

Monetary Policy in a World of Radical Uncertainty*



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1. Introduction

Fifty years ago, I was a graduate student in my first semester at Harvard. Winter in Cambridge Massachusetts is even colder than in Cambridge England. So during the summer I had purchased a winter coat in a country that understood winter clothing – Finland. I was staying with friends who helped me choose the perfect coat, but the shop told me they could not accept my payment: the previous day President Nixon had ended the link between the dollar and gold, and international payments were temporarily suspended.² Using a DIY version of hawala, the coat was purchased. That winter I stayed warm, but the dollar did not.

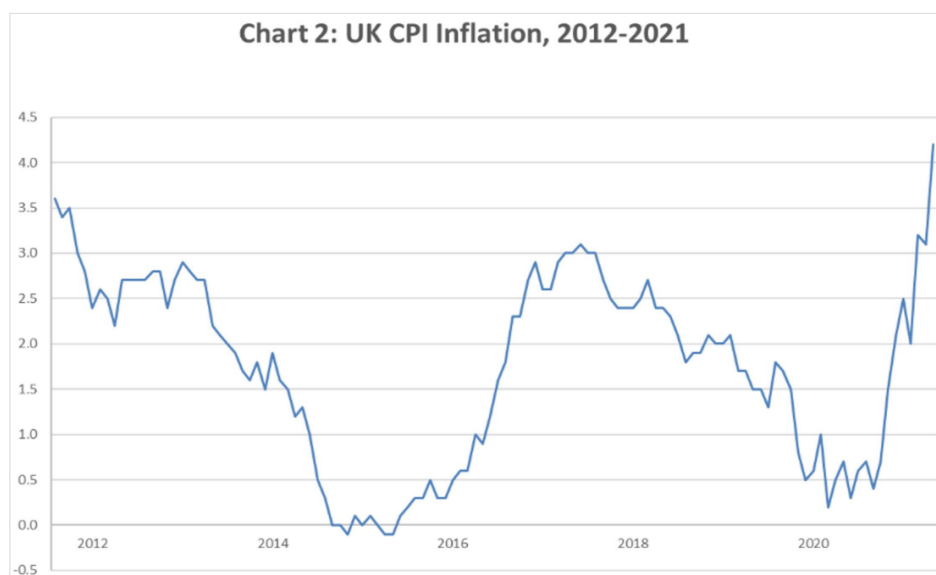
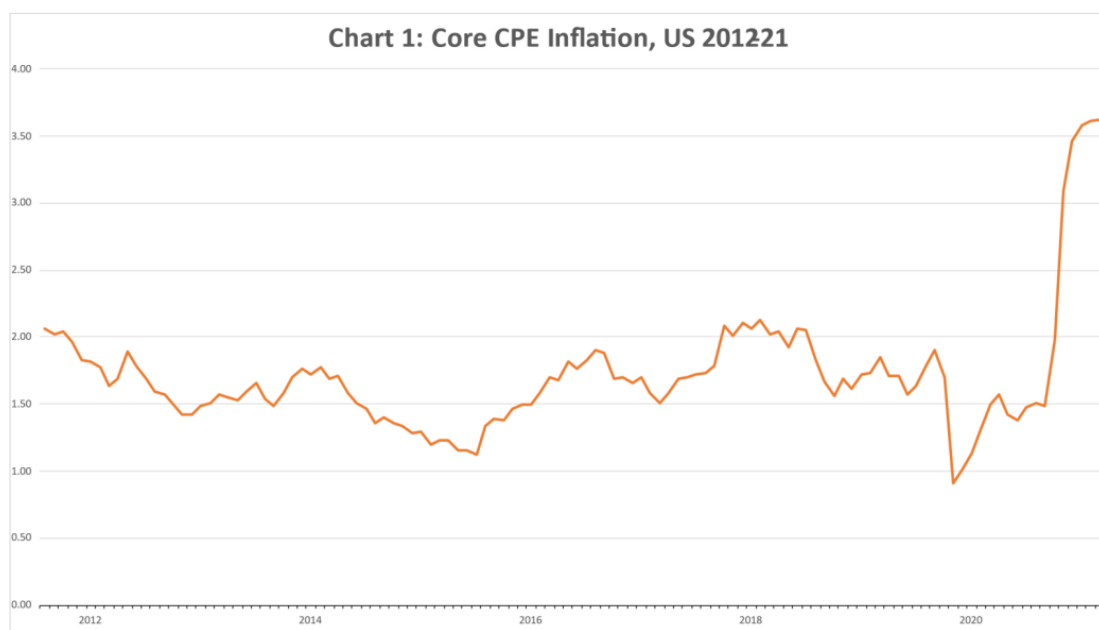
When I bought my coat, inflation in Britain had just hit 10%, up from only 1.4% four years earlier. On both sides of the Atlantic, inflation continued to rise, reaching 27% here in Britain in the summer of 1975. Eventually, policymakers realised that the solution to the inflation problem was monetary policy. But it took another decade or so before a combination of theory and practice led to a credible policy framework

* [Institute of International Monetary Research Annual Public Lecture](https://www.imr.org.uk/annual-public-lecture) held by **Mervyn King**, London, 23 November 2021 (see also: <https://mv-pt.org/wp-content/uploads/2021/11/Mervyn-King-Lecture-Script.pdf>).

¹ I am indebted to Alan Budd and Otmar Issing not only for helpful comments on a draft of this lecture but even more so for a long and fruitful intellectual and personal friendship.

² For an entertaining account of the decisions that led to the end of the dollar link to gold see Garten (2021).

that sustained low and stable inflation. Once again, inflation has risen well beyond the expectations of central banks. In the United States, CPI inflation is now 6.2%. As the Chairman of the Federal Reserve said earlier this month, “The level of inflation we have right now is not at all consistent with price stability.”³ Chart 1 shows the Federal Reserve’s preferred measure of inflation – the core personal consumption expenditure deflator. For a decade, inflation remained in the range of 1-2%, never threatening to fall below zero, but has now risen to its highest level in thirty years. Chart 2 shows CPI inflation in the UK; at 4.2% it is now well above target. Much of the ups and downs of UK inflation over the past decade reflect movements in the sterling exchange rate. That is not true of the recent rise in inflation with the effective exchange rate rather stable and a little higher than a decade ago. In its latest *Monetary Policy Report*, the Bank of England forecast that inflation would exceed 5% in the Spring of next year but argued that higher inflation was “still most likely to prove transitory”.⁴ In both countries official interest rates were left unchanged and remain close to zero. Even in the euro area, inflation has exceeded 4%, the highest rate since the financial crisis, and interest rates remain negative. Around the world, from China to Latin America, inflation is rising.



³ Jerome Powell FOMC Press Conference, 3 November 2021.

⁴ Minutes of the Monetary Policy Committee meeting ending on 2 November 2021, paragraph 70.

While much of the rise in inflation may turn out to be “transitory” – a word that will enter the lexicon of central banking – there is clearly great uncertainty about whether inflation will fall back to below the target or remain above it. My concerns about the inflation outlook stem in part from recent data but even more from the intellectual foundation of central bank policy. Central banks have been caught out by this sudden upturn in inflation. For several years they have been giving “forward guidance” that interest rates will remain close to or below zero for the indefinite future. They have drawn heavily on concepts derived from a family of theoretical models which rely on the assumption that expectations drive inflation, and central banks drive expectations.⁵ Inflation in the long run is determined by the official inflation target. I well remember that in the early days of the Monetary Policy Committee (MPC), we pored over various forecasts for inflation produced by the Bank staff for different interest rate decisions. No matter the path of interest rates that we simulated, inflation always returned to target. Why? Because in these models the only determinant of inflation in the medium term was the official target.

This is the King Canute theory of inflation. A thousand years ago, King Canute of England set his throne by the seashore and commanded the incoming tide to halt. The tide continued to rise and dashed over his feet and legs, driven by the laws of nature. A satisfactory theory of inflation cannot take the form “inflation will remain low because we say it will”; it has to explain how changes in money – whether directly via QE or indirectly via changes in interest rates – affect the economy.

In the models that now dominate central bank thinking, inflation is pinned down by a central bank “reaction function” which guarantees that interest rates or QE will be set so as to ensure that inflation returns to target. But in a world of radical uncertainty, where none of us know the true dynamics of the economy, we cannot be confident that central banks will in fact behave in a way consistent with hitting the inflation target. In such a world, expectations are too fragile to anchor inflation.

The old idea that inflation reflects “too much money chasing too few goods” has more relevance than the view that it is driven solely by expectations. But I have now mentioned the word that dare not speak its name – money. Money has disappeared from modern models of inflation. You do not have to believe that there is a stable mechanical link between a particular measure of money and inflation to regret that development. Expectations matter, but they are an incomplete description of the way changes in interest rates and the money supply translate into prices. And when people start to distrust the word of the central bank, they look at monetary variables, especially the broad money supply, to gauge the outlook for inflation. So, the question I want to pose tonight is: has monetary policy lost its intellectual anchor?

In so doing I want to make clear that I am not criticising decisions of the Bank of England made in recent months and years. The Monetary Policy Committee has access to more data and information than do I. I am more concerned about the intellectual framework that has come to dominate central bank thinking in **all** the advanced economies.

I want to start by sketching **two** implications of radical uncertainty – uncertainty that cannot be quantified – that should underpin any credible monetary policy framework. I then want to describe **three** illusions in the theory

⁵ The standard reference is Woodford (2003) which is the most important work on monetary policy determined solely by reference to an interest rate rule. In such a world inflation is pinned down by a central bank “reaction function” which describes how interest rates are adjusted in response to movements in inflation and the output gap. The practical problem with this approach is that in a world of radical uncertainty when the structure of the economy is changing it is difficult for agents to work out whether economic behaviour has changed or whether the reaction function itself has changed. That has been a challenge for both the Federal Reserve and the Bank of England in recent years.

and practice of monetary policy that have led us astray. Finally, I want to suggest that we abandon **four** ideas that emanate from current academic thinking and suggest a more robust and resilient approach to monetary policy.

2. Two Implications of Radical Uncertainty

One of the progenitors of the application of probabilistic reasoning to economics, Frank Ramsey, understood its limitations when he wrote in 1929, “the chief danger to our philosophy, apart from laziness and woolliness, is *scholasticism*, the essence of which is treating what is vague as if it were precise and trying to fit it into an exact logical category”.⁶ This danger has two implications for how to think about monetary policy in a world of radical uncertainty.

First, the difference between a barter economy and a monetary economy is simply assumed away.⁷ In 1954, the Chicago statistician, Jimmie Savage, imagined a world where people could attach probabilities to every conceivable event and, as a result, they could engage in optimising behaviour.⁸ Savage made clear that this was a purely intellectual exercise because his assumptions held only in “small worlds” and were, in his own words, “utterly ridiculous”.

The large world could not be described in this way, as John Kay and I discuss in our book *Radical Uncertainty*. Indeed, Savage’s small world corresponds exactly to the Arrow-Debreu world of complete markets in which neither money nor monetary policy plays any role at all. It is striking, therefore, that the richness of analyses of a monetary economy developed by Keynes, Patinkin, Tobin, Brunner and Meltzer among others, has been replaced by models which in effect assume complete markets.⁹ It is a tribute to the technical virtuosity of their creators that models in which money is completely absent can be used to explain a fall in the value of money.

The second implication is that the structure of the economy is assumed to be unchanging over long time periods – in the jargon, it is stationary. This assumption is crucial to the use of econometric models to identify stable time-series relationships. In 1939, Maynard Keynes foresaw the problem in his review of Tinbergen’s statistical estimates of economic relationships. And 75 years later, two of Britain’s most distinguished econometricians, David Hendry and Grayham Mizon, pointed out that conventional models failed to predict, or even explain, the global financial crisis precisely because the world is nonstationary.¹⁰ The forecasting models used by central

⁶ Ramsey, F.P. (1929), “Philosophy”, reprinted in ed. Mellor (1990). I am indebted to Cheryl Misak for drawing this quotation to my attention.

⁷ Attempts to represent “model uncertainty” in terms of probabilities – as in the growing literature on ambiguity – are incompatible with radical uncertainty. The idea behind this literature is that just as we might think in terms of a probability distribution of outcomes when we do not know which outcome will occur, then if we do not know those probabilities – or model – we can imagine a distribution of probabilities. Ambiguity is then defined as the degree of uncertainty over the subjective probabilities that people use to formulate their “optimal” plans. These higher order probabilities are supposed to describe uncertainty over the true model of the world. Just as people are risk averse, so they may exhibit “ambiguity aversion”. But how do we know what are these second-order probabilities? And should we not allow for probabilities over the probabilities of the subjective probabilities used by individuals? And why stop there? If there can be probabilities over probabilities, then why not probabilities of probabilities over probabilities, and so on. We are naturally led down a treacherous path to an infinite regress, an approach which Savage (1954) considered and rejected because it “seems very difficult to interpret, and it seems at best to make the theory less realistic, not more.” In plain language, a dead end: either we know the probabilities because we are in a world of resolvable uncertainty, or we don’t because we are in a world of radical uncertainty.

⁸ Savage (1954).

⁹ This quirk of the increasing mathematisation of economic models was foreshadowed by Samuelson (1968).

¹⁰ Hendry and Mizon (2014).

banks perform quite well when nothing much is happening and fail dramatically when something big occurs – precisely the moment when we might hope that the models would have something to offer beyond mere extrapolation of the past.

Radical uncertainty and nonstationarity go hand in hand. A good example comes from the British battle against inflation forty years ago. In the first half of the 1980s, reliance was placed on targets for the monetary aggregates. In the second half, policy focussed on implicit and explicit targets for the exchange rate against the Deutschmark. Both came somewhat unstuck because of nonstationarity – significant changes in financial regulation in the early 1980s altered the relationship between inflation and the monetary aggregates, and German reunification altered the appropriateness of linking sterling to the Deutschmark. With the benefit of hindsight, the degree of tightness of UK monetary policy was probably better indicated by the exchange rate in the early 1980s and the monetary aggregates towards the end of the decade. Intermediate targets fell victim to non-stationarity and monetary policy was then expressed in terms of the final target of low and stable inflation. But that did not mean that money was irrelevant to the setting of policy.

In their rush to jettison money from the analysis of inflation, many economists have relied on the apparent instability in estimated demand for money functions. But as I argued in *The End of Alchemy*, the fact that money demand can shift unpredictably – as in the jump in demand for liquidity in 2007-8 and again for a short period in March 2020 – tells us nothing about the implications of increases in the money supply at other times. And it seems odd at a time when broad money has been rising at the highest rates for many years, not even to ask what that is telling us. As Tim Congdon and Charles Goodhart have repeatedly reminded us, you ignore big rises in broad money at your peril.¹¹

3. Three Illusions in Recent Monetary Theory and Practice

I turn now to three illusions that have characterised the theory, and in turn the practice, of monetary policy in recent years. They are: first, the belief that models are a description of the world and generate reliable forecasts; second, the misdiagnosis of developments in the economy that result from reliance on one narrow model; and, third, the use of forward guidance.

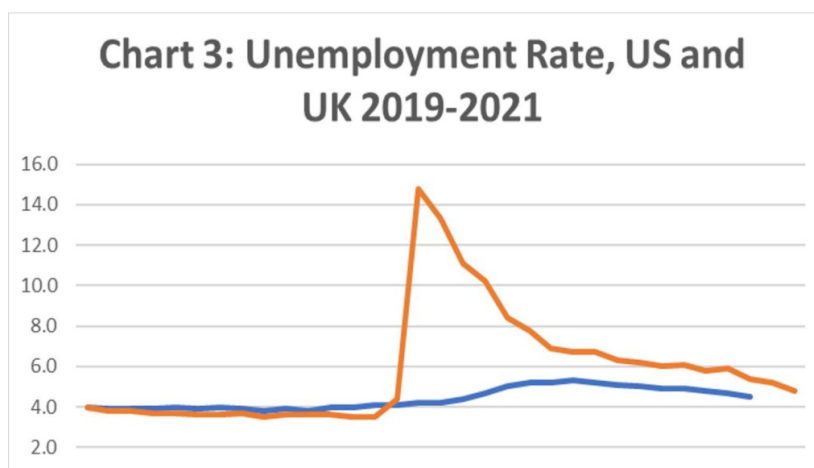
First, the misuse of models. Models are neither right nor wrong; they are more or less useful. They are not descriptions of the world which is why economic forecasts are often so poor. They can generate extremely valuable insights. But they are not a substitute for trying to figure out what is happening in the large world. John Kay and I recommend always asking the question “what is going on here?” At first sight this may seem trivial, but it is in fact immensely helpful in interpreting economic data. Alan Greenspan epitomised this approach when, from the analysis of microeconomic data and conversations with businesses, he discovered that productivity growth had risen in the US in the 1990s. You may agree or disagree with the inference he drew for interest rates from that discovery. But the lesson is not to shoehorn the analysis of the economy into a single model. It is odd that since the financial crisis the models which failed to predict the crisis have come to play an even greater role in monetary policy.

A good example of the power of asking “what is going on here?” was the early realisation by the Bank of England of the large numbers of migrant workers arriving in the UK from the accession countries of Eastern Europe after 2004, despite official statistics showing the opposite. Monthly visits to different parts of the United Kingdom by members of the Monetary Policy Committee, and the regular reports from the Bank’s network of regional agents,

¹¹ See for example Congdon (2011) and Goodhart’s interview with Central Banking Vol. XXXII September 2021.

made it impossible to ignore the phenomenon, and incidentally helped to change the way official migration statistics were collected. Our contacts in the regions changed the narrative that we used. Labour supply was no longer fixed. The output gap, the difference between aggregate demand and potential supply, became less and less relevant to monetary policy because demand was generating its own supply of labour. The Phillips' curve appeared to be flatter and flatter. In the limit, the output gap became meaningless. After Brexit, the narrative has changed again: the elastic supply of labour has largely disappeared, and the output gap is once more relevant to assessing the appropriate monetary policy stance.

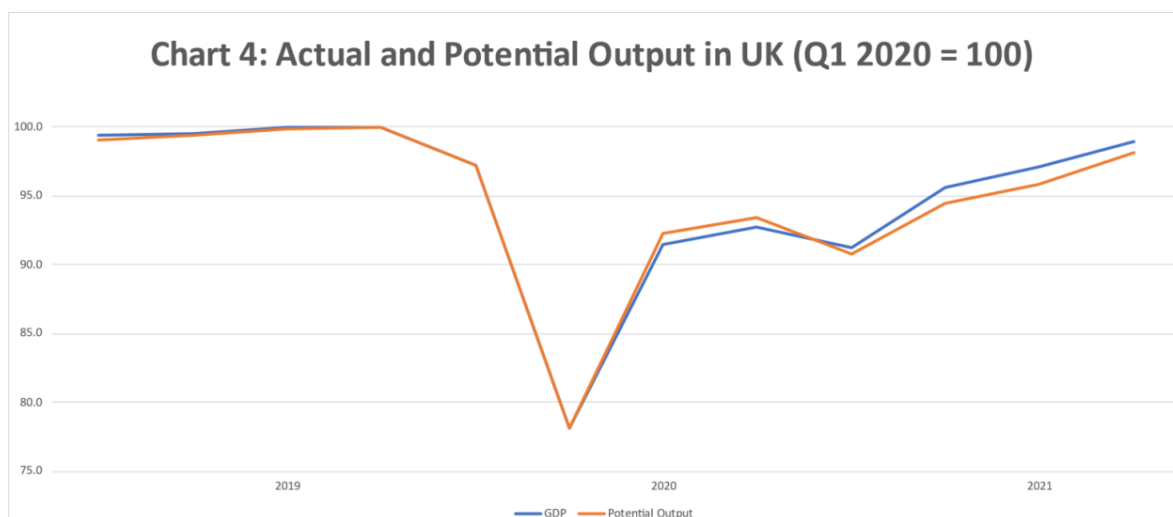
Second, the misdiagnosis of developments in the economy, as in the response to Covid-19. The case for substantial monetary expansion in March 2020 was framed as a response to “dysfunctional markets.” But the monetary injection was not withdrawn once financial markets were operating normally. The stimulus was then justified in terms of “supporting the economy.” The government did indeed need to support the economy – it did so through furlough schemes in Europe and more generous unemployment compensation in the United States. Their success is shown in Chart 3: unemployment in the US rose sharply in 2020 but has now fallen back to pre-Covid levels while unemployment in the UK rose hardly at all right through the pandemic. The furlough scheme was a transfer from future taxpayers to businesses to allow them to maintain employment in a period when revenue fell sharply. It was not designed to boost aggregate demand.



What about monetary policy? Monetary stimulus is appropriate when aggregate demand falls below aggregate supply. In a typical business cycle, demand falls in a recession while potential supply is largely unchanged. An output gap opens up and monetary policy can help to offset that. So far, so good. But Covid-19 was not an ordinary business cycle downturn. Chart 4 shows UK aggregate demand (or GDP), on the one hand, and potential supply as estimated by the Office for Budget Responsibility earlier this month, on the other.¹² As you can see, it is not easy to distinguish the two lines on the chart. As the OBR stated in their March report, the chart “shows only a small margin of spare capacity since the start of the pandemic, reflecting our judgement that most of the fall in output during 2020 should be thought of as a simultaneous contraction in demand and supply”.¹³ It is far from clear that an additional monetary stimulus was required either last year or this. Looking back, monetary policy has never quite managed to get out of crisis mode. Thus, a return to normality could become more and more elusive.

¹² Similar charts could be constructed for other advanced economies.

¹³ Office for Budget Responsibility, Economic and Fiscal Outlook – March 2021, <https://obr.uk/efo/economic-and-fiscal-outlook-march-2021/>.



Quantitative easing is an expansion of the money supply, although most central banks are reluctant to describe it as such which has made calibration of changes to QE difficult and seemingly arbitrary. Unlike its use after the banking crisis a decade or so ago aimed at preventing a **fall** in broad money, this time QE has created a substantial **monetary overhang**. In the United States, M3 was rising at an annual rate of 24% late last year, falling back to a mere 13% in the latest figure. In the UK, M3 was rising at 13% a year in the spring and has now subsided to around 7%. It is certainly possible to debate the transmission mechanism between an increase in broad money and its impact on inflation. But the fact remains that we experienced a substantial, albeit transitory, increase in the growth rate of broad money and we are now experiencing a noticeable, albeit perhaps transitory, rise in inflation.

As the recent report of the Economic Affairs Committee of the House of Lords argued, quantitative easing has become the first resort of central banks to bad news of almost any kind. And the failure to withdraw QE in response to good news, or even the absence of bad news, has led to a ratchet effect on central bank balance sheets. This is unsustainable. The challenge of reducing the size of those balance sheets at a time of large budget deficits is self-evident.

Third, the use of forward guidance as a tool of monetary policy. Precisely because the future is uncertain it is unwise for a central bank to speculate on its own future decisions. The Federal Reserve does not know the short-term policy rate it will want to set six months from now, let alone what it will be in 2023 or 2024. The danger now is that although financial markets may have lost faith in the forward guidance given to them, central banks themselves continue to believe in it and to cling to a narrative about the future path of interest rates that is no longer credible with inevitable problems for the clear communication of policy decisions.

Markets compute their estimate of the future path of interest rates by feeding their own view of the evolution of the economy into the central bank reaction function. Their narrative of where the economy is headed may well be different from that of the central bank. Challenge to those narratives is healthy. And forward guidance, which conflates the reaction function with the narrative of the central bank, is dangerous precisely because it dampens the impact of debates about the economy and switches market focus to quasi-commitments by central banks to a future path of interest rates. There is nothing to be gained by doing this and much credibility to be lost.

Equally unwise are the first cousins of forward guidance: yield curve control adopted by Japan and Australia; flexible average inflation targeting announced last year by the Federal Reserve; and promises to aim at a higher inflation rate in order to lower the perceived real interest rate. The Federal Reserve now appears to have

introduced so-called flexible average inflation targeting at the worst possible time – no-one argued that inflation over 6% was desirable to offset earlier undershoots of the target. It was always an illusion to think that it was possible to control inflation so precisely so as to overshoot the target by a small amount for a short period to compensate for earlier undershoots.

Earlier this month the Reserve Bank of Australia was forced by market movements to abandon yield curve control aimed at holding the three-year bond yield at 0.1%, with the Governor saying that “it’s quite unlikely that we will have a yield target again”.¹⁴ And the attempts by the Bank of Japan to target ten-year bond yields and stimulate the economy by aiming at a higher inflation rate are reminiscent of an Olympic high jumper who, having failed to clear two metres, asks for the bar to be raised in an attempt to convince onlookers he is confident that he can clear an even higher bar.

Forward guidance can all too soon come to be seen as complacency. A central bank should not be ashamed to acknowledge that it does not know where interest rates will be in the future because it cannot know where the economy will go in the months and years ahead. Whatever different economic models were being used on 1 January 2020 to forecast the path of the economy over the next few years, none of them included a possible shutdown of large parts of the economy in response to COVID-19.

What a central bank does know is its own reaction function – to aim to bring inflation back to target over a time horizon which reflects the nature of the shocks hitting the economy. Its role is to focus on the setting of the policy instrument – interest rates and QE – today not in three years’ time. In a report on the monetary policy of the Swedish Riksbank, the late Marvin Goodfriend and I showed how damaging it was for their policy committee to be distracted from the immediate policy decision into an internal debate about where rates should be in three years’ time.¹⁵ The communications of a central bank need to focus on explaining its reaction function and developing a narrative about the state of the economy that changes over time meeting by meeting, report by report. The only forward guidance markets and economic agents need is an unswerving commitment to price stability.

4. Four Funerals and A Wedding

I turn now to the need for four funerals and a wedding in monetary policy. The four funerals mean that we should say farewell to (i) forward guidance, (ii) flexible average inflation targeting, (iii) the pretence that money has nothing to do with inflation, and (iv) the belief that monetary stimulus is an appropriate response to all economic problems.

On a more positive note, the wedding is to join the analysis of “what’s going on in the economy?” with the eternal verities of David Hume and most subsequent economists that inflation is a monetary phenomenon.

The aim should be to reinforce the belief amongst economic agents that central banks are committed to learning about the economy and adapting policy in order to maintain price stability. A credible reaction function can then reduce the number of arbitrary and unexpected changes in policy – as the Maradona theory of monetary policy explains.¹⁶ In a world of radical uncertainty, however, we need to go further. The economy is always changing,

¹⁴ Financial Times, 10 November 2021 <https://www.ft.com/content/0d5ebce8-ce87-4662-9d03-994f2e40481e?segmentId=ddd6252-6e37-bb4b-bda7-2193a3453893>.

¹⁵ Goodfriend and King (2015).

¹⁶ See King (2016) pps.176-178.

and no fixed plan will survive contact with the world. The next step is to adopt what we might call the Pep Guardiola theory of monetary policy which is to equip the players to make good decisions on the pitch in real time. You do not give a fixed plan to the players because it will be negated by an intelligent opposition and unexpected changes in circumstances. As Helmuth von Moltke wrote in 1880, no plan survives first contact with the enemy, a sentiment with which I am sure the Federal Reserve would now sympathise.¹⁷ Forward guidance fails the test of the Guardiola theory of monetary policy.

So what are the principles for helping central bankers make good decisions in real time? The principle behind inflation targeting was to give a degree of discretion – constrained discretion – to members of the Monetary Policy Committee. They were to set interest rates to meet the inflation target delegated by Parliament while forcing them to produce a narrative explaining the justification for those decisions that was updated regularly by the MPC and continuously challenged by others. Inflation targeting was not meant as a non-monetary theory of inflation. Rather, it is a way to take decisions in a world of radical uncertainty. A similar approach was followed by those central banks that did not adopt formal inflation targets, such as the European Central Bank.

Good economic policy frameworks are resilient and robust with respect to unexpected developments in the economy. In a world of radical uncertainty, the holy trinity comprises a narrative about the changing structure of the economy that is explained clearly and transparently; a process by which the prevailing narrative can be challenged; and a heuristic for setting policy that is robust with respect to the many surprises in the economic climate. Above all, keep it simple. An inflation target was a simpler and more robust heuristic than an intermediate target. And a good narrative will take on board the risks that unsustainable developments, such as the rise in leverage and fall in real interest rates before the financial crisis, pose to the economy in the medium term.¹⁸ When King Canute sat in front of the incoming tide, his purpose was to show his courtiers that he was **not** omnipotent and could not by words alone undo the forces of nature. Central banks would do well to show the same humility.

5. Conclusions

Price stability, suggested the former vice-Chairman of the Federal Reserve Alan Blinder, was when most people stop talking about inflation. After twenty years of low and stable inflation, people have started talking about inflation again. Two years ago, the Bank of England renamed its *Inflation Report* as the *Monetary Policy Report*, with a coloured photograph of Glasgow on the cover. Inflation was 1.7% and predicted to decline. Today inflation is 4.2% and predicted to rise. The role of a central bank is to be the voice for price stability. To preserve their hard-earned and vital independence, central banks should accept, indeed insist, that their mandate is a narrow one.

Inflation will remain a major challenge in the years ahead as we embark on a significant reallocation of resources in our economies – resulting from the greater focus on resilience as we emerge from the pandemic, the political pressures to raise public spending, and the restructuring required to meet climate change targets. This reallocation of resources will imply big changes in relative prices and wages. Whether this can easily be achieved while keeping overall inflation close to 2% remains to be seen. The consequences of a shift in resources within the economy from low to more profitable sectors are not something that appear in the current models of monetary policy. The belief that such models actually describe the world has done damage to the credibility of

¹⁷ To be more precise “No plan of operations reaches with any certainty beyond the first encounter with the enemy’s main force”.

¹⁸ See the discussion of a narrative revision downturn in King (2016), p.316.

central banks, as illustrated by the communications problems of several central banks over the past year or so. Short of an intellectual about turn, it will continue to do so.

After a decade of sluggish economic growth, despite the largest monetary stimulus the world has ever seen, it is surely time to recognise that many if not most economic problems are not amenable to monetary policy solutions. The next decade will see a major restructuring of economies around the world. We shall need to ask with increasing frequency, “what is going on here?” Central banks will continue to suffer the slings and arrows of outrageous fortune. They will hope for good fortune but should not rely on it. They will have to cope with the challenge of setting monetary policy, not in a small model, but in the large world of radical uncertainty. The current scale of monetary expansion cannot persist for long without inflationary consequences.¹⁹ Now is the time for central banks to take a gentle step back from being in thrall to the latest theoretical advance and avoid becoming the slaves of living economists. When President Clinton nominated Alan Greenspan for his fourth term in office in 2000, he hailed a “rare combination of technical expertise, sophisticated analysis and old-fashioned common sense”.²⁰ Common sense suggests that when too much money is chasing too few goods the result is inflation. An over reliance on expectations and central bank words has proved a dragging anchor for monetary policy in the industrialised world. It is time to change policy and to secure a more reliable intellectual anchor. ■

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¹⁹ See, for example, the critique of current Federal Reserve policy by Cecchetti and Schoenholtz on 18 November 2021; <https://www.moneyandbanking.com/commentary/2021/11/18/inflation-policy>.

²⁰ Financial Times, 12 November 2021, <https://www.ft.com/content/6410711b-df7b-4ded-9eeb-690305933b9d?emailId=618e72b5ac3e2d000423431d&segmentId=c393f5a6-b640-bff3-cc14-234d058790ed>.

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Mervyn King served as Governor of the Bank of England from 2003 to June 2013. He was knighted (GBE) in 2011, made a life peer in 2013, and appointed by The Queen to be a Knight of the Garter in 2014.

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In 2016 he published *The End of Alchemy*. With a new preface, it appeared in paperback in 2017, and has been translated into many languages. His new book (with John Kay) *Radical Uncertainty* was published in March 2020.

Born in 1948, Mervyn King studied at King's College, Cambridge, and taught at Cambridge and Birmingham Universities before spells as Visiting Professor at both Harvard University and MIT. From October 1984 he was Professor of Economics at the London School of Economics, where he founded the Financial Markets Group. He is Chair of the Philharmonia Orchestra and a member of the House of Lords Economic Affairs Committee.

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