FEATURE

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The impact of the economic downturn on productivity growth

SUMMARY

Labour productivity growth is an important indicator of how efficiently the economy is functioning, particularly in the longer term as an indicator of underlying economic growth potential, but also in the shorter term in that it reflects how efficiently the labour market is interacting with changes in output and production. In the recent economic downturn, productivity growth has fallen significantly, as it has in the previous three recessions in the mid 1970s, early 1980s and early 1990s. As with the last two recessions, productivity growth has fallen in line with the drop in output growth, in terms of both timing and depth, because of a lag in the response of businesses in reducing labour input as output and production has reduced. However, recent labour market data suggests that the labour market has been adjusting apace in recent months, and is likely to continue to do so, while production data suggests there is some plateauing out in the decline. This shift in the dynamics between the labour market and output growth would be expected to result in productivity growth picking up in the coming quarters.

Key points

- Productivity growth has fallen markedly since the middle of 2008, in line with the deterioration in output growth but also exacerbated by a lag in adjustment in the labour market.
- Initial, internal estimates of productivity growth for the first quarter of 2009 suggest that growth in output per worker could be at its lowest since early 1980.
- The comparable drop in productivity growth rates with those of output growth in the second half of 2008 suggest that the labour market has been slower to adjust to the contraction of the economy, as has been the case in previous downturns. It is not unusual for businesses to delay adjusting their labour force, or labour input, as production deteriorates because of short term uncertainty of the duration of the fall in output.
- In the latter stages of 2008, productivity growth was falling at a similar pace for both output per worker and output per hour, suggesting that there had been relatively little adjustment in hours worked, which is the easier mode of reducing labour input, as opposed to reducing workers employed. But in the first quarter of 2009, labour market data suggest there has been a more marked adjustment in hours worked compared to late 2008, and compared to workers employed. This has resulted in a moderation in the drop in productivity growth on a per hour basis, compared to productivity growth on a per worker basis.
- Although the headline labour market data suggest that the labour market has been badly hit in the recent downturn, the productivity growth rates suggest that the labour market has not adjusted to the extent that output or production has declined.
- The sectors showing the most marked declines in productivity growth rates are the production industries, including manufacturing, construction, the distribution, hotels and catering sector and transport and communication. Somewhat surprisingly, the business and financial services sector has been much more resilient in the downturn in terms of productivity growth. This partly reflects a more muted drop in output growth in this sector, but also a more timely adjustment in labour input than some other sectors.
- Once the economy begins to recover, it is likely that productivity growth will pick up relatively strongly, compared to output growth, because it takes time for businesses to replenish their labour stock, and recruit and train workers, but also because in a downturn it is the less productive firms and workers that are lost first leaving a more productive base at the start of the economic recovery.

Introduction

The UK economy has been slowing down markedly since late 2007, and particularly since mid 2008 (see

Figure 1). Gross Domestic Product (GDP) growth in the third quarter of 2007 was 3.3 per cent, compared to the same quarter a year earlier, well above what HM Treasury consider to be trend or potential growth of around 2.75 per cent. But by the second quarter of 2008, GDP growth had already dropped to 1.8 per cent, on a year on year basis, and down further to 0.4 per cent by the third quarter of 2008. For the three quarters to 2009 quarter one, output growth has been negative on a quarter on quarter basis as well as compared to the same quarter a year earlier. In the last 2 quarters the consecutive quarters of negative quarter on quarter growth mark the move into a technical recession, while the deceleration in output growth to -4.1 per cent in the first quarter of 2009 on a year earlier marks the most significant drop in output growth since 1980.

A drop in GDP growth will inevitably have a knock-on impact on productivity growth, and it has, but the timing of this feed-through to productivity growth also depends on what happens in the labour market. Although GDP growth can come down relatively quickly, and sometimes abruptly, businesses tend to delay laying off workers or reducing hours worked i.e. reducing the amount of labour utilised. While hours worked tend to come down more quickly than numbers of people employed, there still tends to be a lag compared with a slowing in GDP growth. The responsiveness of businesses to reduce the amount of labour employed or utilised depends on a number of factors, including the ease with which businesses can recruit suitably qualified and experienced workers, the costs to the business of redundancy and of recruitment, induction and training of new staff, and the like. Generally an existing employee will be more valuable, and productive, to a business than a new recruit because of the experience and 'know-how' that person will have compared to a new recruit, so businesses will tend to hang on to existing labour if they can – known as 'labour hoarding'.

Figure 2 compares GDP growth with productivity growth, based on both the Gross Value Added (GVA) per hour worked and per worker measures. The movement of GDP growth and productivity growth over the last 19 years suggests that there is very little lag in the responsiveness of productivity growth to changes in GDP growth. This suggests a relatively responsive, or flexible, labour market to changes in output growth – if the labour market was relatively rigid, so that it was hard to recruit suitably qualified and experienced staff and

to reduce hours or lay off workers when output declined, then productivity growth rates would tend to decline ahead of falls in output growth in a downturn, but rise ahead of increases in output growth as the economy recovers. However, it could also be argued that the chart demonstrates that the UK's labour market is not terribly flexible in that productivity growth falls when GVA growth falls, rather than being a flatter trend, which would be the case if labour was reduced quickly as output growth declined. The extent to which productivity adjusts to changes in output, and labour is adjusted to changes in output, is clearly a question of degrees.

The current downturn in a longer term perspective

Over the last four decades there have been four downturns, all of which have encompassed technical recessions – 1974-75, 1980-81, 1991-92 and the current downturn. The impact of the drop in output growth on productivity growth appears to have been different during each phase.

Figure 3 suggests that:

- in the 1970s, the fall in output growth was accompanied very closely by a fall

in productivity growth, and to similar proportions;

- in the downturn of the early 1980s and early 1990s, productivity growth seems to have declined before the fall in output growth suggesting that labour was continuing to be employed and recruited beyond the point when output growth had ceased to rise;
- productivity growth recovered ahead of output growth in the aftermath of the downturns in the early 1980s and early 1990s, again perhaps suggesting that labour was continuing to be shed, or at least wasn't being recruited, as output growth was beginning to recover, so that productivity growth rose ahead of output growth;
- despite the lags in responsiveness of companies to lay off and recruit labour as output growth falls and rises, the increasing gaps in the paths of productivity growth and output growth through the 1980s and 1990s coincides with significant reforms to, and therefore liberalisation of, the British labour market through the Thatcher era. It is interesting to see that despite these reforms, productivity growth still declined

Figure 1
GDP growth since 1990

Source: ONS GDP Preliminary Estimate

Figure 2
GDP and productivity growth

Source: ONS GDP Preliminary Estimate and Productivity

Figure 3
Productivity per worker and output growth over the last five decades

Source: ONS GDP Preliminary Estimate and Productivity

markedly when the economy went into recession;

- since 1994, output growth has consistently outperformed productivity growth, in contrast to the decades before when the relationship was more variable. This coincides with increases in the employment rate, which would tend to lower productivity growth rates, but it also coincides with the ICT boom which should have boosted productivity growth rates;
- the latest downturn in output growth seems to have been closely followed by the downturn in productivity growth suggesting that businesses have not been quick to reduce labour as output growth has fallen, so pulling down productivity growth rates with output growth.

It should be noted that during a downturn, productivity growth would be expected not to fall as much as output growth in theory because it is the least productive workers that are laid off first and the more productive workers that are retained; similarly, in an upturn, productivity growth is likely to be lower than output growth because as more workers are taken on, so the skill and experience level of the incremental worker declines, and so does their productive potential.

What's driving the fall in productivity growth?

Figures 4 and 5 demonstrate that productivity growth has been coming down since mid 2008, on both the output per worker and output per hour basis. In the fourth quarter of 2008, growth in output per worker and output per hour, compared to the same quarter a year ago, dropped to -1.7 per cent and -1.8 per cent respectively. Figure 4 and Figure 5 indicate that this was driven by the dramatic drop

in output growth, but reinforced by the lack of adjustment to labour input. Although the growth of workers employed or hours worked declined, by -0.1 per cent and -0.3 per cent, this reduction was much less than the fall in output growth of -2 per cent for the same quarter.

Productivity growth for the first quarter of 2009 will not be published until the beginning of July, however the first release of output growth and labour market data for the first quarter suggest that productivity growth in the first quarter of 2009 is likely to have fallen further to around -2 per cent for output

per hour worked, and -3.5 per cent for output per worker. This is illustrated in Figures 4 and 5 by the dotted lines. It should be noted that these productivity growth estimates are based on preliminary output and labour market growth data, whereas by the beginning of July when the next Productivity Statistical Bulletin (formally First Release) is published, further estimates of output growth and labour market indicators will have been released, so that the published productivity growth rates for 2009 quarter one will contain more up to date data.

The labour market data for 2009 quarter one points to a much more marked reduction in the growth of hours worked compared to the reduction in growth of workers employed, though both have become more negative than in the fourth quarter of 2008. This reflects the absolute reduction in hours worked and workers employed in early 2009. The more notable reduction in growth of hours worked has served to limit the fall in productivity growth on a per hour basis, while the much more limited decline in growth of workers employed in early 2009 has served to exacerbate the fall in productivity growth rates, alongside the significant fall in output growth in early 2009.

Figure 4
Productivity growth per hour worked and its components¹

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

Figure 5
Productivity growth per worker and its components¹

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

Productivity across sectors

The main economic sectors covered by the Productivity Release, with their respective weights in GDP, are:

- agriculture, forestry and fishing (1 per cent)
- production industries (mining, quarrying, manufacturing and utilities; 18 per cent)
- manufacturing (14 per cent)
- services (75 per cent)

Figure 6 and Figure 7 assess the relative productivity performance of the bigger sectors, that is excluding agriculture, forestry and fishing, relative to the whole economy. Figure 6 illustrates that the production industries (including manufacturing) have tended to have higher productivity growth rates than for the whole economy since the late 1990s, while service sector productivity growth rates have tended to be much more closely related to those of the whole economy. This partly reflects the higher capital intensity in production industries compared to service sectors, which would be expected to contribute to stronger productivity growth. In the service sector the scope for capital deepening is, by definition, much more limited because it tends to be labour itself that delivers the service. However, there is some scope for capital investment, particularly through intangible capital such as R&D, human capital development and software development, but the extent and penetration is more limited and less readily measurable. Figure 7 illustrates more clearly the impact of the economic downturn on productivity growth, with the production sector being much more badly hit than the service sector.

The significant weight of the service sector, particularly the financial and business services sector, and its relatively modest productivity growth decline compared to non-service sectors such as manufacturing and construction, has helped to support productivity growth to some extent, that is the drop in productivity growth could have been much more marked if productivity growth in the financial and business services sector had turned negative. While the decline in the productivity growth rate for the production industries has been significant (-4 per cent in 2008 quarter four on a per hour basis), its relatively modest weight (18 per cent) means its impact on whole economy productivity growth has been somewhat limited, though it still seems to have had a marked impact.

So while there have been significant drops in productivity growth by sector, much of this decline has arisen in the non-service sectors which now account for just 25 per cent of the economy. The contribution of each sector to the productivity growth slowdown, in terms of output per worker (Figure 8) and output per hour (Figure 9) are also presented. The sectors have been weighted using GVA weights, which is not entirely appropriate for productivity growth since it is made up of both GVA and labour market components, but GVA weights seem a sensible mechanism for weighting productivity growth to get an indication of which sectors are supporting and which sectors are pulling down productivity growth.

Productivity in the service sector

Since the service sector accounts for 75 per cent of the economy, and has followed the productivity growth pattern of the whole economy fairly closely, it seems incisive to look into the components of service sector productivity in a bit more

detail to assess the varying impact of the downturn on the various elements of the service sector.

Productivity growth for the components of the service sector are not published, with the exception of the distribution, hotels and catering sector, so the following analysis is based on calculated, or derived, estimates of productivity growth using GVA, Workforce Jobs (WFJ) and total hours worked estimates by sector, together with Labour Force Survey (LFS) aggregates for reconciling employment totals, as is done for the series in the Productivity First Release. The GVA estimates are published in the Quarterly National Accounts First Release, and the WFJ estimates are published in the Labour Market First Release, both of which are National Statistics releases. Total hours worked by sector is published for each quarter in Economic and Labour Market Review (ELMR) Table 6.08.

Figure 10 and Figure 11 illustrate the differing impact of the downturn on productivity growth in the main service sectors, for output per worker (Figure 10)

Figure 6
Productivity growth for the whole economy compared to the production and services sectors since 1994²

United Kingdom

Percentage change of output per hour (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

Figure 7
Productivity growth for the whole economy compared to the production and services sectors since 2007²

United Kingdom

Percentage change of output per hour (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

Figure 8
Contributions to productivity growth by sector

United Kingdom

Percentage change of output per worker (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate and Productivity

Figure 9
Contributions to productivity growth by sector

United Kingdom

Percentage change of output per hour (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate and Productivity

and output per hour worked (Figure 11). The figures illustrate the impact of the downturn in recent quarters, as well as offering some medium term context to the recent developments in productivity growth.

The main message emerging is that productivity growth has been relatively stable for some service sectors, such as the financial and business services sector and the public administration, education and health sector, in contrast to productivity growth for the transport and communication sector and the distribution, hotels and catering sector, both of which are perhaps more exposed to short term fluctuations in, and pressures from, exchange rates, disposable income and economic activity.

The stability of productivity growth of the financial and business services sector partly reflects the fact that output of the financial services sector is based in part on interest rate spreads, which have been unusually wide during the financial crisis and economic downturn. Similarly, output in the financial sector and public sector is partly based on the value of inputs, which results in some inherent, or methodological, stability of productivity growth.

While both measures of productivity growth offer useful insight into the efficiency of an economy and its sectors, the change in output per hour is often considered a better indicator of productivity

because it adjusts, or takes account of, differences in working patterns and regimes between countries and across industries. For example, workers in the distribution, hotels and catering sector are more likely to be paid by the hour, and so work a more hour-specific day, whereas workers in the financial and business services sector tend to be paid an annual salary, so the hours worked are less specified, and so workers are perhaps more likely to work a longer day because the focus is the output rather than the hours worked.

Since the recent downturn began to take hold in earnest, in mid 2007, some of these trends have been reinforced but others have shifted. For example:

Figure 10
Productivity growth across the services sector

United Kingdom

Percentage change of output per worker (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

Figure 11
Productivity growth across the services sector

United Kingdom

Percentage change of output per hour (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

- the distribution, hotels and catering sector has suffered a significant fall in productivity growth since mid 2007, but this sector has tended to exhibit relatively volatile productivity growth rates over the last decade;
- the transport and communication sector has also shown marked falls in productivity growth rates since late 2006-early 2007, which is perhaps in keeping with its relatively volatile trend. During 2008 productivity growth rates for this sector have stabilised to some extent, but at very low rates, around zero per cent;
- the financial and business services sector has shown remarkable resilience in its productivity growth with very little decline over the last two years. This reflects a marked drop since mid-2007 in growth in workers and hours worked in the sector. Growth in the worker measure (WFJ) has fallen from 4 per cent in 2007 quarter three to -1 per cent and -2 per cent in quarter three and quarter four of 2008 respectively. Similarly, growth in hours worked for

the sector has fallen from nearly 5 per cent in 2007 quarter three to -0.3 per cent in 2008 quarter three;

- public administration, education and health sector productivity growth (based on the labour input methodology) has become slightly negative in the second half of 2008 as a result of growth in workers rising slightly faster than the growth in output. Productivity per worker growth averaged -0.2 per cent during 2008 compared to 0.9 per cent during 2007. It must be noted, however, that there are a number of measurement difficulties in reliably measuring and comparing the output of the public sector, with that of the private or market sectors of the economy. ONS is taking a lead in developing methodology to better measure the output and productivity of the public sector. Nevertheless, Figures 10 and 11 give an indication of recent developments in productivity growth compared to the trend over the last eight years.

Productivity growth for these four main service sectors for the last two years, based on both per worker and per hour measures are presented in **Figures 12 to 15**. By both measures of productivity growth, the distribution, hotels and catering sector is the only service sector where productivity growth has turned significantly negative with the economic downturn (Figure 12). For most of the service sectors, the two productivity growth measures have followed broadly similar paths, though growth in output per hour has tended to be slightly more volatile than growth in output per worker, because of the relative ease of adjusting hours worked compared to workers. Figure 14 serves to reinforce the notable exception of productivity growth over the last year in the financial and business services sector, which has remained positive and relatively stable, compared to the other three main service sectors.

This perhaps partly reflects difficulties in measuring the output of the financial sector, which is partly based on interest rate spreads.

Productivity growth in a macroeconomic policy context

Trend, or potential, growth reflects the underlying growth potential of the economy outside of, or beyond, cyclical influences. It is a key determinant of the long term growth rate of an economy, and as such is fundamental in determining the direction of living standards and the growth of per capita income. Although short term factors may influence GDP growth, and therefore living standards, such as the recent downturn, in the longer term it is this underlying potential growth of the economy that determines the wealth of a country and prosperity or living standards therein.

Estimates of trend growth for the past are based on the average growth rate between the beginning and end of an economic cycle, but projections of potential (or trend) growth are based on projections of four components:

- productivity growth
- average hours worked
- the employment rate and
- the adult population.

Figure 16 shows how estimates of trend growth across cycles have been attributed to productivity growth and labour input growth.

The Treasury's current projection of trend growth is 2.75 per cent, with an

Figure 12
Comparing output per worker and output per hour for the distribution, hotels and catering sector

Figure 13
Comparing output per worker and output per hour for the transport and communication sector

Figure 14
Comparing output per worker and output per hour for the financial and business services sector

inherent projection of productivity growth of just over 2 per cent. Clearly productivity growth is a fundamental element of what determines the growth potential of an economy. As such, it is an important Public Sector Agreement (PSA) target for the government in raising the rate of UK productivity growth over the economic cycle, improving competitiveness and narrowing the gap with our major industrial competitors.

In order to boost productivity growth,

the government has targeted five drivers of productivity, which are:

- skills
- investment
- innovation
- competition
- enterprise or entrepreneurship.

Given the underlying, or fundamental, contribution of productivity growth to output growth and prosperity, the recent

downturn is unlikely to change medium term projections of productivity growth, or potential (trend) growth. The Treasury consider that the downturn will have lowered the level of GVA or GDP but not affected the potential growth and productivity rate. However, if the downturn results in a significant restructuring of the economy, in particular of the level of 'trend' investment, skill levels or sectoral orientation, then trend productivity is likely to be influenced, and so therefore would trend growth. For the time being, however, the Treasury is maintaining its assumption of trend growth and productivity, of 2.75 per cent and just over 2 per cent respectively, but may come to assess the impact of the downturn once the economy has recovered and a full economic cycle has elapsed.

Conclusion

Productivity growth fell sharply in late 2008 and into early 2009, from an average during 2007 of just over 2 per cent for both major measures of productivity growth, to -2 per cent and -3.5 per cent for output per hour and output per worker respectively in the first quarter of 2009 (estimates based on published output and labour market data). This is due to both the rapid downturn in output growth coupled with a less proportionate downward adjustment to labour input growth, though this has gathered pace in the early part of 2009, particularly for hours worked. The apparent limited adjustment in labour input during the latter stages of 2008 was surprising given anecdotal evidence of redundancies and assumptions that the UK's labour market had increased in flexibility over the last two decades. However, the labour market data for the first quarter of 2009 suggests that the labour input adjustment has been gathering pace in recent months, particularly in terms of a reduction in hours worked, but also to a lesser extent in terms of workers employed. This would point to some 'plateauing out' of the fall in productivity growth rates during the middle of 2009.

The recent decline in productivity growth is not out of kilter with previous economic downturns (early 1980s and early 1990s), when productivity growth fell to similar lows as declines in output growth. However, the timing of the fall in productivity growth compared to the decline in output growth has been slightly tighter this time, with productivity growth falling almost in synch with output growth, whereas in previous downturns productivity growth has tended

Figure 15

Comparing output per worker and output per hour for the public administration, education and health sector

United Kingdom

Percentage change (quarter on same quarter one year ago)

Source: ONS GDP Preliminary Estimate, Productivity and Labour Market Statistics

Figure 16

Annual trend growth across each of the last three cycles³

United Kingdom

Percentage change

Source: HM Treasury

to fall ahead of declines in output growth. This is due to the speed of adjustment to labour input growth. During this downturn, the relative lag in the decline in labour input growth suggests that productivity growth has fallen further than it might have done if labour input had been adjusted more rapidly.

The picture at the whole economy level masks considerable differences across the sectors. In particular, agriculture, forestry and fishing, the manufacturing and other production sectors, construction, the distribution, hotels and catering and transport and communication sectors have all experienced marked drops in productivity growth. This is somewhat unexpected, in that labour input should be relatively adjustable in these sectors. Surprisingly, the business and financial sector has shown much greater resilience in

terms of productivity growth, in good part due to a more marked labour adjustment than in many other sectors. Because of its relatively high weight in overall GVA, at 30 per cent, productivity growth in this sector has gone some way to offsetting the falls in productivity growth in the sectors listed above, which together account for 47 per cent of the economy.

The adverse impact of the downturn and financial market crisis on business investment will tend to reduce the capital intensity of future production, which in turn would be expected to lower the potential for productivity growth. So while productivity growth may recover in the near term as output growth recovers, particularly if this is ahead of the related labour input recovery, it may take longer for underlying productivity growth to recover as capital intensity ratios are restored. Conversely,

the increased competition that a downturn necessarily encompasses, both for firms and workers, will tend to push up underlying productive potential and productivity growth.

Similarly, the skill base may increase in the aftermath of the downturn, partly if people who are made redundant or are under-employed participate in more training and education. In addition, the government has committed to providing financial support for increased training for those aged 18–24 and unemployed for longer than one year. Entrepreneurialism and innovation may also increase as a result of the downturn, with some of those becoming redundant or leaving employment deciding to start up businesses, and the increased competition inherent in weaker economic activity can encourage innovation to stay ahead of competitors. Thus, the wider drivers of productivity growth may be affected by the downturn, in the medium term. However, it is difficult to determine where the balance of the impact on these underlying drivers of productivity growth will lie.

Notes

1. The peak in hours worked and workers in 2008 quarter one was due to Christmas and Easter both falling in the same quarter in 2008, in contrast to the previous year. The growth in hours worked and workers employed for 2009 quarter one are both based on labour market data for January 2009, as a proxy for the first quarter, until more up to date data is released. GVA growth for 2009 quarter one is the published preliminary estimate.
2. Manufacturing makes up 79 per cent of production industries. The remainder is extraction and utilities.
3. More information on HM Treasury's approach to estimating trend growth is provided in HM Treasury (2006) 'Trend growth: new evidence and prospects'. The Treasury's latest estimates of trend growth are set out in the 2009 Budget Report.

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