

The Productivity Conundrum, Interpreting the Recent Behaviour of the Economy

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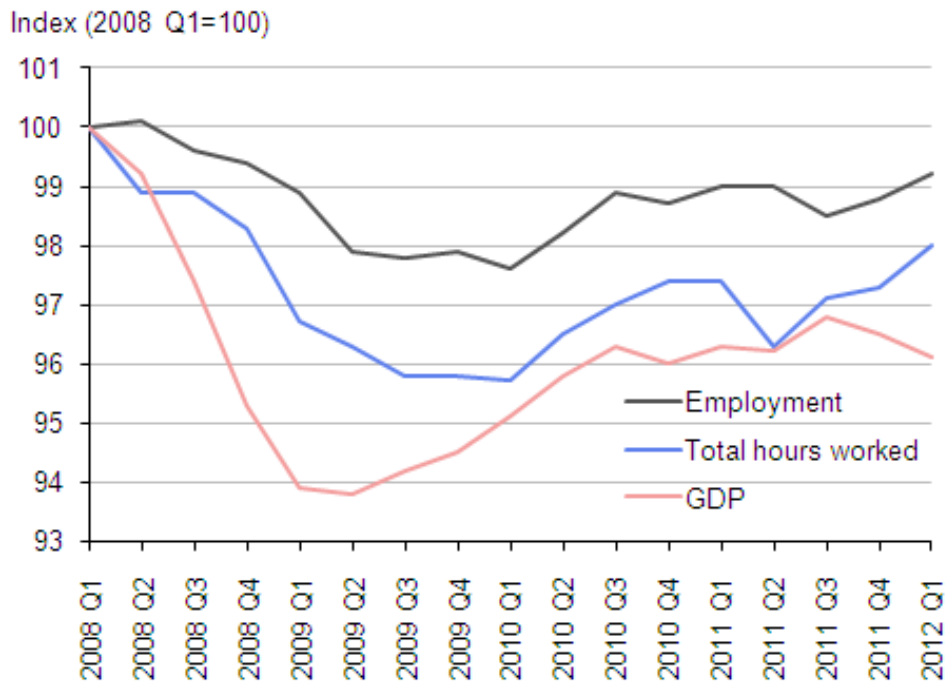
Abstract

This article examines the different movements in GDP and employment since the beginning of the recent recession in 2008, which have implied sluggish productivity performance. It identifies various known factors which may help explain this experience, such as the fall in the number of people working full time, the rise in the number of people working part time, the restraint in average earnings and the healthy cash flows for firms. It notes that the UK's productivity experience has close parallels in other large European economies, which may suggest some common factors are at work, and highlights other factors that need further investigation – for example, the effects of the financial crisis and its aftermath on productive capacity. ONS has several work streams in hand relating to the above and will report progress later in the year.

Introduction and Context

Recent movements in the UK economy have not been entirely straightforward to interpret. In particular, as a number of commentators have pointed out, the labour market has exhibited greater resilience than might have been expected from the outturns for gross domestic product (GDP):

- Since the start of the recession at the beginning of 2008, employment has fallen by less than 1 per cent, and indeed has risen from its low point at the end of 2009.
- By contrast, GDP has fallen by approximately 4 per cent over the same period. While it also recovered somewhat from its low point in the middle of 2009 – when its cumulative decline exceeded 6 per cent, the subsequent recovery petered out. Over the last two years, GDP has fluctuated around a broadly flat trajectory.

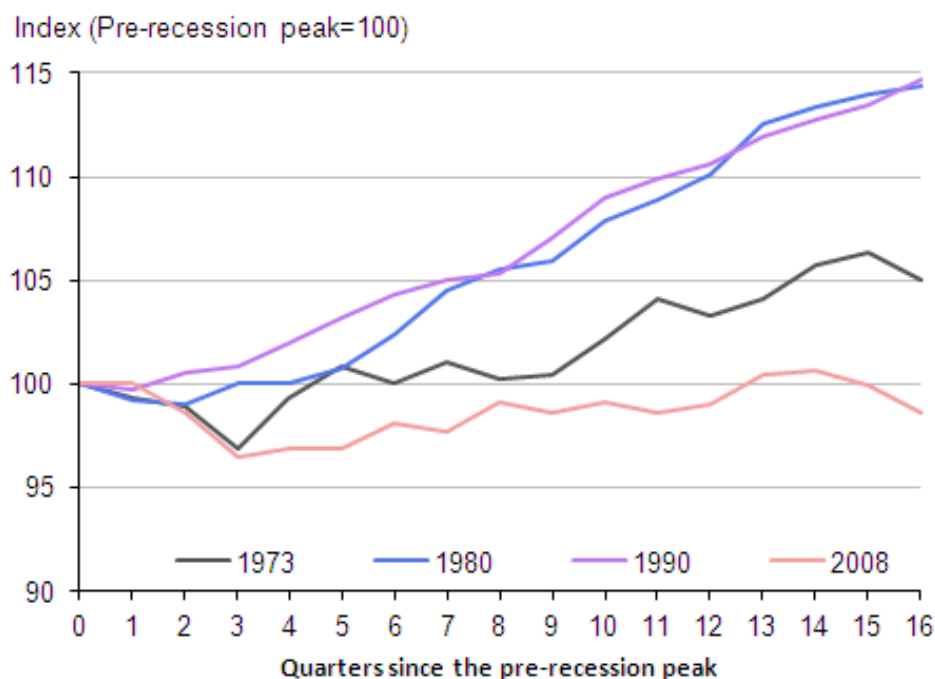
Chart 1: Output, Employment and Total Hours Worked

Source: Office for National Statistics

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In consequence, labour productivity is estimated to have fallen. As chart 2 shows, in terms of output per hour, productivity is currently lower than levels seen at the outset of the recession at the beginning of 2008.

Chart 2: Productivity growth across recessions (Output per hour)

Source: Office for National Statistics

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Generally, labour productivity shows a rising trend, so such labour market productivity as currently observed is unusual. Moreover, Chart 2 also shows that such declines in productivity have not characterised previous recessions and recoveries in the UK.

In both the early 1980s and early 1990s episodes, there was little or no initial fall in productivity and then a substantial recovery. Sixteen quarters after the start of these episodes, productivity had risen by approximately 14 per cent in both cases.

By contrast, the current episode was characterised by a sharp initial fall in productivity and sixteen quarters from the outset of the recession labour productivity per hour is approximately 1.4 per cent lower.

These circumstances have puzzled many commentators and, indeed, led some to question the accuracy of the GDP estimates or the labour market statistics.

This article:

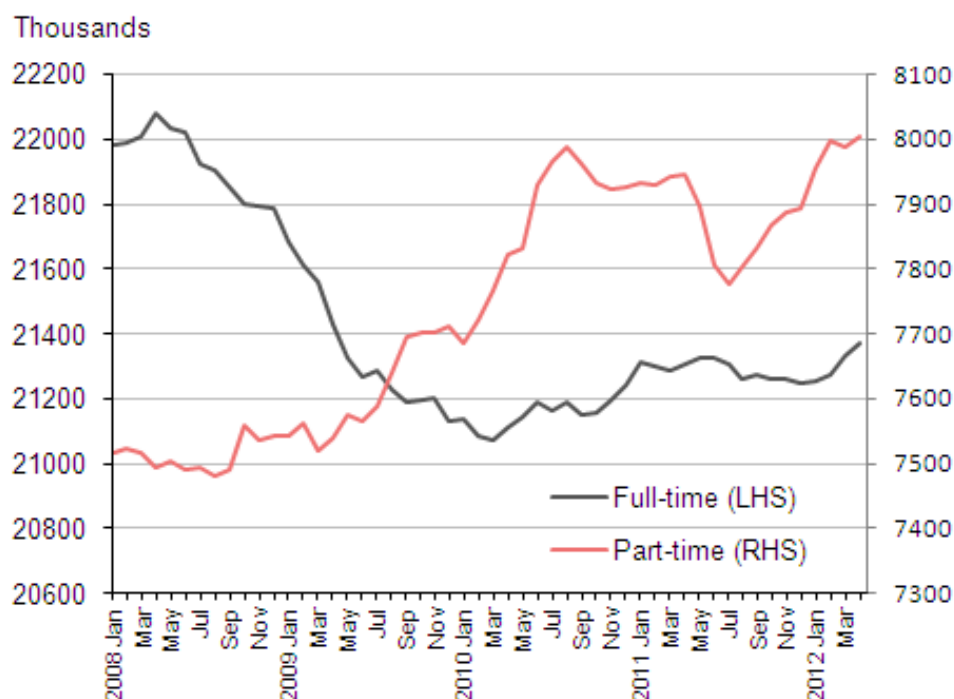
- Examines the extent to which known factors may explain the above puzzles.
- Discusses other sources of evidence such as external surveys and tax receipts.
- Considers other possible explanations of the poor productivity growth.

It also announces that ONS will be holding a seminar in the autumn at which it will report further on the work streams discussed in this article, with a view to underpinning further and wider debate of these economic issues.

Known factors contributing to lower output per job

As was discussed in an earlier ONS article (ONS, 2010), there are several known considerations which would plausibly explain part of the observed fall in output per job. One of these is a sharp movement from full-time to part-time working. Chart 3 shows that by the beginning of 2012, full-time employment had fallen by some 728,000 or about 3 per cent of the total at the beginning of 2008. Correspondingly, part-time employment increased by around 439,000 or approximately 6 per cent over the same period.

Chart 3: Full-time and part-time employment (people aged 16 and over)



Source: Office for National Statistics

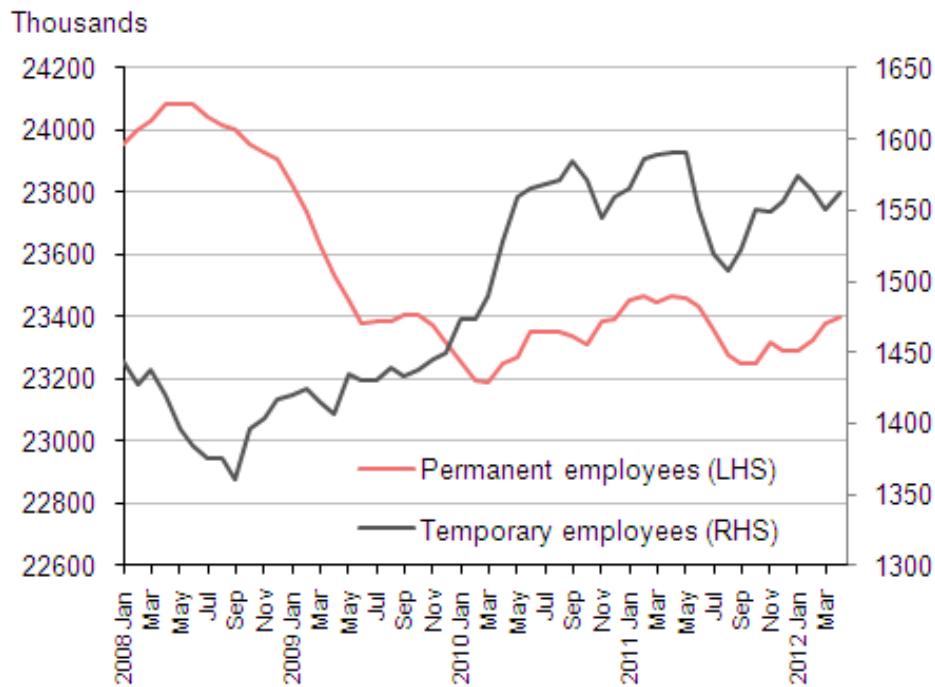
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This movement from full-time to part-time working will have reduced actual hours worked by more than the number of recorded jobs.

This movement towards greater part-time working was matched by a sharp reduction in permanent employment and a smaller rise of employment on temporary contract, as chart 4 shows.

Chart 4: Permanent and temporary employees

Source: Office for National Statistics

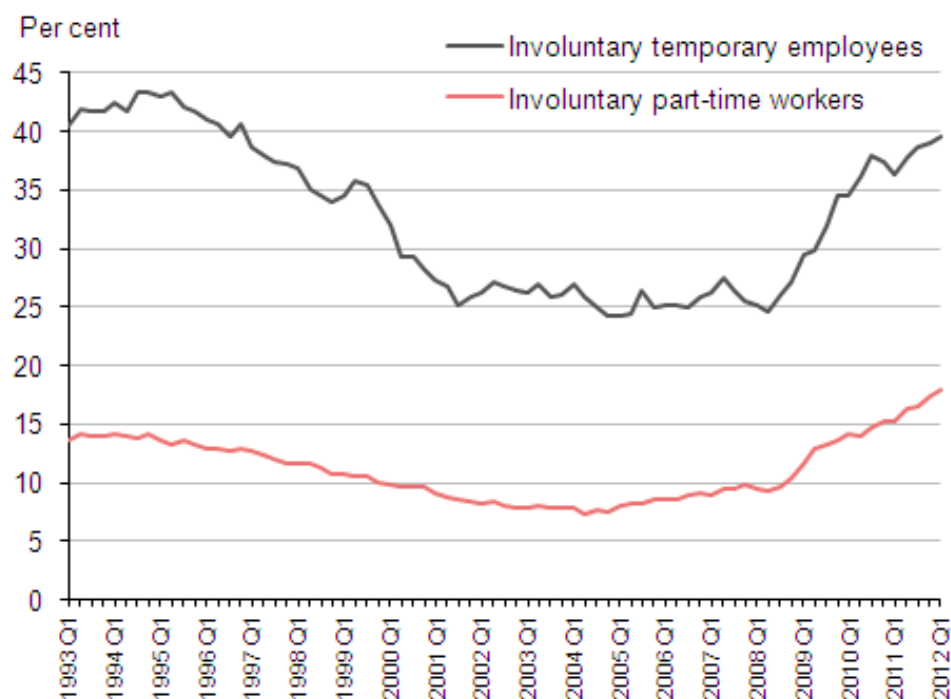
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The Labour Force Survey also indicates that the increases in part-time and temporary contract working were accompanied by increases in the proportions of each which were involuntary – that is, as required by employers rather than being at the choice of the employees themselves.

Chart 5: Involuntary part-time and temporary workers as a proportion of total part-time and temporary workers



Source: Office for National Statistics

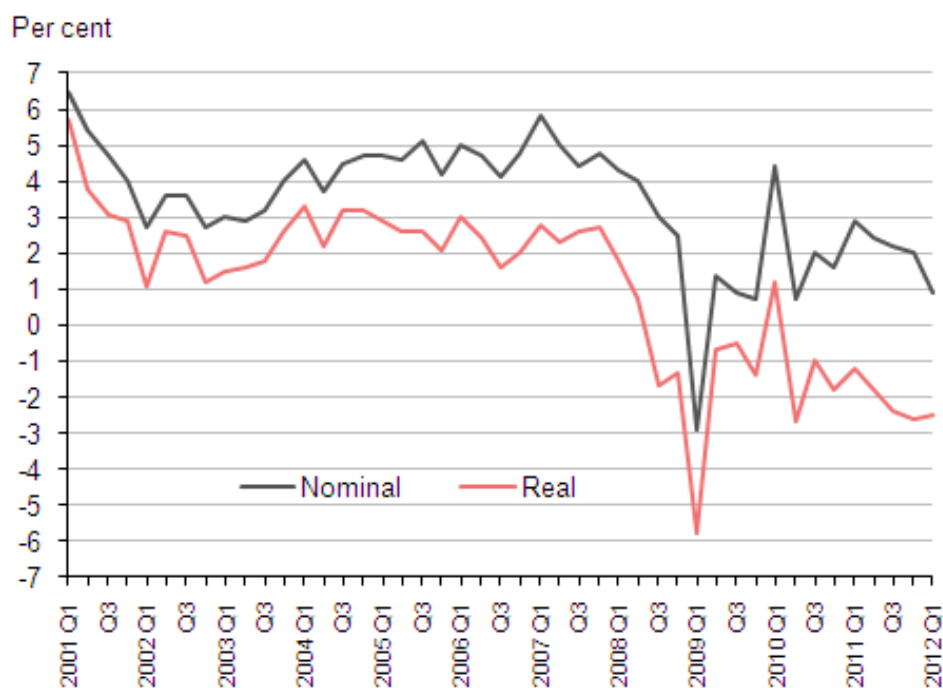
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The changes described above are reflected in Chart 1. This shows the fall in total hours worked since the beginning of 2008 to be around 2 per cent, as compared with a 1 per cent fall in employment. This therefore means that productivity per hour worked is estimated to have fallen over this period but by significantly less than on a productivity per job basis.

These marked changes in average hours worked per job may be a sign of greater labour market flexibility in the UK than in previous recessions and recoveries. In the same vein, greater flexibility appears to have characterised wage adjustment. Chart 6 shows that real earnings growth has been subdued since the beginning of the recession, making it cheaper than otherwise for employers to retain workforce which otherwise might have been shed, perhaps in anticipation of an eventual upturn. This effect would be all the greater if firms were reluctant to lose skilled staff, in whom they had invested training and development. Again, this would manifest itself in both higher employment and higher total hours worked, as compared with previous episodes. The counterpart would be relatively lower productivity.

Chart 6: Earnings growth, quarter on same quarter a year ago

Source: Office for National Statistics

Notes:

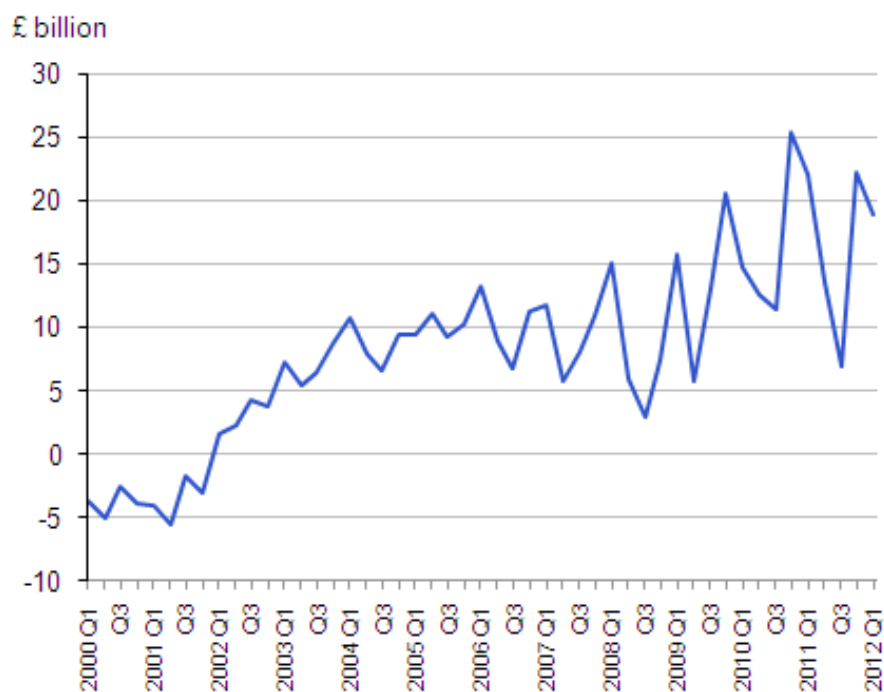
1. Real earnings are defined as earnings after taking into consideration the effects of inflation. They have been derived by deflating nominal earnings by the overall consumer prices index.

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As well as it being cheaper for firms to retain their workforce, albeit sometimes with decreased hours, they have arguably had greater capacity to do so. The cash flow for private non-financial companies (PNFCs) has remained strong over the last few years, as indeed it was for some years before the recession (Chart 7). Unlike in previous recessions, they have therefore not collectively been under the same pressure to reduce their workforce quickly by dint of financial necessity.

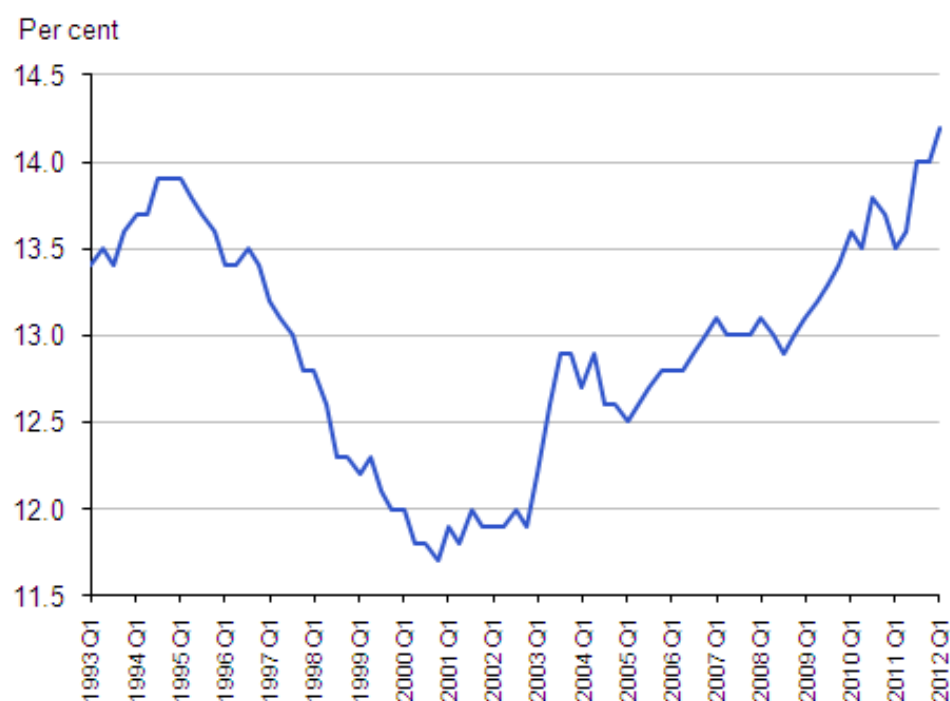
Chart 7: Financial surplus/deficits of private non-financial companies

Source: Office for National Statistics

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One further effect is worthy of attention. Chart 8 shows that there has been an acceleration since the beginning of the recession towards self employment, which was, in any case, on an upward trend. It seems possible that some of this is accounted for by former employees, having lost their jobs, setting up in self employment in similar lines of business. There could therefore be effects on output and hours worked, from such transactions, which are not straightforward to assess.

Chart 8: Self Employment as a percentage of total employment

Source: Office for National Statistics

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These are only hypotheses but they seem to have sufficient plausibility to warrant further investigation to confirm their validity or otherwise.

In summary, each of the effects described above may have a part to play in explaining the apparent poor productivity performance. They also suggest it is sensible to consider productivity per hour worked as the principal measure for attention, given the known changes in average hours worked per job. Nevertheless, on reasonable assumptions, they are not capable of explaining fully the paradoxical behaviour of productivity over the recent period. It is important therefore to have regard to other possible issues.

The Reliability of the GDP and labour market statistics

It is natural and sensible in circumstances such as these to consider whether the statistics on which the productivity figures are based are giving an accurate reflection of reality. ONS's approach is to keep all of its key statistics under consideration to detect shortcomings and emerging issues so that they can be diagnosed and addressed as quickly as possible. Such activity is continuously carried out proportionately.

So far, nothing has come to light which would lead to major concern about the reliability of either the GDP or labour market statistics. If the productivity conundrum were to be the result only of errors in

the statistics, the extent of the paradox would require revisions in these statistics on a scale which was both implausible and for which we have to date been able to find no evidence.

One hypothesis advanced by some commentators is that the productivity paradox may be the result of under recording output in recent years. This is often based on the proposition that early estimates of GDP are subject to bias and later revised upwards. If so, as such upward revisions take place, measured productivity performance would take place proportionately.

ONS publishes each set of initial estimates for GDP alongside future revisions, on its website, in so-called revisions triangles. These date back to 1961. Whether early estimates of GDP are biased or not is therefore an empirically verifiable question. ONS has published periodic assessments of this evidence (ONS 2009) and (ONS 2012) and neither study identified significant bias, such as would support the hypothesis as above. Nevertheless, ONS is updating the work, having regard to the revisions made in the 2012 Blue Book, and will report the results in the autumn.

Congruence of recent GDP estimates with outside survey evidence

The GDP estimates, like all economic statistics, are best regarded as ingredients, albeit in the case of GDP, important ones, in contributing to an overall assessment of the state of the economy.

They need to be interpreted carefully, and in the light of other evidence, rather than mechanically. Equally, they need to be regarded in context, not least in respect to their past behaviour. Excessive or sole attention to the last quarter's growth rate, in the absence of considering wider evidence, can be misleading.

There are now a sizeable number of business surveys of intentions, attitudes and confidence. Others relate to consumers. These surveys differ widely in terms of size, scope, sectoral coverage and purpose. But it is clear many of them have the capacity to form an important part of the evidence base. The Bank of England has been clear that it uses such survey information in combination with official statistics in reaching its judgement about the condition of the economy.

It is important, however, to be clear about the strengths and weaknesses of the various ingredients in the evidence base. The official GDP estimates have a number of strengths in that:

- They are based on a large scale sample – some 100,000 returns per period from businesses required by law, as well as systematic information on price movements.
- The information so provided is then assembled into conceptually rigorous national accounts statistics, using methodologies determined under international conventions, themselves determined after prolonged consideration by experts.

On the other hand, GDP statistics relate by definition to the past or the present. Survey information, by contrast, can often give information about likely future trends and intentions. Moreover, while UK GDP statistics are produced according to some of the fastest timetables in the world, they are inevitably produced with a lag. Surveys can often therefore offer additional timeliness.

In 2007 ONS published an article considering the appropriate use of external surveys in relation to National Accounts data (ONS 2007). That article concluded that survey information often provided

useful prediction of economic trends but that their role in “nowcasting” the present remained unproven. It did, however, confirm the importance of ONS’s practice of using such information for corroborative purposes and as an informal check on its own statistics.

It would now be timely to repeat this assessment since in the interim both the external surveys and ONS’s own methodologies have developed. In addition, there would seem to be value to public debate both in understanding the nature and characteristics of available external survey information and the coherence of official and external survey sources.

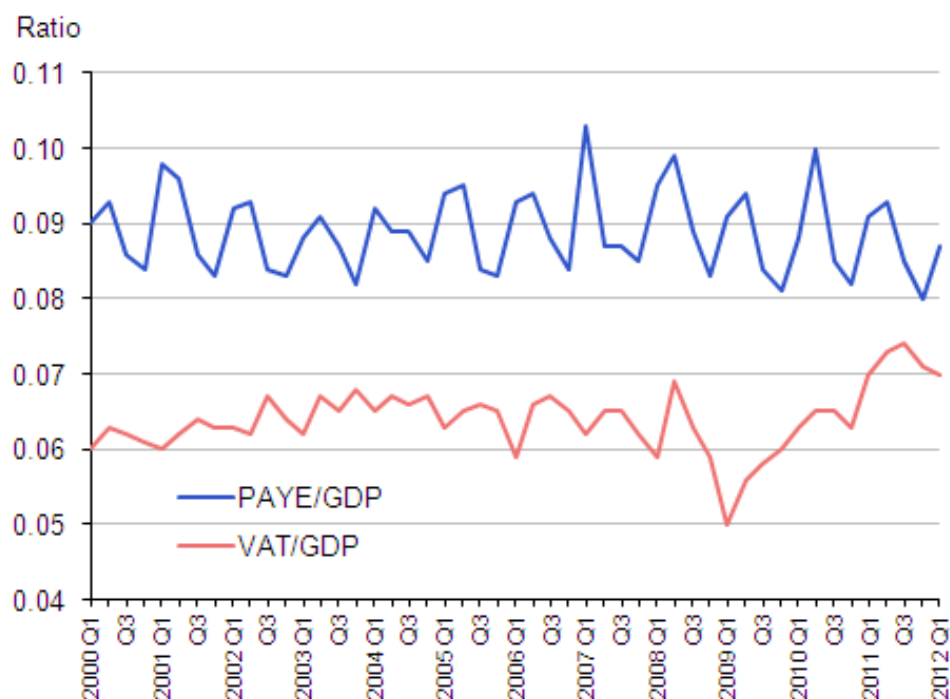
ONS is taking forward work in this area to these ends and will report progress in the autumn.

Coherence of recent GDP estimates with tax data

One strand of the recent public debate has been the suggestion that GDP estimates have moved out of line with PAYE and/or VAT receipts, being less strong than the tax receipts might otherwise suggest. To the extent, this suggested that the recent GDP estimates were too low, it might offer some resolution of the productivity puzzle.

Tax data are clearly part of the available and relevant evidence for an overall assessment and therefore deserves to be taken into account. That said, chart 9 does not immediately suggest anything greatly out of the normal order. The ratio of PAYE receipts to GDP is variable, particularly within years, but does not currently look out of its usual range. There has been more variation in the ratio of VAT receipts to GDP. But they look explicable in terms of the rate changes that occurred. Nevertheless, ONS will carry out further work on this issue and report results in the autumn.

Chart 9: Ratio of PAYE and VAT receipts to GDP



Source: Office for National Statistics

Notes:

1. GDP measure used for tax receipts comparison is expressed in current prices and is seasonally unadjusted.

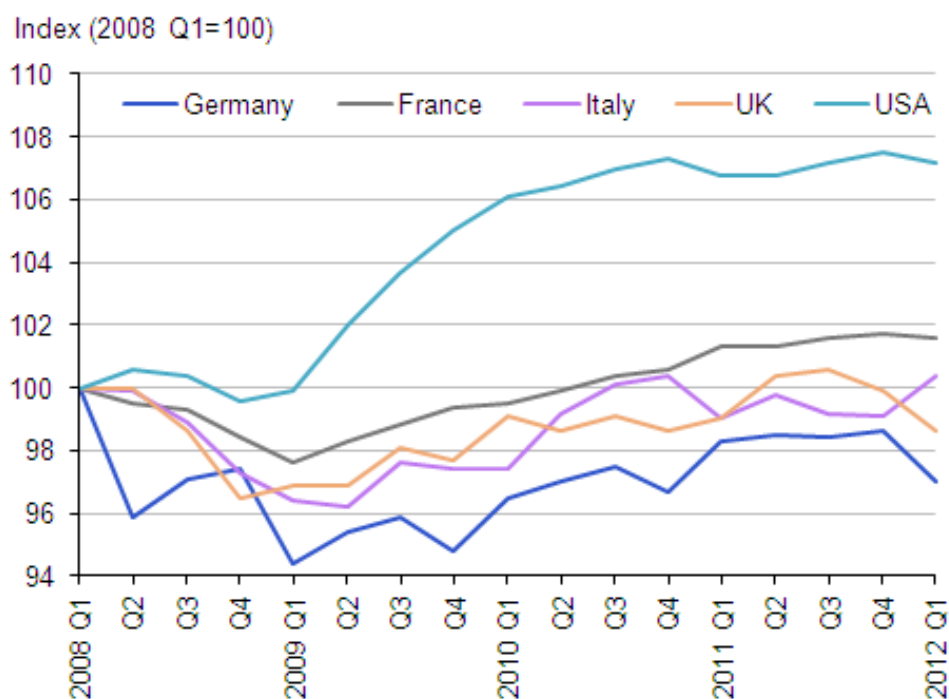
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International Comparisons

There is a danger of considering UK productivity behaviour in isolation without considering experience in other countries. Chart 10 shows the behaviour of productivity in terms of output per hour worked for the United States and some large European economies.

Chart 10: International comparisons of productivity (Real labour productivity per hour)

Source: Office for National Statistics

Notes:

1. Real productivity per hour for the United States only covers the business sector as a total productivity measure is not publicly available.
2. Data for Italy, France and Germany was provided by Eurostat
3. Data for United States was provided by U.S. Bureau of Labor Statistics

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The chart suggests that productivity experience in other large European economies has not been dissimilar to that in the United Kingdom – output per hour worked since the onset of the recession has followed broadly the same path within the inevitable margins of uncertainty. United States experience was initially different in that productivity rose sharply in 2009 driven by job cuts; but even there, productivity has been on a plateau since 2010. In each case, the experience has been a break from previous productivity behaviour in the countries concerned.

This suggests, at least, that part of the explanation for recent productivity puzzles may have been a common factor, rather than purely country-specific ones.

Possible effects of the financial crisis and its aftermath

The OECD has suggested that the financial crisis may have led to harmful effects on the productive potential of developed economies, perhaps reducing productive capacity by around 4 per cent on average. The IMF has reached similar conclusions, possibly consistent with a higher loss of productive capacity.

The mechanisms at work in any such effect would be manifold but would include the following:

- The over-exuberant financial intermediation before the crisis and going in to it may have led to poor economic outcomes with capital and resources going into activities with poor potential returns.
- In the aftermath of the crisis, the risk premium increased markedly. This would have meant that much of the existing capital stock would no longer be capable of generating the new return required at the higher rate. It would thus become unviable.
- After the crisis, levels of financial intermediation declined sharply, again possibly hampering the formation of productive capacity.
- To the extent that earlier poor financial intermediation had resulted in allocation of resources which was non-optimal, there would be negative effects on human capital, as well as physical capital, as the poor allocation was unwound.

Such hypotheses should not be accepted *a priori* but they are sufficiently important to require detailed empirical investigation. They are also clearly pertinent to an assessment of productivity behaviour. If there had been a marked reduction in productive capacity then a period of negative or slow productivity growth would be virtually inevitable.

No doubt along with others, ONS is considering ways in which evidence can be established to determine the validity of these hypotheses or otherwise. One avenue is to consider the sectoral patterns of productivity behaviour - for example, have productivity falls been associated with sectors where the above mechanisms might be expected to have most impact? Or have job losses been observed in previously apparently high productivity sectors, with migration to jobs in lower productivity areas, as the reallocation of resources proceeds?

ONS will report progress on its investigations in the autumn, and welcomes the results of other investigations into these subjects.

Conclusion

This article has considered aspects of recent productivity puzzles on a wide basis. It is not intended to reach definitive conclusions but rather to scope out some of the aspects and issues that merit further discussion and consideration.

When unusual economic behaviour is apparent, it is natural and sensible to question whether the statistics embodying this are reliable. ONS has been carrying out its normal assurance work but nothing has come to light which would help resolve the productivity puzzle.

The public debate would be poorly served if discussion focused only on reliability of the statistics. As this article suggests, there are a number of aspects of the productivity paradox which merit greater attention and investigation. It is important in this connection to note that the paradox is not confined to the UK and other countries experience needs to be taken into account.

For its part in promoting such discussion and debate, ONS will host a seminar in the autumn at which it will report on a number of work streams as set out in this article. Further details will be announced in due course.

Background notes

1. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

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This document is also available on our website at www.ons.gov.uk.

References

1. [Brown G et al \(2009\) 'Understanding the quality of early estimates of Gross Domestic Product', *Economic and Labour Market Review*, 3\(12\), pp 43-50.](#)
2. [Chamberlin G \(2007\) 'Forecasting GDP using external data sources', *Economic and Labour Market Review*, 1\(8\), pp 18-23.](#)
3. [Jenkins J \(2010\) 'The labour market in the 1980s, 1990s and 2008/09 recessions', *Economic and Labour Market Review*, 4\(8\), pp 29-36.](#)
4. [Walker et al \(2012\) 'Why is GDP revised?'.](#)