

Surplus Energy Economics

How the economy REALLY works – Tim Morgan

Coronavirus: The Scope of Financial Risk

By their very nature, events like the Wuhan virus epidemic (or whatever the history-books end up calling it) polarise opinions, some of which become ever more extreme as the crisis unfolds.

At one end of the spectrum, those who claimed that the coronavirus was just some kind of minor variant on 'normal' seasonal ailments are being taught a harsh lesson in reality.

At the other extreme, though, many continue to insist that this is an 'existential' event, from which neither the economy nor the financial system (or anything else that we hitherto took for granted) is going to emerge, at least in any recognizable form.

If you believed either of these things, you probably wouldn't bother trying to plan, or, as is the case here, to try to 'scope' the course that economic and financial trends might take.

Generally, though, extremes, whether of optimism or of pessimism, usually turn out to be wrong. Neither the Pollyanna nor the Sandwich-Board Man approach is going to help. Whistling a cheerful tune isn't going to give us greater visibility on the post-crisis situation, but neither is walking around wearing a placard proclaiming that "The End is Nigh".

The rational and practical response is to reason from what we *do* know to what we *need to* know. This is why, in economics and finance, we do need to try to scope this crisis.

To do this effectively, it makes sense to adopt two working principles.

One of these is that we bring new thinking to bear, so that we're not just playing new tunes on the broken fiddle of 'conventional' economics.

The other is that we're clear about the limitations imposed by the uncertainties implicit in the situation.

This is where 'scoping' differs from *prediction*. What follows doesn't try to forecast what *will* happen, just to set some parameters on what *might*.

About the author

Dr Tim Morgan was Global Head of Research at the international inter-dealer-broker Tullett Prebon, before establishing [Surplus Energy Economics](#) and publishing *Life After Growth*. He is a leading exponent of the view that the economy can only be interpreted effectively from an energy perspective, and has developed the Surplus Energy Economics Data System (SEEDS) to model economics and finance in this way.

From troubled skies

Though the epidemic itself couldn't have been anticipated, many of us have long recognised that trends and conditions pointing towards "GFC II" – a different and more extreme sequel to the 2008 global financial crisis (GFC) – were already in place.

A condensed version of this narrative is that the authorities responded to the "secular stagnation" of the late 1990s, first with 'credit adventurism, and latterly with '*monetary* adventurism' as well. Where the former put the credit (banking) system at risk, the latter called into question the viability of the entire *fiat* monetary structure. Beyond buying some time (at a very hefty price), neither expedient has achieved anything worthwhile, but has inflicted an enormous amount of damage along the way.

It is, indeed, reasonable to conclude that we've spent more than two decades packing dynamite into the foundations of the financial structure.

Signs that economic reality might have started to break through had become apparent well before the current crisis erupted. Sales of everything from cars and smartphones to chips and components had already turned down, world trade in goods was already shrinking, and severe financial stresses were already emerging, particularly in China, and in some of the more irrational parts of the global 'cheap money' economy.

This is why, rather than having hit us out of blue skies, this crisis is really a bolt from the greyⁱ. Whether people had noticed these gathering dark clouds largely depended on whether they were looking at the situation from a point of view founded in reality, or were still persuaded by the 'conventional' tarradiddle that there was nothing too abnormal in the situation (or, at any rate, nothing so abnormal that it couldn't be handled by our omnipotent, omniscient central bankers).

The energy perspective

These past exercises in 'adventurism' have had a shared assumption, which has resulted from a fundamental misconception about how the economy really works.

In order to believe that we can boost the performance of the economy by financial gimmickry – whether by pouring cheap credit into the system, or by flooding it with even cheaper liquidity – you'd have to start by assuming that the economy is a *wholly financial system*. If this assumption was correct, you could conclude that fiscal and monetary policy are the effective levers of control.

In reality, of course, these assumptions are mistaken. An economy that exists wholly in the realm of the human artefact of money - and is unrelated to the physical world in which we live - is a fiction.

As regular readers will know, my approach is based on the understanding that the economy is *not* a financial system, but an energy dynamic.

Briefly stated, the *surplus energy* interpretation of the economy has three central tenets.

The first is that *nothing* of any economic utility whatsoever can be produced without the use of energy.

The second is that, whenever energy is accessed for our use, some of that energy is *always* consumed in the access process (with the consumed-during-access component known here as the Energy Cost of Energy, or ECoE).

The third part of this “trilogy of the blindingly obvious”ⁱⁱⁱ is that money has no *intrinsic* worth, and commands value *only* as a ‘claim’ on the output of the ‘real’ (energy) economy.

The credit connection

From this understanding, we can start with the observation that financial ‘claims’ have grown far more rapidly than the ‘real’ economy on which such claims can be honoured. Comparing data for 2018 with the numbers from 2008 reveals that each \$1 of reported “growth” in the global economy over that decade was accompanied by \$3 of net new borrowing.

The crucial interconnectedness in this situation is that pouring money and credit into the system doesn’t just increase the aggregate of financial claims, *but also inflates the apparent size of the economy itself.*

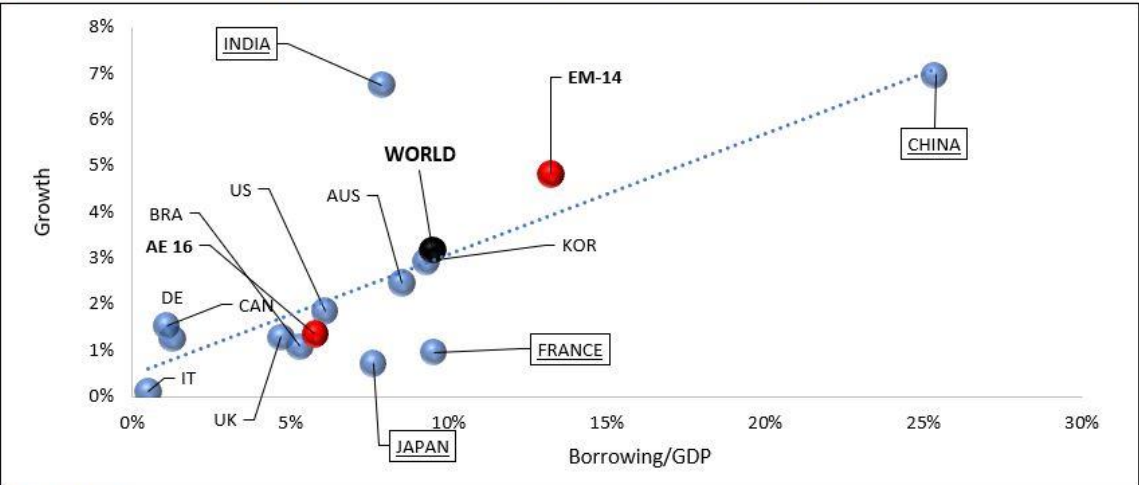
The ways in which this happens can be re-visited at a later date, but what we need to know now is that it happens.

The chart below illustrates this relationship. The vertical axis shows percentage growth in GDP during the years since the 2008 global financial crisis (GFC), whilst the horizontal shows annual borrowing, as a percentage of GDP, over the same period.

The clear outlier here is China, whose annual growth has been around 7%, but whose annual rate of borrowing has been about 25% of GDP. This is why slightly more than doubling Chinese GDP (+115%) required a near-*quadrupling* of debt (+290%), and why borrowing has exceeded growth in the ratio 3.6:1.

Fig. 1

Correlation - rates of growth and borrowing, selected economies



Source: SEEDS

The numbers for India look a lot better (though they've been worsening for some time), because the country has achieved strong growth without a dramatic recourse to borrowing. Both France and Japan are on the negative side of the trend-line, borrowing a lot, but getting precious little growth in return.

Individual economies aside, though, the critical observation which emerges from this is that '*the more you borrow, the more apparent growth you can report*'.

Most of the countries shown on the chart – and the world and regional aggregates, too – are at, or close to, a trend-line which *connects* the extent of borrowing with the quantity of GDP growth that has been reported.

What this means, as it applies to current circumstances, is that the numerator of debt (and, for that matter, of broader commitments), and the denominator of GDP, are not discrete, but are linked together.

Upwards tendencies in debt have had an inflationary effect on apparent GDP. This in turn means that a straightforward ratio which compares debt with GDP is extremely misleading because, when you increase the one, you simultaneously increase the other. This in turn means that debt/GDP ratios operate in ways which tend towards complacency.

The prosperity bench-mark

Energy-based calibration of *prosperity*, as undertaken by the SEEDS model, is designed to provide a measure of economic output which, as well as taking ECoE into account, is distinct from this 'credit pull'.

The result is to revise the interpretation of economic trends, indicating that, rather than 'an economy of \$87tn, growing at 3% annually', we entered this crisis with 'an economy of \$53tn, that is hardly growing *at all*'.

Taking non-government debt as an example, let's examine the implications of this approach.

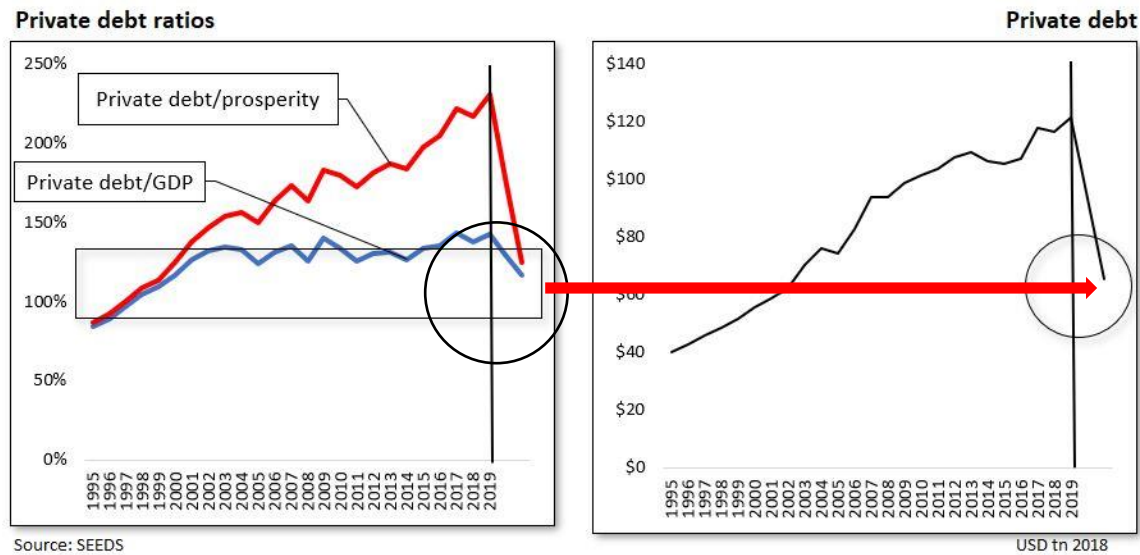
During 2009, nominal world GDP was \$60tn, whilst private debt was \$85tn, for a debt/GDP ratio of 141%. Since then, both debt and GDP are supposed to have grown by just over 20% in real terms, which means that the ratio between them (shown in blue in **fig. 2**) seems hardly to have changed at all.

When we shift the basis of calibration from GDP to *prosperity*, though, the resulting calculus is both very different, and a great deal more cautionary.

Compared with a real increase of 23% in private debt, aggregate world prosperity hasn't actually grown at all since the GFC. One reason why this is so different from the narrative of "growth" is that most of the headline increases in GDP have been the simple consequence of spending borrowed money.

The other is that ECoEs have risen relentlessly, long since passing levels at which prior growth in Western prosperity goes into reverse, and, more recently, entering a band where the same thing starts to happen to the EM (emerging market) economies as well.

Fig. 2



This means that the ratio which expresses GDP as a percentage of *prosperity* (shown in red) has expanded markedly, from 183% in 2009 (and 125% back in 2000) to a current level of just over 230%.

A reasonable inference from this is that the debt-to-prosperity ratio has moved a long way out of equilibrium, leaving it poised to fall back to a prior, much lower level.

Departure from debt equilibrium is, of course, exactly what you would *expect* to have happened after more than a decade in which people have been *paid to borrow*. But quirks in the calculations which use GDP as a measure of debt exposure have served to disguise this critical trend.

Indeed, when you take this enormous process of subsidised borrowing into account, any suggestion that proportionate indebtedness *hasn't* increased becomes wholly counter-intuitive.

An understanding of this principle enables us to scroll back across the years of financial excess in search of ratios which might represent a sustainable equilibrium.

This same calculation, when expressed as debt aggregates in constant dollars (as in the right-hand chart), suggests that a sharp decrease in outstanding non-government debt might have become inescapable.

Unless we're prepared to assume that dramatic inflationary effects will destroy the real value of debt (a 'soft default'), the implication is that we may be facing a process of extensive default, for which the term used here is *a default cascade*.

The bigger picture

Before we move on (in future research projects) to consider what a default cascade might look like in practice, it's important to note that formal debt doesn't, by any means, capture the full extent of financial exposure. A better way to look at this is to reference *financial assets* or, more specifically, the aggregate of such assets excluding those of the central banks.

Financial asset exposure, always important, has taken on renewed significance during the uncertainties of the epidemic, and a causal link can be identified between, for example, the extremity of British financial exposure and recent sharp falls in the value of Sterlingⁱⁱⁱ. Private financial assets stand at 1100% of British GDP, whereas the ratio for the United States is only 460%, so a fall in the value of the pound against the dollar is a wholly logical response to extreme financial uncertainty.

At the global level, financial assets data for countries accounting for about 80% of the world economy is available, and this data puts private financial assets at 450% of GDP. This a number which, like the debt/GDP ratio, hasn't worsened since 2009.

Expressed against *prosperity*, however, this metric *has* expanded, because real financial assets have grown (by about 15%) over a decade in which prosperity hasn't increased at all.

If, as we did with debt, we track back across the years of excess in search of the equilibrium ratios towards which a return might seem likely, the inference is that, like debt, the broader class of financial assets may face a severe retrenchment and this, again, points to various forms of default.

Clear and present danger

In what is intended as a scoping exercise, attaching numbers to these interpretations requires the caveat that our conclusions must recognise the extremity of uncertainty implicit in current conditions.

Indications from SEEDS-based analysis suggest that we should not be too surprised if debt of \$60tn, and broader financial assets of an additional \$100tn, are at risk.

These, as stated earlier, are scoping numbers, not forecasts.

Even so – and given the sheer scale of what we know is happening to the economy - these numbers need not seem all that surprising. The Pollyannas out there might say that little or none of this is actually going to happen, whilst the words “Told you so!” might be added to the doomsters' sandwich-boards. The strong likelihood is that, in finance at least, the sandwich-boarders are a lot nearer the reality than the ditty-whistlers.

On the basis of this scoping exercise, we can anticipate that the global financial system could be facing a hit of \$160tn, which is 185% of GDP.

That might be something from which the economy itself could recover, albeit in a battered and bruised form.

But you'd have to be a long way towards the Pollyanna end of the axis of optimism to think that the financial system could survive without either severe inflationary effects or a systemically-dangerous process of default.

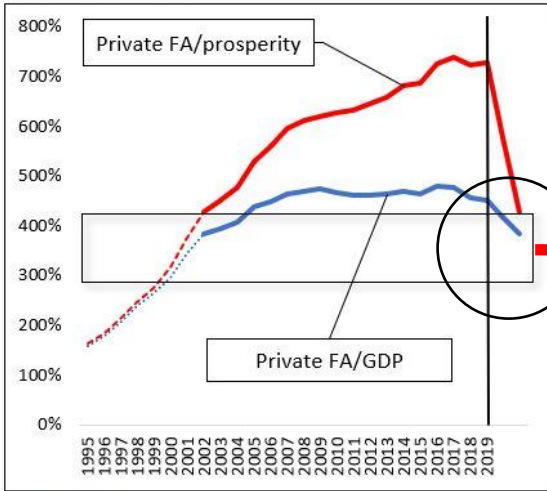
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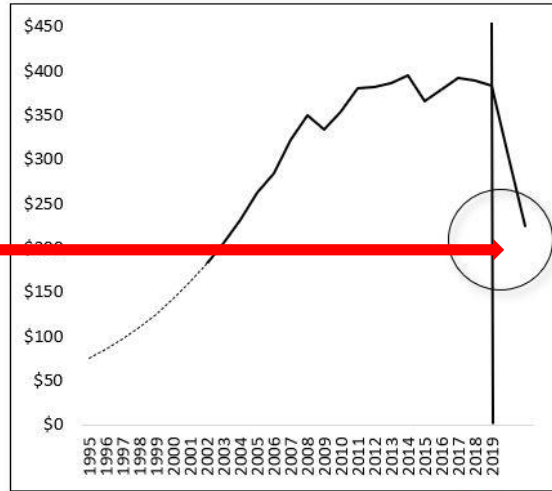
SUPPLEMENTARY INFORMATION

Private financial assets ratios



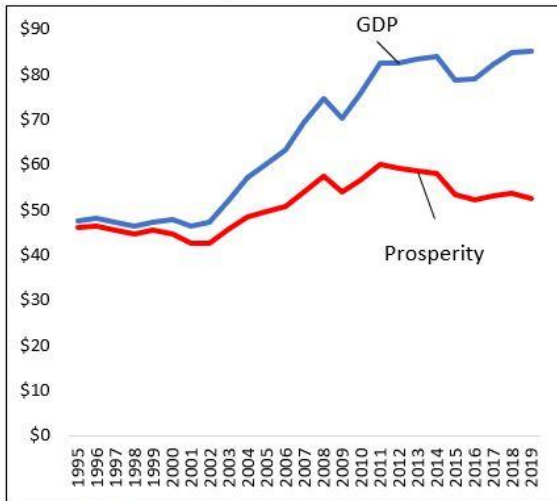
Source: SEEDS

Private financial assets

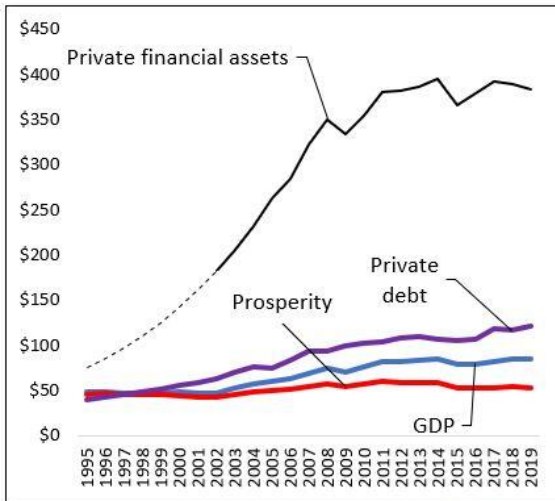


USD tn 2018

Financial metrics, 1995-2019



Source: SEEDS



USD tn 2018

Summary data

\$tn 2018	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019e</u>
GDP	\$47.7	\$47.9	\$60.1	\$75.9	\$78.9	\$79.1	\$82.2	\$84.9	\$85.1
Prosperity	\$46.1	\$44.7	\$49.6	\$56.5	\$53.3	\$52.3	\$53.1	\$53.8	\$52.5
Private debt	-	\$56	\$74	\$102	\$105	\$107	\$118	\$117	\$121
Private financial assets	-	-	\$263	\$355	\$367	\$379	\$393	\$389	\$391
<u>Ratios to GDP:</u>									
Private debt	-	117%	124%	134%	134%	135%	144%	137%	143%
Private financial assets	-	-	437%	467%	465%	479%	478%	458%	460%
<u>Ratios to prosperity:</u>									
Private debt	-	125%	150%	180%	198%	205%	222%	217%	231%
Private financial assets	-	-	530%	628%	688%	725%	739%	722%	745%

Source: SEEDS

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ⁱ <https://surplusenergyeconomics.wordpress.com/2020/02/28/164-a-bolt-from-the-grey/>

ⁱⁱ <https://surplusenergyeconomics.wordpress.com/2020/01/24/163-tesla-from-mount-incomprehension/>

ⁱⁱⁱ <https://radixuk.org/opinion/whats-the-meaning-of-the-sliding-pound>