

Demise of the deflation machine

RUFFE R

The global economy has been inherently disinflationary since at least the early 1990s. The result: a generation of investors who have never had to take inflation risk seriously.

But the predominant, powerful and persistent deflationary forces of recent decades – some technological, some political and some demographic – are dissipating.¹ In some cases, they already have. The demise of the deflation machine is now at hand.

A MORE INFLATIONARY AND VOLATILE WORLD

The financial press is abuzz with articles about bottlenecks, supply chain chaos and the (re)emergence of inflation. Yet, until very recently, and especially in the early phase of the covid crisis, the overwhelming fear amongst investors and policymakers was of deflation.

We should not be surprised that rebooting an economic system, deliberately put into hibernation as the pandemic's first wave raged, is proving to be disruptive; nor that economic reopening is being accompanied by dramatic price hikes along supply chains struggling to adjust to radically different patterns of global demand.² Consumers are buying different things³ in different ways,⁴ from different firms operating in different places; workers are choosing to live different lifestyles in different locations.⁵ Restructuring the economy to meet these changed habits will not be swift or painless.

However, it would be wrong to argue the pandemic is the fundamental reason to fear an inflationary future. This crisis, and the response to it, have generated inflationary momentum not seen in many years (see figure 1), but it is best considered an accelerant of

FIGURE 1 US CORE CONSUMER PRICES, % CHANGE OVER LAST SIX MONTHS, ANNUALISED



Source: Bureau of Labor Statistics, seasonally adjusted, CPI excluding food and energy, data to September 2021

trends – economic, political, geopolitical and social – slowly building in the world economy ever since the financial system was brought to its knees in 2008/2009⁶.

Ruffer has been building a portfolio for such a future. We have had high conviction in the ‘what’ – a burst of inflation that injects inflation risk back into markets after its prolonged absence⁷ – and the ‘why’ – excessive central bank-financed fiscal stimulus, driven by the post-financial crisis political imperative of addressing the lasting hit to living standards on ‘Main Street’. But the ‘when’ was always much harder to pin down.

THE RETURN OF THE BIG STATE

The pandemic has changed the calculus – inflationary regime change is now a clear and present danger to investors. During the pandemic, policymakers deployed their entire arsenal of monetary⁸, fiscal⁹ and regulatory weapons¹⁰. The aim: to build a cashflow bridge to the other side of the pandemic. Stimulus was, and to a large degree remains, without limit (see figure 2).¹¹

We now know what was previously uncertain: that, scarred by the fall-out from the 2008/2009 crisis, the political elite would feel compelled to deploy the State’s

balance sheet on whatever scale was necessary to shield the private sector from further economic harm.

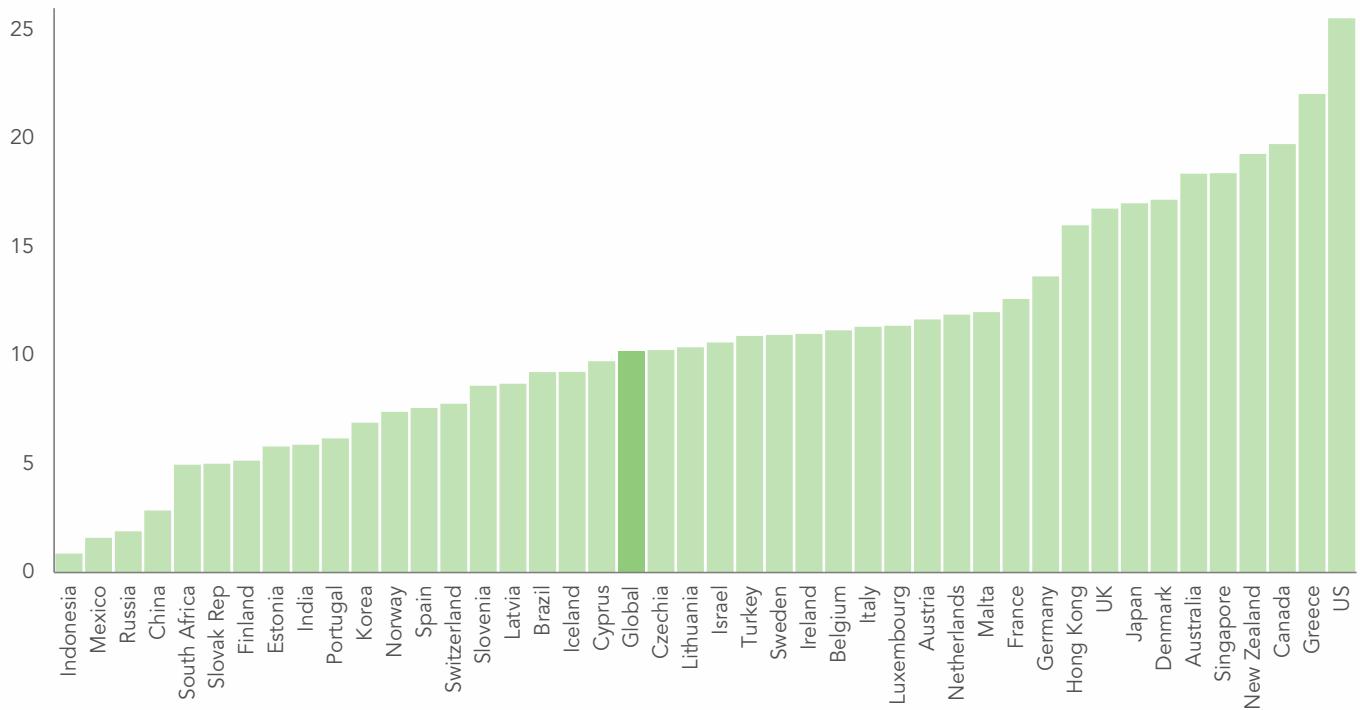
The same political logic has convinced policymakers that substantial policy support must remain in place long after emerging from recession. After the global financial crisis (GFC), we learnt the painful lesson that premature withdrawal of fiscal stimulus, even with very accommodative monetary policy, can be highly detrimental to economic recovery.¹²

There is another critical difference between the environment we faced after the GFC and that today. Back then, the financial system was structurally broken, tethered to a banking sector that had a decade’s worth of balance sheet repair ahead of it. By contrast, banks in the West today are stuffed full of capital and liquidity, leaving them not just well-placed to survive the covid-19 storm but, plausibly, to be a crucial lubricant of the post-pandemic recovery.¹³

THE RISE AND FALL OF THE ‘DEFLATION MACHINE’

The case for extreme policy stimulus was strengthened by the perception of a fundamentally disinflationary background environment. That were it not for the pandemic, inflation risk would remain

FIGURE 2 DISCRETIONARY FISCAL STIMULUS ANNOUNCED IN 2020/2021, % OF GDP



Source: IMF Fiscal Monitor Database, includes tax and spending resources allocated in response to covid-19 since Jan 2020

an absent adversary.¹⁴ Or, at least, this is what central bankers strenuously argue. They proclaim that whatever short-term disruption covid may have caused, the productivity-boosting tailwinds emanating from advances in digital technologies, artificial intelligence, robotics etc continue to blow fiercely.¹⁵

We are sympathetic in a broad sense to the case ‘productivity optimists’ put forward, namely that digital technologies represent, like steam and electricity before them, a ‘general purpose technology’ (GPT), with wide application to all manner of business processes. And as with previous GPTs, this one will be highly beneficial for productivity and living standards.¹⁶

But technological leaps are measured in decades, not months and years.¹⁷ They are also socially and culturally disruptive. Not only is it plausible for high and volatile inflation to coincide with the gradual reshaping of economic life as a GPT develops, one might argue it is the default outcome during the ‘discovery’ and ‘innovation’ phases of a GPT’s evolution – when most financial gains accrue to a small cohort of investors and ‘superstar’ companies.¹⁸ It is only during the ‘diffusion’ phase, when the productivity boost spreads to the long tail of ‘laggard’ firms, that powerful deflationary tailwinds lift living standards more broadly.¹⁹ And a body of empirical evidence suggests this phase has not arrived – and may even be getting more distant.²⁰

Raw scientific discoveries and related innovations may be indifferent to the background environment in which they are occurring (although this proposition is doubtful to us), but the process by which these new ideas permeate through the business world and are adopted by the long tail of slow-growing companies is very much a function of the political context in which this process is unfolding.²¹

Dramatic advances in computing power were clearly a necessary condition for the globalisation of goods supply chains and financial networks that have been so fundamental to the ‘deflation machine’. But their emergence, and subsequent adoption, owed at least as much to political and social trends operating in the background, not to mention a number of one-off developments that ensured these innovations formed the backbone of modern international trade. China emerged from economic obscurity, enjoying unparalleled expansion on the back of its capex-heavy,

export-led, state-dominated growth-model; the USSR collapsed, freeing states in Eastern Europe to integrate themselves into EU supply chains; European nations choose to enter monetary union and radically deepen the single market; labour supply was boosted by the surge of female labour force participation and the social acceptance of two-earner couples;²² and the large baby-boom cohort entered late-middle age, the peak earning/saving part of the lifecycle.²³

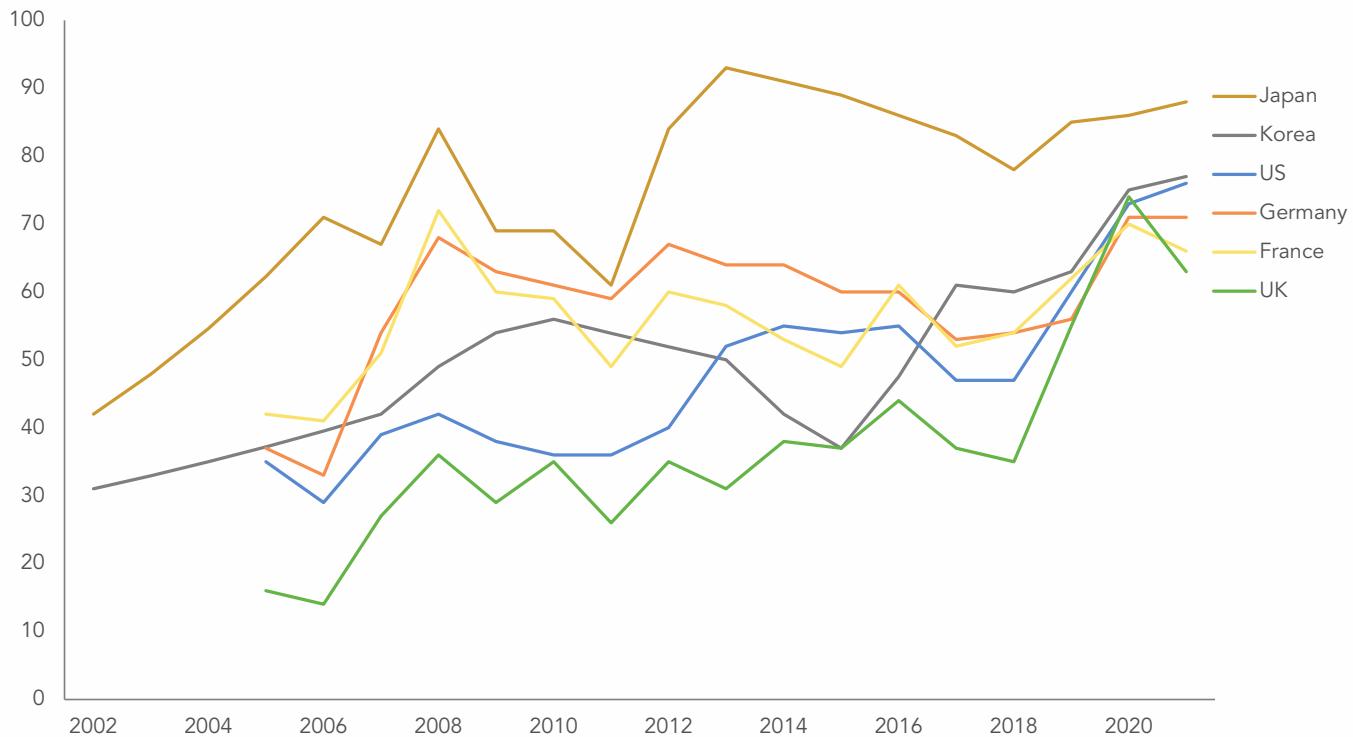
In short, the digital revolution occurred alongside a massive, but ultimately one-time, expansion of the world’s productive capacity, principally its effective labour force.²⁴ And underpinning all of these developments was the acceptance on both the political left and right of neoliberal ideas. Critically, this meant broad support for globalisation, combined with tolerance of free-wheeling finance and free movement of workers. The dominance of an economically liberal, internationalist, rules-based policy regime was ultimately the sufficient condition that gave rise to the ‘deflation machine’.²⁵

But, apart from the technological advances discussed above, these disinflationary tailwinds have one thing in common: they are all now much diminished and, in many cases, have morphed into malign headwinds. This is the central conceit that currently stalks financial markets. The disinflationary potential of digital technologies is not to be dismissed, but the political, geopolitical and social environment of the next decade looks to be eminently hostile to those who hope to profit from them.

THE POLITICAL AREA HAS CHANGED

Indeed, the demise of the ‘deflation machine’ should be viewed as a process that began in the aftermath of the 2008/2009 crisis. This experience exposed the structural flaws in our complex, interconnected economic system, not least the malign side effects of globalisation²⁶ and an unanchored financial system²⁷. It also focused voter attention on the loss of sovereign power, drained from national governments, as we marched towards a globalised economy. ‘Taking back control’ became a dominant theme in Western politics²⁸. The political dynamics unleashed by the 2008/2009 crisis are inherently inflationary: they are anti-globalisation, anti-immigration and populist in nature. The ‘citizens of somewhere’ have found their

FIGURE 3 % OF POPULATION WITH AN UNFAVOURABLE VIEW OF CHINA



Source: Pew Research Centre

voice. The result: a harsher and more polarised political system, focussed on how to allocate the national pie, rather than how to grow it. Not since the 1970s has such a dynamic been seen in the West.²⁹

That this is happening amidst a profound geopolitical realignment between the world's two economic superpowers could not be more relevant. The need to reset relations with China is one of very few issues that commands bipartisan support in US politics – and increasingly across electorates (see figure 3). Politicians from across the floor endorse a move away from strategic cooperation towards strategic rivalry.

Economic decoupling may be too strong a description of the forces that have been unleashed by this shift in Sino-US relations. But there seems little doubt that the process of globalisation has at best been constrained, at worst been in retreat. The pandemic can only add to this trend of economic disengagement. Just-in-time optimisation will give way to just-in-case redundancies in business planning. In the political marketplace, efficiency and growth, the overriding objectives of the pre-GFC regime, have given way to resilience and fairness as the core values that will dominate post-covid.

A LESS COMPETITIVE, MORE INFLATION-PRONE ECONOMIC SYSTEM

If these so-called structural tailwinds had been so important and are now diminished, then why has inflation been so quiescent in the years since the GFC? Does the struggle to lift inflation back to its 2% target not highlight the persistence of structural disinflationary forces? Possibly but just because observed inflation was persistently low over the decade preceding the pandemic, it does not mean that the underlying dynamics of the economic system had themselves remained constant.

Our argument is the world economy has become significantly more inflation prone over this period – more liable to developing its own self-reinforcing inflationary momentum in the face of unexpected developments and shocks. Inflation has remained stubbornly low in spite of the less favourable supply-side backdrop. And the reason: a decade of balance sheet repair by Western banks and private sector borrowers. This 'debt deflation', now largely complete, has hidden from view a slow but profound shift in the inflation sensitivity of the global economy.

The evidence for this is increasingly visible. For instance, across the major advanced economies, the persistent deflation in durable consumer goods categories – the most trade-intensive and information and communications technology (ICT) exposed part of the CPI basket – has been waning consistently through the 2010s. On the eve of the pandemic, it had turned into mild inflation (see figure 4). Entirely consistent with this, there is abundant evidence of slower productivity growth in country after country over the last decade, despite all the talk of a brave new world centred on artificial intelligence (AI), machine learning and the ‘internet of things’ (IoT).³⁰ Reduced competitive forces within the business sector, linked to the increased concentration of industries and the dominance of large entrenched firms, seem to have played the dominant role.

Thus, the situation on the eve of the pandemic can best be described as follows: after a decade of exceptionally loose monetary policy to offset lingering debt-deflationary headwinds, the economic system had become littered with inflationary dry tinder, just waiting to be ignited. When this might occur was the

question that had preoccupied us for some years. The pandemic has now provided the answer.

This perspective is challenged by central bankers, who argue the pandemic-induced spike in prices will prove transitory: a little inflation which does nothing to alter the medium-term inflationary risks. Indeed, the US Federal Reserve doesn’t just believe the rise in inflation will be short-lived, but in some ways is actively supportive of it. As part of its new policy strategy, formalised in summer 2020, it wants to promote a phase of inflation above its 2% target in order to make up some of the shortfall endured after the GFC.³¹ A promise of exceptionally low interest rates and ongoing ‘quantitative easing’, despite the unexpectedly rapid recovery of activity and inflation, is the means to achieve this. The intention is to better anchor stubbornly low inflation expectations at its 2% target (see figure 5), while maximising the chances of a swift return to ‘full employment’.³²

INFLATION IS ALWAYS AND EVERYWHERE A POLITICAL CHOICE

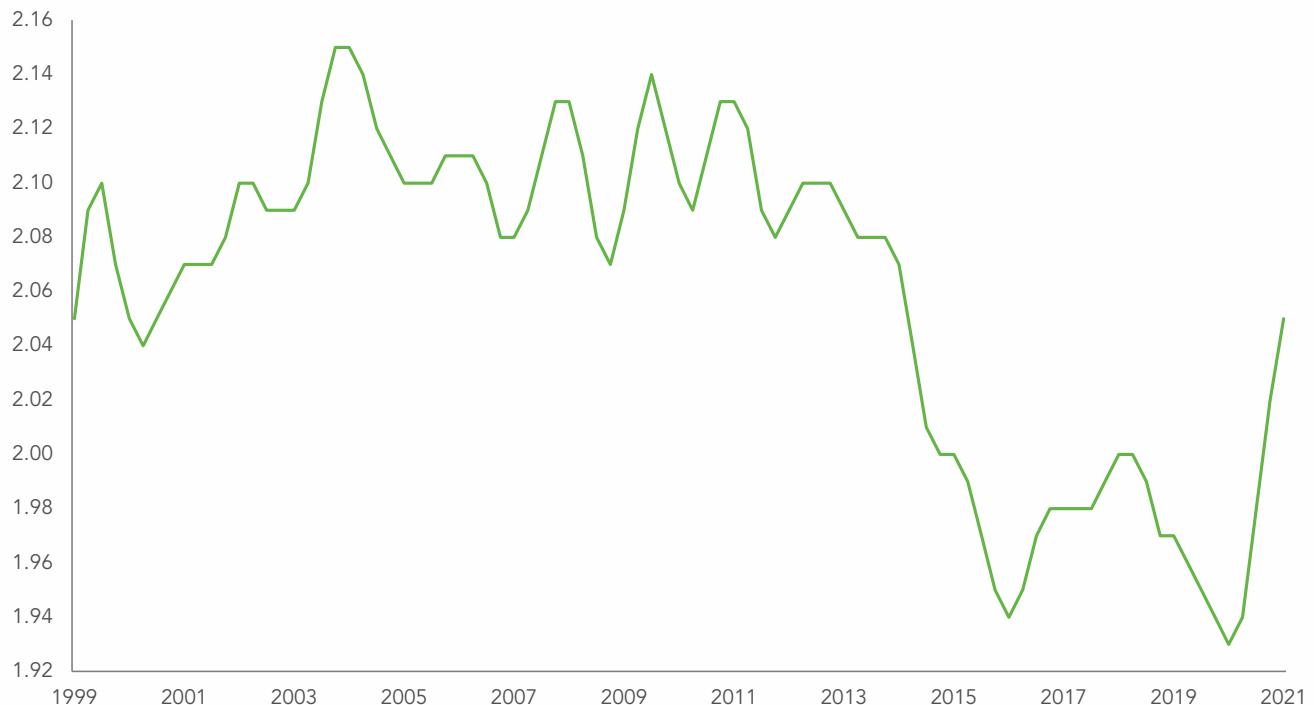
Central bankers now appear committed to exceptionally accommodative monetary policy, until there is clear evidence inflation is above 2%

FIGURE 4 DURABLE CONSUMER GOODS PRICE INFLATION IN ADVANCED ECONOMIES, %



Source: National statistics agencies, Ruffer calculations. Spending weighted aggregate across G7 economies, US data only before 1989. Data to Sep 2021

FIGURE 5 FEDERAL RESERVE BOARD'S INDEX OF COMMON INFLATION EXPECTATIONS, %



Estimated using a dynamic factor model, 21 data series, model output projected onto the 10 year ahead PCE average forecast from the Survey of Professional Forecasters

and poised to overshoot that target for some time.³³ Gone is the notion of ‘long and variable lags’ – the idea that policymakers should pre-empt any rise in inflation, by normalising monetary policy well before ‘full employment’ has been reached.³⁴ Whatever the desirability of this strategy in other environments, it seems highly inappropriate for that which lies before us. It is hard to disagree with Larry Summers, doyen of the liberal economics establishment, who recently remarked US economic policy “was the least responsible [it had been] in forty years”.³⁵ The problem is unprecedented policy support to aggregate demand is meeting constrained aggregate supply, as the global economy gets rebooted. The dominant view is this imbalance will be short-lived, reflective of a temporary shift in patterns of spending, work and travel caused by the pandemic. As businesses fully reopen and the covid-19 virus becomes an endemic, but otherwise unremarkable, feature of society, economic life will return to normal. Bottlenecks and disruption will fade quickly, and with them, any upward pressure on inflation.³⁶ Consumers and firms will look through the current spike in inflation, leaving the world economy’s

fundamentally disinflationary nature to become apparent once again.

The policymaking elite may ultimately be proved right. Indeed, there is almost certainly going to be a period in the middle of next year when inflation rates – the level of prices today compared with twelve months ago – fall back towards central bank targets. On the one hand, there will be sizeable ‘base effects’ due to the big moves in prices on a monthly basis through the second and third quarters this year; on the other, there are sound reasons to expect prices in sectors currently hit hard by bottlenecks to revert towards pre-covid norms.

This will be the moment of maximum danger for investors and policymakers who believe the disinflationary dynamics of recent decades remain entrenched. We are convinced this is not so. No one can be sure what patterns of spending, work, living arrangements and travel will emerge over the years ahead, but it looks increasingly likely the pandemic will permanently reshape the economic landscape.

The journey back towards this reshaped economy is already coinciding with a substantial jump in consumer prices (see figure 1). This is happening at a moment of reviving ‘animal spirits’, of rapidly improving job

prospects and of highly supportive developments in the credit system. The contrast with the last extreme spike in raw materials prices, and CPI inflation, back in 2008 could not be more obvious. Moreover, the inflationary reopening boom is taking place alongside a radical shift in what policymakers are prepared to do, driven, ultimately, by voters' changed attitudes to the State.³⁷ We do not pretend persistently higher and more volatile inflation is a certainty, but at no point in recent decades has our economic system been more primed to accommodate, and over time reinforce, a 'transitory' spike in cost pressures.

Milton Friedman argued "inflation is always and everywhere a monetary phenomenon", a dictum that has dominated the policy environment since Paul Volcker crushed inflation in the early 1980s.³⁸ On one level, he was entirely right: sustained inflation cannot occur without the connivance of the monetary authorities, whose actions ultimately constrain the banking system and its ability to create 'money'. Monetary laxity is a necessary condition for price instability. Because central banks remain independent and committed to price stability, the argument goes, the current spike in inflation cannot be anything other than temporary.

In an important sense, however, Friedman's dictum has been misunderstood.³⁹ At a more fundamental level in modern liberal democracies, inflation is always and everywhere a political choice.⁴⁰ The monetary laxity that sustained inflation arises because it becomes the path of least resistance for the political elite in the face of voter disenchantment.⁴¹ The popular notion inflation is 'too much money chasing too few goods' is therefore incomplete; in practice, this dynamic becomes entrenched only when politics becomes focussed on how to split the existing pie more equitably. Simply put, inflation results when 'too many claimants chase too little income' and the political class chooses to accommodate, or is unable to resist, voters' populist instincts.

For now at least, central banks remain *de facto* independent of the political sphere. But this does not mean those in charge are blind to the political dynamics at work. By their own admission, central bankers have become more tolerant of above-target inflation over the last decade; that is the essence of the Fed's strategic

review. Is it so hard to believe if, or more likely when, central banks are forced to fight elevated inflationary pressures before 'Main Street' has made a full recovery, they choose the path of least political resistance?

Technocratic central bankers serve at the behest of elected representatives. They know how the political game is played and are skilled at it. The incentives to delay exit from their extraordinary stimulus programmes are overwhelming. Moreover, to the extent something unexpected tips the economy back into a downturn in the next few years, they will have little option but to support whatever political efforts are made to shield 'Main Street' from further economic harm. The door to monetary financing is ajar, if not wide open.

HARDWIRED TO THE INEVITABILITY OF LOW INFLATION

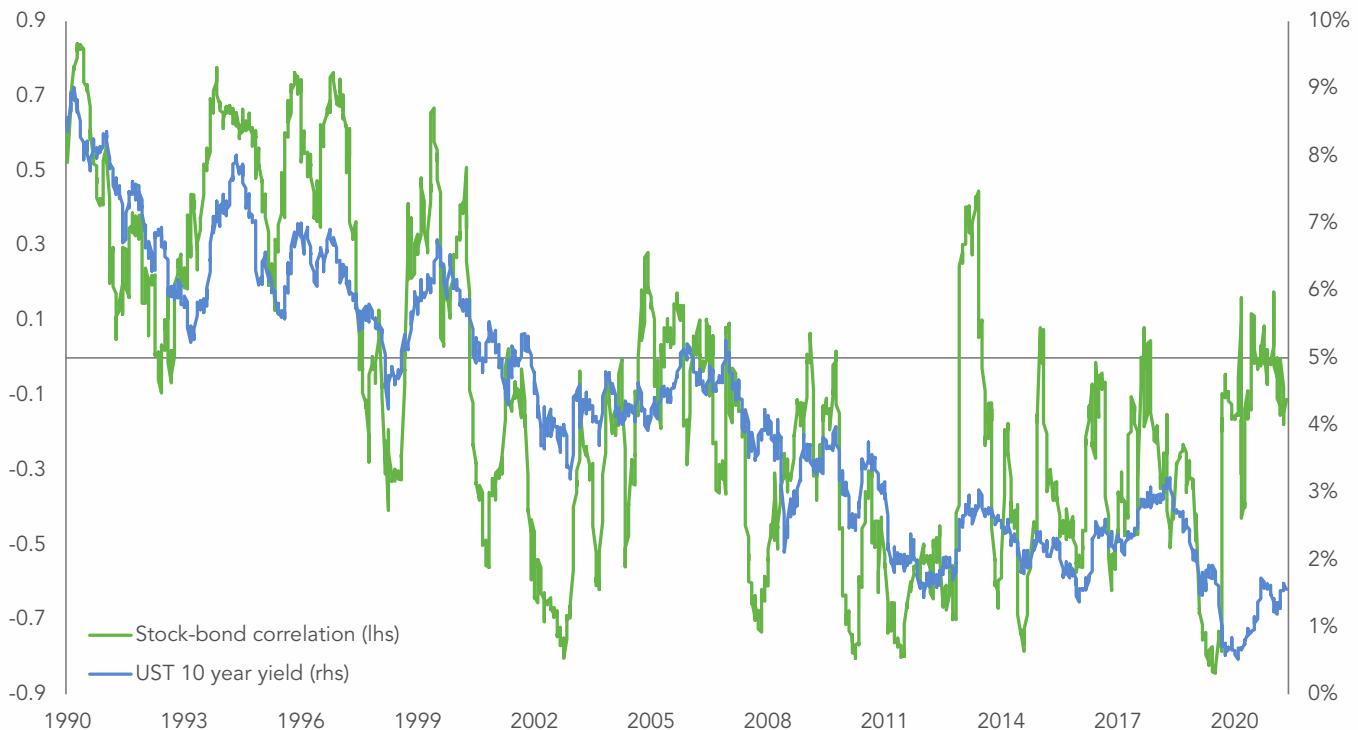
For now, the investment world is focused on the somewhat banal debate about just how transitory the spike in inflation proves to be.

Will it take a few months or somewhat longer before inflation is back at its 2% target? This is the wrong question.

The real threat is a shift in the inflation regime, a transition of profound consequence for investors. The deflation machine bred dynamics within financial markets ideally suited to long-term investment performance: robust global growth, sustained declines in nominal and real interest rates; lower macroeconomic volatility; and a negative correlation between risky assets and government bonds, especially during market drawdowns (see figure 6). The death of inflation risk played a starring role, granting long-duration 'risk-free' debt the ideal hedging characteristics for portfolio diversification.

But stability breeds instability.⁴² After more than a decade of interest rates close to 0% and the heavy footprint of central banks in government bond markets, the financial ecosystem has become wired to the inevitability of low inflation and depressed nominal interest rates. Asset volatility, historically a gauge of risk, has become an input into the process of portfolio construction. It is now as much a driver of risk appetite, as it is a measure of it, a classic example of Goodhart's law at work. The consequence is a financial system

FIGURE 6 CORRELATION BETWEEN US EQUITY AND UST BOND RETURNS



Source: Refinitiv, Ruffer calculations. Weekly data, rolling window of 26 weeks, data to November 2021

into which the absence of inflation risk has been hardwired.⁴³

Yet, the re-emergence of inflation risk is the most likely consequence of the covid-19 pandemic, given the background economic and political environment when it struck. Central bankers are unprepared, they are still fighting the post-GFC war.⁴⁴ Likewise investors, still anchored to the narrative spun by policymakers and conditioned by their recency bias.

RESET REQUIRED

Who knows exactly what the future may hold? Certainly, it seems rather odd, as many do, to consider only two future scenarios, one being the disinflationary status quo, the other a re-run of the 1970s. The OPEC oil embargo of 1973 was undoubtedly an extreme event with profound ramifications for the world economy. It

made the subsequent inflation surge far more powerful than it might have been, but the inflationary writing was already on the wall.⁴⁵

Whatever stands before us, it will not be a re-run of the 1970s. The economic system is structurally very different.⁴⁶ And there is no reason to expect geopolitical shocks to rival either the collapse of the Bretton Woods system or the subsequent oil price spike.

But this should be no comfort for investors. Far more than was the case in the early 1970s, the financial system is anchored to the belief that inflation risk is dormant. Moreover, given how far nominal interest rates have fallen and how stretched asset valuations now appear, the dangers of a reset in market fundamentals to a regime of higher, more volatile inflation look that much greater.



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ENDNOTES

- 1 The creation and evolution of this ‘deflation machine’ were discussed briefly in the author’s [2021 Ruffer Review article](#). A more detailed discussion of the structural forces underpinning the three-decade phase of disinflation can be found in this Ruffer research note, [Globalisation and the Deflation Machine](#)
- 2 No one could have quantified in advance the supply-chain disruption that has emerged in the pandemic’s wake. But, qualitatively, material and pervasive supply-side constraints always seemed a likely consequence during any reopening phase, given earlier efforts to forcibly restrict economic activity and social mobility. That policymakers and forecasters failed to anticipate them is not entirely surprising, since modern macroeconomics is singularly ill-equipped to analyse the economic consequences of a pandemic. For it is predicated on the notion of rational, forward-looking representative firms and households. In short, one can focus solely on the behaviour of this representative firm or household as a proxy of the entire (normally-distributed) population of firms and households in the economy. For numerous reasons, this is an absurd assumption. Most importantly, the economy is, in practice, an astonishingly complex, evolutionary system, inhabited by highly heterogeneous firms and households, distributed in a manner that looks nothing like the symmetric (bell-shaped) normal curve which underpins standard econometric tools. This system is highly path-dependent and displays dynamics – robust most of time, yet exceptionally fragile when critical nodes face economic or financial difficulty – that can never be replicated in a representative agent model. Little known academic work focussing on the economic effects of natural disasters is especially instructive. In particular, we would point interested readers towards research that emerged after the 2011 Japanese earthquake and tsunami. See, for instance, Carvalho et al. (2020), ‘Supply chain disruptions: Evidence from the Great East Japan Earthquake’. Baqae (2019), ‘Cascading failures in production networks’ or Cesa-Bianchi & Ferrero (2021), ‘The transmission of Keynesian supply shocks’ are notable theoretical works in this field.
- 3 US data from the Bureau of Economic Analysis that tracks real (ie price-adjusted) personal consumption expenditures, for instance, suggests that even 18 months into the pandemic the volume of spending on ‘goods’ remains dramatically higher (8%) than the implied pre-covid trend, while an equally sizeable shortfall (5%) in spending on services is apparent. A comparison of trends in spending on ‘goods’ versus ‘services’ after all previous post-WWII recessions also reveals the unique nature of the downturn and recovery triggered by the covid-19 pandemic.
- 4 Most obviously, the accelerated shift in ‘goods’ spending towards online sellers and away from bricks-and-mortar stores.
- 5 See, for instance, Bloom & Ramani (2021), ‘The donut effect of covid-19 on cities’. While most media attention is focussed on bottlenecks in the semiconductor and shipping industries, we would argue that the most profound impact of the pandemic will be on changing regional patterns of demand and activity, linked to a persistent, if not permanent, shift in the nature of office work. As Nicholas Bloom and his co-author highlight, migration flows from high-density city centres to lower-density suburbs have been dramatic (in the US data they uncover, at least). It seems likely that some of these flows will reverse, as the pandemic subsides. But to the extent that full-time office work will no longer be the norm, this ‘donut effect’ on cities will be long-lasting, fundamentally altering where consumer spending takes place within national borders – and by implication the necessary location of commercial real estate, logistics infrastructure and workers.
- 6 Of these, we would stress the central role of political and social forces rather than the economic trends which dominate financial market commentary and analysis. Thematically, we remain convinced of the dominant role that the former play in shaping the dynamics of the economic and financial system – that is, how the economy adjusts to and propagates the random shocks that strike it. Critically, these political and social forces shape over time both the dominant intellectual paradigm and its close cousin, the policy regime, ie how, and with what tools, policymakers react to macroeconomic events. There is an extensive literature in the world of political science documenting these tectonic shifts in political and social life. The following have played an outsized role in shaping our thinking: Luce (2017), ‘The retreat of Western Liberalism’; Goodwin & Eatwell (2018), ‘National Populism: The Revolt Against Liberal Democracy’; Goodhart (2017), ‘The Road to Somewhere: The New Tribes Shaping British Politics’; and Mair (2013), ‘Ruling the Void: The Hollowing of Western Democracy’.
- 7 The [2019 Ruffer Review article](#) by Henry Maxey, our CIO, outlines the changed nature of our financial ecosystem, the transference and mutation of embedded, hidden risk from banks (credit and funding risk) to asset managers (liquidity risk) and its prospective intolerance to a return of inflation risk.
- 8 See, for instance, the global database of central banks’ responses to the pandemic, [compiled by researchers at the BIS](#)

- 9 The IMF Fiscal Monitor Database has collated and aggregated fiscal measures in response to the covid-19 recession across a huge range of countries
- 10 Less cross-country analysis has been done in this area. For research on government support to the banking sector through the pandemic, see Casanova et al. (2021), 'covid-19 policy measures to support the banking lending', *BIS Quarterly Review September 2021*. For analysis of the regulatory support to protect household and small business borrowers in the US, see Cherry et al. (2021), 'Government and household debt relief during covid-19', *Brookings Papers on Economic Activity, Fall 2021*
- 11 This judgement is critical to our global macroeconomic outlook. We do not assume that the fiscal support required to manage the covid-related emergency will be maintained indefinitely; far from it, in fact. As is already clear, emergency support mechanisms will be dialled back once the virus becomes endemic. But we do judge that no major economy will return to the policy approach pursued after the GFC – of persistent, structural fiscal tightening, a policy, one might add, which was politically successful in a number of economies. Indeed, we expect fiscal policy to become the marginal policy instrument in the years ahead, flexing aggressively and quickly if the post-covid recovery starts to fade.
- 12 In recent years, an extensive literature has emerged stressing the contingent nature of the economy's response to fiscal policy. In particular, the 'fiscal multiplier' has been shown to depend particularly on the state of the business cycle (the multiplier is lower when growth/output is weak), the health of the financial system (the multiplier is lower when the credit cycle is more extended or financial conditions are tight) and the direction of the fiscal intervention (the multiplier is lower for fiscal expansions than it is for contractions). Relevant papers are: Cohen-Setton et al. (2019), 'Aggregate effects of budget stimulus: evidence from the large fiscal expansions database', *Peterson Institute for International Economics Working Paper No. 19-12*; Borsi (2016), 'Fiscal multipliers across the credit cycle', *Banco de España Working Paper No. 1618*; and Barnichon et al. (2021), 'Understanding the size of the government spending multiplier: it's in the sign', *Federal Reserve Bank of San Francisco Working Paper No. 2021-01*. Given the conditions after the GFC – depressed aggregate demand and plentiful spare capacity, tight financial conditions and pervasive fiscal contractions – it is little wonder that the economy recovery proved to be so sluggish despite the enormous and long-lasting support from monetary policy.
- 13 The Basel III monitoring report, published by the Basel Committee on Banking Supervision, provides a good summary of the marked improvement in the structure of bank balance sheets over the last decade. For historic data covering individual banking systems, this dataset from the NY Fed is the most comprehensive source for the US. For the UK, visit the Bank of England's Financial Stability webpage
- 14 This speech by Jerome Powell from August 2021 exemplifies the consensus view on the FOMC. For a very similar perspective from Isabel Schnabel, a member of the ECB's executive board, see this speech from October 2021
- 15 See, for instance, Brynjolfsson & McAfee (2014), 'The second machine age: work, progress and prosperity in a time of brilliant technologies'; or Azhar (2021), 'Exponential: how accelerating technology is leaving us behind and what to do about it'.
- 16 Bresnahan & Trajtenberg (1992), 'General purpose technologies: engines of growth?', NBER Working Paper No. 4148, is a widely-referenced paper looking back at the steam and electricity revolutions from an economic standpoint. See Liao et al. (2020), 'ICT as a general purpose technology: the productivity of ICT in the United States revisited' (available here) or van Ark (2016), 'The productivity paradox of the new digital economy' (available here) for the evidence that ICT and digital technologies will drive a new phase of GPT-led growth.
- 17 Plenty has been written about the extended gap between the invention and discovery of electricity (in the 1860s) and the productivity-enhancing diffusion of related technologies throughout the business sector (in the 1920s-30s). See, for instance, Petralia (2017), 'Unravelling the trail of a GPT: the case of electrical and electronic technologies from 1860 to 1930'
- 18 There is now an extensive body of research highlighting the increasing gap along a number of dimensions between so-called 'superstar' firms at the technological frontier and the long (and growing) tail of 'laggard' firms. Andrews et al. (2019), 'The best versus the rest: divergence across firms during the global productivity slowdown', CEP Discussion Paper No. 1645, has been an especially important contribution. Why we have witnessed this growing gap between the frontier and the rest is unclear, although the specific characteristics of ICT and digital technologies – not least their intangible nature – likely play an important role. Recently published research hints at an alternative and intriguing possibility, namely that monetary excess and the ratcheting down of interest rates have exaggerated any technological drivers of the 'superstar' phenomenon. See Liu, Mian & Sufi (2021), 'Falling rates and rising superstars', NBER Working Paper No. 29368

- 19 This is one of the main conclusions of Carlota Perez's engrossing 2002 book, 'Technological revolutions and financial capital: The dynamics of bubbles and golden ages'. Despite being written 20 years ago, its characterisation of 'technological surges' as occurring in two distinct phases, an 'installation' phase (of rapid innovation, high but unequally distributed returns on capital and political turmoil) and a 'deployment' phase (of rapid diffusion and application of productivity-enhancing technologies, broad-based gains in living standards and calmer political waters) remains exceptionally relevant when trying to understand today's disruptive digital technologies.
- 20 See, for instance, Andrews et al. (2016), 'The global productivity slowdown, technology divergence and public policy: a firm-level perspective', *Hutchins Centre Working Paper No. 24*
- 21 There are at least two critical differences in the political and policy regime between the current ICT-led growth phase and earlier technological revolutions. Both would suggest an increased likelihood of economic and political volatility during the 'adoption' phase of this GPT. First, today's economic system is underpinned by a fiat money system, in which it is ultimately only the credibility of the central bank, and at one remove the coercive powers of government, that anchor inflation. Before the First World War, by contrast, national currencies were anchored to gold via Keynes' 'barbarous relic', the Gold Standard; post-WWII, the Bretton Woods system was the foundation of global finance. Whatever the flaws of these systems, they did provide a more robust anchor to the price level than that afforded by the fiat money system. Second, during previous revolutions, the voter franchise was highly restricted along gender and class lines, whereas today we have mass voter participation. Historically, political power was concentrated in the hands of capital owners, the class most likely to benefit during the 'discovery' and 'adoption' phases of previous revolutions. The losers, workers whose jobs were destroyed as new electrical technologies upended existing business practice, could mount little political resistance. Today, by contrast, the 'citizens of somewhere' can exert far greater influence on the political process to resist the rise of superstar companies and the concentrations of wealth they create.
- 22 See Grigoli et al. (2019), 'A cohort-based analysis of labour force participation for advanced economies', *IMF Working Paper No. 18/120*
- 23 See Juselius & Takats (2018), 'The enduring link between demography and inflation', *BIS Working Paper No. 722*. The authors not only document the dramatic shift in demographic structures across the major economies over the last century but also uncover a clear link between these shifts and underlying inflationary trends. While the mechanism remains unclear, there appears to be a strong (low frequency) negative association between the size of the (high-saving) prime-age working population relative to the (low saving) dependent population and inflation.
- 24 This is the central point in Charles Goodhart and Manoj Pradhan's recent book, 'The great demographic reversal: ageing societies, waning inequality and an inflation revival'.
- 25 In the geopolitical sphere, the acceptance and active promotion of 'strategic co-operation' by the US political and business elite in relation to China is also highly relevant. Beguiled by Fukuyama's (misunderstood) notion of the 'End of History', US Administrations of both the Left and the Right pursued a policy of engagement with China. The country was welcomed into the global rules-based economic system in the hope that it would encourage Beijing to become a responsible stakeholder in the US-led multilateral world order. John J. Mearsheimer's recent illuminating article in Foreign Affairs, 'The inevitable rivalry: America, China and the tragedy of great-power politics', makes this point clearly. Even more pertinent, the article stresses the inevitability of the shift to 'strategic rivalry' that would follow, and has followed, from these decisions.
- 26 See, for instance, Bloom et al. (2019), 'The impact of Chinese trade on US employment: the good, the bad and the debatable'. As is true of similar research, the authors find limited evidence that Chinese import penetration into the US economy negatively impacted overall employment. However, there is clearer evidence of damage to jobs in manufacturing and lower-skilled occupations, as well as a critical regional dimension, with jobs shifting from US industrial heartlands towards the more service-orientated coastal cities. These dynamics are suggestive of a causal effect of globalisation and China's economic rise on domestic US political trends.
- 27 Borio (2014), 'The international monetary and financial system: its Achilles heel and what to do about it', *BIS Working Paper No. 456*, provides the most complete and coherent diagnosis of the credit boom/bust phase during the 2000s.
- 28 See the references in footnote 6.
- 29 While this view remains contentious within the economics profession, in other disciplines there is much greater sympathy for the idea that the roots of the 1970s inflation lay in the political and social forces at work. We share that interpretation of the 'stagflationary' environment – or at least take the view that one cannot fully understand why the monetary excesses of the 1970s were allowed to persist without first comprehending the political economy pressures of the day. Goldthorpe & Hirsch (eds) (1978), 'The political economy of inflation', and in particular the

- chapter written by Fred Hirsch, entitled 'The ideological underlay of inflation', is especially illuminating in this regard.
- 30 See, for instance, Cette et al. (2020), 'Growth factors in developed countries: a 1960-2019 growth accounting decomposition', *Banque de France Working Paper No. 783*. Looking at productivity trends across 30 countries since 1960, the authors uncover clear evidence of a broad-based and long-lasting decline in growth of output per worker, with reduced non-ICT capital deepening and slower 'total factor productivity' growth being the dominant reasons for the decline.
- 31 The formal document outlining the FOMC's [reformulated longer-run goals and monetary policy strategy](#). Alongside this document, the FOMC released a plethora of analytical papers authored by Federal Reserve staffers that provide the intellectual foundation of this new policy strategy.
- 32 While the FOMC has gone further than other central banks in formalising a new policy strategy, in which goals other than price stability are given increased weight in the 'reaction function', there is no doubt that other central banks have implicitly shifted towards the Fed's position. The ECB's recent [Strategy Review](#) suggests it is sympathetic towards the intellectual paradigm that underpins the Fed's 'flexible average inflation targeting' framework.
- 33 In recent weeks, short-term interest rate markets have started to price in lift-off for policy interest rates from their lower bound. Other things being equal, this would suggest a tightening of financial conditions. But it is striking that forward interest rates beyond the next year or so have barely moved and in some cases have declined. Financial markets may sense a somewhat less accommodative monetary stance over the next year but all told investors expect that nominal risk-free interest rates will remain exceptionally low relative to history for years to come.
- 34 The phrase was made famous by Milton Friedman in his 1961 *Journal of Political Economy* article, 'The lag effect in monetary policy'.
- 35 He made these remarks in a [Bloomberg TV interview](#) on 19 March 2021
- 36 We are unconvinced by such arguments for two fundamental reasons. First, neither individuals in relation to their working lives, nor businesses in relation to their supply chains and end-customers, can know what patterns of spending will ultimately emerge over the medium to long-run, as the pandemic fades. To what extent will the changes that occurred during the pandemic persist after it recedes into the background? This uncertainty about future demand and the counterpart allocation of resources suggests there are no inherent forces within the economic system that should return it to its previous equilibrium, as policymakers assert should happen quickly. Second, even if there was no uncertainty about future patterns of demand, the astonishing complexity of modern supply-chains and financial networks means that it could take a long time for economic agents and providers of finance across the global economic network to co-ordinate their behaviour such that the system is returned to its pre-covid state. Given how depleted inventories appear in parts of the global goods network, this co-ordination problem is highly relevant for thinking about the nature of the post-covid recovery, in particular the balance between real growth and inflation.
- 37 Janen Ganesh, the FT's US political commentator, put it best in his [2 March 2021 article](#), writing: 'the coronavirus pandemic has become a root of national stereotypes... Of all the surprises, though, it is the US thirst for government that is most confounding.'
- 38 See Friedman (1970), 'The counter-revolution in monetary theory', IEA Occasional Paper No. 33.
- 39 Milton Friedman himself made this point on many occasions, arguing quite categorically that while monetary excess was a necessary condition for sustained inflation, it was not a sufficient condition. He stressed that rampant inflation, while made possible by excessively rapid monetary growth, was intricately linked to political and social forces that permitted and encouraged such policy mistakes. [This speech](#), delivered at the University of San Diego in 1978, makes plain Friedman's view on the subject.
- 40 Economists tend to be dismissive of political and social explanations of inflation and other macroeconomic phenomena. But the functioning and dynamics of the economic system are surely intertwined with the background political environment. One wonders, therefore, whether the shift from elite-dominated to full participatory democracy during the 20th century fundamentally altered the way economies operated, in particular whether this shift made possible the pernicious, sustained inflation of the 1970s.
- 41 This would suggest an important point of departure from the 1970s. Whatever the structural features were that allowed inflation to get out of control 50 years ago, inequality of economic and political power was not one of them. Indeed, economic inequality, whether measured by incomes or wealth, reached historic lows during the 1970s. The contrast with today could not be more stark. Economic inequality is at multi-decade highs across the West. And throughout the political landscape, the issues of sovereignty and excessive elite power are dominant concerns.

- 42 This phrase is most often associated with Hyman Minsky and his ‘financial instability hypothesis’ (outlined in this 1992 Levy Institute Working Paper). In his framework, macroeconomic stability endogenously generates excessively leveraged balance sheets throughout the economy, which in turn create the conditions for a subsequent downturn in activity and employment, as those balance sheets are repaired, forcibly and voluntarily. It is a bank-centric model, in which credit risk plays a starring role. In today’s system, dominated by capital markets, the Minsky framework undoubtedly remains relevant; but liquidity risk probably ought to play the starring role, with non-bank intermediaries being the locus of financial cycles. The critical dynamic that creates endogenous fragility in the modern system is the way in which measures of asset price volatility are used to scale the amount of desired risk taken in investor portfolios. Whether explicit (via VaR constraints on dealer balance sheets) or implicit (via investment processes that equate price volatility to asset risk), the notion of volatility being an input into portfolio construction, and in some corners of the system a traded financial security, has added another dimension to Minsky’s essential insight that macroeconomic stability breeds instability within the financial system. See Cole (2017), ‘Volatility and the alchemy of risk: reflexivity in the shadows of Black Monday 1987’, Artemis Capital Management Research Paper.
- 43 Recent empirical evidence points to a direct link between the level of risk-free nominal interest rates and risk-taking in the financial system. Numerous authors have uncovered behaviours consistent with the so-called ‘risk-taking channel’ of monetary policy, both in relation to banks’ lending behaviour – see, for instance, Adrian et al. (2018), ‘Risk-taking channel of monetary policy’, CEPR Discussion Paper No. 12677 – and in relation to non-banks’ asset allocation – see, for instance, Guizio et al. (2021), ‘Investment funds, risk-taking and monetary policy in the euro area’, ECB Working Paper No. 2605. More troubling is the fact that risk appetite appears to be a non-linear function of the level of interest rates, with investors’ allocation towards risky assets rising sharply as risk-free interest rates falls towards their lower bound. And, strikingly, this convex relationship between portfolio allocation and the level of interest rates is driven, it seems, by nominal risk-free rates. See Lian & Ma (2018), ‘Low interest rates and investor behaviour: a behavioural perspective’.
- 44 Central bankers are ill-prepared for the environment that faces them along three dimensions: intellectually, politically and institutionally. Intellectually because they are wedded to a broken economic model (the representative agent Walrasian ‘New Keynesian DSGE’ model) that embeds a flawed concept (the notion of an ‘equilibrium’ interest rate, r^* , that has dropped precipitously in recent decades to historic lows). Politically because at the very moment that wider social forces are forcing them to pay greater attention to goals other than price stability – inequality, a broad and inclusive measure of full employment, climate change – they have to tackle the most intense inflationary pressures in three decades, a task that inevitably threatens their efforts to achieve these other social aims. Institutionally because in the aftermath of the 2008/9 financial crisis, central banks took on far greater responsibility for financial stability – a shift that exposed these institutions to greater political dangers, as well as redirecting resources and expertise away from their core remit of price stability.
- 45 We analysed the period before the 1973 OPEC oil shock, and the lessons that can be drawn from it, in our 2019 Ruffer Review article, ‘[Make American Inflate Again](#)’
- 46 There are at least two characteristics of today’s economic system that make it less inflation prone than the system 50 years ago. First, labour unions are weaker and represent a much narrower slice of the employed population. Second, the ‘goods economy’, where prices tend to be more responsive and more exposed to global commodity shocks, is a much smaller share of GDP and employment. While it is tempting to argue that these features make the economic system less likely to transmit and reinforce one-off inflation shocks, one can conceive of other structural differences that make the system more inflation prone. First, supply-chains are now cross-border, highly-financialised and far more complex than they were in the 1970s: bottlenecks and disruption could prove much harder to resolve today. Second, perceived and actual economic and political inequality are much greater now than was the case during the Great Inflation. To the extent that inflationary dynamics are heavily influenced by background political and social forces, in particular tensions between the ‘elite’ and the ‘masses’, this should increase concern about the system’s in-built inflationary tendencies. Third, the energy transition, as climate-related risks are managed, represents a long-lasting, and initially inflationary, shock, with profound consequences for the structure of the existing economic network.

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