

UK labour productivity since the onset of the crisis — an international and historical perspective

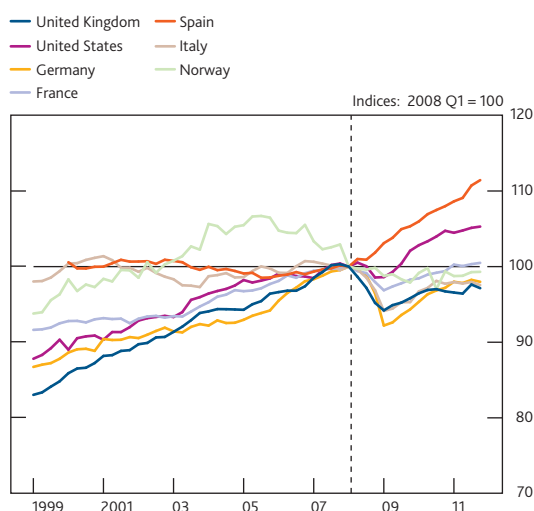
By Abigail Hughes and Jumana Saleheen of the Bank's International Economic Analysis Division.⁽¹⁾

UK labour productivity has been persistently weak since the onset of the recent financial crisis. This suggests that there is significant spare capacity within UK companies, but business surveys instead point to little spare capacity. This article aims to shed light on this puzzle by looking at cross-country and historical evidence. It finds that it has been unusual to see persistently weak labour productivity after previous financial crises in advanced economies. UK labour productivity stands out as being weak relative to historic episodes; it is also weak compared to other countries in the recent crisis. This weakness is concentrated in the energy and service sectors, suggesting the supply potential of the economy has grown more slowly than usual since the start of the crisis.

Introduction

Following very large falls in output during and after the recent financial crisis, labour productivity — measured both as output per person and output per hour worked — in the United Kingdom and a number of other European countries, has been recovering slowly (Charts 1 and 2).⁽²⁾

Chart 1 Labour productivity across countries (output per person)^(a)



Sources: Eurostat, ONS, Thomson Reuters Datastream and Bank calculations.

(a) Dashed line shows 2008 Q1.

Labour productivity often falls in the initial stages of a recession, as the fall in output is not always accompanied by

an immediate fall in employment. But weak labour productivity four years into a crisis is more unusual to see. Typically companies shed labour if activity is expected to remain weak — boosting productivity.

The retention of labour suggests companies have been operating with a margin of spare capacity. In other words, the potential output they could produce given their current levels of capital and labour is somewhat greater than their actual level of output. Similarly, potential or underlying productivity will be greater than actual productivity. The gap between these is one metric of 'slack' in companies; understanding this and, more generally, slack in the economy as a whole is crucial for monetary policy as it is an important source of inflationary pressure.

Underlying productivity is a key determinant of the supply potential of the economy and is influenced by technology, innovation and the capital stock. It is difficult to judge how underlying productivity has evolved over the recession as it is not observable. One useful benchmark is the continuation of a simple pre-crisis trend (Chart 3). In the United Kingdom actual productivity is below this benchmark suggesting that there is spare capacity within companies.

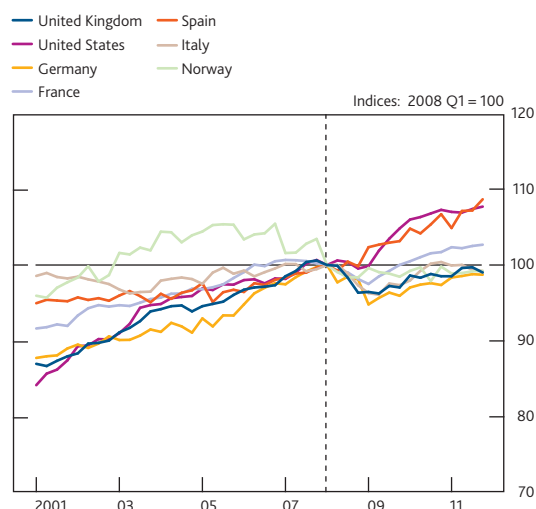
But, as noted in the May *Inflation Report*, a range of UK business surveys suggest that capacity utilisation has

(1) The authors would like to thank Adrian Chiu and William Naughton for their help in producing this article.

(2) This article focuses on labour productivity per person, as data on average hours worked by industrial sector are less readily available on a consistent basis across countries.

returned to just below normal levels. These conflicting signals, also seen in other countries (see the box on pages 144–45), mean that there is uncertainty about the current amount of spare capacity.

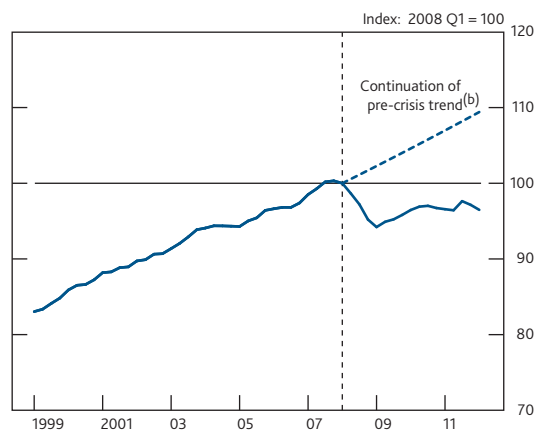
Chart 2 Labour productivity across countries (output per hour worked)^(a)



Sources: Eurostat, ONS, Statistics Norway, Thomson Reuters Datastream and Bank calculations.

(a) Dashed line shows 2008 Q1.

Chart 3 UK labour productivity^(a)



Source: ONS (including the Labour Force Survey).

(a) Dashed line shows 2008 Q1. Final data point is 2012 Q1.

(b) The pre-crisis trend is computed over 1998 Q1–2004 Q4 following the IMF (2009b) method. The trend is given by the average growth rate over a seven-year period that ends three years prior to the start of the crisis; the past three years are excluded to ensure the pre-crisis trend is not boosted by any elevated growth that often precedes a recession.

This article provides a descriptive analysis of cross-country and historical evidence on the behaviour of labour productivity during episodes of recession that are accompanied by a financial crisis. It explores whether a common feature of these recessions is persistently weak labour productivity. It also considers patterns across industrial sectors to see if the disaggregated data can shed any light on whether there has been a fall in underlying productivity following the recent crisis in the United Kingdom. As such, the analysis can help inform a view of the amount of spare capacity within companies. The

UK experience is compared to that of the United States, Germany, France, Spain, Italy, Sweden, Norway and Denmark.

Is weak labour productivity a feature of all financial crises?

The IMF (2009a) and Reinhart and Rogoff (2008, 2009) have found that episodes of recession accompanied by a financial crisis are different from normal recessions: the average loss of output during the downturn tends to be larger in the former and the recession more prolonged. Could it be that the recent weakness of UK labour productivity is a common feature of recessions that are accompanied by financial crises? This section explores this possibility.

IMF (2009b) work considered 88 historical episodes that span both advanced and emerging economies. It shows that, in some crises, the path of output evolves differently in emerging and advanced economies. Productivity in advanced economies may as a result also evolve differently from emerging economies. This article considers, therefore, the experience of advanced economies only.⁽¹⁾ The disadvantage of excluding emerging economies is that the sample size falls to only thirteen episodes of recession and financial crisis.⁽²⁾

Chart 4 puts the recent financial crisis into historical context by comparing the most recent experience of the United Kingdom and other countries with a swathe of historical episodes.

It shows the path of productivity and its components, output and employment.⁽³⁾⁽⁴⁾ These are shown relative to country-specific pre-crisis trend growth rates. So when an observation is at zero it implies a country has recovered its initial productivity losses and is at the level it would have reached had it continued along a simple pre-crisis trend.

The grey swathe in **Charts 4.A–C** refers to the interquartile range of outcomes for each variable during previous episodes; the solid light blue line at the centre of the grey swathe describes the average of those past episodes; and the full range of outturns is depicted in the light blue dashed lines.

- (1) It is hard to know if the experience of advanced or emerging economies is the right comparison for the recent UK crisis. This article considers the former. The experience of both emerging and advanced economies can be found in IMF (2009b).
- (2) Financial crises are identified using the narrative analysis of Reinhart and Rogoff (2008), this approach is also used in IMF (2009a). The sample used in this article includes the following episodes of recession and financial crisis: Australia (1990 Q2–1991 Q2), Denmark (1987 Q1–1988 Q2), Finland (1990 Q2–1993 Q2), France (1992 Q2–1993 Q3), Italy (1992 Q2–1993 Q3), Japan (1993 Q2–1993 Q4, 1997 Q2–1999 Q1), New Zealand (1986 Q4–1987 Q4), Norway (1988 Q2–1988 Q4), Spain (1978 Q3–1979 Q1), Sweden (1990 Q2–1993 Q1) and the United Kingdom (1973 Q3–1974 Q1, 1990 Q3–1991 Q3). The sample excludes Greece and Germany because of data limitations.
- (3) The analysis in this article uses the latest vintage of data. It is possible that there will be some revisions to this vintage because it is difficult to accurately measure productivity in real time. See the box on pages 22–23 of the August 2011 *Inflation Report* on GDP mismeasurement.
- (4) Sweden and Denmark are excluded from this section mainly to prevent the charts from becoming overcrowded.

Chart 4 Comparison of recent financial crisis to previous episodes of financial crisis^(a)

Chart 4.A Productivity

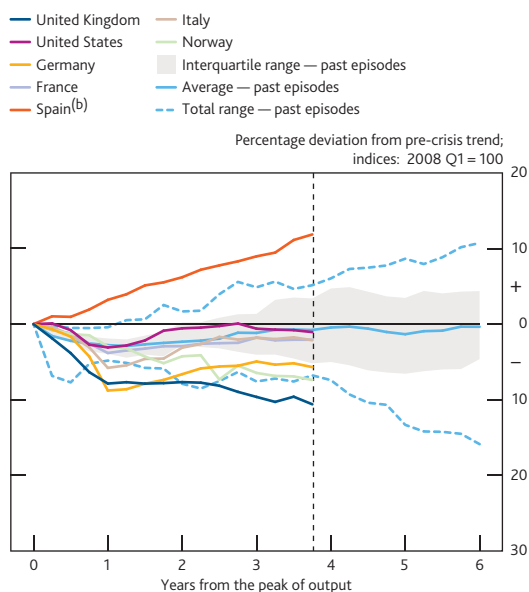


Chart 4.B Output

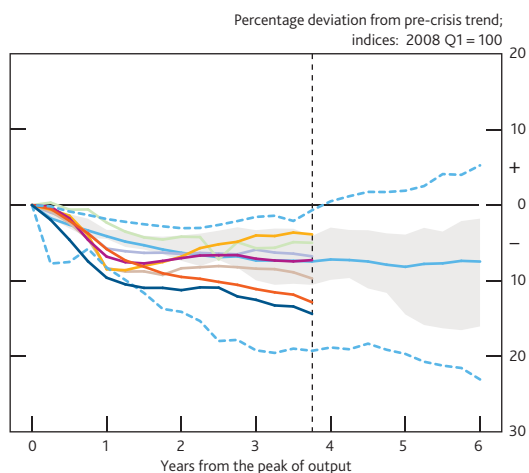
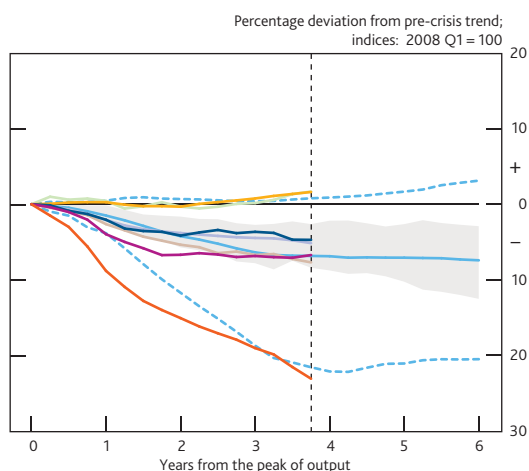


Chart 4.C Employment



Sources: Eurostat, OECD, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) Dashed lines show the latest data point for the recent crisis, 2011 Q4. Pre-crisis trends are computed using the IMF (2009b) method which is described in footnote (b) to Chart 3. Results are robust to changes in the period over which the pre-crisis trends are estimated.
- (b) For Spain, the pre-crisis trend is computed over a shorter period (2000 Q1–2004 Q4) due to lack of historic data.

For example, six years after previous crises, labour productivity ranged from being 10% above the pre-crisis trend in some countries to 15% below in others.

Chart 4.A shows labour productivity. Several features are worth noting: first, previous financial crises in advanced economies have not, on average, been accompanied by a sustained period of below-trend productivity. The average line goes back to zero after about four years and initial productivity losses are more than recovered.⁽¹⁾ **Charts 4.B** and **4.C** show that this recovery in productivity was achieved, on average, because the falls in output were eventually accompanied by falls in employment rather than rising output.

Second, in the initial phases of the 2008 recession, productivity in a number of countries was weaker than the interquartile range of past episodes. More generally, there has been a more varied productivity response across countries in the recent crisis. The United Kingdom was among the weakest but Germany and Italy had similar experiences.

The composition of weak productivity in the recent crisis has also differed across countries. For the United Kingdom, weak productivity can be accounted for by a very large fall in output — the United Kingdom is at the bottom of the output swathe (**Chart 4.B**) — with employment remaining close to the average of the past.⁽²⁾ The weakness in German productivity is, however, accounted for by unusually strong employment relative to the past, driven in part by exceptional country-specific policies.⁽³⁾

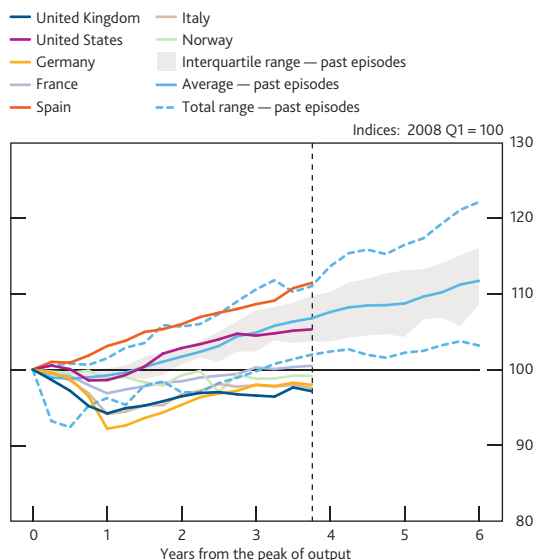
Spain is another exception, with measured labour productivity rising relative to trend — that appears to have come from an aggressive shedding of labour compared to past episodes (**Chart 4.C**).⁽⁴⁾ The United States has also seen a large labour market shakeout which has gone hand in hand with its relatively stronger productivity performance.

Third, as economies around the world have entered the recovery phase, productivity has also begun to recover in some countries, including the United States and Germany. But this is less clear in the United Kingdom where labour productivity remains persistently weak. Indeed UK labour productivity has weakened further relative to its pre-crisis trend and the United Kingdom is notably outside of the dashed line: it has been weaker than in all thirteen previous episodes.

- (1) That said, when considering the sample of both advanced and emerging economies, the IMF (2009b) has found that aggregate productivity does not return to trend. They find that there is a sustained period of below-trend total factor productivity and a fall in the capital labour ratio which persists for seven years.
- (2) See Faccini and Hackworth (2010), for how the behaviour of the UK labour market compares with previous recessions.
- (3) The German government's sponsored short-time working scheme (Kurzarbeit) and other labour market reforms are widely thought to have contributed to resilient employment during the downturn (see Möller (2010) and IMF (2011a)).
- (4) See IMF (2011b).

But **Chart 4.A** will give a misleading steer on the persistence of weak labour productivity this time around if there has been a change in the trend growth rate of productivity since the start of the crisis. **Chart 5** shows the cumulative change in the absolute level of labour productivity and shows that setting aside differences in trends alters the picture.

Chart 5 Level of labour productivity compared to previous episodes of financial crisis^(a)



Sources: Eurostat, OECD, ONS, Thomson Reuters Datastream and Bank calculations.

(a) Dashed lines show latest available data point for the recent crisis, 2011 Q4.

Chart 5 shows that Spain, the United States and France are at or above their pre-crisis productivity levels. But labour productivity in the United Kingdom, Germany, Italy and Norway remains below its level at the beginning of the crisis. This is at odds with past historical experiences: on average labour productivity was about 10% above its pre-crisis level at this point. So even when comparing the absolute level of labour productivity to their levels at the start of the recent crisis, labour productivity in a number of countries has been persistently weak. This does not seem to have been a feature of past episodes of financial crisis.

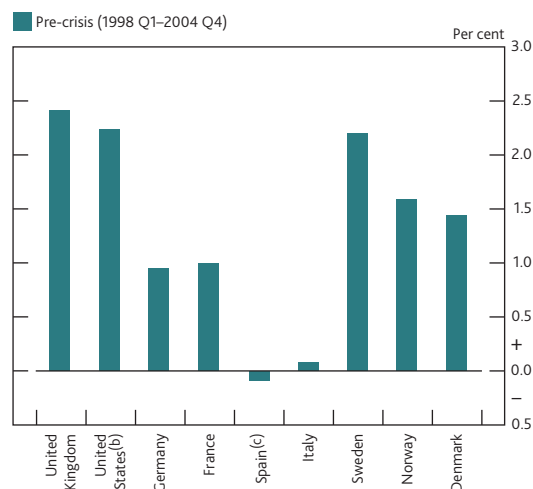
Productivity across countries and sectors

The implications of persistently weak labour productivity for monetary policy depend on whether the weakness in actual productivity reflects a cyclical fall in demand where companies have retained employees (Martin and Rowthorn (2012)), or whether it has been associated with weak underlying productivity. Benito *et al* (2010) and the February 2012 *Inflation Report* investigate how changes to production inputs may have led to a fall in underlying productivity and the supply potential of the economy. This article uses a different approach; it considers the differences in aggregate and sectoral productivity across countries before and after the

recent crisis to try to shed light on whether underlying productivity has fallen.

Pre-crisis average growth rates of labour productivity, computed over the period 1998 Q1–2004 Q4, are shown in **Chart 6**. These show the United Kingdom's pre-crisis average growth rate was in line with that of Sweden and the United States. These differences in aggregate productivity trends could reflect differences in industrial structures and/or differences in sectoral trends across countries.

Chart 6 Estimated pre-crisis average growth rates of labour productivity across countries^(a)



Sources: Bureau of Economic Analysis, Eurostat and Bank calculations.

- (a) Pre-crisis averages are computed using the IMF (2009b) method which is described in footnote (b) to **Chart 3**. Results are robust to choice of sample period.
 (b) US average is computed using annual data from 1998–2004 to ensure trends are comparable with the sectoral breakdown reported in **Tables A and B**.
 (c) For Spain, the pre-crisis average is computed over a shorter period (2001 Q1–2004 Q4) due to lack of historic data.

The industrial structure across the panel of countries is broadly similar and remains relatively unchanged since the crisis (**Table A**).⁽¹⁾ The United Kingdom looks most similar to the United States — particularly with regards to the importance of business and consumer services. But Norway stands out with the largest extraction and utilities sector, Germany with the largest manufacturing sector and Spain with the largest construction sector. The bottom panel of **Table A** shows that these output shares have been rather stable over the crisis.

But while the shares of output across countries is broadly similar, the average growth rates within sectors are very different. **Table B** shows that much of the disparity in the pre-crisis average growth rates comes from heterogeneity within the service sector — particularly business services, where growth had been high and positive in some countries like the United Kingdom, but negative in others. This suggests that the United Kingdom may have had an advantage in business services pre-crisis.

(1) The employment shares across industry follow a broadly similar pattern to the output shares reported in **Table A**. Spain is an exception where employment in construction fell by 4 percentage points to 9% in 2010.

Table A Industry structure across countries**2007 weight in value added**

	United Kingdom	United States	Germany	France	Spain	Italy	Norway	Denmark
Agriculture	1	1	1	2	3	2	2	1
Extraction/utilities	4	4	3	3	3	2	26	5
Manufacturing	11	12	23	12	14	18	9	14
Construction	7	5	4	6	13	6	5	5
Consumer services ^(a)	26	22	20	24	27	26	21	26
Business services ^(b)	29	33	27	29	19	26	18	23
Other services	22	24	21	24	20	19	20	25
Total	100	100	100	100	100	100	100	100

2010 weight in value added

	United Kingdom	United States	Germany	France	Spain	Italy	Norway	Denmark
Agriculture	1	1	1	2	3	2	2	1
Extraction/utilities	3	3	3	2	3	3	24	4
Manufacturing	10	12	20	12	13	17	9	13
Construction	7	4	4	5	12	6	5	5
Consumer services ^(a)	26	22	22	24	28	26	20	25
Business services ^(b)	30	33	28	29	20	27	19	25
Other services	23	26	23	25	22	21	21	27
Total	100	100	100	100	100	100	100	100

Sources: Bureau of Economic Analysis, Eurostat, ONS and Bank calculations.

(a) Consumer services include wholesale and retail, hotels and restaurants, and transport.

(b) Business services include financial intermediation, real estate, renting and other business activity.

Table B Average annual productivity growth before and after the crisis**Pre-crisis (1998 Q1–2004 Q4)**

	United Kingdom	United States ^(a)	Germany	France	Spain ^(b)	Italy	Sweden ^(c)	Norway	Denmark
Total	2.4	2.2	1.0	1.0	-0.1	0.1	2.3	1.6	1.4
Manufacturing	4.3	7.1	2.7	3.2	1.9	0.1		3.5	2.5
Services	2.3	1.7	0.1	0.4	-0.8	-0.2		1.3	1.0
Consumer services ^(d)	3.0	3.3	1.7	1.3	-0.6	0.2		1.5	2.5
Business services ^(e)	2.6	2.1	-1.8	-0.8	-4.0	-2.2		1.9	-0.7

Recovery (2009 Q3–2011 Q4)

	United Kingdom	United States ^(a)	Germany	France	Spain ^(b)	Italy	Sweden ^(c)	Norway	Denmark
Total	0.5	2.2	1.3	1.0	2.9	0.8	2.4	0.0	1.8
Manufacturing	2.9	8.5	4.9	4.2	5.8	3.2		3.2	5.7
Services	0.4	1.2	0.5	0.8	2.0	0.2		0.8	1.9
Consumer services ^(d)	0.8	1.8	2.4	1.5	2.7	0.6		2.5	4.4
Business services ^(e)	0.2	2.6	-1.4	0.2	2.5	-0.2		1.1	2.4

Sources: Bureau of Economic Analysis, Eurostat, ONS and Bank calculations.

(a) US data are only available at an annual frequency and on a consistent sectoral basis from 1998. The top and bottom panel show average growth over the period 1999–2004 and 2009–10 respectively, as the latest data are for 2010.

(b) For Spain, the average is computed over a shorter period (2001 Q1–2004 Q4) due to lack of historic data.

(c) Eurostat does not report sectoral data for Sweden.

(d) Consumer services include wholesale and retail, hotels and restaurants, and transport.

(e) Business services include financial intermediation, real estate, renting and other business activity.

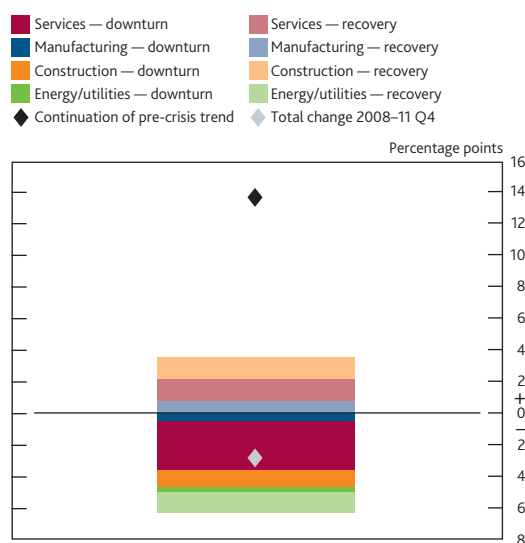
Table B also shows that, while during the pre-crisis period, productivity growth in the United Kingdom averaged 2.4% per year, during the recovery, since 2009 Q3, it has grown at a mere 0.5% per year. So in the recovery so far, the United Kingdom's productivity is growing well below its pre-crisis average rate. In contrast, the United States and

France have already returned to their pre-crisis average growth rates, while Germany is growing faster, suggesting it has begun to catch up to its pre-crisis path.

These differences, in industrial structure and industry growth rates, can be summarised by the contribution of each sector to

the overall change in the level of productivity over the crisis period.⁽¹⁾ **Chart 7** shows the total change in the level of productivity in the United Kingdom (the grey diamond), broken down into the separate contributions of each sector over the recession and recovery period. The black diamond shows what the level of productivity would have been (in 2011 Q4) had it grown in line with its pre-crisis trend since 2008 Q1.⁽²⁾

Chart 7 Change in the level of UK productivity by sector^(a)



Sources: ONS and Bank calculations.

(a) The bars below the zero line show the extent to which total labour productivity fell during the recession, split into the contribution of manufacturing, services, construction and extraction. The bars above the zero line show the recovery in productivity by sector.

The bars in **Chart 7** illustrate that the fall in UK labour productivity during the downturn was spread across all sectors, but clearly dominated by a deterioration in the service sector (shown in red).⁽³⁾

During the recovery phase, productivity has picked up in all sectors except energy and utilities, where productivity has continued to fall. As noted in Dale (2011), productivity growth has slowed in the energy and extraction sector since around 2005, that is before the onset of the financial crisis, as North Sea oil fields have aged and extracting oil has become more difficult.

The recovery in manufacturing and construction since the trough in output has been enough to regain the level of productivity that was reached in those industries before the recession, as shown by comparing the pale and dark colour blue and orange bars in **Chart 7**. But to catch up to the level of labour productivity implied by a continuation of pre-crisis trends within the manufacturing and construction sectors, productivity growth would need to continue to be much faster for a period of time. This can also be seen by comparing the top and bottom panels of **Table B**: productivity growth in

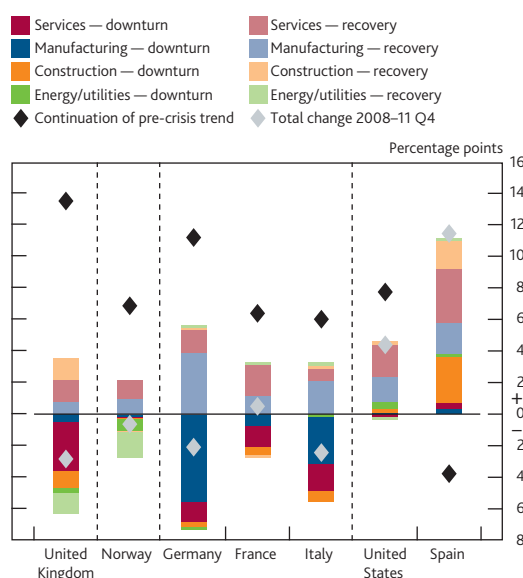
manufacturing during the recovery (2.9%) is still below pre-crisis growth rates (4.3%).

Chart 7 also shows that services have not regained the level of productivity that was reached before the recession. **Table B** shows that in services, average growth rates seen in the recovery period so far are well below pre-crisis growth rates (0.4% compared to 2.3%). In an accounting sense, this poor performance in services is the main reason why UK aggregate labour productivity remains well below the level implied by a continuation of the aggregate pre-crisis trend (black diamond).

How has productivity evolved across sectors in other countries? Four themes emerge.

Norway is similar to the United Kingdom; both have seen falls in energy and utilities productivity over both the recession and recovery periods. This is not a surprise as they extract oil from common waters — the North Sea. The absolute fall at the aggregate level is larger in Norway, as extraction and utilities are a larger share of GDP (**Table A**).⁽⁴⁾ As the decrease in oil production from the North Sea is likely to be structural rather than cyclical in nature, this evidence points to a fall in the level and growth rate of aggregate underlying labour productivity (**Chart 8**).

Chart 8 Change in the level of productivity across countries by sector^(a)



Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Eurostat, ONS and Bank calculations.

(a) See footnote (a) to **Chart 7**.

(1) The contribution of each industrial sector will be determined by its share in output and the average growth rate of that sector.

(2) This counterfactual path of productivity is shown by the dashed line in **Chart 3**.

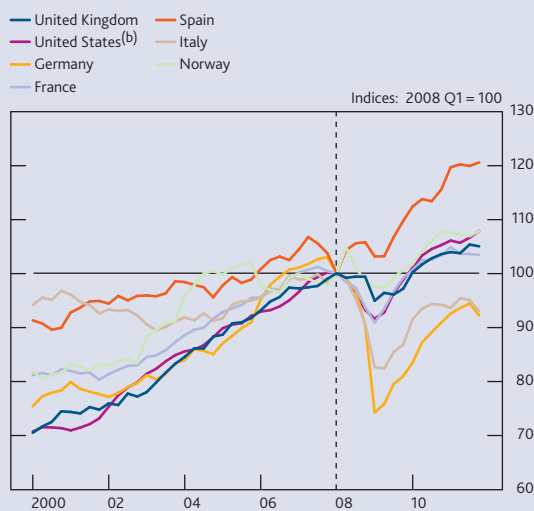
(3) UK manufacturing sector productivity did fall quite sharply during the downturn, but its share in the total fall is small because manufacturing has a small weight in total output.

(4) See Hagelund (2009) for more details on Norway.

Is the productivity puzzle evident elsewhere?

It is not unusual to see conflicting signals about the amount of spare capacity within firms. **Chart A** shows that manufacturing labour productivity fell sharply in a number of countries during the recession. Surveys of manufacturers also indicate an opening up of spare capacity within companies at that time (**Chart B**). But these two measures give different steers on the current amount of spare capacity.

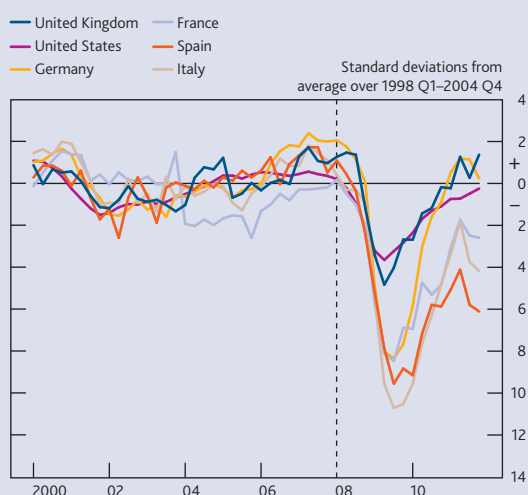
Chart A Labour productivity in manufacturing (output per person)^(a)



Sources: Eurostat, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) Dashed line shows 2008 Q1.
(b) Due to data availability, the United States line shows industrial production.

Chart B Capacity utilisation survey balances in manufacturing^{(a)(b)}



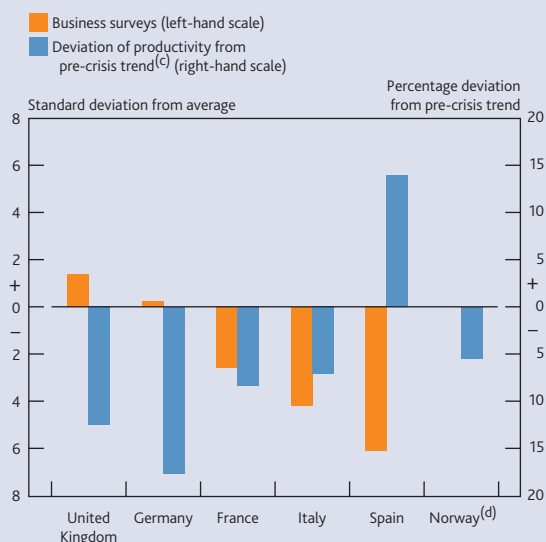
Sources: Thomson Reuters Datastream and Bank calculations.

- (a) Dashed line shows 2008 Q1. To estimate the amount of slack, the survey responses are shown in terms of deviation from pre-crisis averages based on the same seven-year period as the productivity trend. The latest data point on this chart is 2012 Q1.
(b) A comparable measure of capacity utilisation in manufacturing is not available for Norway.

The current signals from the two measures are shown for a range of countries in **Chart C**. Like the United Kingdom,

business surveys in Germany suggest there is limited spare capacity, but the weakness of labour productivity relative to its pre-crisis trend suggests a margin of spare capacity remains. In some countries the puzzle goes in the opposite direction, with business surveys pointing to more spare capacity than the productivity data.

Chart C Two measures of spare capacity across countries in 2011 Q4^{(a)(b)}



Sources: Eurostat, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) This is the latest data point for which data on both labour productivity and surveys are available.
(b) The United States is not included as the survey data relate to manufacturing only which is not comparable to labour productivity data for industrial production.
(c) See footnote (b) to **Chart 3**.
(d) A comparable measure of capacity utilisation in manufacturing is not available for Norway.

Inflation Reports have discussed potential explanations that can reconcile this conflicting evidence from surveys and measured productivity in the United Kingdom. There may indeed be less spare capacity within companies — supply capacity may have grown more slowly since the crisis. That would suggest that the persistent weakness in labour productivity has been associated with weakness in underlying productivity. This could have taken place through a number of channels: a reduction in the growth rate of the capital stock due to a sharp fall in investment spending during the recession; fewer opportunities for staff to acquire skills due to lower employment and hours worked; and through a reduced rate of new company formation due to tighter credit conditions.⁽¹⁾

The two measures might also pick up different aspects of spare capacity. Business surveys may not give a reliable read on long-run capacity, and instead may be a better guide to immediately available spare capacity.⁽²⁾ For example, company responses may exclude production lines that were shut down during the recession. Also, in some industries, productivity may be closely related to the demand for goods and services, but effort, and therefore perceived capacity, may not be. In these sectors companies may have had to continue

to work their factors of production, even as output has fallen. As an example, estate agents may be working intensively even though the volume of business has declined, because it has become harder to match buyers and sellers in a thin market. If this were the case, labour productivity could recover when demand recovers, even though the survey responses indicate little spare capacity. Similarly, if companies have held on to employees during the recession because they have felt it

would be too costly to fire and then rehire skilled staff when demand recovers, productivity growth could rise quite sharply if output growth picks up, although it might also pick up if companies decide to let surplus staff go.

(1) For evidence on each of these channels see Disney, Haskel and Heden (2003), and the November 2011 and February 2012 *Inflation Reports*.

(2) Also, it is not straightforward to map the qualitative information that is collected in the surveys into quantitative measures of spare capacity. See Cunningham (1997).

In contrast to the United Kingdom, the falls in productivity in Germany, France and Italy are concentrated in manufacturing. Over the recovery, manufacturing productivity has grown faster in these countries than in the United Kingdom, which explains why they have started to reclaim some of their lost ground.

In the service sector, before the crisis, average productivity growth rates in the United Kingdom were high, particularly in business services. But growth has been weak during the recovery. It is difficult to explain this weakness as a cyclical pattern: the fall in services output was greater here than elsewhere, which might otherwise have suggested a stronger recovery. It is possible that the financial nature of the crisis has reduced underlying labour productivity in business and financial services. But the challenge to this view is why such weakness is not evident in the United States, where the financial crisis originated and where the business services sector is just as big as it is in the United Kingdom.

In the United States and Spain, productivity has continued to grow since the onset of the crisis as companies have shed labour at a faster rate than output has fallen. The diametrically opposite behaviour of labour productivity in the United Kingdom and the United States is of particular interest. These two countries have a similar industrial structure, but companies in each have reacted very differently in the extent to which they have shed or retained labour.

Conclusion

The behaviour of labour productivity in the United Kingdom has been puzzling: it has been persistently weak, suggesting that as demand has remained weak there has been much more spare capacity in companies than implied by business surveys.

Persistently weak labour productivity is not a feature of past episodes of financial crisis, although it does seem to be common across countries after the recent financial crisis.

Before the crisis, the United Kingdom had seen the fastest average rate of productivity growth in our sample. This performance has worsened considerably since the crisis started and average rates of productivity in the United Kingdom have been one of the slowest in our sample.

It is too early to say whether the level and growth rate of UK labour productivity will remain weak, or whether, when demand recovers, productivity will return to the higher rates seen during the pre-crisis period. Cross-country, cross-sector analysis shows the weakness to be concentrated in the energy and service sectors. The energy sector trends are more likely to be structural rather than cyclical and so point to a possible fall in underlying productivity. While there is no hard evidence that low productivity in the service sector is structural, the low growth rates witnessed in the post-crisis period have been so much weaker than the pre-crisis average rates for so long that it is hard to ignore the possibility that underlying productivity in this sector may have slowed.

Overall, these findings are consistent with the Monetary Policy Committee's judgement in the May 2011 *Inflation Report* (page 55) that underlying productivity growth is likely to have been weaker than usual since the start of the crisis, although there is considerable uncertainty in any evaluation of underlying productivity growth. It is, however, likely that, alongside substantial spare capacity within the labour market, a margin of spare capacity remains within companies.

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