# *World View*[1]

February 2021

## Drivers[2]

**The pandemic**, the primary driver of developments near term, will finally subside only when effective vaccines have at least 60% take-up. There is no long-term trade-off between 'containing the virus' and 'supporting the economy'.[3]

**Monetary policy** easy throughout 2021 in major economies, with substantial further asset purchases, few changes in official rates, and yield-curve control and action to support credit markets in some.

**Fiscal policy.** On announced plans the advanced economies collectively will, in 2021, withdraw about 3/4 of their exceptional discretionary 2020 support; EM and Middle-Income economies however are likely to make little change.[4]

**Climate change** moves towards centre stage with the new pledges of the US, Japan, and China; the evident rising cost of damages;[5] increasing activism of investment managers; and generational change of corporate and political leaders.[6]

**Investment,** although depressed by the recession, may recover unexpectedly quickly, to the extent that changed patterns of demand, not least due to climate change, warrant changes in the structure of the capital stock.[7]

**Trade policies** become less confrontational, with moves towards re-upholding the 'rules' of international trade.[8] But many countries are likely to seek to reduce dependence on China.[9] And carbon border taxes may become contentious.[10]

**Technological change.** The '4th Industrial Revolution' (IR4),[11] in just its early stages so far,[12] is set to wreak accelerating changes in what is demanded, produced, and where. Some countries are better placed than others to benefit.[13]

**Structural change** is being forced by the virus,[14] climate change, technological change, and shortening supply chains. Structural policies, a major determinant of the growth of productive potential, will be a differentiator across countries.[15]

**Demographic change** is now having major effects as the baby-boom generation starts to retire. The direct effects on labour supply are clear; the indirect economic effects less so,[16] but one that is clear is pressure on social expenditure.[17]

## Economic and market prospects

**GDP** growth[18] continues strongly in China, but elsewhere only once vaccines restore a 'new normality'.[19] Historically, re-attaining pre-recession GDP levels has taken some years, [20] and post-recession growth is slower than its prior trend:[21]

**Inflation.** The aggregate price level is likely to spike near-term,[22] but capacity is not strained, and organised labour is much less influential than it used to be: it is unlikely that any shocks will turn into a price/wage spiral.[23]

**Official interest rates** remain low in 2021 and beyond in most countries, given slow recoveries and low inflation.

**Bond yields** continue to edge higher in expectation of large sales of government debt and inflation[24] further out, but remain historically low. Yield curves steepen slightly, being kept down by yield curve control in some countries.[25]

**DM Equities** edge higher but become increasingly vulnerable to bad news. Evaluated on a quantitative basis,[26] such as Shiller's Excess Cyclically Adjusted P/E ratio, the risk does not seem particularly high.[27] But evaluated on a behavioural basis,[28] notably the Minsky typology, they appear to be at stage 5 or 6 of the full 9-stage process to crisis. [29]

**EM Equities,** on PEs only 1/2 that of the S&P 500, look attractive; and some may enjoy recovery. But many EMs have big current account deficits, are heavily indebted, including in US dollars, and may be held back by slow vaccine roll-out.

**Corporate credit** likely to remain good, with the global recovery supporting bank lending and markets.

**Commodity prices.**[30] Oil oscillates in a $40-$60 range, with downside risks long-term.[31] 'Below-ground' commodities follow oil.[32] Above-ground commodities rise slowly in real terms, driven by climate change and rising real incomes.[33]

**Dollar** likely range-bound, but with downside risk. Global recovery will likely reduce 'safe haven' demand for the dollar, as will a burgeoning current account deficit if the Biden stimulus leads to US growth outperformance.[34]

## Watch fors[35]

- **Nominal GDP growth.** Below 4-6% would be uncomfortably low: above 6% probably unsustainable.
- **US treasury yields.** A significant rise would indicate greater financing difficulties for government borrowing than we currently envisage. And increased inflation uncertainty could increase the inflation risk premium in bonds.
- **Inflation.** Were this to pick up significantly as GDP recovers, this would falsify our multi-year low-inflation view.
- **Fiscal stance.** A tightening before growth has become self-sustaining would threaten the prospect of recovery.[36]
- **Public debt.** The way that this is recorded and reported may well influence investors' attitudes to holding it.[37]
- **Investment.** The strength of this will determine the ease of adjustment and the sustainability[38] of GDP growth.
- **Climate change.** China and US delivering together, agreeing big issues such as carbon border adjustment taxes.■

[1] ***World View*** presents our judgement, generally in qualitative terms, about the likely behaviour, over the coming 12 months or so, of the current principal drivers of the world economy; the most likely key economic and market variables; and the most important developments to watch for in order to see if developments are, or are not, evolving broadly as expected.

Given the space constraints of the summary page, it is possible only to state the basic judgement in each area: the argumentation, evidence; and degree of uncertainty are presented in the endnotes. **Individual countries** are mentioned in the summary page only to the extent that they are likely to have global, or at least major regional, significance.

*World View* is a 'living' document; in general it is revised only in the light of major changes. Policy announcements, data developments, and any other factors that may support or challenge our *World View* are assessed first in our weekly *Key Developments,* and then in our monthly *Economic Risks*. When an issue warrants particular consideration, we examine it in detail in our analytic *Comment* pieces and *Global Letters*.

**The core of *World View*** is necessarily macroeconomics, as conventionally recognised. But increasingly, particularly since the 2008 Global Financial Crisis, a widening range of policies have been playing a progressively larger part. The importance of structural policies is a case in point; likewise the influence of the new Fourth Industrial Revolution technologies. And increasingly climate change, an existential issue, is starting to be taken seriously by the governments in all three major emitting regions – Europe, China, and the US. A full understanding of the power and thrust of these various, often longer-run, driving forces and their interactions is essential to understanding the evolution of major economic and financial variables – even in the comparatively near term of just a year or two ahead.

**Forecast error.** It is important that likely margins of error be recognised – especially at present. Unsurprisingly, forecasters typically make their biggest mistakes – least well understand what is going on – when an economy is hit by a shock that is both large (taken to be 2% of GDP or more) and novel. Following the 1973/74 global oil price shock, for example, forecasters over-predicted countries' year-ahead GDP by fully 4 percentage points on average; yet following the similar-sized, but no longer novel, and hence better understood, 1978/79 oil price shock the mean error was only 0.9 of a percentage point. For mores, see Llewellyn, J., Potter, S., and Samuelson, L, 1985. *Economic forecasting and policy – the international dimension.* Chapter 6, p. 101. Routledge and Kegan Paul.

This time, the COVID-19 lockdown shock is unquestionably large, and indubitably novel, having originated outside the economic system, and provoking an unusual response: neither on the occasion of the 1957 influenza pandemic, which killed an estimated 1 million people worldwide, nor after the 1968 pandemic (which killed an estimated 1 to 4 million) did policymakers lock down their economies.

**Risks and uncertainties**. Expressions of degrees of risk and uncertainty are in general offered in the relevant endnotes. In so doing, we recognise the Knightian distinction between 'risk' and 'uncertainty': we use the term 'risk' when we judge it possible to attach, even if only tentatively, a probability to a given outcome; and the term 'uncertainty' when the level of understanding is too low to permit even a tentative assessment of probability. The basic global-level risks are updated monthly in our publication *Economic Risks.*

[2] '**Drivers'**. In complex politico/economic systems, 'everything depends on everything else': almost all developments, from the stance of fiscal and monetary policies to the behaviour of consumption and investment, from the evolution of inflation to the path of interest rates, depend on what is, and often also what has been, happening elsewhere in the system. In such an interconnected, 'general equilibrium', system there are few, if any, truly exogenous forces.

However, at any given moment, just a limited number of factors are likely to be responsible for much of the impetus behind outcomes. Hence, in *World View*, 'Drivers' are taken to be those powerful forces that at present seem most likely to play the predominant role in shaping year-ahead outcomes.

The importance of individual drivers can change, and often does. Indeed, such can be a defining characteristic of an economic 'epoch'. Hence, from time to time, as our colleague Han de Jong has observed:

> "*When you are in the business of forecasting the economy, a thoughtful narrative is more important than models. It is crucial to identify what forces drive the economy at a particular point in time. Models do not know that*."

Sometimes it is feasible to assess, in advance, the probability of a hitherto important driver becoming less so or, conversely, of a 'new' variable becoming a driver. Such possibilities may on occasion be one component of '**risk**'. On other occasions, however, the importance of a potential driver may not be understood, or it may be impossible to attach any meaningful probability to it; in which case the situation can only be dubbed an **uncertainty**.

[3] See for example Alveda, P., Ferguson, T., and Mallery, J. D., 2020. *To Save the Economy, Save People First.* Institute for New Economic Thinking, 18 November. Available at https://www.ineteconomics.org/perspectives/blog/to-save-the-economy-save-people-first [Accessed 1 December 2020] One thrust of this paper is that, while countries that locked down early and had paid an economic price, now they are (virtually) COVID-free. In contrast, countries that dithered have nevertheless still paid a big price (in terms of lost GDP plus fiscal support) and yet still have COVID-19.

[4] A government's fiscal balance is a function of the level of economic activity and the level of government net expenditure.

Hence *changes* in an economy's government fiscal balance are a function of (so-called cyclical) *changes* in the level of economic activity and of (so-called 'discretionary') *changes* in government net expenditure – whether as a result of discretionary changes in tax rates or discretionary changes in expenditure.

Hence the size of the actual (or projected) discretionary *change* in a government's net expenditure – often dubbed the change in its fiscal stance – can be calculated by subtracting the *change* in the (actual or projected) cyclically-adjusted fiscal balance from the *change* in the (actual or projected) fiscal balance. (Sometimes this is described as 'separating the effect of the budget on the economy from that of economy on the budget'.)

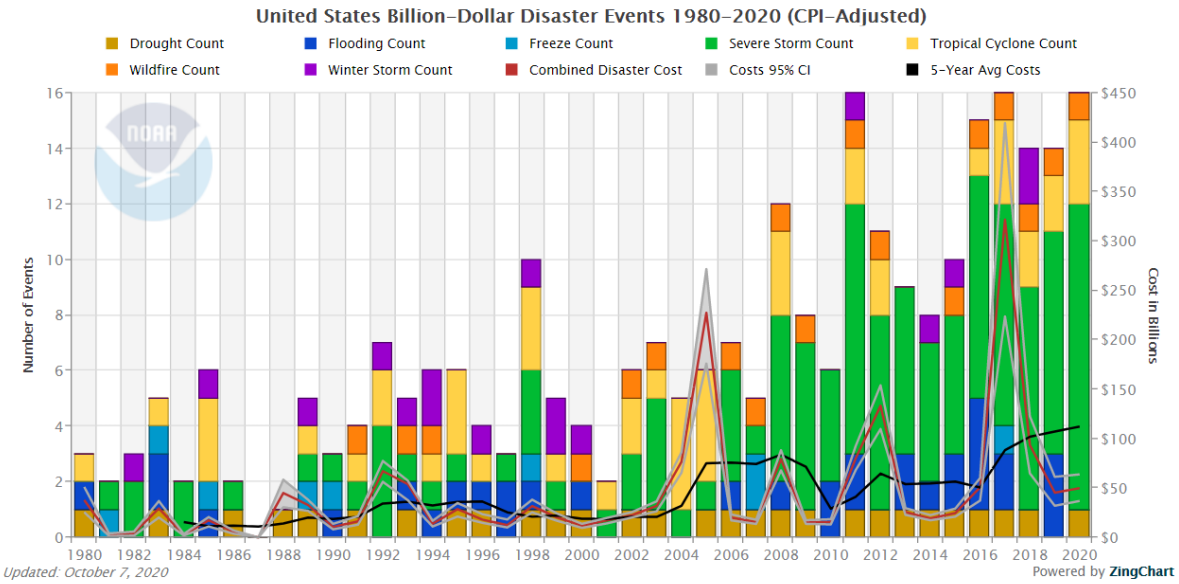
Both the OECD and the IMF publish actual and projected fiscal balances, for most countries, on a standardised basis; and they also calculate cyclically-adjusted values. The most recently available are those of the IMF in October 2020, and it is these that have been used in the calculation above of the size of discretionary fiscal policy changes in 2021. Hence, the conclusion that, on present plans, while fiscal policy will consider to support demand, about ¾ of the exceptional fiscal impulse of 2020 stands to be withdrawn.

These estimates will, however, have been overtaken, in a number of countries, by the response to the second wave of the COVID-19 virus.

For the basic data, see IMF, 2020. *Fiscal Monitor: cyclically adjusted balance, % of GDP.* October. Available at Fiscal Monitor (October 2020) (imf.org). [Accessed 4 December 2020]

[5] The number of 'billion-dollar disaster events' has increased by a factor of around 5 since the 1980s, with the major part of this increase being attributable to severe storms:

**US billion-dollar disaster events, 1980-2020**




*Source: https://www.ncdc.noaa.gov/billions/time-series*

[6] Environmental, Social, and Governance (ESG) issues have been growing in importance over the past several decades. It is probably fair to say that concern about the 'E' component has so far run ahead of concern about 'S' and 'G': perhaps this is because the 'E' is driven by the laws of physics, is more easily quantified, and measured, whereas concern with 'S' and 'G' is impelled more by social and societal pressures. But given the ubiquitous influence of the social media, 'S' and 'G' stand also to grow progressively in importance, with companies becoming obliged to concern themselves here too in the years ahead.

[7] Investment is typically one of the hardest-hit components of expenditure in a recession, and this constrains the rate of growth of productive potential for a period thereafter.

Moreover, this time changes in the structure of demand – for example, reductions in the demand for public transport, airlines, conference centres, cruise ships, even office space – may well result in premature scrapping of some capital stock. Our colleague, Saul Eslake, reminds the importance of this phenomenon, which was so clearly exemplified by the extraordinary sight, following the quadrupling of the price of oil in the 1973/74 oil crisis, of hundreds of still technically viable, but suddenly economically unviable, piston-engined propeller-driven aircrafts mothballed in the Mojave desert prior to their being broken up.

[8] This likely development also stands to restore confidence in alliances, including importantly not only the WTO, but also the WHO and NATO. That said, there will likely be no going back to the 'triumph of western liberalism' that dominated thinking in most Western countries during the period between the fall of the Berlin Wall and the 2008 Global Financial Crisis. In particular, China seems certain to continue to pose challenges to the way in (and rules under) which world affairs are 'managed'.

How far China might present a challenge both to peace and stability in the Asia-Pacific region, remains an open question. There are certainly risks of growing tensions between China on the one hand, and the US and the EU on the other. Our colleague Saul Eslake points out that China may even seek to 'test' the resolve of the Biden Administration early in its term, perhaps in an echo of Premier Khrushchev's 'testing' of President Kennedy with the installation of nuclear missiles in Cuba in 1962. Indeed China has already done so, flying PLA aircraft through Taiwan's ADIZ in late January – although to date the US has not reacted to this 'provocation', at least, not publicly. How the US, and to some extent the EU, might respond to any such 'test' could have a crucial bearing on the willingness of other countries, particularly in the Asia-Pacific area, to resist China's increasing efforts to assert its pre-eminence at least in the region, and perhaps globally.

[9] Dependence on China is likely to be reduced, both as a market for exports and as a source of imports and investment. This seems almost certain in the case of the United States; but the European Union also is finding itself having to define its position vis-à-vis China in respect of trade- and trade-related issues. This may trigger other trade rivalries and disputes, and could carry some risk of increased protectionism, under the guise of securing greater 'self-sufficiency'.

[10] The proposal for 'carbon tariffs' supported by the EU, the UK, the US, and likely Japan could prove to be a 'spanner in the works' in coming international trade negotiations.

[11] **Four principal technological epochs are commonly identified**, each associated with breakthrough technologies, and new products, processes, and industries:

**First (Industrial) Revolution** (1750-1830): introduced steam, water, and mechanical production equipment; which brought steam engines, cotton spinning, railroads.

**Second (Industrial) Revolution** (1860 to 1900): introduced electricity, the internal combustion engine, and running water with indoor plumbing; which brought the telephone, electric light, the automobile, indoor flush toilets, the division of labour, mass production.

**Third (ICT) Revolution** (late 1960s to present): has introduced computerisation, and digitalisation; which brought the internet, and smart products and processes.

**Fourth (ICT) Revolution** (2016 onwards), also known as **IR 4.0**: the marriage of physical assets and advanced digital technologies – the internet of things (IoT), artificial intelligence (AI), robots, drones, autonomous vehicles, 3D printing, cloud computing, nanotechnology, and more – that communicate, analyse, and act upon information, enabling organisations, consumers, and society to be more flexible and responsive and make more intelligent, data-driven decisions. See Deloitte Insights, *The Fourth Industrial Revolution.* Available at https://www2.deloitte.com/content/dam/Deloitte/de/Documents/human-capital/Deloitte_Review_26_Fourth_Industrial_Revolution.pdf IR 4.0 *"… heralds a series of social, political, cultural, and economic upheavals that will unfold over the 21st century. Building on the widespread availability of digital*

*technologies that were the result of the Third Industrial, or Digital, Revolution, the Fourth Industrial Revolution will be driven largely by the convergence of digital, biological, and physical innovations.*" See Schwab, K., The Fourth Industrial revolution. Britannica. Available at The Fourth Industrial Revolution | Special Feature | Britannica [Accessed 30 January 2021]

The first two Industrial Revolutions changed fundamentally the way in which, and where, the majority of people live and work. Economy-wide impacts were however not immediate: the 'golden age' of US productivity growth for example was from 1913 to 1972, well after the second Industrial Revolution (1860-1900).

Speaking in the 1990s about the third Industrial Revolution, the late Professor Christopher Freeman, of the University of Sussex, argued that society was in only the early stages of that revolution, which would eventually prove bigger than the Industrial Revolution, for two principal reasons:

- The ICT Revolution permeates all sectors of the economy – both industry and services – and is therefore more transformative; and
- It is impelled by global competition, and is thereby proceeding much more rapidly.

It seems likely that this prophesy stands to be even more pertinent in the coming decades, as IR 4.0 increasingly takes over the running. Freeman also said that, even if all technological invention and laboratory development were to cease forthwith, technical progress in firms and economies could continue at something like its present pace for at least the following twenty years, just by bringing known technologies into the workplace.

[For more see: Gordon, R. J., 1999. *US economic growth since 1870: One big wave?* American Economic Review 89(2): 123-128; link. Gordon, R. J., 2000. *Does the "new economy" measure up to the great inventions of the past?* National Bureau of Economic Research, working paper 7833; link. Gordon, R. J., 2012. *Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds.* NBER Working Paper No. 18315; link. Gordon, R. J., 2015. *Secular stagnation: A supply-side view.* American Economic Review, Papers & Proceedings 105(5): 54-59; link. Gordon, R. J., 2016. *The Rise and Fall of American Growth*. Princeton, NJ: Princeton University Press. Bughin, J., and Hazan, E., 2017. *The new spring of artificial intelligence: A few early economies.* VOX; link.]

[12] Since 2018 we have been analysing and writing about technologies that will shape the coming decade and beyond, and which, because markets anticipate, are affecting asset prices today. We analyse what each technology is; how it works; principal applications; and implications and issues. We also analyse how specific activities and sectors stand to be affected. We have also undertaken analyses at the macro level to see how well placed different countries are both to absorb the new technologies themselves and to adjust constructively to the structural change that the new technologies impel – each stands to affect specific activities, industries and, whether alone or in combination, entire economies.

To date we have written on 41 separate technologies; 19 sectors/issues; and 3 pieces on countries' comparative ability to adjust structurally. Write to enquiries@llewellyn-consulting.com for more information.

[13] Some countries – the US for example – are particularly advanced in the invention and development of new technologies. But it does not necessarily follow that such countries are also the best placed to benefit from them. The ability to make use of new technologies depends on a raft of factors; and the quantitative evidence on how countries compare with one another in respect of various of these considerations is presented in the heat map below.

The 5 economies that are ranked highest are all small: Switzerland, the Netherlands, Belgium, Denmark, and Sweden. The highest-placed big economy is Canada, which ranks 6th, followed by Finland, the UK, and Norway. The lowest ranking countries are Italy, Latvia, Turkey, Poland, and Hungary.

Interestingly, most of the G7 economies do not rank particularly highly: Germany 11th, the US 15th, Japan 17th, France 20th. The US ranking often evokes surprise, given high-tech images of NASA, Silicon Valley, and its internationally highly ranked universities. But the middling US rank reflects the fact that, notwithstanding all this excellence at the top, the average level in the US – and not least average levels of educational attainment – are not particularly high in international comparison.

**Innovation heatmap**

| *Standardised data* | CHE | NLD | BEL | DNK | SWE | CAN | FIN | UK | NOR | AUS | DEU | AUT | IRL | NZL | US | KOR | JPN | ISR | LUX | FRA | SLV | LIT | PRT | CZE | EST | ESP | GRC | SLK | ITA | LAT | TUR | POL | HUN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Science | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R&D expenditure in public sector | 1.0 | 0.9 | -0.2 | 2.2 | 1.4 | 0.4 | 1.2 | -0.9 | 0.8 | 0.5 | 1.1 | 0.9 | -2.1 | 0.5 | -0.2 | 0.8 | -0.1 | -0.7 | -0.5 | 0.1 | -1.0 | 0.2 | -0.3 | 0.8 | 0.3 | -0.8 | -0.5 | 0.7 | -0.9 | -1.3 | -1.1 | -1.0 | -2.0 |
| R&D expenditure in business sector | 0.9 | -0.2 | 0.5 | 0.6 | 1.1 | 0.5 | 0.7 | -0.2 | -0.3 | -0.2 | 0.7 | 1.0 | -0.3 | -0.9 | 0.7 | 1.9 | 1.7 | 2.6 | -0.8 | 0.2 | 0.4 | -1.2 | -0.9 | -0.3 | -0.8 | -0.8 | -1.2 | -1.2 | -0.7 | -1.4 | -1.0 | -1.0 | -0.4 |
| Private co-funding of public R&D expenditures | 1.8 | 1.6 | 1.1 | -0.9 | -0.2 | 0.2 | 0.1 | -0.4 | 0.0 | 0.2 | 3.0 | -0.1 | -1.4 | 0.0 | -0.9 | 0.6 | -0.9 | 0.3 | -1.3 | -0.3 | 0.2 | 1.8 | -1.3 | -0.5 | -0.3 | -0.4 | -0.1 | -0.3 | -1.2 | 0.3 | 0.8 | -1.0 | -0.6 |
| Public-private co-publications | 3.7 | 0.9 | 0.6 | 2.4 | 1.3 | -0.3 | 0.7 | 0.2 | 0.0 | -0.3 | 0.2 | 0.5 | -0.3 | 0.0 | 0.4 | 0.1 | 0.0 | -0.4 | -0.7 | -0.1 | 0.1 | -0.9 | -0.8 | -0.7 | -0.9 | -0.7 | -0.7 | -0.7 | -0.6 | -0.9 | -0.9 | -0.9 | -0.4 |
| PCT patents, applications | 1.9 | 0.9 | -0.1 | 0.9 | 1.9 | -0.3 | 1.7 | -0.2 | 0.2 | -0.4 | 1.0 | 0.5 | -0.3 | -0.4 | 0.5 | 1.1 | 2.1 | 1.2 | 0.0 | 0.0 | -0.5 | -1.0 | -1.0 | -0.9 | -1.0 | -0.8 | -1.1 | -1.1 | -0.6 | -1.0 | -1.1 | -1.1 | -0.9 |
| Scientific publications among top 10% most cited | 1.7 | 1.4 | 0.9 | 1.1 | 0.6 | 0.7 | 0.3 | 1.5 | 0.4 | 0.8 | 0.5 | 0.6 | 0.7 | 0.0 | 1.3 | -1.0 | -1.1 | 0.0 | 0.6 | 0.4 | -0.4 | -1.8 | -0.2 | -0.9 | -0.6 | 0.0 | -0.3 | -1.3 | 0.1 | -1.8 | -1.6 | -1.5 | -1.1 |
| Readiness | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ICT infrastructure | 1.2 | 0.8 | 0.5 | 1.0 | 1.0 | 0.2 | 0.4 | 1.2 | 0.7 | 0.1 | 0.8 | 0.2 | 0.4 | 0.8 | 0.3 | 0.0 | 0.2 | -0.4 | 1.4 | 0.7 | -0.5 | -0.2 | -0.3 | -0.2 | -0.7 | 0.3 | -0.5 | -2.1 | -0.5 | -0.4 | -3.1 | -1.5 | -1.8 |
| New doctorate graduates | 1.9 | 0.5 | -0.1 | 1.7 | 1.3 | -0.5 | 1.2 | 1.4 | 0.2 | 0.6 | 1.2 | 0.0 | 0.8 | 0.0 | -0.4 | -0.3 | -0.8 | -0.5 | -1.1 | -0.2 | 2.0 | -0.9 | 0.0 | -0.3 | -1.0 | 0.0 | -0.9 | 0.4 | -0.4 | -1.2 | -1.8 | -1.5 | -1.1 |
| Tertiary education | 0.6 | 0.2 | 0.0 | 0.1 | 0.3 | 1.7 | -0.3 | 0.6 | 0.5 | 0.5 | -1.4 | -0.5 | 0.9 | -0.4 | 0.3 | 2.7 | 1.7 | 0.3 | 0.7 | 0.1 | -0.3 | 1.2 | -1.1 | -1.3 | -0.3 | -0.2 | -0.3 | -1.2 | -1.9 | -0.4 | -1.6 | 0.0 | -1.2 |
| Quality of education | 1.8 | 1.2 | 1.3 | 0.8 | 0.5 | 0.9 | 1.3 | 0.7 | 0.9 | 0.8 | 0.5 | 0.0 | 0.6 | 0.9 | 0.7 | -0.6 | -0.3 | 0.1 | -0.3 | 0.2 | -0.1 | -0.3 | -0.4 | -0.7 | 0.4 | -0.8 | -1.8 | -1.6 | -0.8 | -0.7 | -2.1 | -1.1 | -1.9 |
| Digital skills | 1.8 | 1.0 | 0.0 | 1.0 | 0.8 | 0.6 | 1.0 | 0.5 | 1.4 | 0.6 | 0.5 | 0.3 | -1.1 | 1.2 | 0.4 | 0.0 | -0.4 | -0.7 | 1.9 | -0.2 | -0.6 | -0.6 | -0.8 | -0.2 | 0.3 | -0.4 | -1.1 | -0.5 | -1.2 | -0.7 | -2.6 | -1.4 | -0.8 |
| Adoption | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Technological adoption | 1.3 | 1.0 | 0.6 | 0.4 | 1.1 | 0.3 | 0.7 | 1.0 | 1.2 | -0.2 | 0.6 | 0.0 | 1.1 | 0.3 | 1.0 | -0.4 | 0.4 | 1.0 | 1.0 | 0.1 | -1.2 | 0.0 | 0.2 | -0.2 | -0.2 | -0.6 | -2.1 | -0.3 | -1.8 | -1.3 | -1.4 | -1.4 | -2.0 |
| SMEs with product or process innovations | 1.3 | 0.8 | 1.3 | 0.1 | 0.6 | 1.7 | 0.9 | -0.1 | 0.7 | 1.9 | 0.7 | 0.6 | 1.1 | 0.0 | -1.0 | -0.3 | -0.8 | -1.0 | 0.3 | 0.2 | -0.4 | 0.0 | 0.8 | -0.2 | -1.4 | -1.3 | 0.1 | -1.4 | -0.1 | -1.8 | -0.2 | -1.7 | -1.6 |
| SMEs with marketing or organisational innovations | 2.0 | -0.4 | 0.7 | 0.2 | -0.1 | 1.5 | 0.0 | 0.7 | 0.5 | 1.0 | 1.0 | 0.7 | 1.3 | 0.0 | 0.0 | -0.5 | -0.2 | 0.6 | 1.4 | 0.4 | -0.3 | -1.0 | 0.1 | -0.9 | -1.8 | -0.9 | 0.3 | -1.2 | -0.2 | -1.5 | 0.3 | -2.1 | -1.8 |
| Innovative SMEs collaborating with others | -0.6 | 0.9 | 2.8 | 0.2 | 0.2 | 0.0 | 0.8 | 2.1 | 1.2 | 0.2 | -0.4 | 1.4 | 0.3 | 0.0 | 0.0 | -1.7 | 0.8 | 0.1 | -0.5 | 0.2 | 0.2 | 0.5 | -0.8 | -0.4 | -0.2 | -0.9 | 0.4 | -0.7 | -0.9 | -1.6 | -1.0 | -1.5 | -1.0 |
| Ease of starting a business | -0.7 | 0.6 | 0.7 | 0.6 | 0.7 | 1.6 | 0.4 | 0.7 | 0.7 | 1.2 | -1.9 | -1.8 | 1.0 | 2.0 | -0.1 | 1.0 | -1.3 | 0.2 | -0.7 | 0.4 | 0.0 | 0.3 | 0.3 | -1.1 | 0.8 | -1.1 | -0.2 | -0.7 | -0.5 | 0.6 | -1.1 | -1.7 | -1.0 |
| Overall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total score (higher = better) | 4.2 | 3.8 | 3.8 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.6 | 3.4 | 3.3 | 3.3 | 3.3 | 3.2 | 3.2 | 3.1 | 3.1 | 3.1 | 3.1 | 2.9 | 2.8 | 2.6 | 2.6 | 2.5 | 2.4 | 2.3 | 2.2 | 2.2 | 2.1 | 1.9 | 1.8 | 1.7 |
| **Standardised total score** | 1.8 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.6 | 0.4 | 0.4 | 0.4 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | -0.2 | -0.4 | -0.6 | -0.7 | -0.8 | -1.0 | -1.1 | -1.2 | -1.2 | -1.3 | -1.7 | -1.8 | -1.9 |

*Notes: Standardised variables are colour-coded. Dark green shows countries with the best structural policy/setting; dark red those with the worst. A more detailed heatmap, including all the sub-categories, is included in the Appendix (Figure 2).*

For details of how the heatmap was constructed, see Sepping, S., and Dharmasena, B., 2017. *Science, technology, and innovation: a closer look*. Llewellyn Consulting. 12 September.

[14] The virus and the recession have together accelerated a number of trends that were under way before the pandemic hit – in particular towards more pervasive digitisation, and away from globalisation (in the pursuit of greater 'self-sufficiency', either in general or of so-called 'strategic' products).

The consequences of such effects on business/employer and household/employee preferences may be to retard, or even reverse, some other long-standing trends, including the drift of populations towards large conurbations (and within these, the concentration of high-paying services jobs in central business districts or 'downtowns') and rapid growth in international leisure and business travel. They may also have implications for the popularity and viability of mass transit, high-rise housing, and high-rise offices.

[15] Structural reform can be defined as "*policies that encourage, or at least do not inhibit, the flow of resources from declining and less productive activities to growing and more productive activities*". By enabling economies to adjust more smoothly, 'good' (or improving) structural (supply-side) policy settings serve not only to render them more efficient and thereby boost potential output, they may also equip them to adjust better to shocks.

An already extensive and still-growing body of research demonstrates constructive linkages between broad structural policy – both reforms and settings – and economic performance.

- **GDP per capita**. Across nearly 30 advanced economies there is a high correlation between per capita GDP and, for example, our summary measure of the quality of countries' structural policy settings. A regression was performed between GDP per capita (in $US in 2019) and our normalised, summary, country-by-country, structural-policy scores. Just three countries stood out as unusual – Switzerland and Luxembourg (whose financial-service-based economies deliver way above average GDP/capita, and Ireland, which is mismeasured by the relocation of sales proceeds or assets by multinationals to their Irish subsidiaries.

  (To take due account of this, Ireland's Central Statistics Office publishes a Gross National Income (GNI) series, which adjusts for some of the effects of income transfers with the rest of the world and a modified GNI, which corresponds to the GNI adjusted for, among other things, depreciation on R&D service imports. For more, see Eco Notepad, 2021. *The impact of multinationals' transfer on Irish GDP.* Banque de Franc, Post no 202, 3 February. Available at The impact of multinationals' transfers on Irish GDP | Banque de France (banque-france.fr) [Accessed 4 February 2021].) However, these modified data have not been used in our simple calculation below.

- With a single dummy variable to capture the oddities of all three economies, the estimated equation was:

  GDP/capita = 37678 + 13090*Structural core + 53518*dummy $R^2 = 0.79$
  (18.8) (8.5) (5.1)
  (The numbers in parentheses are t-statistics. The data are available on request.)

  Of course, causality may – and likely does – run both ways. But that does not detract from the striking fact that countries with high levels of GDP per capita tend, for whatever reason, to have better structural policies.

- **GDP growth and investment growth**. Moreover, the relationship extends to growth rates: the IMF for example has found a positive relationship between structural policy and economic performance – including with GDP growth and investment growth – and over a range of time horizons. See: IMF, 2015. *Structural Reforms and Macroeconomic Performance*. International Monetary Fund, Washington, D.C., including Box 2, pp. 14-15 and the references cited therein. Available at: http://www.imf.org/external/np/pp/eng/2015/101315.pdf [Accessed 01 January 2021]

- **Reduced 'permanent output losses'.** Moreover, the OECD has found evidence that good structural policies and settings can also improve performance in the face of economic and financial crises: "*More flexible product markets are associated with smaller crisis-related losses in potential output, which may be because this allows for an easier reallocation of resources across firms and sectors in the aftermath of an adverse shock*."

  Moreover, the effects are not only statistically significant, but also quantitatively important: a difference in the OECD's product-market regulation (PMR) indicator of one standard deviation is typically associated with a difference in output losses of 2½ percentage points. See Ollivaud, P., and Turner, D., 2015. *The effect of the global financial crisis on OECD potential output*. Especially p. 42 and Table 2, p. 54. Available at https://www.oecd.org/economy/growth/the-effect-of-the-global-financial-crisis-on-oecd-potential-output-oecd-journal-economic-studies-2014.pdf [Accessed 12 July 2020]

We ourselves have worked extensively in this area to draw together numerous measures of the quality of structural adjustment policies and policy settings across advanced and emerging economies. The results are summarised in the 'heatmap' below.

The four economies that are measured as having the best structural policies overall are all small – Finland, Switzerland, the Netherlands, and New Zealand; and they are followed by Japan and Great Britain. Interestingly, among the G7 economies, only Japan and the UK are in the top 10. Particularly striking is that the US scores just below Canada and Germany. France has an average score, while Italy is the lowest-placed major economy. The Nordic economies generally score well above the OECD average. Some other smaller economies too appear relatively well placed – Chile and Estonia arguably 'punch above their weight'. Southern European economies, however, generally rank relatively poorly. Spain and Portugal, for example, score lower than Chile. The 'bottom' group includes Mexico, Turkey, and Greece.

**Structural policies heatmap**

| | FIN | CHE | NLD | NZL | JPN | GBR | DNK | SWE | NOR | LUX | AUS | CAN | DEU | USA | AUT | EST | BEL | FRA | IRL | KOR | CZE | ISR | LIT | CHL | PRT | SVK | ESP | SVN | LAT | POL | HUN | ITA | GRC | TUR | MEX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Institutions | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 4.0 | 2.0 | 2.0 | 3.0 | 2.0 | 3.0 | 2.0 | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 2.0 | 1.0 |
| 2. Infrastructure | 3.3 | 3.7 | 4.0 | 3.0 | 3.7 | 3.0 | 3.7 | 4.0 | 3.7 | 3.7 | 2.7 | 3.3 | 3.0 | 3.3 | 3.0 | 3.7 | 3.0 | 3.7 | 2.0 | 3.7 | 3.0 | 2.0 | 3.3 | 1.7 | 3.0 | 2.3 | 3.0 | 3.0 | 3.0 | 2.7 | 2.7 | 2.3 | 2.7 | 2.3 | 1.3 |
| 3. Human capital | 3.7 | 4.3 | 3.7 | 3.7 | 4.2 | 3.5 | 3.3 | 3.3 | 3.5 | 3.5 | 3.5 | 3.8 | 3.5 | 3.5 | 3.3 | 3.3 | 3.3 | 3.0 | 4.0 | 3.5 | 3.0 | 2.8 | 2.8 | 1.8 | 2.2 | 2.3 | 2.3 | 3.2 | 2.7 | 2.8 | 1.8 | 2.2 | 2.0 | 1.2 | 1.3 |
| 4. Market regulation | 4.0 | 3.0 | 5.0 | 4.0 | 3.0 | 4.0 | 4.0 | 3.0 | 3.0 | 3.0 | 4.0 | 3.0 | 4.0 | 3.0 | 4.0 | 4.0 | 3.0 | 3.0 | 3.0 | 2.0 | 3.0 | 1.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 2.0 | 3.0 | 2.0 | 4.0 | 4.0 | 2.0 | 1.0 | 2.0 |
| 5. Labour market efficiency | 3.0 | 3.7 | 3.0 | 4.3 | 3.0 | 3.3 | 3.7 | 3.0 | 3.3 | 3.0 | 3.7 | 3.7 | 2.7 | 3.3 | 3.0 | 2.3 | 2.0 | 2.7 | 3.3 | 3.7 | 2.3 | 3.3 | 2.3 | 3.7 | 2.7 | 2.3 | 2.7 | 2.3 | 2.0 | 3.0 | 2.7 | 2.0 | 2.7 | 2.7 | 3.0 |
| 6. Innovation | 4.0 | 4.3 | 3.7 | 3.0 | 3.7 | 3.7 | 3.7 | 4.0 | 3.7 | 3.7 | 3.3 | 3.3 | 4.0 | 3.7 | 3.3 | 3.0 | 3.7 | 3.0 | 3.0 | 3.7 | 3.0 | 4.0 | 2.7 | 2.0 | 2.3 | 2.7 | 2.3 | 2.7 | 2.0 | 2.0 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| 7. Financial market efficiency | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 | 4.0 | 3.0 | 3.0 | 4.0 | 4.0 | 3.0 | 3.0 | 4.0 | 3.0 | 2.0 | 2.0 | 3.0 | 3.0 | 3.0 | 3.0 | 2.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 2.0 |
| **Total score (higher = better)** | **3.9** | **3.9** | **3.8** | **3.7** | **3.6** | **3.6** | **3.6** | **3.6** | **3.6** | **3.5** | **3.5** | **3.5** | **3.5** | **3.4** | **3.2** | **3.2** | **3.1** | **3.0** | **3.0** | **2.9** | **2.8** | **2.7** | **2.7** | **2.6** | **2.6** | **2.5** | **2.5** | **2.5** | **2.4** | **2.4** | **2.3** | **2.0** | **2.0** | **1.8** | **1.8** |
| **Standardized total score** | 1.4 | 1.4 | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.7 | 0.7 | 0.7 | 0.7 | 0.4 | 0.3 | 0.2 | 0.1 | 0.1 | -0.1 | -0.4 | -0.4 | -0.4 | -0.6 | -0.6 | -0.8 | -0.8 | -0.9 | -1.0 | -1.0 | -1.2 | -1.6 | -1.6 | -1.9 | -2.0 |

*Source: Llewellyn Consulting, OECD, IMF, Eurostat*

*Notes: Standardised variables are colour-coded. Dark green shows countries with the best structural policy/setting; dark red those with the worst. A more detailed heatmap, including all the sub-categories, is included in the Appendix (Figure 2).*

For more, see Sepping, S., and Dharmasena, B., 2017. *Structural policies heatmap revisited*. 21 June, Llewellyn Consulting.

[16] Although the retirement age is likely to be raised, *de facto* or *de jure*, in many countries, labour force growth nevertheless seems set to slow in many economies. And household formation and consumption also seem likely to weaken. There is much debate about the likely net outcome, and hence the potential implications – and over what time frame – for demand, inflation, and interest rates.

[17] A range of issues, including standards of care for the aged (and who pays for it); access to affordable housing (particularly in those countries where house prices have escalated rapidly over past decades and are continuing to do so); and 'job security'/ the 'gig economy' may also command greater attention.

[18] We analyse the evolution of GDP as the working-through of economic disturbances, within the prevailing institutional and behavioural framework. Thus we do not employ the concept of the 'business cycle', largely because, whatever else they may be, fluctuations in economic and business activity are scarcely 'cycles', at least in the sense used in the physical sciences. Typically, economic episodes differ greatly in length from one another. For example, while the average length of the 12 post-WWII US peak-to-peak episodes was 75 months, individually they ranged from 32 to 128 months (as measured by the National Bureau of Economic Research. See: *US Business Cycle Expansions and Contractions,* NBER. Available at US Business Cycle Expansions and Contractions | NBER [Accessed 26 December 2020])

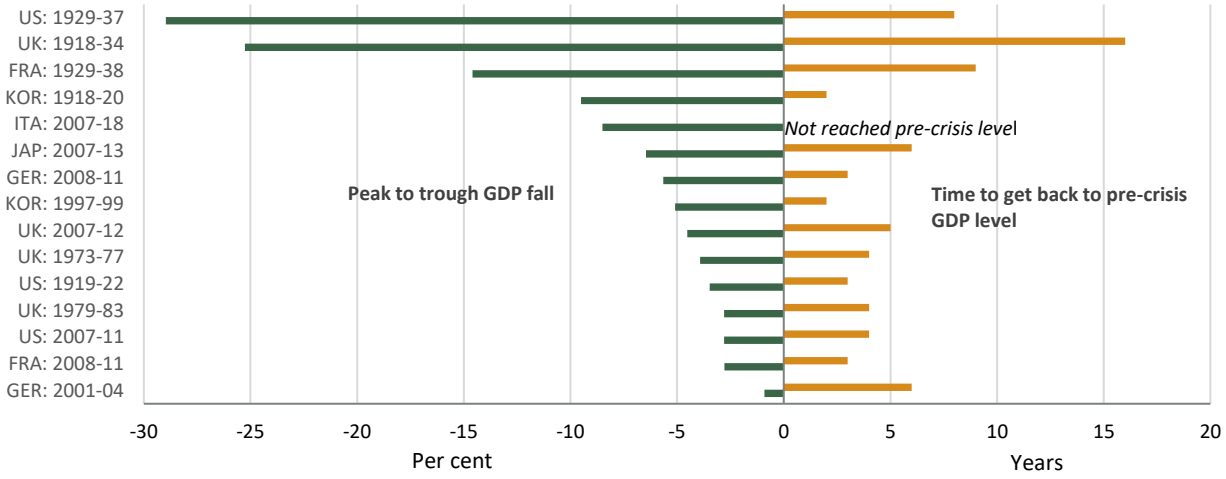
One of the reasons that the notion of 'economic' or 'business' cycles held sway for so long was that, in the pre-computer era, the best – generally the only – way to analyse interactive systems – such as the interaction between the accelerator and the multiplier – was to assume that they took mathematical forms that had already been found to be analytically tractable. With the advent of computers and numerical solution, that practice is no longer necessary: but the word, and thereby the implicit underlying intellectual framework, lingers on. Today, while less elegant, solving computationally the many relationships taken to represent the messy real world of complex, multiple relationships is likely to result in a potentially more accurate depiction of reality. That said, as our colleague Philip Turner points out, there is a risk – that a model may produce a result that is hard to explain, and that the main driver of that result is a hidden technical specification that may be wrong.

Taking all these arguments into account, we side with the judgement expressed by the authors of a comprehensive 2017 IMF study of the dynamic behaviour of more than 150 economies over 40-odd years, that: "*Output does not cycle around a long-term upward trend. Instead, shocks result in a complete shift in the trend line itself. In short, the 'business cycle' is not a cycle."* The authors also take a pot-shot at the interpretation that is placed on trends: "… the traditional paradigm of the business cycle should be replaced with a new paradigm of output dynamics that incorporates hysteresis along the lines shown in the evidence..." See *Cerra, V. and Saxena, S., 2017. Booms, Crises, and Recoveries: A New Paradigm of the Business Cycle and its Policy Implications.* IMF Working Papers, 17(250), p. 6. Available at https://www.imf.org/en/Publications/WP/Issues/2017/11/16/Booms-Crises-and-Recoveries-A-New-Paradigm-of-the-Business-Cycle-and-its-Policy-Implications-45368 [Accessed 12 July 2020]

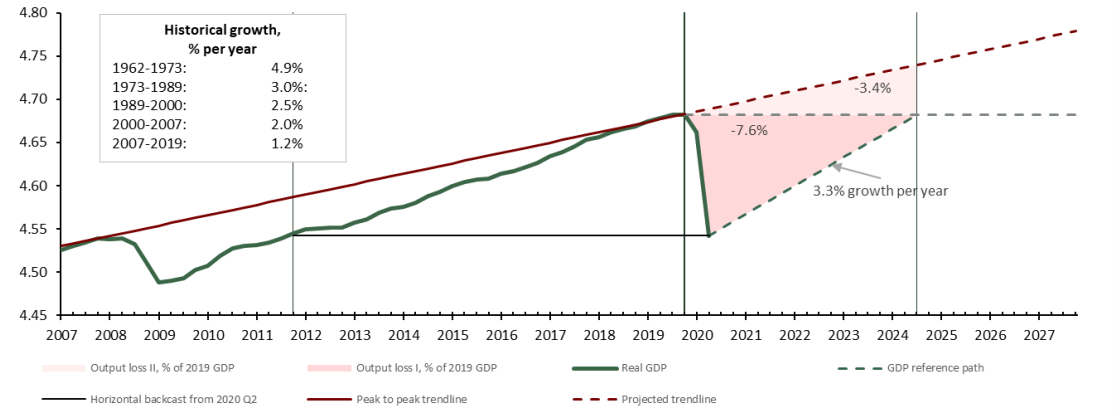
[19] Near-term growth rates can, and likely will, be impressive. But not too much weight should be placed on them: these rebounds may prove to be partial, followed by recoveries that are slow, protracted, and uneven – much as after the Global Financial Crisis, and possibly slower.

[20] Typically, the time that it takes for GDP to reach its trough and then re-attain its pre-crisis level is to be measured in years, not quarters. The figure below shows, for a selection of the largest depressions and recessions, that over the post-WWII period their duration is typically of the order of 3 to 6 years.

**Depth and duration of major recession episodes**




As is happens, that was almost how long it took for the G7 aggregate after the 2008 Global Financial Crisis – from 2007 Q4 to 2011 Q2 (see the figure). On such a reckoning it will be between 2023 and 2026 – mid-point 2024 – before G7 GDP is back to its 2019 level.




On this basis the output loss over the period until the G7 economy finally reattains its 2019 GDP level (often referred to as the 'persistent loss of output') would be 7.6% of 2019 GDP (see the darker triangle). If estimated relative to the GDP that the economy would have produced had it remained on its pre-recession trend, the figure would be around half as much again (a further 3.4% – see the lighter triangle.) This is a typical sort of value. On average, across countries, *"… the magnitude of the persistent loss in output is about 5 percent for balance of payments crises, 10 percent for banking crises, and 15 percent for twin crises."* See *Cerra, V. and Saxena, S., 2017. Booms, Crises, and Recoveries: A New Paradigm of the Business Cycle and its Policy Implications.* IMF Working Papers, 17(250), p.5. Available at . https://www.imf.org/en/Publications/WP/Issues/2017/11/16/Booms-Crises-and-Recoveries-A-New-Paradigm-of-the-Business-Cycle-and-its-Policy-Implications-45368 [Accessed 12 July 2020]

That said, there is a school of thought that the return to the pre-recession level of output will be quicker than it typically is after a financial crisis or a more customary economic recession. For example, the OECD has opined that "*The global economy will gain momentum over the coming two years, with global GDP at pre-pandemic levels by the end of 2021*". See OECD Economic Outlook, Volume 202, Issue 2, December. [Online] Available at Editorial: Turning hope into reality | OECD Economic Outlook, Volume 2020 Issue 2 | OECD iLibrary (oecd-ilibrary.org) [Accessed 15 February 2021

On balance, we incline somewhat towards the OECD view, given that this recession is so different from those typically caused by monetary policy 'errors' and/or financial market crashes, and because policy has done so much more to preserve jobs and businesses and to support household incomes (as evidenced by the unusual and large increases in household savings rates in most countries). Taken all together, this suggests that recovery from recession could initially be quite rapid. But probably little will have changed in underlying conditions, in which case the 'old' problem is likely then to re- emerge: how to create enough demand and deal with low inflation (i.e. excess savings).

[21] The IMF has found that, on average across countries, after recoveries have begun (i.e., the first year of positive growth following a recession), growth has typically been 0.8 percentage points lower than the average in all expansion years if the recession was associated with a banking crisis, and 0.5 percentage points lower than in all expansion years if the recession was not associated with a banking crisis. Growth was 0.6 percentage points and 0.3 percentage points lower during the first four years of recovery for banking crisis- and non-banking crisis-related recoveries, respectively. See *Cerra, V. and Saxena, S., 2017. Booms, Crises, and Recoveries: A New Paradigm of the Business Cycle and its Policy Implications.* IMF Working Papers, 17(250), p.5. Available at . https://www.imf.org/en/Publications/WP/Issues/2017/11/16/Booms-Crises-and-Recoveries-A-New-Paradigm-of-the-Business-Cycle-and-its-Policy-Implications-45368 [Accessed 22 December 2020]

It is an open question what the figure will prove to be for the current crisis which, having been caused by a coronavirus, has no precedent in modern times.

[22] Aggregate price indexes are likely to spike on occasion, partly due to some supply bottlenecks and also due to the base effect of the plunge in oil prices in 2021 following the onset of the global recession. But these 'spikes' would seem likely to be relatively small, of short duration, and more apparent in 'headline' inflation measures than 'core'.

[23] There is currently a widespread view, most notably amongst the financial community, that present high levels of debt and of money supply growth presage an outbreak of inflation. We doubt this. While rapid growth of the money supply is a necessary concomitant of any rapid inflation, it does not necessarily follow that every period of rapid growth in the money supply *causes* an increase in inflation. (This in the spirit of the famous Kaldor question, in the context of the typical money-supply surge at Christmas time, and fallback thereafter: "*Does the money supply cause Christmas, or does Christmas cause the money supply?*").

At present, much of the increase in money supply is the result of recent extraordinary fiscal outlays to support incomes. This is likely to prove only temporary, and start slowing once economies recover. More importantly, a number of the key determinants in earlier high inflation epochs, most notably in the 1970s, are not present today. With the proportionate size of the manufacturing sector diminishing in most economies, so is union membership; and indexation of wages to inflation is no longer common.

Probably the greatest risk of a pickup in inflation is currently in the US, should the Biden stimulus plan prove to be too large in relation to the degree of spare capacity – see Summers, L., 2021. The *Biden stimulus is admirably ambitious. But it brings some big risks, too.* The Washington Post, 4 February. Available at Opinion | Biden's covid stimulus plan is big and bold but has risks, too - The Washington Post February. [Accessed 10 February 2021].

Even were that to prove the case, an open question is the extent to which higher demand would feed into wages. Inflation expectations in the US appear to be well anchored, in which case it would probably take years of bad policy to change these expectations materially.

Meanwhile there is probably considerable potential for employment in the US to expand. The civilian labour force participation rate has fallen by over 5 percentage points since its peak around 2000, and the employment to population ratio has fallen similarly. And union membership has declined steadily, since 1983. In that year, the earliest for which strictly comparable data are available, union membership rate was 20.1 percent of total wage and salary workers. In 2020, the union membership rate was 10.8 percent, See U.S. Bureau of Labor Statistics, 2021. *Union Members Summary*. 22 January. Available at https://www.bls.gov/news.release/union2.nr0.htm [Accessed 10 February 2021]. For a discussion of the evolution, see Dunn, M., and Walker, J., 2016. *Union Membership In The United States.* US Bureau of Labor Statistics. Available at union-membership-in-the-united-states.pdf (bls.gov) [Accessed 10 February 2021]

Taking all these arguments and evidence together, we are currently relatively sanguine about the prospects for US inflation, certainly in 2021, and probably in 2022 also. This is not markedly different from the market view. At the time of writing, the US 10-year bond yield is close to where it was in February 2020 – and there was little apparent concern about inflation then. And the Cleveland Fed's composite measure of 10-year inflation expectations, which is running at around 1.5%, has barely risen over recent months. That said, however – and this is potentially the troubling element – around 0.4 ppts of this is accounted for by the inflation risk premium, as measured. See Federal

Reserve Bank of Cleveland, 2021. *Inflation Expectations.* [online] Available at https://www.clevelandfed.org/our-research/indicators-and-data/inflation-expectations.aspx, [Accessed 11 February 2021]

All that said, there are global-level counterarguments to the low inflation view, particularly over the longer term. In *The Great Demographic Reversal* Goodhart and Pradhan argue that a range of factors that previously checked inflation are now about to go into reverse. They point to the disinflationary consequences of the opening up of China, the former Soviet Union, and various other smaller economies; the Uruguay Round, the birth of the WTO and the admission of China; and falling birth rates, still-young populations and growing participation of women in the labour force. All this they see as potentially reversing the disinflationary tendencies of the past several decades, and particularly since the 2008 Global Financial crisis. See Goodhart, C., and Pradhan, M., 2020. *The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival.* Palgrave Macmillan. Available at The Great Demographic Reversal - Ageing Societies, Waning Inequality, and an Inflation Revival | Charles Goodhart | Palgrave Macmillan

Perhaps one piece of evidence that this might not be so, or at least not yet, is that in Japan, which is often taken to be a harbinger for age-related and other developments, the prices of so-called 'non-tradeables', i.e. goods and services that are produced and consumed domestically, have so far at least not shown any particular tendency to rise.

[24] There seems to be quite a strong view, centred in the US financial community, that bond yields are set to rise significantly in 2021, partly through a rotation from bonds into equities; partly because of the proposed Biden $1.9tr fiscal stimulus, partly because it is reckoned that inflation is set to accelerate in a strong post-COVID-19 recovery; and partly because of large expected sales of government debt. In December 2020 *"… 76 per cent of fund managers surveyed recently by Bank of America expect[ed] a steeper yield curve of long-term rates rising above those for short-term debt. It was the highest level in the survey's history ..."* and "*already … the 10-year Treasury yield has climbed to 0.95 per cent, from just above 0.5 per cent in August, partly on hopes for further fiscal stimulus, further increasing the supply of bonds. Inflation expectations have also rebounded sharply from the lows they touched at the height of the coronavirus crisis."* – see Stubbington, T., 2020. *Why obituaries for the bull market in bonds might be premature*. Financial Times, 30 December. Available at Why obituaries for the bull market in bonds might be premature (ft.com) [Accessed 31 December 2020]

However, the US is only part of the global capital market and, on the basis of past recessions, we continue to expect, unless or until evidence emerges to the contrary, that G7 GDP will reach its 2019 level only some time in 2024. And on that basis, and given the atomistic nature of labour markets in all the major economies, we doubt that such price shocks as may occur will feed through to any material extent into wages.

[25] Most notably, perhaps, Japan. Another risk is that increased uncertainty about inflation (especially as relative changes change a lot) could increase the inflation risk premium in bond prices. And a further possibility, is that the ending of the 'demographic dividend' – a diminishing pool of surplus labour leading to a reduction in the saving rate – may cause the natural rate of interest to rise, even if potential growth remains low. For more on this point, advanced by Goodhart and Pradhan, see the review of their book by Turner, P., 2020. *Book notes: the great demographic reversal, by Charles Goodhart and Manoj Pradhan.* Central banking. Available at Book notes: The great demographic reversal, by Charles Goodhart and Manoj Pradhan - Central Banking [Accessed 10 January 2020]

[26] One quantitative way to consider whether, or the extent to which, assets may be overvalued is to examine the extent to which current valuations lie towards – or perhaps outside – the confidence limits of a well-specified equation that 'explains', in a statistical sense, past movements in terms of their main drivers. The Shiller calculation is a basic example. In practice, however, it often proves difficult to say with any useful degree of probability that assets are overvalued. Before the 2008 Global Financial Crisis, for example, in the years leading up to the 2008 the economics team at Lehman Brothers estimated a number of house price equations, and our experience with them was that, while they suggested that valuations were 'stretched', they did not enable that assertion to be made definitively according to the customary tests of statistical significance.

A somewhat different, and arguably more decisive, test is whether, using plausible scenarios for the drivers of house prices for the period ahead (say 5–7 years) a major decline is likely? Using this test on UK house prices, John Muellbauer and Anthony Murphy found that "*Our model results do not suggest that house prices in 2003 were substantially overvalued.* [Moreover] *Fitting our model to data for 1972–96 to forecast 1997–2003 gives no signs of systematic under-prediction, either for the full period or for 2000–3*." and *"… By mid-2007, however, prices looked a little overvalued …"* See Muellbauer, J., and Murphy, A., 2008. *Housing markets and the economy: the assessment*. Oxford Review of Economic Policy, Volume 24, Number 1, 2008, pp. 11-12.

[27] At the time of writing for the S&P 500, Shiller's 'Excess cyclically adjusted price/earnings ratio' – the inverted cyclically adjusted Price/Earnings Ratio (CAPE) minus the real return on bonds – stands at 3.4%: its average from 1960 (arbitrarily chosen) to the present has been 3.5%. See Shiller's website *Online Data*. Available at Online Data – Robert Shiller (yale.edu) [Accessed 15 February 2021]

**Excess CAPE yield (ECY) and subsequent 10-Year Annualised excess returns**


*Source: http://www.econ.yale.edu/~shiller/data.htm*

A further consideration that pushes upwards on equity valuations, as our colleague Philip Turner emphasises, is that there has been a huge (and deflationary) rise in US corporate saving as defined in the national accounts (that is, not counting financial acquisitions as investment). Investors buy companies to get their hands on this cash, and then leverage profits by loading up on debt.

[28] A fundamentally different, behaviour-based, approach that we also employ, at least as a complement to the econometric approach, is to engage with the Minsky typology, reproduced below. Our experience with this before the 2008 crash, for example, was that a wide spectrum of people – not professional investors, traders and the like, but 'ordinary' people, whether in the US, the UK, and elsewhere – were seemingly unable to avoid mentioning at dinner parties and the like how much their houses had increased in value. This proved to be at least as good an indication of a pending crash as the econometric approach. (This is a version of the old story, quite likely apocryphal, of J. F. Kennedy Sr. being so struck by his "shoeshine boy" offering him unsolicited, supposedly hot, stock tips that he promptly went back to his office, started unloading his stock portfolio, and then actively shorted the market, thereby in due course making a fortune.)

On the basis of the Minsky typology, we judge that at present stock markets, along with various other 'real' assets, are probably at or around stage 5 or 6 of the full 9-stage process to crisis. This does not mean that the progress of events is headed inexorably to stages 8 (Financial distress); 9 (Crisis); and 10 (the panic feeding on itself.) But it does have the advantage of characterising valuation excess as a stepwise process, which can continue, or be reversed, including by policy.

Note that Stage 5 is reached when "*A larger and larger group of people seeks to become rich without a real understanding of the processes involved*." (I note here that my gym trainer has now actively started trading cryptocurrencies); Stage 6 is reached when 'overtrading' spreads from one country to another; and Stage 7 is reached when *"… new recruits to speculation are balanced by insiders who withdraw*." It is striking that recently surges in equity prices have been driven by day-traders and other amateurs, their actions being fuelled by conversations on the social media, such as Reddit. The extent was apparently sufficiently large as to force some hedge funds out of short positions. See: Aliaj, O., Smith, C., and Mackenzie, M., 2020. *Hedge funds retreat in face of day-trader onslaught*. Financial Times, 28 January. Available at Hedge funds retreat in face of day-trader onslaught | Financial Times (ft.com) [Accessed 28 January 2021]. And see also Smith, R., Fletcher, L., and Darbyshire, M., and

Murphy, H., 2020. *'Short squeeze' spreads as day traders hunt next GameStop.* Available at 'Short squeeze' spreads as day traders hunt next GameStop - Google Search [Accessed 28 January 2021].

[29] **Anatomy of a crisis: The Minsky/Kindleberger typology**

1. **Events start with a 'displacement'** – some exogenous shock outside the macroeconomic system e.g. a war, a bumper crop or failure, the widespread adoption of a new invention with pervasive effects, some political event or surprising success, or a precipitous lowering of interest rates.
2. **Expansion of bank credit** enlarges the total money supply and feeds the boom. This may involve the formation of new banks, the development of new credit instruments, and the expansion of personal credit outside of banks.
3. **Demand pressure and prices increase**, giving rise to new profit opportunities and attracting still further firms and investors. Positive feedback develops, as new investment leads to increases in income that stimulate further investment and further income increases.
4. **'Euphoria' sets in.** Speculation for price increases is added to investment for production and sale, often resulting in "overtrading" (pure speculation for a price rise); an overestimate of prospective returns; or excessive gearing.
5. **Bubbles or manias develop.** The number of firms and households engaging in these practices grows large, bringing in segments of the population that are normally aloof from such ventures. The object of speculation may involve primary products, particularly imported; domestic and foreign securities of various kinds; contracts to buy or sell securities of various kinds; land; houses; office buildings; shopping centres; condominiums; foreign exchange. A larger and larger group of people seeks to become rich without a real understanding of the processes involved.
6. **Overtrading spreads from one country to another**, whether through arbitrage for internationally traded commodities and assets; capital flows; money follows; foreign exchange; or purely psychological transmission effects.
7. **Interest rates, velocity of circulation, and prices all continue to mount**. A few insiders take their profits and sell out. At the top of the market there is hesitation, as new recruits to speculation are balanced by insiders who withdraw. Prices begin to level off.
8. **Financial distress**. Awareness starts to grow in a considerable part of the spending community that a rush for liquidity – to get out of assets and into money – may develop, leading some speculative borrowers unable to pay off their loans. As distress persists, speculators come to realise that the market cannot grow higher. It is time to withdraw, the race out of real or long-term financial assets and into money turns into a stampede.
9. **Crisis**. The trigger may be the failure of a bank or firm stretched too tight, the revelation of a swindle or defalcation, or a fall in the price of the primary object of speculation. Prices decline. Bankruptcies increase. Liquidation is sometimes orderly, but may degenerate into panic. Banks cease lending on the collateral assets whose prices are falling.
10. **The panic feeds on itself until one of three things happens:**
    a. Prices fall so low that people are tempted back into less liquid assets
    b. Trade is cut off by setting limits on declines. Shutting down exchanges, or otherwise closing trading.
    c. A lender of last resort succeeds in convincing the market that money will be made available in sufficient volume to meet the demand for cash.

(Condensed from Kindleberger, C. P., *Manias, Panics, and Crashes*, 4th edition, pp. 13-18 (2000, John Wiley & Sons))

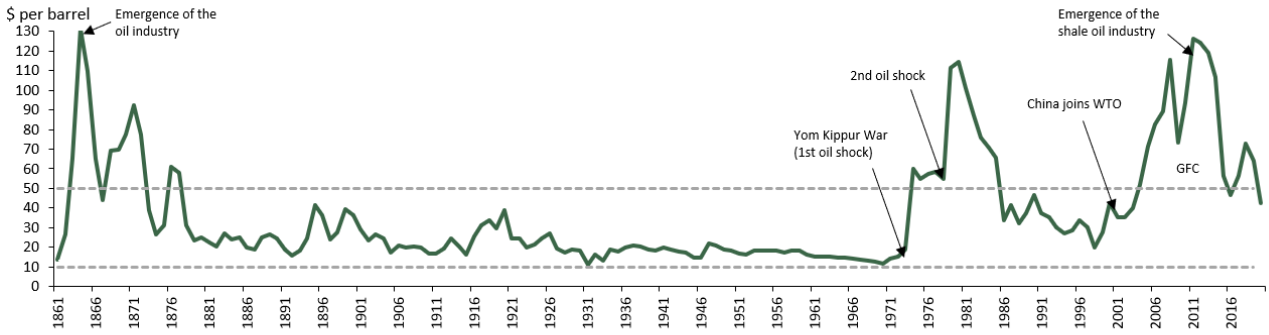
[30] It can be both appropriate and helpful to consider commodities in two broad groups: those 'below the ground' and those 'above the ground'. This empirically-useful typology was advanced by David Jacks, who observed *"… a potentially large, but somewhat underappreciated, distinction between 'commodities to be grown' which have evidenced secular declines in real prices versus 'commodities in the ground' which have evidenced secular increases in real prices."* – see Jacks, D. S., 2013. *From boom to bust: a typology of real commodity prices in the long run.* NBER Working Paper 18874. Available at From Boom to Bust: A Typology of Real Commodity Prices in the Long Run (nber.org) [Accessed 31 December 2020]. Jacks observed, importantly, that from 1900 until the early 1970s the aggregate price indexes for the two groups of commodities moved fairly similarly: but ever since the 1973/74 oil shock the two sets of commodities have behaved quite differently.

[31] The price of internationally traded oil in current prices, i.e., the current price in every period deflated by the 2019 US CPI, oscillated for nearly 100 years within a $10 to $50 band. Then in 1973/74, and again in 1978/79, two huge price spikes took the oil price out of its historical band, the result essentially of the US switching from being a net exporter of oil to a net importer, which put considerable pressure on a then almost non-existent international oil market.

With the re-emergence of the US as a net oil exporter following the discovery and exploitation of shale oil, and with the COVID-19-induced global recession, the oil price has recently re-entered its historic price band.

Our expectation is that, even with a progressive global economic recovery, the effects of increasing moves to decarbonising the economies of Europe, China, and the US, aided by the substantial recent falls in the prices of renewable electricity (particularly solar, but also wind) will keep the oil price henceforth within its historic band.

**Figure 1: Brent crude oil price, inflation-adjusted, 1861-2020e**




*Source: BP Statistical Review of World Energy 2020, Macrobond, and Llewellyn Consulting*
Note: 2019 prices

[32] **'Commodities in the ground',** which include energy products, importantly oil; metals; minerals; and precious metals, have had a variable evolution – see Figure 2. The aggregate index spiked after the two oil shocks in the 1970s; fell back substantially between 1980 and 2000; rose again in the run-up to the 2008 Global Financial Crisis; and has oscillated thereafter. It is self-evident that these movements correlate with the price of energy, as represented by the price of internationally traded oil. But in fact the majority of non-hydrocarbon below the ground commodities individually also generally correlate with the price of oil. And there is good reason for this: digging these commodities up, processing them, and then transporting them involves a considerable amount of energy.

[33] **'Commodities to be grown'**, which include animal products, grains, and soft commodities, have been markedly much less variable than their 'below the ground' counterparts; and they have overall trended downwards – see Figure 3. This basic evolution is also exhibited by the majority of the individual commodity price series that make up the aggregate.

**Real commodity price indexes: 'below the ground' (1974-2020) and 'above the ground' (1960-2020)**

**Figure 2: 'Below the ground' commodities and oil price (all deflated)**

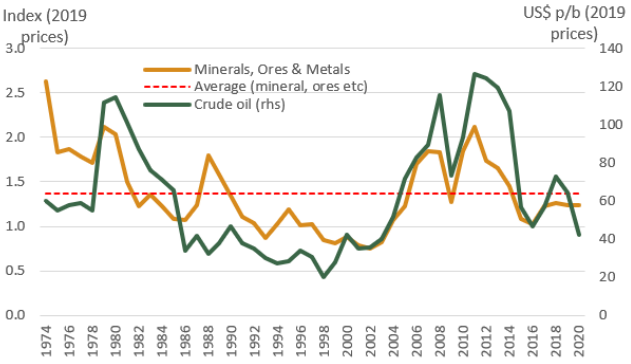
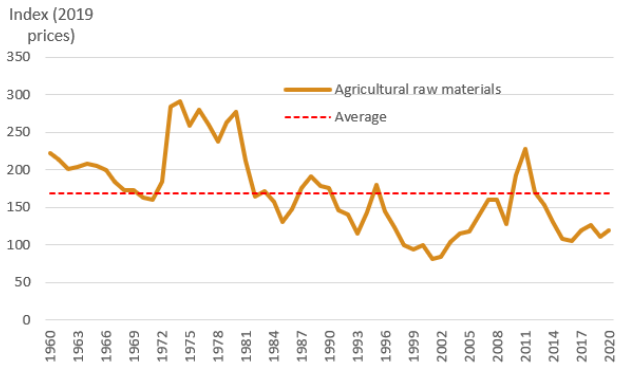
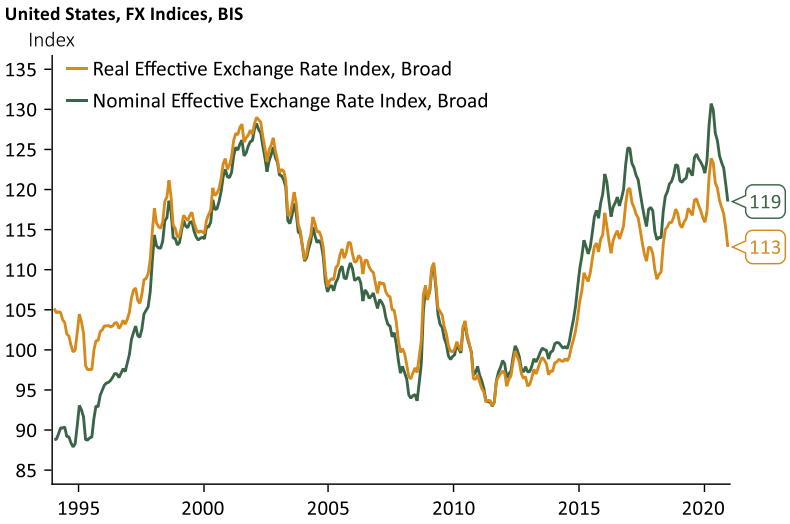



**Figure 3: 'Above the ground' commodities (deflated)**




*Source: Llewellyn Consulting and Macrobond*

[34] **Figure: US dollar trade-weighted index**




*Source: Llewellyn Consulting and Macrobond*

[35] In economics, unlike in the pure sciences, it is generally not possible to run controlled experiments: economic and financial relationships almost invariably have to be inferred from behaviour in a complex world in which it is not possible to hold extraneous influences constant.

Nevertheless, economics is considerably more than mere opinion or assertion. At a minimum, economic history, statistics, and econometrics often make it possible to state, with reasonable certainty, that certain broad propositions are false. Similarly, it is often possible to state what circumstance, or combination of circumstances, would falsify a specific prediction – a sustained pickup in the growth of nominal wages, for example, would falsify our view that inflation in most advanced economies will remain low for at least several years. Moreover, in deciding which data should be asked to bear the greatest weight, particularly in the interpretation of what is going on at the time, it is important to minimise the risk of Kahneman 'confirmation bias'.

It is such thinking that motivates our 'Watch Fors'. In offering these we would not go so far as to claim that we are practicing full 'scientific method' – a concept the validity of which has anyway come to be challenged in recent years – see particularly the rather nihilistic conclusions in the Stanford Encyclopedia of Philosophy, 2015. *Scientific Method.* Available at https://plato.stanford.edu/entries/scientific-method/. [Accessed 31 December 2020]. But at the most basic level it does seem incumbent on any serious analyst or forecaster to indicate what circumstances, were they to eventuate, would call into question either the forecast or, more fundamentally, the understanding on which it was made.

[36] As our colleague Ian Harwood neatly puts it, the most egregious example of this mistake was in the US in 1936/37, when *"… fiscal and monetary policy were both tightened sharply and the economy – which had seen an extraordinarily rapid recovery from its early 1933 nadir (GDP, having contracted one-third between 1929 and 1933, had increased 11% in 1934, 9% in 1935, and 13% in 1936) – was plunged back into deep recession. As the eminent economic historian of the 1930s, Christina Romer, succinctly observed in 2009 when Chair of President Obama's Council of Economic Advisers: "The 1937 episode is an important cautionary tale for modern policy makers". This is as much the case now as it was over a decade ago.""*

[37] We suspect that the authorities in a number of countries, faced with conventional judgements from the rating agencies and other commentators, will look more closely at a range of alternative ways to record public debt. They may, for example, make more of the distinction between that held domestically and that held abroad. They may also distinguish more vociferously between that financed by borrowing from the public and that by borrowing from the central banks. And they may also come to value contingent liabilities – debt guarantees and the like – on a probabilistic, rather than a face value, basis.

[38] When it comes to looking ahead, there are many different possible futures, and a major part of forecasting and investing successfully involves determining which of these various futures is most likely to eventuate. And an important part of this assessment involves deciding whether, or the extent to which, various possible outcomes are 'sustainable'.

One measure of sustainability that we frequently invoke is the 'Rule of Four'. Originally proposed by Norges Bank Deputy Governor Jan Qvigstad, it provides a simple-to-calculate, easily-understood portent of 'danger' in the OECD economies. The 'Rule of Four' focusses on a country's inflation rate, and its current account and budget deficits

expressed as a percentage of GDP. A value of 4 or above for any of these variables is generally a warning signal, while a value of more than 4 for two or more of these variables almost certainly spells serious trouble.

Its predictive power is interestingly strong. For example, had the 'Rule of Four' been applied in the Western economies in the years before 2008 (and it had first been propounded many years before), it would have warned of impending trouble. It is always tempting for policymakers to think that 'this time is different' – but that is seldom so. For more, see Qvigstad. J., Llewellyn. J., Vonen. N.H., and Dharmasena. B. 2012. *The 'Rule of Four'*. March. Available on request from Llewellyn Consulting; or at The 'Rule of Four' by Jan F. Qvigstad, John Llewellyn, Nikka Husom Vonen, Bimal Dharmasena :: SSRN. ■

[The cut-off date for this version is 19 February 2021]