



BANK OF ENGLAND

# Speech

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## **Productivity and monetary policy**

Speech given by

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I would like to thank Abigail Hughes, Neil Meads and Matt Trott for their considerable help in preparing this speech. The views expressed are my own and do not necessarily reflect those of other members of the Monetary Policy Committee.

Thank you for the invitation to speak to you this morning.

It is a pleasure to be in the North East and to have the opportunity to speak to a forum of business leaders from the manufacturing sector. As our economy recovers and rebalances towards a more sustainable pattern of growth and demand, manufacturing and the export sector more generally will need to play an increasing role. So I'm really pleased to have the opportunity to speak to a group of companies at the forefront of this process.

The topic of my talk today is one that is close to many of your hearts. Indeed, it concerns the life blood of the long-term success of each and every one of your companies.

It is also central to the setting of monetary policy.

### Productivity

As you know far better than I, strong, sustained productivity growth is vital for ensuring that your companies remain competitive in the global market place.

Productivity is equally important for the long-term health and prosperity of our economy as a whole. To paraphrase one economist "productivity isn't everything, but in the long-run it is almost everything". (Krugman 1994).

Productivity matters for monetary policy since it plays a crucial role in determining the supply capacity of our economy. The balance between an economy's capacity to supply goods and services and what is actually demanded is a fundamental driver of inflationary pressure in the medium term, and so central to the MPC's task.

The recent behaviour of productivity has been puzzling and worrying in equal measure.

The level of measured productivity in the UK private sector today is lower than it was at the time of the financial crisis.<sup>1</sup> We have had over three years of stagnant productivity. If private sector productivity had continued to grow at the average rate seen prior to the crisis of around two and half percent or so, the level of productivity today would be around 9% higher (Chart 1).<sup>2,3</sup>

What might account for the UK's productivity shortfall? And what implications might it have for monetary policy?

As I fear may often seem to be the case with economists – I'm not going to offer you a simple answer. There is no single smoking gun. Rather I think there are a number of candidate explanations, each of which is likely to have played some role. In the next section of my talk, I'll highlight three broad classes of explanation – which range from the relatively benign to more worrying diagnoses – and try to provide some guide as to their relative importance.

I'll then discuss how the uncertainty surrounding recent developments in productivity complicates the setting of monetary policy. The MPC needs to form an assessment of the strength of supply as well as demand when setting policy. I'll conclude with some thoughts on recent developments in the economy more generally and how they have affected my policy decisions.

### **Productivity weakness: A reality or an illusion?**

So what could account for the recent poor productivity performance?

One possibility is that the weakness of measured productivity growth may exaggerate the true extent of underlying weakness. Let me explain.

An encouraging aspect of the recent recession is that although unemployment increased, it rose by far less than we might have feared given the depth of the recession. The recent data on employment and unemployment are worrying in that context, with unemployment edging up over the summer, after having previously fallen by over 50,000 from its peak in early 2010. If this weakening in the labour market continues that could materially change the relationship between output and employment.

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<sup>1</sup> The private sector has been approximated by excluding employment and output data for the public administration and defence, education and health sectors, reflecting that a significant proportion of these sectors are within the public sector. Workforce Jobs data on sectoral employment have been scaled to match aggregate employment levels indicated by the Labour Force Survey. Resulting calculations for the private sector are estimates only. Official ONS productivity estimates are for the whole economy and so differ slightly.

<sup>2</sup> The productivity shortfall is measured in terms of output per head. The scale of the shortfall would be slightly less if measured in terms of output per hour worked, but the same qualitative patterns (and puzzles) are apparent in productivity per hour measures.

<sup>3</sup> The UK is not alone: OECD data reveal that several of the world's largest economies (including Germany, France and Italy) have also been experiencing sluggish productivity growth by historical standards. One exception to this is the US, where productivity has actually grown at rates in excess of the pre-crisis average over much of the past three years.

But to date, companies appeared to have held onto a greater proportion of their labour force than in past recessions. My own experience of speaking to businesses at the depth of the recession is that this was driven by a desire to retain valuable skills and experience. Many companies had learned from past experience how difficult it is to re-employ skilled workers once let go. But a consequence of this labour hoarding is that the amount of output produced per worker fell very sharply, in many cases partly because working hours were cut back. And although there has been some rebound since then, the level of labour productivity has still not recovered to its previous level.

This greater retention of labour suggests that firms may be sitting on a substantial degree of spare capacity. Underlying productivity – the level of productivity that would be possible if workers and capital were utilised at normal levels of intensity – may have continued to improve even though measured productivity has not. But this will only become apparent if and when demand recovers and the workforce is fully utilised.

Although I place some weight on this explanation, I worry that it is contradicted by what business leaders – just like you – typically say and, more importantly, by what they have been doing. Despite all this apparent hoarding of labour, when responding to business surveys and questions from our network of Agents, companies often say that they have relatively little spare capacity. Now there are good reasons why a company's notion of spare capacity may differ from that of an economist, and so there's a danger that we over-interpret these responses.<sup>4</sup> But it is not just what the managers of those businesses say, it is also what they have been doing. Over the past year, despite only sluggish output growth, private sector employment increased by almost half a million people – the strongest increase in employment since 1997. It is difficult to understand why firms should increase employment so significantly if their existing workforce is not fully utilised.

Some of this behaviour may be explicable if employment growth were concentrated in sectors of the economy which are expanding most quickly, especially those orientated towards the export sector. But it is striking that this pattern of rising employment and weak productivity is common across most sectors of the economy (Chart 2).<sup>5</sup> It is also possible that firms in some parts of our economy are having to work flat out just to generate the same amount of business. Estate agents, for example, trying to match buyers and sellers in a thin housing market. Or M&A teams pitching for new business. The extra effort that is required may explain why these types of companies do not report much spare capacity. But it does not help to explain why companies facing these types of pressures should want to expand greatly their workforces.

It is hard to reconcile the number of new jobs created over the past year with the belief that firms are sitting on a substantial margin of spare capacity.

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<sup>4</sup> As noted in the August 2011 *Inflation Report*, one possibility is that surveys capture companies' immediately available capacity rather than their long-run capacity. So companies may be reporting pressures relative to the capacity that can be used immediately and at little additional cost, and excluding, for example, production lines that were temporarily mothballed during the recession, but which could be reactivated as demand increases.

<sup>5</sup> A related mechanism relates to changes in employment shares from high productivity sectors to lower productivity sectors. The scale of the changes in sectoral employment shares to date can account for some, but only a small proportion, of the productivity shortfall.

The recent weakness in productivity may also have been exaggerated by the sheer difficulty of measuring economic activity in real time. We know that early estimates of output are often revised as more comprehensive data become available. Recent productivity may look less disappointing if subsequent estimates of output are marked up. And indeed, based in part on the pattern of past revisions, the MPC does think that the current and recent level of measured output is more likely to be revised up than down (Chart 3).<sup>6</sup> But such revisions are likely to provide only a partial explanation of the productivity puzzle. For example, if GDP were to be revised in line with the path the MPC judge most likely, that would account for only around one fifth of the 9% productivity shortfall.<sup>7</sup>

If labour hoarding and data revisions provide only a partial explanation of the recent sluggishness of productivity growth, what else might account for it?

### **Difficulty of extrapolating from the past**

The second explanation is that it might be misleading to extrapolate from previous trends when gauging the extent of the productivity puzzle. The past is not necessarily a good guide to the future. In particular, there are reasons to think that past productivity growth in both the energy extraction sector and the financial services sector may provide a poor guide to more recent trends in underlying growth in those sectors.

In the twenty years prior to the financial crisis, productivity in the energy sector grew at an average annual rate of over 3%. But the pace of productivity growth slowed markedly in the past decade or so as North Sea oil fields aged and energy extraction became more difficult. Indeed, since the mid-2000s, productivity has actually been falling (Chart 4).

In contrast, productivity growth in the financial services sector increased very sharply in the 10 years prior to the financial crisis, underpinned by the process of financial liberalisation and strong growth in financial sector balance sheets. It does not seem sensible – certainly with the benefit of hindsight – to think that this strong growth would continue indefinitely.

Re-estimating the scale of the productivity puzzle using more plausible estimates for trend productivity growth in these two sectors reduces the size of the productivity shortfall by up to 2 percentage points – that is from around 9% to 7% - with the majority of that difference reflecting slower underlying productivity growth within the energy extraction sector.

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<sup>6</sup> See the box on pages 22-23 of the August 2011 *Inflation Report*.

<sup>7</sup> Employment data may also be prone to revision reflecting possible sampling errors. Headline productivity figures are based on the regular Labour Force Survey of households. The Workforce Jobs measure of employment reported by businesses has been weaker over the recovery to date. If the LFS measure were revised towards Workforce Jobs, that could raise productivity per head by around 2 percentage points. But survey evidence broadly supports the LFS measure of employment and Workforce Jobs data have been revised in the past towards the LFS measure.

Extrapolating from the past may also be misleading if some businesses were operating at above normal levels of capacity utilisation prior to the recession. If that were the case, some of the subsequent slowdown in productivity growth would simply reflect the need for companies to adjust to more sustainable operating levels. And that indeed appears to be the case, with business surveys pointing to above average capacity pressures in both the manufacturing and services sector prior to the recession. The implied required adjustment may account for around a further 1% point of the productivity shortfall.<sup>8</sup>

Taking account of changes in productivity trends within key sectors of the economy and of the position of the economy prior to the start of the recession may account for around one third of the productivity shortfall. But even if we combine both of these factors with the impact of the likely upward revision to GDP, this still leaves a sizeable productivity puzzle – of around one half of the productivity shortfall – to explain.

The third explanation is that underlying productivity growth has been weakened by the impact of the financial crisis. It is notable that this explanation is consistent with evidence from business surveys of spare capacity which suggest that underlying productivity growth in the manufacturing and services sector has essentially stagnated since the start of the recession (Charts 5 and 6).<sup>9</sup> What might account for this flat lining in potential productivity?

### **Impact of financial crisis**

In an accounting sense, this stalling in productivity growth must be attributable to one of two factors. A slowing in the rate at which companies have added to the physical capital used by each member of their workforce. Or a slowing in the pace of efficiency gains associated with the way in which companies combine capital and labour to produce output, known in the jargon as total factor productivity.

In reality, it is unlikely that a slowing in the pace of capital accumulation contributed significantly to the weakness of productivity. This is largely a matter of arithmetic. Annual business investment flows are small relative to the size of the capital stock. So even though business investment fell by around a quarter in the year following the collapse of Lehman Brothers, and remains 20% below its pre-crisis level, it is unlikely to have had a significant impact on the stock of capital available per worker.<sup>10</sup>

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<sup>8</sup> Evidence from business surveys (eg BCC, CBI) and the Bank's Agents suggest that capacity utilisation was above normal in both manufacturing and services sectors. Qualitative survey balances can be adjusted to match the mean and variance of an estimated productivity gap from which inference about productivity may be drawn. See Charts 3.7 and 3.8 in the August 2011 Inflation Report.

<sup>9</sup> Potential productivity is constructed using the BCC surveys of capacity utilisation and productivity data from the ONS for the manufacturing sector and private services excluding finance sector. The BCC survey asks firms whether they are operating at or below full capacity. Since the survey measures are qualitative, they have been mean and variance adjusted over the period 1989 to 2006 to infer a measure of the gap between actual and potential productivity. The trends shown in charts 5 and 6 are chosen such that the shortfall between actual and potential productivity maps closely to the mean-and-variance-adjusted survey measures of spare capacity.

<sup>10</sup> The annual flow of business investment prior to the recession averaged around 7% of the UK capital stock. A 20% reduction in business investment for 5 years would result in the capital stock being only around 2% lower (assuming plausible assumptions for the rate of depreciation).

It is possible that this simple arithmetic underestimates the impact of the falls in investment spending, particularly if the falls were concentrated in highly-productive forms of investment. Perhaps because in the face of the deep recession companies were less willing to undertake riskier, high-return investment projects, and the constraints on UK banks made them less willing to finance them. But even so, this skewing would have to be very marked to have had a material impact on the quality of the capital stock.<sup>11</sup>

The capital stock is also likely to have been eroded by increased levels of capital scrapping, as some companies were forced out of business and others scaled back their operations in order to survive. Although increased levels of capital scrapping are likely to have played some role, they seem unlikely to provide the key to the productivity puzzle. In particular, although corporate liquidations have increased in the recession, that increase has been relatively contained and significantly less than we might have feared given the depth of the recession.

Rather if the evidence from the business surveys is to be believed, and the growth of productive potential in the manufacturing and services sector has indeed largely stalled in recent years, this is more likely to reflect a slowing in total factor productivity (or TFP for short).

I know what some of you might be thinking: this sounds like another one of those unobservable, abstract concepts so beloved by economists, but with little connection to the real world. And you would have a point! But think of it as efficiency gains. The fact that companies, as they hone their working practices and improve their internal processes, are able to increase the amount of output they produce for a given level of labour and capital input.

Did the financial crisis and recession dampen the pace of efficiency gains in our economy, at least temporarily?

Recessions are actually often credited with improving average levels of efficiency, as less productive firms are forced out of business and others drive through productivity gains in order to stay afloat. Only the fittest – and the most efficient – survive. But this recession differed to those in our recent experience since it was triggered by a financial crisis. Banks' ability to lend was reduced. Credit conditions tightened. The implications of this for the efficiency with which companies operate are potentially far reaching.

Many smaller companies and new businesses, which are a critical source of innovation in our economy, have struggled to secure the finance they need to grow and expand. Company start-ups fell sharply during the recession, and evidence from the Bank's Agents suggests that many smaller businesses are still struggling to access funds at affordable rates. In that context, it is worth recalling that small companies,

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<sup>11</sup> The impact on the physical capital stock would be compounded to the extent that the recession also weighed on the growth in human capital. In particular, employees ability to 'learn by doing' on the job or through job related training is likely to have been reduced as a result of the decline in average hours during the recession. Weale (2010) suggests that the learning by doing channel could eventually reduce aggregate labour productivity by around ½%.

employing less than 100 employees, hold over 40% of UK patents, even though they account for less than 20% of total investment.<sup>12</sup>

Even for those companies that are able to borrow funds, the tightening in credit conditions is likely to have impeded the efficiency of supply. Some companies have become more cautious, preferring to hang onto liquidity or pay down debt rather than invest in increased levels of training and R&D. The increased cost of working capital has led many firms to cut back substantially on their inventory levels, disrupting the efficiency of supply chains. More generally, the amount of management time devoted to raising finance and managing banking relationships has increased very substantially, diverting attention from the search for new products and new markets.

It is impossible to quantify with any precision the effect that strains within the banking system have had on the growth of productivity over the past few years. But evidence from previous periods of financial turmoil suggests that the effect might be material. In particular, research by the IMF suggests that persistent falls in TFP growth following banking crises can account on average for around one third of the loss of output seen following such episodes (IMF 2009).

So where does all this leave us?

As I warned you upfront, I don't think there is a single, simple explanation for the recent surprising weakness of productivity. Some of it may well get revised away. And some of it may be because our sights were set too high based on past trends. But I also think there are good reasons to think that the recession, and particularly the impact of the financial crisis, may have dampened underlying productivity growth in recent years. At the risk of stating the bleeding obvious, we need the banks to be working for our economy to grow and prosper.

### **Productivity and monetary policy**

Why does all this matter for monetary policy?

The medium-term outlook for inflation depends critically on the balance of demand and supply in the economy. If demand is greater than the goods and services that can be supplied, prices will tend to rise. And vice versa. As such, when setting monetary policy, the MPC needs to make an assessment about current and future trends in supply, as well as demand.

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<sup>12</sup> "Investigating the characteristics of patents and the businesses which hold them", Thomas, A., Economic and Labour Market Review, April 2011



The discussions about economic growth we typically read about in newspapers and see on TV are normally posed in terms of demand. Is gloom on the high street spreading? Claims and counter-claims about the likely impact of the fiscal consolidation. But the MPC also needs to consider the prospects for supply. How quickly is the capital stock likely to grow? And, importantly, will the recent weakness in productivity persist or reverse?

Typically, the growth rates of factors determining the supply potential of our economy – population, the capital stock, structural productivity– are far less volatile than those of demand. As such, it is often natural for the main focus of policy to be concentrated on the prospects for demand. But judgements about supply also matter, particularly so in the aftermath of a deep recession.

In recessions, demand typically falls by more than supply. An output gap opens up – the economy can supply more than is currently demanded. And unless that gap is closed, it will push down on costs and prices. The job of monetary policymakers is to loosen policy, so that demand is brought back into balance with supply and inflation remains close to target. Exactly how expansionary policy should be depends critically on the size of the output gap.

But assessing the size of the output gap is very difficult, for exactly the reasons we have been discussing today. Early estimates of economic activity can be revised substantially, so it is hard to know just how weak demand and output really are. And it is equally difficult to know the extent to which the supply potential of the economy has been affected by the recession.<sup>13</sup> This difficulty greatly complicates the setting of monetary policy. Indeed, in a series of influential papers, Athanasios Orphanides (eg Orphanides 2003) has argued that over-estimates of the size of the output gap played an important role in the policy mistakes that led to the period of persistently high inflation in the US in the 1970s and 80s.

I hope that we are learning some of the lessons from the past. Taken at face value, the depth of the recession might suggest there is considerable spare capacity within our economy. And indeed there is considerable slack within the labour market – unemployment has risen by almost 900,000 since the start of the recession – and this has acted to contain wage pressures. But the degree of slack within firms is probably significantly less than implied by the shortfall in productivity for all the reasons I've just explained.

An assessment of the output gap requires an evaluation of the current level of supply. But the MPC also needs to form a view about the pace at which the supply capacity of the economy is growing. When faced with a period of weak output growth, it is tempting to conclude the policy should be eased in order to boost the pace of growth and so stop the output gap widening further. And that may well be the right policy prescription. But just how much demand should be boosted depends on the extent to which the weak demand growth is matched by sluggish growth in potential supply.

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<sup>13</sup> Or indeed, if shocks to supply were instrumental in causing the recession.

If indeed underlying productivity growth in our economy has been weak in the recent past – perhaps due to the lingering effects of the financial crisis – this may well continue for a while yet. To be clear, this is not the same as saying that the growth rate of the supply potential of our economy has been permanently scarred by the financial crisis. But rather over the next two or three years – which is the horizon which matters for monetary policy – we shouldn't automatically assume that underlying productivity will necessarily grow at the sorts of rates to which we have become accustomed to in the past.

Policymakers need to think about supply as well as demand when responding to weak output growth.

### **Recent Policy Developments**

Let me conclude with some brief comments about the current policy outlook.

You may know that between February and August of this year, I was one of the members of the MPC that had been voting to raise Bank Rate. As I mentioned at the time, my vote was not based on the nice reasons that the economic recovery looked firmly entrenched and the exceptional monetary easing implemented at the height of the crisis was no longer required.

Rather, it was driven by nasty reasons. I wasn't confident about the strength of the recovery and I was worried about the downside risks to growth. But I was even more worried about the outlook for inflation. In particular, the risks from continuing global price pressures, and the risk that the prolonged period of high inflation would affect the credibility of monetary policy. And as I've just discussed, the growing belief that the degree of spare capacity in our economy was probably less than might appear at first sight.

But I also suggested that policymakers should approach their task with considerable pragmatism, and that if some of the downside risks to growth materialised, I'd reverse my vote. And that indeed is what has happened. The outlook for demand over the past few months has weakened quite materially. Consequently, at the August MPC meeting, I reversed my position and voted to maintain Bank Rate at 0.5% and the stock of asset purchases at £200 billion. And as shown in the minutes published this morning, I voted the same way at this month's MPC meeting.

So what has happened to our economy over the past few months?

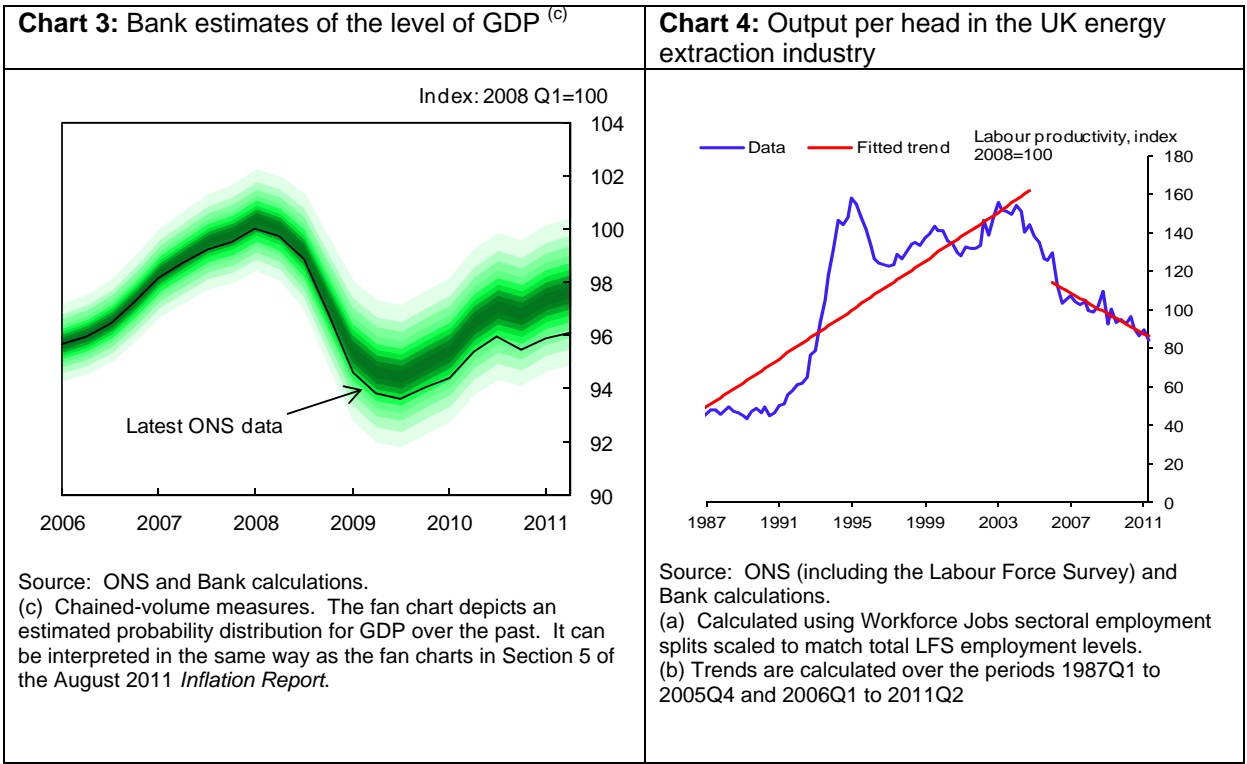
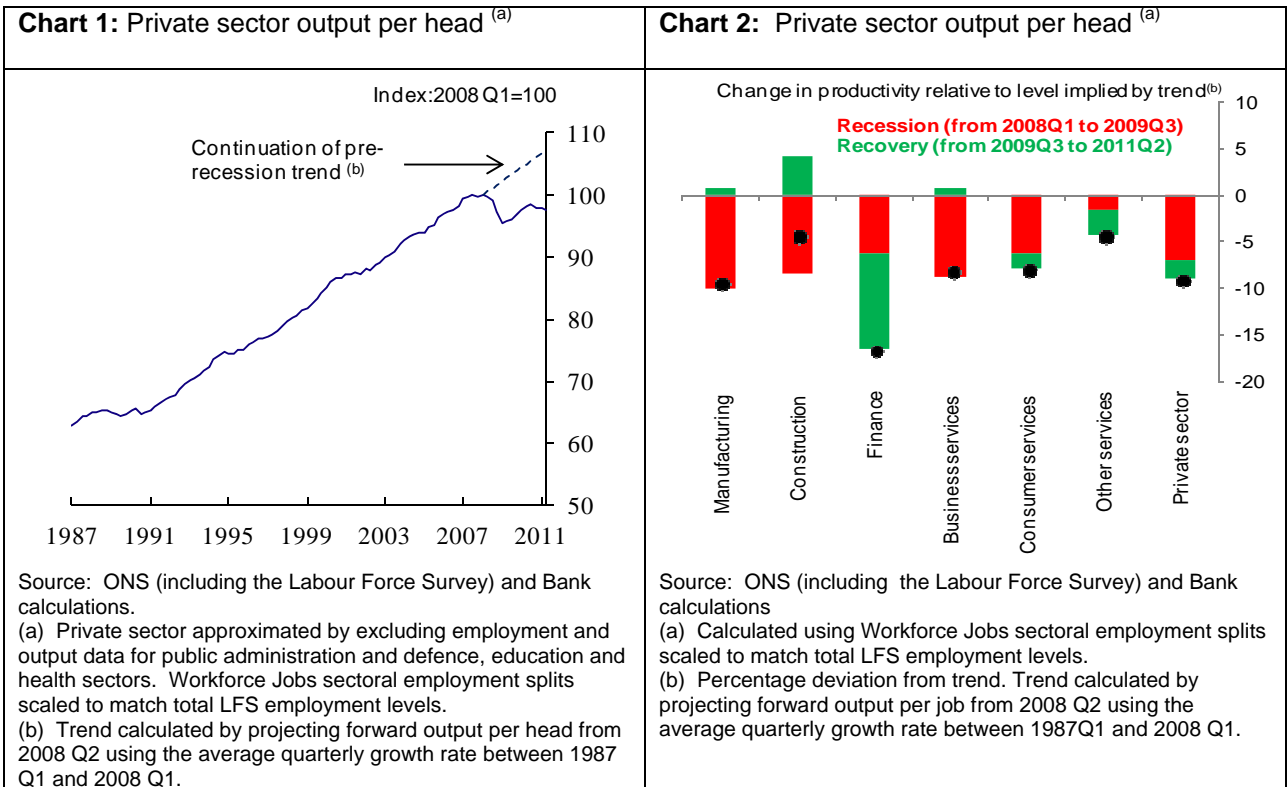
The deterioration in the outlook largely reflects developments outside of our shores. Growth in the world economy, including in our core trading partners in Europe and the US, has slowed. Concerns about the fiscal positions of some countries, particularly within the euro area, have intensified. This in turn has fuelled worries and uncertainties about the resilience of the international banking system. And perhaps most fundamentally of all, confidence that the authorities have the ability to respond to these challenges in a

decisive and timely manner has diminished. These four factors have fed on each other, leading to a pronounced downward spiral.

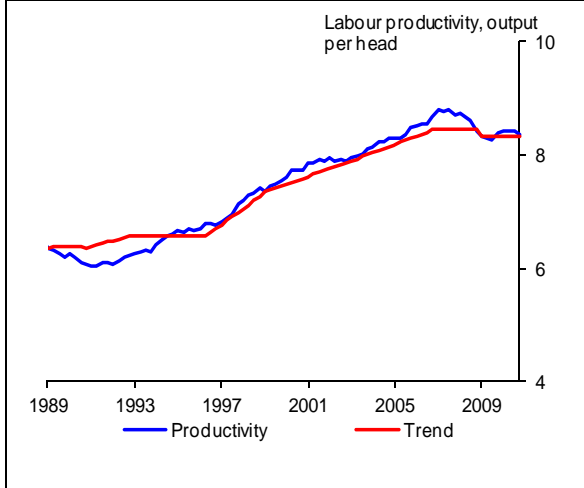
The UK has been caught in the fallout from these external developments. The strong growth in our exports seen through much of the past year has faltered, with knock on implications for the growth of manufacturing output. Renewed turmoil within financial markets has led to a sharp reduction in asset prices and to increased funding pressures on our banks. And confidence, both within companies and households, has taken another downward step.

The role of monetary policy in such circumstances is to support demand, so as to help bring inflation back to target in the medium term. And that is exactly what the MPC is doing. Interest rates remain at exceptionally low levels. The programme of quantitative easing undertaken last year continues to provide significant stimulus to demand. It is also noteworthy that market interest rates two and three years ahead have declined markedly over the past couple of months, leading a material easing in monetary conditions. If the economic situation continues to deteriorate, some additional loosening in monetary policy might be needed. But that decision will need to be weighed against the backdrop of continuing high inflation, with inflation set to climb higher over the next few months. And, as I've emphasised today, it will also need to take account of the extent to which the slowing in output reflects weak growth in supply as well as demand.

**Chart Pack**

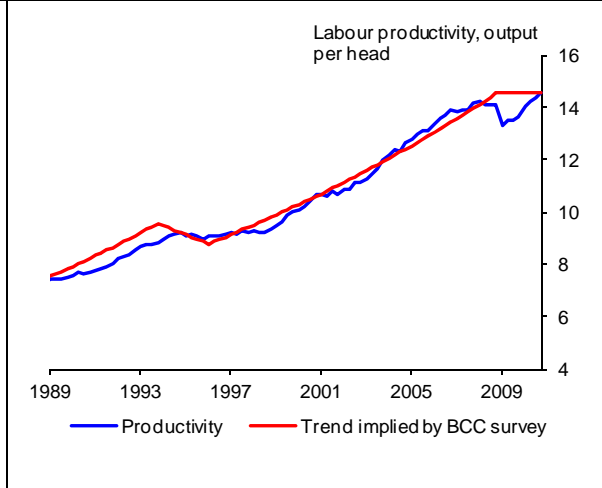


**Chart 5:** Measured productivity and an estimate of trend underlying productivity, based on the BCC survey of space capacity within firms in private services (ex. finance).



Source: ONS (including the Labour Force Survey), British Chambers of Commerce and Bank calculations.

**Chart 6:** Measured productivity and an estimate of trend underlying productivity, based on the BCC survey of space capacity within firms in manufacturing.



Source: ONS (including the Labour Force Survey), British Chambers of Commerce and Bank calculations.

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