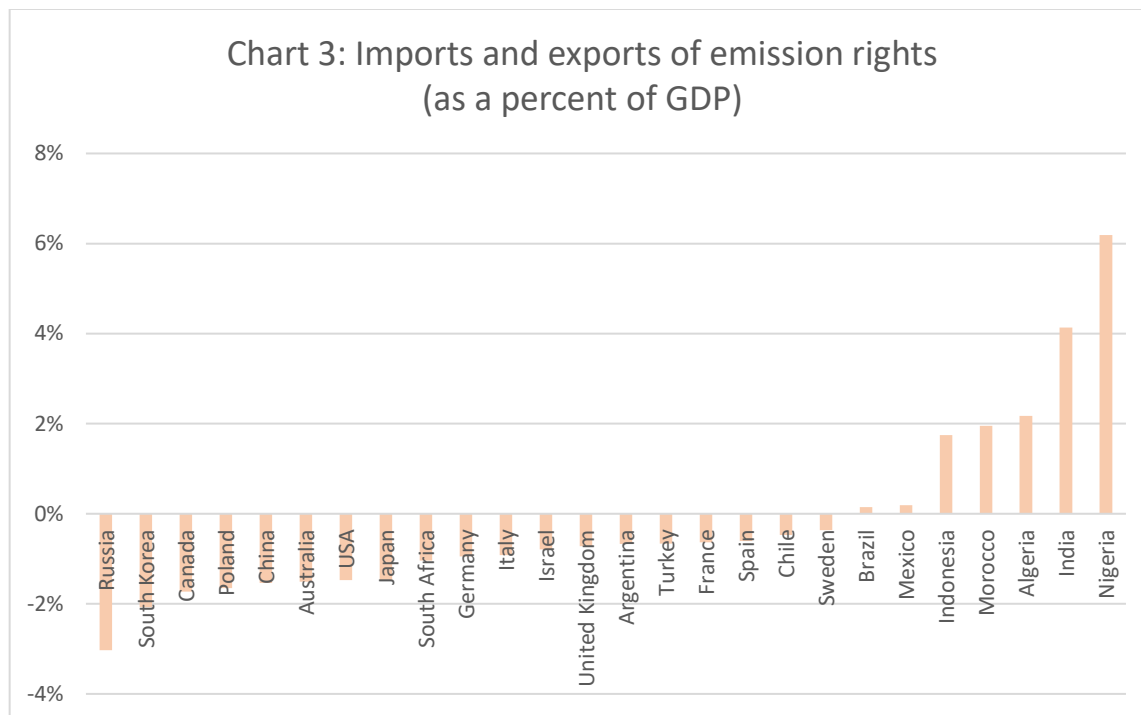
### **Quota imports- and exports-to-GDP ratios**

The effects of the individual quota system on countries' exports and imports of emission rights are more nuanced when compared with their GDP. The US, for instance, is by far the greatest quota importer in absolute USD terms, but ranks among the average quota-importing countries when considering quota imports-to-GDP ratios (around 1,5 percent; see Chart 3). This means that the necessary changes in the US international trade structure mentioned above, even if important in the

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<sup>2</sup> The source of the external trade and investment data in the paper is the IMF (<https://data.imf.org/?sk=7A51304B-6426-40C0-83DD-CA473CA1FD52&slid=1542633711584>).

context of the US current account balance, seem affordable when considered as a (minor) part of the relatively closed US economy.<sup>3</sup>



Like the US, most emission rights-importing countries are high-income countries. It is worth remembering that in 1970, the UN General Assembly adopted the goal for each economically advanced country to increase its official development assistance to a minimum of 0,7 percent of GDP by 1975. Half a century later, only five countries have attained this goal.<sup>4</sup> What was not achieved then through enlightened self-interest and generosity may now, with a climate catastrophe in sight, result from instinctive self-preservation.

High-income countries tend to have high greenhouse gas emissions per capita, greater than their total quotas, and tend to be importers of emission rights. However, among quota-importing countries, Russia, China, and South Africa represent special cases. Russia, not a high-income country, has the highest quota imports-to-GDP ratio (3 percent). Russia is a major gas- and oil-exporting country — the second-largest after Saudi Arabia.<sup>5</sup> Oil-exporting countries typically have high ratios of greenhouse gas emissions to GDP and high per capita emission rates. China and South Africa, with much lower per capita income levels than countries with similarly high quota imports-to-GDP ratios, use relatively carbon-intensive energy sources and technologies. In the case of South Africa, one must also consider the effects on consumption patterns of a highly unequal income distribution.

<sup>3</sup> The US trade openness index (trade-to-GDP ratio) is one of the world's lowest (27 percent, World Bank data for 2022). (<https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS>.)

<sup>4</sup> Norway, Luxemburg, Sweden, Germany, and Denmark (<https://www.oecd.org/en/topics/official-development-assistance-oda.html>).

<sup>5</sup> See <https://www.ceicdata.com/en/indicator/crude-oil-exports>.

Nigeria and India are the economies most benefitting from the global tradable quota scheme, both in absolute terms and as a percentage of GDP. Large additions to the export incomes of these countries should allow for increases of half or more in their rates of investment in capital goods and technology.

Large surpluses of emission quotas over actual emissions are explained by low average incomes and high poverty rates — poverty rates are 63,5 percent in Nigeria and 44 percent in India (poverty headcount ratio of PPP 3,65 USD a day). Indonesia’s poverty ratio is much lower, at 17,5 percent. Algeria does not report poverty data, while Morocco’s rate is 9,8 percent.<sup>6</sup>

### Effects on countries’ income distribution

The magnitude of the quota scheme’s equalizing effect on countries’ income distribution augments with (initial) inequality and diminishes with (initial) income per capita. For a given income per capita, the higher the level of inequality, the lower the incomes of the bottom half of the distribution, and the lower the associated emissions of greenhouse gases. Thus, the greater the excess of allotted quotas over factual emissions, the higher the addition to the incomes of the bottom half of the distribution, and the greater the redistributive effect. For a given initial level of inequality, on the other hand, the higher the initial per capita income, the higher the associated emissions of the bottom half of the distribution. Hence, the lesser the excess of quotas over factual emissions and the smaller the redistributive effect.

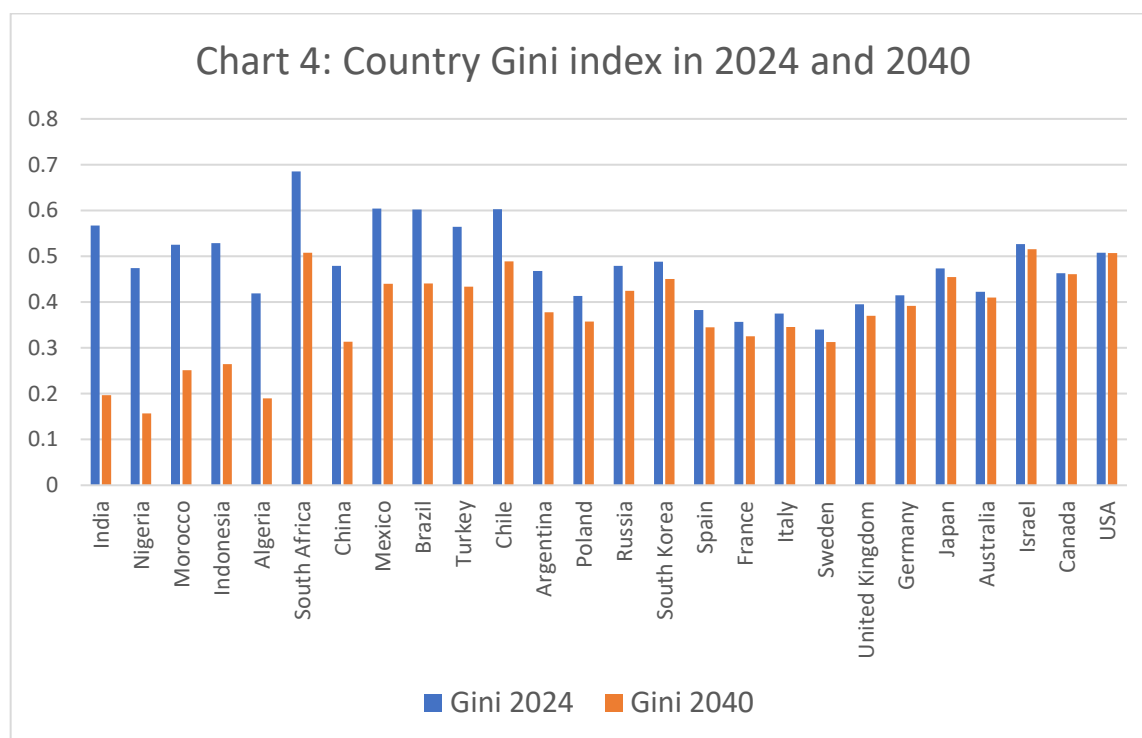


Chart 4 shows the potential impact of the scheme on countries’ income distribution in order of decreasing equalizing effect from left to right, i.e., in order of decreasing differences between initial and final Gini values.

<sup>6</sup> World Bank poverty data (<https://pip.worldbank.org/home>).

The largest distributional changes are found in countries with high initial income inequality and/or low initial average incomes. Increases in income equality are most significant in India and Nigeria. To understand these large changes, it is important to note that, for these countries, yearly exports of emission rights should represent about 4 and 6 percent of GDP, respectively, and that these large income increases accrue to the lower-income groups. Following in the order of decreasing redistributive impact are Morocco, Indonesia, and Algeria, countries with somewhat higher initial average income and somewhat lower poverty levels. Distributional changes in Morocco and Algeria may be representative of potential effects in other Middle East and North African economies.

South Africa and China experience similar decreases in Gini percentage points, but the relative decrease in inequality is greater in China, given South Africa's much higher initial Gini.

Next, in decreasing order of distributional effects, are countries with higher initial per capita incomes and similar levels of initial inequality. Latin American countries are known for their high levels of inequality. Relatively high average incomes in Mexico, Brazil, Chile, and Argentina result in lower, but still significant, redistributive effects (Gini index decreases of 27 percentage points for Mexico and Brazil, and 19 points for Chile and Argentina).

High-income countries may reach income levels where not only top-income groups, but also middle- and even bottom-income groups, exceed their allotted emission quotas, making all groups buyers of emission rights. In such cases, the redistributive effect is smaller. However, the effects are still notable, with a Gini decrease of 6 percentage points in Poland and 2 percentage points in Japan.

Australia, Israel, Canada, and the US are among the world's largest per capita carbon emitters. Most income groups in these countries exceed their allotted quotas. Consequently, the distributional impact is very low, with a Gini decrease of 1 percentage point or less.

## **Final comments**

As shown in Buzaglo and Buzaglo Olofsgård (2024), a global system of individual tradable emission quotas for greenhouse gases is a potentially powerful instrument for reducing global income inequality and controlling greenhouse gas emissions. A model simulation of its probable effects showed that, if carefully designed and implemented, such a system could reduce global income inequality by more than one-third, while simultaneously following the (1,5 degrees) emissions reduction path (2024-2040) recommended by established climate science (IPCC 2023).

As expected, given the large disparities in economic conditions among countries, the effects of the quota scheme on the economies comprising the world economic system vary significantly. The simulations of this study, comprising 26 representative economies, focused on the effects on key variables from a country-level perspective: (a) countries' imports or exports of emission rights, (b) countries' imports or exports of rights as a percentage of GDP, and (c) effects on the countries' levels of income inequality.

The simulations show that international trade in emission quota rights is largely concentrated in four large economies: two importers — the US and China — and two exporters — Nigeria and India. Large imports of emission rights affect the external sector conditions of the US and China differently. In the US, large, permanent external trade deficits and substantial external debt would require adjustments in production and external trade structures. In China, the external sector conditions are the opposite:

large, permanent trade surpluses and accumulated external assets would facilitate the accommodation of an important expected amount of emission rights imports.

The two largest exporters of emission rights, Nigeria and India, are developing economies with characteristic external sector constraints on development. These constraints include insufficient export capacities to finance the imports of goods and services necessary for supporting higher rates of investment, growth, and development. Large exports of emission rights would allow these economies — and potentially others in Southeast Asia and Africa — to remove the external sector constraint on development.

Considering the countries' external trade of emission rights in relation to their overall economies provides additional insights. According to the simulations, the US is the largest potential importer of emission rights. This could further strain an already indebted external sector in permanent deficit. However, in relation to the size of the US economy, the necessary changes in trade and output structures are not particularly imposing. For instance, the increase in exports needed to absorb the cost of emission rights imports would be around 15 percent on average. After this increase, the US economy's degree of openness (trade-to-GDP ratio) would still remain one of the world's lowest.

With a few exceptions, emission rights importing countries are high-income countries. For these countries, rights imports amount to around 1 to 2 percent of GDP on average. To put these figures in context, it is worth recalling the UN 1970 resolution adopting the goal for developed countries to achieve by 1975 a level of development assistance of at least 0,7 percent of GDP — a level to this day achieved by only five countries.

The global personal quota scheme has important equalizing effects in low-income countries and/or countries with high levels of inequality. Low-income, high-inequality countries such as India and Nigeria experience substantial reductions in inequality, becoming the lowest-Gini countries. Important but less pronounced reductions in Gini indices occur in North African and Latin American economies, in decreasing order of per capita GDP and/or increasing order of (initial) inequality. Reductions in inequality diminish with higher per capita incomes. For high-income countries, the emission levels for most income groups exceed their allotted quotas, leading to very low or nonexistent redistributive effects. This the case of Israel, Canada, and the US, where the redistributive impact is minimal or absent. These countries would need to also introduce nationally based, specific redistributive strategies.

## **Appendix**

*Initial greenhouse gas emissions by country.* [https://wir2022.wid.world/www-site/uploads/2021/12/CountrySheets\\_WorldInequalityReport2022\\_-WorldInequalityLab\\_7Dec.pdf](https://wir2022.wid.world/www-site/uploads/2021/12/CountrySheets_WorldInequalityReport2022_-WorldInequalityLab_7Dec.pdf).

For consistency with IPCC data, WIR2022 country emissions initial (2019) data are scaled up by a factor of 1,36. World IPCC emissions (2019) = 1,36 times world WIR2022 emissions (2020). [59,1 Gt CO<sub>2</sub>e = 1,36 x 33,1 Gt CO<sub>2</sub>e]. We assume world emissions in the simulation's initial year (2024) are equal to those in 2019 and 2020.

*Emission quotas reduction path.* 1) Following the Buzaglo and Buzaglo Olofsgård (2024) world model, at the country level individual emission quotas decrease over time following the IPCC (2023) science-based emissions trajectory necessary for maintaining global warming below the 1,5 degrees level. Emissions decline (linearly) to 33,7 billion tons in 2030. They decline thereafter at slower rates, to 23,6 billion tons in 2035, and 18,3 billion in 2040. 2) Individual emission quotas also diminish over time with

population growth. Data on countries' population growth from UN Data Division Population Portal: <https://population.un.org/dataportal/home?df=d3fe8b1e-3767-4302-bea1-11a64d8135b1>.

*National income, income growth, and income distribution.* 1) Countries' initial GDP and its distribution: [https://wir2022.wid.world/www-site/uploads/2021/12/CountrySheets\\_WorldInequalityReport2022\\_-\\_WorldInequalityLab\\_7Dec.pdf](https://wir2022.wid.world/www-site/uploads/2021/12/CountrySheets_WorldInequalityReport2022_-_WorldInequalityLab_7Dec.pdf). 2) Countries' GDP growth is assumed to be equal to world GDP growth, i.e. 2,9 percent annually (see Buzaglo and Buzaglo Olofsgård 2024).

*Income elasticity of greenhouse emissions.* Countries' income elasticity of gas emissions is the same as the assumed world elasticity, equal to one (Buzaglo and Buzaglo Olofsgård 2024).

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# Distributive Consequences of Neoliberalism in Russia

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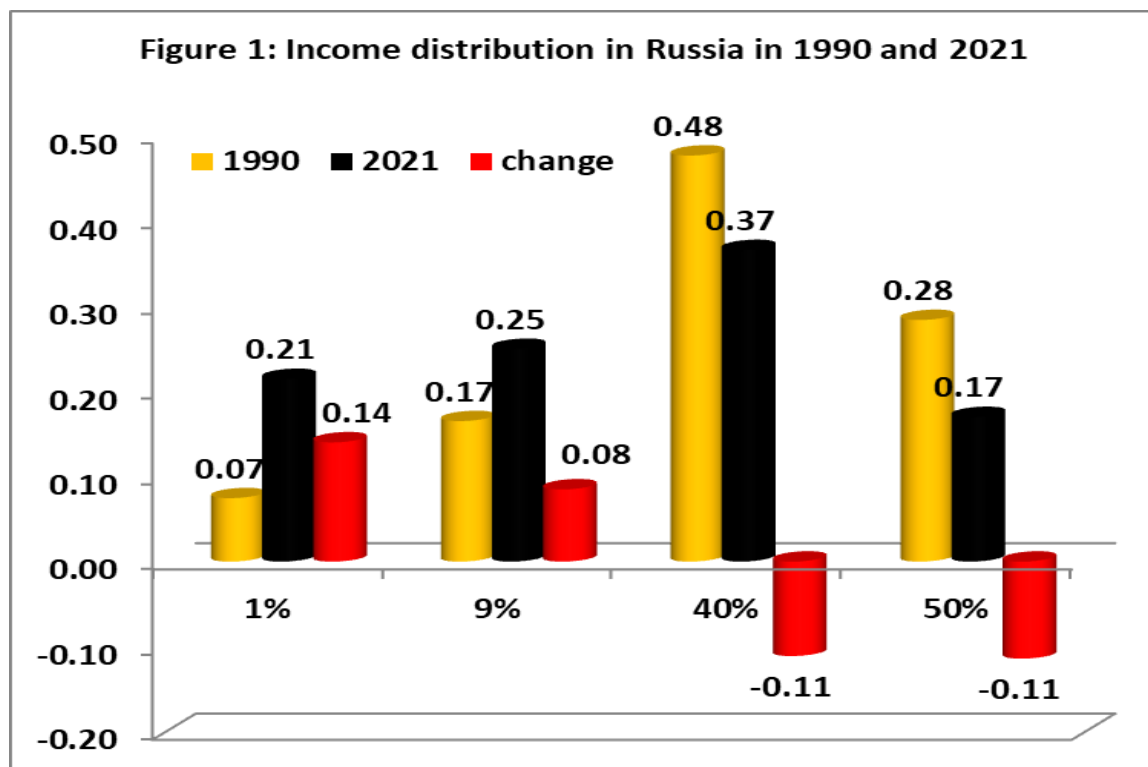
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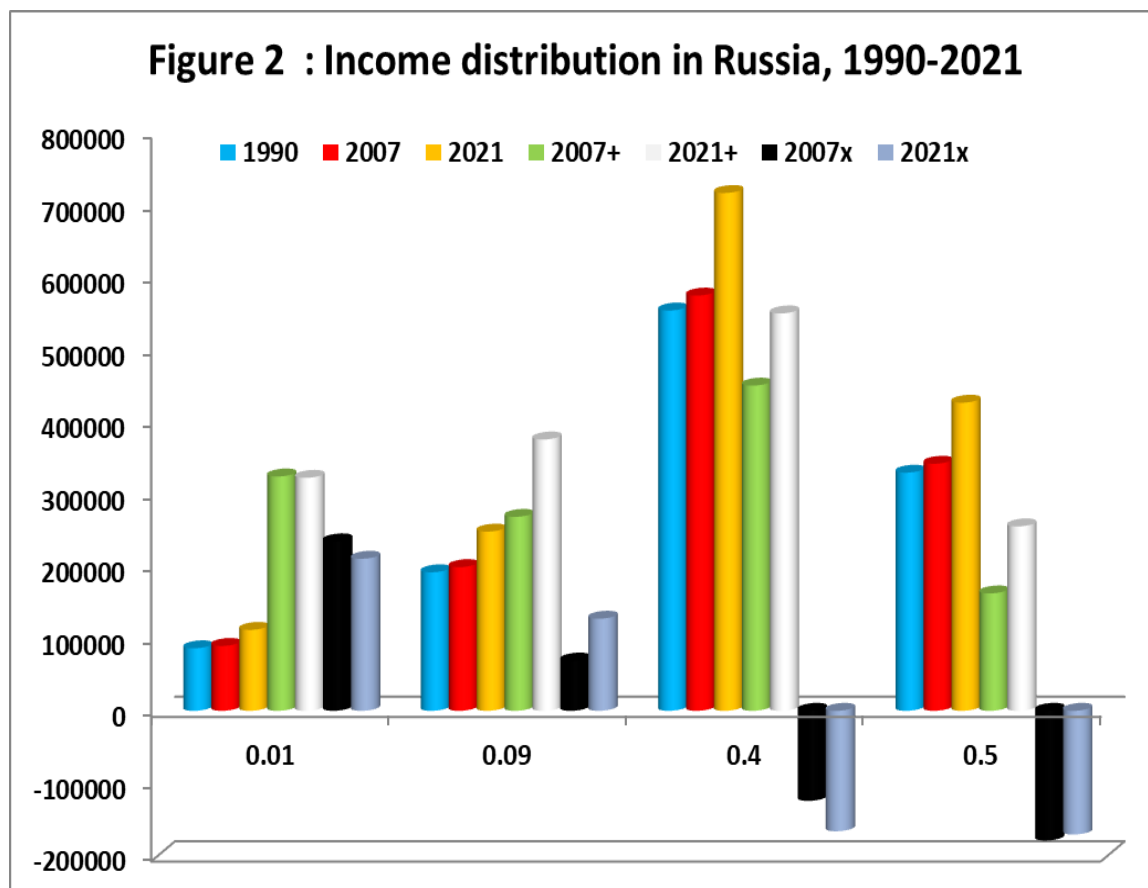
<http://rwer.wordpress.com/comments-on-rwer-issue-no-111/>

In whatever attractive guise it is presented, neoliberalism consists of a set of policies that seek to impose the rules of the market on human life. In other words, what I mean by the rules of the market is in fact the commodification of all that is necessary and required to meet human needs. By relying too much on the possible benefits of market performance, the defenders of these policies do not pay enough attention to the fact that the result of the implementation of these policies is the consolidation of the absolute tyranny of money over all aspects of human life. That is, it is not clear what those who have no money or not enough money should do to meet their needs in such a system? Because the reality is that what exists and is promoted in this system is the belief that you can eat as much as you pay for, or in other words, under the capitalist system, no one gets a free lunch. Assessing all these issues is not a practical category in a short note, and I do not intend to do so. What I intend to do here is to look briefly at the situation in the former Soviet Union as they implemented the neo-liberal economic model after the collapse of the previous economic model, and to discuss some of the economic consequences of this approach to the economy. The reality is that what we have now in Russia is actually the result of the implementation of these policies over the last three decades. Whatever the general coordinates and shortcomings of the Soviet Union's dominant economic system, signs of political and economic crisis began to appear in the country from 1985 onwards. Mikhail Gorbachev, the leader of the Central Committee of the Communist Party, attempted to reform the economy and politics of the Soviet Union under the title of *Golesnost* and *Prostroika*. In March 1991, the majority of the electorate voted in a referendum to end the Soviet system, and in June 1991 Boris Yeltsin became president in the first western-style elections held in Russia. In August 1991 there was an unsuccessful coup against the new government, effectively ending the Communist Party and the Soviet system. By October 1991, the collapse of the old regime was almost complete.

The economic policies that were implemented were mainly neo-liberal economic policies, which took the form of extensive privatisation and deregulation, and a reduction in the economic role of the state. Contrary to the promises made, the implementation of these policies was not very successful in promoting economic growth in Russia, because as far as economic growth is concerned, the Russian economy grew by less than 30% during these 30 years, from \$1160 billion in 1990 to \$1502 billion in 2021. But the main problem of the neoliberal economy is its impact on income distribution. First, Figure 1 shows the distribution of income in Russia at the beginning and end of this period.



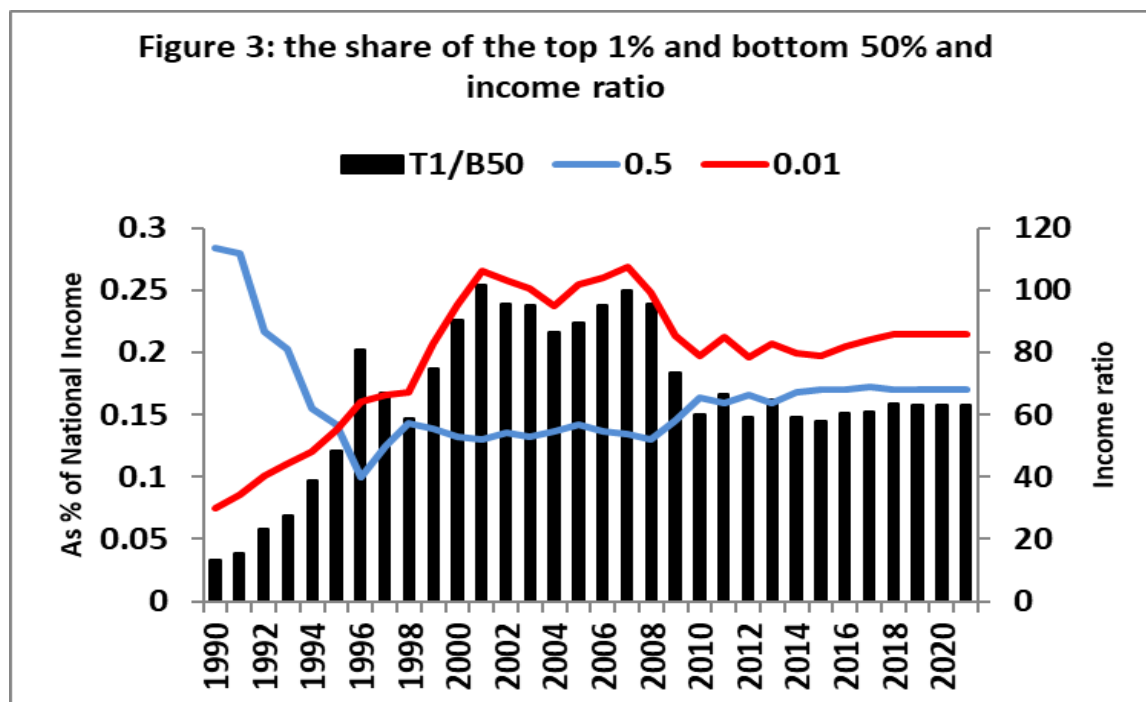
The share of the bottom 50% was only 28% of the national income in 1990, and of course the rich 50% took the rest of the national income, i.e. the remaining 72%, and it can be roughly estimated that the average income of the rich 50% was about three times the average income of the bottom 50%. On the other hand, the 10% took 24% of the national income, the top 1% 7% and the 9% 17%, and the 90% of the rest of the population took 76% of the national income. In 2021, however, the situation of income distribution changes. First of all, let me explain a little about these changes in the distribution of income in Russia. The share of the one per cent, which was only 7 per cent of the national income in 1990, has tripled to 21 per cent in 2021. The share of the bottom 50 per cent, which was 28 per cent of the national income in 1990, fell by 11 per cent to 17 per cent, as did the share of the 40 per cent. In general, the share of the top 10% in national income almost doubled during this period, from 24% to 46%. On the other hand, it is clear that what remained for 90% of the population decreased from 76% of national income in 1990 to 54% in 2021. Expressing these changes in dollars, in 1990 the top 10% of the population received \$278 billion of Russia's total national income and the rest, \$883 billion, was distributed among the 90% of the population. If we divide the period between 1990 and 2021 into two sub-periods, 1990-2007 and 2007-2021, an interesting picture emerges. In the first period, i.e. in 2007, Russia's national income grew by more than \$43 billion, but in the same period the share of the top 10 per cent of the national income increased by more than \$314 billion, of which \$43 billion is the additional income generated by economic growth in these years, and the rest, almost \$271 billion, was the transfer of income from the bottom 90 per cent to the top 10 per cent. In all these three decades, the national income increased by more than \$341 billion, but the take of the top 10 per cent was up by almost \$420 billion, which means that the income transferred from the poor to the rich in Russia for the whole period was more than \$78 billion. In the next section we asked a simple question. If the percentage distribution of income in Russia did not change and remained at the 1990 level, what kind of income distribution would we have? Figure 2 compares the results.



The first three bars show the distribution of income in Russia if the percentage distribution of 1990 had remained unchanged. We can see that the share of each group has improved as the economy has grown. The next two bars, green and light grey, show the situation as it was. The percentage distribution has changed and this has affected the total share of each group. For example, if we look at the share of the top 1 per cent, the red bar shows what they would have had if their share had remained at 1990 levels, but the green bar shows what the top 1 per cent actually had. The difference between these two measures is shown by the black bar above. The same basic rule applies here to the other income groups. What is fascinating about the above is that when we come to the share of the bottom 90 per cent of the population, their position is the reverse of that of the first two groups. In both cases we see that a transfer has taken place.

In Russia, the share of 90% of the population in the national income in 2021 should have been more than 1 trillion and 50 billion dollars, but in reality, due to changes in the percentage distribution of income, it has decreased to 741 billion dollars. In a sense, it can be said that the total income taken from the 90% of the population, actual and potential, was actually 311 billion dollars, which is more than twice what the official data suggests.

Let us examine the situation of different income groups in this volatile and changing situation in Russia. We examine the share of the top 1% and the bottom 50% and the income ratio between the average incomes of these two groups in Figure 3.

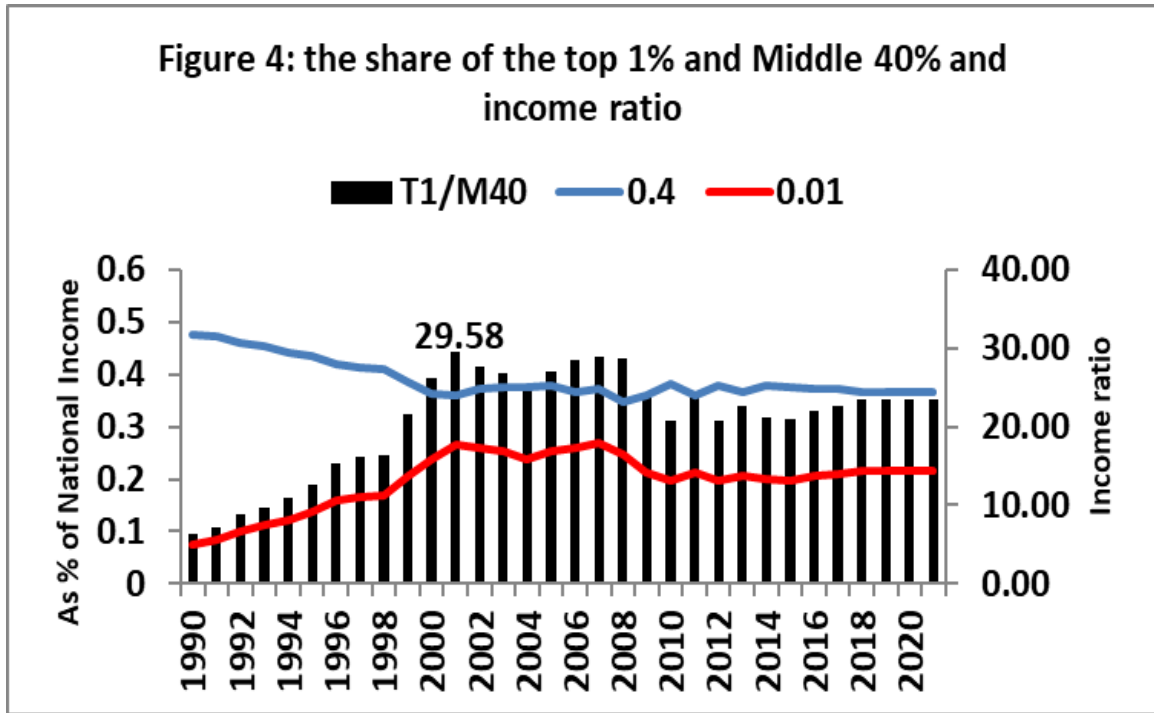


First of all, what I mean by "income ratio" is the ratio of the average income of the top one per cent to the average income of the bottom 50 per cent. This ratio is measured on the right-hand axis, and the highest figure we have here is that in 2001 the average income of the top 1% in Russia was 102 times the average income of the bottom 50%. The lowest income ratio in these 30 years was in 1990, when the average income of the top 1 per cent was only 13 times the average income of the poorest 50 per cent. As we can see in the graph, since the beginning of the neoliberal reforms in Russia, this ratio has been increasing and, as I said, it went from 13 times in 1990 to 102 times in 2001. Then, until 2021, this ratio experiences a declining trend, but in 2021 it will still be 63 times the average income of the bottom 50% in Russia. It is true that compared to 2001 there is some improvement, but compared to 1990 this ratio or this income gap is about 5 times larger. The second point is that, as we can see in the graph, in 1990 the share of the top one per cent in the national income was significantly lower than the share of the bottom 50 per cent, i.e. under the conditions that 28 per cent of the national income was the share of the bottom 50 per cent in Russia, the share of the top 1 per cent was only 7 per cent. What happens after that is that the share of the bottom 50 per cent shows a declining trend and the share of the top 1 per cent experiences a significant increase, and in the 1990s, until around the time of the great global financial crisis, a large gap is created between the shares of these two groups.

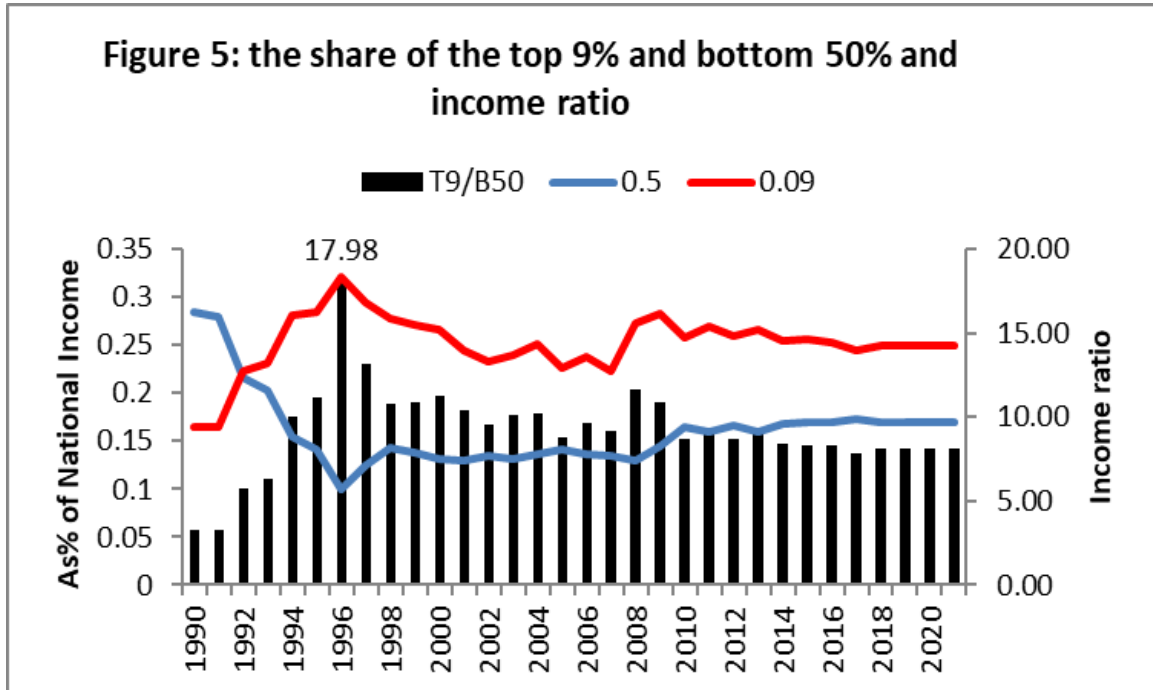
It should be noted that, unlike the previous situation, here the share of the 1% is much higher than the share of the poor 50%, and it goes without saying that such a change in the percentage distribution of national income affects the income ratio. The fact is that the slice of the national cake - the national income - that goes to the top 1% is getting bigger every year, but the share that should be divided among 50 times more Russian citizens is getting smaller every year.

It will be useful to examine the situation of the middle 40% in the next chart. The general orientation is very similar to what we have said so far. Of course, there are differences, which we will discuss. Contrary to the situation we saw in the previous graph, here, at the beginning and at the end of the period, the share of the middle 40% in national income is higher than that of the top 1%, but the notable point is that the share of the 40% has been on a declining trend for several years. It fell from around 48% of national income in 1990 to 36% in 2001 and then remained at that level for the rest of the period. The share of the top one per cent increased significantly until 2007, rising from 7% of national

income in 1990 to 27% in 2007. After the global financial crisis it seems to level off and remains at 21% in 2021, a tripling in three decades. As can be seen in Figure 3, the income ratio has also risen sharply, and although the average income of the top 1% was only 6 times the average income of the 40% at the beginning of the period, this ratio reached 30 times in 2001, but after the crisis it finally falls to 23 times in 2021.

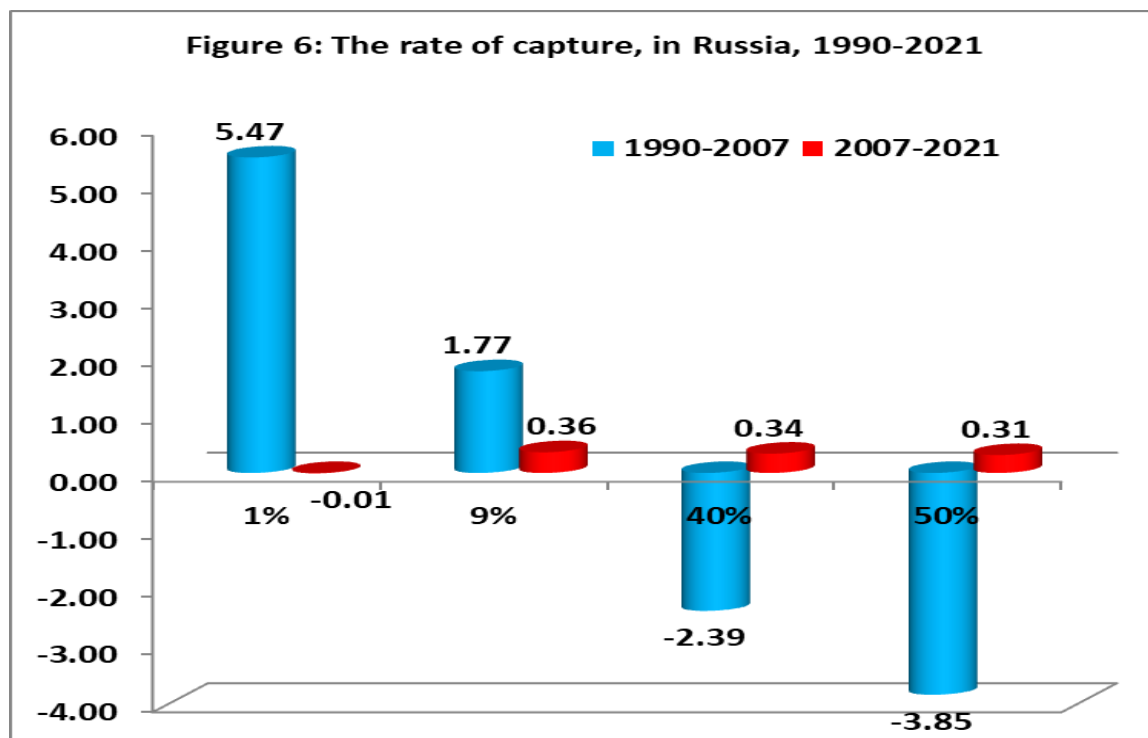


Although the top one per cent has an exceptional and unique situation in the current capitalist system, they are not the only group to benefit from this economic model. The top 9% of the population, i.e. the 91-99% of the population of a country, are also in a situation where this economic model works to their direct benefit.



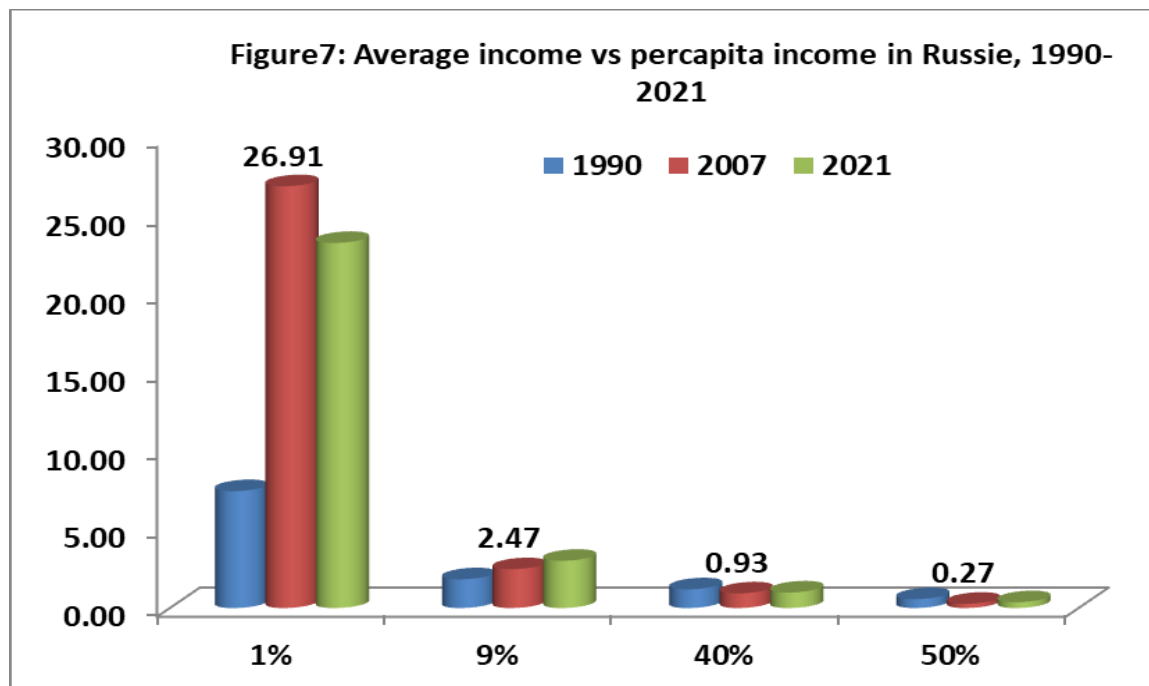
Another group of wealthy people to be studied is the 9 per cent, i.e. those in the 91-99 per cent bracket. The situation of this group is very similar to that of the 1 per cent, except that the increase in their share of national income is slightly lower. At the beginning of the period, in 1990, the share of the bottom 50 per cent is greater than that of the top 9 per cent, but shortly after the start of the neoliberal reforms, in 1992, the share of the 9 per cent is greater than that of the bottom 50 per cent, and this gap widens over time.

Whereas in 1990 the share of national income of the bottom 50 per cent was about 12 per cent higher than that of the 9 per cent, in 2021 the situation is exactly reversed and the share of the top 9 per cent is 12 per cent higher than that of the bottom 50 per cent. The largest gap was in 1996, when the share of national income received by the top 9% was 23% higher than that received by the bottom 50%. In the same year, the income ratio is also at its maximum and the average income of the 9% is 18 times that of the bottom 50%. It should be noted that in 1990 the ratio was only three times higher. I would add that the upward trend in the income ratio will stop in 1996, but the downward trend that has started will not return to 1990 levels. In 2021 the ratio will still be more than eight times higher, although it will have fallen sharply. In these final pages we will provide further evidence to explain some of the changes we have briefly reviewed. This brings me to the concept of the 'capture rate'. What this 'rate' would 'capture' is how the extra income generated in an economy is shared between the citizens of that country. In other words, how much goes to the top 1 per cent or how much is left for the bottom 50 per cent. Using World Bank statistics, I have tried to calculate the capture rate. Figure 6 shows a striking chain of events in Russia.



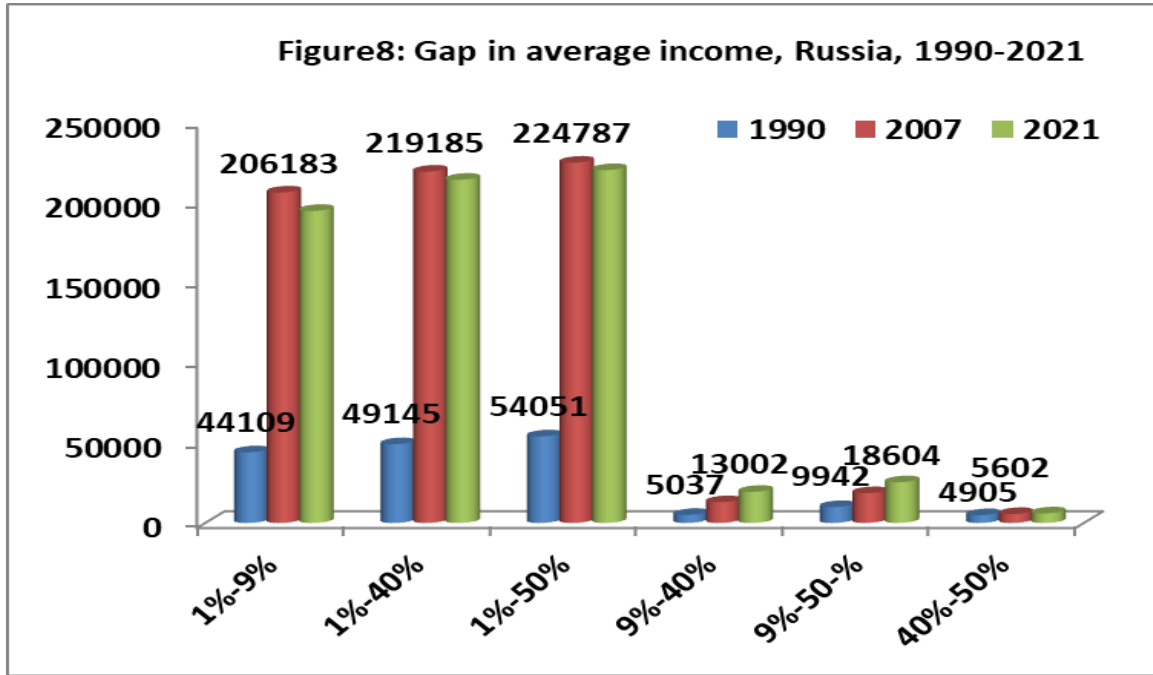
To explore these developments in more detail, I have chosen three dates: 1990, the start of economic reforms in Russia; 2007, a year before the global financial crisis; and finally 2021, the last year for which data are available. Moreover, Russia's national income was \$1161 billion in 1990, \$1205 billion in 2007 and \$1502 billion in 2021. In other words, about \$44 billion more value was produced in 2007, and similarly, \$297 billion more value will be produced in 2021 than in 2007. The question is how these extra dollars will be distributed among Russian citizens. Using the percentage distribution of income, I have shown the share of different groups in Figure 6. These statistics show in a truly alarming way the drain of income from one group to another in this country. Between 1990 and 2007, the extra money made from economic growth was \$44 billion. But the extra money that went to the top one per cent was more than five times this amount. If I report in dollars, the national income of Russia in 2007 was about \$44 billion more than the national income in 1990, but in the same year what the top one per cent received from the national income was \$238 million more than their share in 1990. As we have said elsewhere, not only did not a single dollar of this \$44 billion increase due to growth go to other groups, but the share of other groups would have had to fall by \$194 billion for the top 1 per cent to have their \$238 billion improvement. We see that the top 9 per cent also increased their share, and by 2007 they enjoyed almost \$77 billion more than they did in 1990. There was nothing left of the benefits of economic growth as it all went to the top 1 per cent, so this sum is also a simple transfer of value from the bottom 90 per cent; in total they were more than \$271 billion worse off in 2007. I should immediately add that this additional income for the 1% and 9% was not really a sign of an improvement in the economic situation in Russia, but a sign of a transfer of income from one group of citizens to another group of citizens. At the other end of this unequal distribution scale, what the 40% received in 2007 was more than \$104 billion less than what they received in 1990, and the share of the bottom 50% was also about \$167 billion less. In other words, the income of the top 10% increased by \$270 billion over this period, while the national economy grew by only \$44 billion. It is clear here that the reason for this increase in the wealth of the top 10 per cent in Russia is not that the Russian economy has become more productive over this period, but that this amount actually represents the extraction of value from the 90 per cent of the population. In the next step, I used World Bank statistics to calculate not only the average income of different percentage groups, but also the per capita income of Russia.

Comparing these average incomes and per capita incomes gives an interesting picture that does indeed shed some light on growing income inequality. I have presented these results in chart 7.



On the one hand, I have calculated the per capita income for three different dates, and then for each of these dates I have also measured the average income of the percentage groups. For example, in 1990 the average income of the top one per cent was more than seven times the national per capita income in that year, in 2007 it was 27 times, and finally in 2021 it was more than 21 times. The second group whose average income was higher than Russia's per capita income was the 9% group. In 1990 this ratio was about 2 times the national per capita income, then in 2007 and in 2021 it varied between 2 and 3 times.

It is interesting to compare the average income of the 90% of the Russian population with the per capita income. In 1990 the average income of the 40% was about the same as the country's per capita income, but in 2007 and 2021 the average income of this group was lower than the per capita income. The situation for the bottom 50% was deplorable, with a significant gap between their average income and the country's per capita income over all these years. In 1990, the average income of the bottom 50% was about half of the country's per capita income, but by 2007 this ratio had fallen to about a quarter, and by 2021 it would be a third of the country's per capita income. What can be inferred from these results is that the level of poverty in human societies is much higher than what is reflected in official statistics. I would like to illustrate this with an example. According to my calculations, the per capita income in 2007 was 8438 dollars, but in the same year, based on these statistics, I believe that the average income of the bottom 50% was no more than 2278 dollars. To put it another way, based on the country's per capita income, the average daily income is about \$23, but based on the calculations made on the above pages, the average daily income is only \$6. There is no doubt that these changes will widen the income gap over the years. What we show in Figure 8 is that the income gap has widened for all groups.



Although in Russia, as in other countries, the economy that is regulated and implemented for the benefit of the top one per cent should be stopped as soon as possible, the problem is much wider than that. This chart shows that the income gap between the middle 40 per cent and the bottom 50 per cent has also widened.

The biggest income gap is between the average income of the top one per cent and the rest. In 1990, the average income of the 1 percent was only \$44,000 more than the average income of the 9 percent, but this gap reached more than \$206,000 in 2007 and just over \$179,000 in 2021. The same was true between the average income of the 1 percent and the middle 40 percent, with the income gap rising from \$49,000 in 1990 to more than \$219,000 in 2007 and finally to \$197,000 in 2021. The income gap between the average income of the top 1% and the average income of the bottom 50% also quadrupled over this period, from \$54,000 in 1990 to \$225,000 in 2007 and \$203,000 in 2021. Interestingly, the income gap between the average income of the 9% and other lower income groups has multiplied in the same way. I have already pointed out that the results of this policy of stimulating economic growth have not been very successful, as the Russian economy has grown by less than 30% for more than 30 years, and we have examined the distributional results of this policy in the previous pages. What remains to be seen is the logic and reason for the application of this degenerate and highly undesirable policy, except that the top one per cent, who has taken control of the country's politics, use the instruments of their own control to devise and implement policies that produce these unfavourable results. They also implement the degenerate law, which is mainly written for and implemented by the one per cent.

Note: The statistics used have been downloaded from various statistical banks. The source for the percentage distribution of income in Russia is the World Inequality Lab. I have also used World Bank statistics for GDP and population.

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# The Effects of Markets on Society: What happens to a society when it is exposed to a price system?

Tim van 't Loo

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## Abstract

According to economic theory, selfish optimizing behaviour ultimately benefits all. Yet, empirics show people become like a homo economicus—i.e. selfish and maximizing—when placed in a price system, which has moral implications. Here people use money to let others fulfil their desires, regardless of side effects. For this they must first attain money, which is done by fulfilling demand. When fulfilling demand, one only plays into desires of those who pay, unlike Mill's utilitarianism where one provides for all of society. Furthermore, demand consists of the preferences of the people in society weighted by budget. Homo economici therefore assign value to people based on their budget, creating extreme meritocratic utilitarianism. Notice, however, that someone who pays for a good is not necessarily better off because of it and those who use wealth and power to attain money are tyrants, in a Machiavellian sense, creating modern slaves.

**Keywords:** Price System, Homo Economicus, Demand.

**JEL Codes:** A10, A11, B5.

## Introduction

Economics is usually defined as 'the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses' (Robbins, 1935, p. 16). One may be tempted to limit the study of economics to price systems, with money as an intermediary between scarce means and (infinite) human desires. A closer analysis, however, shows that the price system is merely a form the relation between human desires and scarce means can take. Currently money buys access to elite universities, immigration to countries, mercenaries or certificates to kill endangered species (Sandel, 2012, p. 3-4). Markets are so widespread in both our lives and the academic practice of economics that for many the price system, 'the economy' and markets tend to refer to the same thing. While the scientific domain of economics consists of all forms the relation between human behaviour and scarce means can take, and not just a market or price system.

Within their studies most economist do not concern themselves with moral questions, they believe economics is about explaining behaviour without judging (Sandel, 2012, p. 47). The amorality within most economics stems from the idea that the centre of economics—the market—is a place free of judgement. The market does not judge people's preferences, it only functions as a place that facilitates trade, connecting people who want to get something and are willing to give something else in return. When one tries to buy a new chair or sex the market does not ask how many chairs one has or when someone had sex for the last time, it only connects the people that might want to make such an

exchange. So, in other words markets ‘don’t pass judgement on the preferences they satisfy’ (Sandel, 2012, p. 14). This is not to say that people don’t have morals, economist hold that people will use their morals when acting in a market. Like those who attach special importance to sex—possibly because of their religion—will not make an exchange to attain sex. In theory, a market allows people to live according to their own morality, while enjoying the benefits of a market system, which I will elaborate on later. When most scientist transfer this idea into an economical practice that is free of morality, they implicitly assume that *the morality (and by extension the preferences) of people within a price system is not affected by living in a price system*. To examine this claim I will first introduce the homo economicus and the price system, to empirically examine whether people’s behaviour changes when they are exposed to a price system. Afterwards I will use these findings to examine a fictional society dominated by a price system, analysing behaviour and morality. To finally bring this into practice, by showing how this manifests itself in our society.

## 1. Homo Economicus

### Rationality

Central to the homo economicus is his rationality, which enables him to make the “best” decision given his preferences and scarcity (Ng, 2008, p. 268; Urbina, 2019, p. 66). Primarily because rationality enables the homo economicus to process information and predict outcomes of his options, in an unbiased way. To do so the homo economicus must overcome all biases. In other words, the return a homo economicus expects from a decision should not differ from the expected return based on the information he has (Delgado-Rodríguez, 2004). One of these biases is time inconsistency, where an actor acts against his or her own interest and better judgement because of the state of mind they are in. Instead the rational homo economicus should contemplate ‘a removed, dispassionate perspective’ to overcome all biases (Hoch, 1991, p. 493). After overcoming all biases, the homo economicus should be able to make the “best” decision. Since overcoming biases includes casting emotions—such as sympathy—aside and making decisions indifferent to his state of mind, the homo economicus is also called a ‘cold calculator’ (Urbina 2019, p. 63). The rationale of the homo economicus can be related to a former meaning of the word ‘economy’—which used to refer to efficiency or thrift—and would express itself in using as little resources to accomplish as much as possible. Like travelling ‘economy’ class, which uses minimal resources to achieve the goal, namely to reach the desired location (Brown, 2015, p. 105). The homo economicus in a market system will—in line with the principle of ‘economy’—try to make the most of the money he has. As a consumer he will try to get the maximum return given his budget and or optimize his budget given a return. As a producer he will try to get the maximum profit given his production possibilities and costs.

### Rationality in Practice

The maximization presupposes preferences, since preferences enable the rationality to “calculate” which option he prefers or in other words will give him the most satisfaction. These preferences must meet certain conditions to enable the homo economicus to use his rationality, in the first place they should be complete and transitive (Ross, 2012, p. 634). The property of completeness entails that an agent can relate all possible events to each other, so an agent always prefers one event over the other or is indifferent. An Agent’s preferences are transitive if preferring event A over event B and preferring B over C also means that event A is preferred over C. In practice two other properties are associated with the preferences of the homo economicus, namely monotonicity and convexity (Ross, 2012, p. 634). Convexity implies marginal diminishing returns, or that the satisfaction one gains from an

additional unit decreases with the number of units one has. Finally, monotonicity makes an agent always want more of something they originally desired, i.e. that the diminishing marginal return will never become negative if it was originally positive and vice versa. Together these assumptions imply that if a homo economicus prefers having two pairs of trousers over having a single pair of trousers, he will also prefer (but to a lesser degree) having 101 pairs of trousers over 100. Note that markets 'don't pass judgement on the preferences they satisfy' (Sandel 2012, p. 14), and will therefore not ask how many jeans this homo economicus has.

The "mathematization" of preferences explains how one acts rationally but not why one thing is preferred over another. At the centre of the preferences of the homo economicus lies an Hobbesian understanding of human nature; 'if any two men desire the same thing, which nevertheless they cannot both enjoy, they become opponents' (Hobbes, 1651, p. 87). So, men who face scarcity do not collaborate, instead they each fight for their own interest. In the homo economicus this translates to the characteristic of selfishness (Ng and Tseng, 2008, p. 268). Therefore, the homo economicus considers solely his own benefit when deciding, which does not make him opposed to acting in the interest of others, but this is never his goal. The homo economicus can, therefore, still act in the interest of others, provided this coincides with his own interest. Like the agent who Adam Smith speaks of who 'neither intends to promote the public interest, nor knows how much he is promoting it' (Smith, 1776, p. 363). This unintentionality is not a dealbreaker to Adam Smith.

## **2. Price System**

### **Knowledge**

In the 'Use of Knowledge in Society' Hayek advocates for a price system, which is a form the relation between human behaviour and scarcity can take. Hayek advocates for a price system because it is 'likely to be more efficient' (Hayek, 1945, p. 521). He believes a price system is more efficient because it incorporates more knowledge, compared to a central planning board or a single mind (Hayek, 1945, p. 519). Here Hayek distinguishes two types of knowledge, general and specific knowledge. Craftsmen, for example, may not have knowledge about the price system, instead they have an unparalleled understanding of what is required for their craft and how to practice it. Not only craftsmen but everyone possess specific types of knowledge, like whether he or she prefers event A over B. These countless pieces of specific knowledge are—according to Hayek—impossible to grasp by a central authority. The power of the price system is incorporating specific knowledge, which it does through prices.

The price system allows individuals to communicate their specific knowledge to other individuals, who act on this with their own specific knowledge. All knowledge is comprised in the price, in the price countless pieces of information come together in a single value. Any decision an individual can make, is influenced by almost everything that happens in the world. Since for any number of circumstances event A may be easier to attain for an agent than event B, according to Hayek the circumstances do not matter to the agent, or at least the reasons. The only thing that does matter is how much more or less difficult it is to procure an event and not why. A baker, for example, does not care for the nuances involved in the production of the bags he uses, like whether demand is high, or supply is low. All that matters for him is how hard it is to get a bag and the type of bag this is. The baker, therefore, concerns himself with two factors, the properties of the product and how hard it is to acquire said product. In a price system the baker is free to choose between different bags, here he will consider the final product and the price of this product. In this process the baker uses his specific knowledge in choosing the product that fits his needs the best, while accounting for prices and by extension all specific knowledge that is comprised within this price.

## **Demand and Supply**

So, the price system is a form the relation between scarcity and human behaviour can take. In the price system money functions as an intermediary between those who produce and consume goods. People sell goods they produce and use their money to acquire goods they desire. The exchange of goods takes place in a “market”, where the goods that are for sale (supply) goes hand in hand with consumers and their money (demand). Within supply and demand certain goods are rare and desirable while others are not, which is balanced through prices. If goods are rare and desirable buyers will face competition from other buyers, leading to high prices. While undesirable and common goods will lead to competition among sellers, which results in low prices. The balancing through prices steers what Smith calls the ‘invisible hand’, that makes selfish people act selfless (Smith, 1776, p. 364). For selfish individuals in a price system—such as the homo economicus—the market creates an incentive to act selflessly, since he can attain more money by creating more of goods that are more in demand. Therefore, a selfish actor starts to fulfil desires of others—by creating goods for which financial demand is high—to attain money, so he can fulfil his own desires. On this Hayek says, ‘the individual, while seeking his own interest, does what is in the general interest’, which Smith also called the invisible hand (Hayek, 1945, p. 529).

## **3. Price System and the Homo Economicus**

In reality, people—or homo sapiens—are not the same as the homo economicus (Gintis, 2000, p. 311). This, however, does not exclude a relation between the two. I will now introduce three empirical studies that study the behaviour of people in three different settings. Afterwards, I will introduce the behaviour expected of the homo economicus in the same settings, to finally compare the homo economicus and homo sapiens.

### **Empirics**

#### **Fine and Fee**

In a price system tools can be used to express morals in monetary ways, such as through fines and fees. Although both of these tools require immoral behaviour to be compensated with money, Sandel makes a distinction between the two. He holds a fee is the price that compensates for immoral behaviour, while a fine includes a penalty against behaving immorally (Sandel, 2012, p. 65). Like a pollution fee that allows pollution, given a monetary compensation that is used to offset the negative effects of said pollution. While a fine tries to punish immoral behaviour to nudge people to behave morally. Such as speeding tickets that express speeding is unacceptable, in Finland these tickets are scaled to income which results in tickets that exceed \$200.000 (Sandel, 2012, p. 66). In practice the distinction between fines and fees is not always as clear, such as shown in ‘A Fine is a Price’ (Gneezy, 2000). Gneezy empirically examines late pickups at day-cares, originally a late pickup constituted a violation of the principle ‘being on time’. With the intention to decrease the undesired behaviour of late pickups the researchers introduced a fee, introducing an additional tool that encourages people to arrive on time. Gneezy found that after the fine was introduced the amount of late pickups actually increased.

## **Students**

Ifcher tested whether being exposed to assumptions economists make, changes the behaviour of students. The students who participated first played four games, after which they were exposed to three different bodies of text, to finally play the four games once more (Ifcher, 2018, p. 55). In the first game every participant played one round as 'proposer' and one as a 'responder, with each round being played by a randomly paired proposer and responder. In the game the proposer bid, and the responder can either accept or refuse this bid. Only if the bid is accepted are the players awarded money, with the bidder receiving 20 dollars minus his bid and the responder the bid. The second game once again used randomly assigned pairs, where one person became the 'divider'. He or she was allowed to divide \$20 between him or herself and the other person in the pair. Everybody played this game as divider and receiver but not necessarily with the same person. Thirdly, participants were randomly placed in groups of 4 and all started out with \$20, which they could "invest" in a communal fund. This communal investment was then multiplied with 1.5, in the end everybody kept the money they did not invest and got a quarter of the communal fund. In the final game participants were randomly matched and took part in a prisoners' dilemma game (Ifcher, 2018, p. 56). After playing these games the participant read one of three short texts, one of which elaborated on the purpose of laboratory experiments, and another explained how laboratory experiments were conducted. The third group was faced with a different text, on the assumptions economists make about people when considering human behaviour, namely that people are selfish and maximize their own welfare (Ifcher, 2018, p. 57). Afterwards the participants repeated the played games, which enabled Ifcher to compare behaviour before and after treatment. Ifcher finds little difference between the groups that read texts on laboratory experiments, he did, however, find that participants who read the assumption text exhibited significantly more selfish behaviour in all games (Ifcher, 2018, p. 59).

## **Mice and Market**

In the Mice and Markets study Falk examined the willingness of people to kill mice— which were a surplus from another study and live or die in isolation of the participants—to receive a monetary compensation in four settings (Falk, 2013, p. 707). In the isolation scenario people could either kill the mouse and receive 10 euros or let it live, here 46 percent chose to kill their mouse (Falk, 2013, p. 708). In the second scenario—called the bilateral trading market—people were paired and either became seller or buyer, only if a bid was accepted would the mouse be killed and would the players receive monetary compensation. The buyer could place a bid and if this was accepted, he gained 20 euros minus the bid, while the seller gained the amount of the bid. In the bilateral trading market 72 percent of people made a transaction and therefore killed a mouse (Falk, 2013, p. 708). The third scenario is the same as the bilateral market, except for the introduction of additional players, resulting in seven buyers and nine sellers. Here 76 percent of the people made a transaction that resulted in the killing of a mouse (Falk, 2013, 710). Therefore, the introduction of markets decreased the 'willingness to pay for the upkeep of these surplus mice', from 54 percent survival in the non-market scenario to 28 and 24 percent in the market scenarios (Falk, 2013, p. 707).

## **Homo Economicus**

Recall that the homo economicus is selfish and maximizes his own welfare, he therefore pays little care to letting down workers at the day-care centre, since he only cares about himself. When considering if he will pick up his children on time, he will not factor in breaking the principle of 'being on time', as long as there are no costs he himself will suffer from this. In the example of the day-care,

two reasons stand out that may encourage him to indirectly obey to this principle, namely reciprocity and monetary. Reciprocity can force the homo economicus to arrive on time, because when he gets threatened with being kicked out of the daycare it will be in his own interest to oblige. Secondly a monetary punishment may sway him to arrive on time, so he can avoid paying the fine. The homo economicus may also be willing to pay, in this case the fine becomes a fee.

The experiment by Ifcher tests for selfishness and actually speaks of behaviour that is in ‘accordance with traditional economy’, i.e. the homo economicus (Ifcher, 2018, p. 59). Within these experiments the homo economicus would prove to be selfish. So, in the first game, as a responder the homo economicus would offer as little of his endowment as possible, provided he believes his offer will still be accepted. As a receiver he will accept low bids, because less money is still more than no money. As a divider he would keep all the money to himself and as a receiver he has no choice but to accept the money he is given, especially because the experiment matches participants randomly and keeps them anonymous from each other which prevents reciprocity. Thirdly, the homo economicus could invest in a mutual fund, of which the return was his personal investment multiplied by a factor and divided by the number of people in the game. As long as the factor does not outweigh the division—which it does not in the experiment—the homo economicus will choose not to invest his money, since he expects a higher return from keeping it. Finally in the prisoner’s dilemma the homo economicus will choose to maximize his own wealth and not overall wealth.

A homo economicus with the option to kill a mouse—as in ‘Mice and Markets’—for money will make his ‘cold calculation’, as I discussed previously. Here his rationality will weigh his selfish preferences to decide whether to kill a mouse for money or not. Since the homo economicus is selfish he does not care for the intrinsic value of the mouse’s life, but only what this mouse can do for him. There is, however, no form of interaction between the participants and the mouse, therefore the homo economicus does not care about the mouse. The homo economicus does care about the money, which he can use in the price system to (partially) fulfil his preferences. Therefore, the “best” a mouse can do for the homo economicus is to die, so the homo economicus can receive a monetary reward.

## **Outcome**

In the study of ‘Mice and Markets’ the homo economicus kills mice for monetary compensation. Empirically Falk showed that an increase in market interaction increased the number of mice killed and reduced the price for which they were killed, i.e. people acted more like the homo economicus as market interaction increased. Similarly, Ifcher found people express more selfish behaviour after they had been exposed to assumptions about human behaviour that economists tend to make, namely that economists assume people act selfish. This resulted in behaviour that became more in ‘accordance with traditional economic rationality’ (Ifcher, 2018, p. 59), or in other words more like the homo economicus. Finally, Gneezy examined a day-care that introduced a fine for late pickups. This fine was an additional cost—besides violating the principle of being on time—that people faced when arriving late, and this fine had a significant effect on the number of late pickups. The implicit assumption that markets do not influence morals would suggest a decrease in late pickups, since the monetary incentive would create an additional reason to arrive on time. The empirically found increase in late pickups can, therefore, only be explained when one realizes the original principle of ‘being on time’ is (at least partially) replaced with a market principle, where people consider their payment a fee for arriving late. These three studies illustrate the effect a market has on people, it changes their behaviour in at least the domain in question, where it erodes their original morality and replaces it with a market morality. These examples can, however, never live up to the lifelong exposure to markets, which may even spill over into other domains. All this suggests that the more a society exposes people to markets

the more their behaviour and morality becomes in line with the homo economicus. In other words when homo sapiens are placed in a price system they become like homo economici.

#### **4. Homo Economici in a Price System**

The next part of this article will take the previous finding—that people become more like the homo economicus when they are exposed to markets—to the extreme, by examining a market that is filled with homo economici. Within a market money becomes a tool for the homo economicus, which he spends to fulfil his preferences. Since the rationality of the homo economicus will realize that others can and will fulfil his preferences, if he pays them for this. A homo economicus may choose to buy a bread instead of making one himself, here the homo economicus can enjoy bread without growing wheat, grinding it into flour and getting up early to bake it, he only has to pay for it. Similarly, the baker does not need to grow and grind his own wheat, instead he may buy flour. The 'marvel' of prices in turn incorporates all costs that went into the bread—from creating wheat to the baking itself—and intermediates between production and demand to create the price (Hayek, 1945, p. 527).

#### **Spending Money**

When the homo economicus buys a good, he does not suffer the costs that come with creating said good, like getting up early to bake bread. The homo economicus also does not care for costs others suffer because of his choices (like I discussed in part 1), instead he suffers another cost, namely the price of the good he buys. Besides this obvious cost I will discuss two other types of cost the homo economicus can suffer, he can suffer directly from a side effect or indirectly through reciprocity. Almost all products have side effects, like the baker who produces noise early in the morning to bake his bread. The people who live close to the bakery will suffer this cost, but because the homo economicus is selfish he is indifferent to the costs others suffer. He does, however, care for the costs he himself suffers, like if he lives close to the bakery. But even if the homo economicus suffers more from the noise than he gains from the bread, he will still be reluctant to change his behaviour. Since ceasing his consumption of the good will have a limited impact on the production of the good. For if the baker were to lose one customer, he will likely still continue his business. This direct cost is therefore of little influence on him, but indirect costs may still prove to be influential. Reciprocity entails a society that rewards behaviour it considers to be positive and punishes behaviour it considers to be negative, of which the day-care study provides an example (Gneezy, 2000, p. 4). Here parents who regularly failed to pick-up their children on time could end up getting kicked out of the daycare. The homo economicus would not mind arriving late, as long as the consequences are minimal. When the day-care starts to threaten kicking his children out, the homo economicus gets forced into changing his behaviour or accepting the consequences of his actions. Reciprocity can therefore be a powerful tool but relies completely on the degree that it is exercised by the society. This becomes problematic when everyone acts like a homo economicus, because reciprocity then disappears.

#### **Attaining Money**

## General Interest

To satisfy his preferences through the market the homo economicus will have to attain money. Smith holds that the invisible hand encourages a selfish actor—such as the homo economicus—to act in the interest of others and enlarge the ‘general interest’ (Hayek, 1945, p. 529). The general interest consists of the interest of all individuals and is enlarged when the interest of some people are met, or in other words preferences are fulfilled (Smith, 1776, p. 364). The supposed power of the price system is that prices signal for which preferences demand is highest and those who fulfil these preferences are rewarded the most. When maximizing his income, the homo economicus will play into this demand and provide goods and services for which demand is high. In this process the homo economicus provides for those that buy and consume his services, implicitly his work is only enjoyed by these individuals and not other people nor the public as a whole.

I will make two distinctions between this general interest Adam Smith speaks of and other interests that transcend the individual, for which I will address the ‘public good’ that is present in Machiavelli’s work and the empathy from Mill’s work (Mill, 1863; Machiavelli, 1532 [1954]). Machiavelli is often read as a man without morals, since he believed leaders should resort to immoral ways to achieve their goals when due to ‘Fortuna’—factors that are beyond the rulers control—moral ways proved unsuccessful (Machiavelli, 1532 [1954], p. 177–78). The homo economicus may seem similar to Machiavelli’s views, but he has a different motivation. The homo economicus is primarily selfish while Machiavelli believes good men act selflessly and tyrants are selfish (Giorgini, 2019, p. 58). Secondly, the invisible hand only encourages selfish actors to act in the interest of a particular group, while Machiavelli’s general interest, instead, is related to ‘aggrandizing the state’ and ‘saving the state’ or in other words acting for a common goal (Giorgini, 2019, p. 60). Similarly, in ‘Utilitarianism’ Mill speaks of sympathy, when discussing how people should act. Mill holds humans feel empathy not only for their offspring, but the community as a whole (Mill, 1863, p. 75). Mill goes on to say that people sympathise ‘with all human, and even with all sentient, beings’ (Mill, 1863, p. 75). Creating a “holistic” doctrine that acts selflessly not for selfish reasons, but out of an appreciation of others. This appreciation is not limited to certain individuals within a society, instead it applies to all individuals in society and by extension to society itself. So, the homo economicus who seeks to maximize his utility, is not in line with Mill’s view of utilitarianism. Firstly, because the homo economicus does not act out of empathy, but out of self-interest. Secondly, because even if the price system aligns these selfish interests with the interests of others, they are not aligned with the society as a whole. Instead of improving overall utility the homo economicus only provides for the select few to who the homo economicus sells his services. The utilitarianism found within a homo economicus in a price system may therefore be called ‘individual utilitarianism’ because it primarily concerns itself with the utility of the producer and the consumer, i.e. individuals and not society as a whole.

## Weighted Demand

If the homo economicus will only serve certain individuals within a price system, who will these be? When Smith speaks of the general interest it suggests that everybody will serve each other within a price system, making it sound like everybody is served equally through the price system. Which sounds probable but does not mean that everyone will receive the same amount of service from the price system, equal serving presupposes that everyone’s sum of preferences is equally represented in the market system. It is true that market demand is the sum of all individual demands, but I argue this only holds when one fails ‘to distinguish between the willingness to pay and the ability to pay’ (Sandel, 2012, p. 63). This can be explained when one recognizes a step between market demand and the non-market individual preferences, or what I just called individual demands. In this intermediary step personal preferences are expressed in the personal budget. This is illustrated by comparing a

homeless and a wealthy person. The homeless person has little money and to survive primarily spends money on food. While the wealthy person may find food very important or disdain cooking, he therefore always eats out. Both may spend half of their budget on food, in a non-market way they assign the same value—namely half their budget—to food. In the market sense, however, the homeless person expresses substantially less value for food than the wealthy person, because half the budget of the homeless person is smaller than half of the wealthy person. Since the market demand—or the sum of market preferences—consists of the sum of all these budgets the wealthy person influences the market demand more and is therefore represented to a larger degree than the homeless person, who has a more modest budget. This illustrates a form of power money brings, when one starts to consider spending money as a form of voting. Since every time someone purchases a good this person uses his or her money to “vote” on the good in question. With their vote people vote for all things that were involved in the final product, therefore they implicitly do not vote for all things that were not involved in the final product. If one buys a bread one votes for a bakery, the suppliers of this bakery, the baker of this bakery and so on. One does not vote for other bakeries nor for other bakers. These votes matter, because the baker with the most votes, or most money spent at their location, can survive where others cannot, in the sense that they turn a profit instead of making a loss. The inequality shines through when one realizes that twice as much money buys twice as many votes. Therefore, practices that are valued by a wealthy person gain more market recognition than those that are valued by a person with modest means, creating a discrepancy between market appreciation and actual positive impact.

$$\text{Interest of the Community} = \Sigma \text{Individual Interest} = \Sigma (\Sigma X_i)$$

≠

$$\text{Given: } \frac{B}{\Sigma B} \neq 1$$

$$\text{Market Demand} = \Sigma (\text{Relative Budget} \cdot \text{Individual Interest}) = \Sigma \left( \frac{B_j}{\Sigma B} \cdot (\Sigma X_i) \right)$$

In which B stands for individual budget, n the number of people in the population and  $\Sigma X_i$  is an approximation of individual interests. So, to be more precise, the market demand is the *weighted* sum of individual preferences, where the weight an individual's preferences carry in market demand is determined by their budget. The homo economicus who tries to attain as much money as possible therefore also assigns different weights to the preference of different individuals. He will try to fulfil preferences of those that are willing to pay the most for his services, for which they must first be able to pay him. Therefore, the invisible hand and by extension the price system not only produces inequality in terms of outcome, like successful people being rewarded with more money and by extension goods. Since in the process of appreciating people's work the larger one's budget the more one determines the worth of goods and the smaller one's budget the less one determines the worth of goods. Creating a system that values people's preferences on the basis of their budget, creating—besides an inequality in wealth—an inequality in worth. Note that the same principle applies to the knowledge Hayek spoke of, because this knowledge is comprised within prices. The higher one's budget, the more weight one's knowledge carries in the price system and vice versa. Therefore, the knowledge comprised within the price system is not representative of everyone's specific knowledge but biased towards higher budgets.<sup>1</sup> For the homo economicus this makes it even more important to earn substantial amounts of money, not only to fulfil more of his preferences but also to make sure his preferences are “heard” by the market system.

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<sup>1</sup> To counteract these effects financial means could be redistributed, to ensure everyone has the same—or at least a comparable—budget. A basic income could, for example, create a price system where equal weight is assigned to everyone's knowledge. Instead of the overvaluation of wealthy individuals' knowledge, this would lead to a price system that 'is likely to be more efficient' (Hayek, 1945, p. 521), turning Hayek on his head.

The weight assigned to preferences introduces an inequality which requires a refinement of the individual utilitarianism I previously discussed. This nuance is captured by introducing Young's idea of meritocracy, which holds inequality is inevitable and the least objected form of inequality is based on merit (Young, 1994 [1958], p. 122). The principle of merit accepts inequality if 'a man won a good job after having fought his way up the educational ladder' (Young, 1994 [1958], p. 123). Here people can "earn" their position in society explicitly by working hard, implicitly they need to have a chance, so their efforts are not in vain. To achieve an equal playing field education should give opportunities to everyone—including the ones from lower classes—so they can make the most of their talents (Young, 1958, p. 129). For the homo economicus in a price system the consumption and wealth he acquires becomes his merit, based on the market's appreciation of his production. This nuance transforms the previously discussed individual utilitarianism into an extreme case of meritocratic utilitarianism, which is extreme because it has not only inequality in wealth but also in value.

Sandel notices that a meritocracy does not prevent inequality, it just bases it on a less objected principle (Sandel, 2020, p. 164). At the same time, he questions the implications of a meritocratic form of inequality, which implies that the successful deserve to be part of a higher class and those who are less successful deserve to be part of a lower class. He holds that in a meritocracy higher classes start to look down on the lower classes because they believe their success is to their own doing (like people feeling entitled to the money they earn), unlike for example an aristocracy where classes realized their position in society was arbitrary. Sandel, however, holds that success in a meritocracy is based on a combination of talent and hard work. Talent and the degree to which one's talents are appreciated are not something one earns, it is—just like the wealth one can be born into—a matter of luck. With talent being arbitrary success also becomes arbitrary, because no matter how hard one works, he or she is always limited by their talents (Sandel, 2020, p. 175).

The discrepancy between market appreciation to the actual positive impact exists in the first place in the inequality in worth, i.e. that the preferences of certain people carry more weight. In the second place, it becomes larger when one considers whose preferences are considered more. Since the price system not only places emphasis on the preferences of certain people (those with larger budgets), but the people who could benefit the most have a smaller say (those with smaller budgets). Since diminishing marginal utility entails that the more one has, the less one gains from another unit. Or that a person with 2 trousers gains more from additional trousers than an otherwise identical individual with 100 trousers. So, in a utilitarian sense—and to homo economicus—people with less wealth benefit more from an additional unit of wealth. Contrarily the price system emphasises based on budget, where with an increase in budget comes an increase in wealth and a decrease in marginal utility. Therefore, the price system places opposite emphasis, compared to a system that maximizes overall utility.

The aforementioned illustrates the curious way the homo economicus acts selflessly, with his selfish motives. One must, however, recognize that the translation from selfishness to selflessness also comes with caveats, of which I will discuss two. Firstly, the homo economicus does not have to actually improve the lives of others, they only need to pay him. The selfish homo economicus may, for example, make people addicted to his product. In a market sense this is attractive because it creates present and future customers, but this is likely not to benefit these customers themselves. Secondly, the homo economicus can use his time and energy to produce, but as Marx already explained and critiqued, he may also use his wealth to produce, provided he has wealth (Marx, 1867 [1990], p. 169). Notice that the possibility to enlarge the wealth one has through his or her own wealth enables individuals to consume goods made by others, without working and producing goods themselves. Since—when selling—homo economicus and thus the market do not distinguish between ways buyers have enlarged their wealth (e.g. through labour or capital income), they do not care about the one that pays, only how

much one pays. Additionally, as the amount of wealth increases creating wealth through wealth becomes more attractive, in part because of the power that comes with large amounts of wealth. Since an owner can (ab)use his or her property in any way he or she sees fit, making the owner the “ruler” of his property. The control owners exercise over their property, implicitly makes everyone else control-less over said property. The selfish homo economicus will, obviously, rule his property to maximize the financial return it can give him, making him a tyrant in the eyes of Machiavelli. The tyranny of the homo economicus can easily take over entire spheres, this becomes especially problematic when a substantial part of a domain—such as the place of public discourse—falls under the rule of homo economicus. For these homo economicus care little for the purpose of these domains—such as facilitating free speech—but primarily what it can do for them, i.e. make them money. In a price system filled with homo economicus public discourse therefore becomes subject to individuals that control the space of public discourse. These individuals rule this space as tyrants and will not shy away from measures such as suppressing certain ideas or even casting out people, if it aggrandizes their wealth. This control clashes—among other things—with Mill’s view on freedom of speech. He holds no opinion should be suppressed, since an opinion that is true and is oppressed robs humanity of knowledge, and even false opinions should not be oppressed because they allow humanity to sharpen their knowledge (Mill, 1859, p. 18).

Together these two caveats explain how a price system not only exists out of homo economicus that work—i.e. produce—to be able to buy goods—i.e. consume. Instead, some use their wealth and the power that comes with wealth to make more wealth, which need not improve the lives of others.

## **In Practice**

In this final part, I will examine our society; by discussing the influence our price system has on the world and the extreme cases this leads to. These extreme cases are more and more prevalent in our globalized world—where the consequences of our actions can be so far away that they become all but invisible—and illustrate the effects of our price system. To a degree these effects apply to all facets of what is generally referred to as “the economy”.

In our world the introduction of a price system changes people—at least in certain facets of their lives and to a certain degree—into homo economicus, making them more selfish, which expresses itself in maximizing their money. Our price system consists of wealthy individuals who do not produce value themselves, as opposed to the working class. Instead, these individuals let their wealth and power create wealth for them, which results in more money for themselves. Those who do work in the price system (i.e. everyone else) are financially encouraged to fulfil the preferences of extremely wealthy individuals, instead of fulfilling the preferences of the people who could use the help the most, because of the idea of weighted preferences. Making it financially viable to spend years fulfilling a minor need of a wealthy few, instead of providing major services to the many. In our world this price system translates into extreme cases, like yacht builders who—in line with the homo economicus—actually choose to create superyachts for tech billionaires, instead of sheltering children in Africa. These tech billionaires gain their wealth from touching the lives of hundreds of millions of people with their property, but whether their technology and applications change our lives for the better or destroy—among other things—the public debate is another question.

This question is, however, irrelevant to these tyrants who search to aggrandize their own wealth by employing people who help them in their search. Said tyrants make the working class want to work for them by paying them more, which they can do because they are not only willing to pay them but also able to pay them more. This makes the jobs these tyrants offer financially attractive and therefore

highly coveted by the working class. Those that become chief officers end up making millions of dollars and in turn express their preferences in the price system. The preferences of these chief officers carry a lot of weight in our economy, because these chief officers have large budgets. These preferences are in their turn fulfilled by other people from the working class, whose preferences are also fulfilled by people in the working class. Creating a financial “ladder” that gets more and more crowded the more one goes down, with less money per individual with every step. In our world the people at the bottom of this ladder are—among other places—found in Asia, where millions of people work in factories to create products for the “wealthy” western world. These factory workers are only paid a fraction—sometimes not even 0.1%—of what the chief officers and owners make (*Company Pay Ratios*, 2024). Therefore, their preferences carry little to no weight in the price system. So, they lose control over their lives. This has become so extreme that people have coined the term ‘modern slavery’ to illustrate how irrelevant the desires of these groups of people have become to the market.

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# Towards a Just Economy with Video Clips

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## Introduction

In a bid to shift the focus from the technicalities of stylized mathematical problems and towards addressing real world issues, I came across Romeo (2024) which was promoted at the CORE website.<sup>1</sup> This is not to take away from the important task set up by Keen (2022, p. 143) who opines that “failing to do mathematical modelling cedes to the Neoclassicals” and that “the mathematical foundation of a post-Neoclassical economics is system dynamics”. However, my approach at the ECON 101 level has been to expose students to pluralist perspectives through short video clips, and there is some literature that connects heterodox economics and critiques with animation clips (Jahangir, 2021; 2023). In this regard, Romeo (2024) provides an excellent opportunity to introduce students to alternative ways of achieving a more just economy. This is because each of his book chapters can be paired up with short videos of less than 5 minutes each that do not take much of class time and which can be helpful in retaining student interest. As Sexton (2006) mentions, the use of 3–5-minute short video clips to highlight economic principles can “break up the monotony of a straight lecture”. In what follows, seven short videos are showcased along with a synopsis of the main ideas offered by Romeo (2024).

Romeo is clear that a just economy includes fairness and sustainability, which necessitates solutions to real world issues of economic inequality, climate change, loss of good jobs, casualization of jobs, and erosion of democracy (pp. 3-4). His book illustrates practical solutions of true prices that reflect the impact of goods on humans and the environment, job guarantee that addresses community needs, gig work based on a public platform, worker cooperatives that limit the wage gap between CEOs and workers, trusts where the goal of business is not profit maximization but purpose like environment protection or profit sharing with employees, and participatory budgeting where citizens decide democratically (pp. 9-11).

However, before delineating the practical solutions chapter by chapter, he sets up the stage with the state of economics education. Like other popular writers, he is critical of neoclassical economics and argues that its technocratic jargon that pretends to be value neutral is based on certain ethical and political positions (pp. 8-9). Often, such positions serve the status quo by rationalizing doing nothing to combat economic inequality and by arguing for minimal governments. Additionally, through education based on self-interest and utility maximization, neoclassical economics prepares undergraduate economics students to be less cooperative (p. 42). In terms of alternatives to neoclassical economics, he illustrates the critique by Ha-Joon Chang who finds the CORE textbook as “fundamentally neoclassical” and one that lacks genuine economic pluralism (p. 44). However, Romeo’s objective is not to critique economic theory or to provide alternative ways of teaching economics, as there already exist options like Keen (2011) and Komlos (2023) respectively. Rather, his objective is to illustrate practical solutions towards achieving a just economy as follows.

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<sup>1</sup> “CORE in the news” section (news item from 18 January 2024), <https://www.core-econ.org/press/>.

## True Price



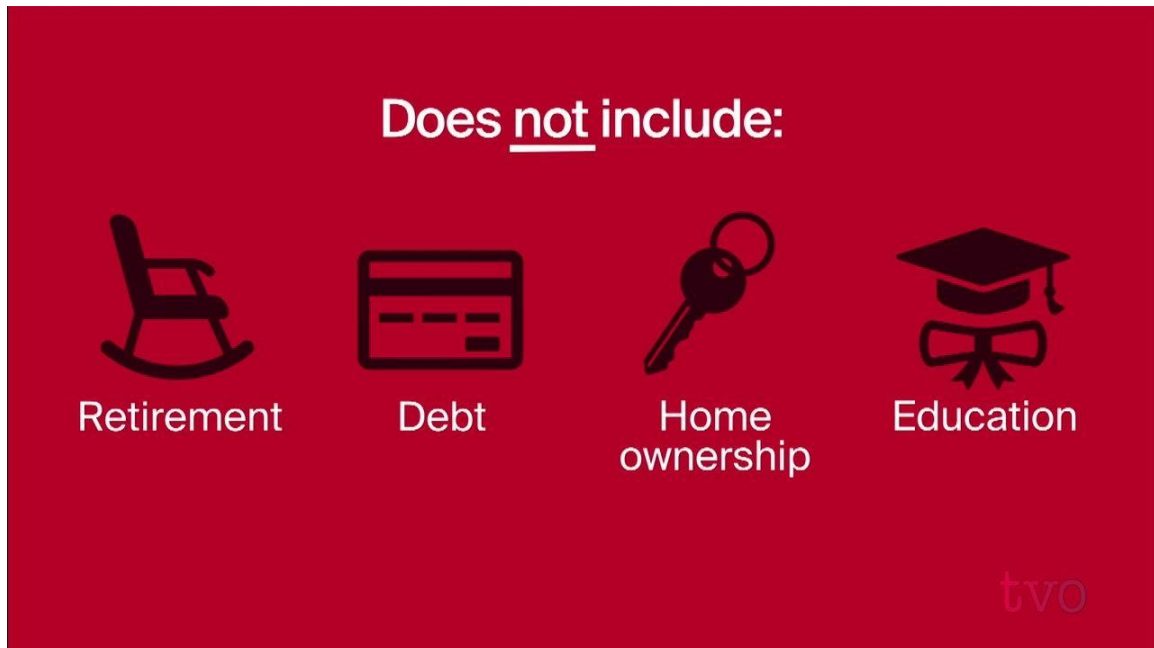
[https://www.youtube.com/watch?v=MtO6w\\_mn5Us](https://www.youtube.com/watch?v=MtO6w_mn5Us)

Join the movement of True Price Stores!

3:42 min

This video clip can be shown to illustrate the concept of a true price, which, according to Romeo, accounts for externalities by covering various categories of damage during production, i.e., impact on climate, water, land, and workers (p. 51). He argues that no amount of value added for shareholders, consumer convenience, or job creation can justify the exploitation of child labour or elimination of biodiversity (p. 57). However, he is critical of labelling or certification, as many labels do not include all externalities or damages. For instance, he illustrates that Fairtrade labels do not guarantee that the workers involved earned a living wage (p. 119). Likewise, organic products may have a large carbon footprint, produced by workers that don't earn a living wage, and may come from a farm based on the destruction of a biodiverse rainforest (p. 52). Overall, a true price offers an alternative that minimizes the limitations of other labels like Fairtrade or Organic.

## Living Wage



<https://www.youtube.com/watch?v=GT85WC0qhBc>

**What is a Living Wage?**

1:28 min

This video clip can be shown to illustrate the difference between a minimum wage and the superior alternative of a living wage. An example of the latter is the company Well Paid Maids in Washington D.C. where the job is based on predictable work schedule, health and dental benefits, and commuting costs paid by the employer (p. 84). Romeo argues that society faces a choice to either pay a living wage or pay indirectly through taxes when the working poor access hospital services or social safety programs (pp. 86, 101). He also argues that shareholder right to dividends should be subordinate to worker right to a living wage, and therefore, corporations that do not pay a living wage should not pay dividends (p. 100). Alternatively, corporation success should be gauged by the ability to pay a living wage, therefore those unable to pay a living wage should go out of business (p. 101). Overall, compared to the minimum wage, the alternative a living wage brings greater stability in the lives of the precariat through higher paying stable jobs instead of low paying casual jobs.

## Job Guarantee



<https://www.youtube.com/watch?v=qrlGk6U9U7k>

**Say Goodbye to Lousy, Low-Paying Jobs: The Benefits of a Jobs Guarantee | Robert Reich**

3:24 min

This video clip can be shown to illustrate a job guarantee that would connect discouraged workers and others with good jobs in the green economy and the care economy. Additionally, a job guarantee would act as an automatic stabilizer during economic downturns. According to Romeo, a job guarantee can put pressure on the private sector including gig companies, Amazon, and fast-food corporations to improve wages and work conditions (pp. 123, 138). This is important as work offers a source of esteem, structure, and purpose in life whereas unemployment is associated with depression, addiction, suicide ideation, and domestic problems (p. 124). Thus, a job guarantee offers the benefit of increased mental and physical health, which may allow it to be budget neutral, and by reducing unemployment it can help prevent the rise of extremism, as in the 1930s (pp. 138, 148). Romeo also argues that just as we do not want to argue for a natural rate of starvation, we can avoid rationalizing the natural rate of unemployment (p. 137). Overall, a job guarantee offers a viable alternative to a UBI (universal basic income), which is increasingly being considered with a future with impending automation.

## Gig Work on a Public Platform



<https://abc30.com/prop-22-california-2020-ca-what-is/6557878/>

**What is Prop. 22? Voters to decide if app-based drivers should be classified as employees or contractors**

1:28 min

This video clip can be shown to illustrate the power differential between unions and corporations in the context of proposition 22 in California that denied gig workers benefits like paid sick time and employment insurance (p. 149). Romeo notes that corporations including Uber, Lyft, and Doordash spent over \$200 million in their campaign to support Proposition 22, and consequently Uber and Lyft valuation increased by \$13 billion after the proposition passed (p. 149). He highlights that operating gig work on a public platform means workers can see a diverse array of jobs offered by various employers instead of only one type of work on a private gig work platform (p. 152). He adds that a public platform for gig work would include health care and retirement benefits, access to job training, and would have smaller transaction fees thereby leaving more for wages and benefits (p. 160). Moreover, a public platform for gig work can put pressure on private gig work platforms to improve wages and benefits and leave corporations with the choice to “adapt or perish” (pp. 154, 157). Overall, like a job guarantee, a public platform for gig work offers a viable alternative that helps restructure the economy away from low paying gig work without benefits.

## Worker Cooperatives



<https://www.youtube.com/watch?v=8Zol0C1mPek>

The Mondragon Cooperatives

2:41 min

This video clip can be shown to illustrate that companies can have objectives other than profit maximization, as in the case of cooperatives that emphasize job creation. According to Romeo, at the Mondragon cooperative, workers vote equally on decisions related to salary and policy, and during economic downturns, they reduce their salaries or work hours to preserve jobs (p. 184). Additionally, executive pay is capped at 6 times the pay of the lowest paid workers (p. 184). This helps limit economic inequality, as in the case of the U.S. where CEOs earn as much as 350 times the workers. Moreover, contrary to the stereotype that cooperatives are inefficient, Mondragon has many businesses including a grocery store chain, industrial manufacturing, technological research and consulting services, has more than 500 patents, and owns subsidiaries in China, Germany, and Mexico (p. 185). Romeo adds that many academic studies show that cooperatives are at least as profitable as conventional firms because worker incentives are aligned, as they benefit when the firm does well, and because they suggest improvements through democratic participation (p. 199). Overall, a worker cooperative offers an alternative to corporations by broadening the focus from shareholder value maximization to other stakeholders like workers and the community.

## Purpose-based Companies



<https://www.youtube.com/watch?v=4kPTDViI9tk>

**Meet Trust Neighborhoods**

2:17 min

This video clip can be shown to showcase Trust Neighbourhoods, which according to Romeo, are based on a MINT (mixed income neighbourhood trust) whose purpose is to provide affordable housing by purchasing a portfolio of real estate (p. 242). This is achieved by subsidizing the majority of housing units in the portfolio by the minority of units that are offered at market rates (p. 242). Moreover, a MINT removes real estate from the speculative market (p. 244), which facilitates the provision of affordable housing. Generally, such purpose-based companies have other objectives like sharing profit with workers, protecting the environment, or hiring former incarcerated folks (pp. 215-216). Overall, like worker cooperatives, purpose-based companies shift the focus away from shareholder value maximization and towards alternative goals like the wellbeing of workers and the community.

## Participatory Budgeting



<https://www.youtube.com/watch?v=XQTPcbGC1ko>

**Cascais Participatory Budget**

**4:10 min**

This video clip can be shown to showcase participatory budgeting in the city of Cascais in Portugal. According to Romeo, participatory budgeting facilitates citizens to democratically debate on the use of public funds, which improves the quality of public works (p. 248). Overall, the case of participatory budgeting in Cascais provides one practical example of participatory socialism, which according to Piketty (2021) requires citizen involvement, as change will not come from the top echelons of power.

## Building Equity

In the final chapter, Romeo highlights the alternatives of ESOPs (employee stock ownership plans) and a National Investment Authority. Both options are ways to address the hollowing out of the middle class by allowing them a share in capital ownership (p. 283). According to Romeo, the benefits of technological development predominantly went to capital owners and not workers and therefore ESOPs were created to remedy for unequal access to technology driven profits (p. 225). However, he cautions that worker ownership is no substitute for taxation or regulation, as not everybody works including the retirees, the sick, and the unemployed (p. 282).

Romeo mentions that a National Investment Authority can mobilize private capital towards long term investment in the green economy and essential supply chains (p. 306). By obtaining an equity share

in companies, it can improve wages and work conditions, and divert private capital away from speculative activities, asset stripping and layoffs (p. 307). This is because such equity investment can be made contingent on companies offering a living wage, capping CEO-worker pay ratios, or providing employee ownership (p. 309). Overall, while the proposal for a minimum inheritance for all has already been offered by Piketty (2021), Romeo provides practical examples to achieve the goal of sharing capital ownership through the alternatives of ESOPs and a National Investment Authority.

## Concluding Remarks

In conclusion, Romeo highlights inequality and climate change as the two defining problems of the 21<sup>st</sup> century, which must both be addressed, as neither a green economy with wealth inequality nor wealth equality on a destroyed planet are appealing options (p. 281). He breaks the binary of public versus private by stating that public-private initiatives can start from the private sector with living wage and true price or with the public sector with job guarantee and public platform for gig work (p. 320). Overall, through practical examples of a true price, living wage, job guarantee, gig work on a public platform, worker cooperatives, purpose-based companies, participatory budgeting, and broad-based equity, he provides viable alternatives to the neoclassical model of the economy based on the myopic goal of shareholder value maximization. Based on his book, it becomes clear that the alternative towards a just economy is already here.

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# Who's Eating the Pudding? Economic Principles in Business Administration

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## Introduction

As the old adage goes, “the proof of the pudding is in the eating.” In matters of science, the value of a tributary discipline is often measured in terms of its ability to affect or influence its distributary disciplines. For example, thermodynamics has had a key role to play in the life sciences (biology, medicine, ecology). Similarly, it is often argued that business administration is a distributary discipline of economics, focusing on the applied, rather than the theoretical. Examples include corporate finance, marketing, management, and operations, all of which have their roots in late 19<sup>th</sup>-century political economy and 20<sup>th</sup> century economics. Table 1 presents the results of a Quora thread on the question of “how does business administration relate to economics.” Clearly, the overall consensus appears to be that business administration applies economic concepts to real-world business decision making. In short, economics is the “physics” of business administration.

**Table 1**

**Quora Thread: How Does Business Administration Relate to Economics?**

“Business administration applies economic concepts to real-world business decision making.”
“Business administration applies these economic principles in the practical context of running a business, making decisions about how to allocate resources such as labor, capital and materials in order to achieve the goals of business.”
“The relationship between business administration and economics is somewhat akin to the relationship between engineering and physics. The first item in each pair is an applied professional discipline, the second item contains the underlying science and theories.”
“Economics provides the theoretical and conceptual foundation for business management.”
“Business is the application of economic principles within a firm context.”
“Economics would provide you with a good foundation for Business and so would Business studies.”

Source: <https://www.quora.com/How-does-business-administration-relate-to-economics>

This raises the question, to what extent are the basic economic principles, the cornerstones of the discipline, a factor in the study of, and understanding of business administration? That is, to what extent are they present in one form or another in the study of business?

The paper is organized as follows. To begin with, a brief review of the literature/debate is provided. This is then followed by the results of a survey of the core economics concepts in the business literature. The latter consists of on-line textbooks in business administration, management, marketing,

finance and production management. This is then followed by a discussion of the role of both economics and economics' own tributary disciplines of psychology and production engineering (i.e. applied physics) in business administration. The upshot is that economics has contributed little to the study of business administration, and that its tributary files of psychology and process engineering appear to have contributed more.

This raises the question of why? Why has the study of business administration, supposedly a distributary field of economics, circumvented it in favor of it's the latter's own tributary fields? A number of possible reasons are advanced. For example, the fact that economics has ignored and continues to ignore developments in the latter's own tributary fields explains the circumvention. This suggest that to become relevant, it has to update its basic principles in line with its tributary fields. Specifically, utility and production theory have to be updated so as to become relevant.

## **Literature Review**

The question of the role of economics in the study of business administration is as old as the study of business administration itself. This can be attributed in part to the fact that the study of business was an off-shoot of economics in the late 19<sup>th</sup>/early 20<sup>th</sup> century. That the question was even discussed is, in this author's view, both problematic and symbolic. After all, there was never a doubt that the study of chemistry would be largely an off-shoot of physics. Why then has this debate persisted for over a century.

A century ago, Roswell C McCrea asked "What is the place of economics in the curriculum of business?" in an article published in *the Journal of Political Economy*. Largely epistemological, it offered a variety of views from the role of profit maximization in the daily operation of companies to the greater social role of economics. He concluded:

"In my own view, economics, wherever else it may or may not belong, does belong in the school of business. Both business and economics need to be saved from themselves. Without the presence of economics in some vital form, the work of a school of business is likely to degenerate into detailed description of business organization and procedure, with no organizing principle other than the possible one of search for effective competitive devices, and with no clear vision of the social goal of business activity. (McCrea 1926, p. 222)"

Leclair (2023) argued that economics was an academic, not a vocational subject. In his words, "We don't do economics in the same way we do accounting," The role of economists in business schools was to "curate concepts in economics that can enable students to manage organizations more effectively (profitably) and build their careers in business (i.e. get promoted and make more money)" (Leclair 2023, p.1)

Other critiques include an article in *The Economist* (2023) in which the author argues that while economics has come a long way in the past few years, it falls short of providing a realistic theory of the firm. It points out that "most of what makes for a flourishing business cannot be captured in a tight theory with a few equations."

## **Exploring the Economics Content of Business Administration Textbooks**

This raises the obvious question, exactly what is the contribution of basic economics in business administration curricula? What role do the key concepts in microeconomics and macroeconomics play in management, production management, finance and marketing? To this end, a keyword search was conducted using fifteen e-textbooks freely available on the net. Three textbooks in each of the fields of business administration, management, finance, marketing and production management were used (see list in Appendix). The search concepts were broad in nature, ranging from opportunity cost to marginal utility, marginal cost and elasticity. The results are presented in Table 2.

**Table 2**  
**Keyword Search Results: Business Administration, Management, Marketing, Finance and Process Management\***

Concept	BA 1	BA 2	BA 3	MAN 1	MAN 2	MAN 3	FIN 1	FIN 2	FIN 3	MKT 1	MKT 2	MKT 3	PRM 1	PRM 2	PRM 3
Scarcity															
Opportunity Cost	x	x			x		x	x	x						
Marginal Utility															
Normal Good															
Substitution Effect															
Elasticity										x					
Marginal Productivity															
Profit Maximization	x	x		x							x	x			
Marginal Cost Pricing															
Perfect Competition	x	x	x												
Monopoly	x	x	x												
Monopolistic Competition	x	x	x												
Oligopoly	x	x	x												
Multiplier															
Marginal Efficiency of Capital															
General Equilibrium															
Comparative Advantage	x	x	x												

\*BA: business administration, MAN: management, FIN: finance, MKT: marketing, PRM: production management.

In general, the results were disappointing. Overall, the presence of the seventeen concepts in each was minimal, to say the least. In general, business administration textbooks have the most economic content, with the concepts of opportunity cost, profit maximization and comparative advantage. All

three business administration textbooks provide what are descriptions of the four types of industry structure (i.e. industrial organization). The concept of opportunity cost appears to be a fixture in the finance literature, which is understandable given the subject matter (comparative returns). The marketing textbooks as well as those from production management were, for the most part, devoid of economic concepts.

### Descriptive, Not Analytical

As mentioned, business administration textbooks contain the most references to economic concepts. However, the references in question are mainly descriptive and not analytical. Nothing beyond descriptions of the various industry structures is provided. For example, references (mention of) revenue and cost conditions, equilibrium, and behavioral predictions (the bread and butter of industrial organization) are not provided. In the case of comparative advantage, two of the business administration textbooks went as far as to provide numerical examples. This is also the case with the concept of opportunity cost in finance textbooks. Examples (non-numerical) are provided, but no analysis.

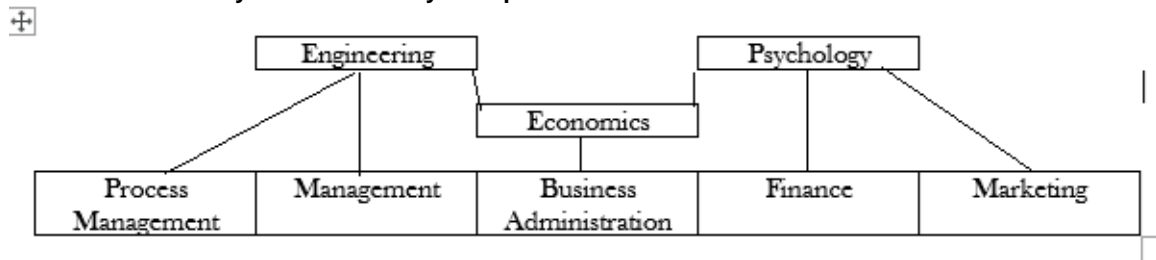
This would indicate that, on the basis of our sample of textbooks, the contribution of economics to business administration in general is limited to descriptions of a handful of basic concepts as well as a taxonomy of market structures. The theory of the consumer and the theory of the producer are conspicuous by their absence as are the more applied concepts such as elasticity and marginal cost pricing – the latter being the cornerstone of optimization theory as it applied to managerial behavior.

Given that business administration textbooks provide general overviews of the subject matter, the next question was whether the seventeen economic concepts would be more prevalent in the specialized fields of management, finance and marketing? As shown in Table 2, this was not the case. In fact, just the reverse is true. These fields have no economic content – at least, not explicitly. At no point in time do the authors make reference to the economics concepts the undergraduate student may have seen in his business administration or introductory economics courses.

### Discussion

These findings raise a number of questions, the most salient being, why is the study of business administration largely devoid of economics and economic concepts? Why is it that its purported tributary science is, in large measure, ignored? Why are the basic predictions of consumer and producer theory, the bread and butter of modern-day economics, not given the time of day?

**Figure 1**  
**Economics Tributary and Distributary Disciplines**



There are a number of possible reasons, running from the level of abstraction to the irrelevance or impertinence of the theory itself. The theory of the consumer is intended to formalize, analytically, the behavior of agents with an eye to understanding and predicting (i.e. guiding behavior). Clearly, this appears not to be the case. Another possible reason is that the theory provides little value added to business majors. A cursory reading of the three marketing textbooks turned up more direct references to the behavioral psychology literature than to the economics literature. For example, various need hierarchies (e.g. the VAL framework, values, attitudes and lifestyle) are introduced to understand both consumer and managerial behavior. The same could be said of the three management textbooks. In short, behavioral psychology appears to be more prevalent than does the theory of the consumer.

A similar argument can be made for the theory of the firm which is conspicuous by its absence in all of the applied business administration fields, including production management. Concepts such as marginal productivity, marginal cost, and returns to scale are nowhere to be found in this literature.

### **What Are We to Make of the Current Situation?**

It goes without saying that this state of affairs is particularly troubling. After all, the overriding view is that business administration is a form of applied economics, that economics is somehow the equivalent of physics in the pure and applied sciences. Yet, there is little of even the most basic concepts in introductory economics in the five business fields studied here. What then are we to make of the current situation?

One could argue that economics and business administration are not *de facto* related, despite have commonalities in so far as the subject matter and tributary disciplines, are concerned. For most of its history, economics (political economy) has attempted to resolve a number of existential questions, such as proving the existence of a unique and stable equilibrium in a market setting, especially since cataclysmic events such as the Great Depression or the Financial Meltdown of 2008, or proving that profits are not a form of unearned income as alleged by the more radical members of the profession (e.g. Karl Marx). To these ends, the analysis of the past half-century, being highly abstract, has opened a wedge between it and the understanding of, and teaching of business administration. Its role is no longer to understand day-to-day behavior so as to better instruct students wanting to be use the knowledge in applied fields, but rather, is to address these big-picture issues using abstract theoretical constructs. In other words, techniques such as stochastic dynamic optimization techniques are not intended to shed light on real-world behavior, but rather to address a series of overriding, big-picture issues.

If this is indeed the case, then it poses a number of epistemological problems. If the starting and ending points of these abstractions (consumer theory and producer theory) have little bearing on the most basic of notions found in its tributary and distributary disciplines, then the question of relevance arises – that is, how relevant is economics to real-world problems? If authors of business administration textbooks see no added value to even the most basic concepts in economics, and draw increasingly from psychology and production engineering, thus bypassing economics, then something is wrong. A good example is contemporary price theory where a variety of pricing models can be found, yet none have been proven, with the result that they are totally absent from the study of business administration. Simply put, what is the purpose of understanding the underpinnings of marginal cost when it is irrelevant in the day-to-day setting of prices.

### **The Way Forward**

The present situation is rather disconcerting in so far as the relevance of economics is concerned, especially to an economist. What use is a discipline that has no upstream (tributary) or downstream (distributary) relevance? Is it at all relevant? This raises the question of what can be done in response? What is the best way forward in re-establishing the discipline in the matrix of tributary and distributary fields of inquiry? Should the profession take heed of its irrelevance and adjust? Or, just continue? Some in the past have argued that this is a non-issue, that while there is no hard evidence to support consumer or producer theory, that its logical foundations are sufficient, and moreover, that agents behave as if. For example, there is no evidence that marginal cost plays a role in pricing and output decisions. Yet, it is typically argued that while companies are not aware or conscious of doing so, they are actually doing so.<sup>2</sup>

We are thus presented with a choice. Either continue on the current path (abstractions and few real-world applications) or adopt a more consilient approach, one that incorporates in a meaningful way, the tributary fields and addresses the questions of, among others, the distributary fields. The former is the most appealing for a number of reasons, not the least of which is the view that increasing abstraction and the use of more sophisticated tools will eventually unlock the answers. Of course, this is the path of least resistance. However, the downside is continued marginalization in so far as its distributary fields are concerned, and increasing irrelevance in so far as its tributary-based contents are concerned.

Alternatively, it could adjust its focus. Instead of ignoring its tributary fields that are increasingly present in business administration (e.g. behavioral psychology), it could incorporate them into their analysis and in the process, make the outcome more relevant to not only business administration but to all concerned. Put differently, if business administration is to eat the pudding, it has to be appetizing. Otherwise, it will simply continue eating the pudding's alleged ingredients (tributary fields).

## **Conclusions**

We conclude with a list of lessons learned. As pointed out in the Introduction, the proof of the pudding is in the eating. The results presented above suggest that the economics pudding is either not being eaten at all, or that the distributary field of business administration has left most, if not all, on its plate. In short, the evidence appears to indicate that it provides very little value to those who have study the field of business administration.

Given the preponderance of psychology and engineering in the business literature, one could argue that the economics profession should take heed. Simplistic approaches to consumer and producer behavior need to be abandoned in favor of those based on psychology and engineering. While the latter may potentially not be a neat and analytically tractable (i.e. differentiable), it is imperative that the profession move to occupy a greater place in what is perhaps its greatest distributary discipline, business administration.

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# Industrial strategy, winners and losers in the twenty-first century

***Industrial Policy for the United States: Winning the Competition for Good Jobs and High-Value Industries.* By Marc Fasteau and Ian Fletcher. Cambridge University Press. 2024. 812pp. Hbk. ISBN 978-1-009-24307-0. £39.99 or \$47.76**

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This massive book has a simple message, most countries with successful economies that serve their populations have some form of industrial policy that extends also to management of its conditions of international trade, the US has neglected industrial policy after WWII, especially in the period from 1974, and has subsequently suffered because of this. All this being so, the US ought to implement a “coherent and comprehensive industrial policy”. To be clear, the authors are not advocating policies that reduce to chaotic indiscriminate implementation of tariffs according to some dubious rationale along the lines of 2025.<sup>1</sup> This is not President Trump’s brand of America First – the authors are affiliated to the Coalition for a Prosperous America, an organization with diverse membership and support.<sup>2</sup> The underlying thesis is, however, that there is a competition to dominate the technologies of the future that the US is in danger of losing (to the detriment also of its security) and the argument is self-consciously protectionist within a narrative structure that recognises great swathes of the American population have been ill-served as workers and communities by policies that have led to deindustrialisation, massive trade deficits in goods (not compensated for by a trade surplus in services), failing infrastructure and very different experiences of income growth and wealth accumulation. The authors identify three pillars of industrial policy:

1. Support for “advantageous industries” – backed by an overview that suggests there are limits to what free markets can deliver, that institution building is extremely important, government has a vital role to play and that innovation and commercialisation occur within an ecosystem rather than in one isolated firm. Notably, the US should fund basic and applied R&D at a percentage of GDP equal to or higher than rivals and it should support innovation through all of the steps from basic science to production at scale.<sup>3</sup>
2. Strategic protectionism – targeted tariffs to protect specific high value industries, notably capital goods that produce other goods, products that have advanced military uses or public health dependencies, products with general uses within multiple economic sectors which potentially underpin large parts of the economy – semiconductors, processors etc. – and (especially) advanced manufacturing products. Tariffs are matched by pressure to open

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<sup>1</sup> See: [https://www.congress.gov/crs\\_external\\_products/R/PDF/R48549/R48549.9.pdf](https://www.congress.gov/crs_external_products/R/PDF/R48549/R48549.9.pdf).

<sup>2</sup> Visit: <https://prosperousamerica.org/> The book does try to provide a balanced view of Trump’s first term, see pp. 355-364.

<sup>3</sup> This last sentence comes from a summary in the recommendations section p. 597.

foreign markets to US export of some of these products combined with policies to deny “economic and geopolitical adversaries key technologies”.

3. Exchange rate management to achieve a more balanced trade position in goods – essentially use of capital controls and interventions to devalue the dollar in order to drive up export of goods and drive down imports, combined with countermeasures to deter other countries from dumping in the US market.

The book is split into six parts and thirty chapters followed by a short “Recommendations” chapter. Part I discusses free market economic theory and its mismatch with the practice of effective economies. Part II provides a series of selected case studies of countries that have some version of industrial policy in order to identify what has worked and what hasn’t – Japan, South Korea, China, Germany, India, Argentina etc. Part III takes a step back to consider the origins of industrial policy and its history in the US from 1750 to the present period (noting also that while the US has neglected formal industrial policy in the Post WWII era, it has had some elements of industrial policies during that time). Part IV develops a toolkit of policies and issue-areas for government support of and role in innovation, and ends on the need to reassess the patent system. Part V provides some industry focused case studies (cars, semiconductors, robotics and nanotechnology) and Part VI some case studies of geographic clustering and its network effects.

The following provides a flavour of the argument:

*... fairly open trade, is a good thing. No valid analysis supports autarky, knee-jerk protectionism, or crude protectionism that aims at nothing more than short-term retention of existing jobs. But 100 percent free trade with 100 percent of the world 100 percent of the time – even if this were possible – is not optimal. Free trade, like free markets in other areas of the economy, should be just one strand of policy, employed as a strategic choice, not a blanket ideological commitment... [this book] shows that economic development is path-dependent, that what industries a nation can have tomorrow largely depends on what industry it has today, and that industrial policy interventions by government can push economies onto different paths, some better than others* (Fasteau and Fletcher 2024: 74 and 77)

While the authors draw heavily on Erik Reinert for their general orientation and acknowledge in an endnote to Chapter 2 his help in writing the book (Fasteau and Fletcher 2024:621), the book’s idea of clusters and networks has a long tradition dating back to Book IV of Alfred Marshall’s *Principles of Economics*, first published in 1890 and revised through to an eight edition in 1920. Marshall introduced the notion of industrial organization and attendant concepts and his work provided the inspiration for work on industrial districts and the Italian “new view” as well as economic geography (see Marshall 1959 [1890/1920]; Arena and Quéré 2003; Raffaelli, Becattini and Dardi 2006). In terms of ideas of the state more broadly, *Industrial Policy for the United States* also resonates to some degree with work such as Mariana Mazzucato’s *The Entrepreneurial State*, which makes the case that the role of the state is not restricted to correcting “market failures” and that if one moves beyond unrealistic models of ideal economies, great swathes of what we think of as private economic success stories have depended to some degree on state intervention and support – including in the US (see Mazzucato 2018: Chapter 4). Writing in 2013 (albeit revised in 2015), well before the first Trump administration started to disrupt trade and Biden started to rehabilitate the idea of industrial strategy, she concludes:

We live in an era in which the state is being cut back. Public services are being outsourced. State budgets are being slashed and fear rather than courage is determining national strategies. Much of this change is being done in the name of rendering markets more competitive, more dynamic. This book is an open call to

change the way we talk about the State, its role in the economy and the images and ideas we use to describe the role. (Mazzucato 2018: 213)

Mazzucato perhaps tracks more to the left than Fasteau and Fletcher and, as far as I am aware, there is no equivalent in her earlier work of “a different international legal structure will eventually be adopted and that in the meantime, US policy should not be constrained by the one that now exists...” (Fasteau and Fletcher 2024: 75).

### **Comments: the view from where?**

To many Americans this book will read as the common sense they have been waiting for. It is clear, programmatic and well-considered. I would recommend it to anyone with an interest in the intelligent side of the argument for protectionism in the US today. That said, while it is usually not reasonable to take a book to task for what it is not about rather than what it is, it seems worth noting that *Industrial Policy for the United States* probably reads rather differently depending on where you live in the world. From the outside Pax Americana has never been a system of fair trade nor has it ever really been free trade, it has been the idea of markets when that idea suited. As such the concerns that underpin *Industrial Policy for the United States* are liable to be seen quite differently elsewhere in terms of power relationships, consequences and ultimate concerns. Moreover, the problems experienced in the US, which the book looks to address, are as much about rebalancing power inside of the US as they are about meeting competition from other countries.

The view from the outside is very much of the US as global power that devised and benefited from the systems that have existed over the last eighty years.<sup>4</sup> Post WWII, the US has been the main, though by no means sole, architect of and influence on the international organizations that have overseen global finance and trade – the IMF, World Bank and World Trade Organization – and the Federal Reserve has become the apex central bank. Since Bretton Woods, the US dollar has been the global reserve currency, within what came to be known as the Triffin dilemma, and though some of the mechanics of the role of the dollar have changed over the years, the dominance of the dollar has not changed much and that dominance has brought various advantages to the US (not least the Treasury).<sup>5</sup> Moreover, it was US corporations that mainly led the way in creating a system of least cost offshored manufacture and regional assembly in long supply chains, it was US commercial and investment banks that developed the systems and instruments that have dominated credit creation and financial flows and it has been US hedge funds that have seized the role of piranha that feed on the vulnerabilities of countries, corporations and capital markets everywhere.

Getting a grip on transnational corporations, financialization, plutocracy and kleptocracy are at least as urgent, as facing down China, if you happen to be American and to be fair to the authors there is a sense of this at various times in the book – notably Chapter 17. Still, this is very much a US-centric book about US concerns with an inside and an outside. I’m sure that will seem a positive to most Americans and can only help the books plausibility and domestic sales. But the US is not just any other country... It cannot really have a domestic only set of policies.

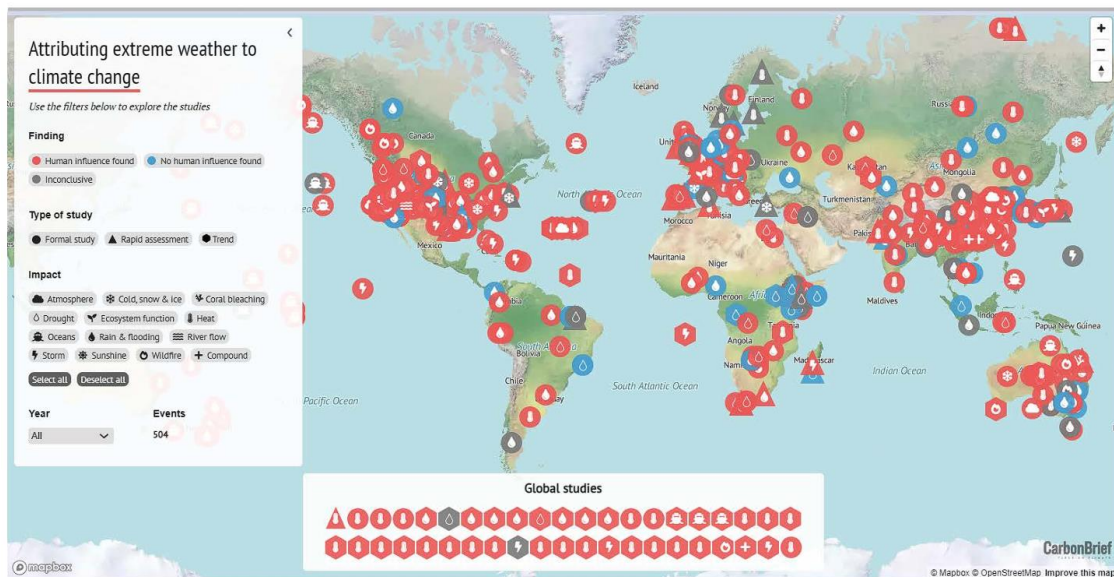
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<sup>4</sup> There are, as such, very different foci of concerns. See, for example, Hickel (2017); Hickel, Sullivan and Zoomkawala (2021); Ingham (2025).

<sup>5</sup> It is true, however, that there are currently more discussions of and signs of challenge to the role of the dollar than has been typical in previous years. For example: <https://positivemoney.org/uk-global/update/dollar-dominance-the-future/>

It is, therefore, notable that the book has little to say about geopolitical context and the future, despite its many interesting case studies and command of material from multiple countries. It is more or less a given that there is competition and it is important the US comes out on top and there isn't really a strong sense of the US's role as hegemon and what difference industrial policy might make to America's place in the world and the nature of any subsequent new world – deglobalized (?), fragmentary (?), multipolar (?), one with respect for fair international organizations and rules (?) etc.<sup>6</sup> The dynamics of competition with China, for example, is a massive geostrategic issue that overflows economic considerations. US self-sufficiency in some technologies is feasible but denying those technologies to China is probably not. Moreover, given the current climate emergency, shouldn't technology transfer be a first principle for climate significant technologies? And who exactly is going to win the future if all countries persist with forms of economies that are resource hungry, extractive and waste creating, given that climate change is just one urgent problem among many created by ever-expanding industrial consumer economies? Industrial policy is not solving that problem if its main focus is technology development, protection and growth rather than drivers of economic activity.<sup>7</sup> The US has one of the highest levels of GHG emissions per capita, energy use per person and material footprint of any country and no country will be prosperous and safe on a climate hostile planet (see also appended figures).<sup>8</sup>

Figure 6: Global attribution map of extreme weather events to climate change.



Source: Carbon Brief Mapped: How climate change affects extreme weather around the world (carbonbrief.org)

In the end then, though *Industrial Policy for the United States* has many insightful things to say about the nature of trade and the fallacies of economic theory of free trade (for example, the flaws of comparative advantage pp. 60-67), this book is more of a how to succeed in a status quo world that might not exist, for a country that can expect to set and repudiate rules and has the scale and resources

<sup>6</sup> On hegemonic stability and previous concerns regarding the decline of the US see Gills and Patomäki (2017).

<sup>7</sup> See, for example, Bärnthaler, Mang and Hickel (2025); Hauge and Hickel (2025); Spash (2024).

<sup>8</sup> Figure 6 comes from the Institute and Faculty of Actuaries, *Clime Scorpion* report but originates with Carbon Brief (Trust et al 2024). Visit: <https://interactive.carbonbrief.org/attribution-studies/index.html>

to be self-sufficient in some sectors and this is reflected in its final chapter of recommendations. This chapter contains an interesting set of general guidelines and specific interventions rather than the more reflexive concerns usually expressed in conclusions. This is not to suggest the argument lacks detail, nuance or credibility, rather it is to note it is an itemised clearly stated to do list. Whether readers elsewhere are receptive to the message may in the end be beside the point for the authors and the intended readers, but maybe not – the authors are careful to emphasise that friends and enemies are treated differently. In the meantime, if looking for an economic strategy to “take back US home markets” and, inter alia, to address the travails of fly over states and the rustbelt, then this book is a good place to start (see also appended figures).<sup>9</sup>

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<sup>9</sup> Though here one might also argue that economic welfare would be improved by universal healthcare a stable welfare support system and also some sense of how to respond to the consequences of new technology for employment prospects. See also: <https://www.deanbaker.net/> and <https://www.epi.org/people/eilen-appelbaum/>

Of course all this may be moot if something like the AI 2027 scenario is feasible: <https://ai-2027.com/>

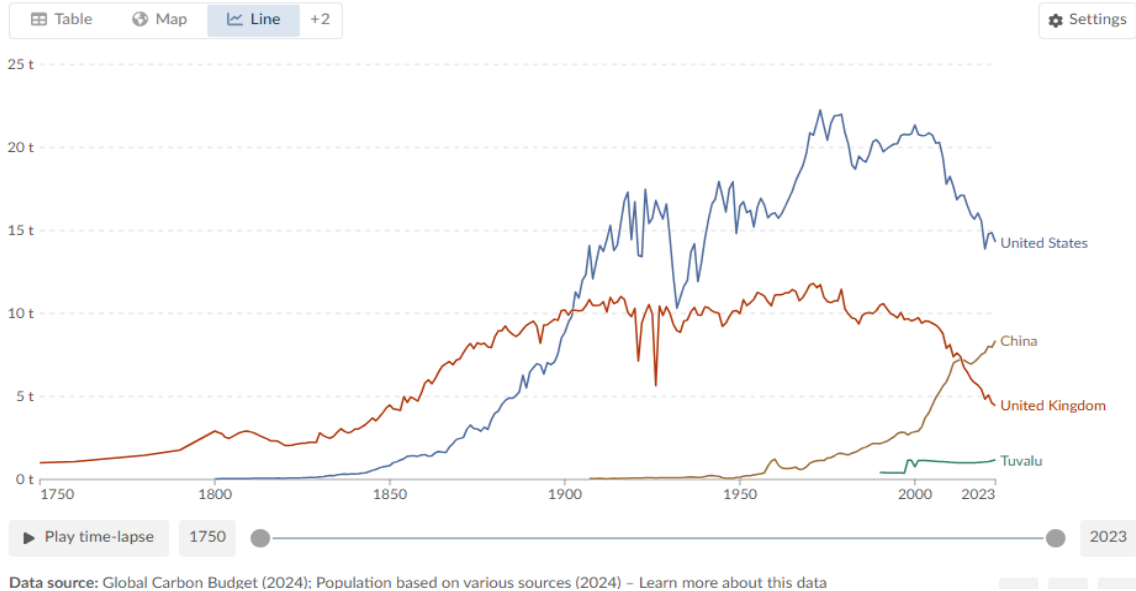
## Appended<sup>10</sup>

### Emissions per capita comparison:

#### CO<sub>2</sub> emissions per capita

Carbon dioxide (CO<sub>2</sub>) emissions from burning fossil fuels and industrial processes. This includes emissions from transport, electricity generation, and heating, but not land-use change.

Our World  
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<sup>10</sup> For energy use see per person see: <https://archive.ourworldindata.org/20250825-064920/grapher/per-capita-energy-use.html?mapSelect=GBR~USA~CHN~NGA>

For emissions per capita visit: <https://ourworldindata.org/grapher/co-emissions-per-capita?country=USA~GBR~CHN~TUV>

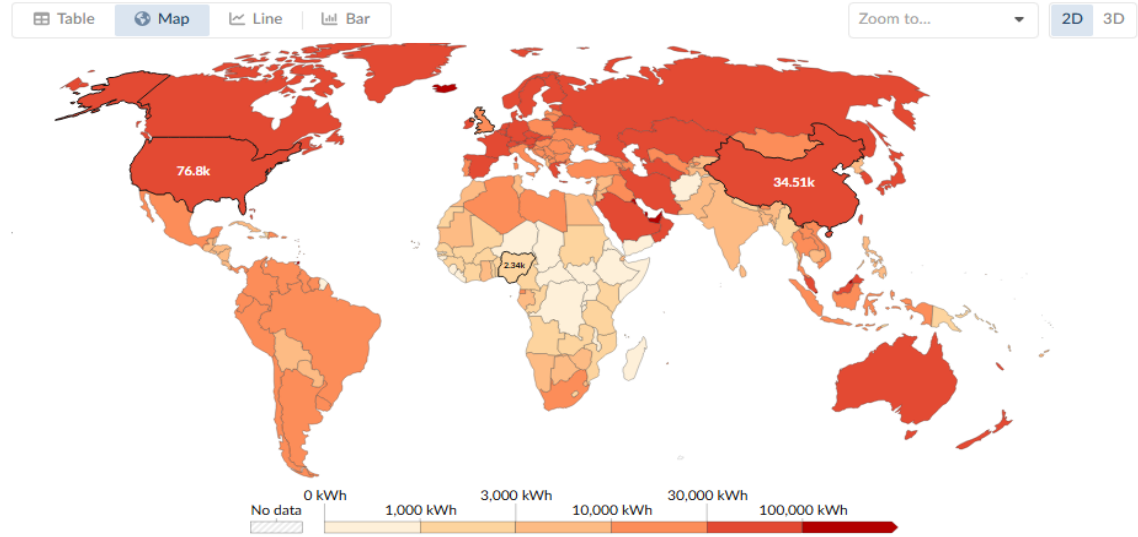
For income and wealth inequality visit: <https://wid.world/country/usa/>

### Energy use per person comparison:

## Energy use per person, 2024

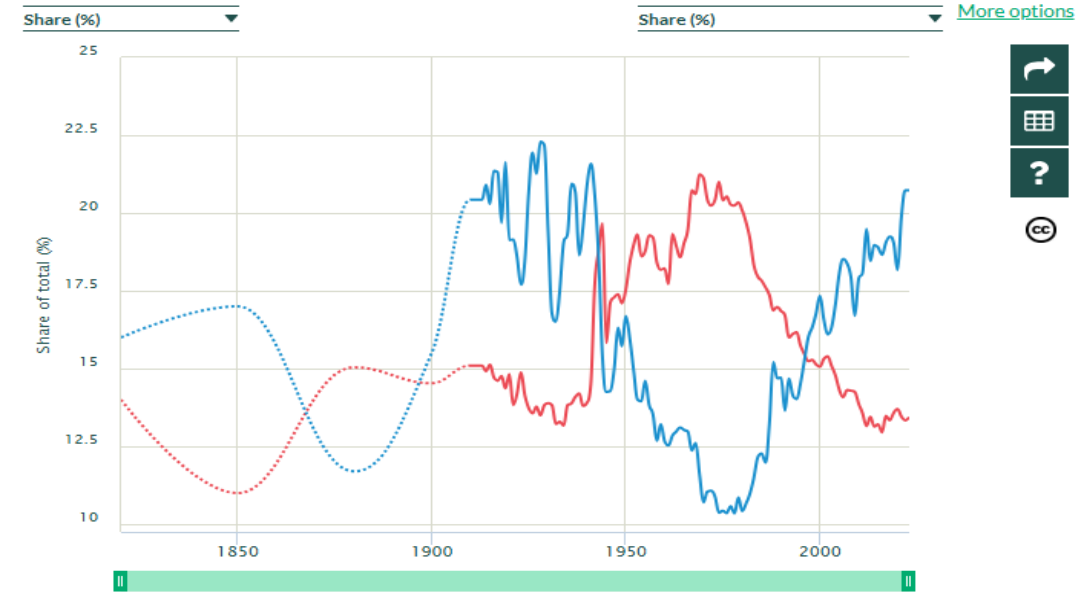
Measured in kilowatt-hours per person. Here, energy refers to primary energy using the substitution method.

Our World  
in Data



### US income inequality:

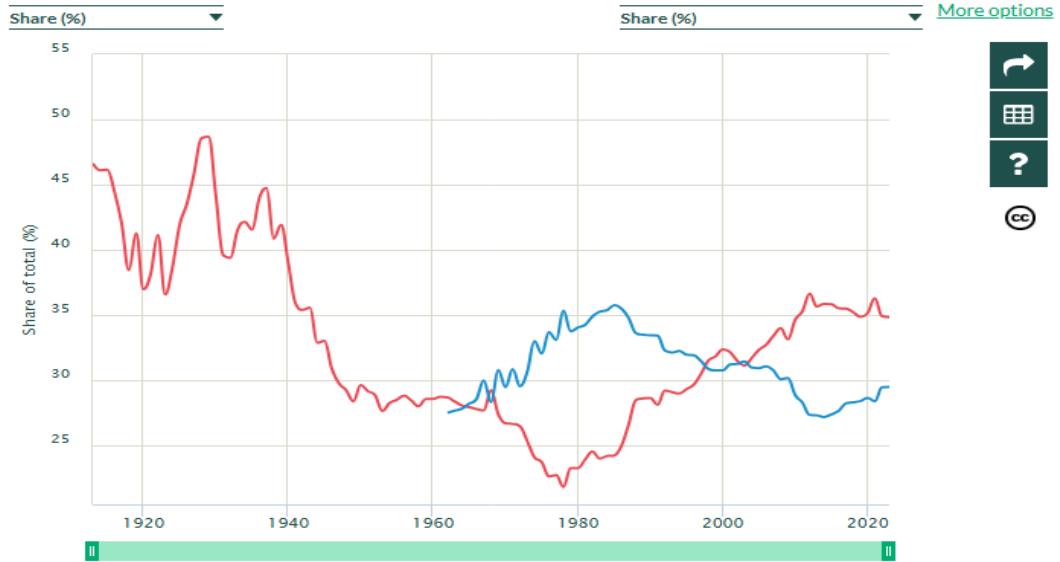
## Income inequality, USA, 1820-2023



- Pre-tax national income | Bottom 50% | share | ADULTS | EQUAL SPLIT  ★★★★★ surveys and tax microdata ?
- Pre-tax national income | Top 1% | share | ADULTS | EQUAL SPLIT  ★★★★★ surveys and tax microdata ?

**US wealth inequality:**

**Wealth inequality, USA, 1913-2023**



■ Net personal wealth | Top 1% | share | ADULTS | EQUAL SPLIT ✕

■ Net personal wealth | Middle 40% | share | ADULTS | EQUAL SPLIT ✕

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# The Fundamental Error of the ‘Science’ of Economics: Equilibrium Particle Mechanics, Instead of Actor Cybernetics

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## Abstract

This essay suggests that the fundamental error of the ‘science’ of economics is conceptualizing humans as objects just passively reacting to impersonal market forces described in terms of 18<sup>th</sup> century particle mechanics. Instead, the essay characterizes humans as active biological cybernetic systems, which continuously have to pursue the goal-value of serving existential needs. For that three control strategies are available (securing short-term necessities, accumulating surplus, spending surplus). Ways to pursue these strategies with others and in relation to environments of different scarcity are identified. That yields a limited set of economic behaviors only derived from the prime human goal-value of having to serve needs. Some decisive differences between this cybernetic approach and current micro- and macroeconomic thinking are highlighted. The analysis of the supply chain of money in a capitalist economy shows the explanative power of this approach. It surfaces how successful accumulation strategies bring some actors in earlier positions in this chain (e.g. as bank owners, investors, or entrepreneurs). Such positions in turn allow furthering own accumulation while restricting the options of actors down the chain. In sum, this supply chain does not aim at any equilibrium, but at positive feedback loops reinforcing previous accumulation. Finally, the essay suggests to develop a supply science investigating how human needs can be served out of scarce environments.

**Keywords:** Human Needs, Serving Needs, Cybernetics, Control, Economic Behavior, Money Supply.

## 1. Introduction

Economists claim that economic theory would follow the model of the natural sciences. Yet, there are many facts which contradict this belief. Most importantly, the natural sciences show a strict hierarchy of explanations, where the properties of lower-level elements explain the emergent properties of higher-level aggregates. E.g. the properties of atoms explain the properties of molecules, which explain the properties of materials or the biochemical base of life, which in turn explain technical structures or biological species.

Anything like that is missing in the social sciences and particularly in economics: Humans and their properties do not form the base of the theory of households and firms, firms do not show in the theory of markets, and even microeconomics and macroeconomics do not add up. According to the standards

of the natural sciences such unrelated constructs could be called at best a bunch of working hypotheses, but not even a theory, and even less science.

This essay starts from a decisive point, where the consideration of the properties of lower level 'elements' is fatally missing in economic theory. Considerations of Gregory Bateson (1972, 487), one of the founding fathers of cybernetics, can be used to locate the problem. What he observed was, summarized in a sentence: Kick a stone and it flies away, kick a dog and it might come back. Obviously, a dog has more options of behavior, than a stone. And obviously humans, if kicked, would have even more options to strike back, e.g. via police, courts, economic retaliation, etc. So, indirectly, Bateson's musing points towards the most fatal error of economics:

Economics tries characterizing complex interactions of humans with models matching not even the physics of dogs, but of stones.

Economics follows vaguely, but wrongly, ideas of 18<sup>th</sup> century equilibrium particle mechanics: Enhance a price and demand will drop, decrease interest and investment will rise, etc. And that amounts to a fundamental error in the root metaphor on which the 'science' of economics rests. There are no humans involved, which can make *decisions*, if they *want to come back* on a price or an interest rate *kicked* up or down.

So, this 'science' deliberately and normatively reduces interactions of humans, the constituent 'elements' of its subject, to those of dead particles like stones. And it ignores the most important characteristics of humans, particularly the ability to set goal-values and to pursue strategies and to make decisions for actions to realize them. It will be tried in the following to crisply grasp these characteristics, and, based on that, to sketch what they mean for a truly scientific understanding - according to the standards of natural sciences - of an economy.

## **2. An Elementary Cybernetic Concept of the Economy**

### **2.1. Humans as 'Biological Cybernetic Systems'**

To understand the difference between passive stones and particle physics, versus active humans and the cybernetics of their interactions, it is necessary to have a minimal model of humans as 'biological cybernetic systems'. That has at least to contain the following (for more details see Nechansky, 2017a):

1. Humans depend on a semi-continuous supply of energy.

Getting that energy requires serving the *existential needs* according to Maslow (1970). Put shortly, that requires getting either water and food directly, or money to buy it. That is the base for their life and for any activity (like coming back when kicked, or buying and selling in markets).

2. Humans have two main control units to regulate their energy supply:

- (a) A prime, mainly internally orientated control unit surveys, if the currently available energy is above a minimal stock level. If the stock approaches this level, this control unit turns - and has to turn to secure life - the individual towards seeking new energy supplies.

- (b) A secondary, mainly externally orientated control unit can deliberately set goal-values and decide for expectedly goal-orientated behavior of the individual in the environment. Since these activities depend on energy supply, this unit is *subordinated* to the prime unit: Whenever the energy stock is low, the secondary unit will be turned towards seeking new

supplies. But if, and only if, the energy supply is sufficient, this secondary control unit is free - yes, *free* - to set any other goals and pursue related activities.

3. The current energy supply and these two control units completely determine human behavior. And that can be grouped into three different strategies:

- (a) A type I, *need-serving existential strategy* works in relation to biologically set, internal *existential goal-values*, to immediately serve needs (like getting food whenever energy stock is low).
- (b) A type II, *supply-seeking accumulation strategy* works by, first, individually setting *security goal-values*, determining a preferred level of energy supply sufficiently above the minimal stock level; Then, second, it pursues the related long-term supply-securing behavior (like growing food, storing supplies, earning money, etc.)

This allows avoiding the stress and the threats of the existential strategy, which seeks supplies only in the short run when already needed.

- (c) A type III, *supply-spending pleasure strategy* works by, first, individually setting *deliberate goal-values*, i.e. goals for any activity, which is possible when energy is available (like pursuing philosophy, or arts, or financial speculation, or doing nothing, etc.); Then, second, it pursues the related deliberate behavior.

This path can be chosen, whenever energy supply is above the minimum, i.e. as long as the existential strategy does not set in; But it is safer within the frame of an accumulation strategy.

Pursuing a secondary or a tertiary strategy are alternative options. The more energy and time are put in a secondary strategy the less are available for a tertiary one. The more energy and time are spent in a tertiary strategy, the earlier a secondary or primary strategy have to be pursued.

We might say that the whole life of humans is a succession of *goal-orientated episodes*, aiming serially at goal-values belonging to one of these strategies; Yet existential goal-values are the most important ones, linger always in the background and serving them demands related episodes most urgently.

Obviously, none of these points applies to stones; Therefore they follow particle mechanics. And obviously, all the phenomena making up an economy presuppose humans getting sufficient energy; Only that allows them to escape the particle mechanics of dead corpses, and to make decisions, to come back when kicked, or to buy, sell, or refrain from activities in markets. Yet the 'science' of economics ignores all that.

The points above are fully in accordance with the insights of the late Carl Menger (1923, 1), one of the founding fathers of Austrian Economics, who writes at the start of the *2<sup>nd</sup> Edition* of his "Principles of Economics" (seemingly never translated into English):

„The theory of needs (the knowledge and the comprehension of their nature) is of fundamental importance for economics and is at the same time the bridge, which leads from the natural sciences, particularly from biology, to the humanities and here particularly to economics.”

And the points above provide a minimal answer in the sense of Blaug (1992, 44), that "... explanation in social science must run not in terms of physical cause and effect but in terms of the motives and intentions of individuals". Needs are the base as well as constraints for the three strategies delineated above, which in turn describe three basic types of motivations.

## 2.2. Humans Depend on Resource Control

Now we have something like a *minimal* cybernetic model characterizing the behavior of humans. This model still ignores much of what makes being a human (like psychic inclinations, idiosyncratic capabilities, as well as questions of love, reproduction, etc.). So, it can definitely not completely cover that topic. But it grasps some essential behavioral options and allows deriving basic insights about interactions. (Just as the chemical model of atoms grasps only some of their physics, but allows explaining their bonding interactions yielding molecules.)

This model contains four main aspects:

- (1) It has a *physiological* core putting *existential needs* of humans at the center.
- (2) It has to be *dynamic*, acknowledging the *ongoing* necessity of serving these needs.
- (3) It has to include an *environmental* view, considering where the resources for serving these needs come from.
- (4) And it has to focus on *resource control*, i.e. if and how individuals can access the needed resources in their environment.

*Resource control* is attained, if an individual has direct unrestricted access to a resource (which may be food, materials, goods, data, or money, etc.): Only then the individual can utilize a resource, i.e. is in a position to set a goal-value if and how to use it (like consume, store, sell, etc.), and to decide when and how to act accordingly.

In sum, a science considering human activity has to be a physiological, dynamic, environmental and cybernetic science investigating how individuals can get control of the supplies they need or want.

## 2.3. Four Cybernetic Options for Seeking Resource Control

An elementary cybernetic analysis shows that two individuals or parties have just four options to pursue their individual goal-values and strategies (no matter if type I, II, or III; for the details see Nechansky, 2016a, 2016b, 2017b, 2018):

- (1) *Conflict*: A and B pursue mutually exclusive goal-values, i.e. here A and B want to get the same resources for themselves. E.g. a security or pleasures strategy of A might deplete resources B would need for his or her existential strategy.
- (2) *Hierarchy*: A is sufficiently powerful, i.e. has superior resource control, to make B submit and pursue primarily A's goal-values and strategy. E.g. A might believably threaten to cut B off from existential resources, if not working primarily for A's interests.
- (3) *Independence in a niche*: A and B might pursue their own goal-values in their own niches without interaction. Presupposition for that is that both find sufficient resources in their respective niches (this point is detailed in section 2.5. below).
- (4) *Cooperation*: A and B might stipulate mutual goal-values, mutually pursue a corresponding strategy and share the results. E.g. A and B might pool their resources to work together in a shared company.

I.e. individuals or parties can work against each other, primarily for one of them, alone, or with each other, whenever seeking to pursue their goal-values and strategies.

Which interaction they *want* to pursue depends on their *psychological inclination* for one of these modes of coexistence, which they *can* pursue depends on the inclinations of both interacting parties, on their relative power and resource control, and on the resources available in the environment.

Interactions of more than two parties are combinations of these dyadic modes, but tend to develop towards one prevailing mode. And particularly, if hierarchy or cooperation prevail that may lead to stable aggregates, ranging from companies or communities to societies (Nechansky, 2017b).

#### **2.4. Individuals and Social Units Face the Same Strategic and Behavioral Options**

Now, if individuals arrive at a hierarchy or cooperation to organize their interactions, then larger social units emerge, where individuals or parties work towards the same goal-values, either enforced or agreed on.

Since such social units are nothing but 'aggregates' of the 'biological cybernetic systems', which humans are, they are subject to the same three strategies:

1. The type I existential strategy of a social unit has to secure sufficient resources to secure the survival of its members and to maintain its structure. I.e. the social unit has to serve the existential goal-values and the needs of its members indirectly via serving the goal-values of the unit, otherwise it is not viable in its given form.

The key indicator for that is the 'break even point' for earning sufficient resources. If not reaching the break even, a social unit can expel part of its members to enable the surviving of the rest.

2. The type II accumulation strategy will invest anything beyond the break even into projects promising to stabilize or even increase resource control in the future, e.g. by expanding production, friendly or unfriendly take over, financial speculation, etc.

A usual indicator for evaluating if such strategies are promising is the 'net present value'. It works with a deliberately set goal-value for sought accumulation, and determines if the outflows for a project may lead to expected greater inflows, so that this goal-value is superseded.

3. The alternative type III pleasure strategy might put anything beyond the break even into improving the working and / or living conditions of the members, e.g. by improving housing, or by distributing gains to members, etc.

The four behavioral options identified in section 4 above show internally in the social units, e.g. how work is organized (competitively, hierarchically, independently in niches, or cooperatively) and how type III strategy resources are distributed (meritocratically, hierarchically, to single experts, or egalitarian).

And these four options show externally in the relations to other social units. Here social units can compete for the same resources (e.g. in markets, or with weapons), can subordinate or submit to others (e.g. in acquisitions, or mergers), can remain independent in some niche, or can cooperate (e.g. in networks, or unions).

## 2.5. That's all there is: Individuals and Social Units Pursue Strategies for Resource Control in Environments

In short, existential human needs compel individuals to seek continuous control of the necessary resources. So, they have always to realize a type I existential strategy. Beyond that they can aim at a type II accumulation or type III pleasure strategy. They can try to realize their strategies against others in conflict, in a hierarchy, alone in a sufficient niche, or cooperating with others. What they can achieve depends on (a) the resources available in their environment, on (b) the social arrangements providing or denying them access to resources, on (c) the individual strategies of the parties (existential, accumulation, or pleasure), and on (d) the modes of coexistence they seek (conflict, hierarchy, niche, or cooperation).

It is important to delineate these delicate interrelations (Nechansky, 2011):

- A 'paradisiacal' environment provides sufficient resources to serve all existential needs:  
Then type I strategies can be immediately fulfilled, type II strategies are not necessary. Conflicts may eventually arise about resources for type III strategies.
- An environment may not provide enough resources to immediately serve all existential needs, yet some resources to pursue *internal* type II accumulation strategies:

- Existential resources may be sufficient for a temporal type I strategy enabling e.g. ongoing agricultural work to directly increase these resources; That can allow living an autarkic life in a locally created niche.
- Or, resources may be used to develop technologies for improving production and / or storage of existential goods; This is an indirect, technological variation to maintain a niche.
- Or, the available resources for serving needs may be appropriated by some *against others*; the usual name for that is establishing *private property*. Here the cybernetic view of the nature of property must be detailed:

Basis is Emerson's (1962) power dependency theory, which says that any resource control can become a form of power, if one actor controls a resource needed by another. That has been confirmed in many fields; Pfeffer and Salancik (2003) showed how that applies to business economics and has to be reflected in strategic management. So, it can be assumed to hold for the economy in general.

Now, the claim of property aims at separating the direct access to a resource from exercising the control of that resource. With that it aims at determining somebody (an individual or a social unit) who has the final word about exercising the control of a certain resource, i.e. determining if, when, how and by whom it might be used. To make this claim effective, there must be some threat and ultimately a means to hinder any deliberate direct exercise of resource control; Historically, that was just brute force; Today it is a societal cooperative arrangement between claimants of property and societal institutions like police and courts, still ultimately relying on the societal monopoly on the means of force.

Property, then, is exclusive resource control backed by some superior resource control, individual or social.

Or, put the other way round: Superior power, i.e. control of some decisive resource, can turn any claim for a resource into property.

Two points have to be added here: First, the superior resource control enabling the enforcement of property is mostly the result of a previous type II accumulation strategy, individual or social. Second, once property claims are protected, their definition determines all that can normally happen in an economy, namely who can exploit, use, give, exchange, or dispose, etc., of which resource - without meeting force; I.e. what is going on in an economy working with property can only be understood by knowing the definition(s) of property.

Based on that, two cases are possible here:

- The niche may *not* provide more resources than for serving the needs of the property claimants (pursuing a type I existential strategy).

Then the property-less may seek some external supply (see the next point), or will have to leave the niche.

- The property claimants may have appropriated more resources than are necessary for serving their needs (pursuing a type II accumulation strategy).

Then they may employ others paying them some of their excess resources.

- An environment may show scarcity of resources for serving existential needs, but an excess of other resources. That can enable the following *external* options:
  - Excess resources may be directly exchanged *with others*;
  - Or, excess resources may be used to develop technologies for producing goods, which can be exchanged *with others*;
  - Or, resources may be used to develop weapons for appropriating resources *against others*.

All three ways have to secure primarily getting existential resources (i.e. serving a type I existential strategy); Given that, they may be extended for accumulating (type II) or consuming (type III) any resources.

The first two ways of trade, i.e. of peaceful exchange, require establishing a *supply chain*, which ultimately has to secure existential resources.

Trade is eased by introducing some form of money as a universal exchange medium. Money must be ultimately exchangeable against existential resources, otherwise it has only value for individuals running at least a successful type I existential strategy.

- Any scarce environment allowing neither serving existential needs nor maintaining a supply chain leads to hunger or starvation, and is better given up for migration.
- The environmental presuppositions for any type III pleasure strategy are a paradise, or a sufficient niche, or successful appropriation for serving basic needs, or working supply chains.

Given any of that, type III *pleasure strategies* can turn towards any resources appropriate for directly or indirectly serving wants.

Two points have to be added to this scheme concerning the scarcity of environments:

- The scarcity of an environment may have *natural causes*.

Or, the scarcity may have *social causes* resulting from the successful property claims on available resources by some, denying access to others: This is the easiest way to gain liberties and power, for it forces those others to choose from the limited behavioral options coming with scarcity and to eke out a living from the resources left to them.

- Any reduction of the availability of decisive resources in an environment - due to natural or social causes - like depletion or pollution, etc., requires a downscaling of strategies, from III via II to I.

This straightforward, a little branching scheme explains, as claimed above, the major forms of economic behavior out of the resources available in an environment, the social arrangements providing or denying access to these resources, the strategies of the parties, (existential, accumulation, or pleasure), and their intentions to realize them in a certain mode of coexistence (conflict, hierarchy, niche, or cooperation).

### 3. Actor Cybernetics versus the 'Science' of Economics: Some Crucial Differences

The following overview outlines some crucial differences between the 'science' of economics playing with actor-less, need-less particle mechanics, and the biology based cybernetic view forwarded here, which is actor-centered, focused on humans, starts from their need-dependence, and emphasizes that this forces them to seek resource control, ultimately to serve the goal-value of securing existential resources from their environment:

- Surprisingly the *homo economicus*, the concept of the human of the 'science' economics, knows only greed, but no need.

According to this concept, humans have only two characteristics, namely (1) they are only driven by egomaniac self-interest for "maximizing" their personal "utility" and (2) they would command a perfect "rationality", enabling them always making "optimal" choices yielding "maximum utility".

That humans have to serve existential needs for surviving does not show in this concept. That serving these needs (i.e. pursuing a type I or II strategy) has to periodically interrupt any other economic activities is ignored.

- Microeconomics pictures humans, or rather "households", as if they would be free to realize any "preferences" for any "utilities".

Yet humans have always to serve existential needs first, because, in economic terms, "needs are characterized by their non-substitutability" (Heidenreich, 1998, 976). Turning freely to any "preferences" is a deliberate type III pleasure strategy presupposing a successful type I and / or type II strategy securing needs.

- Stripping the *homo economicus* from any needs allows ignoring questions of power in the 'science' economics (Max-Neef, 1991).

That humans are dependent on continually serving their needs is the prime cause for their economic vulnerability. The power, i.e. the superior resource control, to deny other humans access to resources for serving these needs is the easiest way to force them into subordination. This can be achieved directly by denying access to water, food, or housing, etc., or indirectly by cutting off money supply to buy that - Konings and Adkins (2022, 14) nicely put the latter in economic terms: "The absence of liquidity forces people to make choices even when only bad options present themselves".

- Microeconomic investigations usually start with “households” and “firms”, which already have a “budget” or productive “factors” to start economic activities. Two things are strange about that:

First, humans do not show explicitly in either of these social units. With that, the problem, that social units have to secure serving the needs of all its members to be viable, is ignored.

And second, the interesting question, how these social units initially got the resources making up their “budget” or “factors” is left out. So, actually microeconomic inquiry starts at a point, where humans must have already carried out a successful type II accumulation strategy leading beyond a break even point, so that exchange of unneeded resources and / or production for exchange become possible at all.

- In the same way microeconomic analysis of markets investigates acts of exchanging goods against money and how changes in prices might change their amounts.

Here microeconomics simply presupposes that sellers can provide all the required goods and buyers have sufficient amounts of money. Again, microeconomics does not ask where goods and money initially might come from.

Particularly, if a buyer does not mint or print the money, then he or she depends on a *supply chain of money*. Then the ability to acquire money in that supply chain depends on a successful type II accumulation strategy yielding some basic resource or good which can be traded for *money from a source*. In detail that means:

- The supply chain of a buyer for getting his or her budget has to be *ultimately grounded in the access to a material resource*, which can be sufficiently accumulated beyond own needs so that it can be offered for exchange; That may concern sufficient food supply to offer labor, or access to other resources to offer natural or self-made products, etc. Only *material* accumulation allowing such offers can enable an initial or anew acquisition of money from a source.
- Then this offer of labor or a product, etc., has to be considered as valuable by those in control of the source of money making them agree on that prime trade.
- Only after that a buyer is in a position for a first or any repeated market exchange where he or she can spend the money for goods. And this exchange leads him or her immediately back into the initial money-less state and the sequence has to start all over again.

This amounts to a sequence where, first, some prime resources from previous accumulation are exchanged against money from a source; Second, this money is exchanged against goods; Then, thirdly, the acquired goods have to serve needs and have somehow to allow replenishing money, enabling acquiring further goods, and so on. If this sequence should not work further market exchange becomes impossible. I.e. repeated market exchange works only with a grounding in a material base, which ultimately has to enable serving needs.

Hayek's (1945) simplistic idea that all economic knowledge could be expressed in a system of money prices overlooks that there must be a prime part of the economy and a related prime knowledge enabling access to resources to repeatedly get from a money-less to a money-owning state (comprising the main options dig, harvest, trade, earn, borrow, beg, or steal); Without that base and knowledge no one can get to the money necessary to participate in the secondary part of the economy working with money prices.

- Generally, exchange in markets is not sufficiently characterized by studying single acts of trading goods for money. Usually both sides of a trade depend on supply chains, one enabling producing the good, the other providing the money.

A single act of exchange presupposes that these supply chains worked - once. Repeating such acts presupposes that both parties can reactivate these supply chains to provide another good and replenish the budget. I.e. both must be able to rerun a successful type II accumulation strategy and *two counter-directed supply chains* to come again in a position allowing *one* more exchange of a good against money.

The importance of supply chains is clear to everyone at least since they broke down in the Covid crisis. Yet, checking how nine major introductory works on economics deal with them, yielded only one comment<sup>1</sup>: Dorman (2014a, 301) observes that supply chains can “break down the abstract, anonymous universe of supply and demand”. So, what is a prerequisite for every exchange of goods against money and “break down” its own “universe” is seemingly not of particular interest for the ‘science’ of economics.

- Furthermore, supply chains allowing repeated exchange in markets require secured resource control along the whole chain, so that goods or money passed along these chains actually reach the designated trading partners.

Secured resource control means, of course, that property claims along the supply chain have to be secured. This in turn presupposes social systems which control property claims and, if necessary, ultimately can enforce them, as discussed above. So, once the consideration of market exchange moves from single acts of exchange to supply chains enabling further exchange, an accurate scientific description has to consider the societal arrangements (like property laws) and control units (like police, courts) steering and maintaining these chains. As Swedberg (2005, 440) observed: “Since private property is a precondition for a capitalist economy, so is the law about private property.” And, it has to be added, not only the law, but also some superior resource control able to enforce it.

Yet neither supply chains, nor property, nor property law, nor the societal control units committed to enforce it, which together enable repeated exchange, show in the ‘science’ of economics. Supply always simply goes up, if prices can be kicked up. It’s so simple; Just particle mechanics, isn’t it?

- In the same way, the idea of “market equilibrium” ignores supply chains, too. It assumes that all products can be exchanged immediately, clearing markets and making all buyers and sellers happy. Arrow and Debreu (1954) even ‘proved’ that this is possible - yet just *once* and that only under totally unrealistic assumptions.<sup>2</sup>

But the most important and sophisticated products (like computers, cars, railways, air planes, production plants, etc.) cannot be exchanged at once, because they depend on increasingly long supply chains; These in turn presuppose increasingly amounting type II accumulation strategies to finance supply, and in parallel increasingly interacting social control units to protect all that,

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<sup>1</sup> The other 8 works checked showed the following results: Supply chains are not mentioned in Baumol *et al.* (2020), Bofinger (2011); They are mentioned once, yet without any discussion in Bontrup and Marquardt (2021, 701), Dorman (2014b, 199), Krugman *et al.* (2014, 613), Lavoie (2022, 134), Mankiw (2021, 179), Samuelson and Nordhaus (2010, 32).

<sup>2</sup> Arrow and Debreu (1954, 270, 280, 267) assume that either (a) *all* consumers own a bit of *all* commodities and get a share of *all* profits, or, alternatively that (b) *every* individual can supply productive labor, while, anyway, their fictitious market economy is always characterized by “non-increasing returns to scale” - *sic!* - and “labor cannot be produced by production-units” - i.e. there is no technology, no automation, no artificial intelligence. In short Arrow and Debreu ‘proof’ that market equilibrium can show *once*, if, and only if, reality does not.

before completing these products becomes possible. So, the longer the supply chain, the longer the production time, the more important become property and its societal protection.

Given that, “market equilibrium” cannot be seriously considered as a one-time event where clearing markets now might guarantee that all buyers and sellers get happy. For the prospective happiness of many buyers and sellers depends on many working supply chains, which should enable series of exchanges yielding complex products perhaps only after years. The abstractly ‘proved’ *one-time* “equilibrium” does in no way guarantee that and is therefore meaningless (additionally to the totally unrealistic assumptions). Introducing the reality of supply chains into economics might finally help burying the idea of “equilibrium” derived from particle mechanics as well as the related plays of the Arrow and Debreu (1954) kind.

- That a successful type II accumulation strategy is the base for an initial market exchange as well as for the maintenance of a supply chain enabling further exchange, leads to the view that *every single act of market exchange is path dependent* and socially embedded in a system of resource control and property protection.

Every act of exchange, then, is the result of a specific combination of the factors discussed in section 2.5., i.e. of (a) the resources available in their environment, of (b) the social arrangements providing or denying parties access to resources, of (c) the individual strategies of the parties - based on previously gained resource control and characterized by the ongoing selection of type I, II or III strategies -, and of (d) the intentions to realize the strategies in a specific mode of coexistence, namely conflict, hierarchy, niche, or cooperation.

- Furthermore, a successful type II accumulation strategy is the base for influencing any given situation in a market for achieving an advantage compared to other, less successfully accumulating participants:

Whatever the current market price, if successful accumulation allows offering some more dollars for a scarce product, then one can usually secure the purchase. Insofar it does not make sense to study markets, and to speak about fairy tales like “market equilibrium”, without considering the different accumulation of participants giving them different purchasing power and allowing them individually and immediately to *alter* the market.

That means, too, that a market is not an institution working with the *democratic principle* of ‘one-person-one-vote’, but with what might be called the *oligarchic principle* of ‘one-dollar-one-vote’ (see e.g. Johannisova and Wolf, 2012, Chang, 2008, 172), taking here the form ‘one more accumulated dollar, one more secured purchase’. So, a market is an institution favoring the richest oligarchs. As such a market will always be a strange, impairing element in a democracy.

How capitalist markets not only favor oligarchs on the *demand side*, but on the supply side, too, and may even produce oligarchs will interest us below.

- Now, as outlined above, microeconomics just studies selected acts of economic behavior, while ignoring flows which enable these acts, like the basic accumulation of resources form an environment as well as the existence of supply chains.

Macroeconomics, on the other hand, lumps together overall aggregates of “states”, “banks”, “enterprises” and “households”. And between these abstract units only flows of “money” are counted, even if these flows mostly depend on exchanges for “labor” and for “goods”. “Labor” emerges, of course, with money and not from humans with needs, while “goods” require neither resources nor supply chains. In short, macroeconomics studies only flows of money between all to big aggregates, *while ignoring the determinants of all necessary counter-directed physical flows*. It’s all that simple: A national economy is just kicking money in circles, isn’t it?!

Occasionally even economists wonder why these microeconomic and macroeconomic plays do not add up. The simple answer is, they do not add up, because the *steps of the flows* really determining an economy are beyond microeconomics and beneath macroeconomics. Put more precisely, they do not add up because the 'science' of economics ignores all the processes sketched above, namely resource availability, resource control, resource accumulation, supply chains of resources for making complex products, and counter-directed interacting supply chains of products and money enabling market exchange, as well as, most importantly, the cybernetic goal-values and relates strategies of the parties directing all these processes (these will be further detailed in section 4 below).

In short, seen from the view of the natural sciences and starting with a focus on human nature, i.e. on the characteristics of the constituting 'elements' of every social science, the current 'science' of economics is a strange construct, out of touch with the empirical evidence of economic life.

In this 'science' the prime motivation for any economic activity, i.e. serving existential needs to make a living, simply does not show. The survival of single individuals and of the whole human species is disregarded and unintended: Should it happen, it remains unexplainable in this framework, should it not happen, it would not count.

#### **4. An Application: The Cybernetics of the Capitalist Supply Chain of Money**

In the following it will be tried to illustrate the cybernetics of economic strategies sketched above. To achieve that two important topics will be combined, which are surprisingly rarely addressed in the 'science' of economics, namely (1) supply chains and (2) how money comes into a capitalist economy. Main actors - individuals or social units - will be identified, which are involved in getting money from a central bank to an unassuming member of a society. Particularly, for every actor the following points will be analyzed:

- *Preceding accumulation*: It will be asked, which preceding type II accumulation was necessary, allowing an actor to gain the resource control enabling to take a particular position in the supply chain.
- *Decisive inputs*: The inputs from previous actors in the supply chain will be identified, which constrain and / or determine the decisions of an actor under investigation.
- *Options for decision-making*: Then the options of an actor are discussed, how own goal-values can be set and pursued while observing the determinants and / or constraints defined by previous actors.
- *Decisive outputs*: Finally, decisive outputs will be named, which become determinants and / or constraints of following actors.

That way the following will be tried to show: (1) How accumulation determines which positions in the supply chain can be gained; (2) How preceding positions can become hierarchically higher 'top' positions in cascading cybernetic levels of control, where the goal-setting and related decision making of a prior actor can normatively define the conditions for further flows of money, and where particularly interest- or profit-goals of a prior actor determine the break even points of later ones; (3) How that amounts to a 'top-down' economy where the 'top' interests have to be served first; And, finally, (4) how

all that does not yield negative feedback loops leading towards some “equilibrium” in markets, but constitutes reinforcing positive feedback loops fostering more money accumulation at the ‘top’.

Figure 1 outlines an exemplary overview on the cascading cybernetic levels of control steering the capitalist supply chain of money; The activities of the actors are discussed step by step in the following.

#### **4.1. The State Defines a Framework for Actor Cybernetics**

The role of the state for an economy is only touched in the ‘science’ of economics. Here at least some decisive functions shaping an economy must be pointed out:

- *Preceding accumulation*: Every state is the result of a type II accumulation strategy, where some people succeeded securing resource control in a territory. This control is ultimately realized via a monopoly of the means of force (i.e. a form of centralized superior resource control).
- *Decisive inputs*: Some time during the appropriation of a territory ideas come to the fore, how resource control should be carried out within the forming state. These ideas are usually organized on two levels:

- An ideological level is derived from a foundational myth, the words of a prime leader, a religion, or a political vision, etc. It expresses basic normative ideas of a ‘good’ life. This level is hardly to change; Actually, changing it would alter most of the life in the state.

Only one point can illustrate that here: An ideology defines what should become private property for enabling a ‘good’ life - e.g. communists think almost nothing, neoliberals almost everything.

- The ideology is translated into a constitution specifying principal ranges and limits of allowed behavior characterizing the sought ‘good’ life. It is difficult to change this level, but wide agreement allows adjustment of points.

Part of that is specifying the allowed scope of private property expressed in the basic ideological ideas (e.g. communist, or neoliberal).

These are the highest and most decisive levels of this analysis. They define how the legislative and executive institutions of the state should work and can make decisions intervening in all the lower levels discussed below.

- *Options for decision-making*: The constitution defines how legislative institutions can elaborate a lower level of special laws, which further detail ranges and limits of allowed behaviors for particular areas of the ideologically defined ‘good’ life.

That concerns e.g. establishing special institutions (like a central bank, etc.), as well as special regulations for particular forms of resource control, which include property laws.

- *Decisive outputs*: Outputs aim primarily at regulating private, economic and public activities.

Here central bank and banking laws are of prime relevance. Next come property laws defining shareholder and stakeholder rights in relation to land, housing, production plants, corporate governance, intellectual property rights, etc.

This cybernetic control hierarchy of ideology - constitution - laws defines increasingly detailed and precise contents determining who can control which resources in an economy. And here property laws are among the most important and most contested regulations (see e.g. Pistor, 2019), since (1) they

guarantee exclusive resource control, (2) are the base for the right to trade goods in markets and (3) define everything that can become a 'security' in the supply chain of money.

Yet specifying such regulations is only the theoretical, normative part of the control function of a state for an economy. The other part is what might be called the administrative and juridical *control practice*, and its predictability and reliability concerning all the hard to define activities related to realizing the theoretical norms. That includes activities for sticking to and enforcing regulations in administrative practice, controlling economic conduct, settling disputes by courts, enforcing court decisions, etc.

A part of this control practice particularly important here is the difficult to grasp task of a state to establish and maintain 'trust' in its currency. This is necessary, because the acceptance of money requires *cooperative* long-term relations applying Polanyi's (1957) *principle of reciprocity*, in the form that you accept my money today and I yours tomorrow, or next year. Only a realistic expectation of such acceptance will enable the exchange of goods against money in markets. This constitutes a funny and usually overlooked fact - which is definitely not mirrored in the 'science' of economics:

*Market exchange working with money presupposes and continually has to be embedded in a cooperative societal setting which guarantees the reciprocal long-term acceptance of money.*

The fairytale of the superiority and alleged 'efficiency' of competitive markets fostered by capitalists and their 'scientists' immediately breaks down, whenever the actual efficiency of this *cooperative* setting is threatened.

Should a state fail to deliver whatever it takes to maintain the trust in the cooperative setting sustaining its currency, then its monetary system will break down, and the further steps of the supply chain of money, discussed below, will hardly work or not even show.

## 4.2. Central Banks

Central banks are the immediate starting point of the supply chain of money. In the scheme used here the following points are important:

- *Preceding accumulation*: Central Banks are the result of long histories different in most countries (see e.g. Herger, 2016). Initially they were often established as private institutions when rich men pooled resources - i.e. the results of their type II accumulation strategies - to control credit and money supply.
- *Decisive inputs*: The transformation of central banks into state institutions came late, their independence from public control even later. It has to be emphasized that both steps were the result of ideological inputs - i.e. the first conceptual level shaping states, as named above - and of different ideologies, one leftist, the other right wing.

On a more concrete level specific state laws determine the prime goal-values central banks have to aim at, e.g. targeting inflation alone (EU - ECB), or inflation plus unemployment rate (US - Fed).

- *Options for decision-making*: To realize these state-set goal-values in the economy, central banks try to control the money supply to banks. They can manipulate a few variables for that, of which here only the most important one is considered. This is the interest rate, which is demanded for lending central bank money against accepted treasury securities from private banks. It is here just called central bank interest.

Demanding interest can also be understood as type I strategy covering the costs of the bank.

- *Decisive outputs*: The set goal-value for the central bank interest defines the framework for the whole supply chain of money, because it enters into the determination of the break even points of all following players.

Lietaer and Dunne (2013, 39) point out the strange fact that the central bank issues a certain amount of money, while demanding back that amount plus interest, i.e. more than issued. They argue that this introduces an instability already at the very start of the supply chain of money: theoretically the circulation of money can never be balanced, and practically creditors cannot pay their dues without begging someone else.

That initiates a general scheme that debtors have to pay back to creditors more than they lent, money they have to extract from other players in the economy. It is this overall extraction that interests us here.

#### **4.3. The Owners of Private Banks and Their Banks**

Usually capitalist central banks provide money only to private banks. So, at a first glimpse these seem to be the second step in the supply chain of money. Yet, they alone are not, for the analysis of the necessary preceding accumulation leads to the question who can establish a bank. So, in this view we have to consider owners and their banks:

- *Preceding accumulation*: Establishing a private bank requires providing a legally prescribed amount of assets (e.g. in the EU € 15 mill., Wikipedia, 2025). So, private banks presuppose individuals or social units who were running a quite successful type II accumulation strategy, and cannot be understood without the legal, economic and social conditions allowing the acquisition of the required wealth.

It might even be argued that establishing a bank is sort of a type III pleasure strategy of actors who will not need their resources for a type II security strategy shortly.

- *Decisive inputs*: Prime inputs come, of course, from the state, in the form of goal-values and regulations cast e.g. in banking law and property law, etc. Part of that are legally defined minimum reserves; today they determine that private banks can give credits in a high of something like 9 times their minimum reserves.

The secondary input comes from the central bank, in form of the central bank interest rate.

- *Options for goal-setting*: The central bank interest determines the break even of the bank.

Beyond that the bank can set own goal-values, particularly sought levels of profits for the bank owners and the bank. Based on that it can determine details for credits policy, including demanded securities, paybacks schemes and interest.

- *Decisive outputs*: Now the banks can grant credits to investors or entrepreneurs for any projects, which they think will serve their self-set profit and interest goal-values.

For anything accepted as security they can give credit, freely create money out of nothing, formally till they reach the allowed maximum value in relation to the defined minimum reserves.

When turning from the central bank to private banks it should become clear that the supply chain of money works with a system of cascading goal-values, where the demands of every previous suppliers restrict the goal-setting of the next one; Yet, the resulting limited goal-values even further restrict the goal-setting of the following one. I.e. an earlier position in this chain is always freer, while allowing to constrain a following position.

For private banks that means, that they can define and pursue own profit interests in relation to debtors and fund only the projects promising to be most profitable to them, while determining payback schemes.

#### 4.4. Investors as Debtors of Private Banks

Investors may or may not show in the supply chain of money, and if, then on various positions: They may be creditors of banks, or may act on their own investing directly or via shadow banks, or they may be debtors of banks, as exemplarily discussed here (and shown in figure 1).

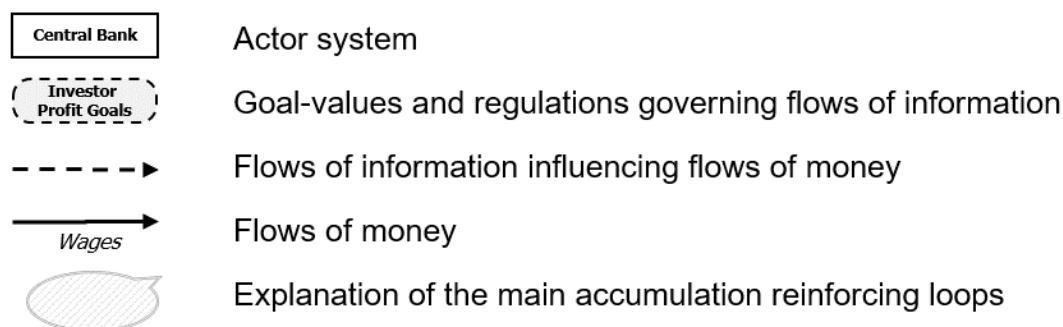
Investors are considered here, because they can add variety to the flows of money:

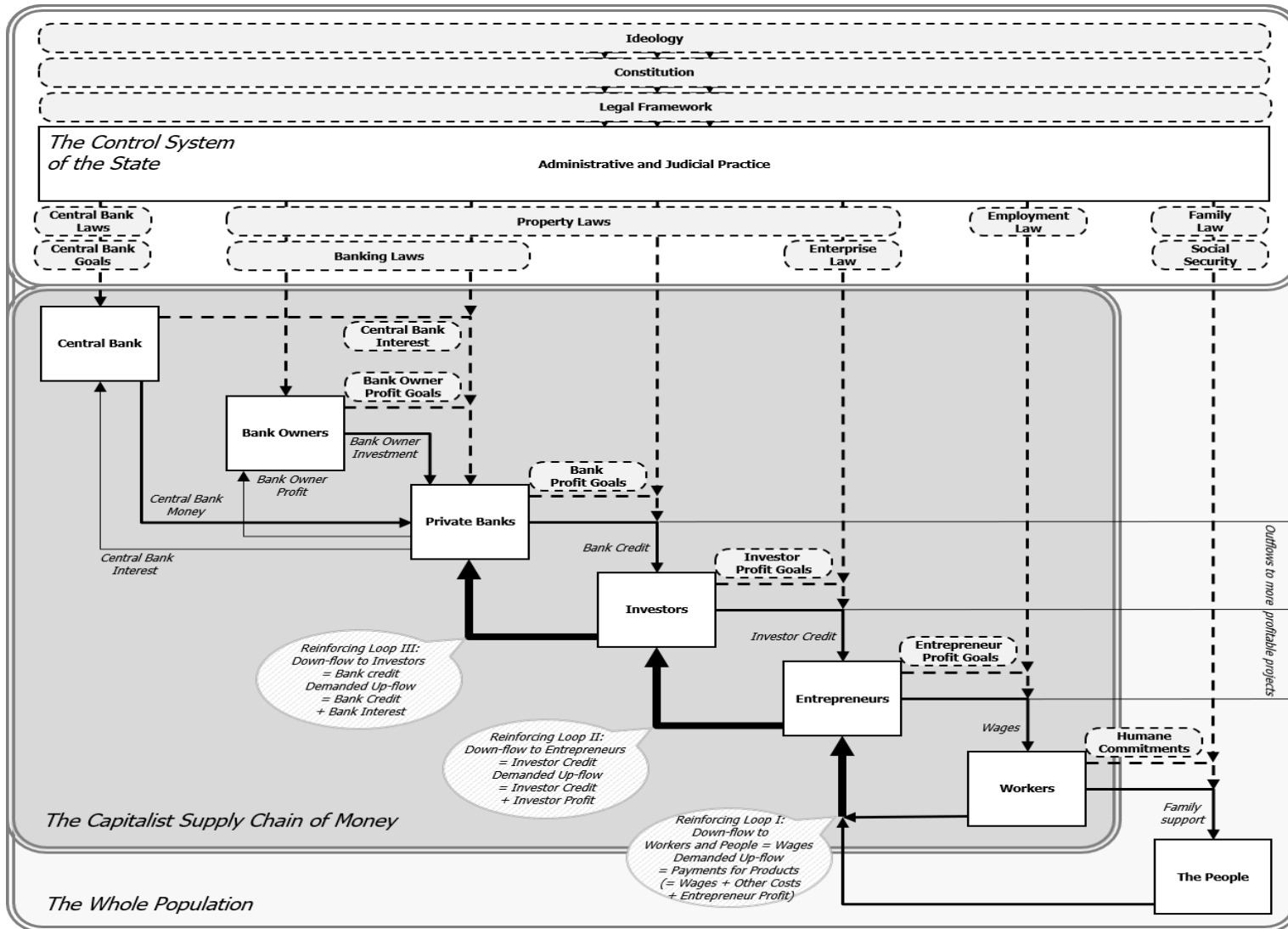
- *Preceding accumulation*: The phenomenon of the investor presupposes - like that of the bank owner - the existence of individuals or social units who where running a successful type II accumulation strategy (subject to the same societal conditions).
- *Decisive inputs*: Unlike bank owners, investors seek to use and enhance their wealth freely. I.e. their activities are, of course, subject to state laws, but not to banking law.

If they work with credits of private banks, then the demanded interest rate will enter in their calculation.

Figure 1 (next page): Exemplary illustration of the capitalist supply chain of money

Cascading conceptual levels of goal-values and regulations steering flows of money (without up-flows to and down-flows from the state). See main text for details.





- *Options for goal-setting:* The input of private banks interest determines their break even point. Beyond that investors can set their own goal-values for their sought levels of profits. Based on that they can select projects promising at least these profits.
- *Decisive outputs:* Investors may direct their money basically into (a) private credits, (b) investments in companies, (c) buying assets speculating on asset price inflation, or (d) speculation in money markets or derivatives.

The decisions of the investors determine if their money goes further down the supply chain into entrepreneurial activities or disappears elsewhere.

#### 4.5. Entrepreneurs

The next actors are entrepreneurs, which are the proclaimed cornerstones of the capitalist creed. They are individuals with ideas for products or services, which promise to be successful in markets. Success, of course, means to pay interest, credits, costs and profits –in that order.

- *Preceding accumulation:* Entrepreneurs with sufficient wealth to manufacture their own product on their own expense, do not differ from investors.

Yet usually entrepreneurs have only some assets (like intellectual property rights), which can serve as securities for credits providing further needed money. Eventually they may approach a bank or an investor even without assets, but only a great idea.

- *Decisive inputs:* At that point it shows most clearly that the economy has nothing to do with equilibrium particle mechanics, but is a process of actor cybernetics:

Here the creditors - private banks and / or investors - are in a position to deliberately set their own goal-values for profits. Based on that they can calculate the net present value of every project, and estimate the likelihood that it will fulfill their profit goals. As support they can apply any criteria they consider as important to judge the related risks, scrutinizing (a) the ideas and abilities of the entrepreneur, (b) available securities, assets and / or other resources, (c) the market situation, (d) the overall economic development, as well as (e) their own alternatives promising more profits, etc. As a result, the creditors may offer a credit at an interest rate seeming profitable to them.

In short, credit-dependent entrepreneurial activities do not show because they can serve a demand in a market, but because they can serve the profit goals of creditors *via* a demand in a market.

This point cannot be overemphasized: In capitalist markets there is not only the - secondary - competition to make products cheaper or better and make customers happy, which is often talked about. Before there is the - prime - competition to make more profitable products, to be able to attract investors and make these happy.

Besides, this brief consideration of decisions for funding entrepreneurs makes it clear that investment cannot be directly influenced by changing the central bank interest rate, in a scheme following equilibrium particle mechanics, as macroeconomic textbooks have it (see e.g. Samuelson and Nordhaus, 2010; And this view is not empirically observed either, e.g. when tracing the effects of zero interest rate policy on investments in the EU in recent years.). This view ignores the cybernetic effects of the ability of the intermediate actors - private banks and investors - to set profit goals and make related funding decisions to realize them.

- *Options for goal-setting*: The criteria for credits determine the break even point of the entrepreneur.

Beyond that he or she can seek own profits.

- *Decisive outputs*: The entrepreneur can realize the very project stipulated with the creditors. That includes engaging workers, getting material resources via supply chains, managing production, and selling the particular products or services. Finally, the success in the market determines, if he or she can meet the criteria of creditors and reach break even.

Schumpeter (1987, 153) observed in relation to these processes:

„Granting credit in this sense works like a command to the economy to subordinate to the purposes of the entrepreneur, like an order to provide the goods, which he needs, like an entrusting of productive forces.”

We have to add that this command includes that the economy has to serve the goal-values of all preceding players in the supply chain of money, too, particularly and primarily their interest and profit claims.

#### **4.6. Workers**

As far as entrepreneurs need what the ‘science’ of economics dryly calls “labor” they have to employ *humans*. For that they have to rely on the mass of the men and women in a society - which we will call the *people* and characterize in section 4.7. below - and have to select out of them *workers* appropriate for them. A worker qualifying for this selection and for employment becomes part of the capitalist supply chain of money:

- *Preceding accumulation*: A worker can offer a preceding accumulation of individual knowledge, skills and / or powers, which *currently* promise serving the profit goal-values of entrepreneurs.
- *Decisive inputs*: A worker gets a wage offer for providing his abilities.
- *Options for goal-setting*: The limited options for goal-setting are basically accept or decline the wage offer. Further options, like bargaining or changing employers, depend on accumulated abilities, on the availability of alternative employers, and other competing workers.

The wage (or a sum of wages derived from more jobs) has to be higher than the break even of the type I survival strategy of the worker (plus eventually his or her family).

- *Decisive outputs*: A worker realizes products or services as defined by the goal-values of the entrepreneur.

It cannot be overemphasized that in capitalism a worker is not employed to make a product serving the needs, wants, or “utility” of other humans, but because making and selling the product promises to serve the goal-values of all preceding players in the supply chain of money. These are, if somewhere a credit was involved, primarily earning interest, secondarily earning scheduled repayments, tertiary earning costs and forth providing profit for the employer.

#### **4.7. The People**

We call the mass of the men and women, kids and elders in a society here shortly the *people*. They share a common background: The paths of their lives somehow confined them to scarcity. Occasionally this may have individual reasons, like bad choices or bad health. But mostly this is a collective experience resulting either from scarce natural environments, or from societally fabricated scarcity, when the property claims of others are enforced against them, or when money is channeled elsewhere:

- *Preceding accumulation*: Sole uniting characteristic of the people is that they lack the accumulation required for earlier positions in the supply chain. I.e. they (a) lack the assets to qualify as bank owners, investors, or entrepreneurs; (b) They lack abilities currently sought by entrepreneurs; (c) Or, they cannot currently offer abilities due to youth, sickness, or old age, or due to current commitment to care work helping needy humans. Therefore, the people are not served via the capitalist supply chain of money.

- *Decisive inputs*: The people do not receive direct inputs to guide their lives, yet they are restrained by limited resource access and the conditions to get to occasional money inputs.

There may be pressure towards adaption to the goal-values of the players controlling the supply chain of money to become useful to them, called 'education'.

- *Options for goal-setting*: Due to scarcity of resources the focus has to be on existential goal-values for securing a type I strategy.

Setting any other goal-values depends on any access to resources, eventually accumulated resources, or occasional money inputs.

- *Decisive outputs*: Activities aim at directly securing existential needs or getting money to achieve that.

So, the people widely lack direct access to the resources they need. And if they cannot become workers and serve the profit goal-values of capitalists, then they are excluded from the capitalist supply chain of money, too. All that makes them needy and vulnerable. In Lenski's (1966) telling term they are "expendables", they are unnecessary to produce and maintain the wealth of the capitalists.

Therefore, the needs of the people are mostly served via insecure channels: They may be supported by family members, friends, or the state. I.e. the money supply of the people shows only if they fit a type III *pleasure strategy* of capitalists, workers, or the state - which depends on the previous type II accumulation strategy of these.

It may be telling to estimate the numbers of the people:

In the EU in 2023 63,8 % of the population were aged 20 to 65 (Eurostat, 2024a), and 75,3 % of them were employed including self-employed (Eurostat, 2024b); this amounts to 48 % of the whole population. That means that in a highly developed region like the EU 52 % of the population are not directly served via the capitalist supply chain of money; *i.e. more than half of the population is not served via markets*, but via Polanyian (1957, 1947) redistribution and reciprocity. Polanyi stated already in 1947 that the importance and the reach of the market economy are grossly overestimated. And these numbers show that they still are.

#### **4.8. General Criteria for Down-flows along the Supply Chain**

Now we have to emphasize what it will normally mean that the earlier players in the supply chain can determine where their money goes:

- The general criterion for the occurrence of any down-flows is the expectation that the up-flows will be greater - i.e. in a word: profit.
- Yet profit is not a nice residual of achievable market price minus costs, as microeconomics has it (see e.g. Samuelson and Nordhaus, 2010, 26):

Profit is a goal-value determining if any downward flows along the supply chain occur at all. Expectable profit beyond a self-set goal-value, as expressed in the net present value, is the criterion for starting any down-flows. And actual profits remaining below these expectations are the criterion to stop any further down-flows.

In short targeted profitability is the criterion that money flows and that capitalist markets show at all. Demand, even any increasing demand, is not sufficient for supply; only demand promising profit is. The 'science' of economics does not reflect that.

Above we observed that the purchasing power of oligarchs allows them to alter the *demand side* of capitalist markets:

*Here we are at the point where the ability of oligarchs to set goal-values for the occurrence of flows of money allows them to influence what will show at the supply side.*

Moving from considerations of supply and demand to the goal-values determining if there is any supply, marks the move from 18<sup>th</sup> century mechanics and the physics of stones, to the reality of actor cybernetics.

#### **4.9. Backflows Going up the Supply Chain**

So far, we focused on the accumulation necessary for an earlier position in the supply chain of money. And we discussed the cascading chain of goal-values determining if and to whom down-flows of money may occur, which flow only if they promise profit:

- That the up-flow should be greater than the downflow holds even for the central bank. We already pointed towards the destabilizing effect.
- For bank-owners, banks, investors and entrepreneurs it is their core business to maintain greater up-flows than down-flows.
- If the up-flows remain below stipulated levels, then a creditor has a variety of options to intervene in the business of a debtor to secure his or her claims (like changing management, taking over, claiming insolvency, etc.)
- If all that should not work, the creditor can still demand liquidation and getting at stipulated securities. So, risks are always widely left with later players.
- The possibility to establish greater up-flows ends with workers. They may still gain from manual and care work of family members, but that does not translate directly in monetary income.

Even if they earn enough, can pursue a type II security strategy, save money and gain interest from bank, this interest is lower than for the higher accounts of upper players.

- Any money the people might spend, passes by the workers and pays for products of entrepreneurs.
- The decisive point in this scheme is: Via the capitalist supply chain of money, workers and the people receive only the *wages* of the workers.

But, they are expected to pay product prices to entrepreneurs, which contain *wages plus interests plus paybacks plus costs plus profits*.

I.e. the sum of the down-flows - just wages - is smaller than the sum of the sought up-flows - product prices including wages.

That cannot work out. That means that the capitalist supply chain of money can never balance *alone*. It requires at least support for the survival of the people - which has to be ultimately guaranteed by the state. Otherwise it will just suck up any resources the people might still have, while slowly pushing them into poverty and starvation.

All that means, the function of the capitalist supply chain of money is always to create *positive feedback loops to reinforce the accumulation* of the preceding players - bank-owners, banks, investors and entrepreneurs - at the cost of later ones, and ultimately of workers and the people.

Strangely, positive feedback loops do not feature prominently in the 'science' of economics: Only the critical, yet successful practitioner Soros (1987, 2008, for a good summary see Umpleby, 2007) repeatedly emphasized their importance; Arthur (1994, 2014) seems to have gone farthest in considering them, while e.g. Forrester (2013) outlined ways to model them.

*The decisive point in this capitalist supply chain of money is that neither workers nor the people are in a position to set and pursue own goal-values and to establish goal-orientated and even less reinforcing flows of money serving them. They are totally dependent on serving the goal-values of others and on being able to feed the upwards flows strengthening others, draining their own resources.*

It is difficult to conceive how such a system of cascading goal-values aiming at *positive* reinforcing feedback loops *increasing* accumulation should lead to anything like an "equilibrium" in an economy. Cybernetically any equilibrium requires *negative* feedback loops *decreasing* any differences (see e. g. Ashby, 1957). Such loops are absent here.

Furthermore, since the actual down-flows are generally smaller than the sought up-flows, that cannot work out for everyone; Some of these planned up-flows cannot show. I.e. only some of the earlier players in the chain can win and increase their accumulation:

*That means that capitalist markets not only favor oligarchs on the demand and the supply side, as discussed above. The capitalist supply chain of money will even tend to produce oligarchs.*

If such a development sets in, it not only means more accumulation of wealth at the top of the supply chain; More importantly it means, too, that the *power of goal-setting* at the top increases: Controlling more wealth allows more decisions fostering the own profit goals, and selecting more projects, which promise to yield further profits. I.e. the winners along the supply will come in a position easing further winning. On the other hand, the later players in the supply chain will be drained of resources and with that their ability will decrease to set own goal-values and pursue own related projects independently of the funding from the earlier players. In sum the goal-values and projects pursued in a society will shift towards ever more serving the top players, while serving the interests of the people less and less.

In terms of the - hard to grasp - *evolutionary dynamics* of a society such a decrease of the variety of goal-values and projects pursued may additionally mean that the society may lose know how and structures not serving oligarchs, and with that may lose variety and flexibility to react to any changes of internal or external circumstances.

Furthermore, according to Korpi's (1985) "power resource theory" power need not be something actively applied, because superior "power resources" usually have a silencing and deterring effect on weaker parties. So, in the face of increasingly accumulated wealth open opposition may break down, while frustration and anger may boil underground (and may show occasionally in the election of extremist parties, if not outbreaks of open violence).

Finally, accumulation of wealth, spreading of incomes and the upcoming of radical views are important factors in Goldstone's "political stress indicator", which proved to be able to predict increasing instabilities in societies (Goldstone, 2016, Turchin, 2013). It seems that the capitalist supply chain of money has inbuilt mechanisms working in that direction.

By lumping together bank owners, investors, entrepreneurs, workers and the people in just one category of "households", the 'science' of economics manages to keep out of view the positive accumulation enhancing feedback loops between them. Simply considering them apart shows the capitalist supply chain of money and its consequences.

#### **4.10. Changes in Accumulation Change the Position in the Supply Chain**

Should the planned positive feedback loops not work out for a creditor, then he or she will lose money, and eventually even significant amounts of accumulated wealth. That may mean that he or she has to give up the previous position in the supply chain of money and has to move down a step (e.g. from investor to entrepreneur).

On the other hand, any successful player may accumulate enough to move up a step (e.g. from worker to entrepreneur).

That previous accumulation determines the position in the supply chain of money, and with that the conditions and costs of financing and the economic possibilities of an actor, is not reflected in the 'science' of economics.

#### **4.11. The Role of the State: Reinforcing or Weakening Accumulation**

Now, as outlined, the state is omnipresent in an economy as passive frame-setting regulator, defining laws for the central banks, banks, property, etc. and as an active enforcer of laws and particularly property laws. To maintain all that the state as a social unit has, of course, to actively pursue one of the three strategies identified above:

- The state may pursue a type I existential strategy seeking only the minimal resources for maintaining 'minimal' institutions. This is the neoliberal idea of the state.

- Or, the state may pursue a type II security strategy seeking to establish and maintain institutions which ensure that the functioning of the state and the provisions for the needs of the people can be continuously guaranteed. This is the social-democratic idea of the state.
- Finally, a state running a successful type II security strategy may additionally realize elements of a type III pleasure strategy.

Yet, while the available recourses are determined by the type II strategy, the scope of their consumers is not defined: Pleasures might be restricted to government officials, or extended to their buddies, or shared with the people.

To finance the sought strategy the state has less or more to intervene into the flows and accumulations along the supply chain of money. Where and how it does that determines if it weakens or reinforces the normally up-ward pumped, accumulating flows of money:

- The following options have a goal-orientation of weakening the accumulation:
  - The state can collect taxes from accumulators (e.g. taxes on wealth, on income from profits and interest, on inheritance, etc.)
  - And the state can turn any income exceeding the own needs into funding of social services for workers and the people (like family support, education, health services, unemployment aid, pensions, etc.)
- The following options have a goal-orientation of reinforcing the accumulation:
  - The state can become another player in the supply chain of money financing own activities via credits from private banks and investors.

Then the state is financially in a position equal to entrepreneurs, has to make a policy pleasing banks and investors, has to pay interest, and that way has to contribute to their accumulation machine.
  - The state can collect taxes mainly from the workers and the people (like sales taxes).
  - The state can turn income exceeding the own needs into down-flows funding the activities of banks, investors and entrepreneurs. That may lead to investments and increased employment in the short-run, but only if promising to intensify their accumulation in the long-run.
  - Finally, if such down-flows are funded via credits, then the state funds banks and investors by paying interest to them, to fund activities yielding more interest for them. This is sort of a double reinforcing feedback loop for super-strengthening their accumulation machine.

In sum, at the margins, the role of the state can be either to weaken or to reinforce the accumulation tendencies of the capitalist supply chain of money. Which side is chosen is, of course, a question of ideology and the derived economic policy, left or right wing.

## **5. Summary: The Cybernetics of the Economy**

This essay outlined an alternative - *cybernetic* - approach to economic analysis based on one elementary step:

- The concept of the human at the root of the 'science' of economics - greedy humans without needs behaving like particles - was dropped.

Instead the concept of needy humans - with or without greed - was introduced, based on the fact that humans need something to eat and to drink. Unlike greed, needs are 100 % empirically validated.

- If humans want to survive, then serving existential needs has to be the ultimate goal-value for their behavior.
- These needs give all human action a necessary goal-orientation: They have to semi-continuously pursue a necessary type I existential strategy providing the necessary resources.
- Beyond that they can pursue a type II accumulation strategy for getting control of resources to secure their needs. Any superior power - alone or with others - allows claiming and protecting such resources as property.
- Given that they can occasionally pursue a type III pleasure strategy using accumulated resources.
- Human behavior can be considered as goal-orientated episodes switching between these three strategies depending on available resources.
- Individuals can pursue these strategies against others in conflict, for others, alone in a sufficient niche, or with others.
- When humans pursue them for others that leads to hierarchical, with others to cooperative social units.
- Social units face the same options for strategies and interactions.
- The scarcity of environments - which may result from natural or social causes - reduces the available options of individuals or social units to pursue strategies.

In sum, the option for economic behavior of individuals and social units depends on (a) the resources available in their environment, on (b) the social arrangements providing or denying parties access to resources, (c) the individual strategies of the parties - based on previously gained resource control and characterized by the ongoing selection of type I, II or III strategies (existential, accumulation, or pleasure) - and on (d) the modes of coexistence they seek in relation to specific others (conflict, hierarchy, niche, or cooperation).

From these need-centered and cybernetic fundamentals follow immediately crucial differences to the current 'science' of economics:

- The concept of the *homo economicus* wrongly disregards the prime driver of all economic activity, namely existential needs.

And that allows ignoring questions of power based on resource control enabling to withhold access to existential resources from others.

- Microeconomic theory of "households" and "firms" ignores that these consist of humans and have to serve their existential needs.

And it never asks where the resources making up "budgets" of "households" and the productive "factors" of "firms" initially come from; i.e. it lacks real world grounding.

- In the same way microeconomic theory of markets never asks where goods and money for exchange initially come from, ignoring that these depend on two counter-directed supply chains, which have to ultimately grounded in access to material resources.
- This ubiquitous necessity of supply chains leading to exchangeable products only after extended periods of time contradicts the idea of “market equilibrium”, that all markets could be cleared in an immediate one-time exchange.
- Furthermore, the idea of “market equilibrium” derived from particle mechanics gives an unrealistically nice picture of markets ignoring three decisive facts:
  - Successful accumulation of money gives parties superior purchasing power allowing to individually *alter* the *demand* side of markets.
  - Successful accumulation of money allowing to support investments gives parties the *power of goal-setting* to *influence* the *supply* side of markets by funding only those projects which promise to be most profitable for them.
  - Finally, if such projects succeed they work as positive reinforcing feedback loops further increasing accumulation (as shown along the supply chain of money).

All that totally contradicts any mechanistic idea of “market equilibrium”.

In reality capitalist markets favor oligarchs on the demand and the supply side and they tend to produce and strengthen them in reinforcing loops. They work with the *oligarchic principle* of ‘one-dollar-one-vote’, and thus contradict and undermine any democratic institutions working with the principle of ‘one-person-one-vote’.

- Generally, the ‘science’ of economics ignores that property claims and control systems necessary to enforce them are societal prerequisites for (a) securing access to material resources, (b) protecting accumulated resources, (c) protecting goods and money along supply chains, and (d) to authorize their exchange.
- And, even more importantly, the ‘science’ of economics ignores that any system working with money has to be *embedded* in a *cooperative* societal order, able to establish and maintain long-term *reciprocal* relations (in the sense of Polanyi, 1957), justifying the *trust* that money personally accepted today will be accepted by others in the future. Without trust in such reciprocity any system working with money immediately breaks down.

That means that the praised capitalist competitive markets depend on a cooperative, reciprocal societal order guaranteeing trust in its currency. I.e. cooperation, not competition is the prime driver of any money-based economy.

Finally, we applied this cybernetic approach to an analysis of the capitalist supply chain of money, which delineated more steps than in standard macroeconomics and national accounting, considering the following actors and primarily *the down-flows of money* connecting them:

- Any supply chain of money is embedded in the normative framework of a state working with three main conceptual levels of (a) ideology - (b) derived constitution - (c) derived laws and regulations - and active offices pursuing an administrative and legalistic practice more or less derived from that.
- Central banks follow state laws and goal-values. They are the prime source of money offered to private banks against securities and for central bank interest.

- Private banks depend on sufficient previous accumulation of bank owners. Given that, they can get central bank money from the central bank.  
They work with deliberately set goal-values for bank owner profits and bank profits, and can give credit to projects which seems promising to earn interest, pay backs and profits.
- Investors have sufficient accumulated own resources to invest in enterprises and / or to get private bank credit easily.  
They can deliberately set goal-values for own profits and can give credit for projects which seems promising to earn interest, pay backs and profits.
- Entrepreneurs have production facilities, know how and / or ideas for making goods, but mostly lack sufficient means to finance them shortly. So, they have to turn to private banks and / or investors for credits.  
They can deliberately set goal-values for products and own profits, and then can try to realize them with minimal costs, to earn interest, pay backs, costs and profits.
- Workers lack accumulation for any earlier position in the supply chain, but have capabilities which are currently profitable for entrepreneurs.  
They can accept the best wage offer currently available to them.
- The people lack accumulation and currently sought capabilities needed for any earlier position; Accordingly, they are not served by the capitalist supply chain of money.  
Their income for survival results mainly from familial (and legal) commitments of workers, or eventually from transfers from the state.

This capitalist supply chain of money favors parties which had success in previous accumulation, which is a prerequisite for an earlier position in chain: The more accumulation, the earlier the position. And it is established and maintained because it allows the earlier players to select and fund projects which promise the following *up-flows of money* further enhancing their accumulation:

- Bank owners seek profits from private banks generated via interest on credits for investors and entrepreneurs backed by securities.
- Investors seek profits via interest on credits for entrepreneurs backed by securities.
- Entrepreneurs seek profits via selling products to the workers and the people, demanding prices covering interest, pay backs, costs and profit. If that does not work out they own securities to creditors.
- The workers and the people are expected to pay the bill.  
Yet, they together receive only the worker's wages via the supply chain of money. So, the sum of the down-flows - just wages - is smaller than the sum of the sought up-flows - product prices including wages.
- Finally, that actual down-flows are smaller than the sought up-flows concerns earlier players in the chain, too. Only some of them will be able to realize their planned profits. So, the capitalist supply chain of money will tend to produce oligarchs.

In short that means that the capitalist supply chain of money, which tries to establish reinforcing accumulating feedback loops, can never balance *alone*; Alone it can just slowly suck up resources to

some earlier players, while begging later ones and pushing the last ones - workers and the people - into poverty.

## **6. Discussion: The Goal-orientation of the Cybernetics of the Economy**

Trying to understand the economy by just observing flows of money, while ignoring all the cognitive levels of ideological, societal, organizational and individual goal-values set to direct and control them, is like trying to grasp the essence of philosophy by observing how philosophers make tea.

To move beyond that, this essay tried to surface the goal-values, which individuals and social units set and apply to guide and control their behavior. First, it was shown that goal-values occur naturally and work primarily bottom-up:

- The highest goal-values directing human behavior come from the necessity to serve existential needs. These require at least an existential strategy to provide the necessary resources in time, but are better secured by an accumulation strategy (which may enable an occasional pleasure strategy, too).
- Accumulation requires resource control allowing to keep others away, i.e. securing property.
- Existential, accumulation and pleasure strategies can be pursued alone or in social units with others. In social units the shared needs give their members mutual goal-values and a basic goal-orientation.
- Mutual accumulation of a social unit and the related resource control give a power position in relation to others, causing scarcity for others and thereby reducing their behavioral options. It can be used to try enforcing own goal-values against others.
- Social units pursuing mutual accumulation developed so far up to the size of states.

Secondarily, the achieved resource control of states and of the social units within them can be turned into a top-down scheme, where those with more resource control can set a frame for those with less. We touched that scheme in the analysis of the capitalist supply chain of money. The usual capitalist top-down scheme is the following, with the state as prime frame-setting institution:

- The state organizes the interest of the inhabitants occupying a certain territory. Its power is based on the ultimate resource control - the monopoly of the means of force.  
  
These interests are expressed in complex sets of goal-values and derived regulations usually comprising the three levels ideology - constitution - legal system. The first two levels define the frame for the third, which includes rules for economic issues.
- The state defines the scope of allowed accumulation, i.e. of property, defining who can use and exchange which resources.
- The state establishes a central bank to serve certain goal-values (like inflation and / or unemployment) and to provide central bank money to defined players.
- The state sets a legal framework what a private bank can do and defines how much accumulation is necessary to establish one.
- The state may regulate what accumulators can do as investors (in speculation, derivatives, shadow banking, etc.).

- The state defines which activities are open to private entrepreneurs, and sets a framework what they can do.
- Within that framework private banks and investors can set and pursue their own profit goal-values and then fund only projects promising them.
- Entrepreneurs in need of private bank or investor credit have primarily to serve the goal-values of their creditors - profits and paybacks. Beyond that they can set and pursue own profit goal-values and then pursue only projects promising them.
- Workers have to serve the goal-values of their employers (and with that of all their creditors).

This whole top-down scheme of goal-setting is based on superior resource control and accumulation. It amounts to a cybernetic system of cascading goal-values, a 'top-down' economy, where those with more accumulation and power can set goal-values for those with less, at least restricting or even determining their behavior.

Anything, which cannot serve the profitability goal-values of banks, investors and entrepreneurs, is excluded from the capitalist economy. This concerns individuals which are not currently needed (called above the people), as well as products or services satisfying some demand, but not the sought profitability.

A few more observations might be in place here:

- As already mentioned, it is difficult to conceive how such a cybernetic system of cascading goal-values aiming at increasing accumulation of banks, investors and entrepreneurs via positive reinforcing feedback loops, should lead to any "equilibrium" in an economy.

And accordingly, it is equally difficult to conceive how this cybernetic system should follow simple equations of the "IS = LM" type found in textbooks of the 'science' of economics (What in figure 1 could justify this relation?).

- The more successful the positive reinforcing feedback loops feed the further accumulation of banks, investors and entrepreneurs, the less will be available to all workers and people. Sooner or later that has to lead to social unrest.

Today this scheme seems to be pursued primarily by oligarchs worldwide and secondarily by the Western upper and middle classes at the cost of rest of the world.

- Piketty (2014) suggested that accumulation occurs when the rate of return on capital ( $r$ ) is greater than the growth rate ( $g$ ) of an economy. Here can only be suggested that accumulation via positive reinforcing feedback loops might work without growth, too.
- Finally, it is suggested that only the study how resource control and accumulation can initially occur bottom-up, and how they later allow to influence or to control flows of goods and money, top-down, seems to promise a valid picture of an economy.

Nobel laureate Rabindranath Tagore (1917, 520) once observed:

"In the so-called free countries the majority of the people are not free; they are driven by the minority to a goal which is not even known to them."

This essay tried to bring to light towards who's and which goal-values the majority in a capitalist society is driven: These are the interest and profit goals of the minority of oligarchs, bankers, investors and entrepreneurs. They are based on property claims on and accumulation of resources - protected by the state - and realized via reinforcing positive feedback loops along the supply chain of money - accepted by the state. When successful, these loops tend to enhance accumulation and to reduce the number of goal-values pursued in the economy, focusing it on the profit goals of fewer and fewer oligarchs. Outrageously, all that is not even known to the 'science' of economics, too.

## **7. Conclusion: Establishing a Supply Science**

The arguments presented above suggest that the 'science' of economics is as far off empirical reality as its contemporary, alchemy, was. Alchemy was ignorant of elementary properties of matter, so it did not work out. Consequently, it was put into the dustbin of intellectual history already two hundred years ago, to give way to - *natural science*. The 'science' of economics is similarly ignorant of elementary properties of humans. As conclusion, it is suggested - particularly for those interested in human survival - to replace the 'science' of economics with a - *supply science*.

This should be a science focusing, first, on the biological needs of humans and serving them *for all* via a *coordinated* type I existential strategy - coordinated between as many participants as any possible. This has to be primarily a substantive approach, asking how to provide the necessary material resources from the environment, how to turn these into the goods for serving human needs and how to bring these goods to the people. As such it has to combine mainly ecology, human physiology, production technology and operations research. Since money cannot directly serve needs, it is of interest here only insofar as it can ease handling these material processes. The overall task is - completely contrary to the 'science' of economics seeking the maximization of individual profits - the *coordinated minimization* of the overall resource use for serving all needs.

Then, second, a *coordinated* type II accumulation strategy should try to ensure the universal security of this type I strategy. Here the supply science should even turn to ambitious issues essential for human flourishing, which are completely beyond the current 'science' of economics, like how to ensure a loving upbringing for infants and a broad education for the young and all the required care work related to that.

Finally, third, the aim of all that should be creating room for type III pleasure strategies, giving all individuals the widest possible freedom to pursue their wants - as far as these are compatible with the foundational type I and II strategies and the long-term sustainable development of the planet.

In sum, combining such strategies, the supply science should enable providing a common sustained and secured base for realizing individual liberal aspirations. That will not attract any saturated conservatives, but should appeal to social-democrats and liberals alike.

Much of the foreseeable conflicts upcoming with increasing inequality and climate change could be avoided with elaborating and pursuing such a supply science.

Optimizing sustainable human supply in that way, would require turning today's political and economic thinking upside down. It would mean stopping the reinforcing positive feedback loops discussed above enabling unbelievable profits, ever expanding property, and limitless liberties for a few. Instead it would aim at a sufficient base, stable security and satisfactory freedom for all. Sounds utopian? Sure, it is. Will face massive opposition from those profiting most from the current system and the 'scientists' they

pay? Sure, it will. But without conceptualizing such a utopian egalitarian order there can never be a coordinated development pointing in that direction.

We know already enough about all the errors of the 'science' of economics; This essay just highlighted some further fundamental ones. So, we should stop wasting any more time on this 'science'. It is time to start something new. This time really following the natural sciences. This time starting with the constitutive 'elements' of all economies and their properties, i.e. with humans and their needs, and seeking scientifically ways to serve them for all.

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# The crises of economic policy formation in Africa: Lessons from the COVID-19 pandemic

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## Abstract

The COVID-19 pandemic exposed quite graphically the vulnerabilities of African economies in responding robustly to this globe spanning health challenge. Ultimately African nations had to depend on aid to tide through the pandemic. Using Ghana as a case study, this paper argues that the neoliberalisation of African economies in the last forty years is responsible for the continent's largely non self-reliant response to the pandemic and that this reveals a deep crisis of economic policy formation in Africa. This calls for a radical rethink of the theoretical foundations and the praxis of African economic policy formation away from its neoliberal foundations.

## 1. Introduction

The microbe is nothing; the terrain, everything.

Attributed to Louis Pasteur (Selye 1955 :631)

In March, 2022, John Nkengasong, director of the African Centres for Disease Control, gave the fortieth Aggrey-Fraser-Guggisberg Memorial Lectures at the University of Ghana. His speech entitled, *Fighting the COVID-19 Pandemic: Africa at the Crossroads*, had a sobering effect as it was revealing. Nkengasong pointed constantly to what he referred as a polarized world that was averse to global solidarity and cooperation in the fight against the pandemic and essentially left Africa on its own to battle the pandemic. Africa found itself as the pandemic raged at the crossroads because, according to Nkengasong, while other continents set in motion concrete measures to fight the virus involving among other things sequencing the pathogen, drug manufacturing and vaccines development, "no country in Africa developed any of the medical countermeasures thus creating dependency" (Nkengasong, 2022). Africa had to fall on the MasterCard Foundation for the first critical financial resources to fight the Corona virus. In 2021, the Foundation provided an initial \$40million (Nkengasong, 2022) for the purchase of critical diagnostics equipment which was not available on the continent when the virus struck. MasterCard then subsequently provided another \$1.3 billion (Kedem, 2021). This second tranche was meant for purchasing vaccines for 50million Africans over the next three years and putting in place "the groundwork for vaccine manufacturing capacity on the continent by focusing on human capital development" (Kedem, 2021).

Africa's obvious glaring incapacity to respond to the pandemic on its own leading to dependence on others raises questions, especially fundamental ones, regarding why this is the case and how to overcome it. Such questions border on why Africa had no vaccine manufacturing infrastructure and

the required human medical capital to tackle the pandemic. The pandemic after all represented one of the most potent existential threats the world has faced since the Second World War.

## **2. COVID-19 and Africa: Impact, lessons and vulnerabilities**

A critical engagement of the literature during the height of pandemic on Africa (2020-2022) reveals a focus on questions that deal less with why Africa was bereft of the capacity to respond to the pandemic on its own than with the effects and other issues. I will group the literature in question into three thematic areas namely, Impact, Lessons and Vulnerabilities. The literature on impact is concerned with the effects of COVID-19 on Africa. Such impact analysis focused on the health sector naturally and wider political and socio-economic issues. Writing on COVID-19(linked to pandemic preparedness and response) in Africa, MacGregor *et al* highlighted its impacts on the continent and the globe: “The COVID-19 pandemic continues to have marked effects on *health systems, economies, and livelihoods* across the globe. Such impacts have been particularly acute in contexts that were already facing societal challenges such as austerity and deepening inequalities...” (2022, p.19; italics mine). The pandemic’s impact on business and by extension economies in Africa has been analyzed extensively in the literature. Indeed the *African Journal of Management* (2021) published a special issue titled “Preliminary investigations into the COVID-19 pandemic and management in Africa.” This special issue was interested in the impact of the pandemic on medium and small scale enterprises (MSMEs) in particular and government and wider society in general in Africa. Out of the six articles published under the special issue, four (Kiggundu and Larsen, 2021; Muthuri *et al*, 2021; Aidoo *et al*, 2021; Ibrahim *et al*, 2021) were concerned with business entities in Africa. In the Maghreb, a sobering article (Badran and Turbull, 2022) is at pains to explicate the rise of authoritarianism in the region. There is an uncanny parallel in this abuse of emergency powers which is reflected in the Nigerian case as well in what is described as “executive aggrandizement” (Oni and Dele-Dada, 2022, p.186).

Many lessons have been pointed out-ranging from the importance of regionalism, new urban planning approaches to urban design and bird watching-that the African continent should learn from the pandemic (Oloruntuba, 2021; Engel and Herpolsheimer, 2021; Rose *et al* , 2021; Aboagye *et al*, 2022; Cobbinah, Erdiaw-Kwasie and Adams, 2021; Weir-Smith, Tholang, and Simangele, 2022). On these lessons learned, Nkengasong argues that one of the key ones is that “we are more connected than we thought we were” (Nkengasong,2022); what he described as “common connectivity”. Africa’s spatial vulnerabilities were also highlighted in the literature on COVID-19(Cobbinah, Erdiaw-Kwasie and Adams, 2021).

While the focus on impacts and lessons allow a multi-dimensional appreciation of the pandemic with respect to Africa, it is the vulnerabilities of the continent exposed in the literature that point to the necessity for a radical understanding and interpretation of the theoretical and empirical sources of these vulnerabilities. In this work, vulnerabilities refer to the abject, even criminal absence of basic public goods and services in a given polity and with it the in-built yet masked logic of the existing public policy infrastructure for underwriting, ensuring and safeguarding the severe underproduction or non-production of such goods and services. The acute and perceptive observations of Paul Farmer (Kidder, 2003) during the Ebola epidemic in Liberia in 2014 will be used to illustrate and set the tone for unpacking this notion of vulnerability canvassed here. Farmer was described as a practitioner of “social medicine,” who argued that “ there was no point in treating patients for diseases only to send them back into the desperate circumstances that contributed to them in the first place. Illness... has social roots and must be addressed through social structures” (Porter and Stolberg, 2022).

This vulnerability that was evident in Liberia during the Ebola pandemic in the health sector of that West African country re-emerged when the COVID-19 pandemic struck. In Nigeria, Africa's most populous country and one of its very well oil endowed (fourth and fifteenth largest in Africa and the world respectively), the state's weak administrative, regulatory and legislative capacities for responding to the pandemic were not in doubt (Saro-Wiwa, 2021; Ardo, 2022; Tade, 2021; Onuaha, 2021; Eze *et al*, 2022). Ashindorbe *et al*, 2022, p.3) draw attention to the phenomenon of "vaccine nationalism" and bemoan Nigeria's incapacity to produce any COVID-19 vaccines and link this state of affairs to the "weak underbelly of decades of criminal neglect of the public healthcare delivery system in the country. Ghana, Nigeria's western neighbor, also lacked the capacity to produce its own vaccines. It was only when the government realized that Ghana like other African countries was a clear victim of vaccine nationalism that moves were made to produce vaccines in Ghana. In February 2021, at the height of the pandemic, a Presidential Vaccine Development and Manufacturing Committee (PVDMC) was set-up (Frimpong, 2021); it had taken two generations and four years (sixty-four years) after Ghana's independence for this to happen. This helpless state of affairs is confounding given that Africa grapples with some notable pandemic and epidemic causing pathogens such as Dengue Virus (Dengue), Poliovirus (Poliomyelitis), *Vibrio cholera* (Cholera), Ebola Virus (Ebola), *Plasmodium falciparum* (Malaria), *Streptococcus pneumoniae* and *Neisseria meningitidis* (bacterial meningitis) among others.

### **3. The International Context and Underproduction of Public Goods and Services**

The preceding section has laid bare in particular Africa's healthcare challenges in the face of the COVID-19 pandemic. It is clear that Africa's health system simply lacked both basic necessities such as reagents, facemasks, oxygen and sophisticated prerequisites such as highly trained medical personnel, vaccine manufacturing capability and specially designed hospitals for handling pandemics of such a scale and ferocity. In sum, Africa's response to the pandemic was hampered by the very limited availability of public goods and services in the health sector.

In early postcolonial Africa, public goods and services in key areas such as education, health, defense, public safety among others had traditionally been provided by the African state. This has been the case in other parts of the world as well so much so that "public goods are often defined as being provided by the state, and the provision of these goods is seen as one of the main rationales for the existence of the state" (Desai, 2003, p. 63). This work while recognizing the longstanding debates within different historical and regional contexts on the definition, nature and suppliers of public goods and services (Masayuk and Wong, 2019; Samuelson, 1954; Ostrom, 2003; Ostrom, Gardner and James, 1994) will not be detained by the substantive issues in these discourses but will draw from it the consensual view that public goods fundamentally refer to those which the provision of are to varying degrees "essential to the smooth functioning of society—economically, politically, and culturally...." (Reiss, 2021).

I return at this juncture to the claim that the role of the state in the provision of public goods has changed in the last thirty years and has essentially been ceded to the market and therefore the private sector (Desai, 2003). This switch points to that which is hidden in plain view: the rise of neoliberalism and with it the retreat of the state from the provision of public goods; or more to the point the promotion by the state of private capital for such public provisioning. The rise of Thatcher and Reagan to power in 1979 and 1981 respectively played a major role in the active promotion of an international neoliberalism policy agenda in which the privatization and marketization of entities producing public goods and services was one of the key tenets. In the United Kingdom, this affected public utilities such as those for gas, water and electricity as well as major state enterprises like British Steel, British Rail, and British

Airways (BA). The British health sector experienced the deleterious impact of Thatcher's neoliberal policies evident in "subjecting the NHS to a particular form of managerialism that in turn led directly to the introduction of a quasi-market in health care centered around competition and choice" (Scott-Samuel *et al*, 2014, p.61). This managerialist tendency, which lay at the heart of worldwide management reforms known as New Public Management (NPM), in which the state increasingly cedes or worse abandons some of its critical public goods and services functions through contractual and other arrangements to especially private firms has come to be described in the literature as the hollowing out of the state (Milward and Provan, 2000). Such a state has also been described as the "market state" (Scott-Samuel *et al*, 2014, p.61) and the regulatory state (Moran, 2000).

The United States also adopted this managerialist approach to policy formation in the Clinton administration's "re-inventing government push" (encapsulated in the 1990 Chief Financial Officers (CFO) Act and the 1993 Government Performance and Results Act [GPRA]) which was deepened further under the presidency of George W. Bush (Lynn, 2008). The foundation for this American managerialist approach had been laid in Reagan era (1981-1989) policies which acquired the name "Reaganomics" (Kenton, p.2021) and which was marked by the pursuit of conservative ideals such as tax cuts for corporations, decreased social spending, increased military spending, and the deregulation of domestic markets. Decreased social spending exacted an impact on the health and wellbeing of Americans (Moore, 2007; Burgin, 2015; Emmanue,l 2014; Starr, 2013; Brill, 2015; Davidson, 2015) which state of affairs was further deepened by the financialization and marketization of the American health sector. The Obama administration tried to respond to America's health challenges with the passage of the Patient Protection and Affordable Care Act, 2010, which has faced legislative, fiscal and other counter measures. In the Ghana case of the underproduction of public goods and services to which we turn similar but specific circumstances conditioned by the context set the tone for the neoliberalization of the society, economy and life. The Ghana case is instructive (for the African context) because this West African nation having been subjected to the adjustment programme of the Bretton Woods Institutions(BWIs) beginning in 1983 came to be touted as an exemplar; "a triumph of neo-liberalism" (Hutchful, 1995, p. 303).

#### **4. The Ghana Case and Underproduction of Public Goods and Services**

Ghana faced severe economic and social strains in 1981(Ocquaye, 2004). This state of affairs was attributable to the economic mismanagement and political instability that the preceding decade had generated. To be sure, the Limann administration voted into power in 1979 tried to get a handle of the dire situation with bold and well thought through policies (see Addae-Mensah, 2016). In any event, the Limann administration was barely three years in office when it was overthrown in the coup d'état of 31<sup>st</sup> December 1981. The Provisional National Defence Council (PNDC) junta which subsequently took power attempted a Marxist inspired re-organization of the Ghanaian political economy as a panacea to the country's woes (Graham 1985). This however proved short lived as a deadly combination of drought, famine, the expulsion of over one million Ghanaians from Nigeria, bushfires, numerous attempted counter-coups and a dramatic change in the international political economy forced the PNDC to abandon its populism and embrace an orthodox approach to economic policymaking when it opened talks with the International Monetary Fund (IMF) in mid-1982(See Graham 1985). The substantive policy debate in question involving the IMF was whether or not to devalue the Ghanaian currency and how to do that. While the right in the constellation of political elements that made up the PNDC and its support base saw the devaluation as a practical step required by the objective conditions of Ghana's fiscal and monetary realities of the period (and therefore sought a face saving devaluation cast "within a set of anti-imperialist and democratic measures" [Graham 1985, p.58]), the left simply viewed this as an IMF false flag aimed at curtailing the revolutionary process. It is important to note

that this turn to the IMF was secured only after a bitter internal struggle in the PNDC which pitched the leftists against those on the right (or better still revolutionary pragmatists) who eventually won. Defeated, some of the leading leftists in the PNDC resigned, were imprisoned, exiled or murdered (Atim, 1983). One must pay attention to the fact that the cataclysmic change in the international political economy played a part in the PNDC's turn and ultimately full embrace of the IMF and with it the policies of the BWIs more generally.

As already alluded to, the informal Thatcher-Reagan alliance precipitated the emergence and pursuit of a global neoliberalization policy agenda tied to the leadership of two powerful countries in the Global North. Ghana was not going to be able to escape this agenda under the PNDC given especially that its initial revolutionary posturing had not generated the sorely needed economic support from the expected sources, the Union of Soviet Socialist Republic(USSR) and its satellites in the Eastern bloc. It is pertinent to draw attention at this juncture to how the BWIs had signaled their neoliberalization of Africa by 1981 in the publication of the World Bank's(WB) *Accelerated Development in Sub-Saharan Africa: An Agenda for Action*. The report is described as "an important document" (Schultheis, 1984, p.9) which barely disguised the intent by the World Bank to operationalize an economic strategy in Africa "similar in many respects to the domestic economic prescriptions of the United States" and by reason of this make African economics part and parcel of the international regimen of "supply side economics" (Schultheis,1984, p.10). Central to the strategy of the WB in the Report was the prescription for African economies like Ghana's to "accelerate economic growth", suggesting that African governments "must reorder their priorities in favor of productivity and away from such goals as political consolidation, *construction of basic infrastructure* and the development of human resource" (Schultheis, 1984, p.9; italics mine).

It is ironic though that it is precisely these kinds of basic infrastructure that was required to keep a semblance of life and the economy going during the COVID-19 pandemic-forty odd years after such a prescription was offered-and the absence of which exposed the vulnerabilities of African countries like Ghana. Approximately two years after this Report was published, Ghana signed onto an Economic Recovery Programme (ERP) under the aegis of the IMF which was embodied and operationalized in the announcement of an Austerity Budget in April 1983. The ERP among other neoliberal policy measures was deliberate in its "drastic withdrawal of state subsidies on social services" (Konings,1986, p.273). This withdrawal of subsidies hit the Ghana health sector hard. The health sector, neglected and without the necessary funds to keep it going as the Ghanaian state shrunk from the provision of public goods and services, experienced perennial "acute shortages of drugs, medical supplies and equipment and widespread poor quality of healthcare." (Alatinga and Williams, 2014, p.367). This reality was acutely exposed by the COVID-19 pandemic. Under Nkrumah, all Ghanaians could access healthcare for free. By the mid-1980s, accident victims, for example, were searched for money before they were attended to under a system that has come to be known as the *Cash and Carry System*. This obnoxious system was introduced by the PNDC government in 1985. From a universal healthcare system, Ghana now has a market-driven one.

The year 1985 is significant because Ghana in that year started to implement the Structural Adjustment Programme (SAP) under the aegis of the BWIs. The ERP concerned itself with macroeconomic stabilization focusing on inflation and exchange rate problems. The SAP took off from the foundation that the ERP had built and was focused on two major objectives, one, "establish an incentive framework that would stimulate growth, savings and investment," and "strengthen the balance of payments" and two, establish a framework that will improve "resource use, particularly in the public sector and direct resources to key areas of adjustment, while ensuring fiscal and monetary stability" (World Bank, 1992, p. xi). The direction of funding of the SAP reveals the focus of the kind of structural changes that the BWIs subjected the Ghanaian political economy to. Under the International

Development Agency's (IDA) Structural Adjustment Credits (SAC) I and II, a total of US\$600 million was spent on SAP; out of this US\$250 million was targeted at trade liberalization of which removal of all quantitative, tax and tariff barriers as well as "changes in public expenditure and tax policy" and "state-owned enterprise reform" (World Bank, 1992, p xii) are instructive. SACII while deepening the foci of SACI promoted the reform of the Ghanaian private sector. When COVID-19 struck in 2021, the state that tried to combat it and which was the handiwork of in the main of the BWIs and Ghana's elite fractions can best be described as the Ghanaian Neoliberal Capitalist State (GNCS). This state has since the 1990s come to frame, and ever more so, the deep structural problems of the Ghanaian political economy-absence of a domestic resource base for industry, the lack of a capital goods sector, and declining agricultural productivity-as matters tractable by means of monetary and pricing policies. The upshot of such an approach and thinking has been that in the last ten years the Ghanaian economy has become deeply financialized (Brown, 2012). In Africa, Ghana became the leading issuer of Eurobonds in the last three years. The 2021 sovereign Eurobond issue was targeted at defraying part of Ghana's debt (World Bank, 2022).

Ghana has recently paid a heavy price for its rather huge appetite for the global financial markets. In the last quarter of 2022, it was shut out of the international financial markets (Dontoh, 2022) because investors were of the view that it could not repay its loans which stood at 76% of Gross Domestic Product (GDP) in October 2022. The corollary of this debt overhung was among other issues, a 60% depreciation of the cedi against the US dollar and galloping inflation which the Bank of Ghana on November 11 indicated to be 40.4% (Bank of Ghana, 2022).

## **5. Curing the Crises of Economic Policy Making in Africa-Engaging the Methodological and Ontological Problems**

The question that needs to be engaged following the explications above is how African countries can construct a new policy framework that is able to safeguard the adequate production of public goods that will not make the continent vulnerable when other pandemics on the scale of COVID-19 strike again. I will argue that this question borders on the methodological and ontological and is tied to the discipline of neoclassical economics which by means of the global neoliberal agenda has come to frame and dominate policy formation in Africa in the last forty years.

These methodological and ontological problems are critical issues that have not been tackled regarding Africa's policy challenges. In this era of neoliberal capitalism, the standard refrain for the cause of especially Africa's economic weakness and stagnation is the so-called "implementation problem". The implementation problem refers to the claim that Africa's economic policy shortcomings are the direct result of the lack of technical capacity, know-how and competence to realize expected policy outputs and outcomes. As a consequence, fundamental ideational questions have not been raised with economic policy formation because economic policy failure has nothing to do with the extant policy's neoclassical economic ideas, framework and tools which are therefore deemed sacrosanct. In Ghana, public officials repeat this line as if on cue at seminars, conferences and in their wider public statements. A typical example can be found in a very important document of the Akufo-Addo government: "Ghanaians are well capable of preparing technically good plans. The key issue is: Do we have in place the conditions that facilitate successful plan implementation? (Government of Ghana 2019, p.13)."

Implicit-and therefore cleverly disguised- in this implementation problem is the idea that the largely Western originating episteme embedded in economic policy formation encounters no serious complications in the African context and that Africa has become a development laggard because its

bureaucrats and policy makers are simply inept. The response to this purported ineptitude has been an inordinate focus on new technical skills sets for Africa's policymakers (Roberts and Andrews, 2005). While the implementation problem may have some purchase, I argue that it is a superficial and more insidious a diversionist response that leaves unanswered critical questions regarding the basis and nature of economic policy thinking and practise applied in Africa in the last forty years that may be responsible for why African development has tarried for so long and evidence for which was on display during the COVID pandemic.

### **5.1. Engaging the Methodological and Ontological Problems**

It is worth noting at this point that in the heartland of neoliberal economic thought and practise such as Britain, scholars have long raised perceptive problems with neoclassical economics and especially so in the face of global financial crises. One notable scholar who has been seized with this is Lawson (1997, 2003; 2009; 2017; 2013). In response to the global financial crisis of 2007-2008, Lawson (2009) pointed out the methodological and ontological problems of academic economics that in his view lay at the heart of the crisis. Lawson argues that the methodological problem in economics had not been focused on regarding why the financial crises occurred:

Seemingly little attention is given to the modes of analysis that have been utilised in support of these positions. Yet method matters. And in my assessment the sorts of methods that prevail in modern economics, whilst fundamental to understanding how recently prominent theories have been sustained, do not carry the warrant that their widespread usage seems to presuppose. In consequence, I am especially concerned that the critics avoid now filling academic journals with contributions that make the same more fundamental, essentially methodological, mistakes as their economic opponents, albeit in slightly different guise. (Lawson, 2009, p.759).

What is this methodological problem then? This is the dominant tendency exemplified in mathematical deductivist methods in economics; "For many years now, economic policy analysis emanating from the academy has been framed mostly in terms of properties of mathematical deductivist models. This modelling activity has not provided too much insight" (Lawson, 2009, p.759). This mathematical deductively derived economic policy analysis is logically tied to a particular ontology embodied in idealized isolated atomistic individuals by which is meant not something small but "something constructed as if it has the same independent invariable effect whatever the context. *The assumption that such atoms are isolated, means that, if triggered, their effects are unimpeded by other factors*, and so are deducible, or predictable, and so mathematically tractable" (Lawson, 2009, p.763; italics mine). The enduring inference from such an ontological position is the privileging of the individual in neoliberal economic policy formation and with it a particular conception of social reality which elevates the individual above society. For Lawson this is unrealistic because "The nature and conditions of social reality are such that the forms of mathematical deductivist reasoning favoured by modern economists are almost entirely inadequate as tools of insightful social analysis" (Lawson, 2009, p.763).

### **6. A Suggested African Response to the Methodological and Ontological Problems**

Just as scholars at the Cambridge School of Economics (whose research has come to be identified as Cambridge Social Ontology[CSO]) have long raised questions about the methodology and ontology of economics in particular and social scientific disciplines more broadly (Faulkner, Pratten and Runde, 2017), so have the Legon (the University of Ghana, is also known as Legon on account of where it is

located in the capital of Ghana, Accra) Tradition of African Philosophy (TLTAP; hereafter Legon Tradition) and Legon School of International Relations (LSIR) deliberated on some of these same issues (Ajei, 2018; Tieku, 2021; Amoah, 2020). Kwame Gyekye, one of the key figures of the Legon Tradition, is at pains to point out, for example, that ideal social contract theories (Mills, 1997) “beloved of the seventeenth- and eighteenth- century European as well as contemporary American individualist political thinkers” which insist that “human beings are individuals, live prosocial lives, and require a contract—a social contract—as a basis for the formation of a real political community” (Gyekye, 1997, p.126) are problematic if not fantastical. Ajei (2015; 2019), another key thinker of the Legon Tradition who is seized with the same issues as Gyekye, describes the individuation of human rights which serves as the ontological core of contemporary African democratic politics as the “neoliberal seizure of the rights agenda” (2015, p. 17). This seizure in his view has meant that the focus on collective rights in the African Charter on Human and People’s Rights (ACHPR) is subsumed relative to the individual rights dominated International Bill of Human Rights (IBHR). To be sure, the IBHR cleverly avoids the endorsement of liberalism as its source but “its liberal orientation is easily intuited in the ubiquitous presence of paradigmatic terms of liberalism such as “freedom”, “liberty”, “equality”, and “reason”, and in the preponderance of the provisions affirming personal civil and political rights over those that espouse social and economic rights and duties” (Ajei, 2019, p.22). What has been the African response then to the ontology of the autonomous self-directed being to which contemporary dominant political and economic thought is so tightly wedded? I suggest that Gyekye’s moderate communitarianism theory (Gyekye, 1997) provides one of the most compelling and plausible African responses. Initially framed to provide an ontological basis for his political philosophy and ethic of human dignity, I argue that it has purchase for setting economic policy in Africa on fresh far more desirable ontological footings. Gyekye’s moderate communitarianism holds that by nature human beings are simultaneously both social and individual beings. This suggests a relational ontology by which “dependence on social relations is essential for their individuality....without dissolving this individuality in a communal pool of norms and beliefs” (Ajei, 2019, p.24). In this rendering of a relational ontology, the individual is called upon to be a necessary part of building the common good which defines her and is understood to mean the social context for the flourishing of the individual. The common good is thus not merely a volitional concern derived from the exercise of individual rights but on the contrary is tied to the very definition of what at all it means to be human (Wiredu, 1996). In rather sharp contrast to Gyekye’s relational ontology, the Rawlsian (2005) and Millian (1987) conception of the human being in which society is not logically co-constitutive draws out the implication that sociality has purchase and commands attention if at all so long as it augments her individuality. In the light of Africa’s COVID-19 vulnerabilities, I am arguing that this relational ontology must commend itself as a critical foundational basis for economic policy thinking and making in Africa given that on the ontological turns so much. What will be the value then of such an exercise? I discuss briefly three of these below.

I will use the case of Ghana to flesh out my first value which is essentially the need for a methodological re-orientation because as Lawson noted and aptly “method matters” (Lawson 2009, p.759). The teaching and studying of economics at the University of Ghana is a pertinent illustrative case here given that this university has “influenced university development all over the continent” (Kimble, 1969, p.713). Indeed, the Department of Economics was set-up in the same year as the University College of the Gold Coast (as Legon was then known) was established and the teaching of the subject took off in earnest in the 1949-1950 academic year (Kimble, 1969, p.713). In a major work (Agyei-Mensah, Oduro and Ayee, 2014), Ghanaian scholars teaching economics lead one into the ontological mooring of the discipline where “at the level of microeconomics students are introduced to the workings of the market based on assumption of rationality of the consumer and the firm. While the consumer is assumed to aim at maximizing satisfaction, the firm operates on the assumption of profit maximization. The invisible hand within the classical framework is argued to allocate resources efficiently, suggesting irrelevance of any external intervention in the market” (Boakye-Yiadom, Baah-Boateng and Oduro

2014, p.135; italics mine). On the back of this rational atomistic agent, the teaching of economics at the University of Ghana is heavily mathematized which these Legon academics bemoan even if rather coyly: “Undoubtedly, the introduction of high level quantitative techniques in economics has become a controversial issue. The insistence on ever higher levels of mathematics in economics has actually led to shallower understanding of basic economic processes...” (Boakye-Yiadom, Baah-Boateng and Oduro, 2014, pp.139-140).

This mathematical-deductivism has also become the staple of economic policy formation in Ghana where modelling at the behest of the Bretton Woods institutions has become the norm. An engagement with a top bureaucrat on this subject matter revealed how through the IMF, Ghana’s Ministry of Finance officials have been exposed and are expected to master one of the key models of the IMF, Financial Programming and Policies (FPP) Model. My research for this work reveals that the FPP is actually part of a staple of courses from the introductory to advanced levels-and heavy on econometrics- that the IMF expect bureaucrats engaged in economic policy analysis in developing and other member countries to be conversant with. On the website for these courses, the IMF states that they are “designed to equip officials with the ability to interpret macroeconomic developments using various techniques and apply analysis to policy formation and forecasting” (The International Monetary Fund, 2022). If the Gyekye relational ontology is to be taken seriously, it should suggest a methodology that need not privilege the mathematical as the only means for making sense of economic phenomena. Indeed, the Gyekye relational ontology forces upon Africa a social framework for economic policy analysis (Lawson, 2009; Alves and Ingrid Kvangraven, 2020). This social framework then brings me to my second value which is a realistic not idealistic (which models engender) approach to African economies. A realistic rendering of African economies should take into far more serious consideration than currently pertains the ways in which aggregate social categories such as race, class, gender and labour impact and are impacted upon by power and even spatial relations within the underlying and existent socio-economic and cultural matrix at both local and international levels and what all that means for truly affecting real lives. This realistic rendering therefore tries to understand the economy in terms of its sociality marked by mechanisms, structures and practises rather than by means and simplistically of reified models that sit on computer hard drives. If real lives matter, we are confronted with my third value which is the necessary ethical concern of economics and which the Gyekye relational ontology is insistent on. This social approach to economics is not one in which the economist can be easily likened to Duflo’s (2017) plumber<sup>1</sup> who is simply a technician and thus detached and not bothered in the least by ethical concerns. In this ethical construal those engaged with the economy will not just utilize their models (their plumbing tools for that matter) and fold their arms; they will be forced to ask themselves whether they have done their duty to the community and, even more salient, whether they have earned the right to become human beings at all. I claim that such an ethical orientation would have pre-empted the acute shortage of public goods and services in Africa that has been painfully revealed during the pandemic and exposed the continent’s vulnerabilities.

## **7. Conclusion**

This work has argued that the COVID-19 pandemic exposed in particular the vulnerabilities of African societies and economies. These vulnerabilities were embodied in the absence and inadequacy of

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<sup>1</sup> One may even question whether this plumber analogy is apt. Certainly the plumber will want her work to be deemed good if she wants to keep getting deals. The plumber should also be concerned about the impact of her work on others. The plumber may therefore not be an entirely unethical being.

public goods and services across African countries. These vulnerabilities were traced to the ontological and methodological problems that were claimed to inhere in the theory and practice of modern economics in Africa especially its neoliberal version which has become *de rigueur* and championed actively by the Bretton Woods institutions. These problems have long been debated in the West going back over a hundred years and captured tersely in the *methodenstreit* between Carl Menger and Gustav Schmoller (Louzek, 2011; Nardinelli and Meiners, 1988) and still very much alive. Africa needs to begin in earnest its *methodenstreit* (battle of methodology) on economic policy drawing on some of the ideas of its best thinkers which Gyekye's work on relational ontology best exemplifies. Applied to economics it opens up new possibilities for methodology as well as ontology that will direct the discipline more towards the real everyday lives of Africans and weaken the grip of cold numbers which has proved incapable of providing Africa's critically needed public goods and services. The COVID-19 pandemic and the existential threat it posed especially to Africa provides a unique long awaited opportunity to confront the crisis in Africa's economic policy making once and for all.

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# Degrowth: Implications for the Left

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## Abstract

The degrowth movement sets a number of fundamental challenges for traditional left theory and practice. This article argues that when the magnitude of the present sustainability situation is understood it is evident that various core goals and strategies of the Socialist left are mistaken. Global per capita consumption of resources now far exceeds levels that could be sustained or spread to all people. This means that there is a need for large scale degrowth down to lifestyles and systems associated with far lower levels. It is argued that this can only be done via transition to some kind of radically simpler way, which is at variance with the traditional Socialist vision of post-capitalist society, especially with respect to the role of the state and the achievement of high “living standards”. In addition it is argued that the taken for granted state-centred Socialist transition strategy is no longer appropriate. The grounds for these conclusions indicate that the degrowth project needs to be conceived in Anarchist not Socialist terms. The difference is not trivial.

## Introduction.

The emergence of the Degrowth movement over the last three decades has been remarkable. Since Georgescu-Roegen (1975, Messier 2016) questioned the wisdom of economic growth little attention had been given to the issue. The Ehrlichs’ book Population Resources and Environment (1972) considered problems being created by high throughput consumer societies, and the publication of The Limits to Growth by Meadows et al. in 1972 had a significant impact, but both were confined to discussing the effects and viability of growth as distinct from calling for its cessation or reversal. The book Abandon Affluence (Trainer, 1985) focused on the way the pursuit of growth generates all the major global problems and on the need to transition to some kind of Simpler Way, but it received no significant attention. Hamilton’s Affluenza (2005) was more successful, as was Herman Daly’s case for a steady-state economy, (1980) but the few related works in the years to about 1995 had little effect on the taken for granted desirability of growth.

The term “degrowth” began to appear in the 1990s and since then the topic has received accelerating interest, accompanied by a surge in publications, conferences and recognition by official institutions. The movement is now extremely diverse, including strands focused on for instance trade reform, tax reform, housing justice, alternative currencies, inequality, colonialism, patriarch, and racism. Many of the projects and campaigns that have flocked to be under the umbrella actually have little or nothing to do with degrowth or could be achieved without any reduction in the amount of producing and consuming going on, which is the essential and defining element in the concept of degrowth. A more appropriate label might be the “Finally fed up with capitalism” movement. This somewhat chaotic

diversity is welcome as it reflects the rapidly increasing discontent and recognition that capitalism is the basic cause of the deteriorating global predicament.

There is now a strand in the literature which is explicitly Marxist/Socialist. It is diverse, including for instance tendencies to Ecomodernist and “Green Growth”, and therefore no neat and unified conception of the “Left” will be assumed here. The concern will only be with major strands to be found within left literature. Much of it does not go far beyond pointing out that the problems being discussed are due to capitalism, and claiming that the solution has to be some kind of Socialism.

The following argument confronts the Socialist camp with the claim that its ideas on both the goals of and the means to the required degrowth revolution are fundamentally mistaken. It is agreed that Socialists get the primary goal right, which is the elimination of capitalism, but their vision of the alternative kind of society required is seriously mistaken, as is their taken-for-granted transition strategy.

These claims derive from the understanding of the historically unique an alarming global predicament or polly-crisis that has emerged in recent decades. The following outline of this situation is the essential prerequisite for the critique of most left thinking.

### **1. The Sustainability Predicament.**

The now abundant literature on the “limits to growth” and “Planetary Boundaries” has established that global and especially rich world rates of production and consumption are now far beyond levels that are sustainable. Per capita levels are many times those that can be kept up indefinitely or could be generalized to all the world’s people. (Trainer 2021.) For instance the World Wildlife Fund’s “Footprint” measure (2022) indicates that the amount of productive land required to meet the demand of the average Australian is around 6-7 ha. This means that if the 10 billion people likely by 2050 rose to Australian “living standards” we would need possibly 70 billion ha. But the planet has only about 12 billion ha of productive land, so if one-third of it was to be left for nature the per capita amount available would average only 0.8 ha. In other words, Australians today are using approaching 9 times the per capita amounts that would be available to all in 2050.

The Footprint measure takes into account only a limited number of factors. A full accounting of the sustainability overshoot would reveal a much higher multiple than is indicated above. The Planetary Boundaries approach identifies limits in 9 realms and states that sustainable limits have already been exceeded in 6 of them. In addition to those boundaries is the fact that almost all global resource sources are depleting. Mineral ore grades are falling, water resources are increasingly scarce, most fisheries are over fished, forests are diminishing, agricultural soils are being lost or damaged causing concerns about global food supply. Biodiversity loss is rapid and due primarily to loss of habitat, a consequence of economic growth. These rates of depletion are unsustainable and will cause serious problems within decades.

And then there is the climate crisis. There is now no possibility of limiting temperature rise to 1.5 degrees. The rate of transition to renewable energy sources is a small proportion of what would be required, and there is a strong case that renewables cannot sustain energy-intensive societies. (See below.) Emissions continue to rise and the present global trajectory is to a rise of over 3 degrees. Global energy supply seems to be peaking while the energy cost of supplying it continues to rise. Again these factors show that gross overshoot is evident and the answer must be reduction in demand.

Finally, rich world affluence is built on large scale exploitative resource extraction from poor countries, estimated by Hickel to be worth a net annual flow of \$2.5 trillion (2021), not including the environmental damage and low wages and social disruption left in poor countries. The global capitalist economy inevitably generates this outcome. Again, the situation cannot be remedied without vast degrowth in rich countries.

Too few realise the magnitude of the sustainability and injustice predicament set by these figures. The argument below is that solutions cannot be achieved by action on the supply side; that is by attempting to find more resources or reduce impact to meet existing demand within the existing system. The overshoot is far too great now. Sustainability can only be achieved by enormous and radical transition to a very different social form, primarily defined in terms of simplicity.

Against this case it is commonly argued that growth of GDP can continue because it can be “decoupled” from resource demand and environmental impact. This claim is contradicted by recent studies, including the lengthy reviews by Hickel and Kallis (2019), Parrique et al., (2019) (300 studies reviewed), and Haberl et al. (2020) (800 studies considered.) These find that except in limited areas absolute decoupling is not occurring and is highly unlikely to do so in future. (TSW 2024a.) In fact, Lenzen et al. (2022) and Zheng et al. (2018) find that far from decreasing in relation to economic growth, when measured in PPP global mineral demand is increasing at almost two times the GDP growth rate.

Some within and without the Marxist camp understand how this rules out “Green Growth” salvation for capitalism, and “Promethian” visions for “communism”. (Roos and Hornborg 2024, Kruger 2024.)

The Simpler Way perspective (TSW. 2020) derives implications of this case which would seem to be undeniable. It recognises that the solution to the sustainability crisis must involve transition to lifestyles and systems that enable a high quality of life for all on far lower rates of per capita resource throughput than is typical of rich countries today. This means there must be a substantial degrowth transition to a very different kind of social system. Its fundamental principles must be, most people living in small, highly self-sufficient, self-governing and cooperative communities, in control of their local zero-growth and needs-based economies which are not driven by profit or market forces, and in which people are willing to live very frugally, unconcerned with acquisitive values. (For the detail see TSW 2024b, and the Pigface Point video, 2023.) The chances of this vision being realised in the near future are obviously remote but the question is, given the magnitude of the limits to growth predicament, can there be any other ultimate goal?

A brief indication of the causal rationale for asserting the necessity for this social form needs to be indicated here. The required settlements involve smallness of scale, proximity of functions and integration of functions. The significance of these elements is illustrated by a study of egg supply (Trainer, Malik and Lenzen 2019) which compared the dollar and energy costs of eggs supplied by the conventional industrial path with those associated with eggs produced in backyards and village cooperatives. The figures for the former were around 50 to 200 times those of the latter.

The supermarket egg involves a vast and complex global input supply chain involving agribusiness, fishing fleets, shipping and trucking transport, warehousing, chemicals, infrastructures, supermarkets, storage, packaging, marketing, finance and advertising and insurance industries, waste removal and dumping, computers, a commuting workforce, OH&S provisions, and highly trained technicians. It also involves damage to ecosystems, especially via carbon emissions and agribusiness effects including the non-return of nutrients to soils.

However eggs supplied via backyards or integrated village cooperatives can avoid almost all of these costs, while enabling immediate use of all “wastes” and providing other collateral benefits. Recycling of kitchen and garden scraps along with free ranging can meet most poultry nutrient needs. Animal manures, including human, can be directly fed into nearby compost heaps, methane digesters, and algae ponds, thereby eliminating the need for sewers or for inputs to village food production from the fertilizer industry. Little in the way of transport of inputs, products or workers is necessary. Care and maintenance of systems can be largely informal, via committees, working bees and spontaneous discussion and action. In addition, cooperative care of animals adds to amenity and leisure resources and facilitates community bonding.

Similar reductions through localisation can be established in many other domains, including other food items, dwelling construction, clothing supply, welfare, educational and other services, and especially in provision for leisure and entertainment. In coming years resource scarcity will probably enforce severe degrowth to these kinds of localised economies driven by needs as distinct from market forces or profits.

Trainer (2024) derives detailed figures for the very low overall dollar and energy costs achievable via systems of this kind. These align with those found for the Dancing Rabbit Ecovillage in Missouri (Lockyer 2017), which are in the region of 5-10% of US national averages. Further documentation is provided in the video by Trainer (2023.)

These new ways need not involve any reduction in socially useful R and D, sophisticated technology, modern medicine, universities, health care etc. There will still be a need for some (much reduced) “state-level” agencies, for instance to coordinate national railway, legal and communications systems, but the right decisions for very large numbers of small towns cannot be made by centralised states. (For a lengthy discussion of the alternative see further below, and TSW [The Alternative](#). 2024b.)

Kruger (2024) notes the rejection by some on the left of engaging in speculation about the nature of post capitalist society. The foregoing outline of the global predicament shows that this is essential.

## **2. Implications for the Left.**

This Simpler Way vision has profound implications for Left theory and practice. It determines that in general the Socialist perspective is mistaken. It is correct regarding the need to replace capitalism but its traditional views on the nature of post-revolutionary society and the strategy for achieving it can now be seen to be inappropriate.

Throughout the history of Socialism it made sense for revolutionary effort to be directed to taking power from the ruling class and then running the productive apparatus for the benefit of the people. That meant that “taking the state” was the supreme goal, enabling implementation of alternative structures and systems.

Firstly, consider the traditional Socialist goal of lifting people to higher “living standards”. This strong “productivist” or “Promethian” strand in Socialism has recently led some to argue strenuously for the “eco-modernist” quest for “fully automated luxury communism”. (Phillips 2012. See also Scharzer 2012 and Bastini 2019.) This vision would have considerable difficulty dealing with the above case regarding limits.

Some recent “Eco-socialists” recognise that in view of resource scarcity and ecological impacts a satisfactory post-capitalist society would have to reduce consumption but none of the following theorists come to terms with the magnitude of the reductions required that was explained above: Albert on “Parecon” (2003), Kovel (2007), Lowy (2015), Bellamy-Foster (2011), Sarkar (1999), Vettise and Pendergrass (2022), and Smith (2016). Nor does the account of “Inclusive Democracy”, (1997) put forward by Fotopoulos recognise it. If the magnitude of the overshoot is as great as was argued above it is obvious that the revolutionary goal cannot be anything like “normal” rich word “living standards” and ways. Indeed they must be reduced to a small fraction of those ways. There is little or no recognition in the Socialist literature that the good society cannot be an affluent society. (The Eco-socialist Nayer is unusual in recognising this; 2021.) A Socialism which maintained commitment to economic growth and high “living standards” would still accelerate us towards ecological collapse.

Secondly, the core assumption in most Socialist thinking about post-capitalist society is that it would be highly centralised. It is taken for granted that the state has to be the dominant element in society. But the Simpler Way communities described above cannot be run from the centre. This is not primarily due to the logistical impossibility of state bureaucracies making the right decisions for enormous numbers of small communities. Crucial for satisfactory local economies and polities must be thinking, discussion, planning, decision making, implementation and monitoring by conscientious citizens within highly participatory and consensus-seeking arrangements in all of the local communities. Their members are the only ones who understand the local ecological and social conditions, what is needed and what will work. The (small, remnant) “state” can only be a facilitating agency under the control of federated towns and regions. Many present state functions will no longer be necessary and most decision making will have been devolved down to the local level. (See further below.)

The small communities would be highly autonomous but would still function within national guidelines and laws. Some centralised procedures would be needed to monitor, administer and coordinate (e.g., railways, legal and communications systems), but the eventual goal would be to shift legislative power regarding even national issues down to the local assemblies.

Possibly the most important oversight in Marxist and current Socialist thinking is the underestimation of the significance of culture. The focus has been on economics and power but the ultimate prerequisites for transition to a satisfactory post-affluence society are to do with the ideas, values and dispositions held by ordinary people. The characteristics that are crucial for the communities under discussion can only emerge from specific local grass-roots conditions and experience and cannot be given, taught, imposed or enforced by the state no matter how powerful or benign it is.

It can be argued that Marx’s greatest mistake was his failure to grasp the significance of culture. He gave little attention to the importance of ideas, values and dispositions for the nature of the good society or for the strategy for achieving it. The revolution only required of working class mentality that workers become united against the ruling class. Avineri (1968) points out that they would still hold ideas and values to do with competition, work discipline, individualism and acquisitiveness, and still be willing to work for a boss in alienating conditions. It was assumed that these elements would be gradually remedied in the long post-revolutionary transition from Socialism to Communism.

However the advent of the era of limits and scarcity has fundamentally changed the situation. Given the above account of the global predicament, the required new society cannot be achieved unless there is first a profound cultural revolution establishing radically different understandings, values and dispositions in at least among large numbers of ordinary people.

This reflects the fundamental difference between Marx and Proudhon. Their serious conflict was over Proudhon's rejection of centralisation. Proudhon believed people had the capacity to work out and manage mutually beneficial arrangements. This implicitly assumes that they can come to hold the necessary ideas and values to enable Anarchist ways. As Avineri makes clear, "Marxists", especially Lenin, believed in the need for strong "leadership" to generate revolutionary force. It was difficult enough to get the working class to turn against capitalism (i.e., to become a "class for itself"), let alone to be capable of the mutualism, collectivism and responsibility Proudhon saw that Anarchism would require. But now the situation is different. When the localised social form required is understood it is evident that it cannot be run by authoritarian centralism, ruthless or friendly, and success will depend on the extent to which people have adopted the alternative Anarchist vision and culture.

When a society is made up by a state which rules from the centre and citizens who obey its edicts, there is at best an impoverished social ecology that is largely irrelevant to their life experience. The village puts a rich social ecology between the two, and that is where most governing takes place and where quality of life and economic fates are determined.

Socialists in general and Marx in particular have failed to recognise the significance of "social ecology" (...where the term is not defined as Bookchin uses it, which only stands for a more harmonious relationship between humans and the environment.) Here the term refers to the vast number of complex relations, structures and interactions in a society that are similar to the web of ecological relations in a biological system. These kinds of relations determine and constitute the form, functioning and health of a rainforest and of a society. No one rules a robust rainforest; its nature, health and trajectory is determined by the interactions between its components.

Marx's account of Communism could be said to have failed to recognise society. It took for granted that the state would run post-revolutionary Socialism, then fade away, without much if any indication of what would then be the nature of the social ecology that the resulting Communism would involve.

To put it bluntly, the socialist seems to think society is not important; all that matters is the state, since it is to do all the ruling. The role of the citizen is to obey its edicts. But if the solution to the global predicament must be driven by self-governing communities of conscientious, responsible, aware and cooperative citizens then the situation is utterly different because the nature and viability of the village will depend predominantly on its social ecology.

### **3. Strategy.**

It should be evident that the advent of the limits to growth predicament makes this revolution unlike any previous one. The foregoing discussion shows that its goals contradict some core assumptions taken for granted by socialists. The following argument is that it also rules out Socialist strategy.

The main strand in most if not all Socialist revolutionary strategy has been essentially, "...take state power." (This is the at least implicit goal in for instance Koch's 2022a discussion of strategy, in Gramsci 1999, Bourdieu 2015 and Poulantzas 1978.) That might have been the appropriate overriding concern in earlier times, but it is not now. It would not be possible for the state to run vast numbers of self-sufficient settlements, and more importantly it could not establish them in the first place. They could only be established and run by people with the intention and wisdom to do so. They can only emerge from lived experience at the grassroots level whereby people learn from the conditions they are living in that the new ways are essential. They must be motivated by intrinsic, willingly-accepted new ideas, values and dispositions. Governments cannot create or impose these cultural elements. Thus profound

cultural change must gain great momentum long before capitalism can be swept aside. Kropotkin and Tolstoy understood this. (Marshall 1992, p. 372.)

Thus, Socialists greatly overestimate the power of the state for the purposes of the kind of revolution shown to be needed by the Simpler Way perspective. They argue that being in control of the state would enable implementation of the new ways, but those ways could not be implemented unless the radically new culture had first come into existence. The Socialist would argue that Socialist control of the state would enable the state to facilitate the cultural transition. But this would be feasible only if those in control of the state had previously come to hold the new world view, and that could not be the case unless the government had been elected by citizens who had come to hold that world view long before the election. Again, this shows that the cultural revolution has to come first and therefore that it is a serious mistake to prioritise taking state power.

Clearly the cultural change would be the real revolution, enabling probably smooth change in social structures, power, functioning etc. The left in general has failed to appreciate this, although Gramsci's discussion of hegemony and the "integral state" could be said to have moved somewhat in the desired direction. (D'Alisa and Kallis 2020 recognise this, but see Trainer 2024.)

It can be argued that prioritising the taking of state power was appropriate for the Bolsheviks, but their goals were not to do with achieving the kind of cultural change crucial for this revolution. It is of course important to work for the eventual election of a government with the alternative perspective and purposes but that would require a long effort to build the necessary vision in electors. If this succeeded to the point where the right kind of party was elected, the revolution would have already been won. The essence of this revolution is the cultural change, and if that is achieved then the taking of state power and the structural changes which that enables will best be seen as consequences of the revolution.

It follows that the focus for revolutionary effort at present has to be simply on attempting to develop the crucial ideas, values and dispositions in as many people as possible. The focus should not at this point in time be on attempting to change government or policies, let alone trying to take state power. The appropriate maxim might be "Ignore capitalism to death", given that it would now seem to be well along the path to self-destruction. In the article "On degrowth strategy" Trainer (2024) applies the label "Turning away" to the approach being taken by literally millions in tribal and peasant societies, especially in Latin America. (Barkin and Sanchez, 2019.). The Zapatistas for instance are not interested in taking state power; they are ignoring the state and its conception of "development", except to defend against it, and focusing on building their own radically alternative ways. This spirit is evident in the Campesino, Satyagraha, Ubuntu, Chikukwa, Rojavan Kurd, Catalan and Andean peasant movements. It is also the spirit evident in some rich world ecovillage and Transition Towns initiatives. It has been supported at the theoretical level for some time. (See Appfel-Marglin, 1998, p. 39, Relocalise, 2009, Mies and Shiva, 1993, Benholdt-Thompson and Mies, 1999, Korten, 1999, p. 262, Rude, 1998, p. 53, and Quinn, 1999, pp. 95, 137.)

Central in this approach is "prefiguring", that is, building here and now some of the institutions and practices that will be the norm in the new society the revolution is intended to establish. Socialists are strongly inclined to see this as a mistake on the grounds that it is not only no threat to capitalism, it defuses discontent. But the intent should not be primarily to gradually replace the existing system by establishing more and more community gardens and swap shops, it should be to raise awareness of alternative ways and the need to transition to them. The gardens should be conceived primarily as "educational" institutions, with display boards, handouts, and dioramas showing how the town or suburb could eventually be restructured, and it should have participants eager to explain The Simpler

Way perspective to visitors. Of course there are also many other ways of raising public awareness of the need to reject the dominant paradigm and of increasing awareness of viable and attractive alternatives.

It is distressing that a great deal of the effort within the Degrowth movement is not being focused on the awareness raising task. Lengthy and turgid academic analyses, detailed utopian visions and time-consuming debates within the camp abound. Much of this makes no contribution to the revolution. The main thing that we can do so at this point in time is increasing the number of people who understand a) that consumer capitalism must be scrapped and b) that there is a satisfactory alternative. Most regrettable is the eco-village movement. It is in the best position to show the kind of settlements that towns could transition to, and to explain their significance for saving the planet, but its information does not make this clear. The eco-village can seem to be merely a pleasant lifestyle option for a few.

#### **4. Some other brief criticisms of standard Marxist/Socialist transition theory.**

One is the notion that capitalism must mature and be swept away before the new society can be built. Some Marxists, such as Warren (1973) have sought to hold back revolutionary initiatives for this reason. However, it is not obvious that the system has to reach any particular condition today before it makes sense to work to undermine its legitimacy. The emergence of the many peasant and tribal movements mentioned above seems to have taken place independently of any system-maturing process.

The standard Socialist view of transition assumes a marked temporal distinction and sequence between getting rid of the old system and building the new one. The process assumed above does not involve such a separation, and it does not assume that the scrapping of the old system is a step that has to be taken prior to or separately from building the new one.

The left has a fundamental faith in the importance and the role of the working class in the revolution. However there are a number of reasons why it is not likely to lead the coming revolution. Unfortunately the traditional class interests of workers in capitalist society do not align well with The Simpler Way. Workers are vitally dependent on jobs and wages and thus on the “health” of the economy. They are for better work conditions, bigger pay packets enabling increased consumption, more jobs and production, more foreign investment and trade, a greater role for the state in running things, redistribution of wealth and provision of better “welfare” by the state. In general, the working class is strongly in favour of economic growth.

This revolution is not just or primarily about liberating the worker from capitalism and it is not going to be led by workers. It is about liberating all people from consumer-capitalist society and it will be carried out, if it succeeds, by people of all kinds as they shift to the alternative ideas and ways. All people will be the revolutionary agents through their participation in and control of the development of the emerging new self-governing local communities.

As has been argued, it is a mistake to focus on explicitly fighting against capitalism or trying to take state power... at this point in time. Hence a major tactical principle would seem to be, “Do not confront capitalism.” This contradicts the Socialist’s fundamental assumption that we must get rid of the old before the new can be built, on the rubble. This again is due to the historically unique situation we have entered. It presents us with the need for a basically non-confrontational strategy, one that involves turning away and “ignoring capitalism to death.” (This does not deny the need to confront over specific threats, such as climate action or a decision to log a forest.)

The Socialist left is strongly inclined to argue that that if alternative initiatives begin to threaten capitalism they will be crushed. But in an era of deteriorating resource availability and increasing disorder it is not obvious that ruling elites will find it easy to do this. Armies and police forces require a lot of oil. It will not be a matter of turning the police and army on rioting workers but of preventing large numbers of people in scattered towns and suburbs from boycotting the market and organizing their own cooperative gardens, committees and working bees.

## 5. What then is the answer?

If Socialism is not the answer, what is? The answer is Anarchism. The above account of the form that a post-growth, post-capitalist sustainable and just society must take embodies Anarchist principles, structures, processes, values and transition strategies. Decision making and administration are devolved down to the lowest possible level. This is the Anarchist principle of “Subsidiarity”. Decision making is thoroughly participatory, via consideration of issues at the grass roots level and participation at town assemblies. Citizens are involved in informal discussion of issues seeking mutually beneficial solutions. Thus centralisation of power and bureaucracy is avoided and all are involved in system functioning and maintenance via town assemblies, committees and working bees. Citizens are responsible, equal, conscientious participants as distinct from being passive and governed recipients of edicts from rulers. That means there is equality of responsibility, power and respect. Above all, these procedures embodied the supreme Anarchist principle of avoiding the domination of some by others, even via elected representatives. We govern ourselves as equals concerned to maximise the welfare of all.

Bookchin (1980) stresses that this situation is “educative”, as was the case in ancient Greece. It involves individuals taking responsibility to contribute to their community’s welfare, to become informed and to think carefully about options, knowing that all will suffer if bad decisions are made. The mutual dependence on how well the town is running weighs against individualism and self-interest and for collectivist values. Quality of life depend on how well the town is functioning, not on individual wealth. The situation enables a sense of empowerment and pride in one’s town; people gain satisfaction from knowing that they are running an admirable society. It also generates social cohesion and solidarity. All are aware that one’s individual welfare depends primarily, not on one’s material wealth, but on how well the town and its gardens, committees, working bees and ecosystems are functioning. The dependence on local ecosystems creates “earth bonding”. Motivation is positive, not coerced; people turn up to working bees eagerly because these obviously benefit all the town’s people, as distinct from reluctantly paying their taxes, and working bees are enjoyable social gatherings.

These realisations and dispositions produce what the Anarchists label as “Spontaneity”. Many good things are done informally and quickly by citizens who see a leaking tap or an invasive weed or a sad face, as distinct from phoning some agency to fix it, or ignoring it. Thus the situation requires good citizenship, and rewards it. These ways manifest the principle of seeking consensus on mutually agreeable arrangements between equals.

What about the state? If all goes well, the gradual spread and power of local communities will take more and more functions away from the state, not by force but just by making their own arrangements for functions that the state can no longer perform, such as making sure there is no poverty or unemployment and that everyone has a respected livelihood. Some towns are already buying their hotel and making it into a community centre, some have set up their own schools and dementia care homes, some have set up their own electricity supply systems. They can establish their own

cooperative farms (... as agribusiness deteriorates many big farmers will have to sell land, due primarily to accelerating fuel and transport costs.) The Catalan Integral Cooperative (TSW 2023) is an impressive example of what is possible, having organised many of its own services including food production and distribution, an employment agency, medical facilities, educational activities, legal and financial services, premises for craft groups and firms. They refuse to have anything to do with the market or the state. In other cases councils and official bodies are assisting such ventures. All this will reduce the activity, relevance and power of the centre.

Meanwhile large numbers of communities will be putting pressure on the centre to adopt appropriate policies in those domains where it has capacity to gear resources to the welfare the towns. As the global economy deteriorates the state will be decreasingly able to meet needs or to resist pressure from the grass roots. The outcome to be worked for is a remnant administrative (not legislative) "state" that is little more than a bureaucracy coordinating national functions such as railways and telecommunications, with relatively little to do as most of the governing will be taking place in community assemblies. Above all, ideally the "state" will eventually have no power over us because all decisions from neighbourhood to national level will be made by town assemblies. This would be an elaboration of the processes whereby many towns at present decide budgets etc. via citizen juries etc.. Bookchin (1980) described the way this has been done in many localities, such as New England towns (...and in Medieval towns; see Kropotkin 1912.) The Swiss decide national issues in these kinds of ways. The vision therefore is that we will get the "state", not by taking and remaking it, but somewhat automatically in the process of taking control over our own local arrangements.

## **6. Clarifying some recent confusions.**

It is useful to briefly apply the foregoing perspective to some recent contributions on degrowth and the left.

The term "left" is of course highly ambiguous. It is usually applied to mainstream parties and factions inclined to increased state activity within the existing capitalist system, with no suggestion of any need for degrowth or replacing capitalism. (For example the Australian Labor Party, which never questions the commitment to growth.) The following comments refer to some recent discussions which mostly do focus on degrowth from a Socialist perspective.

Few have made greater contributions than Hickel or Kallis. (Hickel,2021, Hickel and Kallis, 2019). However some of their views have been somewhat questionable. Trainer (2020) notes Hickel's statement that reducing material throughput does not necessarily mean reducing GDP. The decoupling evidence indicates that any such suggestion should be avoided.

Like many others Hickel puts forward his particular conception of degrowth and gives the impression that this defines what it is, when there are many other conceptions. The very different Simpler Way view is most evident with respect to Third World "development". Hickel's recommendations are for little more than fairer trade and investment deals for poor countries, facilitating better outcomes within a more or less existing global economy. However from the Simpler Way perspective development must be conceived in terms of highly self-sufficient cooperative and frugal villages with minimal connections to the global system. (Trainer 2023.)

Schwartzman (2022) provides an example of the common EcoSocialist technical optimism, centred on the potential of renewable energy, and failing to recognise the magnitude of the overshoot documented above. He assumes/asserts that a rational new economy would have plenty of resources to enable

sustainable economic growth. No significant case is given for this statement of faith nor for the assumption that renewable energy can make it achievable. He proceeds as if the carbon/energy problem is the only or core problem, whereas the above outline of the poly-crisis predicament shows that there are many other elements. Abundant renewable energy would make little difference to biodiversity loss, declining ore grades, forest loss, soil deterioration etc.

The superficiality of Schwartzman's analysis is illustrated by his claim that, "...renewable energy supply can facilitate the virtual end of extractive mining by recycling and industrial ecologies." But recycling cannot provide constant supply. More importantly Schwartzman does not deal with the considerable literature on the difficulties and limits renewables involve. (For an Indication see Appendix.) Roos and Hornborg (2024) effectively challenge the historical readiness of the Marxist left to take such "Promethean approaches".

More disturbing is Schwartzman's acceptance of the common conventional critique that degrowth would mean reduction in the living standards of the poor. "Leading degrowthers advocate a global reduction in energy consumption, which is a prescription for mass death for most of humanity." This is an inexcusable erroneous statement, explicitly denied by degrowth advocates who typically stress global redistribution and prioritisation of the needs of the poor. (For instance Butler, 2022.)

Schwartzman's comments on this issue reveal acceptance of conventional "development" thinking. He sees the task as enabling poor countries to have a fair share of energy so that they can provide themselves with lifestyles and systems comparable to Italy today. There is no concept of any need to radically restructure settlement patterns, to localise economies, or to maximise self-sufficiency, let alone to achieve radical cultural transition.

These criticisms can also be levelled at Bellamy-Foster's general eco-Socialist perspective, which is not grounded on a satisfactory grasp of the global predicament. He sees "planning" as the core concern, with no conception of any reason to question centralised state control, or any need for radical simplicity.

Huber's book [Climate Change as Class War: Building Socialism on a Warming Planet](#), (2024), provides another example of Socialist thinking which is at variance with the above perspective. He identifies the climate problem as being due to the machinations of the capitalist class and argues for strategy led by working class opposition. The "...climate crisis is ... a class problem rooted in who owns, controls and profits from material production. As such, it will take a class struggle to solve." "Winning the climate struggle will need to be internationalist based on a form of planetary working class solidarity." This seems to be recycling standard Marxist doctrine.

Huber's basic mistake is in misconceiving the nature of the problem. He attributes it to the greed and power of the ruthless capitalist class. As a reviewer says, he is saying "...the carbon-intensive capitalist class must be confronted for producing climate change." But the problem is primarily due to the demand of the working class which in this society has no option but to consume large volumes of fossil fuelled energy, and it is due to an economic system which cannot function without the consumption of those volumes. It is also a mistake to blame the politicians opening new coal mines for their irresponsibility, stupidity and corruption. They have no choice but to keep the energy flowing and in a growth economy the rate of flow must constantly increase. Any failure to ensure this means electoral death. The blame should be on the unsustainable system, and all who have failed to question it for decades.

It follows that Huber's change strategy is also mistaken. He says "It is a class problem rooted in who owns, controls and profits from material production. As such, it will take a class struggle to solve." His core strategy is to propose a "...climate politics that appeals to the vast majority of society: the working class." Confidence in this strategy is not bolstered by statements such as, "Planetary working-class solidarity and the unionization of the energy industry will be the greatest tools in the climate movement." Workers "... can exert power at the point of electricity production."

Huber thus accepts the strategy common among Socialist and non-Socialist degrowthers; that is, call loudly for policy and structural change, assuming that eventually governments will respond. This is a fundamental mistake; governments will not and cannot adopt degrowth policies. They must deliver growth. That's all they understand and again their fate depends on whether they can do it. This does not mean that demanding degrowth is a waste of time, but it should be seen as an awareness raising project, not engaged in with any expectation of achieving policy change.

LaVinia and Busk (2024) rightly criticise Huber for opposing degrowth and class analysis, and prioritising the latter. Class analysis is indeed essential and so is degrowth, and there is no need for any contradiction. Unfortunately Kruger (2024) argues that the two are incompatible; "... a Marxist vision for a communist future is one motivated by freedom not degrowth". He insists that there is "... nothing to add to Marxism from degrowth." These are confused and unsatisfactory claims. "Freedom" can exist alongside degrowth but a sustainable and just society must embrace degrowth. More importantly, the foregoing argument has been that Marxism has failed to grasp the significance of the limits situation leading to seriously mistaken conclusions concerning goals and strategies.

To summarise re Huber, he is like many Socialists mistaken in thinking that in this revolution the working class will be the agent of change, class conflict will be the means of change, and the goal will be a society with lifestyles and systems more or less similar to existing rich world societies. He takes for granted Socialist centralization. More importantly, his analysis is like that of most Socialists in failing to build on an understanding of the global limits predicament and its implications, and therefore making no reference to any need for far simpler lifestyles and systems, localism, alternative grassroots initiatives etc. He advocates class struggle over and against calls for degrowth, and concludes that there is "... nothing to add to Marxism from degrowth." But the foregoing argument has been that attending to the degrowth arena is essential for clarifying the significance and role of Marxism in this revolution, and its deficiencies.

## **7. Conclusion.**

What will happen and what can or should we do? The coming global system mega breakdown will be decisive. It will be triggered by financial collapse, quickly followed by cascading terminations of banking, investment, trade, production, etc. and massive destruction of capital, firms, savings and welfare. (Trainer, 2020.) It could be game-ending for "civilisation". Everything depends on how widely the alternative vision has been spread before the time of great troubles impacts. It will force people to see that their governments are not going to provide for them and that they must strive to develop cooperative self-sufficient local alternative arrangements. Our task is not to try to persuade or force officialdom to change its ways, but to prepare for and facilitate localism by getting as many as possible to see that a) the system must be scrapped and b) a satisfactory alternative can be built.

In The Dawn of Everything Graeber and Wengrow (2021) lament the way Western "civilisation" has been stuck on the wrong path involving hierarchy, elites, class domination, tyrannical rulers, centralisation, and passive long-suffering masses being ruled and sent to war on the whims of kings

and governments. This has been our story for over 10,000 years. But the book discusses societies that have not made our mistake and have exhibited inspiring examples of non-hierarchical, equitable and participatory-democratic social arrangements. These cases show that we can get off the wrong path. Those working for transition to the alternative advocated above should recognise the immense historical significance of helping us to transition to the right path. The implications for left thinking about social goals and strategies are numerous and profound.

### **Appendix: A note on renewable energy.**

This note is only intended to indicate one line of inquiry which casts significant doubt on the affordability of 100% renewable supply systems. Trainer's recent study (2024) aligns with European studies of periods when solar and wind input a negligible amount, sometimes for several days in a row, referred to as "Dunkelflaute". (Ohlendorf and Shill (2020). Australian data reveal frequent short periods when combined solar and wind input are very low, around 5% or less of combined capacity. In these periods demand can be met only if there is an additional supply system capable of meeting total demand, such as batteries. When losses due to factors such as storage input-output, transmission, system O&M, and the immense embodied energy costs of equipment are added, the total cost would probably be several times the cost of wind plus solar generating capacity.

Electricity demand makes up only about 20% of total energy demand, the rest being in forms that are difficult to transform electricity into and are therefore energy-costly to carry out. Trainer concludes that even if 2/3 of this non-electrical demand could be met by renewables the total system cost would be an unaffordable proportion of GDP. (For a list of about 80 papers putting similar analyses see [EnergyCritiques.htm](#).)

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