

The Towering Problem of Externality-Denying Capitalism

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Illustrations by Matt Tweed

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After M.C. Escher

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1. Stepping Back

A major first response to our sustainability challenges has been to try and turn profit to more sustainable ends. Alas, even 'purposeful profit' seems unable to overcome the deeper momentum of what might be termed 'externality-denying capitalism' – 'externality-denying' in that billions of daily investment and consumption decisions ignore certain of their social and environmental consequences.

As just one example, the World Bank reports that less than 4 percent of global carbon emissions are currently priced at levels consistent with the Paris Agreement's temperature goals, endorsed by 194 nations.²⁵ Hence, hardly any of today's market transactions are *fully costed*, in terms of reflecting their contribution to climate change. The same neglect repeats to varying degrees for certain other environmental and social problems.

We don't call our predominant socio-economic system 'externality-denying capitalism', but possibly we should, to constantly remind ourselves of what we are doing.

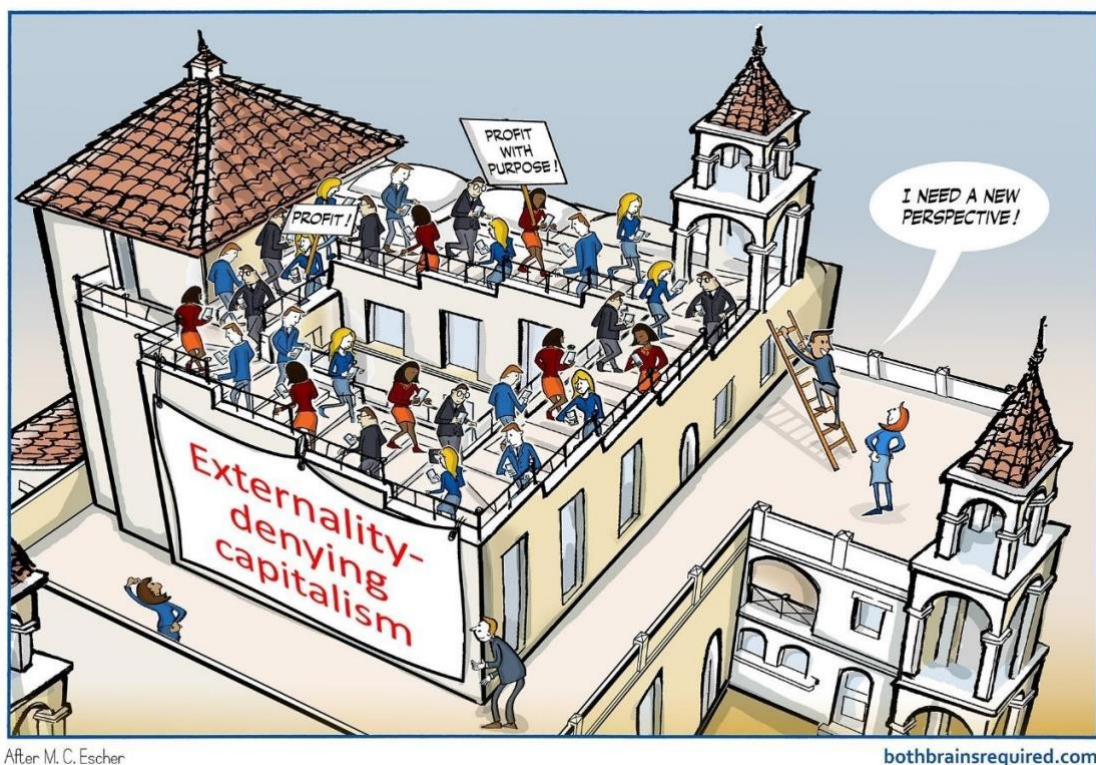


Figure 1

Caught in this embracing dynamic, first-response market-led sustainability strategies – such as socially responsible investing (SRI), corporate social responsibility (CSR), and an environmental, social and governance (ESG) movement – are showing signs of exhaustion. While these strategies have helpfully accelerated awareness of sustainability challenges and have catalysed fresh innovation paths and business models, they are being overpowered by the externality-denying capitalism that remains the larger force shaping our social and natural worlds. Hence, there is a pressing need to step out of the day-to-day frame to appraise this bigger system (Figure 1).

²⁵ World Bank, *State and Trends of Carbon Pricing 2022* (Washington, DC: World Bank, 24 May 2022). <https://doi.org/10.1596/978-1-4648-1895-0>, page 9

In part, we have arrived at externality-denying capitalism – read, consequence-denying capitalism – because it has been rationalized by an externality-downplaying economics discipline (Figure 2). Economics has had a theory of externalities for over a century, but a concept that should have been central to the subject was fatefully marginalized – and not for particularly good reasons.

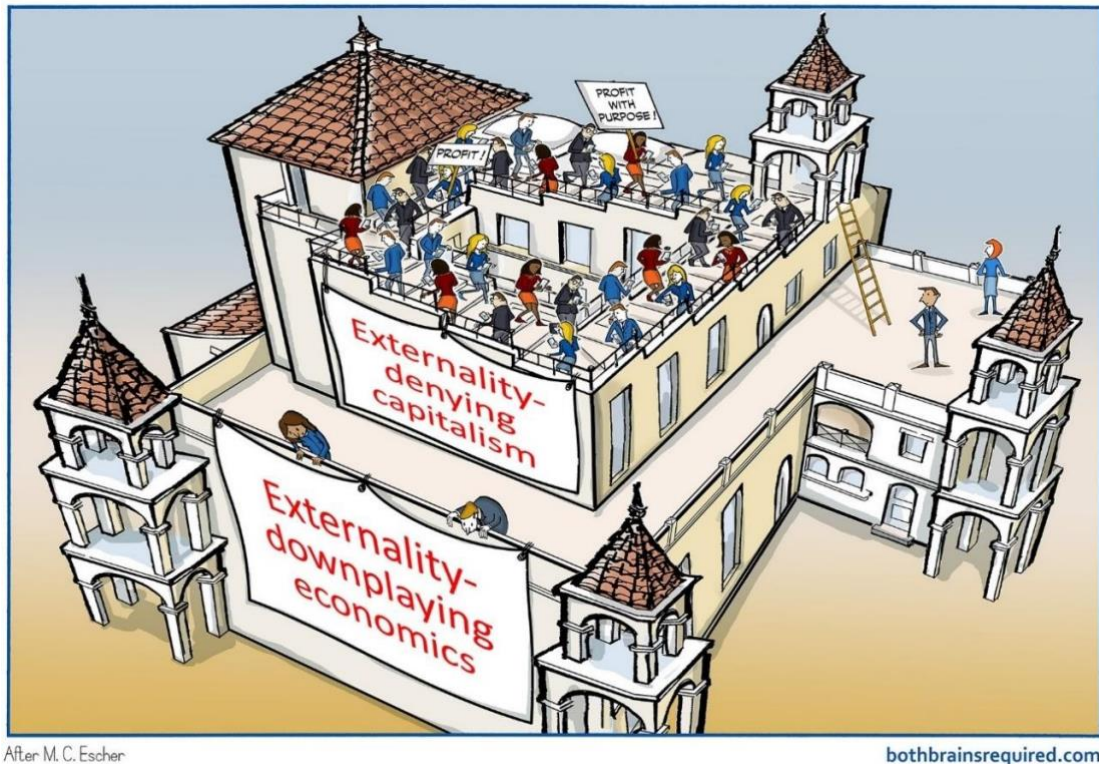


Figure 2

There has been a general attitude that external costs might be small, or that positive and negative externalities might roughly cancel out to leave market signals as a still reliable guide for economic decisions. (Unfortunately, there is an important asymmetry: positive externalities are ‘free good things’, of which you can never have too much, while negative externalities may accumulate to have system-breaking consequences).

Above all, 20th Century economists’ craving for elegant mathematical models, for which externalities were a complication too far, encouraged a view of externalities as the negligible residuals of an all-encompassing efficient market system. (See Postscript for more details).

However, externalities can no longer be dismissed as negligible market failures when they are becoming *the main event!* Economics’ – and now society’s – markets-first, world-second perspective is no longer credible – no longer *sustainable*.

Externality-downplaying economics promotes various ideas – ‘trickle-down’, ‘rising tide lifts all boats’, ‘win-win’, ‘green growth’ etc. – that are all variants of the same basic attitude: whatever the problem, more growth is surely the answer (Figure 3).

But if the measurement of growth is externality-denying, then the growth that is meant to solve problems may simply create more of those problems along the way. Externality-denying growth may *rebound* or *backfire* to become not the solution but the driver of various social and environmental harms.



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Figure 3

2. Technical intermission

(a) Kuznets Curves

Economics' story – a hypothesis not a law – that 'growth is always the solution' is expressed in the (social) Kuznets Curve and a related Environmental Kuznets Curve (EKC, shown in Figure 4). The inverted U-shaped curves hypothesize that while economic growth may initially increase social inequalities or environmental damages, more growth 'bends the curve' to solve the problems. The moral of the hypothesis: 'stay the course, growth will save the day'.

The Environmental Kuznets Curve (EKC)

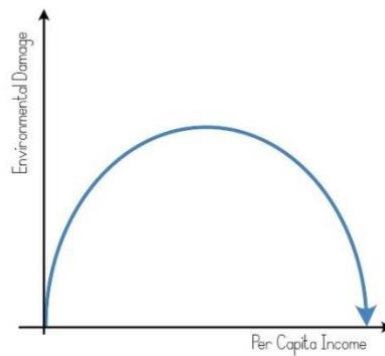


Figure 4

Certain anecdotes and intuitions support the idea – it takes a wealthy country to invent solar panels, say – but the key question is whether the curve for the relevant system can bend back down far enough and fast enough.

Critically, the EKC does not envisage biophysical 'tipping points' – thresholds which, if crossed, may set in motion natural dynamics that become impossible to slow or reverse even if the triggering human activities are subsequently halted. The possibility of tipping points or thresholds requires adding a horizontal line to a Kuznets Curve diagram, which has profound implications.

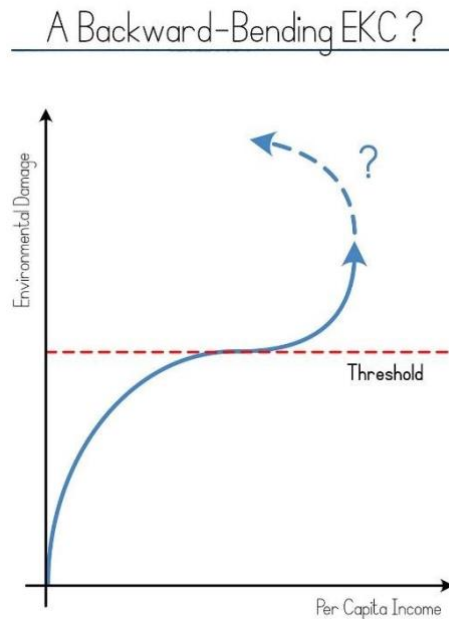


Figure 5

If the natural world contains irreversible biophysical tipping points to which our measures of ‘economic growth’ are blind, our pursuit of that growth may lead us to breach thresholds that trigger ecological breakdown beyond any ability to remedy or reverse subsequently. How wealthy we were all going to be becomes a moot point. Indeed, it is quite possible that ecological damage beyond irreversible thresholds not only slows economic growth but reverses it if the environmental damage erodes economic foundations. In such a case, the EKC becomes backward-bending (Figure 5).

(While the tipping points for ecological issues are strictly matters of biophysics, for social issues they can be thought of as fuzzier lines of how much inequality and injustice can be tolerated before a society ‘snaps’ or breaks down. Social lines are defined not just by measures of relative income, say, but also by our ever-evolving sense of what is fair and how far ‘society’ extends).

Why does the horizontal red line matter? Today, climate scientists and ecologists are increasingly pointing out – and the public is only slowly recognizing – that the critical feature of climate change and biodiversity problems is that they are characterized by tipping points.

The significance of tipping points has been surfacing with a lag through the deliberative IPCC process, but the growing recognition that tipping points pose greater risks at lower temperatures than first thought is one of the major conclusions of the last twenty years of climate science research:

“[Two decades ago,] ‘large-scale discontinuities’ in the climate system were considered likely only if global warming exceeded 5°C above pre-industrial levels. Information summarized in the two most recent IPCC Special Reports (published in 2018 and 2019) suggests that tipping points could be exceeded even between 1°C and 2°C of warming.”²⁶

²⁶ Timothy Lenton and others, ‘Climate tipping points – too risky to bet against’, *Nature*, Vol. 575, Issue 7784, pp. 592-595, <https://doi.org/10.1038/d41586-019-03595-0>

Even with the IPCC now identifying 15 significant tipping elements in the 2021 Sixth Assessment Report, an August 2022 review in the Proceedings of the National Academy of Sciences (PNAS) argued the consequences of tipping points still remain “dangerously unexplored”:

“There are feedbacks in the carbon cycle and potential tipping points that could generate high GHG concentrations that are **often missing from models**. Examples include Arctic permafrost thawing that releases methane and CO₂, carbon loss due to intense droughts and fires in the Amazon, and the apparent slowing of dampening feedbacks such as natural carbon sink capacity. These are likely to not be proportional to warming, as is sometimes assumed. **Instead, abrupt and/or irreversible changes may be triggered at a temperature threshold**. Such changes are evident in Earth’s geological record, and their impacts cascaded across the coupled climate–ecological–social system.”²⁷ (emphasis added)

Summarizing the latest information, a September 2022 *Science* article identified that with global temperatures now ~1.1°C above pre-industrial levels we are already in range of five globally significant tipping points, including the collapse of the Greenland and West Antarctic ice sheets, expected to be triggered at 1.5°C of warming.²⁸

The PNAS review also highlighted:

“Particularly worrying is a ‘tipping cascade’ in which multiple tipping elements interact in such a way that tipping one threshold increases the likelihood of tipping another.”²⁹

In a tipping cascade, as each threshold is breached the EKC is deflected upwards to become progressively steeper (Figure 6). (The EKC does not have a time axis, but a cascade would likely exhibit a temporal acceleration of damage, too).

²⁷ Luke Kemp and others, ‘Climate Endgame: Exploring Catastrophic Climate Change Scenarios’, *Proceedings of the National Academy of Sciences*, 119.34 (2022), e2108146119 <https://doi.org/10.1073/pnas.2108146119>

²⁸ David I. Armstrong McKay and others, ‘Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points’, *Science*, 377.6611 (2022), eabn7950 <https://doi.org/10.1126/science.abn7950>

²⁹ Kemp and others.

EKC and a 'Tipping Cascade' Effect

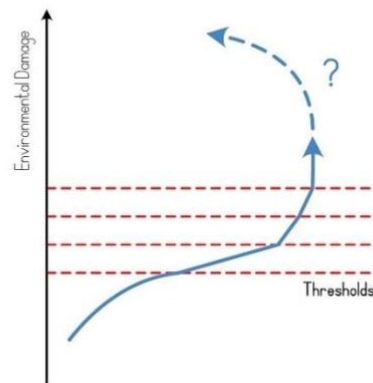


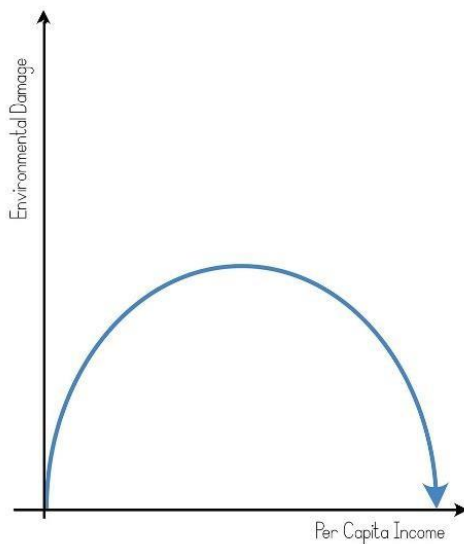
Figure 6

Figure 7 illustrates the two fundamentally contrasting perspectives – threshold-denying and threshold-aware – that represent the core difference between ‘economic’ and ‘ecological’ perceptions of the world. ‘Which of the two worlds do you see?’ is becoming the Rorschach test of our times. The reader may want to reflect on not just *which* perspective accords more strongly with their intuition but also *why* they may intuit one graph as truer than another. What educational, professional, and cultural experiences have shaped their views on the matter? And what influences were those influences drawing on?

The Growth Debate in One Chart

Which world do you see?

Growth fixes problems...



...or growth is the problem?

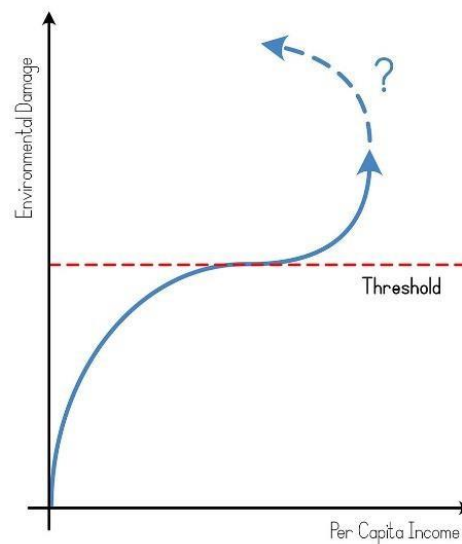


Figure 7

The Kuznets Curves are hypotheses and the time-honoured way to test hypotheses is via experiment. It is an empirical matter whether various social and environmental Kuznets Curves have been or will continue to be true. The data to inspect are measures of social inequality and global environmental health.

Of interest, Simon Kuznets had reservations about the validity of the (social) curve he hypothesized (the environmental version was formulated after his death). Kuznets suggested the US patterns of the 1950s and 1960s, which inspired the idea, might just prove to be an exceptional period of falling inequality. Indeed, were he alive to review the last 50 years of US data, he would probably hypothesize the exact opposite relationship to the one he did.³⁰

Unfortunately, for climate change we are the experiment, and the experiment is global and ongoing. There is nowhere to stand that is not part of the experiment.

Figure 8 shows the latest global EKC for climate change, plotting per capita income against global average temperature that is the proximate driver for tipping points scientists are most focused on. The dotted lines represent central estimates of the temperature levels at which key global tipping points are thought to lie, though at ~1.1°C, we are already in the forecast range of some tipping points (e.g., the estimated temperature at which the Greenland ice sheet will collapse is between 0.8°C and 3.0°C above pre-industrial levels).³¹

³⁰ See, e.g., page 229 of the World Inequality Report, 2022; Lucas Chancel and others, *World Inequality Report 2022* (World Inequality Lab, 2021) <<https://wir2022.wid.world/download/>>.

³¹ Global per capita income from World Bank Open Data website measured in constant 2015\$. Global average temperature data from NOAA National Centers for Environmental Information, expressed as degrees Celsius above 1881-1900 average. Tipping point lines are median estimates for selected tipping points from Armstrong McKay and others, Science 2022 (see above).

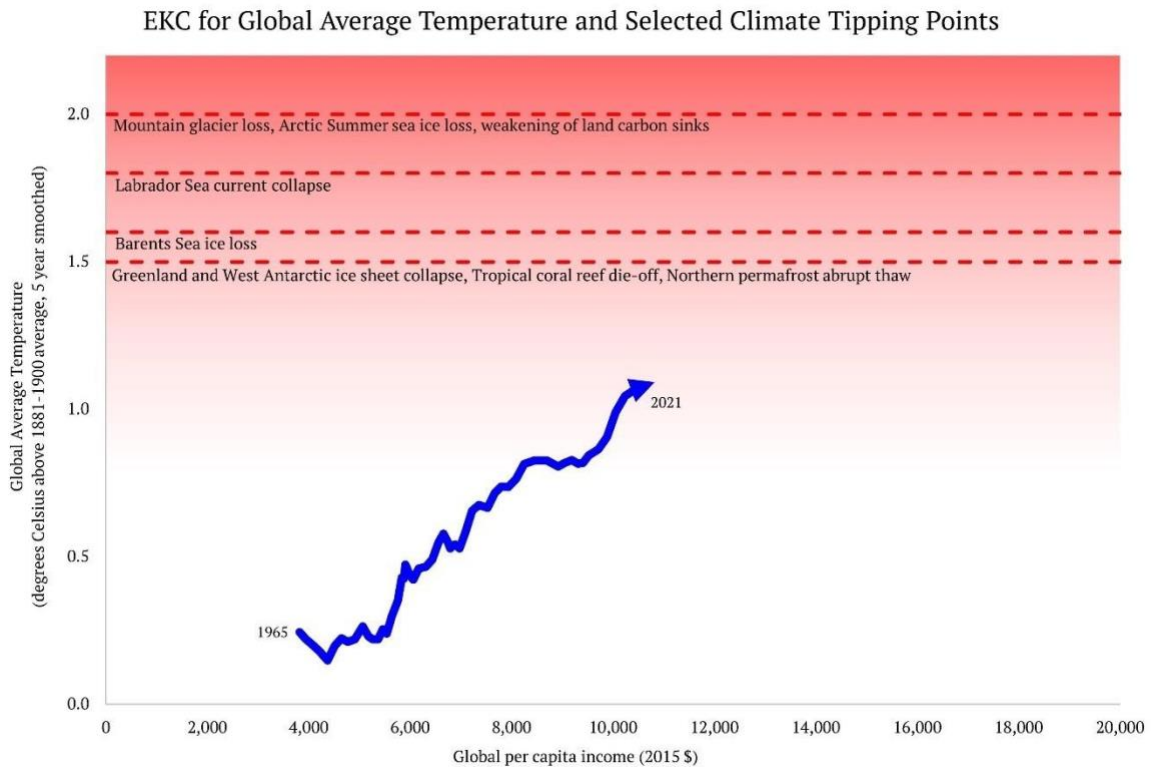


Figure 8

It is critical to remember that the proximate driver of climate damages is *global temperature* not *national GHG emissions*. There has been some recent enthusiasm that several high-income countries have been able to *begin* to bend down their EKC curves of *national emissions* from high initial per capita levels – also known as ‘decoupling’ of emissions. Of course, reduction of absolute emissions is exactly what is needed, but there is a clear danger that a ‘decoupling of emissions’ narrative, based on moderate reductions in atypical countries, invites complacency that global economic growth is imminently about to bend down the *global temperature* curve. It is the need to bend the *global temperature* curve quickly down that lies behind the urgent call for much stiffer ‘net zero’- and ‘zero’ type emissions reductions strategies, for which several countries reporting decoupling of *emissions* is only the first small step in what is a race against time. Too much enthusiasm for moderate and piecemeal decoupling risks defusing the sense of urgency.

(b) Kuznets Curves and Externalities

How do the Kuznets curves link to externalities?

What determines how fast a Kuznets curve can bend down, if at all, is the degree to which the ‘downward’ force – the solutions of market-led growth – can overpower the ‘upward’ force – the damaging consequences of the growth. In other words, externality-denying capitalism is a dynamic system consisting of positive and negative forces in tension – a pattern systems thinkers recognize as a ‘fix that fails’ dynamic (Figure 9).

The 'Fix that Fails' Dynamic of a Market System

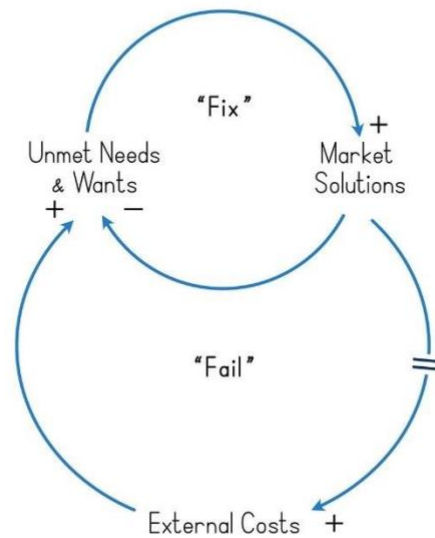


Figure 9

The 'fix that fails' systems archetype is usually drawn as a 'fat 8'. In this case, the top loop illustrates that market solutions are often a good 'fix' for 'unmet needs and wants'. However, the bottom loop reflects that the 'fixing' of market activities may also trigger adverse consequences – the 'fails' of externalities – that prompt new needs and wants (e.g., less polluted air, restored landscapes, a stable climate etc.). Importantly, the lower 'fail' loop often arises or is recognized with a lag (the '=' sign indicates delay).

Hence, a market system is a dynamic system in which a 'fixing' market is in a continual contest against the 'failures' of external costs spun off by the market. As such, two contrasting scenarios are possible (Figure 10). If the 'fixing' is a stronger force than the 'failing', then the Kuznets curve will beneficially bend down because growth fixes problems fast enough. On the other hand, if the 'fixing' is a weaker force than the 'failing', the Kuznets curve will continue upwards, potentially breaching irreversible thresholds.

Market 'Fix' and 'Fail' Loops and the Environmental Kuznets Curve

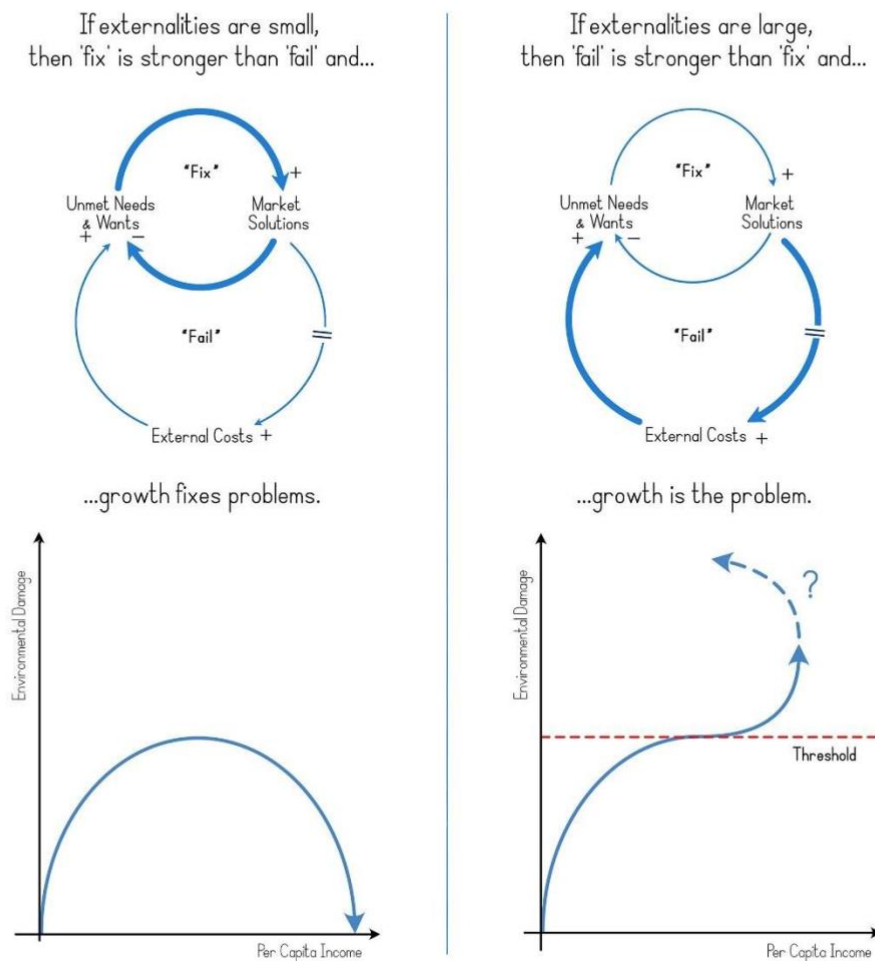


Figure 10

Thus, whether a market system can avoid potentially catastrophic runaway or overshoot behaviour depends on the degree to which human market participants are conscious of – and have accepted – the harms associated with market growth and taken adequate steps to prevent them. The more that markets fail to recognize external costs, the more likely it is that a market system will lead its human participants to breach important thresholds and trigger irreversible consequences.

For any living system, from a small organism to complex human society, to avoid runaway or overshoot ecological events, it must be able to regulate its behaviour to the surrounding environment. Yet, as systems thinker Stafford Beer emphasized:

“We cannot regulate our interaction with any aspect of reality that our model of reality does not include.”

A market system is essentially a large, shared ‘model’ that coordinates human behaviour by organizing information about parts of the world and attaching differential ‘values’ to possible choices, which then

guide our actions. In turn, a market-led culture is one that self-organizes predominantly to follow the signals of the market model over alternative models of behaviour upheld by other cultural systems and traditions. The stewards of a market-led culture may frequently opine that 'the market is always right.'

But, if markets have large externalities, *the market system is not a good model of reality* and granting it too much authority in its externality-denying state invites social and environmental dysregulation and runaway. If we submit too much to the signals of externality-denying markets, we cannot regulate our behaviour to important aspects of reality that may be existential in nature.

To avert that outcome, externalities can be recognized, either by explicit pricing (e.g. taxes, fees, etc.) or by various regulatory or policy actions that place an implicit 'price' on harmful behaviours. A legal or cultural prohibition, for example, is the equivalent of placing an infinite price on a certain activity. In both cases, the market calculus must now work around an identified 'scarcity' rather than assume certain inputs or waste sinks are 'free to use', as is the default otherwise. A 'pricing' action, in its various forms, is the process by which markets become 'aware' of a scarcity.

Personally, I find a metaphor helpful to grasp all this. Essentially, a fixing Invisible Hand is connected to a failing Unmentionable Foot (Figure 11).



Figure 11

The correspondence to the earlier discussion is indicated by the arrows in Figure 12. (Ecological and social fail loops have been split for artistic purposes, but there exist many interactions between them).

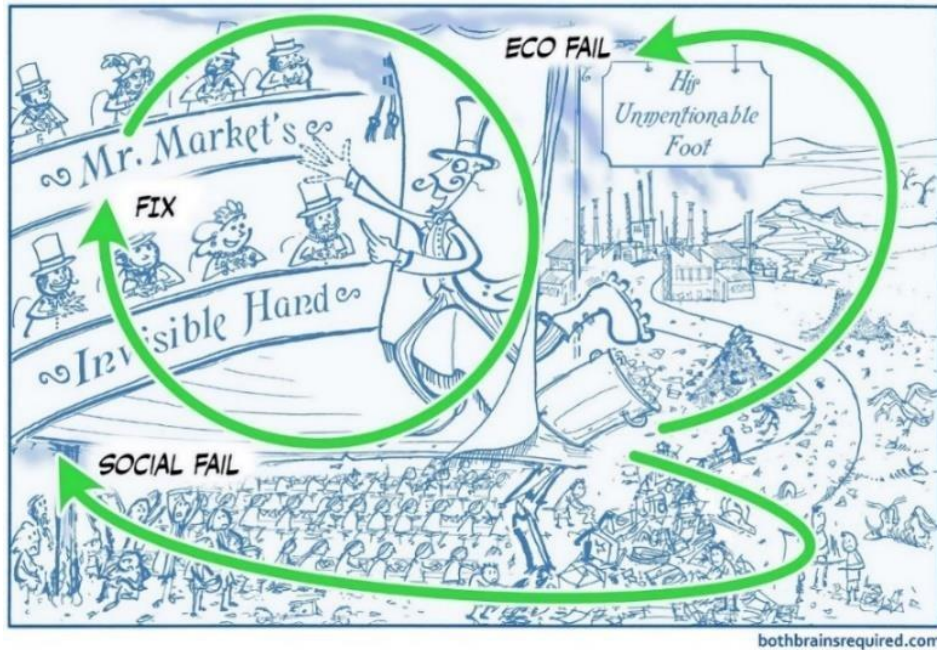


Figure 12

Again, it is an empirical matter whether the Hand is stronger than the Foot, or vice-versa. Unfortunately, various environmental and social trajectories indicate that the Foot is now overpowering the Hand in important ways. Note that the situation is not that markets are outright 'good' or 'bad' – as polarizing capitalism-versus-socialism debates so often quickly descend to – but rather how helpful or harmful current markets are based on how well they reflect known reality.

A critical factor in evaluating the relative strength of the Hand and the Foot is how broadly one chooses to look. If the world becomes 'smaller' because population grows and communications technologies connect everyone so that we become more aware of inequalities, and if the world becomes 'smarter' so that we identify hard-to-discern trends of climate change and biodiversity decline, the damages of the Foot become more visible than they were, *and ever harder to unseen*.

Alas, a market-led culture exhibits blinkered vision in that its decision-making is directed overwhelmingly by what markets 'see', i.e., what is priced. This vision may be 'sticky' or slow to perceive and integrate new realities. Effectively, Mr. Market suffers from *hemianopsia* – a loss of vision in half of the visual field. In Mr. Market's case, he can see what is priced *but nothing else exists* (Figure 13).



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Figure 13

To try and overcome this problem, one of the 'first response' strategies of the sustainability movement has been to push for measurement and disclosure of what Mr. Market cannot see – to spotlight what markets miss (Figure 14).



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Figure 14

However, this strategy is flagging, because it has not (yet) led to the 'pricing' or regulating of the spotlighted externalities, and so this new information remains largely outside the market realm of 'real' prices and costs which continue to be privileged. While some companies and investors attend seriously to the new social and environmental information, *at the level of the whole system* this information has not achieved decision-making equivalence with financial information, so those that choose to ignore the

new information can avail themselves of opportunities left behind by those who deem it important. Moreover, in the crucible of making difficult career- or business-protecting decisions, new social and environmental information may not even have full equivalence in the companies and portfolios that profess to take it seriously.

'What gets measured gets managed' was the idea, but that is not a law of the universe, only a management consulting slogan of dubious validity. Instead, we often measure things to disclose them in supplementary tables to not really have to manage them. Unfortunately, 'measuring and disclosing to avoid really managing' seems to have caught on. We are still a long way from having an integrated decision-making vision which weighs the damages of the Foot and benefits of the Hand on truly equal terms, and which would constitute an expansion of our integrated consciousness (Figure 15).



Figure 15

The Kuznets Curve hypothesises, then, are how economics strives to maintain self-coherence on the issue of growth on a finite planet. The appealing 'bend' of the curves sanctions the ongoing use of externality-denying economic and financial metrics, because even if relying on those flawed metrics creates harms along the way, the growth they facilitate can supposedly clean it all up before it is too late.

However, to assume Kuznets curves will always bend down away from tipping points is to take a leap of faith that reveals economics is just as much a faith-based system of thought as other systems that declare themselves so. To live in modern society is to be a member of the church of externality-denying growth, though you may never have been formally asked or told. Faith-based systems generally announce themselves with a portal – a church door, say – or a ritual message of welcome that alerts people to the fact they are entering a faith-based frame but, to paraphrase Ursula K Le Guin, we live *in* externality-denying capitalism, so there is no warning for the unsuspecting or unreflecting.

3. The Tower of Externality-Denying Capitalism

It gets (meta) worse. One might hope that rising awareness of the innately physical problems of climate change and biodiversity would prompt a re-grounding impulse, but exactly the opposite dynamic seems to be playing out in the continued momentum behind virtualization.



Figure 16

Externality-denying capitalism is fundamentally a phenomenon of *abstraction* (from Latin: ‘drawing away’ or ‘detaching’). We lift selected parts of the world via ‘commodification’ so that we can combine and allocate those parts into new configurations that, by our estimation, are more ‘valuable’ than how the parts were distributed before. We value a car more than the initially widely-dispersed molecules that were consumed or assembled to produce it.

However, of necessity, these acts of ‘value creation’ are also acts of ‘value destruction’ as potentially critical social and natural patterns are compromised. In only keeping proper tabs on the ‘creation’ side of the ledger, we inexorably disembody economic and financial ‘value’ from a richer social and biophysical reality. This impulse to keep on abstracting and virtualizing – to keep *drawing away* from reality – continues apace, from derivatives markets to Bitcoin to virtual worlds. We are constructing a virtual exchangeable part-world in which critical connecting relationships – social and natural – are severed and left behind to wither.

Perhaps it is logically consistent that externality-denying capitalism should spawn reality-denying business models, but it feels like we are approaching the terminal stages of what the ‘logic’ can support. Indeed, we seem to have reached the reality-denying stage of capitalism. It is, of course, a delusion because even the latest and greatest virtualizations must have a tether back to the material and energy foundations upon which they entirely depend. Virtual reality goggles – the epitomising product of externality-denying capitalism – need plastic and electricity to conjure their illusions.

In a sense, we find ourselves atop a high tower. Certain cognitive and behavioural developments of different vintages have proved mutually reinforcing in erecting the perch we are upon. A 'Western' mindset has paired with extractive behaviours of Western countries and empires that promoted and exported externality-denying capitalism. The cognitive and behavioural are two faces of the same tower (Figure 17).



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Figure 17

Cognitively, the abstraction that is modern economics is a continuation of the peculiar, biased perspective that took hold at the dawn of the Scientific Revolution in which quantitative ways of knowing the world were granted fateful primacy over qualitative ways of knowing – an intellectual development that has culminated in economics' eagerness to mathematize social and natural relationships. (See Postscript for more on this long-term and critical cognitive development).

Behaviourally, while 'externality-denial' is not unique to capitalism, capitalism happens to be the widely embraced vehicle by which externality-denial has achieved today's global scale and threatening pace. (Other externality-denying systems had flaws that prevented them from reaching global scale). For many countries in the Global South, disproportionately on the receiving end of this global cost-shunting system, the experience is that of 'neocolonialism' – a continuation of extractive colonial patterns by new, market-led, means. Similarly, from an environmental perspective, capitalism is proving not to be the efficient ideal of economic theory, so much as the most efficient way we have yet discovered to mine, harvest and pollute Nature beyond its capacity to absorb and regenerate.

An excessively abstract approach to the world has licensed large-scale extractive behaviour, which has generated material spoils that reward the abstract thinking and encourage more of it... creating a runaway feedback loop. The mutual reinforcement of how we behave and how we have chosen to know (epistemology) is central:

"Epistemological error is all right, it's fine, up to the point at which you create around yourself a universe in which that error becomes immanent in monstrous changes of the universe that you have created and now try to live in." (Gregory Bateson)

4. If Market 'Fixes' are Failing, We Must Fix Markets

Alas, sustainability appears to be a much bigger project of 'unlearning' than many are yet reconciled to. Urgent re-grounding would seem to be the order of the day. It is not enough to aim for a 'sustainable economy', but rather we need a sustainable culture that has an economy, rooted in a more sustainable shared cognition of the world.

One critical intervention point is now 'cultural' – or *extra*-market – decisions *about* the markets we have rather than continuing to hope that markets as currently constituted can deliver enough change, fast enough. If market fixes are failing, among other measures we need to fix markets.

This is not straightforward. A curious but critical aspect of our current predicament is that the practice of externality-denying capitalism for several decades has produced a surrounding culture whose norms, institutions and power relationships prevent the internalization of externalities that is capitalism's own proposed remedy for externalities!

The notion, for example, that we might follow the prescriptions of economics textbooks and levy meaningful taxes on carbon emissions is widely held to be 'impractical'. Perversely, 'capitalism', the idea, has become 'externality-denying capitalism' in practice, has begotten an 'externality-denying culture' that cannot repair itself, because the remedies proposed by its own rationalizing science – 'economics' – are deemed 'not practical'! Ideologies that beget cultures that cannot implement their very own theories of self-repair are not self-coherent *in practice* and risk dysregulating and even collapsing as complete systems (Figure 18).

For want of alternative, 'growth' becomes the only 'practical' solution, uniting almost all political parties, but only exacerbating problems if the growth is externality-denying. Hence, the degrowth agenda is

radical in the true sense of the term – it dares challenge the *root* problem that superficially opposed parties are all agreed upon (even if the implied ‘degrowth forever’ does not seem quite right).

We have reached the bizarre point where societies built around a professed enthusiasm for markets find they cannot implement the policy and regulatory changes required for markets to address our largest problems. It is critical to remember that the theoretical superiority of markets as allocative mechanisms rests on *all costs being recognized*, implying all financial statements are *fully costed*. According to market logic, if a project’s – or business’s or investment’s – revenues exceed costs, it is profitable and so ‘good’ to do. But if a project is not fully costed, we can have no assurance of the equivalence of ‘profit’ and ‘good’, which is the cornerstone premise of a market-led culture. If financial statements are not fully costed, some portion of economic growth and profit just comes from running down valuable resources not recognized by markets because earlier generations did not comprehend the value of those resources. In such circumstances, it is not clear whether we want more or less of what we are measuring as ‘growth’ and ‘profit’.

In essence, we are not only not stewarding the planet well, but we are also not stewarding the market system well. A basic stewarding duty of market-favouring societies must be to internalize externalities that become known on their watch. It is the fate of current generations that large and global externalities have been identified on our watch.

As such, a society that enjoys the freedoms and genuine innovative and allocative possibilities of markets must periodically ‘true up’ its market model to realities that become known to its human participants but have not yet been communicated to Mr. Market. With less than 4 percent of global carbon adequately priced, Mr. Market has no real inkling of the climate crisis because it has not been communicated to him in the language he understands. It might help to tell him – by ‘pricing’ carbon so he comes to know of the problem. Certainly, he is likely to respond badly on hearing the news – and might angrily ask why he was not told earlier! – but immediately thereafter, he will prove to be of almost incomparable assistance.

Of course, it’s the telling him that is difficult. While markets can easily and autonomously sniff out new revenue streams, the crystallization of new costs to true up a market system to reality can only be achieved via extra-market regulatory or policy interventions. The latter are difficult to implement because they can be portrayed and resisted as arbitrary interventions in otherwise ‘efficient’ and ‘free’ markets. But this misses that the seeming precision of today’s market values is entirely founded on the no less arbitrary patterns of existing property rights and regulations established by prior generations based on their earlier understanding of reality and scarcity. It is to mistake an incumbent model for an accurate model, in the context of ever-changing human comprehension of reality.

However, the difficulty of introducing new costs is very real, so induces the widespread sense that ‘it’s not practical’ – a refrain that becomes a self-reinforcing belief the more it is voiced. Yet, it is probably behind the door marked ‘not practical’ that genuine sustainability solutions now lie. The sooner we self-organize to open that door, the better.

Ah, but now we are finally getting towards the heart of it, for the stubborn force holding the door in place is nothing other than greed – from individual to species-wide. The real barrier to ‘truing up’ markets is that it requires reconciling ourselves to real costs, past and present, that may be painful to accept and share. In many respects it has been the function of externality-denying capitalism to shield us from this difficult reality.



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Figure 18

The exonerating story economics offered was that the pursuit of greed was socially acceptable because the Invisible Hand could grasp the expressions of self-interest made in the marketplace and transmute them into the best possible outcome for humankind. This was the counter-intuitive possibility that de Mandeville and Smith glimpsed in the 18th Century, but from qualified beginnings the Hand has acquired mythical status, gradually being elevated from a beneficial Invisible Hand to an Infallible Hand – able to turn *all* greed into good. This was the transformation of the Hand facilitated by mathematical economics through the 20th Century, for in eliminating externalities from their models because the maths was too complex, the Hand was recast as all powerful. The Foot was unmodelable, the market ‘fail’ loop could not be represented, and so an unblemished Hand emerged. Economists at their blackboards may have understood the limitations of what they were doing, but their models were seized upon by certain political opportunists and brought to real life.

Yet, if markets are incomplete – if externalities exist – then markets do *not* capture and neutralize all the effects of greed, with the consequence that plenty of greed slips through the Hand’s grasp and behaves like, well, plain old greed with excesses that dysregulate social relations and undermine ecological systems.

Morally, the elevation of the Invisible Hand to status of near Infallible Hand has been nothing less than the culture-scale sanctioning of selfishness and deshaming of greed in the belief-cum-hope that the Hand can soak it all up and smooth things out. This has been deeply systemized and normalized, inducing the runaway dynamics we now face. But if a culture has venerated the Hand too much for too long, its counterbalancing institutions and traditions will have diminished. It may even feel uncomfortable to express the view that greed is the root problem for there will be a ‘common sense’ that we have outgrown such old-fashioned ideas. Greed had been discovered to be good, no?

The words of Gus Speth crystallize the innately moral dimension of the moment:

“I used to think the top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that with 30 years of good science we could address those problems. But I was wrong. The top environmental problems are selfishness, greed and apathy...and to deal with those we need a spiritual and cultural transformation.”

Sustainability is a profoundly cultural issue – a moral challenge before it is a market opportunity. Moreover, the continued insistence that sustainability *be* a market opportunity looks increasingly like the effort to fend off acceptance of the moral obligation. The sustainability problem is not ‘out there’, it is ‘in us’ and in our systems, made by humans and alterable by humans.

Postscript: Western Science’s Neglect of Quality and Meaning

Quality-disavowing science (see Figures 17 and 18)? A bit cryptic, but a rough overview for those interested:

A major impetus behind the emergence of externality-denying capitalism was the yearning of 20th Century economists to be taken seriously as ‘scientists’ of equal prestige and forecasting-power as physicists. Economics’ craving for its own ‘Nobel Prize’ was a marker of the aspiration.

To achieve scientific credibility, economists felt compelled to communicate in maths, but the mathematical techniques of the time were too limited to do justice to the complex reality of societies dependent on natural systems, even as maths was sufficiently well advanced to handle physics’ less

complex problems. (Yes, physics is complicated but is helped enormously by studying only 'dead' things).

Nonetheless, the compulsion of economists to craft elegant mathematical models led to the fateful development of growth theories in which growth was delinked from natural foundations and of 'complete market' theories that denied the possibility of markets causing external damages. While at some level economists understood these were just theories, the models nonetheless took hold – and were opportunistically seized upon – as 'good enough' depictions of reality with which to run nations.

In turn, the belief that mathematics was the route to credibility reflects the yet earlier development in which 'science' was profoundly shaped by Galileo and others to include only what could be measured – so-called primary properties (weight, length etc.) not secondary properties (taste, smell, appearance etc.). Science became a quantitative method to understand the world, in which there was no room for qualities. That was a fine assumption to get classical physics up and running, but a very restrictive assumption for living systems. Unfortunately, the early breakthroughs in the 'hard sciences' of physics and chemistry etc., were so stunning and beneficial, the inadvertent meta-conclusion of the Western Enlightenment was that all investigations of the world should proceed in a similarly quantitative fashion. Of all the disciplines that then strove to be social 'sciences', economics drank the quantitative Kool-Aid most deeply.

Unfortunately, living systems also derive 'meaning' from the world by recognizing and responding to patterns (qualities). We humans know that we navigate the world by responding to what is beautiful or ugly, delicious or disgusting, painful or soothing. These are all qualities based on pattern recognition. Critically, all living things are engaged in pattern recognition even if dimmer and less sophisticated than what we do – or, in many cases, more advanced. Hence, to eliminate pattern recognition from explanations of the living world is a massively limiting step. Not only does it 'deaden' and diminish the human view of Nature – in contrast to pre-Scientific Enlightenment traditions which intuit Nature as living and deeply connected – but a quantitative view of the world eventually loops back to dehumanize us in the conception of a *Homo Economicus* ideal around which we fashion a socio-economic system, and which we then must try to live up to simply to get along. In following quantitative reductionism to its logical conclusion, we have unwittingly ended up 'reducing' ourselves.

The eclipse of quality in favour of quantity shows up in many ways. One major consequence is the term 'capitalism' (from *capita* or 'head' of cattle, sheep etc. = 'counting-ism') whose *sine qua non* technology is the *accounting* statement and which propels the urge to quantify everything ('human capital', 'social capital', 'knowledge capital', 'natural capital' etc., little of which is convincingly quantifiable).

Another repercussion is the ascendancy of quantitative disciplines, i.e., STEM, over disciplines that transmit knowledge through patterns, such as literature, humanities, and the arts – the latter, of course, further penalized for enriching their students in ways that are less quantifiable...! We have inserted a quantitative filter between ourselves and the world, leading us to count our way back from the world and each other. We are in a quantitative doom loop.

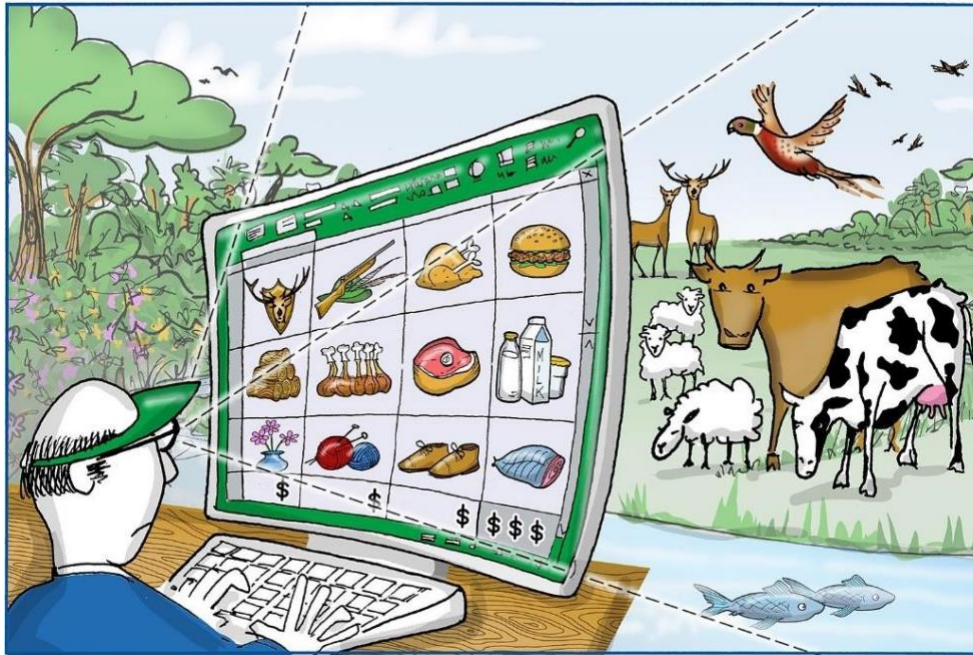


Figure 19

That's why biologists like Brian Goodwin argued that we need to develop a 'science of qualities' to complement the 'science of quantities' we have had (which raises questions about what then to do with the word 'science' given its deeply quantitative heritage). Ultimately, the question is not 'how enlightened are we?' but 'how are we enlightened?' - and how not? Fittingly, the latter are qualitative questions, not quantitative ones.

Ironically, as economists were racing down a mathematical dead end, physicists had already reversed course. Classical physics' initial productive dependency on quantification did not survive the discovery of quantum physics. Quantum physics is baffling but one of its central problems is 'The Measurement Problem' (!), which forces a systemic, non-quantitative interpretation of how small particles behave.

Similarly, other social 'sciences' dabbled in quantification only to turn back. Sociology, for example, rushed to embrace 'social capital', out of the same credibility-from-quantification impulse that had earlier gripped economics, but there are now decidedly mixed views on the value of the concept.

Fortunately, and genuinely encouraging, the uptake of systemic thinking in many disciplines amounts to a collective 're-cognizing' of the need to temper the quantitative, reductionist mindset that has dominated Western science. This is how the Western mind, at least, is coming back to its senses, but the true repository of wisdom in these areas lies in many indigenous cultures and traditions that never excised quality from their understanding of the world in the first place, and so never dulled their appreciation of the living world we all depend upon.

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