



BANK OF ENGLAND

# Speech

---

## Failure to launch

Speech given by

Kristin Forbes, External MPC Member, Bank of England

London Business School

22 June 2017

Thanks to Ida Hjortsoe, Tsveti Nenova and Jack Marston for their assistance in putting together these comments, and to Lewis Kirkham and Konstantinos Theodoridis for collaboration on the research paper underlying parts of these comments. Further thanks to Elizabeth Drapper, Lewis Kirkham, Clare Macallan, Gareth Ramsay, Marilynne Tolle, Alex Tuckett, and Jan Vlieghe for helpful suggestions. The views expressed here are my own and do not necessarily reflect those of the Bank of England or other members of the Monetary Policy Committee

Central banks around the world have experienced a “failure to launch”. And by “failure to launch”, I do not mean the decision by some thirty-somethings to remain living with their parents – as parodied in a 2006 movie of the same name. Instead, I mean the inability of central banks in almost all developed countries to launch interest rates off the emergency levels adopted in response to the Global Financial Crisis.

Why are interest rates still near zero in so many countries – even though it has been almost nine years since the peak of the crisis? Why is so much monetary stimulus still believed to be needed – even as global economic growth has been above 3% for 7 years in a row and global inflation expected to pick up to about 3.5% by year end<sup>1</sup>? Why are central banks so reticent to raise rates given their experience that interest rates at such low levels, especially for a prolonged period of time, can increase risks – such as fostering financial market bubbles and unsustainable borrowing, supporting an inefficient allocation of resources, and creating challenges for pension funds, savers and banks?<sup>2</sup>

The US is the closest to achieving a successful “launch” – having now raised interest rates four times starting in late-2015. The top part of Figure 1, however, puts this into context. The U.S. Federal Reserve has only raised the US federal funds rate to 1.00% - 1.25%, well below the 5.25% before the crisis began in 2008 (and even ignoring the \$3.4 trillion of asset purchases since then). And the US “launch speed” has been so slow compared to past launches that one could argue that it does not even qualify as a “rate hiking cycle” until this March. Over the last twenty years, the average rate hiking cycle in the US has involved 8 increases in interest rates, averaging 2 percentage points over 13 months. In this context, the US may have hit the launch button, but it has clearly not yet flown high enough to elude the reach of the earth’s gravitational pull.

Even more striking is the lack of other countries’ ability to sustain any tightening in monetary policy since the crisis. No advanced economy in our sample – other than the US – has maintained an increase in policy rates since 2011.<sup>3</sup> Nine other central banks in our sample of advanced economics have “lifted off”, in the sense of increasing their respective policy rates at least once since 2009, but all of them subsequently reversed that increase. Even more disconcerting, in almost all of these cases (with Canada and Taiwan the exceptions), the central banks then lowered rates to well below the levels from which they initially increased them. Figure 1 (panel b) shows each of these lift-offs that were then aborted before becoming a full-fledged launch.

Many other advanced economies have only eased monetary policy since the crisis. The bottom of Figure 1 shows some examples of countries where official interest rates have remained grounded – from the Czech

---

<sup>1</sup> Based on IMF data for the *World Economic Outlook*, April 2017. Global growth is the percent change in GDP at constant prices on an annualized basis.

<sup>2</sup> For a discussion of the costs of low interest rates, see Forbes (2015a), “[Low Interest Rates: King Midas’ Golden Touch?](#)”. Also see Coimbra and Rey (2017), which shows how reducing interest rates when rates are already low can disproportionately increase systemic financial risk.

<sup>3</sup> For this comparison of advanced economies, we do not include Denmark, Hong Kong or Singapore (as their monetary policies are focused on managing exchange rates) or Iceland (given the special circumstances around its crisis).

Republic to Japan to Switzerland and, of course, the United Kingdom. Some of these countries have tried to lay the groundwork to get a lift-off on the calendar, but never got the rocket to the launch pad.

This “failure to launch” has been particularly meaningful on a personal level. In July 2014, when I started on the Bank of England’s Monetary Policy Committee, it was widely expected (including by me) that we would begin increasing interest rates soon. It has been almost three years – and growth has averaged a healthy and above trend 2.3% (year-on-year) over this period. Yet interest rates are now lower – instead of higher – than when I started my term. And that doesn’t even include the additional monetary easing in the form of £70 billion of government and corporate bond purchases announced in August. Granted, monetary policy was loosened in August in response to unique circumstances related to concerns about how the Brexit decision would impact the economy. But why was there no consensus to tighten monetary policy before then?

And as the UK economy has held up well since the Brexit vote, why has there been no consensus to tighten monetary policy – or at least slightly reduce the substantial amount of stimulus provided in August – since then? A key justification for the large amount of stimulus that many people (albeit not me) supported in August was a forecast for a sharp contraction in growth to near recession levels and sharp increase in unemployment that would leave a meaningful increase in the number of people without a job. That forecast has not materialized. Instead, over the three full quarters since the referendum, GDP has increased by over three times more (by almost 1 percentage point more) than forecast in the August *Inflation Report*, and unemployment is 0.5 percentage points lower. Put slightly differently, instead of increasing, unemployment has fallen so much that it is now at its lowest level in over 40 years. At the same time, inflation spiked to 2.9% in May. It is expected to continue increasing over the next few months and remain above target for over three years. Why has there been no reduction in the substantial amount of emergency stimulus still being provided given that the sharp slowdown that motivated the emergency response has not materialized and inflation is well above target? Although I have been voting to increase Bank Rate in the UK since March, and two of my colleagues on the MPC (Ian McCafferty and Michael Saunders), also voted to increase Bank Rate last week, a majority on the MPC does not support reversing a small portion of last August’s stimulus (although Andy Haldane indicated in a speech yesterday that he was also considering this). Each member has valid arguments supporting their votes each month, but when taken together, the outcome is quite a change from the series of rate hikes that I had expected to occur over the last three years.

This personal experience – combined with the failure of most major central banks to successfully “launch” – raises the question that I will address today: Why has it been so hard to raise interest rates around the world from their emergency levels adopted during the crisis? I will focus on the experience of the UK, but many of the insights also apply to other economies around the world.

My comments will begin by quickly discussing the obvious economic challenges to raising rates – arguments which have dominated most of the discussion: the fragile recovery (including headwinds from the crisis), the

low natural rate of interest (including secular stagnation), and the series of “unfortunate events”. All of these factors have undoubtedly played some role. The UK economy has faced no shortage of challenges. But an assessment of the key characteristics of the UK economy that are critical for monetary policy, including adjustments for structural changes that affect sustainable levels of growth, inflation, and unemployment, have led me to believe that these economic arguments are not the full reason why interest rates have not been raised even once since the crisis. In fact, in my view, a simple assessment of key variables suggests that although the UK may still require some support from monetary policy, the substantial amount that is in place today is not currently warranted by standard economic measures. It is increasingly difficult to make the case that fundamental economic weakness (whether couched in terms of secular stagnation, low  $r^*$ , or a series of unfortunate events) is the main reason why it has been so hard to increase interest rates at all from emergency levels in the UK. There must be other factors at play.

The second part of my comments will then shift to other factors that have received less attention: a series of ways in which the monetary policy process has fundamentally changed since the crisis and could raise the hurdle to increasing interest rates. I will discuss whether the new tools used by central banks (such as quantitative easing and macroprudential policy), expanded roles for central bankers (such as changes in their remits, greater emphasis on financial sector risks, greater public role, and greater demands on their time), and increased constraints on central banks (due to the lower bound and sensitivity of the exchange rate) may be complicating their ability to raise rates. This part of the discussion is more speculative and harder to measure concretely – but in my view – these factors have become increasingly important in explaining the “failure to launch” interest rates as the economic recovery has solidified.

The final part of my comments will discuss another hypothesis – based on a new research paper with two colleagues at the Bank of England – Lewis Kirkham and Konstantinos Theodoridis.<sup>4</sup> This analysis suggests that UK inflation dynamics may be more persistent than generally believed and less affected by many of the variables on which central bankers focus – such as inflation expectations and slack. This research also highlights the role of the exchange rate in meaningfully affecting the slow-moving and persistent component of UK inflation. Sterling’s appreciation in 2014-2015 seems to have played a powerful role in dampening UK inflation, and thereby making it more difficult to launch a cycle of interest rate hikes until recently. But that cycle has now gone into reverse. Sterling’s recent depreciation appears to be shifting the trend component of UK inflation upward quickly, potentially generating more persistent inflationary pressures and providing a powerful reason to raise interest rates now.

My comments will conclude by evaluating how these different sets of factors that contributed to a “failure to launch” interest rates over the past three years have recently evolved, and if these factors continue to provide a reason to delay raising interest rates today. This evaluation suggests that although some of the reasons why it has been difficult to raise interest rates – especially the changes in the monetary policy

---

<sup>4</sup> Forbes, Kirkham and Theodoridis (2017).

process—are likely to continue playing a role, other economic factors are moving in the opposite direction. Potentially most important, the powerful dampening effect on the persistent trend component of inflation from sterling's past appreciation has now gone into reverse. Instead, sterling is now creating a fairly persistent upward pressure on prices. In my view, if this is not countered soon by a moderate tightening in monetary policy, a “failure to launch” in the UK could soon generate even greater challenges than having a thirty-something remain in their parents' home indefinitely.

## ***I. Fragile Economies (and its Many Iterations)***

A central theme of many explanations for why advanced economies have had difficulty launching interest rates above the emergency levels adopted during the crisis is the fragility of the recovery and underlying economies. Put simply, the economies have not been strong enough to sustain growth around trend, unemployment around its natural rate, and inflation around target without continued, aggressive support from monetary policy. This could result from headwinds related to the crisis, the low natural rate of interest (which reduces the amount of stimulus from low interest rates), or simply a series of unfortunate economic events and challenges. I will quickly review each of these arguments – all of which have been made in detail elsewhere. But then I will make the case that although these factors have all played a role, they are unlikely to fully explain why interest rates have not been raised from emergency levels in countries such as the UK.

### *a. Crisis-Related Headwinds and Other Enduring Factors Holding Back Growth*

One prominent set of arguments is that a series of “headwinds” that were induced by the crisis are holding back growth. This line of reasoning argues that monetary policy has needed to continue to be extremely supportive to provide a “tailwind” against these headwinds. There are many possible headwinds that could still be important – even though the peak of the crisis was almost 9 years ago.

Reinhart and Rogoff (2014) show that severe banking crises weigh on economies for many years, with the countries in their sample taking an average of eight years for incomes just to recover to pre-crisis levels after a severe banking crisis. Even after this period, however, and after a financial system has largely healed, a financial crisis can leave other legacies that continue to hold back growth. Probably most important is the higher government debt accumulated during the crisis – a burden which requires tighter fiscal policy and thereby acts as a direct drag on growth.<sup>5</sup> Another headwind could be lower productivity growth – whether resulting from lower levels of investment during the crisis, or from any reduced efficiency in the allocation of resources (see Borio *et al.*, 2016). There could also be continued effects in the financial system influencing the demand for safe assets, and reduced credit and liquidity due to increased regulation aimed at reducing

---

<sup>5</sup> For example, in “[The Spectre of Monetarism](#)” given in December 2016, Mark Carney suggests that fiscal austerity has on average subtracted 1pp from demand each year since 2010.

the risk of future crises.<sup>6</sup> Consumers and workers scarred from the crisis could also continue to be more cautious – such as in their willingness to switch jobs or bargain for higher wages – possibly driving lower earnings growth.<sup>7</sup> Any of these headwinds could persist for years after a financial crisis, continuing to drag on growth and justifying some degree of continued support from monetary policy.

An extension of this argument that crisis-related headwinds are restraining growth is that the low interest rates adopted in response to the crisis are now generating their own set of headwinds – especially as rates have been so low for so long. For example, one issue that I've been concerned about for years is that low interest rates can reduce the “churn” in an economy, an important (albeit often painful) process by which new and more efficient companies replace older, highly indebted, and less efficient companies.<sup>8</sup> This “churn” has historically been an important driver of productivity growth – but has fallen notably in many developed countries. Another potential headwind from an extended period of low rates is abysmal returns for savers and pension funds.<sup>9</sup> If consumers are “target savers” (meaning they adjust the amount they save to ensure a certain income stream), lower returns could cause them to increase savings and reduce spending – thereby slowing overall GDP growth.<sup>10</sup> Similarly, companies whose pension funds are earning lower returns than expected could cut back investment and spending in other areas in order to replenish pensions – further slowing overall GDP growth.<sup>11</sup>

These arguments suggest that low interest rates could provide drags or headwinds to growth – especially if the low rates persist for an extended period – in addition to the other headwinds that are legacies of the crisis. Granted, the evidence suggests that the “tailwinds” from low rates supporting overall growth still outweigh the headwinds – but if these headwinds from low rates build over time (while the support from the initial easing of monetary policy fades over time), then the cumulative effects could imply somewhat slower growth that makes it even more challenging to increase interest rates over time.

### *b. R\* and Secular Stagnation*

A closely related set of explanations for the combination of the slow recovery and low interest rates since the crisis is that the “natural rate of interest” (often called  $r^*$  for short) has fallen.<sup>12</sup> This  $r^*$  is basically the level of real interest rates which should sustain growth around the economy's potential growth rate with inflation

---

<sup>6</sup> See Gourinchas and Rey (2016) for a discussion of how many of these factors could lead to a scarcity of safe assets and global savings glut.

<sup>7</sup> See Malmendier and Nagel (2011) for evidence on the long-lasting effects of crises on behaviour.

<sup>8</sup> See my discussion of this concern for the UK in Forbes (2015a), “[Low interest rates: King Midas' golden touch](#)”. Also see Haldane (2017a) and Charlie Bean's comments in “Low interest rates depress productivity, Bank deputies warn”, *The Times*, 14 March 2017. [Barnett et al. \(2014\)](#), find that 1/3 of the shortfall in UK productivity since 2007 can be attributed to slower reallocation of resources – although they do not explicitly link this to lower interest rates. McGowan et al. (2017) provide evidence on the role of zombie firms in reducing productivity growth recently in OECD economies.

<sup>9</sup> Of course, many savers also have substantial wealth holdings and will have benefitted from higher asset prices over this period, as discussed in Carney (2016b).

<sup>10</sup> See Ford and Vlasenko (2011) for an analysis of such effects in the US.

<sup>11</sup> See the Bank Underground post “[Low for long: what does this mean for defined-benefit pensions in the UK?](#)” for further detail.

<sup>12</sup> See Rachel and Smith (2015) and Hall (2016).

around target. If this has fallen, today's low interest rates are not providing nearly as much support to the economy as in the past (as the amount of stimulus corresponds to the size of the gap between  $r^*$  and the main policy interest rate). If  $r^*$  has fallen, interest rates would also not need to rise to levels anywhere near past averages – and may not even need to increase much at all to be at a new, lower equilibrium that implies neutral monetary policy.<sup>13</sup> An extreme variant of this line of argument is that  $r^*$  is so low that it causes “secular stagnation”; central banks cannot lower nominal rates (which cannot fall below zero) by enough below  $r^*$  to provide the desired amount of economic stimulus to avoid stagnation.<sup>14</sup>

There is no doubt that  $r^*$  has fallen over time. There is also little disagreement that this fall reflects changes in desired savings and investment around the world. Demographics have likely played an important role in the slow downward movement of  $r^*$ , while factors related to the crisis (such as greater financial market regulation) and other longer-term trends may also have contributed to a more recent decline.<sup>15</sup> But there are a number of ways to calculate  $r^*$  (none of which is ideal) and quite a bit of disagreement about where the level actually is today in any country. There is even more disagreement on where it is heading in the next few years. With those caveats, Figure 2 shows recent calculations of  $r^*$  for the US and UK since 1960.<sup>16</sup> These graphs suggest that  $r^*$  is much lower today in both countries than in the mid-2000s before the crisis, and the amount of stimulus provided by rates around 0.25% in the UK and 1.00%-1.25% in the US is much less than would have resulted from rates at those levels in 2005.<sup>17</sup>

Yet, even though today's low interest rates are not providing as much stimulus as they would have in the past, these calculations still suggest that rates in the UK are well below estimates of  $r^*$ , and therefore monetary policy is providing a meaningful amount of stimulus today. But even if  $r^*$  has been this low, I am not convinced by arguments that  $r^*$  will stay around today's levels in the future. In fact, there are more convincing arguments why  $r^*$  may already be beginning to increase – which suggests that keeping rates constant at their current low levels may already be providing more stimulus – instead of less.<sup>18</sup>

I do not want to wade further into this already extensive debate on where  $r^*$  is, why it is there, and where it is going. This is a topic on which far too much precision has already been claimed given the little we actually know and can calculate in real time. Instead, let me just quickly summarize how I think it matters for the key question of my comments today. While  $r^*$  has fallen, and this implies that today's low rates are providing

---

<sup>13</sup> See Vlieghe (2016b) and Broadbent (2014) for details on these arguments.

<sup>14</sup> Summers (2013).

<sup>15</sup> See Rachel and Smith (2015), Bouis *et al.* (2014) and IMF (2014) for different estimates of the factors behind this decline in  $r^*$ . See also Vlieghe (2016a).

<sup>16</sup> This estimate for the UK is a little higher than implied in work by Jan Vlieghe, as discussed at his appointment hearing before the Treasury Select Committee on October 13, 2015, when Vlieghe suggested that the natural nominal rate is likely to be between 1% and 3% for the UK.

<sup>17</sup> For other evidence, see Bernanke (2016), Fisher (2016), Johannsen and Mertens (2016), Laubach and Williams (2015), Bean *et al.* (2015), Rachel and Smith (2015), Summers (2014) and Vlieghe (2016b).

<sup>18</sup> [Bean \*et al.\* \(2015\)](#) note that some of the forces that have driven interest rates down are likely to go into reverse, with time. Similarly, [Kindberg-Hanlon \(2017\)](#) finds that the low post-crisis level of real interest rates cannot be explained by the secular drivers usually pointed out, implying that interest rates are likely to be due to more temporary factors and thus reverse over time.

less stimulus than they would have in the past, I do not believe this is the main reason why rates have not been lifted in so many countries. This is especially true when trying to explain why rates have not been raised recently as inflation has picked up in most countries and  $r^*$  might be beginning to rise. Higher inflation, combined with steady nominal policy rates, implies that central banks are providing more stimulus today, instead of starting to withdraw the emergency stimulus provided during the crisis.

*c. A Series of Unfortunate Events*<sup>19</sup>

Another set of economic arguments for why interest rates have remained so low, without growth picking up more, focuses less on longer-term factors holding back growth, and instead on a “series of unfortunate events”. This line of reasoning argues that advanced economies have been on the verge of strong recoveries and periods when they could successfully “launch” a series of sustained interest rate hikes – and then an external shock, increased risk of a major external event, or a political event provides reasons to delay. Although this is certainly not the whole explanation, and I can’t remember when we lived in a period without surprises and shocks of some type or another, my experience on the Monetary Policy Committee over the last three years has made me sympathetic to these arguments. At the very least, there have been a number of times where increased global risks – or a configuration of global shocks – have been important considerations in my decision not to support an immediate increase in interest rates.

For example, Figure 3 shows a timeline of the periods when there were heightened global economic risks (in grey) and major domestic political events (in red for the UK and black for the US) affecting the UK and US since 2014.<sup>20</sup> The year 2014 is a useful starting point as this was a period when the output gap was believed to be fairly small in the US and UK (albeit with a huge degree of uncertainty about how big it actually was), inflation was closing in on target, and the growth outlook strong enough that it was possible to make a case to begin increasing interest rates. In fact, some central bankers and market analysts in both the US and UK began to suggest “lift-off” would begin soon.<sup>21</sup> Market curves suggested investors expected lift-off to be around 2015Q2 in the UK and around 2015Q3 in the US<sup>22</sup>.

Then oil prices began to fall...and fall...and fall some more. Other commodity prices followed suit. The fall in oil prices over the course of mid-2014 to start-2016 was the largest since the 1980s. This significantly reduced headline inflation in most countries around the world – and the effects were fairly extended as the declines in oil prices had several legs. In fact, the drag from lower oil prices that started in 2014 helped reduce inflation for over two years in the UK – with the effects still rolling off the price indices at the start of

---

<sup>19</sup> As I noted in “A MONIAC (not manic) economy” given in February 2017, my colleagues on the MPC Minouche Shafik and Jon Cunliffe have fretted about the series of unfortunate events which were dragging on the UK economy in 2015.

<sup>20</sup> For the EU referendum, the period from when the election date is announced until the result is known is highlighted in light grey. There was also heightened uncertainty around the other elections, but we’ve chosen not to highlight those uncertain periods as there was not always a clear start or end date to the corresponding uncertainty.

<sup>21</sup> See Governor Carney’s Mansion House Speech from 2014 and the transcript from Chair Yellen’s March 19, 2014 Press Conference.

<sup>22</sup> For the UK, according to the 2014 February *Inflation Report*, averaged over the same 15 business days to 5 February. For the US, as implied by the US dollar OIS curve



2017. Although these drags on headline inflation from commodity price movements are usually temporary and can be “looked through” from the viewpoint of monetary policy, the magnitude and duration of the oil price falls undoubtedly reduced pressures to begin the process of raising interest rates. The falls in headline inflation also likely reduced pressures for wage increases – just as workers in many countries were beginning to feel more confident after the crisis – thereby further slowing the growth in labour costs and reducing inflationary pressures.

Moreover, the decline in oil prices was not the only major global event to affect inflation prospects and the outlook for monetary policy in advanced economies. Although concerns about the sustainability of China’s economic growth model have existed for some time, these concerns increased notably in late 2015. Growth in China slowed, capital outflows increased, reserve levels started to fall, credit concerns increased, and the weakness in China seemed to be shared more broadly as other emerging markets experienced disappointing growth and global trade growth stagnated. This weakness in major emerging markets – and especially the risk of a much sharper slowdown or financial crisis in China – began to affect financial markets and advanced economies. If a crisis or sharper slowdown emerged, it would undermine the recovery and case for raising interest rates. The heads of the Bank of England and US Federal Reserve both highlighted concerns about weakness in emerging markets as being a factor behind their monetary policy decisions around this time.<sup>23</sup> Figure 4 shows this shift in concerns in an analysis of the frequency by which different words are used in the Federal Reserve’s minutes in conjunction with the term “risks”; “inflation” was the prominent concern in Dec 2015, but then in Jan 2016, the prominent concerns (according to this word cloud) were “foreign” and “market”.

Moreover, the fall in oil prices and weakness in major emerging markets weren’t the only “unfortunate events” that provided an incentive to delay raising interest rates in advanced economies. In the few windows when these risks appeared to be easing, there inevitably seemed to be some major election, political event, or debt negotiation that was generating heightened volatility in financial markets and that could potentially undermine the broader recovery. In the case of just the US and UK, there was the Scottish referendum on UK membership, the UK referendum on EU membership, two general elections in the UK, and a tight presidential election in the US. In the early summer of 2015, there was a period when negotiations on Greece’s debts appeared to be about to collapse, with risks to the stability of the euro area (a deal was reached on July 13, after 17 hours of talks). These events all increased uncertainty – and given the evidence that heightened uncertainty can weigh on an economy in multifaceted ways that can reduce economic growth<sup>24</sup> – any of these events could provide a reason to delay increasing interest rates.

---

<sup>23</sup> In “The Turn of the Year”, given in January 2016, Mark Carney notes that the volatility in China has played a role in his monetary policy decision. And, in a speech in March 2017, ([From Adding Accommodation to Scaling it Back](#)) Yellen explains that “In 2015, the unemployment rate fell significantly faster than we generally had anticipated in 2014. However, a series of unanticipated global developments beginning in the second half of 2014—including a prolonged decline in oil prices, a sizable appreciation of the dollar, and financial market turbulence emanating from abroad—ended up having adverse implications for the *outlook* for inflation and economic activity in the United States, prompting the FOMC to remove monetary policy accommodation at a slower pace than we had anticipated in mid-2014.”

<sup>24</sup>See Forbes (2016).

And whatever one's views are on the economic effects of these events, many of them – especially the elections – would have a clear resolution (at least to the immediate issue) on a specific date, after which there would be substantially more information on the economic outlook. I personally would not delay a needed increase in interest rates due to an upcoming political election. But when the case for raising interest rates is not urgent, there is little cost to delay a decision for a few weeks until a major result is known – especially if it could provide more certainty on key economic variables. And even if policymakers try to ignore these influences—they could affect firm and work decisions in ways that in turn affect the outlook for monetary policy. For example, concerns around Brexit may have made UK workers more hesitant to quit, switch jobs, and bargain for higher wages – as shown in Figure 5. This recent fall in quits around the Brexit referendum is quite striking, especially in the context of unemployment being at the lowest level in over 40 years and other evidence of robust labour demand. For someone who is uncertain about the case for adjusting monetary policy, these types of uncertainties around political events and how they might affect the economy can provide a reason for delaying an increase in interest rates. There is always the hope that next month brings more clarity. Although, more often than not, greater clarity on one dimension of the data usually occurs with a new puzzle arising in another dimension.

*d. Is the Economy Really this Weak?*

Each of the arguments I just discussed for why growth has not been stronger and inflationary pressures have been subdued have some merit. The crisis has generated headwinds that slow economic growth and make the recovery more fragile; the natural rate of interest is lower today than before the crisis, and economies have experienced a number of short-term events and surprises that reduced inflationary pressures. But all of these arguments depend at least in part on the assumption that underlying economic growth and inflationary dynamics are too weak to support an increase in interest rates from emergency levels. And a simple look at the economic data suggests that this may not be true. Although major advanced economies certainly have economic challenges, and potential growth is lower than historic averages (if for no other reason than demographics), the key macroeconomic statistics central to monetary policy suggest that economies are as strong by many measures as they have traditionally been when monetary policy has been tightened.

For example, consider Figure 6a, which shows GDP growth, unemployment, headline and core CPI inflation, and wage growth for the US and UK for three time periods: today (in blue); historic averages since 1997 (in black dashes); and averages at the start of past tightening cycles (in red). For each indicator, the closer the point to the centre, the weaker the economy.<sup>25</sup> By some measures, such as unemployment and both measures of inflation, the UK is stronger than when past “launches” to higher interest rates occurred. By other measures, however, such as GDP growth and wage growth, the economy is not as strong as at the

---

<sup>25</sup> To be read consistently with the other measures, the axis for the unemployment rate is reversed.

start of past tightening cycles. It is also worth noting that by the simplistic measures on these graphs, the UK economy is more clearly positioned for a tightening cycle than the US, at least relative to past decisions.

These measures are not terribly informative for assessing the key variables relevant to monetary policy today, however, as the comparisons to historic averages do not capture structural changes in the economy which may change the thresholds by which to evaluate when tighter monetary policy is justified. For example, demographic changes and slower productivity growth have lowered the potential growth rate in the US and UK. Changes in the labour market have lowered the equilibrium unemployment rate. And slower productivity growth implies a lower rate of wage growth that would be consistent with keeping inflation around each country's target. A better comparison for this type of graph is where each variable is relative to the level consistent with maintaining inflation around the target.

Figure 6b makes this comparison. It shows the same variables as before, but instead of showing what happened in past lift-offs or the historical average, it shows where each of the indicators is relative to estimates of the "potential" or "steady-state" value – basically the value believed to be consistent with supporting growth as strong as possible while keeping inflation around target sustainably. Since these numbers are not directly comparable to those from past hiking cycles, it graphs the "target" for each point in red (the estimated potential GDP growth rate, the natural unemployment rate as estimated by the MPC and the Fed respectively, the equilibrium growth in wages consistent with productivity growth at the average rate over the past 15 years and inflation at target, and the targets of 2% for inflation). The most recent value for each variable continues to be shown in blue.

There is substantial uncertainty around exactly where these "targets" are (such as the debate on where the natural rate of unemployment is), but with this important caveat, the graphs in Figure 6b present a striking picture. The UK economy is clearly outperforming or close to equilibrium by every measure except wage growth – with headline inflation, core inflation, GDP growth, and unemployment around or above levels consistent with steady-state growth and inflation at target. This is not an economy that is too weak to support an increase in interest rates. Instead, it appears to be an economy that is "overstimulated" and where monetary policy has been set too loosely. In contrast, the US economy appears to be closer to a steady-state level by most variables – with GDP growth, unemployment, wage growth and headline inflation around steady-state levels, but core-inflation slightly lower.<sup>26</sup>

The bottom line: when considering the current structure of the economy and performance in the key variables critical for monetary policy, the US and UK are not doing badly. This is particularly true when considering the demographic changes which imply slower potential growth rates (as well as the structural changes which imply lower natural rates of unemployment). There are certainly economic challenges. The

---

<sup>26</sup> Recent weakness in core-PCE inflation in the US appears to partly reflect declines in prices for cellular telephone services and prescription drugs, which may not persist. Recent strength in core inflation in the UK partially reflects the effects of sterling's depreciation.

recovery from the crisis has been prolonged and extremely accommodative monetary policy has been an important part of the recovery. Some support from monetary policy is likely still warranted in the UK – and may be for some time. But the data suggest economies have recovered enough that a gradual reduction in the substantial stimulus in place is warranted. This argument appears to be even stronger for the UK than the US – where the UK is showing signs of being “behind the curve” in terms of adjusting monetary policy. As a result, it is increasingly difficult to make the case that fundamental economic weakness (whether couched in terms of secular stagnation, low  $r^*$ , or a series of unfortunate events) is the main reason why it has been so hard to increase interest rates at all from emergency levels. There must be other factors at play.

## **II. *The Nature of Policymaking and Policy Environment***

If it is not purely economic developments holding back a launch of interest rates from emergency levels, could characteristics of the policy environment and policy process be important? Monetary policy has fundamentally changed in many ways since the crisis – including new tools for central banks (such as quantitative easing and macroprudential tools), expanded roles for central bankers (such as greater emphasis on financial sector risks, more transparency and accountability, and greater political attention), and increased constraints on central banks (due to the zero lower bound and sensitivity of the exchange rate). This section will explore if these changes in the policy environment may be making it more difficult, or less necessary, to increase interest rates over the past few years as the economy has strengthened.

### *a. New Tools Take the Burden off Interest Rate Adjustments*

One of the more striking changes in monetary policy since the crisis has been the expansion of tools in the standard central bank “toolkit”. Central bank policy adjustments are no longer primarily about votes to change a key interest rate by a discrete amount. Instead, they regularly involve explicit forward guidance<sup>27</sup>, asset purchases, macroprudential tools, and even attempts to change the shape of the yield curve. Although some of these policies had been used selectively before the crisis (such as quantitative easing in Japan), many of these “unconventional” tools have now become not only conventional, but common. Ip (2010) describes the increased use of quantitative easing as the “Star Trek of central banking, taking the Fed into strange new worlds with unknown consequences.”<sup>28</sup> Central banks have now made these new worlds part of their regular travelling routes. These additional tools have provided a number of benefits, such as when additional monetary stimulus was needed in countries with interest rates at their lower bound, as well as to help address additional mandates given to some central banks (such as for financial stability).<sup>29</sup> These additional tools, however, can also influence debates on when it is appropriate to increase interest rates by providing a way to tighten financial conditions without increasing the official policy rate.

---

<sup>27</sup> Many central banks, including the Bank of England, regularly provided information on the likely path of future policy (such as through the fan charts in the Bank of England’s *Inflation Report*), but this guidance has become more explicit.

<sup>28</sup> Ip (2010), pg. 159.

<sup>29</sup> According to the Tinbergen principle of “one objective-one tool”.

For example, consider the now “conventional” tool of quantitative easing. Figure 7 shows the massive growth in asset holdings of around \$10 trillion since the crisis in four major central banks. Any reduction in the rate of asset purchases, or corresponding information about when the expected stock of asset holdings would stop increasing, could have similar effects as increasing interest rates.<sup>30</sup> The experience of the “taper tantrum” in 2013, when the US Federal Reserve hinted that at some point in the future it would gradually reduce its rate of asset purchases, supports this hypothesis. Figure 8 shows the response over the subsequent two months until July: US 10-year interest rates increased by about 90 basis points, the US exchange rate index strengthened by 2.7%, spreads on emerging market debt increased sharply, and emerging market currencies depreciated abruptly. Over \$20 billion of private capital flew out of emerging markets.<sup>31</sup> The effects were qualitatively similar to what one would have expected if the US had instead tightened monetary policy using the traditional tool of increasing interest rates.

Macroprudential instruments provide another example of how the expanded toolkit of central banks may be taking the burden off adjusting interest rates<sup>32</sup>. In some cases, macroprudential tools could be used to address concerns which might otherwise have contributed to a decision to tighten monetary policy (such as rapid credit growth or vulnerabilities related to an overheating property market)<sup>33</sup>. Although the desirability of raising interest rates to address credit concerns or vulnerabilities in certain sectors (such as housing), is a controversial topic<sup>34</sup>, these concerns often factor into monetary policy discussions. For example, Australia was the second central bank in an advanced economy (after Israel) to begin increasing interest rates after the crisis, and raised them 7 times before reversing course and reducing them to an even lower rate. There were a number of reasons why Australia tightened monetary policy so aggressively – including a robust economy by many measures. Australia is also a central bank that does not have control over the major macroprudential tools and cited concerns about the “unsustainable growth” in dwelling prices and “build-up of other imbalances in the economy” as factors behind its rate increase decisions. It is impossible to know the counterfactual, but if Australia (and other central banks who also lacked macroprudential tools) had more potent use of policies other than interest rates, could they have used those other tools to address their concerns and not increased interest rates as aggressively?

An even clearer example of how macroprudential policy can reduce incentives to increase interest rates comes from my own experience at the Bank of England. In 2014, UK house prices were increasing rapidly and consumer borrowing to finance home purchases was accelerating to levels that could indicate future

---

<sup>30</sup> See D’Amico and King (2013).

<sup>31</sup> The number refers to the sum of net private portfolio capital outflows in May and June 2013, as reported in the Monthly EM Portfolio Flows Database compiled by the Institute of International Finance.

<sup>32</sup> See Akinci and Olmstead-Rumsey (2017), Cerutti *et al.* (2017) and Reinhardt and Sowerbutts (2015).

<sup>33</sup> See Forbes, Reinhardt and Wieladek (2016) for discussion of how macroprudential policy affected UK international bank lending.

<sup>34</sup> For samples of this debate, see Adrian and Liang (2016), Stein (2014), Svensson (2013), Ajello *et al.* (2015) and Woodford (2012).

vulnerabilities.<sup>35</sup> Bank exposure to housing-related loans was growing at rates that were starting to generate concerns. One response to these types of risks could have been to raise interest rates. The economy was strong enough that an increase in rates soon was already part of the discussion – and if these risks related to the housing market and debt accumulation were not addressed – they would have strengthened the case to move sooner.<sup>36</sup> But instead, the Financial Policy Committee at the Bank of England tightened macroprudential policy to reduce future risks from housing-related debt in the banking sector. Although I wouldn't want to speak for the rest of the Monetary Policy Committee, for me this somewhat reduced the urgency behind one reason to raise rates, providing more time to evaluate whether other economic developments justified tighter monetary policy.

#### *b. Expanded Roles Shift the Focus of Central Bankers*

Just as central banks have a larger set of tools today than before the crisis<sup>37</sup>, they also have a larger set of responsibilities. And by responsibilities, I mean not just over economic and financial variables, but also in terms of transparency and to the broader public.<sup>38</sup> These larger and more demanding roles, especially when combined with changes in their remits, could, in some cases, make it more difficult to raise rates.

In the past, advanced economy central banks primarily focused (some might say myopically) on inflation. Granted, different institutions had somewhat different mandates – with some focused on keeping inflation around or below a target (such as the ECB), some focused on keeping inflation symmetrically around a target (such as the BoE) and some focused on maintaining “maximum employment as well as stable prices” (such as the US Federal Reserve). Although the frameworks differed, there was no doubt that maintaining low inflation was at the core of every central banks' remit.

Over the last decade, however, the remits of several major central banks have been expanded to incorporate risks to the financial sector and broader financial stability, often in conjunction with new tools to accomplish this broader mandate. Prominent examples include the Norges Bank and, closer to home, the Bank of England.<sup>39</sup> This major change in the responsibilities of the Bank of England was made in the Financial Services Act of 2012.<sup>40</sup> This act created an independent Financial Policy Committee (focused on

---

<sup>35</sup> In the June 2014 *Financial Stability Report*, the FPC notes that the “recovery in the UK housing market has been associated with a marked rise in the share of mortgages extended at high loan to income multiples [...] This could pose direct risks to the resilience of the UK banking system, and indirect risks via its impact on economic stability. The FPC... has agreed that it is prudent to insure against the risk of a marked loosening in underwriting standards and a further significant rise in the number of highly indebted households.”

<sup>36</sup> For example, the [MPC minutes from June 2014](#) noted that “While the low level of Bank Rate could encourage financial imbalances, particularly in the housing market, the mitigation of such risks was best addressed using the macroprudential tools available to the FPC in the first instance.”

<sup>37</sup> Granted, in his [Per Jacobsson lecture](#), Tim Geithner discusses how “the tools available to limit the intensity of financial crises” may be more limited in central banks in some advanced economies, primarily due to the low level of interest rates, larger balance sheets, and new restrictions on the Federal Reserve.

<sup>38</sup> See Haldane (2014) for a discussion of the changing role of central banks.

<sup>39</sup> More specifically, in 2012 the Norges Bank published a new loss function that explicitly takes into account the risk of a buildup of financial imbalances (by adding an interest rate gap to the policy function and also by increasing the weight of the output gap, i.e. leaning against the wind). See Evjen and Kloster (2012).

<sup>40</sup> See <http://www.bankofengland.co.uk/about/Pages/history/default.aspx>

macroprudential and financial risks)<sup>41</sup> and a Prudential Regulation Authority (focused on prudential regulation of financial institutions), and gave the Bank new responsibilities for supervising financial market infrastructure providers. The formal mandate for the Monetary Policy Committee has also changed. In 2013, the Government updated the MPC's remit to "clarify the trade-offs that are involved in setting monetary policy" – in other words allowing the MPC to place more weight on other variables and considerations than simply returning inflation to target in about two years' time.<sup>42</sup> And since the independent FPC was set up in 2013, the government has required the MPC to coordinate with the FPC in cases where trade-offs between the two committees' objectives emerge and asked it "to reflect in any statements on its decisions, the minutes of its meetings and its Inflation Reports how it has had regard to the policy actions of the FPC"<sup>43</sup>. Around 80% of central banks currently have some role in macroprudential policy, and about 50% have the primary responsibility for these tools.<sup>44</sup>

Moreover, as the formal remits of major central banks have expanded in these types of ways over the past few years, the expectations for transparency and the public role played by those leading these institutions has also grown.<sup>45</sup> Think back to the days of Montagu Norman, the Governor of the Bank of England from 1920 to 1944, who is often cited as saying that the role of a central banker was: "Never explain, never apologise". The Bank not only avoided press conferences and hearings before the Treasury Select Committee, but would not even announce changes in interest rates.<sup>46</sup> Central bankers believed that too much talk and public discourse would cause unnecessary volatility in markets, and discussing their actions could tie their hands in the future.

The world has certainly changed. Sebastian Mallaby's brilliant book *Greenspan: The Man Who Knew* documents how Alan Greenspan developed from a young, data-obsessed economic analyst to one of the most talented political players and influential figures in the United States. His political skills were so sophisticated, that he supposedly even outwitted Henry Kissinger – one of the world's premier political strategists – in a disagreement about an oil deal with Iran. The book also raises serious questions about whether Greenspan might have been more proactive in addressing vulnerabilities that contributed to the Global Financial Crisis if he had been less concerned about his political popularity.

In contrast, to "the maestro" of Alan Greenspan, Mallaby's book also describes Paul Volcker's term as chairman of the Federal Reserve in the 1980's. Volcker's single-minded focus on bringing inflation down through sharp hikes in interest rates made him so unpopular that he was regularly subject to political attacks

---

<sup>41</sup> More specifically, the mandate of the Financial Policy Committee is "identifying, monitoring and taking action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system".

<sup>42</sup> See 2013 Review of the monetary policy framework for details. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/221567/ukecon\\_mon\\_policy\\_framework](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221567/ukecon_mon_policy_framework)

<sup>43</sup> For further detail see the latest Remit and Recommendations Letter for the Financial Policy Committee from 8 March 2017, available at: <http://www.bankofengland.co.uk/financialstability/Documents/fpc/letters/chancellorletter080317.pdf>.

<sup>44</sup> Claessens *et al.* (2016).

<sup>45</sup> See Haldane (2017b) for a longer discussion of the changing transparency and public role played by central banks.

<sup>46</sup> Ip (2010), p.154.

and public protests. He faced discontent in the form of two-by-four planks mailed to his office from bankrupt homebuilders, keys of unsold vehicles sent from struggling carmakers, and farmers driving their tractors to Washington and creating a blockade around the Fed's headquarters.<sup>47</sup> Can you imagine a central banker today facing that type of ire? Central bankers can no longer hide behind their thick stone walls as they are now regularly interacting with people throughout the country. And even if central bankers today were willing to make decisions that put them in this extremely unpopular position – would there be pressure for them to resign from their jobs? While at the Bank of England, I have not seen any evidence of the Government pressuring any MPC member to adjust their stance to support government policy. But there have been other voices calling for central bank governors to resign for actions that do not seem to have caused nearly as much economic distress as the increases in foreclosures and unemployment during Volcker's era.<sup>48</sup> The fact that central bankers today have a broader set of issues that they are held responsible for in their remits, are more transparent about their decisions, and play a more public role, does not mean that they are making the wrong decisions. Instead, moving past the era of “never apologise, never explain” to having to publicly explain decisions and meet with a broad set of constituents has undoubtedly improved the decision making process. Nonetheless, there are also ways in which these changes may have made it more difficult to raise interest rates.

More specifically, as central banks have seen their remit expanded to include a broader set of considerations and have played a more public role, this could make them more hesitant to “take away the punch bowl” and make the difficult decisions that can be required to keep inflation stable. In the UK, changes to the BoE's remit explicitly require a consideration of the trade-offs involved in deciding the speed with which inflation is returned sustainably to target. Central bankers may place more weight on supporting the economy today and worry less about future risks related to low interest rates and high inflation if they are constantly on the firing line for the current state of the economy – including for issues other than inflation. As Thomas Hoenig (the former President of the Federal Reserve Bank of Kansas City) recently worried: “In a world of discretionary policy, when the moment comes to choose between long-run goals and short-term effects, policymakers experience enormous pressure to choose the more expedient short-run solution, deferring to another time concern with the long-run implications.”<sup>49</sup>

Put slightly differently, do central bankers today put more weight on how tighter monetary policy could affect unemployment during their term and less on the costs of low interest rates in the future? Or given their more public roles, do central bankers today worry more about what could go wrong around the times that rates were tightened—even if any problems were not related to the increase in rates – knowing that they will be blamed nonetheless? As central bankers consider a broader range of economic and political concerns,

---

<sup>47</sup> Mallaby (2016).

<sup>48</sup> For example, see <http://www.dailymail.co.uk/news/article-3802935/Disgraceful-Bank-England-chief-Mark-Carney-quit-fuelling-Brexit-fears-claims-ex-Chancellor-Lord-Nigel-Lawson.html> for a call for Governor Carney to resign. Or, see <http://www.nbcnews.com/storyline/2016-election-day/trump-said-janet-yellen-should-be-ashamed-herself-so-will-n681581> for discussion of Chair Yellen's position at the helm of the Federal Reserve during the US election.

<sup>49</sup> Thomas Hoenig, “The Long-Run Imperatives of Monetary Policy and Macro-Prudential Supervision”, comments at the Cato Institute's 34<sup>th</sup> Annual Monetary Conference, Nov. 17, 2016.



could this shift away from the basic focus of monetary policy – inflation – mean it gets less weight in their decisions? Figure 9 shows some support for this hypothesis. It graphs the number of times that the term “downside” and “risk” are cited in MPC Minutes since 1998. Although there are certainly risks and uncertainty about the economy today, it is hard to believe that these risks are so much more elevated than during the Global Financial Crisis in 2008 when the entire global financial system was freezing up and the world experienced the sharpest slowdown since the Great Depression.

Could this greater focus on risks have created an asymmetry in our monetary policy responses? Over my term on the MPC, we have been much quicker to adjust monetary policy in response to downside risks than upside. We adopted a large stimulus package in August due to concerns that the economy might weaken substantially – not waiting for hard data. Then the economy outperformed for much of a year, yet today a majority of the Committee still does not support a recalibration of this stimulus. Granted a greater focus on downside risks – and willingness to respond to them – has made sense over the last few years given risks around deflation, the lower bound, and secular stagnation – as I discussed earlier. But as I also discussed earlier, these risks have receded. And the August stimulus package has confirmed the power of quantitative easing as a policy tool even when interest rates are near zero. It is disconcerting that 1-year-1-year forward rates have become so much less responsive to positive news surprises in the UK, such that staff estimates indicate their sensitivity to positive events is insignificant today – the first time since end-2008.

Also, even if this greater focus on risks and willingness to respond to risks has not been a key factor weighing on interest rate decisions, there is also the fundamental issue of time constraints. In the past, monetary policy was the key focus of most members of monetary policy committees (MPCs). Now, some members of the Bank of England’s MPC spend a substantial amount of time on other Committees and focusing on other mandates. For example, the Governor and Deputy Governors at the Bank of England now also sit on the Financial Policy Committee and Prudential Regulatory Committee. As an external member of the MPC, I only have the responsibility to one committee – and there are some weeks that it is hard to keep up with just that workload. Even for people who work extremely long hours, there are only so many hours in a day.

One way to illustrate how this wider set of responsibilities may be affecting the focus of MPC members is to look at the topics of their public speeches. In the three years before the FPC was launched (from 2010 to 2012), about 70% of the speeches given by internal MPC members (excluding the Governor) were at least partly on monetary policy. In the three years after the FPC was operating (from 2014 to 2016), only about 55% of the speeches by the same group included a discussion of monetary policy. In sharp contrast, external members – who do not sit on other committees – maintained their exclusive focus on monetary policy. About 98% of the speeches of external MPC members discussed monetary policy – in both the 2010 to 2012 as well as the 2014 to 2016 periods. Of course, the fact that internal MPC members are focusing on issues other than monetary policy can also bring benefits – such as putting monetary policy decisions in a broader context. But as with any issue, there may also be costs.

Moreover, even if talented officials keep up with all of the issues relevant to all the committees on which they sit, there is little chance for those with a myriad of responsibilities to pursue their own thinking or analysis on issues specific to monetary policy – making it harder to challenge the baseline analysis presented by staff. This may make it more challenging for full committees to thoughtfully consider different approaches and points of view. As potential evidence of this, Figure 10a graphs all dissenting votes on the MPC since it started in 1998. Dissenting votes by both internal and external members are not unusual in the earlier years of the MPC.<sup>50</sup> Over the first 16 years that the MPC was operating (from 1998 through 2013), about 10% of the total votes were dissents from the majority, reflecting a healthy range of views. Internal MPC members were a key part of this range of views – with about 34% of the dissenting views over this period cast by internals. Even the Governor was outvoted on several occasions (as shown in the yellow parts of the bars). This pattern of robust debate by all committee members continued during the tumultuous period from 2007 through 2013 – a period when there may have been more pressure for internal management to show a united front given the heightened risk around the global financial crisis and euro crisis – with 30% of dissenting votes still continuing to come from internals.

This pattern of different views and dissent by all types of committee members, however, seems to have changed around 2013 – a period when there were a number of changes at the Bank and to the MPC's remit, making it hard to pinpoint the cause. From 2014 onwards, there have been 26 non-consensus votes, 3% of all votes cast. This lower rate of dissent could reflect changes in the economy that have made monetary policy decisions straightforward and non-controversial over this period—although given the sharp undershoot and now overshoot of inflation over much of this window – it is hard to believe this is the entire explanation. What is even more striking is changes in the pattern of where the dissents come from. Not a single dissent since 2013 has come from an internal member.<sup>51</sup> This is a sharp change from before 2013, when dissents were spread across external members, internal members, and even at times the Governor.

It is hard to identify exactly what has driven the change. The year 2013 was when the FPC was created – substantially adding to the workload of the members of the MPC that also sat on the FPC. The year 2013 was when the remit of the MPC was changed to incorporate a greater consideration of trade-offs and the speed with which inflation was returned to target. There were also a number of changes in the composition of the committee (with a new Governor, three new deputy governors, and a new chief economist over the course of 2013 and 2014). These comparisons are also on very small sample sizes, so changes in voting patterns could simply reflect changes in committee membership from year to year – especially of any individual external member who frequently had minority opinions. Figure 10b breaks down the number of dissenting votes by internals and externals by meeting (instead of year), however, and suggests that these

---

<sup>50</sup> External members are the four external MPC members. Internal members are the full-time employees of the Bank and include the Governor, deputy governors, and chief economist.

<sup>51</sup> Non-consensus votes include votes for tighter and looser monetary policy. On days when there was a vote on more than one issue (such as in August 2016, when there were also votes on additional government bond purchases and a new program of corporate bond purchases), the votes on each issue are counted separately.

changes do not just reflect changes in individual membership – such as just one or two individuals who consistently voted in a minority leaving or joining the committee. Instead, this shift in patterns seems to reflect a more fundamental change in the committee. All except one of the 26 non-consensus votes since 2013 have also been for tighter monetary policy than the consensus.<sup>52</sup>

To summarize, this discussion is not intended to imply that anyone is making a decision for political reasons or making the wrong decision. Instead, the main lesson that I draw is that changes in the institutional structure of central banks, including changes in their remits, the increased expectations for central bankers, and the increased demands on their time, may have shifted their focus and risk assessments in the portion of their role relevant to monetary policy. These institutional changes may provide substantial benefits for the central bank as a whole and overall economy, but these changes may also have played a role in making it more difficult to increase interest rates.

### *c. Increased Constraints on the Effectiveness of Interest Rates for Monetary Policy*

A final way in which the policy environment for central bankers has fundamentally changed in ways that could make it harder to raise interest rates is the way in which the standard tool – of adjusting rates – works. More specifically, are adjustments to interest rates more challenging given the constraints of the effective-lower bound and the sensitivity of the exchange rate?

I'll begin with one issue raised in this context – mainly as I believe it is easy to dismiss. With nominal interest rates in so many countries near zero, it has been argued that central banks are “out of ammunition”. If the neutral rate of interest ( $r^*$ , as discussed above) remains low, then central banks will continue to have less room to manoeuvre through adjusting interest rates as they will remain closer to their effective lower bounds. Risk assessment – and formal models – suggest that it may therefore make sense to be more cautious in raising interest rates today as you will have less ability to respond in the future to negative shocks. Although there is some merit to these arguments, they implicitly assume that central banks will “run out of ammunition” and are unable to ease policy through tools other than interest rates. And recent experience suggests this is not true – at least for the UK. Although adjusting interest rates is my preferred means for adjusting monetary policy, there is now a body of evidence showing that other tools – such as quantitative easing – can provide meaningful economic stimulus.<sup>53</sup> The quantitative easing programs and Term Funding Scheme adopted by the Bank of England in August seemed to not only be effective, but have even larger immediate effects than expected – at least to the best that we can measure.<sup>54</sup>

---

<sup>52</sup> The one exception is in July 2016, when there was one vote to ease monetary policy.

<sup>53</sup> Weale and Wieladek (2016) find that an asset purchase announcement of 1% of nominal GDP (about £18bn) leads to a statistically significant rise of 0.25% in real GDP and 0.32 percentage points in CPI inflation. Averaging across several different estimation methods, Haldane *et al.* (2016) concluded that £200 billion of QE may have raised the level of real GDP by 1½% to 2% and increased inflation by between ¾% and 1½% – effects roughly equivalent to a 150 to 300 basis point cut in Bank Rate.

<sup>54</sup> See box “Developments in UK financial conditions since the August Report” on pages 2-3 of the November 2016 *Inflation Report*.

A more important constraint on raising interest rates, however, and one that interacts with low interest rates, is the constraint resulting from exchange rate movements in this globalized world. If the increased possibility of an increase in interest rates causes an exchange rate to appreciate, and a stronger exchange rate, in turn, tightens financial conditions and slows exports and demand, then it may no longer be as urgent to raise interest rates. In some sense, the tightening of monetary policy could happen without the policy rate even being tightened. And this is more likely to occur in a world such as today when interest rates in so many countries are at record low levels, so perceived “tightening” happens more through guidance and language than actual adjustments in rates. Put slightly differently, the “impossible trilemma”, which already made it difficult for small, open-economies to adjust monetary policy to address domestic imbalances, may have become even more difficult in this era of interest rates near zero.<sup>55</sup> I realize that there are many caveats and “ifs” in this line of reasoning – but my experience at the Bank of England suggests that these effects may be important.

For example, consider the UK’s experience in 2014. As shown in Figure 11a, market expectations were for the MPC to increase interest rates soon – not only before the FOMC, but well before the ECB (where rates were expected to remain near zero for at least 2 years). This expectation helped drive a sharp appreciation of sterling (shown in Figure 11b) – by more than 20% between March 2013 and August 2015. This appreciation, in turn, led to tighter financial conditions, lower net exports, and a sharp fall in import prices. All of these contributed to lower inflation. Figure 11c shows the estimates I made of this effect in my first speech on the MPC, in October 2014.<sup>56</sup> It suggests that if sterling had not appreciated so sharply, inflation would have been well above target and I likely would have been voting for an increase in interest rates. Moreover, in more recent work with two bank colleagues, we show that when exchange rate movements are driven more by monetary policy, they tend to have larger effects on prices than when the exchange rate moves for other domestic reasons.<sup>57</sup> Figure 11d shows our estimates for how much larger the effect of a monetary-policy induced exchange rate movement can be – with a given exchange rate appreciation driven entirely by changes in monetary policy predicted to have more than twice as large a drag on prices than if the exchange rate movement was driven by other domestic factors (such as supply or demand shocks or changes in risk premia). These types of large effects – of expected changes in monetary policy on the exchange rate and then on inflation – could in turn make it harder to carry through and change monetary policy.

To take these arguments one step further, these exchange rate effects (and their corresponding constraints on adjusting monetary policy) may have increased over time due to changes in the global environment. Globalization often implies that small changes in the exchange rate have larger effects on the broader

---

<sup>55</sup> See Rey (2014) for a detailed discussion of the “trilemma” and why it has become a “dilemma”.

<sup>56</sup> See Forbes (2014a), “[The economic impact of sterling’s recent moves: more than a midsummer night’s dream](#)”.

<sup>57</sup> See Forbes, Hjortsoe and Nenova (2015) and Forbes (2015b), “[When, Why and What’s Next for Low Inflation: No Magic Slippers Needed](#)” given in June 2015.

economy through capital flows and trade, especially in an open economy, such as the UK.<sup>58</sup> And these effects could have been aggravated over the last few years as so many countries have interest rates near zero – such that any small changes in rates have disproportionately larger effects. Some interesting internal work at the Bank of England suggests that the relationship between relative rates and sterling is significantly greater when there is an increase in rates (compared to a decrease), and that the effect has trebled since the UK policy rate hit the effective lower bound. An interesting new BIS paper finds that exchange rates in a broader set of countries have become significantly more sensitive to monetary policy over time, and that the foreign exchange impact of changes in monetary policy is greater, the lower are rates<sup>59</sup>. Put slightly differently, in this era of low rates, a greater share of the adjustment from changes in monetary policy works through exchange rates, and since the exchange rate effects complement those that are the goal of monetary policy, they can subsequently make it less necessary to actually raise interest rates.

### **III. *Persistent Inflation Dynamics: A “Trendy” Approach***

Changes in the monetary policy process (such as the additional tools used by central banks, greater focus on risks, and additional responsibilities of central banks) plus changes in the global environment (such as the increased sensitivity of exchange rates to potential changes in monetary policy) may have made it more difficult to “lift off” interest rates above the emergency levels adopted after the crisis. The global environment, and especially the exchange rate, may also be playing a particularly important role in UK inflation dynamics – a role not adequately accounted for in standard models of inflation dynamics. These effects may have played an important role in muting inflationary pressures in the UK from 2013 to 2016 as the economy recovered and exchange rate appreciated, and therefore supported the case not to increase interest rates over this period. But these channels have recently gone into reverse – and now provide a compelling reason why the UK should no longer delay its “lift-off” of interest rates.

Let me back up and explain what I mean by a different channel than in our standard models of inflation dynamics. Most inflation forecasts – used by the majority of economists as well as central banks such as the Bank of England – rely heavily on models that assume slack and inflation expectations are the key drivers of inflation dynamics (often based on some type of Phillips curve relationship). These basic concepts are developed formally in DSGE models that incorporate a complex set of structural relationships. In a recent paper with two colleagues at the Bank of England (Lewis Kirkham and Konstantinos Theodoridis), however, we argue that a very different approach to understanding and modelling inflation dynamics can provide important insights for the UK.<sup>60</sup> This “trendy” analysis takes a more a theoretical approach than in the standard DSGE models and focuses on the time-series in order to understand what drives movements in the slow-moving trend rate of inflation. This approach provides information on when movements in inflation

---

<sup>58</sup> Although trade and global capital flows have increased since the early 2000s, banking flows decreased sharply during the crisis and have not recovered since. See Forbes (2014b) for more details.

<sup>59</sup> See Ferrari *et al.* (2017).

<sup>60</sup> See Forbes, Kirkham and Theodoridis (2017), “A Trendy Approach to UK Inflation Dynamics”, available at: <http://www.bankofengland.co.uk/monetarypolicy/Pages/externalmpcpapers/extmpcpaper0049.aspx>

away from a target are likely to be short-lived, and when they are likely to be more persistent – and therefore can provide important insights for setting monetary policy.

More specifically, we show how UK inflation can be separated empirically into two components: a slow-moving trend and short-term movements around this trend.<sup>61</sup> Figure 12 shows the resulting decomposition of UK headline and core CPI inflation since 1984 – with the more persistent trend component of inflation in blue, and the shorter-lived, cyclical component in red. This breakdown confirms that cyclical movements have been a key driver of inflation dynamics during certain periods – such as during the period of high inflation in the late-1980s/early-1990s and during the commodity price booms of 2007/08 and 2010/2011. But the slow-moving trend (in blue) also plays an important role in driving overall inflation as well as its movements – explaining about 39% of the variation in headline inflation and 46% in core inflation since 1984.

What is perhaps most striking, however, are several periods since the mid-1990s when trend inflation moved sharply and has been a key factor driving inflation away from 2%. This is particularly evident over the past few years. The recent movement is so striking that I have broken out the estimates of this trend rate of inflation for both the headline and core CPI in separate graphs (Figure 13). I've also included dashed lines showing the 10<sup>th</sup> and 90<sup>th</sup> percentiles of these estimates (basically where we can say the estimated trend is with 80% confidence). The estimated trends of both headline and core inflation have fluctuated well away from the 2% inflation target over the past decade – and recently picked up quite sharply. For example, the trend of headline inflation troughed at 0.6% in 2015 and has recently picked up to reach 2.4% in the 2<sup>nd</sup> quarter of 2017.<sup>62</sup> And although movements in core inflation tend to be smaller, the estimated trend of core inflation has fluctuated from a recent low of 1.5% in 2015 to just above 2% in 2017.

Understanding what drives movements in this persistent trend rate of inflation, and what drives more short-term cyclical movements around it, is useful for deciding when monetary policy should “lift off” or respond to deviations of inflation from the target in either direction. The analysis in Forbes, Kirkham, and Theodoridis (2017) runs a horse race to understand these patterns and reaches a number of conclusions. First, global variables – primarily international prices (commodity prices or world export prices) and the exchange rate (which also has a domestic component) – are critical determinants of these inflation dynamics. Across a range of specifications, international prices are important determinants of the short-term cyclical movements in UK inflation around its trend, and the sterling exchange rate is an important determinant of movements in the more persistent trend in inflation. These relationships are not only significant, but economically meaningful and robust to a range of specifications. For example, using the paper's baseline estimates, the roughly 20% sterling depreciation in the year to October 2016 (in the run-up

---

<sup>61</sup> This approach builds on the work of Stock and Watson (2007), Chan, Koop, and Potter (2013), and Cecchetti *et al.* (2017). Most of the previous literature using this “trendy” approach has focused on the US, and we are the first to apply it carefully to the UK experience.

<sup>62</sup> These estimates for trend headline and core inflation in the 2<sup>nd</sup> quarter of 2017 use reported data through May 2017, combined with the Bank of England's short-term inflation forecast as of mid-June 2017.

and aftermath of the June 2016 vote for the UK to leave the European Union) would imply an eventual increase in trend headline CPI inflation of 0.73pp and in trend core CPI inflation of 0.86pp. This suggests the exchange rate has a potent and long-lasting effect on UK inflationary dynamics.

A second, and related conclusion, is that UK domestic variables at the core of the popular DSGE models of inflation dynamics, such as slack and inflation expectations, seem to play a less important role, especially when explaining the dynamics of core inflation. Even in the specifications when slack and inflation expectations are estimated to be significant, the magnitudes of their estimated relationships with UK inflation tend to be much smaller than those for international prices and the exchange rate.<sup>63</sup> This implies that if the economy starts around steady-state with trend inflation around the 2% target, and then a moderate exchange rate movement drives the slow-moving trend rate of inflation in one direction, it would take a very substantial movement in slack or inflation expectations to offset this impact of sterling and return inflation to the 2% target.

Finally, these results provide insights on why inflationary pressures remained subdued over much of my term on the MPC – from mid-2014 until the beginning of 2016 – and why it was difficult to “launch” a cycle of interest rate increases despite strength in economic activity and a sharp fall in the unemployment rate. During this period, UK inflation was subdued for two reasons: the fall in commodity prices from mid-2014 to early-2016 (which caused the cyclical component of inflation to fall) and the simultaneous sharp appreciation of sterling (which caused a sharp fall in the trend component of inflation). The drop in the cyclical component of inflation is largely temporary, so that in isolation, the appropriate monetary policy response to the fall in inflation induced by lower commodity prices would be to “look through” and not respond. This was an important component of MPC communication over my term, and has remained true even though commodity prices had several legs down, so that the combined effects lasted for well over a year. Since these commodity-induced movements in inflation did not significantly affect the underlying inflation trend, there was no need for the MPC to provide additional monetary stimulus to compensate for the fall in inflation over this period resulting from this short-term cyclical effect.

In contrast, the fall in the trend component of inflation corresponding to sterling’s appreciation had different implications. This effect was likely to be more persistent, and provided a reason not to “lift off” interest rates. Monetary policy could remain more accommodative than it otherwise would have because of this persistent sterling-induced drag – despite the reduction in slack to what was believed to be close to zero at the time. The very low level of slack and continued growth momentum were expected to continue to push up on inflation and close this output gap over time – but these effects of economic activity on inflation would work slowly and be small in magnitude – so it made sense to delay an increase in interest rates until the trend rate

---

<sup>63</sup> For example, a 1 percentage point increase in household inflation expectations, measured by the Barclays Basix1-year ahead measure, is associated with only a 0.08pp increase in trend headline inflation (and an insignificant relationship with core inflation). An unemployment gap of 1% is also correlated with only around a 0.08pp increase in headline trend inflation (and around a 0.03pp increase for core). Of course, if slack or inflation expectations remained elevated over several years, these effects would accumulate and become more meaningful.

of inflation was close to 2%. This combination of factors could have contributed to the myriad of other factors discussed above to justify not launching interest rates off post-crisis levels.....at least until recently....

#### **IV. *Conclusions and Implications for Monetary Policy Today***

These comments have discussed a number of reasons why it has been difficult to “launch” a cycle of interest rate increases in most advanced countries around the world over the past few years – drawing on my experience in the UK over my term on the Monetary Policy Committee. The UK is a poignant example of this “failure to launch”. When I started my term in the summer of 2014, it was widely believed that the UK would soon be the first country to begin the voyage of raising and maintaining interest rates above emergency levels. Since then, the UK has not only lost its lead, but slipped back in the queue so far that the yield curve at the start of the week indicated investors did not expect Bank Rate to be increased until Q3 2019.

Does this continued delay in increasing Bank Rate make sense? To answer this question, it is useful to review the three categories of reasons I’ve discussed for why interest rates have not been raised over the past three years – including before the Brexit vote. Do the same factors preventing a “lift-off” then still explain the MPC’s majority decision last week to keep interest rates constant (a majority decision which three members, including myself, voted against)? Can these factors justify a continuation of the full stimulus package announced last August?

In the first part of my comments, I argued that one set of factors delaying a “lift-off” of interest rates over the past three years is a broad set of concerns about the fragility of the economic recovery since 2008: headwinds dragging on growth, reduced stimulus due to the fall in  $r^*$ , and a series of “unfortunate events”. Some of these factors are undoubtedly still playing some role. There continues to be moderate headwinds to growth – such as from fiscal consolidation. The lower equilibrium interest rate implies that today’s low rates are providing less support than in the past. And there is never a shortage of “unfortunate events” that could derail a recovery – although the recent acceleration in global economic activity has shifted these risks away from abroad and toward those around domestic uncertainty related to the Brexit negotiations.

Despite all of these factors, in my assessment, the UK economy appears to be solid enough on key economic criteria, and even “overstimulated” by others, such that a moderate reduction in the substantial amount of monetary stimulus currently being provided makes sense. GDP growth over the last 4 quarters has averaged 0.5% (quarter-on-quarter), and although the moderate slowdown that we have been expecting appears to be in process, the MPC’s latest forecast expects growth to continue to be at or just above trend over the next three years. Unemployment is now 4.6% – the lowest since 1975 – and there is likely little (if any) slack in the labour market. Headline inflation in May was 2.9%, and will probably soon surpass the 3% threshold that will require a letter to the Chancellor. Core inflation spiked to 2.6% in May, and although some of this reflects the temporary effects of sterling’s depreciation, the pickup in various price indicators is now broad enough that some of this is likely to be persistent (as discussed in Section III). Composite and average measures of domestic cost pressures have been building gradually over the last 18 months, so that



just over half of the measures of domestically-generated inflation (DGI) that I follow are at or above levels consistent with inflation at target. My preferred measure of domestic inflation (an inverse-variance-weighted average of DGI measures which puts less weight on the more volatile components of domestic inflation that bounce around from month to month) is now at 2.2%. When adjusting for trends in underlying core goods inflation, service inflation is now at or above levels consistent with inflation sustainably at target.<sup>64</sup>

Granted, soft wage growth points in the other direction, but an assessment of domestic inflation should involve measures broader than just wages. It is also important to remember that it is not simply wage growth – but the broader measure of unit labour costs – which is most relevant to assess the domestic labour costs feeding through to headline inflation. If productivity growth remains subdued, then wage growth will not need to increase by much – and certainly not to pre-crisis levels – to be consistent with sustaining headline inflation around 2%. Moreover, a key lesson from monetary history is that a tightening cycle should start before wages accelerate to reach their level consistent with sustainable 2% inflation – why we spend so much time trying to estimate slack and output gaps.

Different people may focus on different economic variables when evaluating the UK economy. Different people can interpret the same data and variables in different ways that make them more cautious about increasing rates. Some people may worry about the strength of the economy today, and others about the economic outlook, especially given the myriad of uncertainties related to the Brexit negotiations. Any of these assessments could support a case not to increase interest rates today. But could there also be other factors contributing to the lack of any “lift-off” in the UK?

In the middle of my comments, I discussed another set of reasons – reasons related to how the monetary policy process has changed over the last decade. It is harder to quantify these effects, but my sense is that they have played, and will continue to play, some role in raising the hurdle to increase interest rates. These factors include the broader “toolkit” of some central banks – such as macroprudential policies – which can now be adjusted instead of interest rates as a way to tighten financial conditions. The broader mandate of some central banks, changes to their remits, and the greater political attention they receive, could make it more difficult to “take away the punch bowl” by increasing interest rates – especially when compared to the period when members of Monetary Policy Committees had more time to narrowly focus on meeting their single mandate of the inflation target. There is also some evidence that exchange rates have become more sensitive to adjustments in monetary policy, possibly making it harder to “lift off”, as any such discussion causes sterling to appreciate and financial conditions to tighten without ever getting interest rates off the ground. These changes to how monetary policy works are likely to continue. Many of these changes could

---

<sup>64</sup> Although most composite DGI measures are currently lower than pre-crisis, pre-crisis levels are no longer a useful benchmark for assessing whether domestic costs are consistent with 2% headline inflation. Underlying core goods prices fell on an annual basis in the decade before the crisis – allowing for elevated DGI while still meeting the inflation target. Looking forward, staff analysis suggests that core goods prices are likely to increase around ¼% to ½% over the next few years—suggesting DGI measures should be lower than pre-crisis, and by some measures, around current levels.

also provide substantial benefits (such as the coordinated use of macroprudential and monetary policy tools) – but they could also make it somewhat more difficult to increase interest rates than previously.

My third and final set of arguments suggested that a different framework for thinking about inflationary dynamics, one which focuses on isolating the persistent trend rate of inflation from cyclical and shorter-term movements around the trend, may help explain some of the challenges to increasing interest rates in the UK over the last few years. This framework provides an alternative to standard Phillips-curve based models that explain inflationary dynamics based primarily on slack and inflation expectations – models which have recently not been very successful.<sup>65</sup> This “trendy” framework suggests that sterling’s appreciation from 2013 to 2015 could have played an important role in keeping the slow-moving trend in UK inflation subdued – and therefore a powerful reason not to increase interest rates during this period.

But this last set of arguments for not increasing interest rates no longer applies. Instead, it has gone into reverse. Sterling’s roughly 20% depreciation since the fall of 2015 is pushing the slow moving trend in inflation up, instead of down. Updated estimates suggest that this persistent component of headline inflation has now picked up to reach 2.4%. Given the long-lasting nature of movements in trend inflation, this type of movement in trend inflation away from 2% would normally require a monetary policy response. Granted, there may be times when any such effects of sterling on inflation are partially balanced by other variables – such as the degree of slack in the economy or changes in inflation expectations. But the empirical estimates in Forbes, Kirkham and Theodoridis (2017) suggest that since the effect of exchange rate movements on trend inflation is substantially larger than that of other variables, a material amount of slack or fall in inflation expectations would be required to fully balance the impact of a moderate fall in sterling on trend inflation. Given that inflation expectations have risen instead of fallen, and given that there is little slack in the economy and most evidence suggests it will continue to fall (instead of rise), the conditions to ignore the overshoot of trend inflation in this framework are not in place.

This framework also suggests that the magnitude and timing of deviations of inflation from the 2% target can be important when assessing the magnitude and timing of monetary policy responses. The longer (or greater amount by which) this trend rate of inflation moves away from target, the more difficult it will be to return to target.<sup>66</sup> Given that UK inflation is now likely to reach 3%, and is forecast to remain above 2% for at least three years (as of the *May Inflation Report*), this suggests some urgency in tightening monetary policy. Granted, the atheoretical approach in this “trendy” framework may not capture complex structural economic relationships that are not easily tested in simple regressions, or broader concerns that may factor into monetary policy decisions. But it does provide a powerful rationale why keeping interest rates on hold in 2014/2015 made sense, as well as why these reasons have evolved in ways that no longer apply today.

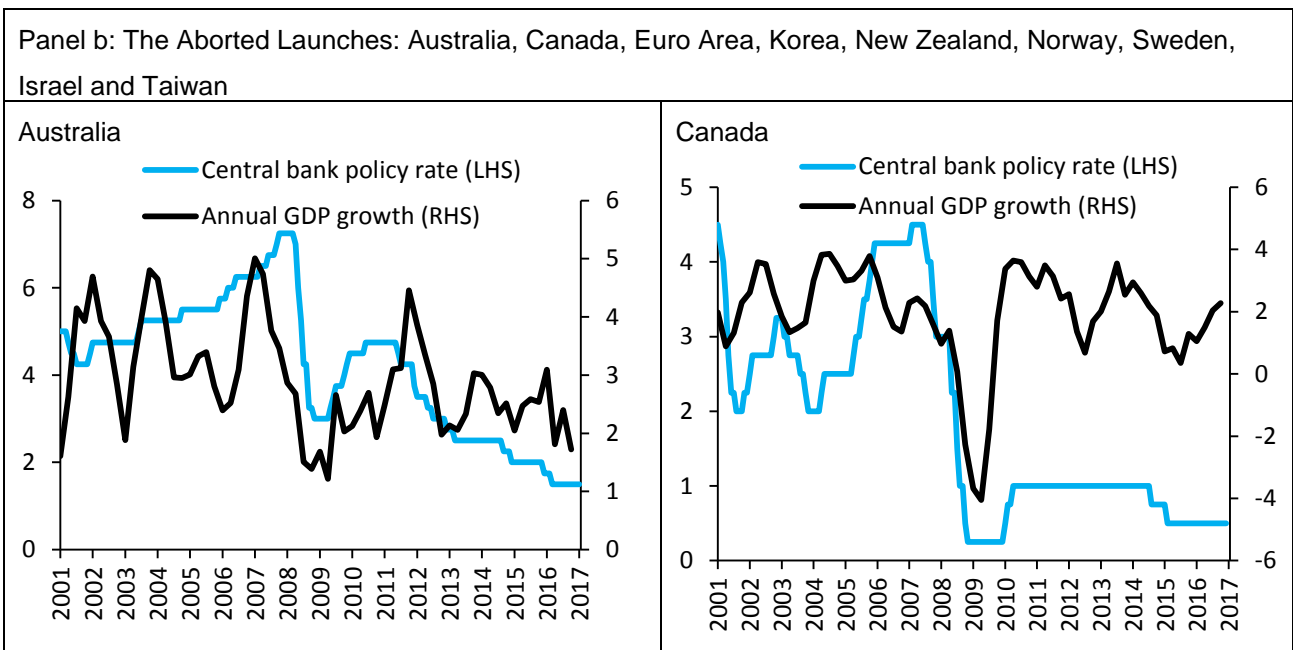
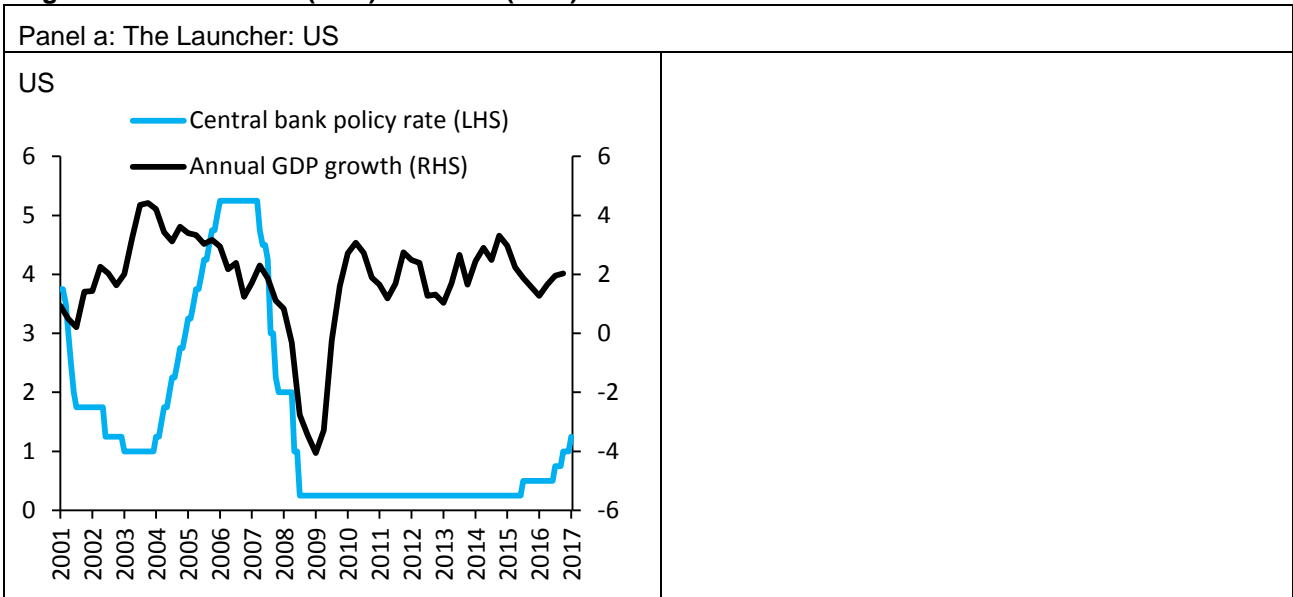
---

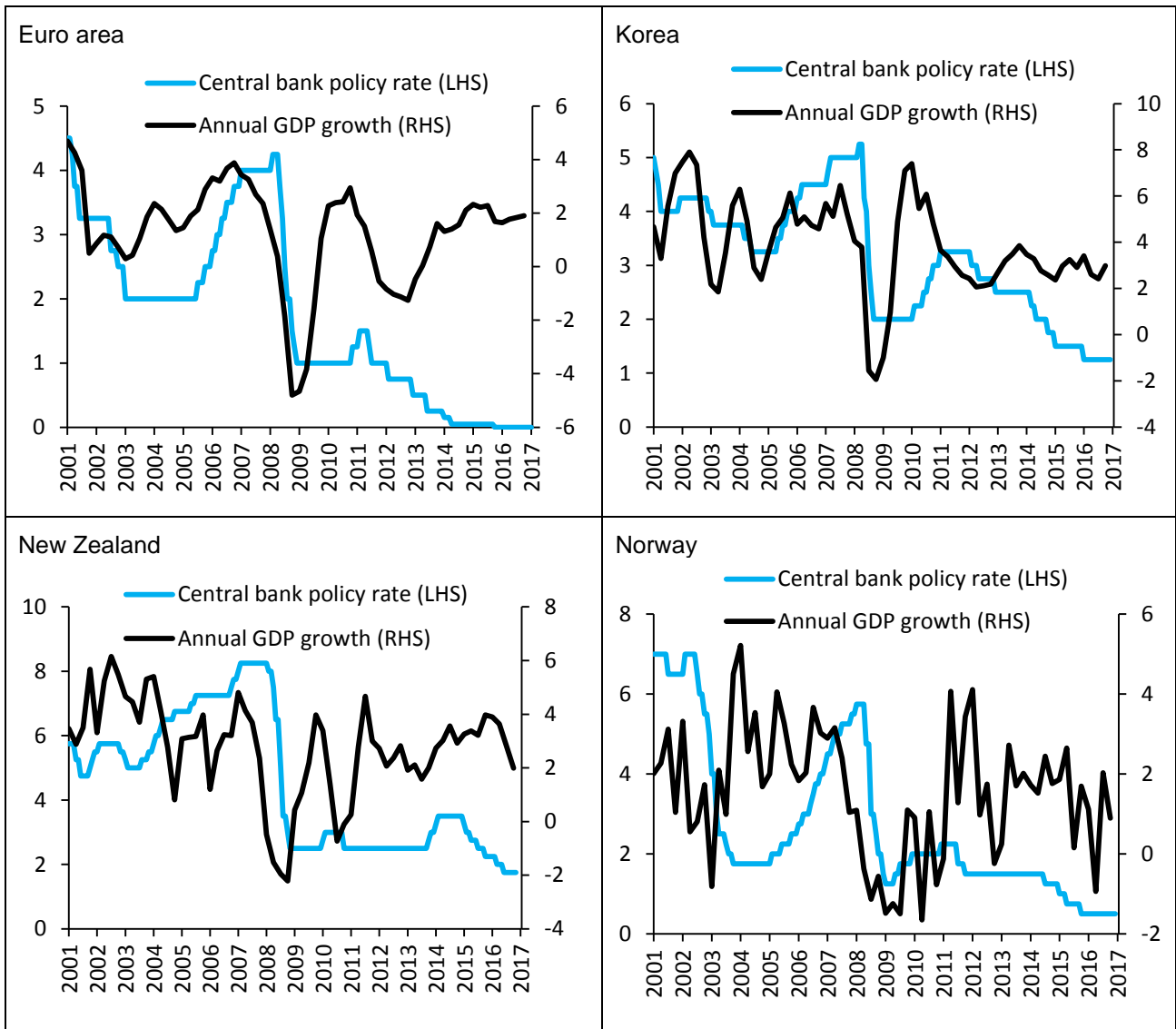
<sup>65</sup> For recent evidence on how the Phillips curve has changed, see IMF (2013), Blanchard, Cerutti and Summers (2015), Saunders (2016), and Auer, Borio and Filardo (2017).

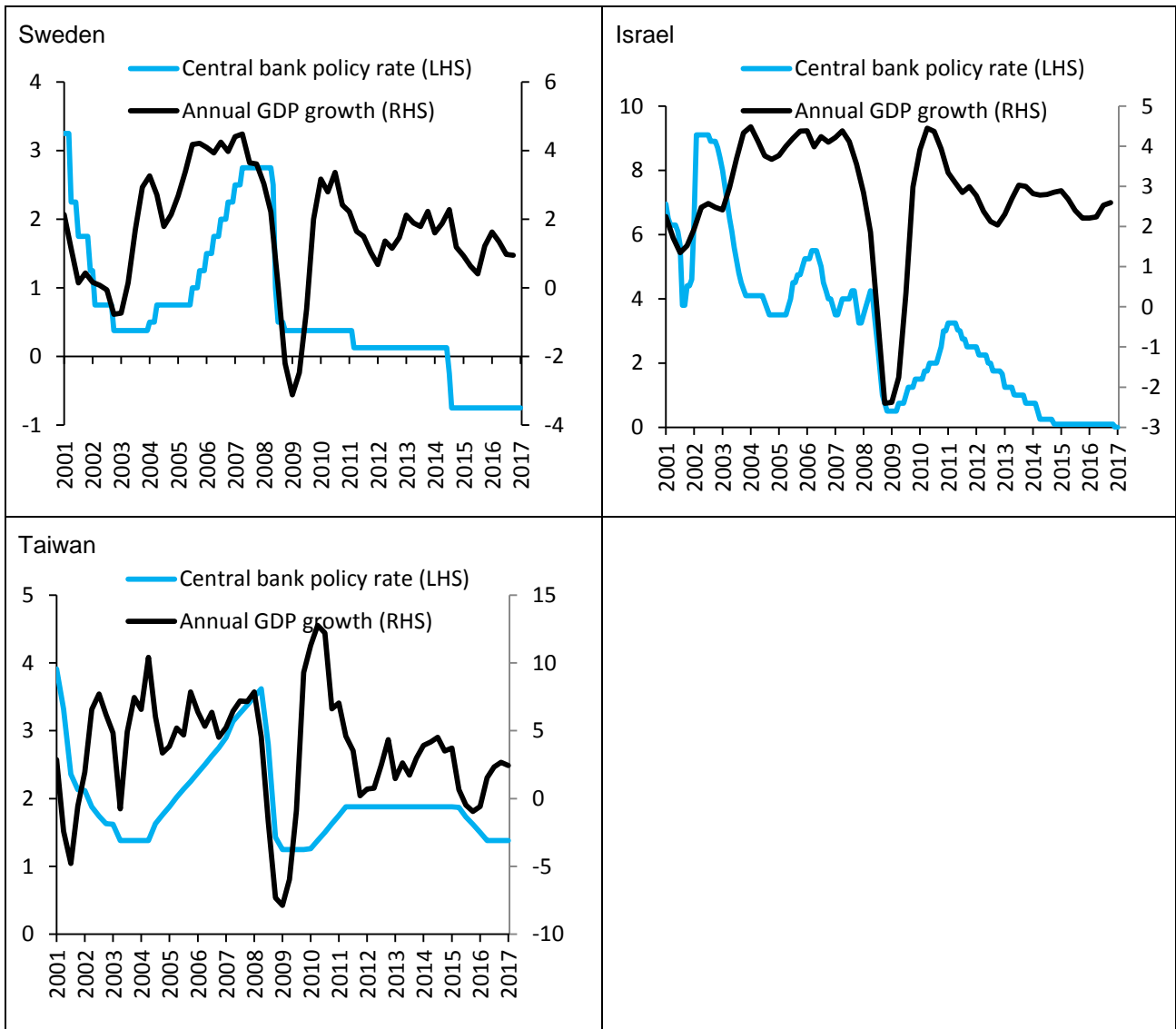
<sup>66</sup> See Cecchetti *et al.* (2017) which uses this framework for the US and shows that the more trend inflation moves above 2%, and assuming no other variables are affecting trend inflation in a meaningful way, then the more headline inflation will need to undershoot 2% in order to return the trend to 2%. This point is made using a different framework in papers such as Clarida, Galí and Gertler (1999).

This combination of results suggests that, in my view, the “lift-off” of UK interest rates should not be delayed any longer. Many of the factors that have justified keeping interest rates at emergency levels over the past few years have become less potent, and sterling’s depreciation has fundamentally shifted underlying inflation dynamics in a way that makes it more pressing to begin this voyage soon. Granted, there are changes in the monetary policy process that may still slow this launch, especially given concerns about the broader evolution of the economy as it adjusts to new arrangements with its most important trading partner. These concerns reinforce the case to make any adjustments in monetary policy limited and gradual. For me, however, these risks also highlight the need to make monetary policy more nimble – both today and in the future. We should be less hesitant to adjust interest rates – in either direction – as the situation changes. Engineers are quick to adjust a launch date if there is a technical concern or if the weather shifts. We should do the same. Otherwise, the UK economy may face greater challenges than parents face when their thirty-something fails to launch from their home.

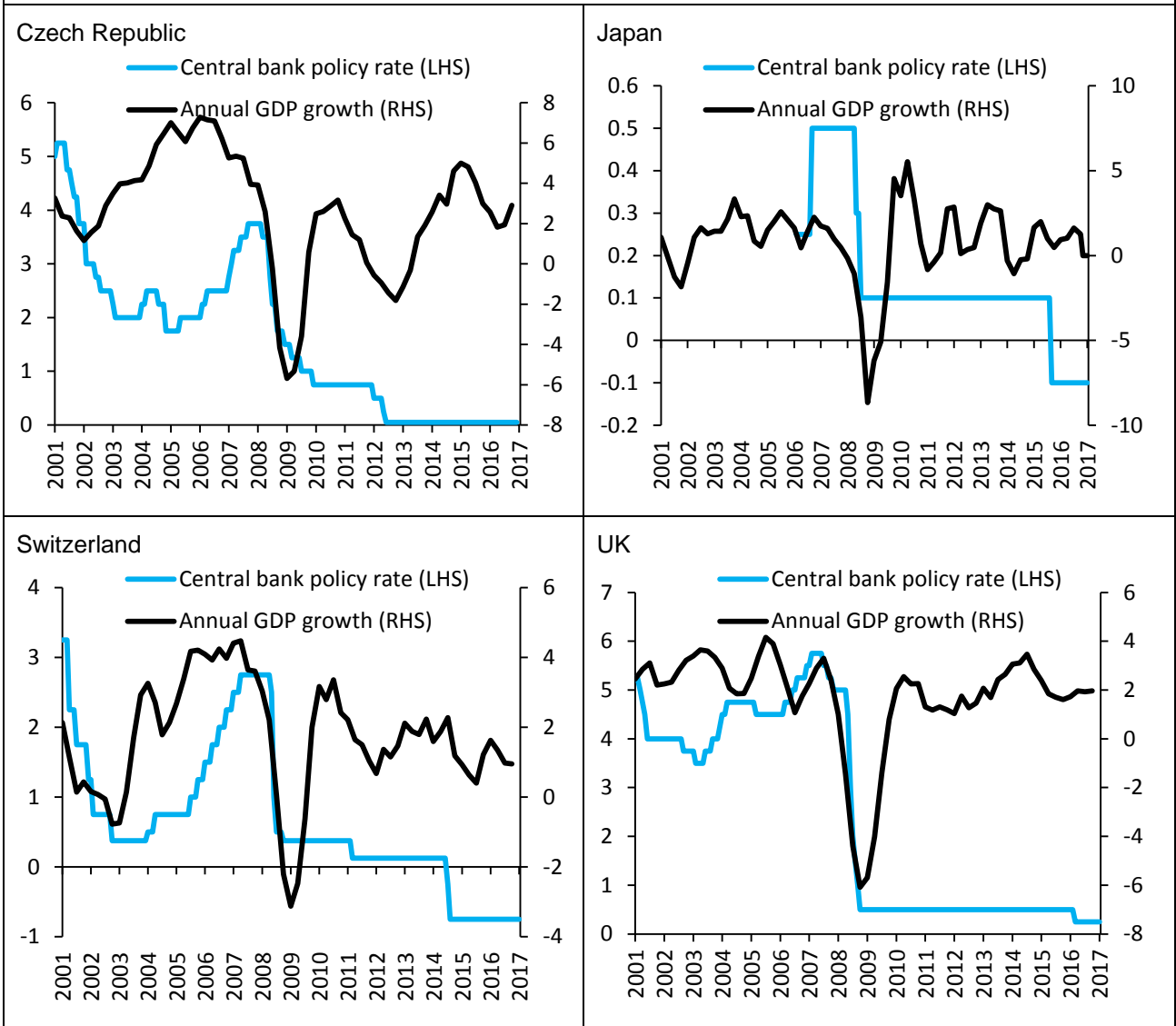
**Figure 1: Interest Rate (LHS) and GDP (RHS) in Advanced Economies**



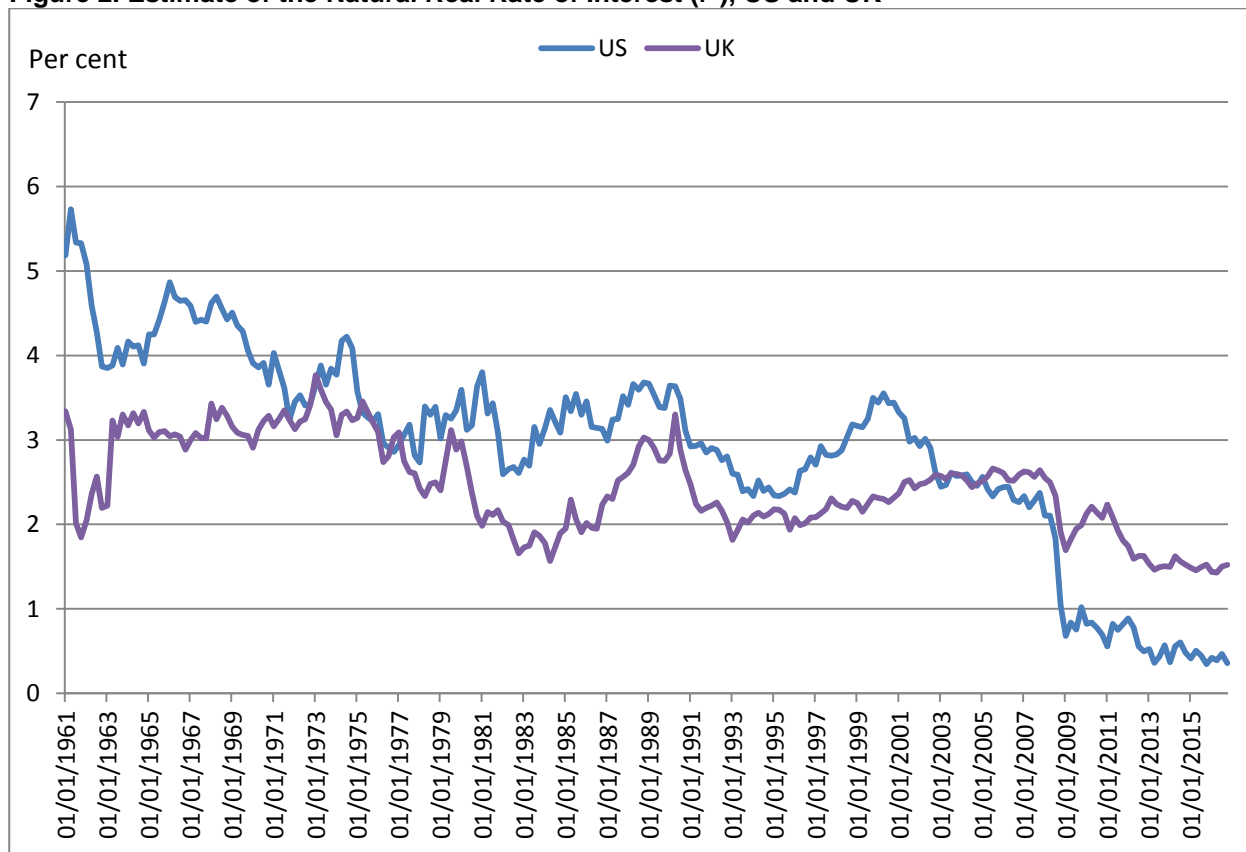




Panel c: Grounded: Czech Republic, Japan, Switzerland, UK



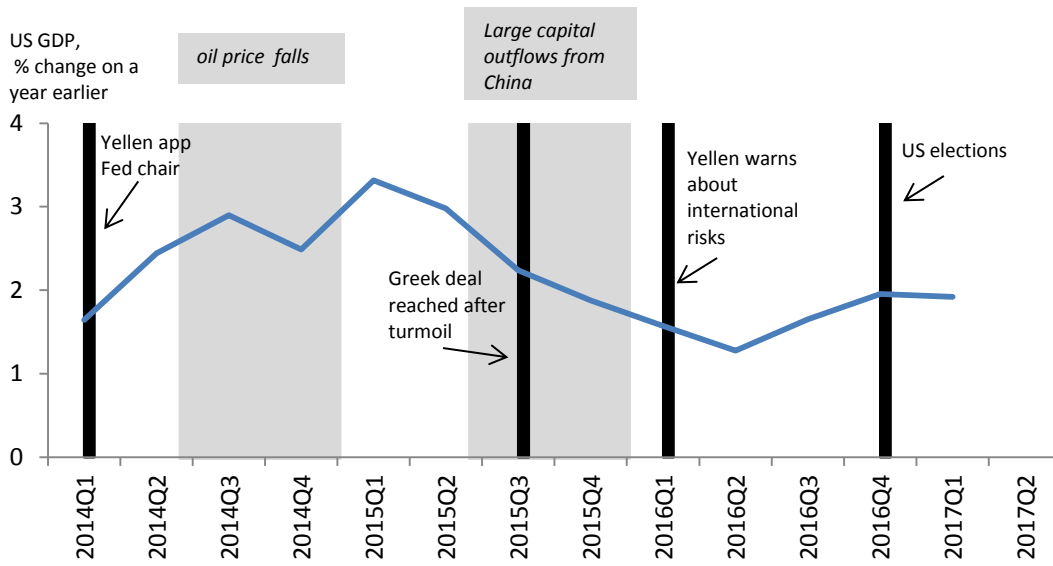
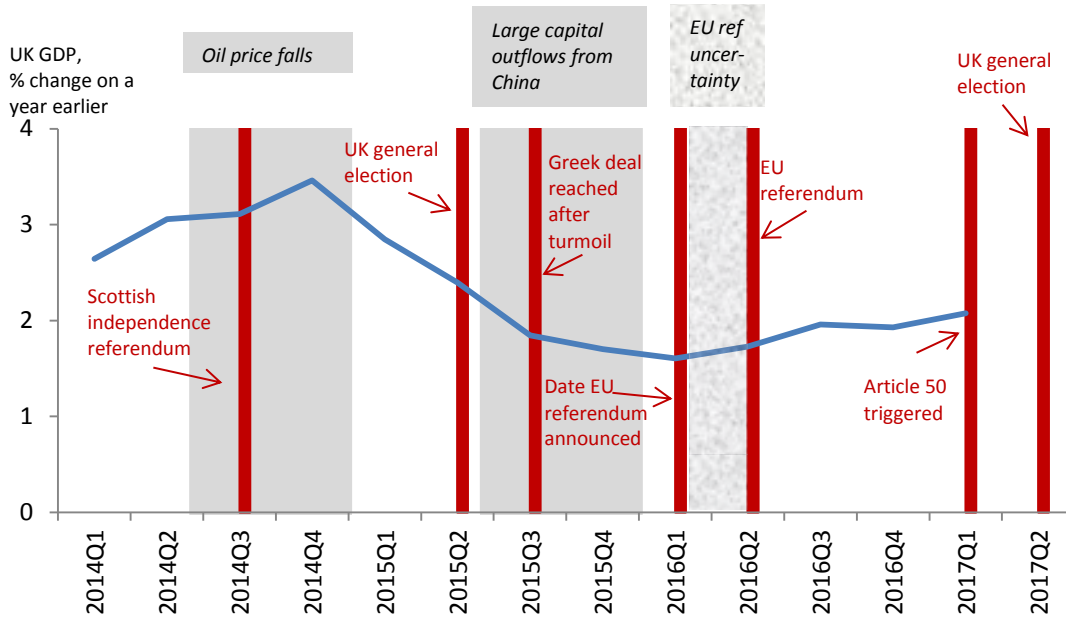
**Figure 2. Estimate of the Natural Real Rate of Interest ( $r^*$ ), US and UK**



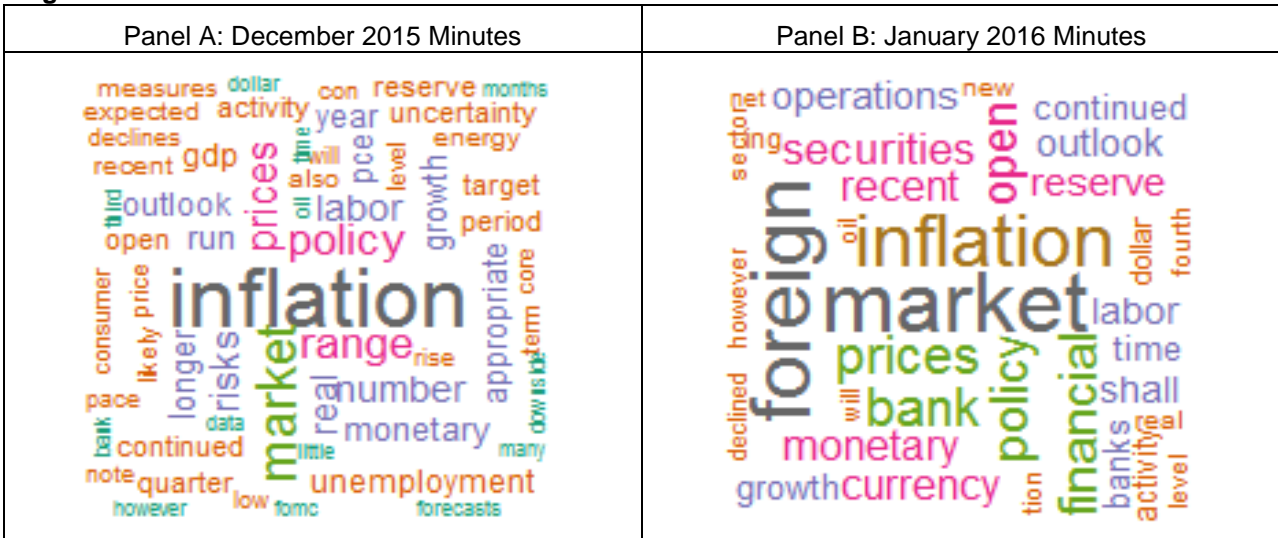
Source: "Measuring the Natural rate of Interest: International Trends and Determinants," by Kathryn Holston, Thomas Laubach, and John C. Williams, forthcoming in the *Journal of International Economics*. Final data point: 2016:Q4.



**Figure 3: Timeline of Key Political and Economic Events in UK and US**

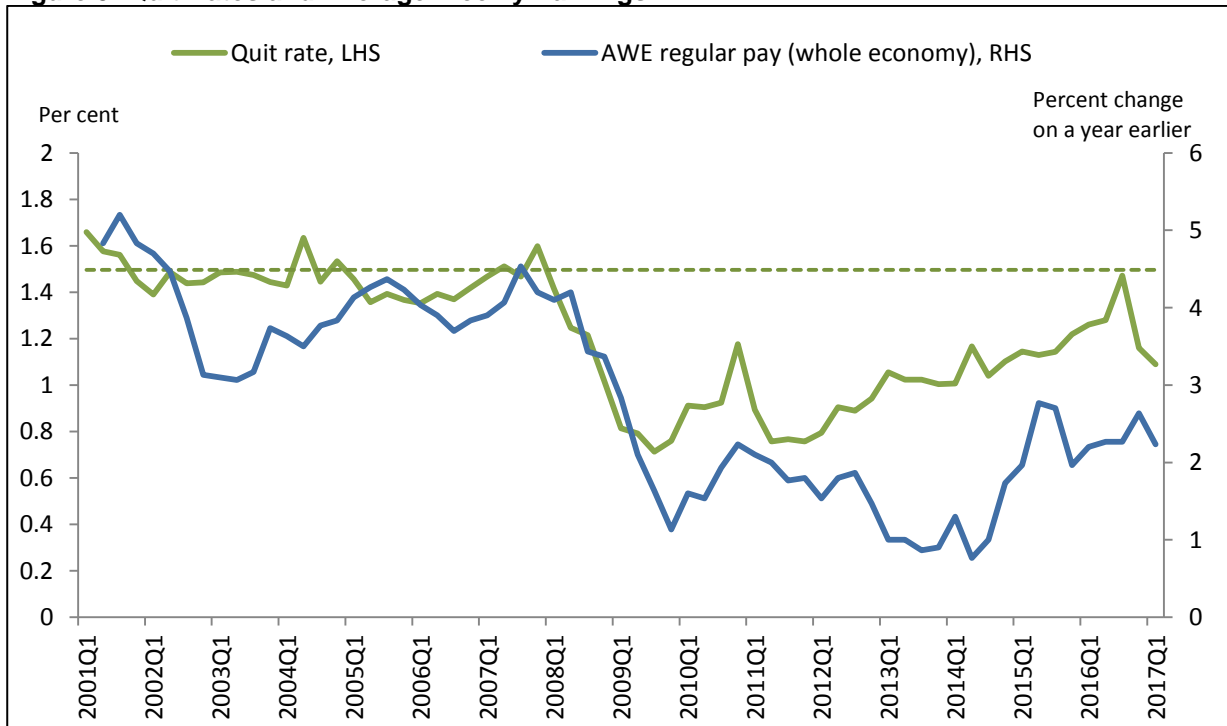


**Figure 4: Words Associated with Mentions of Risk in FOMC Minutes**



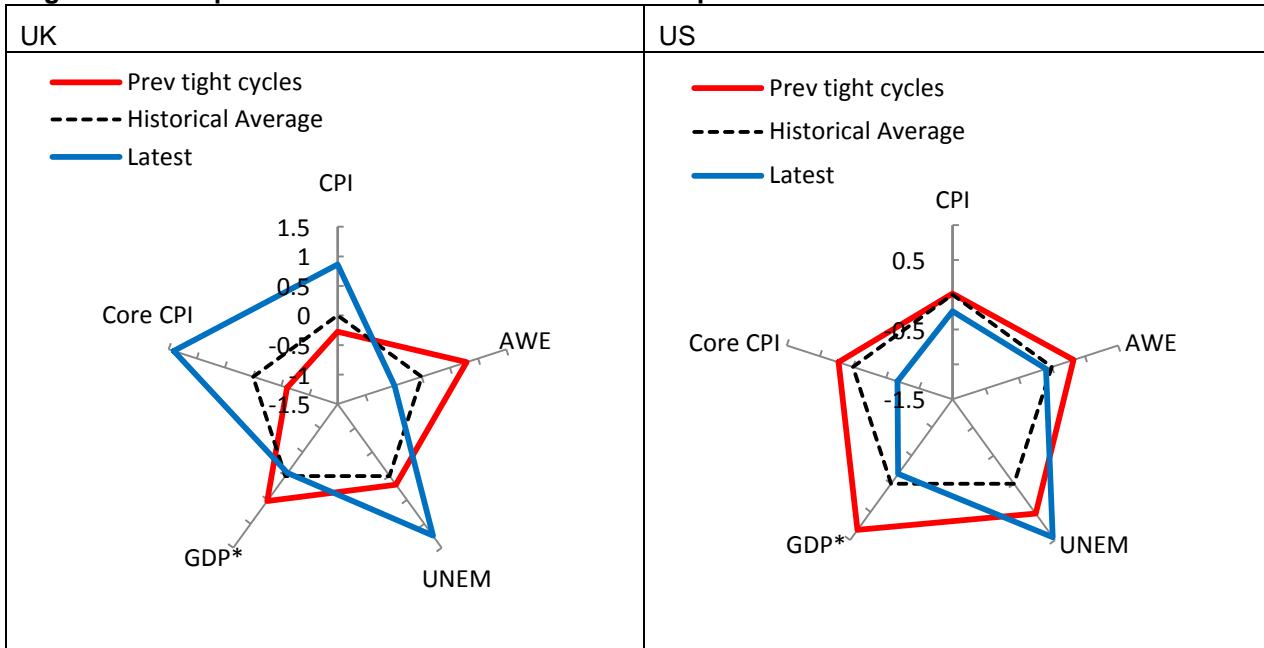
Source: Bank of England

**Figure 5: Quit Rates and Average Weekly Earnings**



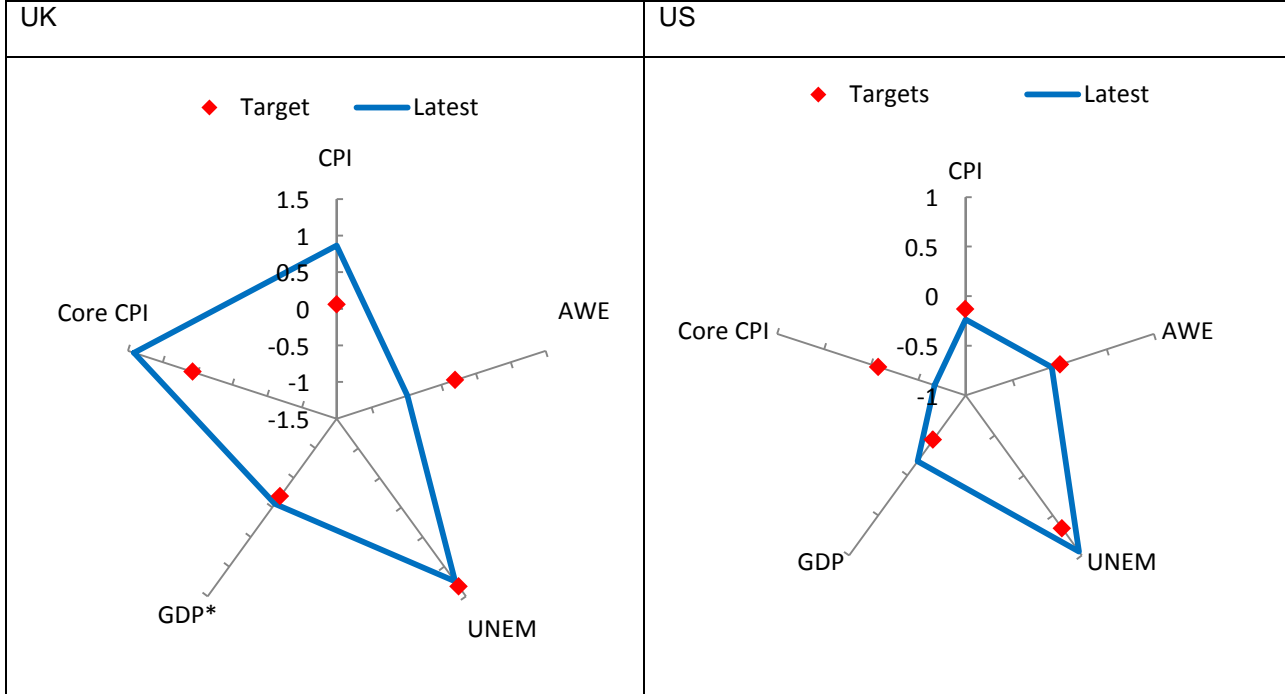
Source: ONS and Bank calculations. The dashed line depicts the 1997-2007 average quit rate.

**Figure 6a: Comparison to Past Lift-Offs: US and UK Spider Web**



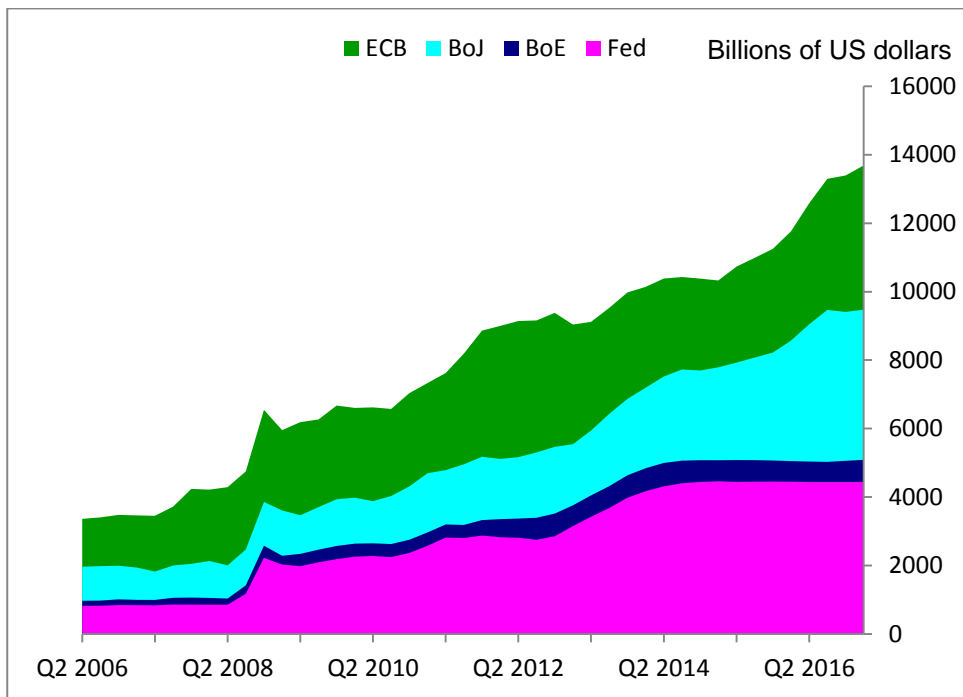
Note: All variables are expressed in terms of standard deviations from their historical averages. Historical averages refer to the period 1997-latest data except for AWE. For the UK's AWE, the data starts in March 2001 and for the US March 1997. Unemployment rates have been reversed so that a high unemployment rate relative to average is close to the centre whereas a low unemployment rate is further from the centre. GDP numbers are the average of the last two quarters rather than latest available quarter, to smooth any volatility in the GDP data. Previous tightening cycles are the averages of March 1997, June 1999, June 2004 and December 2015 for the US and of May 1997, September 1999, June 2004 and August 2006 for the UK.

**Figure 6b: Comparison to Targets: US and UK Spider Web**

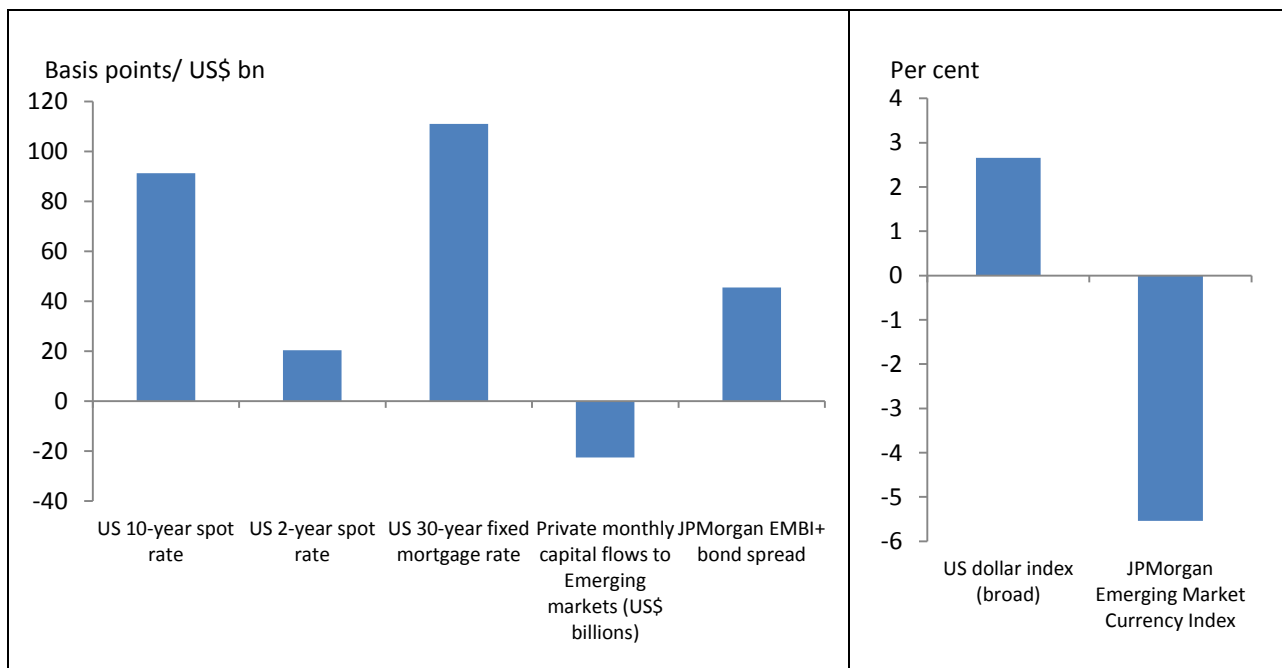


Note: See previous chart. Target numbers for CPI and core CPI are 2%; target numbers for output growth are potential output growth for 2016 according to OECD (1.7% for the UK and 1.5% for the US); Target unemployment rates are the equilibrium rates (NAIRU) estimated by the MPC and Fed (UK: 4.5%, US: 4.8%); AWE target numbers are the 2000-2015 average labour productivity growth plus target inflation rates.

**Figure 7: QE Asset Holdings of 4 Major Central Banks**



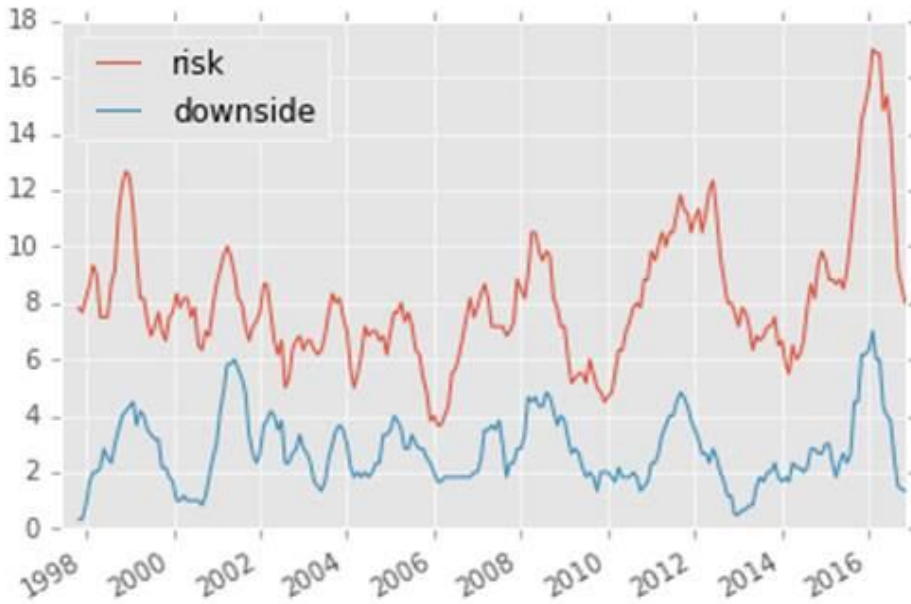
**Figure 8: The Taper Tantrum**



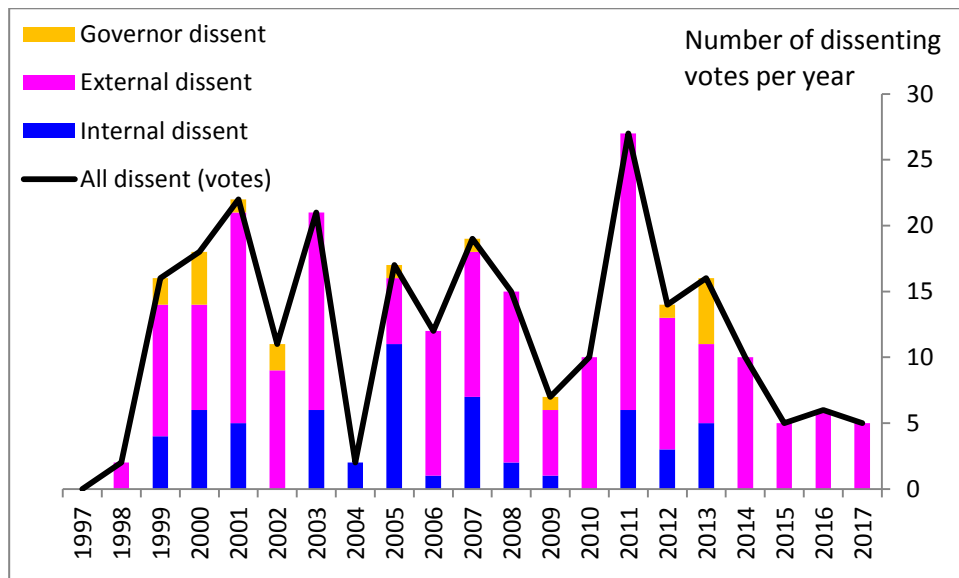
Note: The bars depicting interest rates, spreads and exchange rates correspond to their change from 1 May 2013 to 1 July 2013. The bar showing capital flows to emerging markets depict the cumulative net flow to these countries in May and June 2013.

**Figure 9: Mentions of “risk” and “downside” in MPC Minutes**

Number of mentions per thousand words



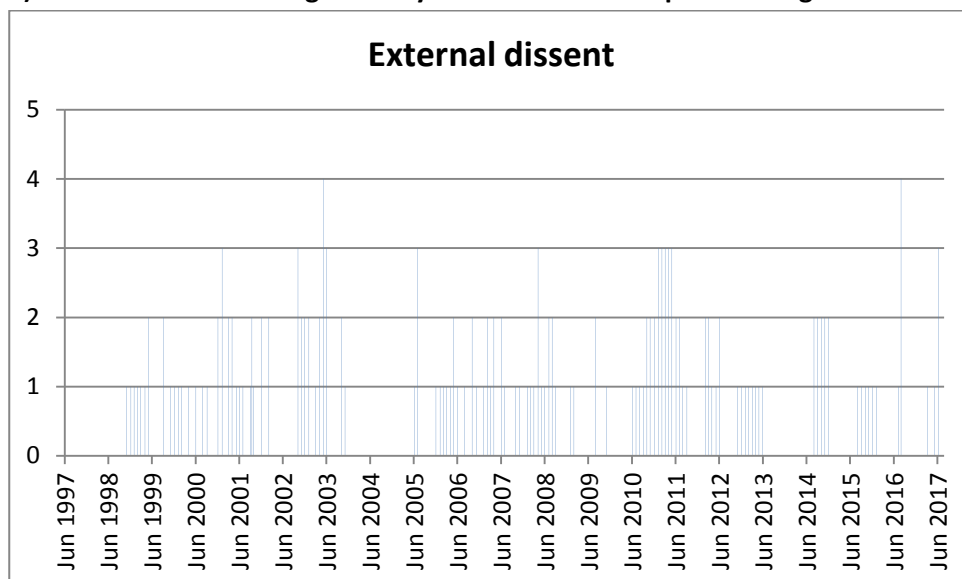
**Figure 10a: Number of MPC Dissenting Votes by Year since Independence, Split by Role**



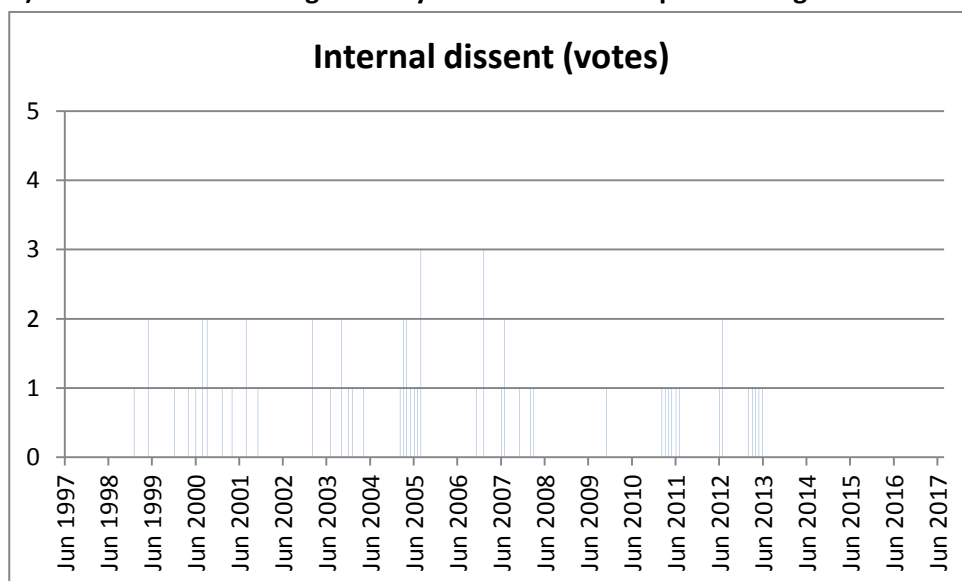
Note: “External dissent” is all dissenting votes by external MPC members. “Governor dissent” is only by the Governor. “Internal dissent” is by any other MPC members, including the Deputy Governors and Chief Economist. A dissent is a vote that is not in the majority on any issue put before the Committee at an MPC Policy meeting, including on Bank Rate, government or corporate asset purchases, or other schemes.

**Figure 10b. Dissenting Votes by Meeting**

**a) Number of dissenting votes by external members per meeting over time**

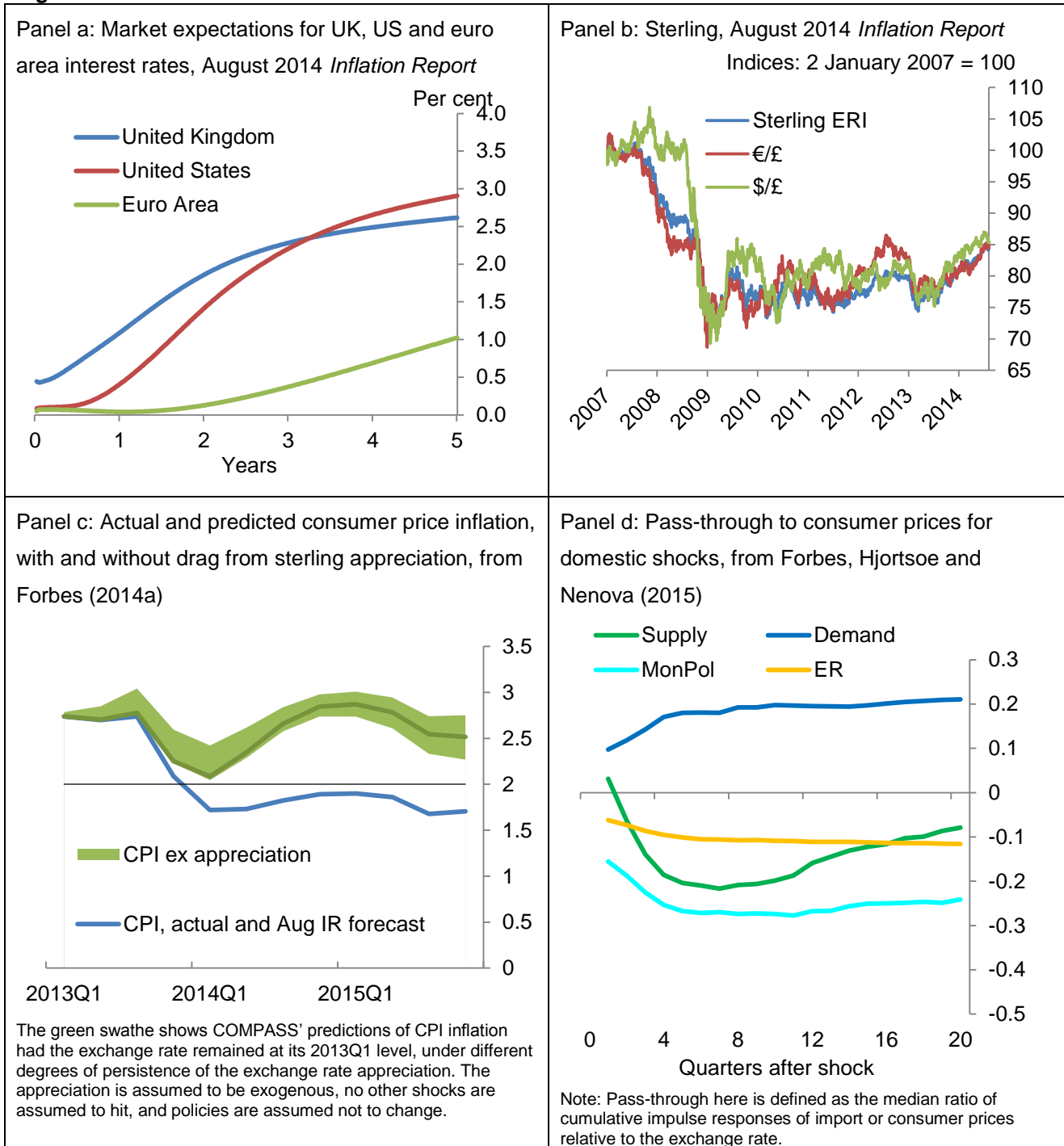


**b) Number of dissenting votes by internal members per meeting over time**

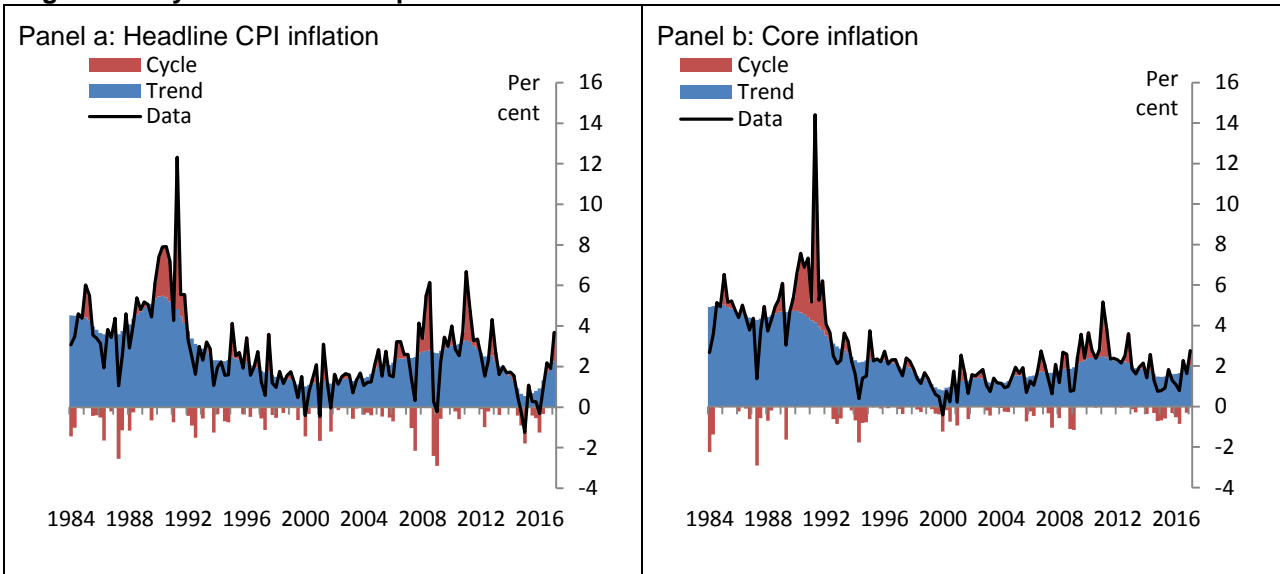


Note: "External dissent" is all dissenting votes by external MPC members. "Internal dissent" is by any internal MPC member, including the Governor, Deputy Governors and Chief Economist. A dissent is a vote that is not in the majority on any issue put before the Committee at an MPC Policy meeting, including on Bank Rate, government or corporate asset purchases, or other schemes.

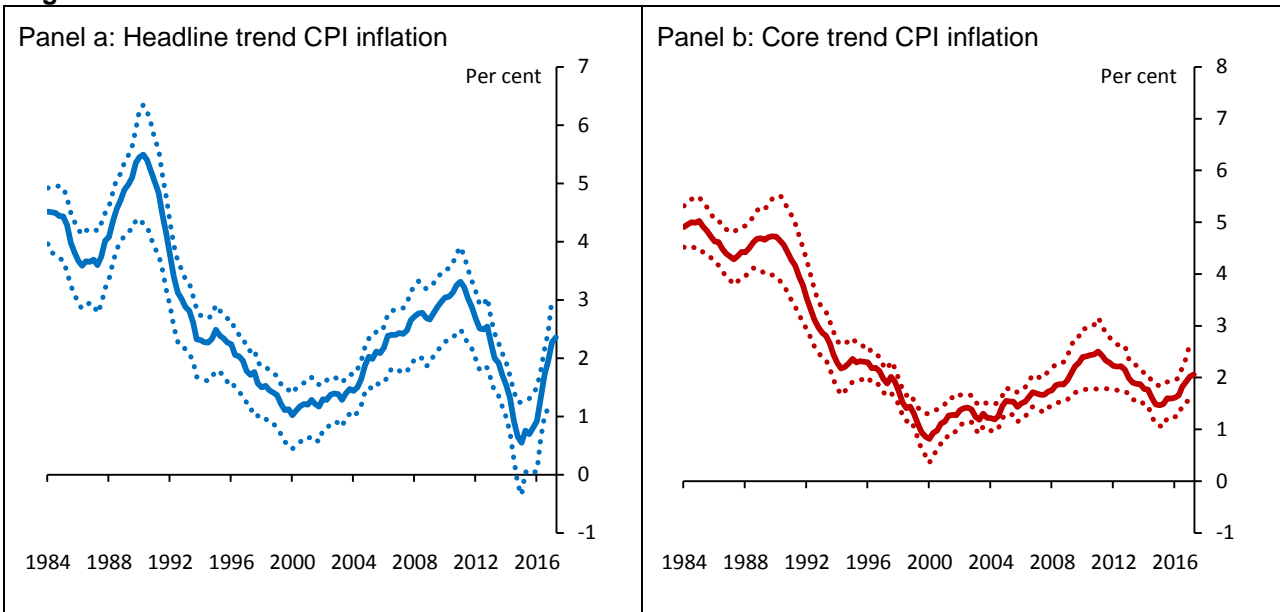
**Figure 11: The UK Dilemma in 2014**



**Figure 12: Cycle-trend Decomposition of Inflation**



**Figure 13: A Closer Look at Trend Inflation**





## References

- Adrian, Tobias and Liang, Nellie. (2016). "Monetary Policy, Financial Conditions, and Financial Stability." *Federal Reserve Bank of New York Staff Reports*, No. 690.
- Ajello, Andrea, Laubach, Thomas, Lopez-Salido, David and Nakata, Taisuke. (2016). "Financial Stability and Optimal Interest-Rate Policy." *Finance and Economics Discussion Series 2016-067*. Washington: Board of Governors of the Federal Reserve System.
- Akinci, Ozge and Olmstead-Rumsey, Jane. (2017). "How effective are macroprudential policies? An empirical investigation." *Journal of Financial Intermediation*. Available at <https://doi.org/10.1016/j.jfi.2017.04.001>.
- Auer, Raphael, Borio, Claudio and Filardo, Andrew. (2017). "The globalisation of inflation: the growing importance of global value chains", *BIS Working Paper*, No. 602
- Borio, Claudio, Kharroubi, Enisse, Upper, Christian and Zampolli, Fabrizio. (2016). "Labour reallocation and productivity dynamics: financial causes, real consequences." *BIS Working Papers No 534*, Bank for International Settlements.
- Barnett, Alina, Chiu, Adrian, Franklin, Jeremy and Sebasti a-Barriel, Mar a. (2014). "The productivity puzzle: a firm-level investigation into employment behaviour and resource allocation over the crisis." *Bank of England Working Paper*, No. 495.
- Bean, Charles, Broda, Christian, Ito, Takatoshi and Kroszner, Randall. (2015). "Low for Long? Causes and Consequences of Persistently Low Interest Rates." *17th CEPR-ICMB Geneva Report on the World Economy*. Available at: <http://voxeu.org/content/low-long-causes-and-consequences-persistently-low-interest-rates>.
- Blanchard, Olivier, Cerutti, Eugenio and Summers, Lawrence. (2015). "Inflation and Activity: Two Explorations and their Monetary Policy Implications", *IMF Working Paper*, No. 230.
- Broadbent, Ben. (2014). "Monetary policy, asset prices and distribution." Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech770.pdf>
- Bouis, Romain, Inaba, Kei-Ichiro, Rawdanowicz, Lukasz and Christensen, Ane. (2014). "Factors behind the decline in real long-term government bond yields", *OECD Economics Department Working Papers*, No. 1167, OECD Publishing: <http://dx.doi.org/10.1787/5jxvvgg7q1322-en>.
- Carney, Mark. (2016a). "The Turn of the Year." Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech873.pdf>.

Carney, Mark. (2016b). “The Spectre of Monetarism.” Available at:

<http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech946.pdf>.

Cecchetti, Stephen, Feroli, Michael, Hooper, Peter, Kashyap, Anil, and Schoenholtz, Kermit. (2017).

“Deflating Inflation Expectations: The Implications of Inflation’s Simple Dynamics.” Paper prepared for the 2017 US Monetary Policy Forum, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2941510](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2941510).

Cerutti, Eugenio, Claessens, Stijn and Laeven, Luc. (2017). “The use and effectiveness of macroprudential policies: New evidence.” *Journal of Financial Stability*, Elsevier, vol. 28(C), pages 203-224.

Coimbra, Nuno, and Rey, H el ene. (2017). “Financial Cycles with Heterogeneous Intermediaries.” London Business School, unpublished working paper.

D’Amico, Stefania and King, Thomas. (2013). “Flow and Stock Effects of Large-Scale Asset Purchases: Evidence on the Importance of Local Supply.” *Journal of Financial Economics*, Elsevier, vol. 108(2), pages 425-448.

Evjen, Snorre and Kloster, Thea. (2012). “Norges Bank’s new monetary policy loss function – further discussion.” *Staff Memo No. 11*, Norges Bank.

Ferrari, Massimo, Kearns, Jonathan and Schrimpf, Andreas. (2017). “Monetary policy’s rising FX impact in the era of ultra-low rates.” *BIS Working Papers No 626*.

Forbes, Kristin (2014a). “The economic impact of sterling’s recent moves: More than a Midsummer Night’s Dream.” Available at: <http://www.bankofengland.co.uk/publications/Pages/news/2014/124.aspx>

Forbes, Kristin. (2014b). “Financial “deglobalization”?: capital flows, banks, and the Beatles.” Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech777.pdf>.

Forbes, Kristin. (2015a). “Low interest rates: King Midas’ golden touch?” Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech798.pdf>.

Forbes, Kristin. (2015b). “When, Why and What’s Next for Low Inflation: No Magic Slippers Needed.” Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech823.pdf>.

Forbes, Kristin. (2016). “Uncertainty About Uncertainty”. Available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech942.pdf>

Forbes, Kristin, Hjortsoe, Ida and Nenova, Tsvetelina. (2015). “The shocks matter: Improving our estimates of exchange rate pass-through.” *External MPC Unit Discussion Paper No. 43*, Bank of England.

Forbes, Kristin, Kirkham, Lewis and Theodoridis, Konstantinos. (2017). “A trendy approach to UK inflation dynamics.” *External MPC Unit Discussion Paper No. 49*, Bank of England.

Forbes, Kristin, Reinhardt, Dennis and Wieladek, Tomasz. (2017). "The spillovers, interactions, and (un)intended consequences of monetary and regulatory policies." *Journal of Monetary Economics*, Elsevier, vol. 85(C), pages 1-22.

Ford, William and Vlasenko, Polina. (2011), "The Downside of Monetary Easing", American Institute for Economic Research, Vol. 78, No 22, 4 July 2011.

Geithner, Timothy. (2016). "Are We Safer? The Case for Strengthening the Bagehot Arsenal." Per Jacobsson Lecture at the 2016 Annual Meetings of the International Monetary Fund and World Bank Group.

Gourinchas, Pierre-Olivier and Rey, H  l  ne. (2016). "Real Interest Rates, Imbalances and the Curse of Regional Safe Asset Providers at the Zero Lower Bound." *Presented at the 2016 ECB Forum on Central Banking, June*. Available at: [http://socrates.berkeley.edu/~pog/academic/Sintra\\_POGHR.pdf](http://socrates.berkeley.edu/~pog/academic/Sintra_POGHR.pdf).

Haldane, Andrew. (2014). "Halfway up the stairs." Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech751.pdf>.

Haldane, Andrew. (2017a). "Productivity puzzles." Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech968.pdf>.

Haldane, Andrew. (2017b). "A Little More Conversation, A Little Less Action." Available at: <http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech971.pdf>.

Haldane, Andrew, Roberts-Sklar, Matt, Wieladek, Tomasz and Young, Chris. (2016). "QE: the story so far." *Staff Working Paper 624*, Bank of England.

Hall, Robert. (2016), "The Role of Growth of Risk-Averse Wealth in the Decline of the Safe Real Interest Rate", mimeo.

International Monetary Fund. (2013). "The dog that didn't bark: Has inflation been muzzled or was it just sleeping?" *World Economic Outlook April 2013*, Chapter 3.

International Monetary Fund. (2014). "Perspectives on Global Real Interest Rates." *World Economic Outlook April 2014*, Chapter 3.

Ip, Greg. (2010). "The Little Book of Economics: How the Economy Works in the Real World." Hoboken, N.J: John Wiley & Sons.

Mallaby, Sebastian. (2016). "The man who knew: The life and times of Alan Greenspan." *New York*: Penguin Press.

McGowan, M  ge Adalet, Andrews, Dan and Millot, Valentine. (2017). "The Walking Dead? Zombie Firms and Productivity Performance in OECD Countries." *Economics Department Working Papers No. 1372*.

Rachel, Lukasz and Smith, Thomas. (2015). "Secular drivers of the global real interest rate." *Staff Working Paper No. 571*, Bank of England.

Reinhardt, Dennis and Sowerbutts, Rhiannon. (2015). "Regulatory arbitrage in action: evidence from banking flows and macroprudential policy." *Bank of England Working Paper 546*, Bank of England.

Reinhart, Carmen and Rogoff, Kenneth. (2014). "Recovery from Financial Crises: Evidence from 100 Episodes." *American Economic Review*, 104(5): 50-55.

Rey, H el ene. (2014). "Dilemma not Trilemma: the Global Financial Sector and Monetary Policy Independence." Paper published in 2013 Federal Reserve Bank of Kansas City's Symposium in Jackson Hole, pp. 285-333.

Saunders, Michael. (2017). "The labour market". Available at:  
<http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech953.pdf>

Stein, Jeremy. (2014). "Incorporating Financial Stability Considerations into a Monetary Policy Framework." Available at: <https://www.federalreserve.gov/newsevents/speech/stein20140321a.htm>.

Summers, Laurence. (2013). "IMF Fourteenth Annual Research Conference in Honor of Stanley Fischer." Available at: <http://larrysummers.com/2013/11/08/imf-fourteenth-annual-research-conference-in-honor-of-stanley-fischer/>

Summers, Laurence. (2014). "US economic prospects: secular stagnation, hysteresis and the zero lower bound." *Business Economics*, Vol. 49, No. 2.

Svensson, Lars. (2013). "Some Lessons from Six Years of Practical Inflation Targeting." *CEPR Discussion Paper No. DP9756*.

Vlieghe, Gertjan. (2016a). "Debt, Demographics and the Distribution of Income: New challenges for monetary policy." Available at:  
<http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech872.pdf>.

Vlieghe, Gertjan. (2016b). "Monetary policy expectations and long term interest rates." Available at:  
<http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech909.pdf>.

Weale, Martin and Wieladek, Tomasz. (2016). "What are the macroeconomic effects of asset purchases?" *Journal of Monetary Economics*, Volume 79, Pages 81-93.

Woodford, Michael. (2012). "Inflation Targeting and Financial Stability." *NBER Working Paper No. 17967*.

Yellen, Janet. (2017). "From Adding Accommodation to Scaling It Back." Available at:  
<https://www.federalreserve.gov/newsevents/speech/yellen20170303a.htm>.