



BANK OF ENGLAND

# Speech

---

## **Policy Panel: Investment and growth in advanced economies**

Remarks given by

Mark Carney, Governor of the Bank of England

2017 ECB Forum on Central Banking, Sintra

28 June 2017

The experience of business investment in the UK since the onset of the financial crisis broadly matches that elsewhere in the advanced world – a sharp fall followed by a feeble recovery (Chart 1). Peak to trough, the level of UK business investment fell by 20%, and it was six years before it surpassed its pre-crisis level, putting the recent experience at the bottom of the swathe of past UK cycles (Chart 2).

In my brief remarks today, I will offer some possible explanations for this performance before concluding with comments on the outlooks for UK investment and monetary policy.

## **I. Investment since the crisis**

In part, weak investment reflects a weak economy, with the recovery following the crash being the slowest since the Great Depression.

Weakness in demand is not, however, the whole explanation. Business investment has underperformed relative to output since the crisis, with the ratio of the two falling in the UK by around 2 percentage points in the immediate aftermath (Chart 3), similar to the experience in other advanced economies.

Falls in investment tend to be more persistent for recessions associated with financial crises (Chart 4).<sup>1</sup> This partly reflects restrictions in credit supply constraining investment, as well as productivity, wages and economic performance more generally.<sup>2</sup>

But weak UK investment also reflected a necessary adjustment in the capital stock. That overhang – which peaked at close to 10% in the UK – is being gradually worked off through a combination of a recovery in output and a prolonged period of subdued net investment (Chart 5).

And in part weak investment could reflect a misallocation of capital in the run-up to the crisis. In this regard, the situation in the UK was a bit different to that in countries such as Spain and the US where significant residential and commercial property construction booms subsequently turned to busts. Without a housing glut to work off, the weakness of UK investment is all the more striking.

Another form of misallocation could be the ability of so-called zombie firms to live on in the very low interest rate environment. The BIS's proxy for this has seen the share of the "living dead" more than double since the crisis.<sup>3</sup> In contrast, the Bank of England estimates that the proportion of zombie firms in the UK has fallen by a quarter since 2008 (Chart 6).

---

<sup>1</sup> See, for example, Reinhart, C. and K. Rogoff. 2009. *This Time is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press, and Jorda, O., Schularick, M. and Taylor, A. (2013), 'When Credit Bites Back', *Journal of Money, Credit and Banking*, Vol. 45, Issue s2.

<sup>2</sup> Bank research (Franklin, Rostom and Thwaites, 2016), finds that the reduction in bank credit supply had an economically and statistically significant effect on companies: a 10% fall in the amount a firm could borrow is estimated to have reduced capital per worker by around 5-6%, labour productivity by 5-8% and wages by 7-9%, and increased the probability of bankruptcy by around 60%.

<sup>3</sup> See page 52 of the Bank for International Settlements 87<sup>th</sup> Annual Report, available at <http://www.bis.org/publ/arpdf/ar2017e.htm>. Zombie firms are defined as those with a ratio of earnings before interest and taxes to interest expenses below one, with the firm aged 10 years or more.

Increased uncertainty has undoubtedly contributed to weak investment.<sup>4</sup> Confirming the adage that bad things come in threes, companies have faced uncertainty about the economy, geopolitics, and economic policy, all of which are likely to have clouded the outlook for how investments will perform (Chart 7).<sup>5</sup>

Greater uncertainty about returns means that fewer investment projects will be seen as worthwhile. This could help explain the “puzzle” of why hurdle rates in business investment have remained stubbornly high despite the weaker secular outlook for growth implied, for example, by long-term bond yields. The answer may be that the expected volatility of earnings growth has increased. As an illustration, a simple Black – Scholes model suggests that the hurdle rate for expected returns is high – in the region of 10 percentage points (Chart 8)<sup>6</sup> –consistent with survey evidence for the UK (Chart 9). A 10-percentage point pick up in the volatility of expected earnings could almost double that rate, swamping the impact of lower risk-free returns.

All of these explanations concern the legacy effects of the crisis, but secular forces may also be at work. For example, over the past thirty years investment has shifted from fixed assets towards intangibles – such as computer software, intellectual property, and research and development.<sup>7</sup> This may have dampened the traditional investment accelerator. Increases in demand are usually accelerated by increases in investment – higher demand boosts companies’ profits, increasing their net worth and so allowing them to undertake further investment, as well as stimulating incomes and spending further. A wide range of analysis suggests that the shift towards intangibles has, however, dampened this effect, perhaps because intangible assets are less suitable for use as collateral than physical assets, such as property.<sup>8</sup>

The weakness in investment is of course linked to weak productivity. In the UK, while the most productive companies have continued to innovate, others have become slower at adopting those innovations. That has stalled diffusion of productivity gains through the economy (Chart 10). This shortfall in investment could reflect deeper causes such as inadequate competition, barriers to investment in knowledge-based capital and sub-optimal managerial practices.<sup>9</sup>

---

<sup>4</sup> Identifying the effect of increased uncertainty is complicated by the fact that it is usually accompanied by a tightening in financial conditions. In this regard, the pickup in uncertainty following the referendum on EU membership in the UK was unusual, as financial conditions eased, helped by a series of monetary and macro-financial policy measures taken by the Bank of England.

<sup>5</sup> ‘Uncertainty, the economy and policy’, speech given by Mark Carney, 30 June 2016, available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech915.pdf>.

<sup>6</sup> For individual firms, the standard variation of annual earnings was around 30 percentage points in the period before the crisis. See ‘Uncertain times’, speech by Ben Broadbent at the Wall Street Journal, 5 October 2016, available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech929.pdf>.

<sup>7</sup> For example, estimates by the Bank for International Settlements suggest that between 1990 and 2016, the investment rate in fixed assets declined from around 8% to 3½% of total assets, while the investment rate in intangible assets increased from around 7% in 1990 to 10% in 2016.

<sup>8</sup> Various papers find evidence that intangibles investment is less responsive to changes in demand than investment in fixed assets. For example, Masayuki (2015) estimates an accelerator-type investment model, where growth of the firm’s sales is included as regressor, together with a measure of cash flow. The estimated “accelerator” coefficient is small and not statistically significant for intangible investment, suggesting this effect might be absent. Estimates from regression analysis by BIS show that the sensitivity of investment to investment opportunities (proxied by Tobin’s Q) is approximately three times more sensitive for physical investment than for intangible investment – a result that the BIS suggest could be explained by “the structural lumpiness of intangible investment”. In a similar vein, Ryan and Taylor (2017) also find that intangible capital responds more slowly to changes in investment opportunities. They conclude that, compared with physical capital, intangible capital’s convex adjustment costs are roughly twice as large.

<sup>9</sup> See <https://www.oecd.org/eco/growth/OECD-2015-The-future-of-productivity-book.pdf>.

Although these secular forces may likely persist, many of the conditions for a revival in business investment are now in place.

## II. The Contribution of Central Banks to Investment

Recognising that the most important contributions will be from structural policies, how can central banks support that belated investment recovery?

First, we must acknowledge that, while the cost and availability of finance matters; internal cash flows, the profit outlook and uncertainty are far more important determinants of investment. Monetary policy affects companies' profits and cash flows through its effects on domestic demand and, via the exchange rate, external demand. Given the importance of internal finance for investment, and the high hurdle rates investment projects must clear, such indirect effects are more important for investment than the direct effects on the cost of capital. The biggest contributions of central banks are therefore improving the demand and profit outlooks and reducing uncertainty.

Allow me to use the current situation in the UK to illustrate these points.

UK output is now in sight of potential, and the capital overhang looks set to be eliminated over the next few years. In order to expand, companies will increasingly need to invest.

A strengthening global economy should tempt UK companies to do so, particularly since UK companies are generally competitive given the recent fall in sterling. Indeed, the broad-based global recovery is creating the possibility of a self-reinforcing revival in investment. The Bank of England estimates that more than 80% of the world economy is now growing above potential. Global measures of industrial production and capital goods orders, as well as world trade, have strengthened markedly over the past year, suggesting some rotation in the composition of global demand towards investment. With that more favourable outlook, investment intentions are now rising around the world (Chart 11).

If these intentions are realised, the global equilibrium interest rate could rise somewhat, making a given policy setting more accommodative. The extent to which it does will depend on other secular factors that have been holding it down, including demographics, debt overhangs and the capital intensity of production.<sup>10</sup>

In this generally constructive environment, the main issues facing UK companies are uncertainties – about how consumers will adjust to a period of weaker real income growth; about market access post-Brexit; about the potential risks in the transition to new arrangements with the EU and the rest of the world.<sup>11</sup> In this

---

<sup>10</sup> See Rachel, L and Smith, T (2015), 'Secular drivers of the global real interest rate', Bank of England Working Paper No. 571 and 'Resolving the climate paradox', speech by Mark Carney at the Arthur Burns Memorial Lecture, Berlin, 22 September 2016, available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech923.pdf>.

<sup>11</sup> Among companies responding to the Bank's Decision Maker Panel survey between February and April 2017, Brexit was the largest current source of uncertainty for 10%, one of the top two or three sources of uncertainty for 30%, one of many drivers of uncertainty for 40% and not important for the remaining 20%.

context, the best contribution the Bank of England can make is maintaining financial and monetary stability by pursuing the right policies within consistent frameworks.

In recent years, the Bank has been determined to remove any lingering uncertainties that companies may have about access to finance in good times and bad. The Bank is building the resilience of the financial system through much higher capital levels, more prudent underwriting standards, rigorous stress testing and appropriate contingency planning. The core tier 1 capital ratios for major UK banks are now almost 14% (Chart 12). Yesterday, the FPC increased the countercyclical capital buffer rate to 0.5% from 0%, announced higher expectations of lenders' underwriting standards for consumer credit, and recalibrated the leverage ratio. With detailed contingency planning for the financial stability impacts of Brexit, UK companies can be confident of continued access to finance in an uncertain world.

Reforms mean the UK financial system is working well. Net lending to private companies is been growing following six years of contraction. Corporate bond spreads are well below their long-run averages (Chart 13). And credit conditions among SMEs have been steadily improving.

If the opportunities present themselves, UK corporates could readily draw on this finance as their balance sheets are in good health following a decade of de-levering to ratios amongst the lowest in advanced economies.<sup>12</sup>

Turning now to monetary policy, the Bank operates within an established framework, anchored in the inflation target (Chart 14). The MPC set out in advance of the referendum how it would apply that framework, emphasising that the effects of the process of leaving the EU on inflation would depend on its impact on demand, supply and the exchange rate. The Committee has repeatedly stressed that, as a result, the implications for monetary policy would not be automatic.

The MPC has also clearly set out its reaction function consistent with its remit. Under the exceptional circumstances Brexit entails (with an inflation overshoot driven entirely by an exchange rate depreciation caused a large fundamental shock), the Committee is required by its remit to balance a period of above-target inflation with a period of weaker growth. As the primary objective of monetary policy remains inflation control, any overshoot of inflation above the target can only be temporary in nature and limited in scope. As such, the MPC has been clear that its tolerance for above-target inflation is limited.

Since the prospect of Brexit emerged, financial markets, notably sterling, have marked down the UK's economic prospects. Monetary policy cannot prevent the weaker real income growth likely to accompany the transition to new trading arrangements with the EU. But it can influence how this hit to incomes is distributed between job losses and price rises. And it can support households and businesses as they adjust to such profound change.

---

<sup>12</sup> See the statistical annex to the Bank for International Settlements 87<sup>th</sup> Annual Report, *ibid*.

As spare capacity erodes, the trade-off that the MPC must balance lessens, and, all else equal, its tolerance for above-target inflation falls (Chart 15). Different members of the MPC will understandably have different views about the outlook and therefore the potential timing of any Bank Rate increase. But all expect that any changes would be limited in scope and gradual in pace.

When the MPC last met earlier this month, my view was that given the mixed signals on consumer spending and business investment, it was too early to judge with confidence how large and persistent the slowdown in growth would prove. Moreover, with domestic inflationary pressures, particularly wages and unit labour costs, still subdued, it was appropriate to leave the policy stance unchanged at that time.

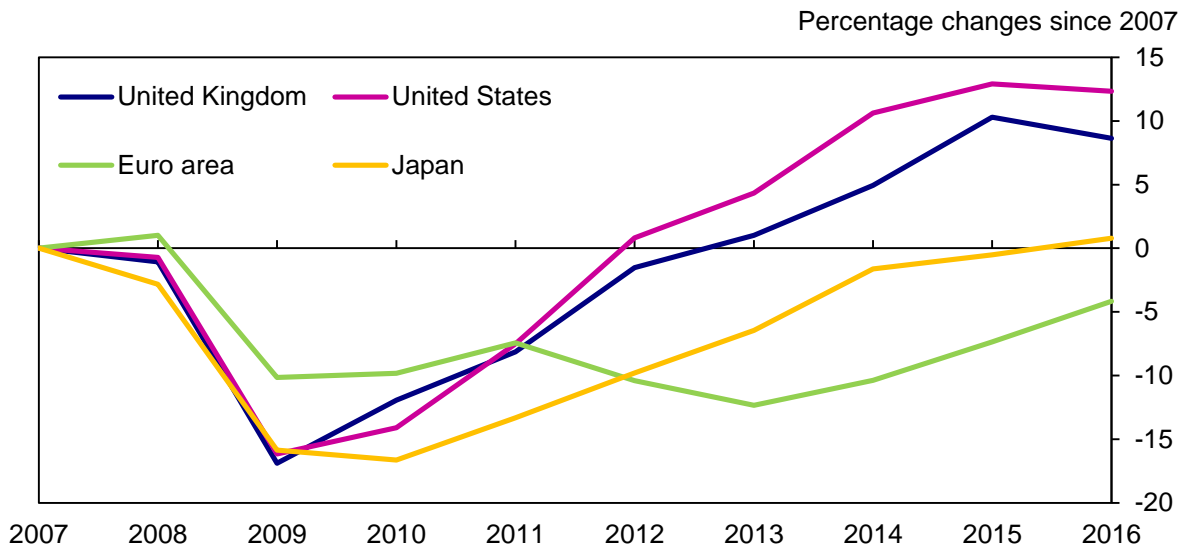
Some removal of monetary stimulus is likely to become necessary if the trade-off facing the MPC continues to lessen and the policy decision accordingly becomes more conventional. The extent to which the trade-off moves in that direction will depend on the extent to which weaker consumption growth is offset by other components of demand including business investment, whether wages and unit labour costs begin to firm, and more generally, how the economy reacts to both tighter financial conditions and the reality of Brexit negotiations. These are some of the issues that the MPC will debate in the coming months.

### **III. Conclusion**

After an expansion that has relied overly on consumption, the rotation to other components of demand, particularly investment, will be important to sustain momentum. Stronger investment will support productivity growth, stronger wages and higher welfare for all.

It will also give monetary policy more traction. Globally, there are signs that such a rotation may be beginning. Although some UK-specific uncertainties might limit the UK's participation in that pickup, the Bank of England will make its contribution by pursuing determined policies within well-established frameworks in order to maintain monetary and financial stability.

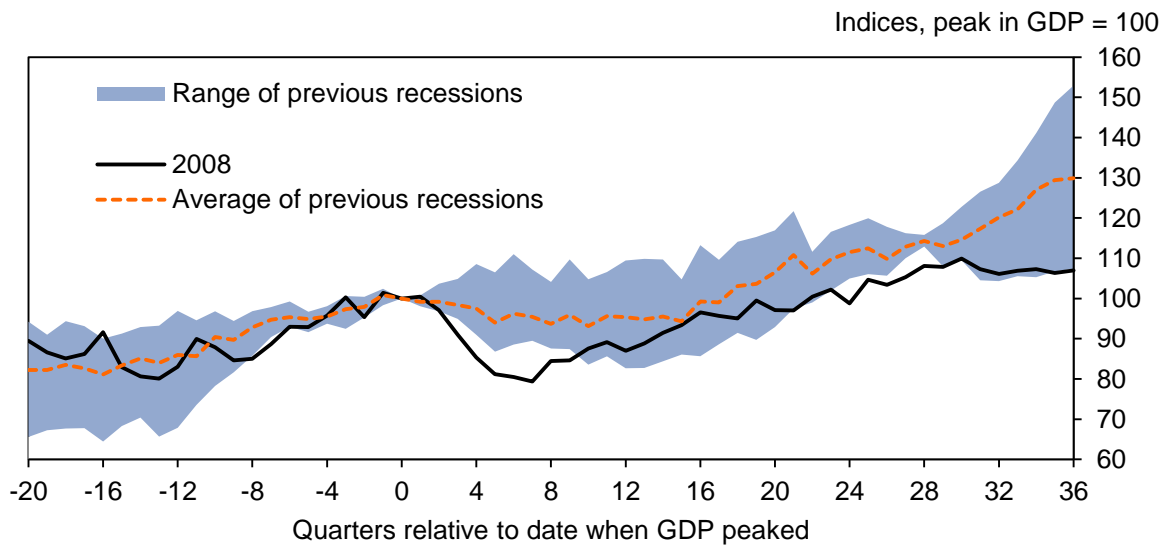
**Chart 1: G4 non-residential investment weak since the crisis**



Sources: Eurostat, ONS, OECD and Bank of England calculations.

Notes: The data for the UK, the US and Japan are for private non-residential investment; the data for the euro area include public non-residential investment.

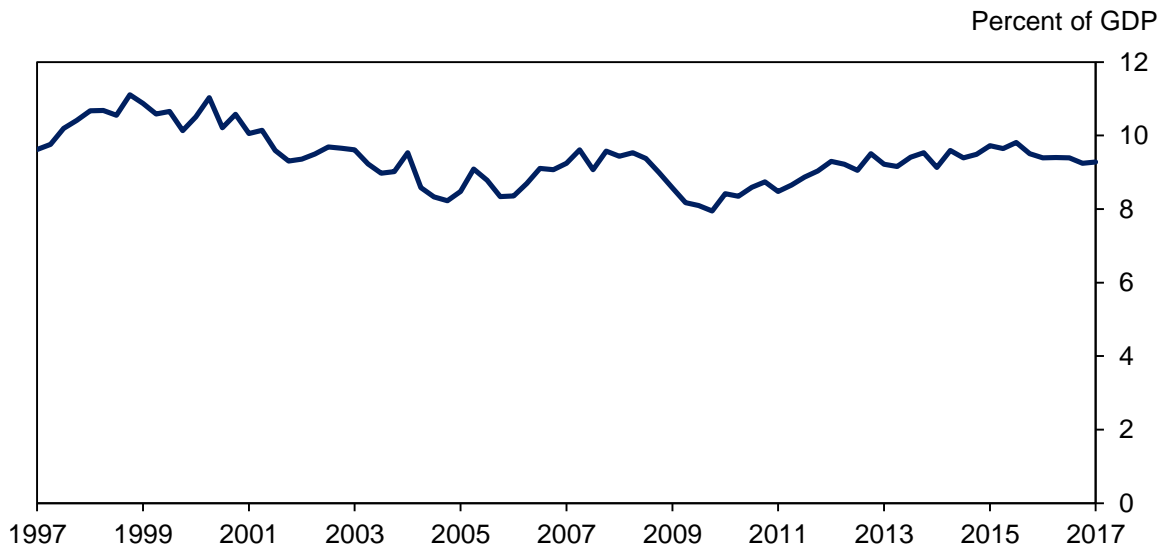
**Chart 2: Weakest UK business investment in half a century**



Sources: ONS and Bank calculations.

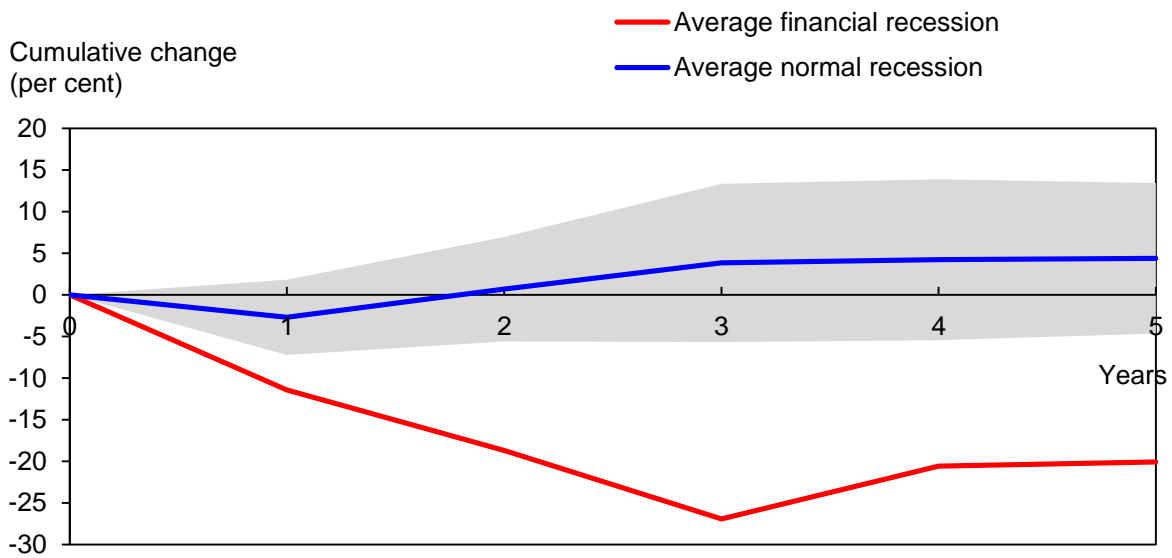
Notes: The chart plots real business investment. The range includes the recessions of 1973, 1979 and 1990.

**Chart 3: UK real business investment to GDP ratio is falling**



Source: ONS.

**Chart 4: Investment consistently weaker post-crises**

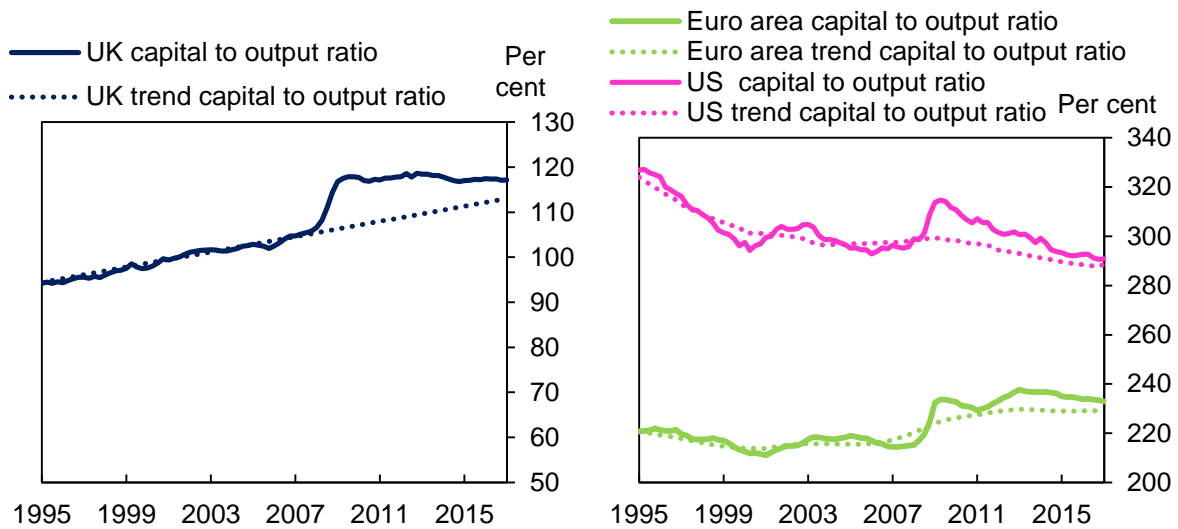


Source: Jordá, O., Schularick, M. and Taylor, A. (2013), 'When Credit Bites Back', *Journal of Money, Credit and Banking*, Vol. 45, Issue s2.

Notes: The chart shows the cumulative change in per capita investment. The grey shaded area shows a 95% confidence interval around the average normal recession.

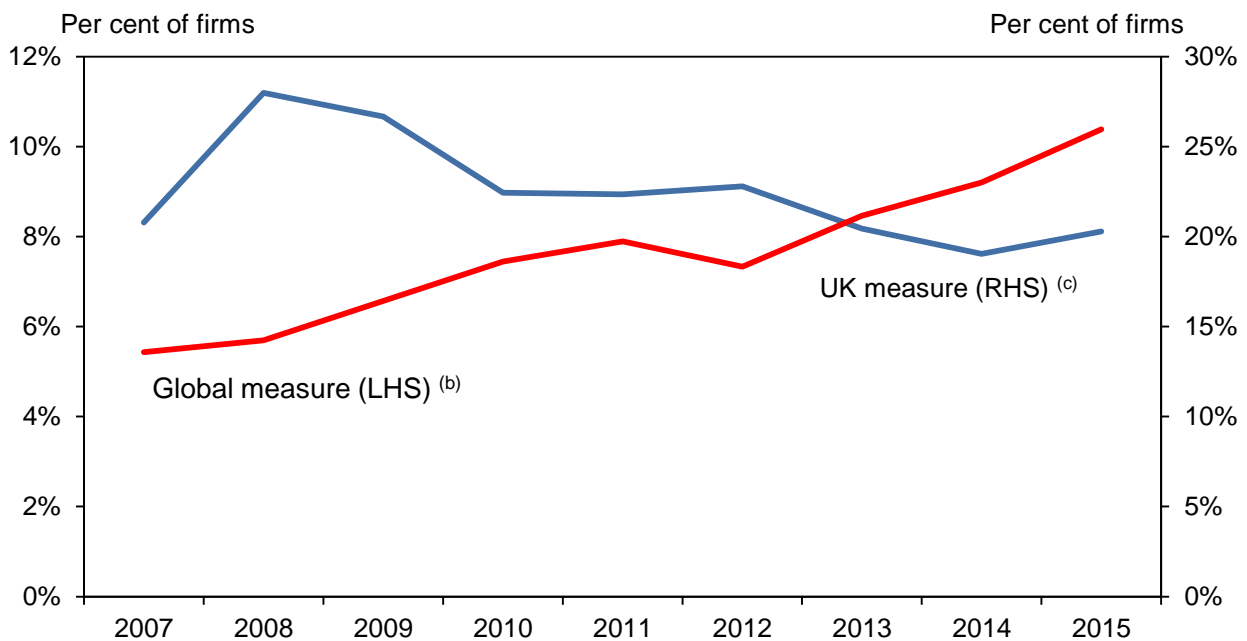


**Chart 5: UK, US and euro-area capital overhangs being worked off**



Sources: BEA, OECD, ONS and Bank calculations.

**Chart 6: Zombie firms rising in AEs, falling in the UK <sup>(a)</sup>**



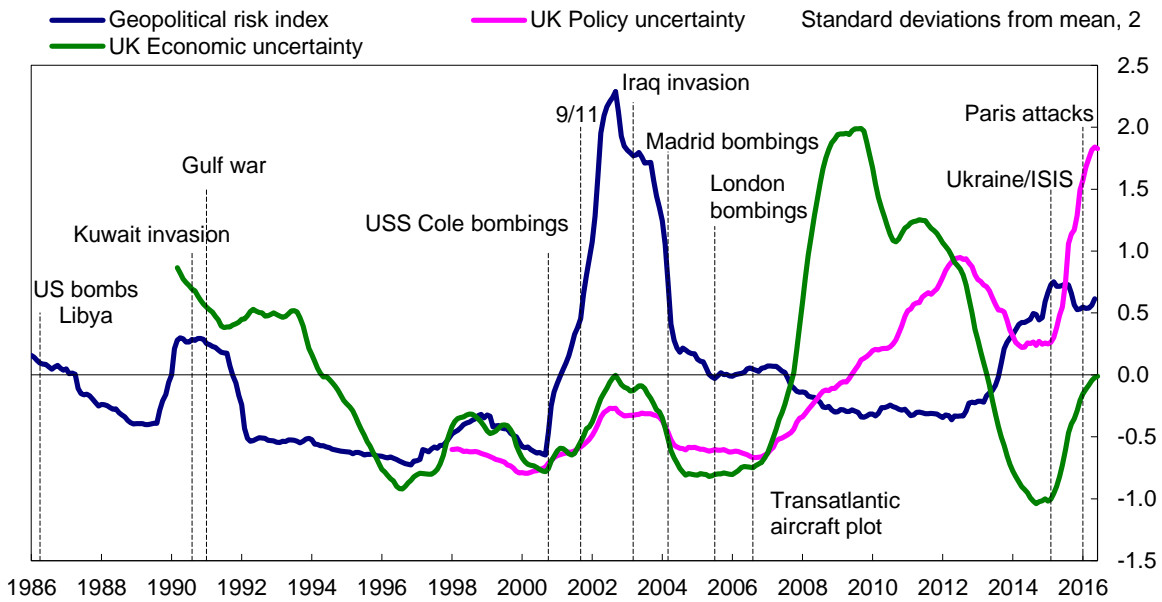
Source: European Commission, AMECO database; IMF, World Economic Outlook; Datastream Worldscope; The Conference Board; BIS calculations; Bureau van Dijk and Bank calculations.

(a) Zombie firms are defined as firms with a ratio of earnings before interest and taxes to interest expenses below one.

(b) Sample includes listed firms aged 10 years or more. Shown is the median share across AU, BE, CA, CH, DE, DK, ES, FR, GB, IT, JP, NL, SE and US.

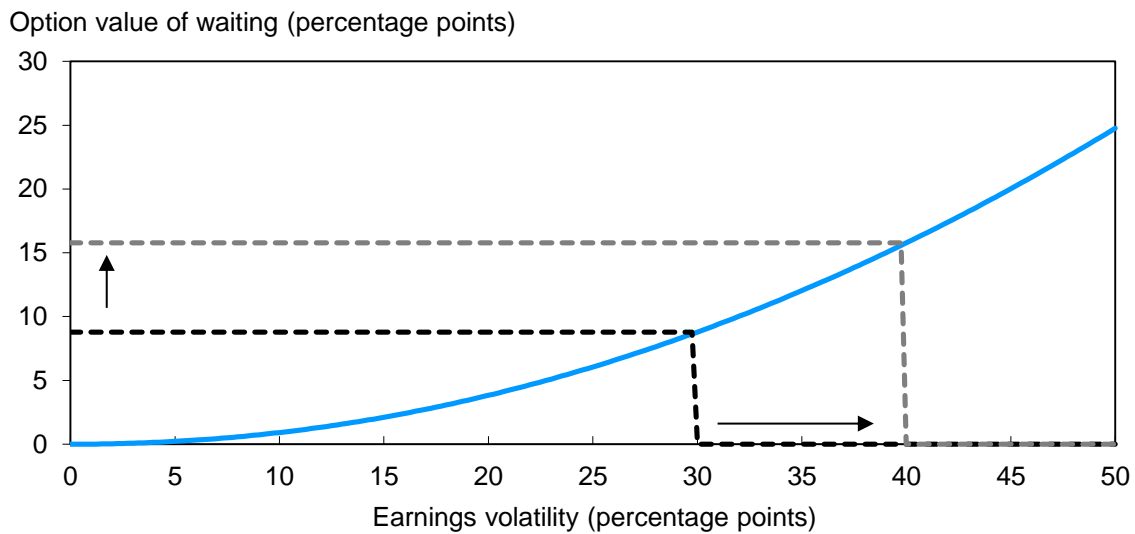
(c) Sample includes both publicly listed and private UK firms. Only firms whose turnover reached £1 million in one of the past ten years are included. There are around 17,200 firms per year in the sample.

**Chart 7: UK companies facing multiple uncertainties**



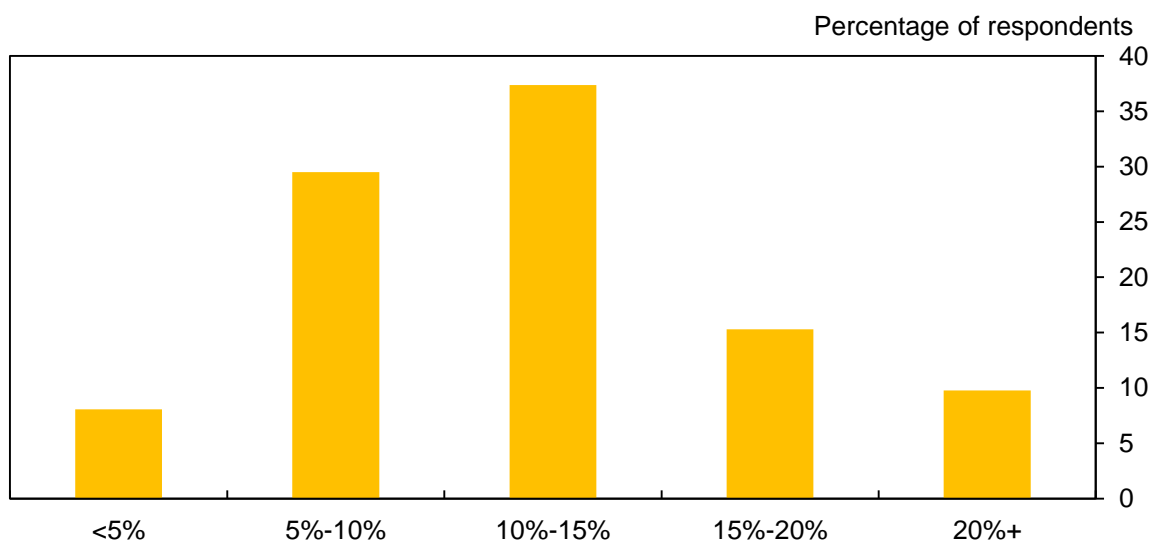
Notes: economic policy and geopolitical uncertainty indices are de-measured and shown relative to their respective standard deviations. Chart shows two-year centred moving average for each measure. See 'Uncertainty, the economy and policy', speech by Mark Carney, 30 June 2016, available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech915.pdf>, for more details.

**Chart 8: Greater uncertainty drives hurdle rates up**



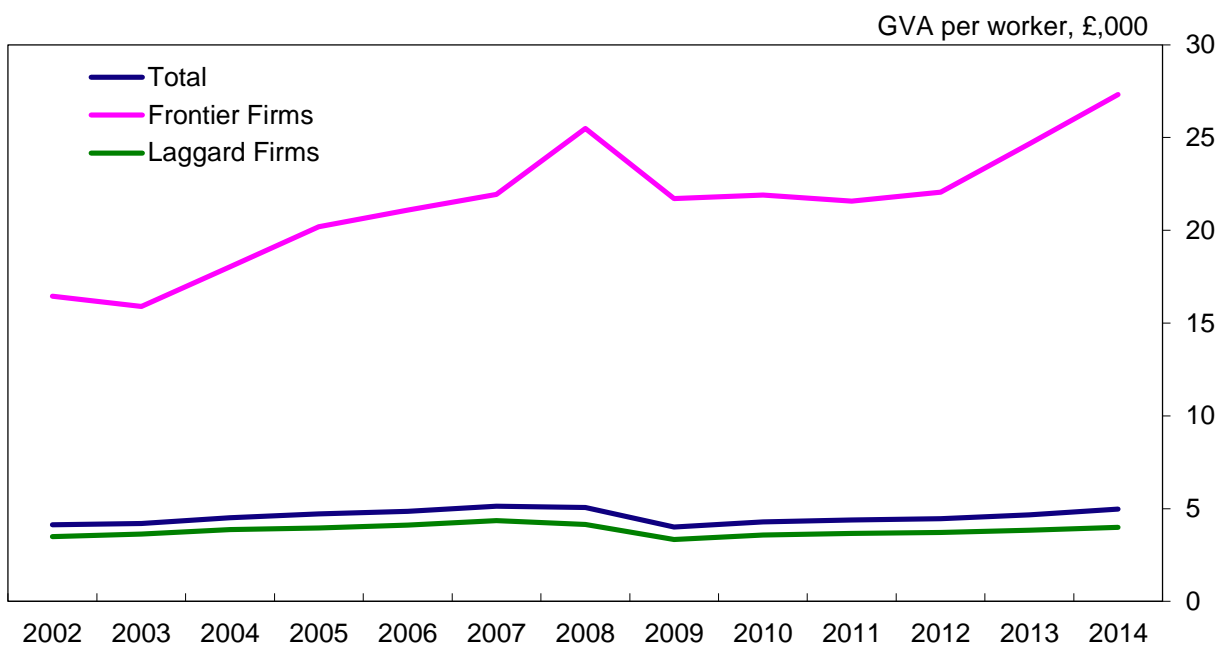
Notes: the chart shows a simple Black-Scholes model of the required hurdle rate given earnings volatility. For individual firms, the standard variation of annual earnings was around 30 percentage points in the period before the crisis.

**Chart 9: Hurdle rates for UK businesses remain high**



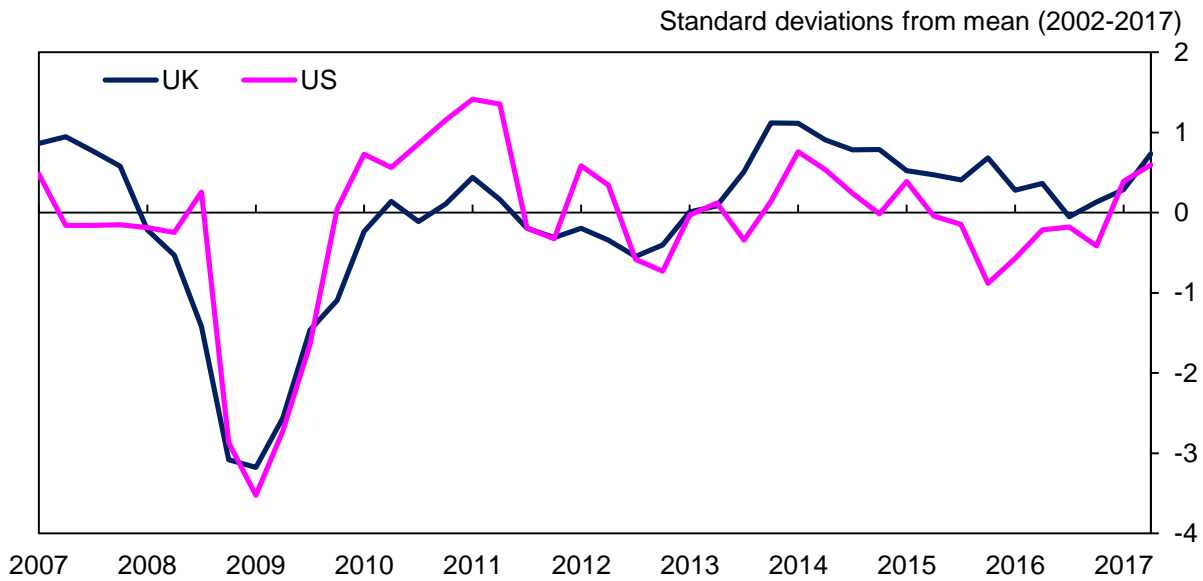
Source: Bank of England Finance and Investment Decisions Survey, as reported in Levina, I., Melolinna, M., Saleheen, J., and Tatomir, S. (2017), 'The financial system and productive investment: new survey evidence', *Bank of England Quarterly Bulletin*, Vol. 57, No. 1, available at [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2017/q1/q1pre.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2017/q1/q1pre.pdf).

**Chart 10: Diffusion of productivity stalling?**



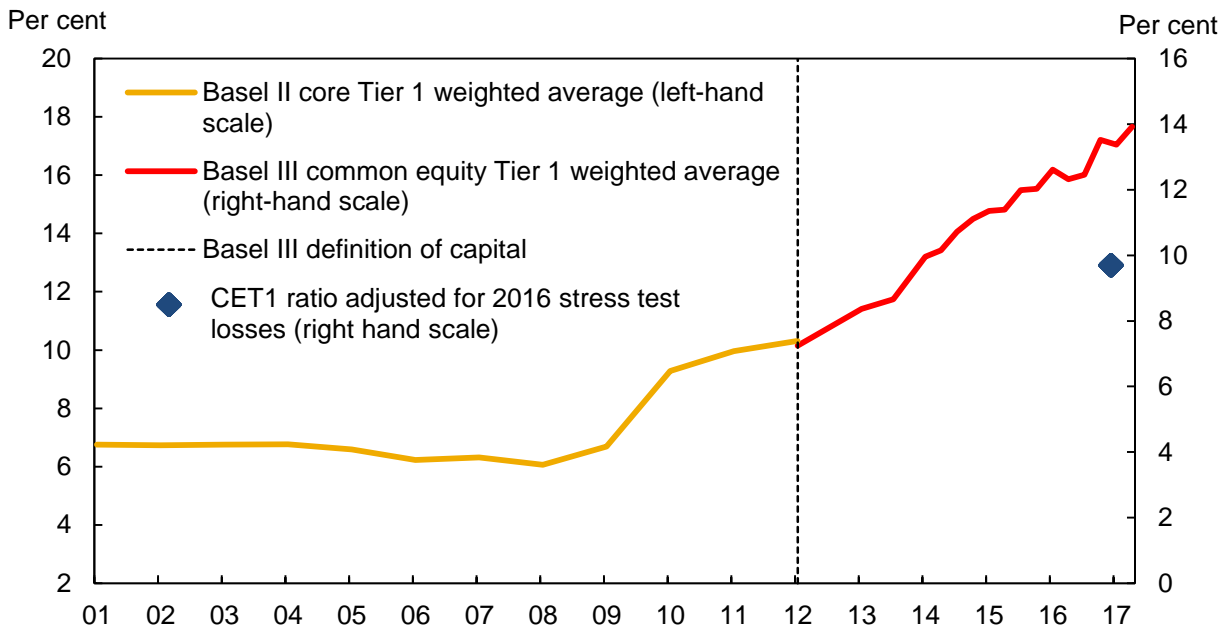
Sources: ONS Research Database and Bank calculations. See Productivity puzzles - speech by Andy Haldane at the London School of Economics, 20 March 2017, available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech968.pdf>.

**Chart 11: Investment intentions picking up globally**



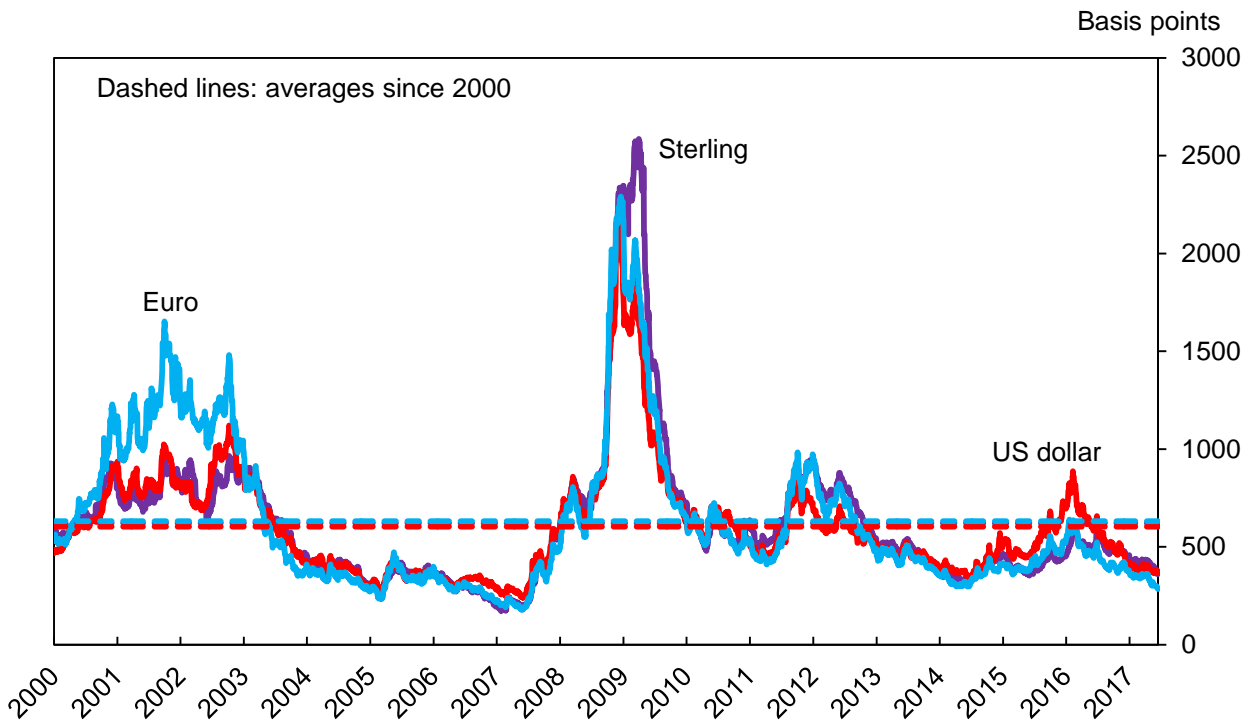
Sources: BCC, CBI, CIPS, Business Roundtable CEO Survey and Bank of England.  
 Notes: the line for the UK shows the average of the BCC, CBI, CIPS and Bank of England Agents' survey measures of investment intentions. The line for the US shows the Business Roundtable CEO Survey measure.

**Chart 12: UK financial system much more resilient**



Sources: PRA regulatory returns, published accounts and Bank calculations. See June 2017 Financial Stability Report for details of series.  
 Notes: The chart shows major UK banks' capital ratios as a percentage of their risk-weighted assets.

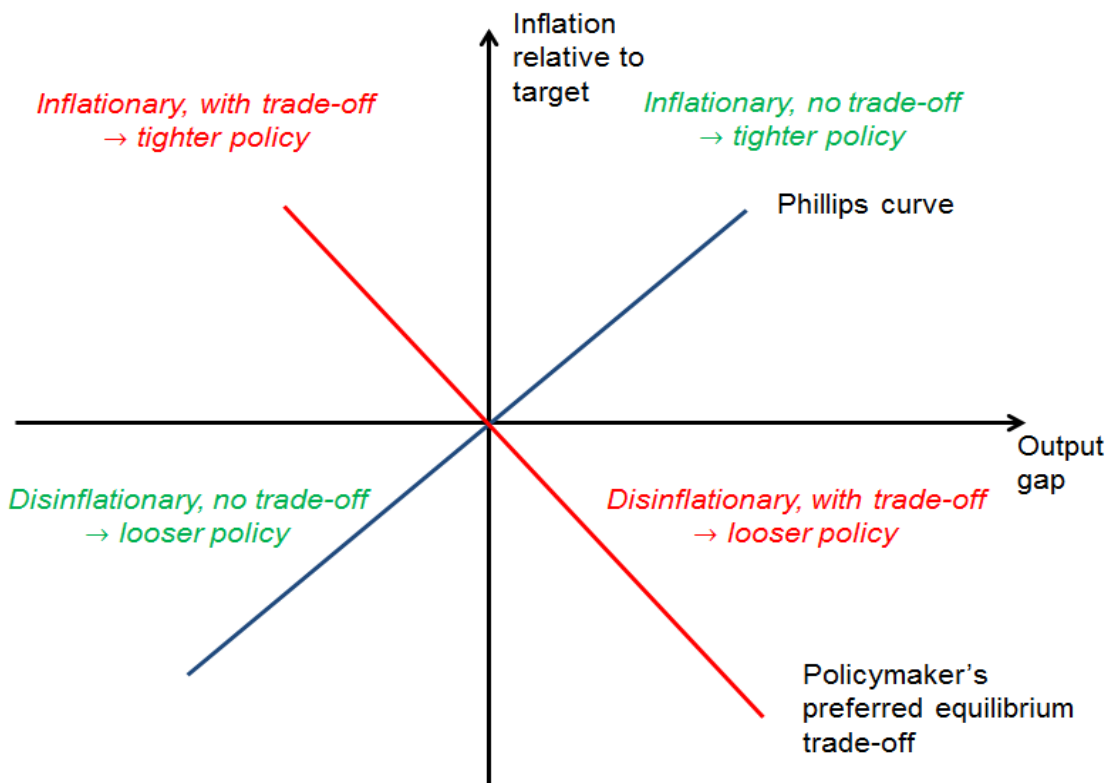
**Chart 13: Corporate bond spreads below historic averages**



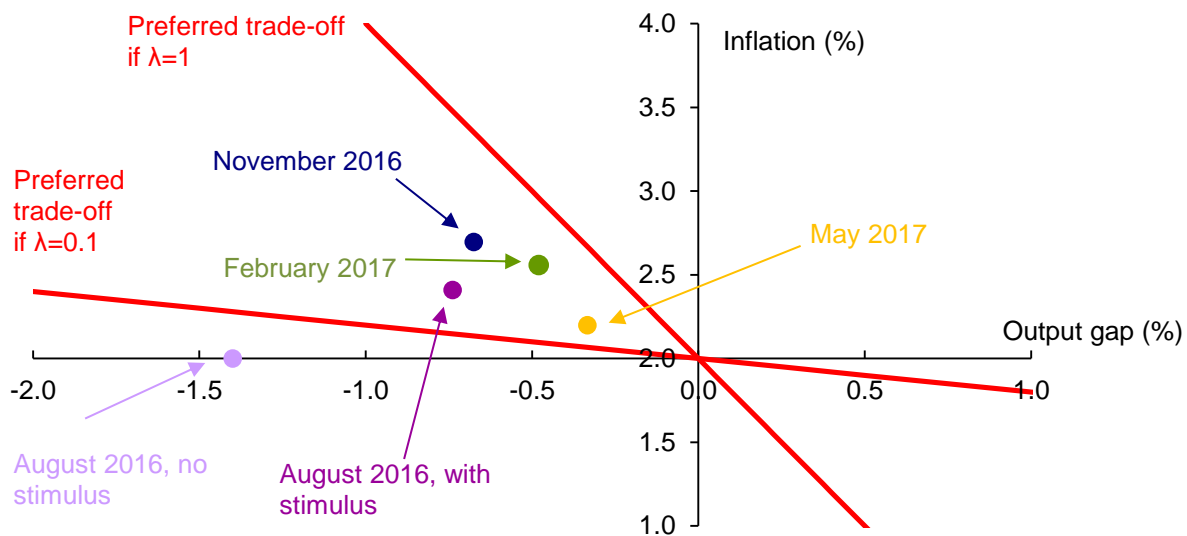
Sources: Bank of America Merrill Lynch Global Research and Bank calculations.

Notes: Option-adjusted spreads. The US dollar series refers to US dollar-denominated bonds issued in the US domestic market, while the sterling and euro series refer to bonds issued in domestic or eurobond markets in the respective currencies.

**Chart 14: Stylised monetary policy responses**



**Chart 15: Monetary policy trade-off lessening**



Source: Bank of England.

Notes: the chart shows *Inflation Report* projections for inflation and the output gap at the year 2 horizon. A value of 0.1 gives an approximate lower bound on estimates of lambda over the post inflation targeting period. A value of unity would correspond to a “balanced approach” which weighs inflation stabilisation and output gap stabilisation equally. For more information, see ‘Lambda’, speech by Mark Carney at the London School of Economics, 16 January 2017, available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech954.pdf>.