

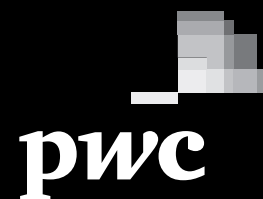


University of
Strathclyde
Business
School

Fraser of Allander Institute
Economic Commentary

Vol 37 No. 2 - October 2013

In association with



Fraser of Allander economic commentary

Vol 37 No 2
October 2013

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ISSN 2-46-5378

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The Fraser of Allander Institute was established in 1975 as a result of a donation from the Hugh Fraser Foundation. We gratefully acknowledge the contribution of the Buchanan and Ewing Bequest towards the publication costs of the Commentary.

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Notes

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Fraser of Allander Institute
Department of Economics
University of Strathclyde
Sir William Duncan Building
130 Rottenrow
Glasgow G4 0GE

t: +44 (0) 141 548 3958

f: +44 (0) 141 548 5776

e: fraser@strath.ac.uk

w: <http://www.strath.ac.uk/fraser/>

Outlook and Appraisal

Overview

There is little doubt that after five years since the start of the Great Recession we are now witnessing a stronger recovery, all be it belatedly compared to any recession in the last 70 to 80 years. And there are good reasons to be hesitant about whether the recovery can be sustained. Nevertheless, the Scottish economy has grown for five successive quarters to the second quarter of this year. The UK has grown for three successive quarters to the third quarter of the year. And the growth rate has been rising as 2013 unfolds.

In the second quarter, GDP in Scotland was -1.4% below the pre-recession peak, whereas UK GDP stood at -3.3% below its pre-recession peak 5 years ago. Overall, Scottish GDP has recovered by 4.4% since the trough of recession while UK GDP has recovered by 4.3% from its trough, suggesting that the broad track of the recovery has been similar in Scotland and UK. Removing falling oil & gas production from the UK data to compare like with like reveals that UK GDP (ex-oil & gas) has recovered by 5.3% from its trough. Hence, the UK recovery has actually been somewhat stronger.

The industry structure of the recovery differs between the UK and Scotland. The service sector is weaker in Scotland while growth in production and the manufacturing sector within it has been stronger in Scotland. But construction sector growth has been quite similar between the two countries with recovery weak. Financial services appear to have experienced a structural decline since the beginning of the recession in both Scotland and the UK. This decline may be bottoming out but whether the sector will return to 2007 levels of output is a moot point. It is clear that a strong recovery is now taking place in the important business services sector in Scotland and the recovery is stronger than in the UK. The recovery and growth of real estate activities and transport, storage & communications in Scotland is weaker, while that in distribution is stronger.

The different industrial pattern of the recovery in Scotland may account for some of the differences that have emerged between the Scottish and UK labour markets.

Despite recent strong job creation Scottish jobs are now -0.8% below their pre-recession peak, which is worse than the UK, where the jobs total is 0.8% *above* the pre-recession peak. But Scotland's unemployment rate of 7.3% is lower than the UK's 7.7%. However this is still, in Scotland, much above the

3.9% unemployment rate that existed before the recession began in 2008. Labour productivity in Scotland has improved relative to the UK, which has experienced a sharp drop in productivity. This may principally be due to the different pattern of industrial growth in the recovery in Scotland which has favoured more highly productive, capital intensive sectors. The recent improvements in the Scottish jobs market and unemployment have started to feed through into the employment population ratio. Previously this had remained persistently low because the jobs that were being created were not matching the rise in the working population. Nevertheless, with the ratio -3% below the pre-recession peak there is still plenty of spare capacity or unused labour resources in the Scottish economy. And this statistic takes no account of the large increase in the part-time and self-employed workforce due in large measure to a lack of full-time employment. In these numbers there lie hidden, unused labour reserves.

With a recovery in output and jobs now clearly occurring, the key question is whether it can be sustained over several quarters and even years. The recovery has a better chance of being sustained if growth is broadly-based. Unfortunately, this is not the case up to the first quarter 2013. What is clear is that household spending remains the main driver of growth, although investment is beginning to figure in the UK while net trade in Scotland remains weak. In addition, we are faced with more fiscal consolidation with £70 billion still to be taken out of the UK economy. So, the recovery is mainly dependent on growth in household spending. And the main drivers of household spending remain weak: real incomes are falling while asset prices are either flat or falling, or where they are rising, such as in stock and shares, they have only a limited significance for household spending. The Scottish household saving rate remains high at 8.1% and is nearly 4 percentage points higher than in the UK. This suggests that debt continues to be paid down.

But also the household savings ratio has been falling in Scotland over the past year: by more than 4 percentage points from 12.3% in the first quarter of 2012. Anecdotal and some statistical evidence suggest that households in Scotland as in the UK are borrowing more. Scots and others in the rest of the UK are buying more new cars. And a greater proportion is being bought on credit of one form or another. But if real incomes continue to fall and asset prices - mainly housing - remain flat, it is difficult to see how such borrowing and spending can be sustained. One way is highlighted by the growth of pawnbrokers on Scottish high streets, cash generators and pay-day loan operations. Impressionistically, it appears that many people are selling assets - cameras, electronic equipment, and musical instruments - to raise funds for current spending. This readymade mechanism for rapidly transferring assets

into cash could be giving a boost to the economy. But it is hard to see how it can last, without rising real incomes and asset values; the amount of saleable assets held by households is obviously finite.

It is against this background that we have prepared our latest forecasts.

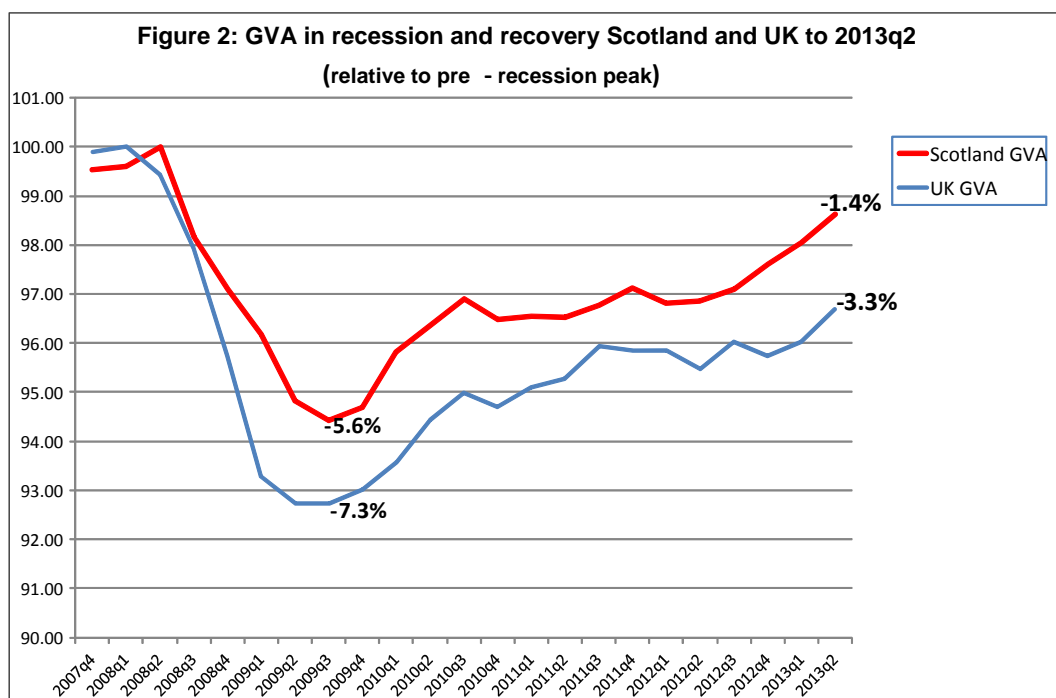
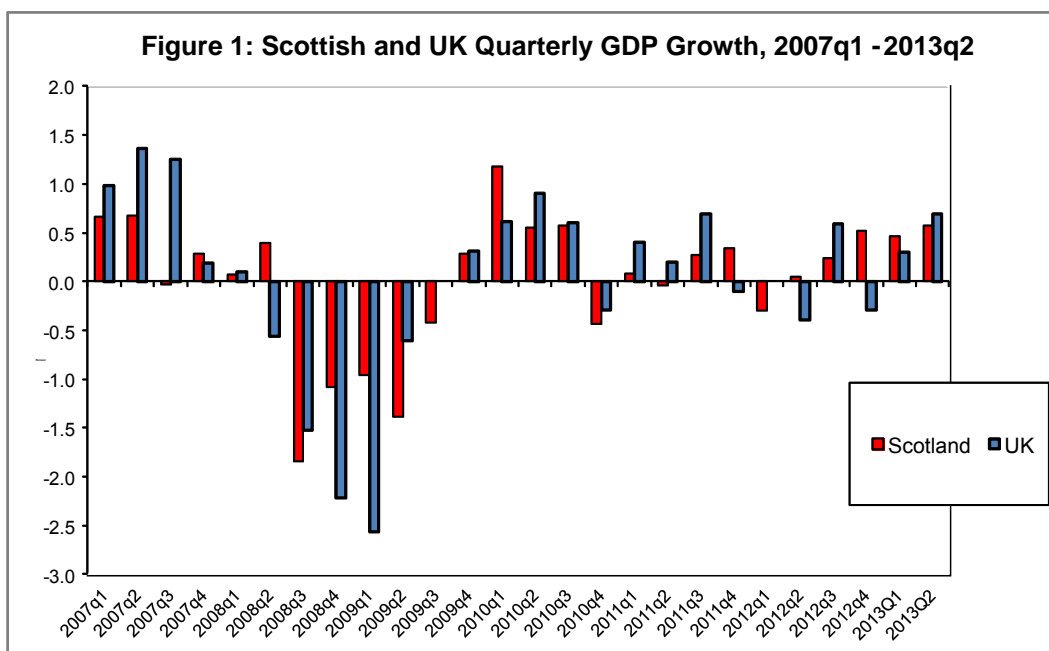
Our GDP forecast for 2013 at 1.3% has been revised upwards from our June and March forecast of 0.9%. For 2014 we have also revised up our forecast from the 1.6% predicted in June to 1.8%, while for 2015, we retain the same 2.1% prediction as in June. The forecasts for 2013 and 2014 are higher than in June because of better than expected outturn data on the growth of household spending and increasingly optimistic surveys during the summer and early autumn. But we are still predicting below trend growth next year reflecting the continued relative weakness of domestic demand, in particular government spending and consumer expenditure, and only slowly rising growth in eurozone markets but stronger growth in the rest of UK to which Scottish exports are so reliant.

In the labour market, we predict rising employment, rising unemployment next year, and falling unemployment in 2015. On the central forecast, we are now forecasting that net jobs will rise by 21,200 in 2013, rising to 27,200 in 2014 and 38,400 in 2015. The majority of jobs created will be in the service sector. Our unemployment forecasts have been revised down again from June, reflecting higher employment given the growth of output. We are now seeing many workers re-entering the labour market as job prospects improve. This lowers our estimate of 'real' unemployment but may tend to raise measured unemployment as jobs are being created. The upshot is that unemployment may not fall as much as the job creation figures might suggest. Our projection for unemployment on the ILO measure at the end of 2013 is now 204,550 (7.6%). We continue to expect the unemployment position to deteriorate slightly in 2014 compared to 2013 due to relatively weak output and employment growth. Unemployment is now forecast to be 224,800 (8.4%) by the end of 2014 but then falls back to 186,450 (7.0%) by the end of 2015 as growth in the economy strengthens.

Recent GDP performance

The latest Scottish GDP data for the second quarter of this year show that Scottish GDP rose by 0.6% in Scotland in the quarter, slightly less than the 0.7% rise in the UK, see Figure 1.

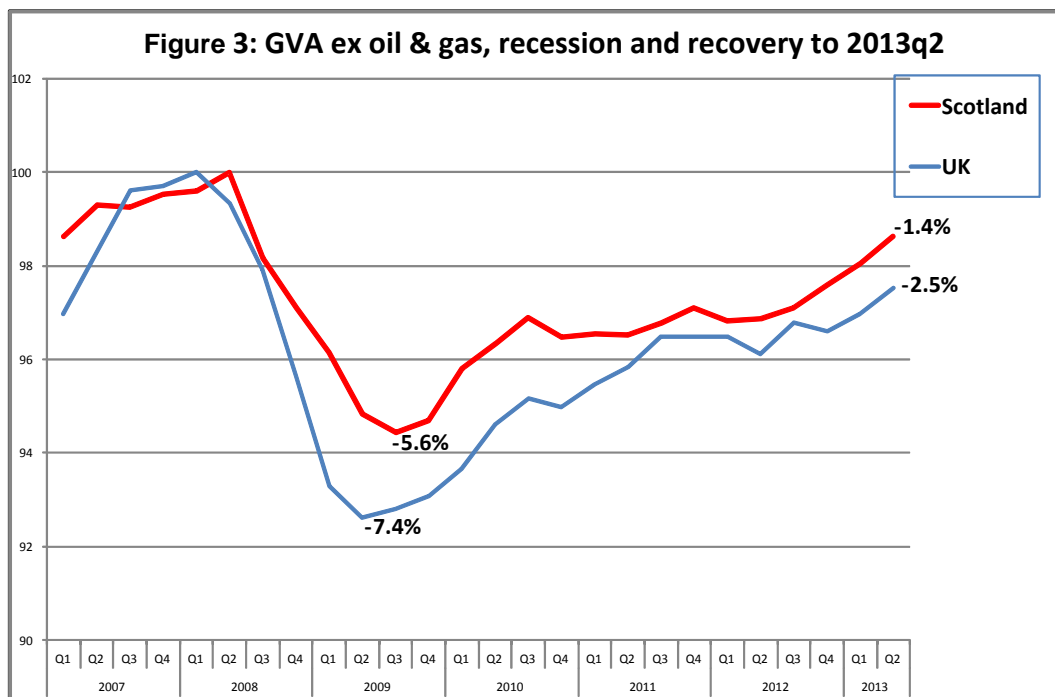
However, over the year to the second quarter - four quarters on previous four quarters - Scottish GDP growth was weak at 1% but a lot stronger than the 0.4% outturn in the UK. These data suggest that the economy may have entered a stronger recovery phase, with positive growth recorded over the last 5 quarters. But the recovery continues to be much weaker than that experienced from any recession in the last 70 to 80 years. The effect of the new data on Scotland's recovery from recession is shown in Figure 2.



In the second quarter, GDP in Scotland was -1.4% below the pre-recession peak, whereas UK GDP stood at -3.3% below its pre-recession peak 5 years ago. What is clear from Figure 2 is that the UK GDP data have been significantly revised, and revised in a downwards direction. The scale of the recession now amounts to a fall in output of -7.3% as compared to -6.3% in earlier estimates. As a result, despite positive growth in the last two quarters, UK GDP is -3.3% below its pre-recession peak compared to -2.9% in the final quarter of last year. Hence, the gap between Scotland and the UK has widened in Scotland's favour. A stronger UK recovery to late 2011 was replaced by a stronger Scottish recovery

from mid 2012. Overall, Scottish GDP has recovered by 4.4% since the trough of recession while UK GDP has recovered by 4.3% from its trough, suggesting that the broad track of the recovery has been similar in Scotland and UK.

However, as mentioned in previous Commentaries, there is the complicating factor of oil and gas production - offshore production – which is included in the UK GDP data but not in the Scottish data. Removing oil and gas production gives us Figure 3.



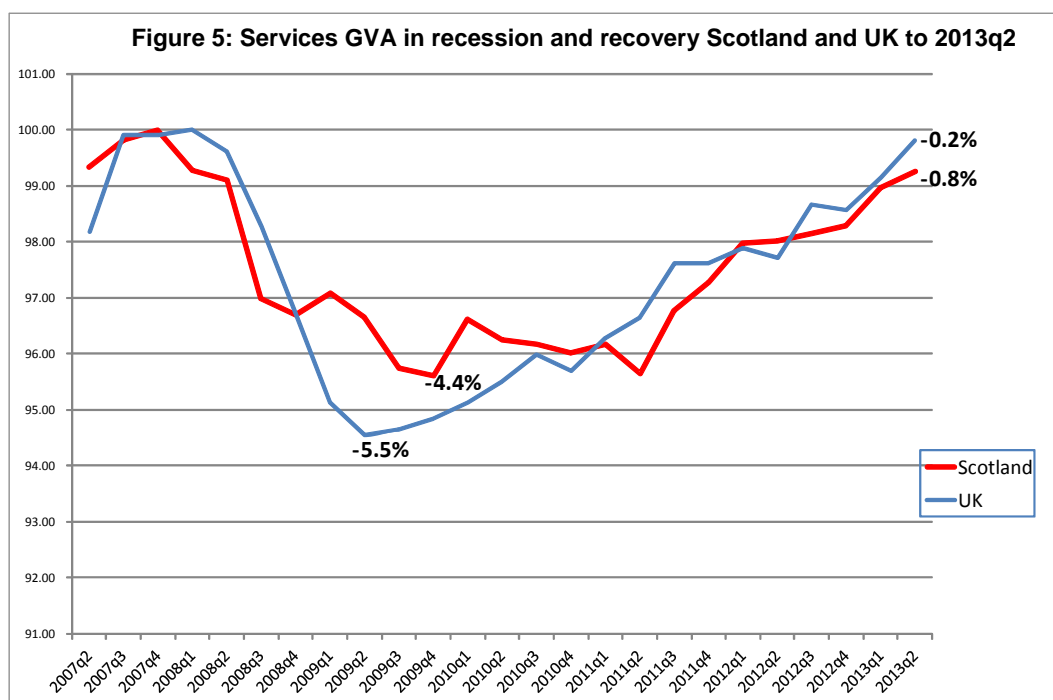
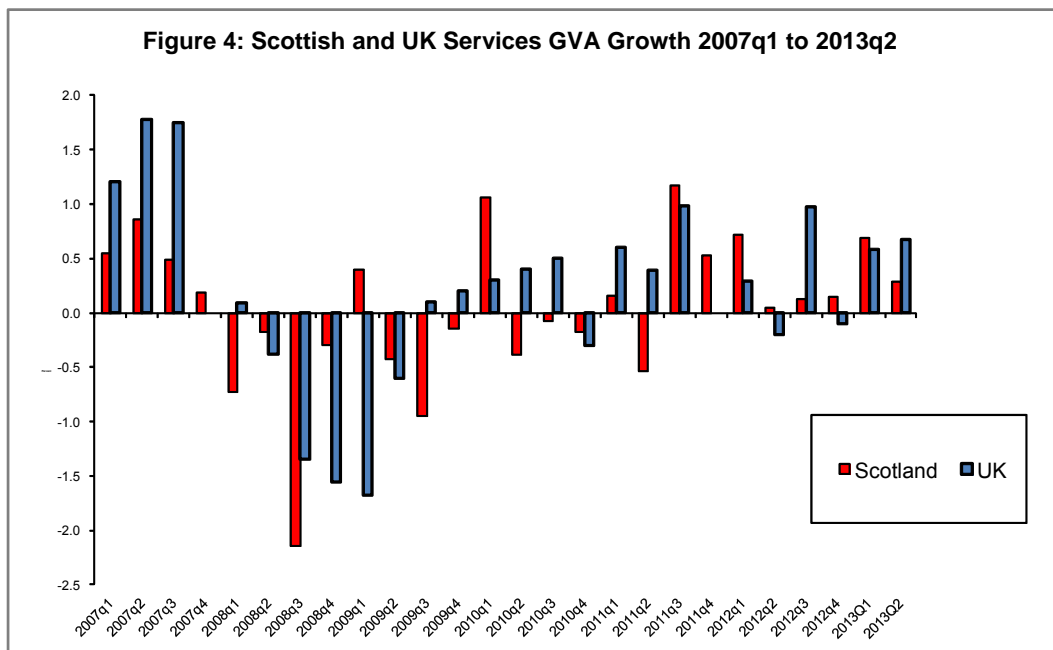
When oil and gas production is removed, we find that both Scotland and the UK grew by 0.6% between the first and second quarters. So, after a long period of weakness oil and gas production actually boosted UK GDP overall in the second quarter. But Scottish growth - ex oil & gas - was still stronger over the year - 4 quarters on 4 quarters - at 1% compared to 0.6% in the UK. But the previous weak growth of oil and gas production gives the UK GDP - ex oil & gas - a stronger recovery from recession than Scottish GDP. Scottish GDP has recovered by 4.4% since the trough of recession while UK GDP - ex oil & gas - has recovered by 5.3% from its trough. So, by the second quarter of this year UK GDP - ex oil & gas - was -2.5% below its pre-recession peak compared to -1.4% for Scotland. Scottish GDP is closer to its pre-recession peak than the UK despite the recovery of GDP - ex oil & gas - being stronger in the UK. This is because the scale of the recession was much greater in the UK as a whole.

Turning now to individual sectors of the economy, we see that the Scottish service sector, which accounts for 72% of GDP in Scotland and 77% in the UK, was weaker in Scotland in the second quarter with GVA growing by 0.3% compared to 0.7% in the UK as Figure 4 shows.

Over the year - that is four quarters over previous four quarters - the service sector in Scotland grew by 1.2%, which was slightly worse than UK service sector growth of 1.4%. The state of the recovery in Scottish and UK services is presented in Figure 5.

After the revisions to the UK data which have reduced GVA across the board, the recovery of the service sector is now more similar in Scotland to the UK than previously. By the second quarter of this year, Scottish services GVA was -0.8% below its pre-recession peak compared to a UK position where the sector now stands, at -0.2%, just below its pre-recession peak. Note that we reported in the June *Commentary* that the UK service sector stood at 0.5% *above* its pre-recession peak output at the end of the fourth quarter last year. The loss of Scottish service sector output in the recession was -4.4%

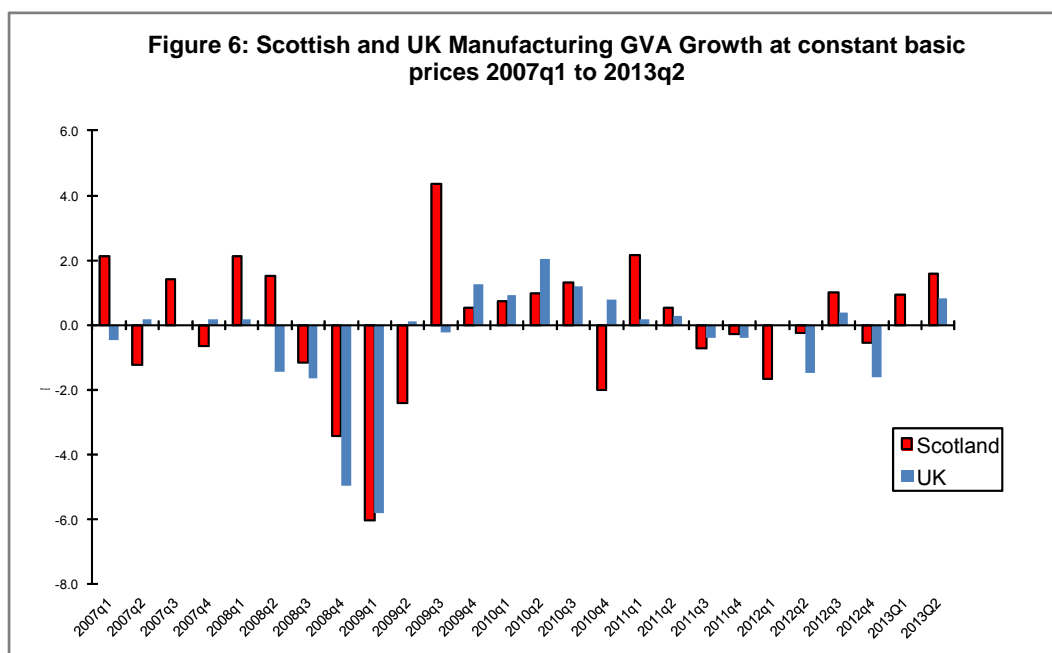
somewhat less than the -5.5% output loss in services in the UK. So, after data revisions it now appears that the Scottish services sector's growth is closer to UK services than previously thought. Some recovery is evident but with growth of 3.8% since the trough of the recession compared to 5.6% in UK services the sector is clearly weaker than its UK counterpart. Although as we noted in the previous *Commentary* - and discuss below - there are some bright spots within Scottish services.



One final point to note about Scottish services is that its growth is underperforming the overall performance of the economy whereas that is not the case in the UK where the growth of the two is broadly similar. It is the production sector that has boosted Scottish growth, while conversely it has been a significant drag on UK growth.

In the Scottish production sector output continued to grow strongly. Output rose by 1% in the quarter compared to a rise of 0.8% in the UK. Over the year - four quarters on four quarters - production GVA rose by 1.3% in Scotland compared to a large fall of -2.1% in the UK. A key feature in the differential performance is the erratic behaviour in electricity & gas supply production in Scotland. We noted in the June *Commentary* that the strong growth of 8.8% in electricity and gas supply in Scotland in the final quarter of last year may have been due to structural reasons such as a power plant coming back on stream after maintenance shut down. If so, a fall in output or flat growth would be expected in the first quarter. This proved to be the case with output falling by -5.4% in the first quarter. In the second quarter, electricity & gas GVA rose by 2.9% in Scotland while falling by 2.1% in the UK. But, reflecting the erratic nature of production, output fell by -1.5% over the year in the sector in Scotland but rose by 2% in the sector in the UK. Mining & quarrying production contracted by -3.1% in the second quarter in Scotland but GVA rose by 6.7% over the year. In contrast, UK mining & quarrying rose 1.5% in the quarter but contracted by -8.2% over the year. Some of the volatility in the UK production figures of mining & quarrying appears to be structural due to oil production issues in the North Sea.

Manufacturing is, however, the main component of the production sector accounting in Scotland for 63% of production and 12% of total GVA.

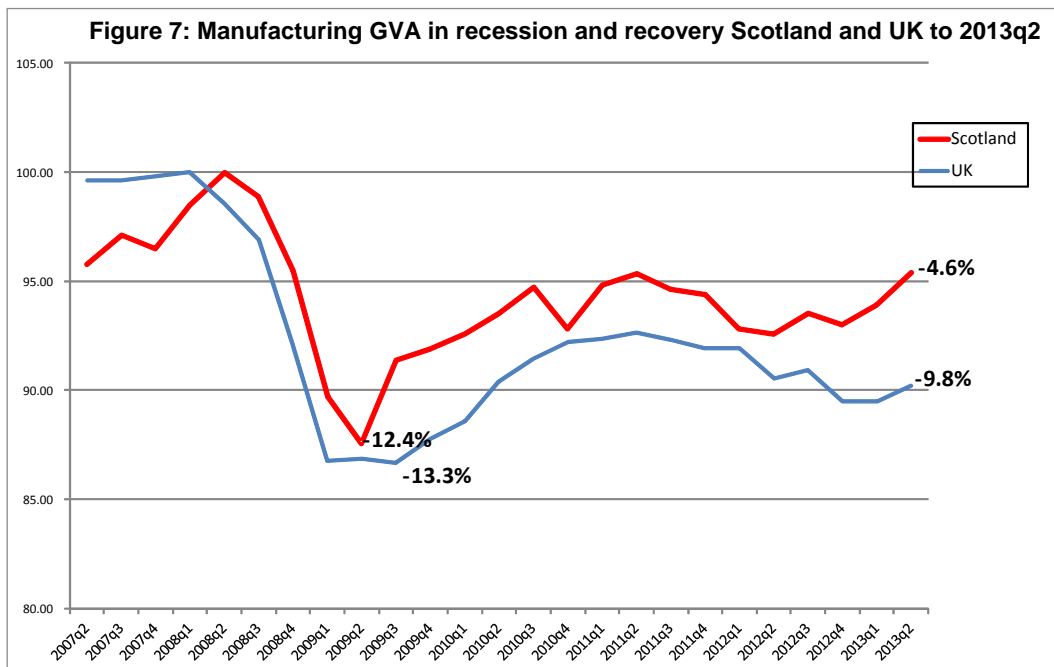


Manufacturing GVA rose by 1.6% in the quarter in Scotland after growth of 0.9% in the first quarter and a fall of -0.5% in the final quarter of last year - see Figure 6. UK manufacturing, in contrast, has fared worse than the sector in Scotland for the last 5 quarters with output rising by 0.8%. Over the year to the second quarter, Scottish manufacturing GVA rose by 0.4% while UK manufacturing output fell by -1.8%. Figure 7 shows the impact of the latest data on the manufacturing sector's recovery from recession.

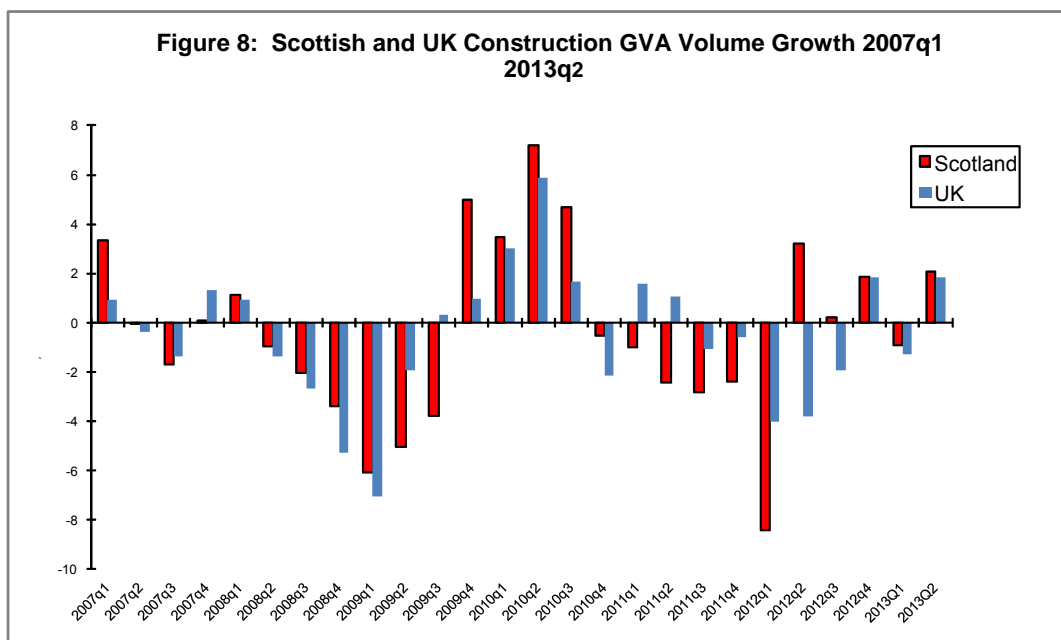
Scottish manufacturing GVA now stands at -4.6% below the 2009-09 pre-recession peak, while the figure for UK manufacturing is -9.8%, with the overall level of UK manufacturing GVA revised downwards in the latest revisions. The favourable gap between Scotland and UK manufacturing performance has therefore widened.

Within manufacturing, the main boost to growth in the second quarter came from the food and drinks sector and other manufacturing, which account for 28% and 21%, respectively, of manufacturing GVA. Output rose by 3% and 2.2%, respectively in the two sectors, in the quarter. Over the year - four quarter on four quarter - food and drink grew by 2% while other manufacturing contracted by -0.6%. Textiles and clothing grew by 2.6% during the quarter but the sector contributes little to manufacturing output - about

2.5%. Refined petroleum, chemical and pharmaceutical products, which account for 12% of manufacturing GVA, grew by 1.8% in the quarter but contracted by -2.4% over the year. The main sectors holding back manufacturing growth in the second quarter were: computer, electrical and optical products (electronics), and transport equipment, which contracted by -0.5% and -0.1%, respectively, during the quarter. However, "electronics" grew by 2.2% over the year, while transport equipment contracted by -3.2%.

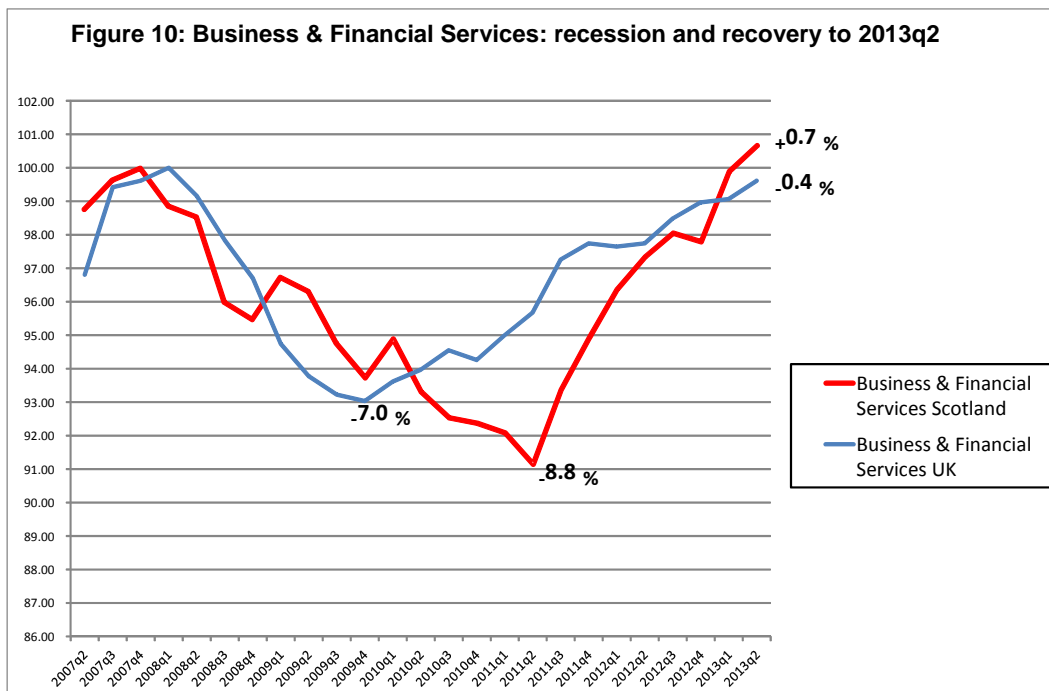
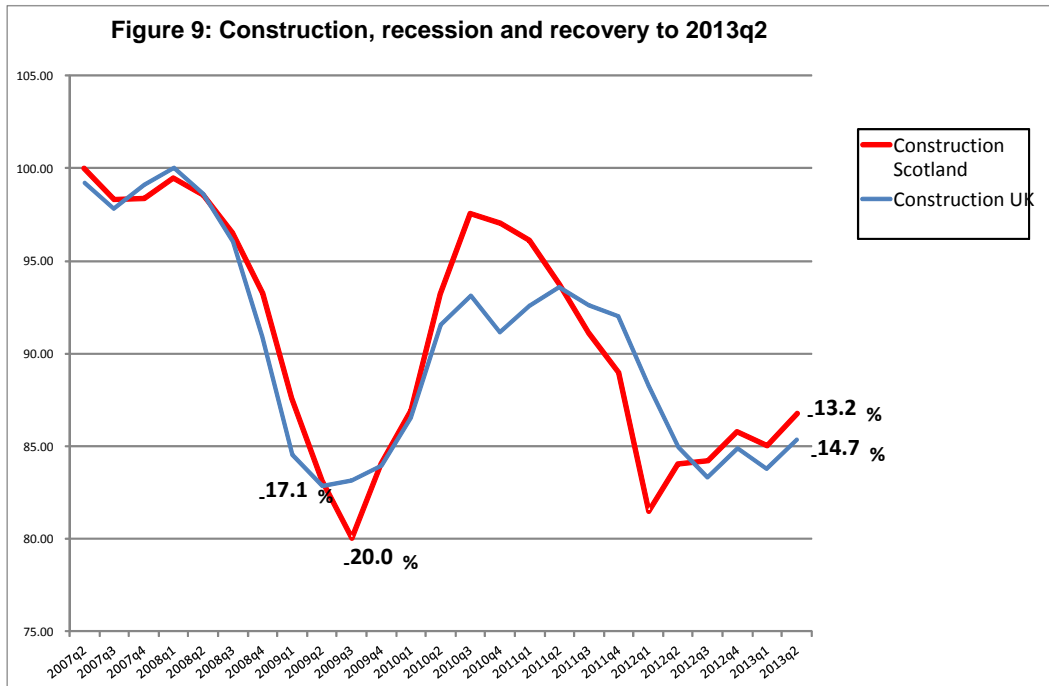


Turning now to construction, the latest data are presented in Figure 8.



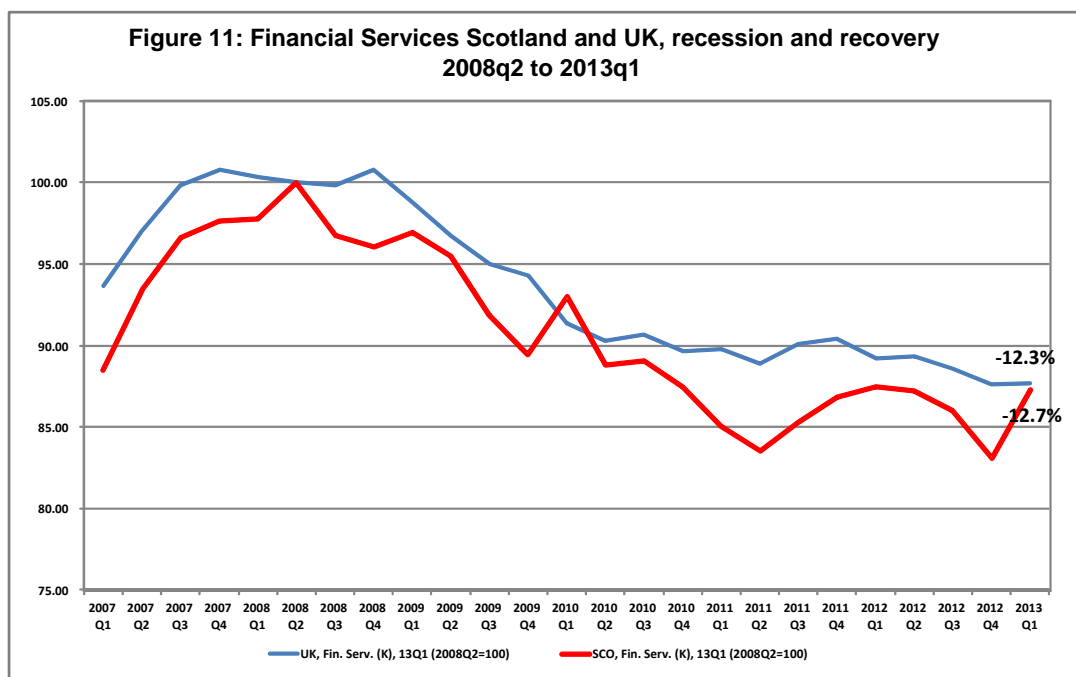
Scottish construction GVA rose by 2.1% in the quarter but fell by -1.1% over the year. UK construction, in contrast, grew a little weaker in the quarter at 0.8% and contracted by a lot more, -5.7%, over the year. Growth in the sector does appear to have picked up since the dark days of 2010q4 to 2012q1 and

a recovery may now be underway, but the upward trend is erratic with negative growth still occurring in some quarters as Figure 9 shows.



Within services, we noted in the previous *Commentary* the importance of the growth of business and financial services to the Scottish economy. In the second quarter of this year, the sector grew by 0.8% and by 3.8% over the year. In the UK, the sector grew at a similar rate of 0.7% in the quarter but at the slower rate of 1.5% over the year. Figure 10 shows the growth of the sector in Scotland and UK during the recession and recovery.

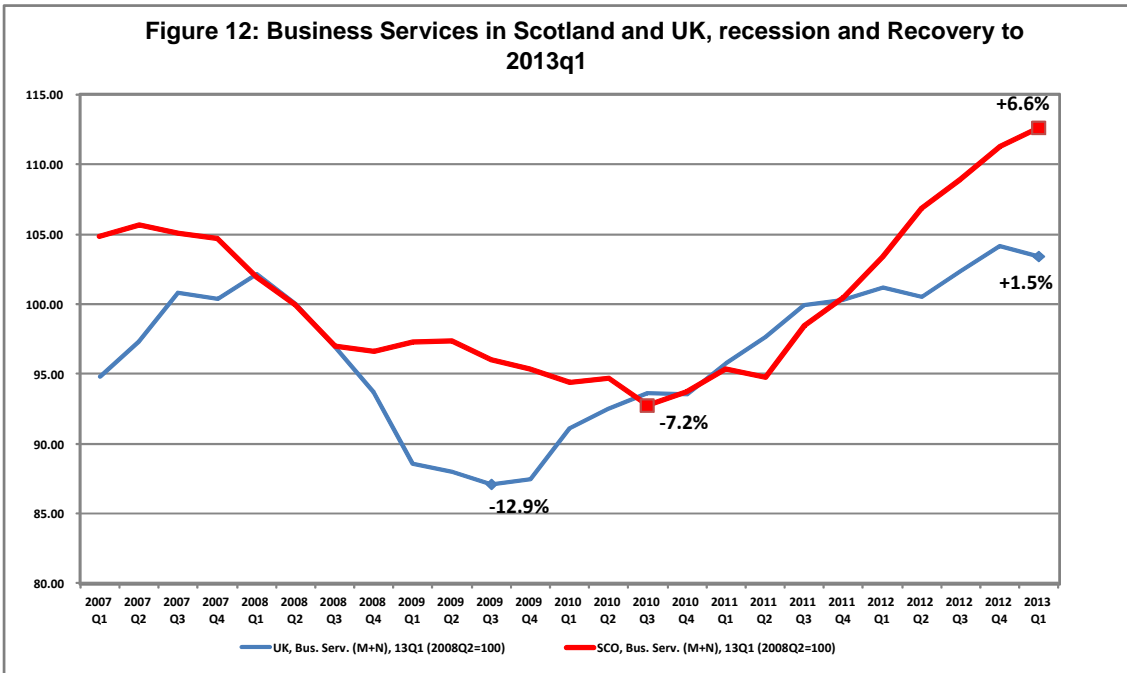
By the latest quarter, the sector in the UK was -0.4% below its pre-recession peak but its Scottish counterpart was 0.7% above. Moreover, as noted in the June Commentary, aggregate GVA data for business and financial services in Scotland mask significant differences between the performance of financial services on the one hand and business services on the other. There is only disaggregated data published for Scotland but Scottish Government statisticians have kindly made available UK figures on a like-for-like basis. Figure 11 shows what has been happening to financial services since peak output in the second quarter of 2008.



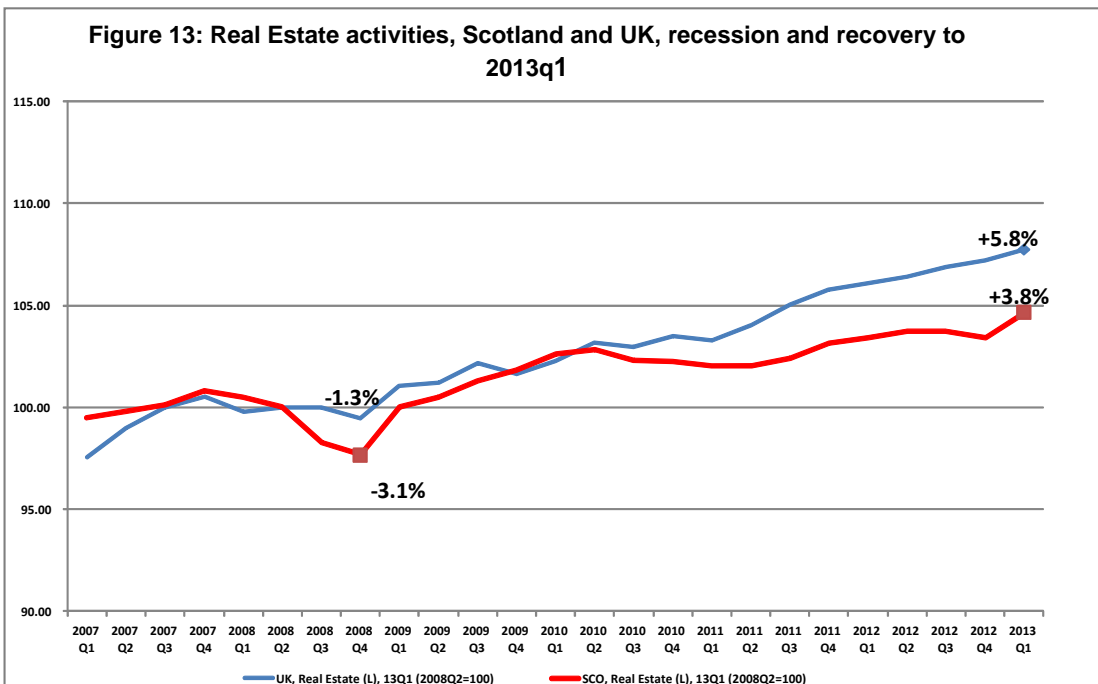
These data suggest that a structural decline has been taking place in financial services in both Scotland and the UK. GVA had fallen by about 13% below the pre-recession peak in both Scotland and UK. There is a strong likelihood that some of this lost output may never return. When we now turn to business services on its own - a combination of professional, scientific, administrative & support services - we see a very different picture as Figure 12 reveals.

It is clear that a strong recovery is now taking place in business services in Scotland and the recovery is stronger than in the UK. The contraction in Scottish business services in the recession was less and more drawn out than its UK counterpart, with decline from peak of -7.2% and -12.9% respectively. From then on Scottish business services began to recover strongly, attaining its pre-recession peak between the first and second quarter of last year. By the end of the first quarter 2013, GVA stood 6.6% above its pre-recession peak. In this analysis, unlike in the June *Commentary* we have separated real estate activities from business services. The relative Scottish and UK performance of real estate is given in Figure 13.

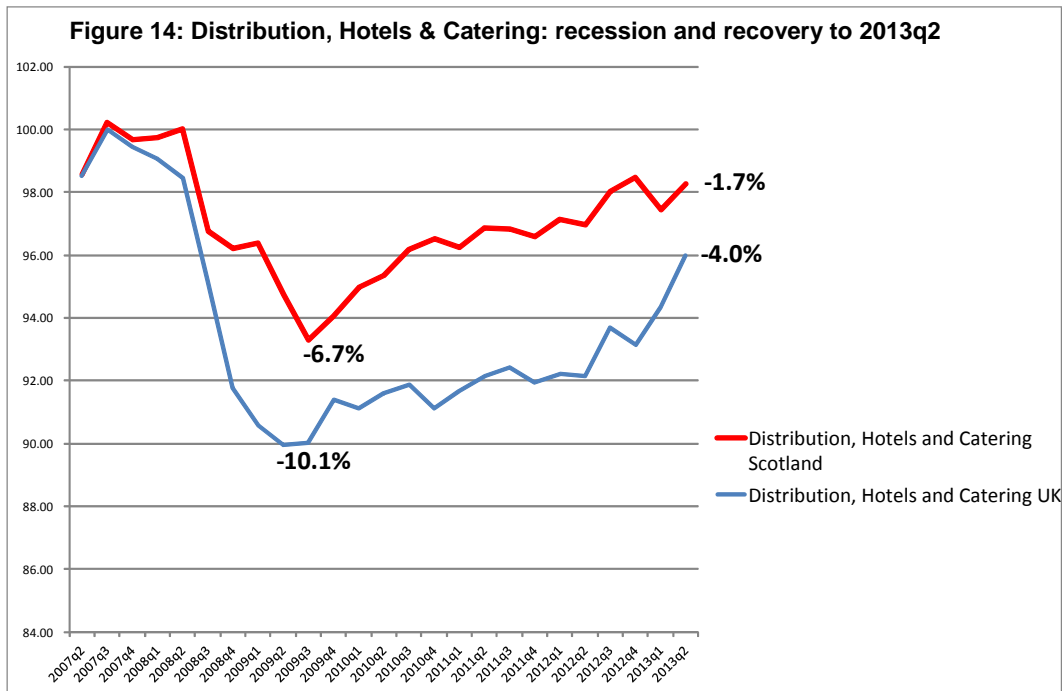
Real estate activities experienced a much shallower recession in UK than in Scotland with output falling by -1.3% and -3.1%, respectively. Moreover, since the middle of 2010 the rate of recovery in the sector slowed compared with the UK, perhaps indicating the weaker state of the housing market in Scotland. Nevertheless, while house prices are currently still falling in Scotland, real estate activities stood at 3.8% above the pre-recession peak in the first quarter of this year. But the stronger UK recovery since 2010 has resulted in the sector in the UK reaching 5.8% above its pre-recession peak by the first quarter.



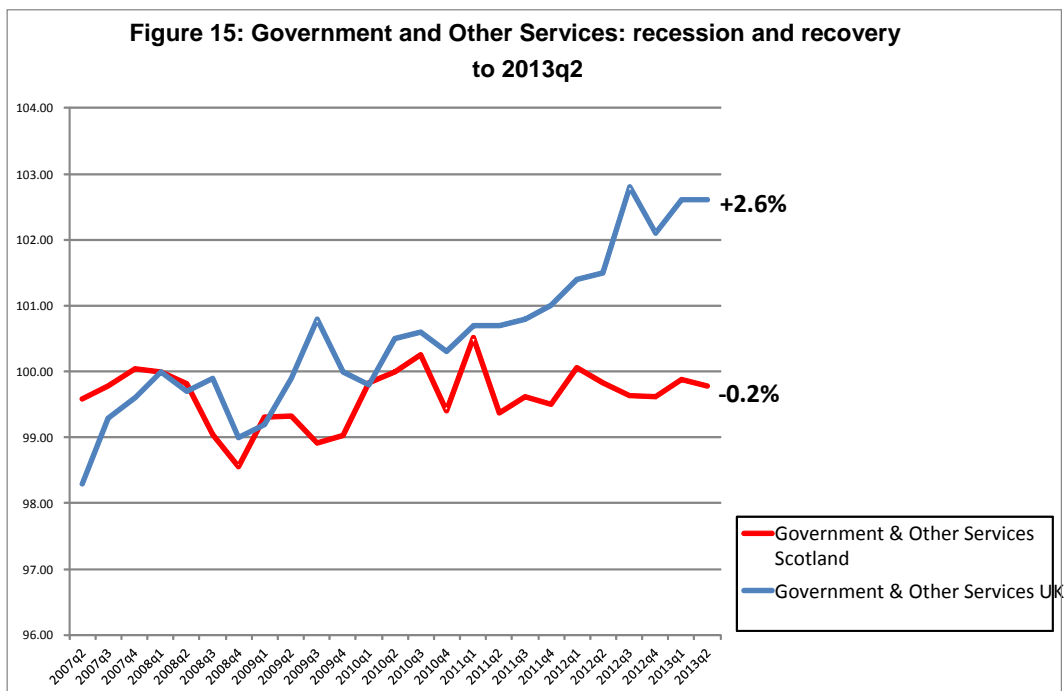
Elsewhere in private services, the main sector is distribution, hotels and catering, accounting for 19% of services sector output in Scotland; this grew by 0.8% in the second quarter compared to an increase of 1.8% in the UK. Over the year, the sector grew by 1.2% in Scotland compared to 2.3% in the UK. Figure 14 shows the performance of the sector during recession and recovery.



From Figure 14 we can note that up until the last year the sector has performed much better in Scotland throughout both recession and recovery. Until recently retailing and spending in the high street may have held up better in Scotland than in the UK, but as the SNAP data show Scottish households persist with a higher savings rate even though it is now falling.

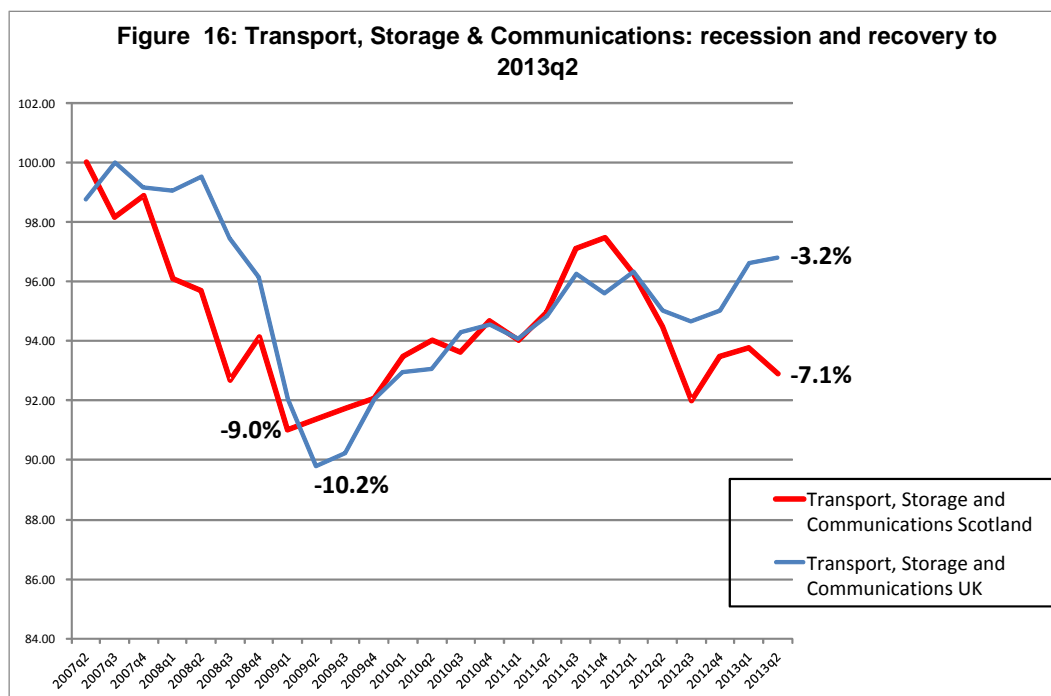


Government & Other Services GVA contracted by -0.1% in Scotland in the second quarter compared to no change in the UK. Over the year, measured value added in the sector was flat in Scotland compared to a rise of 1.3% in the UK. Figure 15 shows performance in recession and recovery.



We again continue to find the growth in the sector in the UK difficult to understand, at a time of fiscal consolidation, while the Scottish sector's performance is more intuitively reasonable. What is clear though, is that the downward revisions to the UK GVA data have reduced the level of GVA in this sector too. As a result, the gap between Scottish and UK performance is much narrower than before the revisions.

Finally, Figure 16 highlights the performance of transport, storage & communications in Scotland and UK in recession and recovery. The sector accounts for nearly 8% of total GVA and about 11% of service sector output.



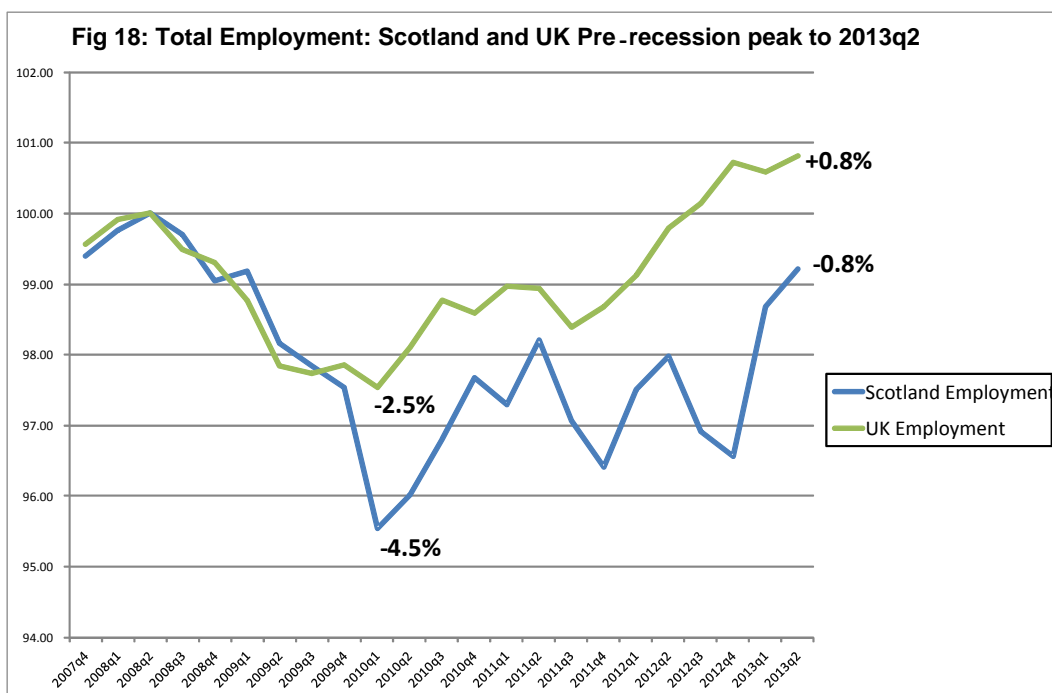
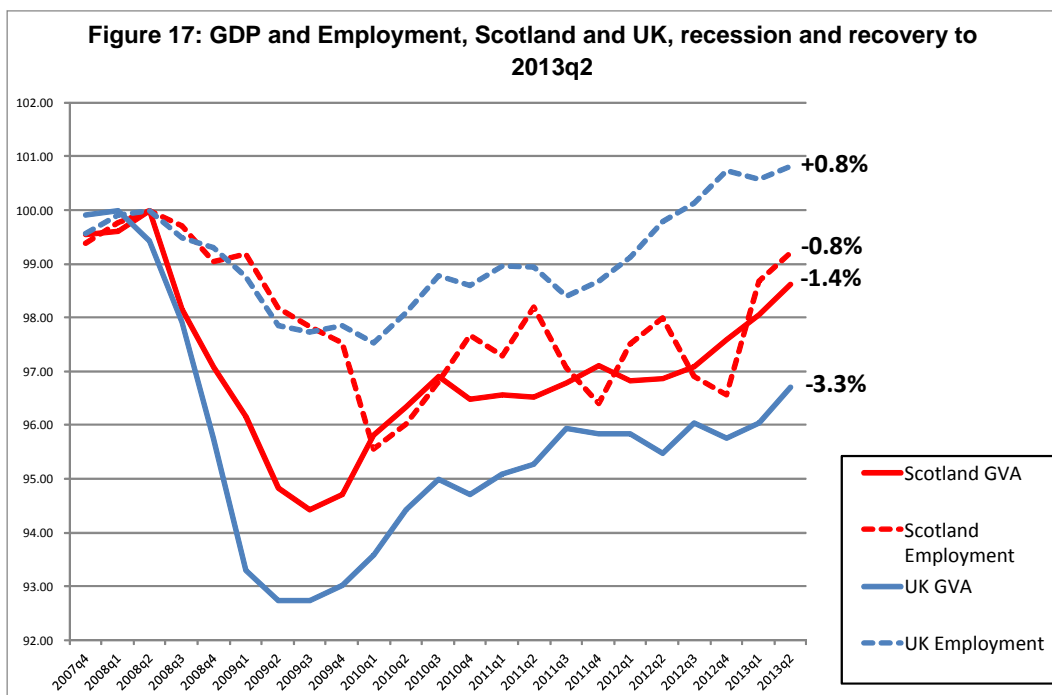
It is now evident after revisions to UK data that the sector experienced a slightly shallower recession in Scotland rather than a worse recession as reported in the June *Commentary*. However, it remains the case that the recovery in Scotland that was occurring has fallen away so that by the second quarter GVA was still more than 7% below the pre-recession peak compared to just over -3% in the UK. In the latest quarter GVA contracted by -1.7% compared to an increase of 0.2% in the UK. And, over the year, output in the sector fell by -3.4% in Scotland while remaining flat in the UK.

The Labour Market

The latest labour market data (see *Overview of the labour market* below) provide further evidence of an improvement in conditions in the Scottish labour market. In the quarter June to August employment continued to rise at a faster rate than in the UK but at a slower rate than in the first quarter. Jobs rose by 37,000, or 1.5%, compared to a rise of 155,000, a rise of 0.5%, in the UK as a whole. In addition unemployment fell by more than 3,000 to 201,000, or a rate of 7.3%. In the UK, unemployment fell more slowly by 18,000 maintaining the same unemployment rate of 7.7%.

As Figures 17 and 18 show these recent changes have brought the Scottish jobs market performance more into line with the performance of Scottish GDP and somewhat closer to UK jobs market performance. But as can be seen there are wide differences between UK GDP and UK job creation, with the faster growth in jobs clearly indicating a fall in labour productivity, which has not occurred to the same extent in Scotland.

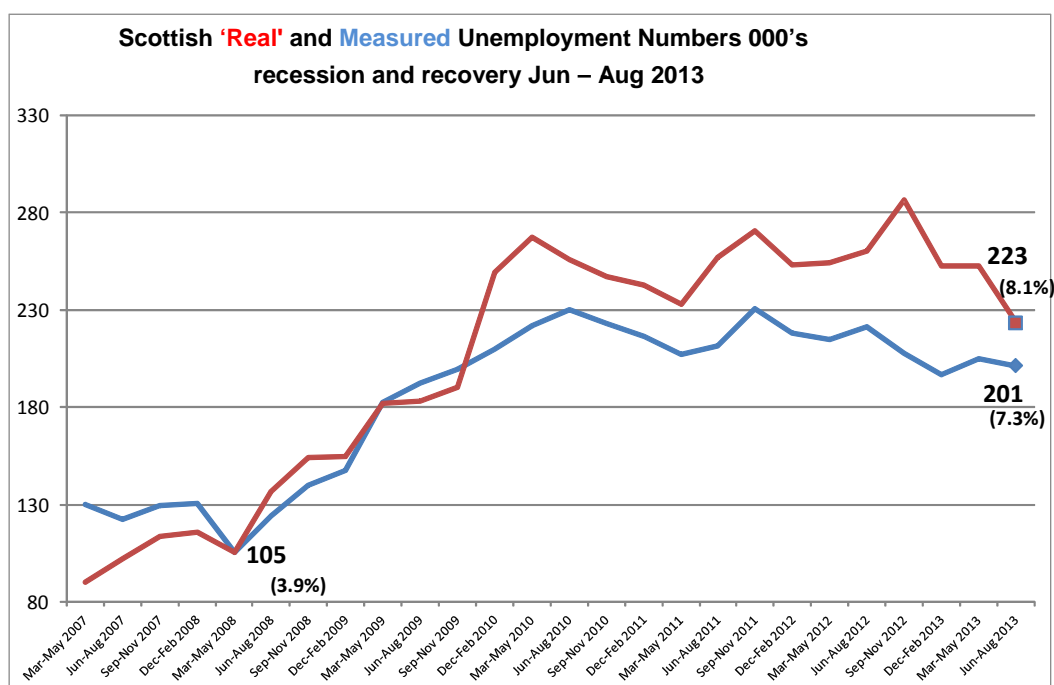
Scottish jobs are now -0.8% below their pre-recession peak, which is still worse than the UK, where the jobs total is 0.8% above the pre-recession peak.



The August *State of the Economy* report from Dr Gary Gillespie, the Chief Economist of the Scottish Government, provides *inter alia* an excellent analysis of recent trends in labour productivity in Scotland and the UK. The report also seeks to account for the greater deterioration in labour productivity in the UK compared to Scotland. We are persuaded by some of the report's arguments and think it highly probable that a different pattern of sectoral growth, given sectoral differences in labour productivities, could be a key reason explaining the greater deterioration in labour productivity in the UK. Other possibilities include factor substitution in favour of labour and away from capital given falling labour costs thus lowering labour productivity. But the evidence provided by the Scottish Government is that the fall in

real wages between 2009 and 2012 of -8.1% has been less than the fall in the UK but not by much, with the fall in the UK being -8.5%. Demand deficiency, while, in our view, still clearly depressing output - confirmed by the report's estimates of the size of the output gap in Scotland - cannot explain the differences in productivity performance between Scotland and UK. The weaker output and demand position in the UK could be associated with greater labour hoarding in UK than Scotland but why would employment rise more quickly? Equally, the misallocation of capital argument allowing so-called 'zombie' firms to continue in production might account for a greater loss of GDP than jobs in the recession and it might mean that firms cannot get enough capital to expand. But it doesn't seem to explain why jobs would grow much more rapidly than output in the UK. A switch from full-time to part-time and self-employed jobs could raise the number of jobs even when output and the demand for labour is weak or even falling. But the differences between Scotland and the UK on these indicators are not sufficient, we believe, to account for a labour productivity 'puzzle' in the UK but not in Scotland.

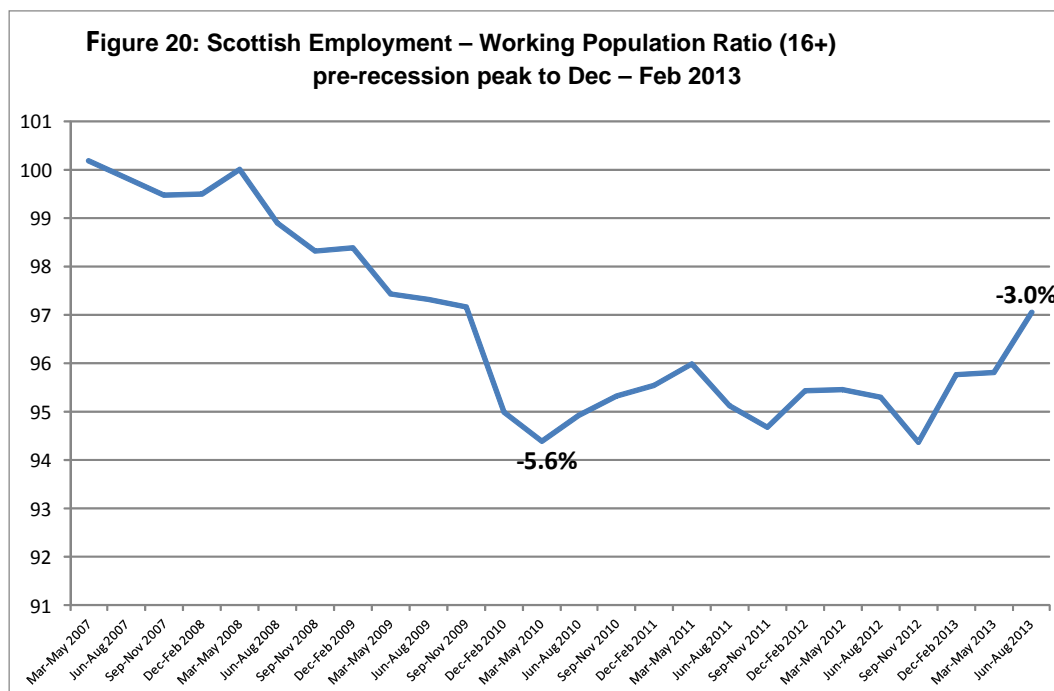
One interesting consequence of the recent burst in job creation in Scotland is the effect it has had on our estimate of the 'real' unemployment position compared to measured unemployment. This is shown in Figure 19 below.



What has happened here is that as jobs have been created and the expectations of those without a job of finding employment has risen, the number of so-called inactive workers has fallen.

Finally, the recent improvements in the Scottish jobs market and falling unemployment have started to feed through into the employment population ratio. Previously this had remained persistently low because the jobs that were being created were not matching the rise in the working population. This is shown in Figure 20.

Nevertheless, with the ratio still -3% below the pre-recession peak there is still plenty of spare capacity, or unused labour resources in the Scottish economy. And this statistic takes no account of the large increase in the part-time and self-employed workforce due to a lack of full-time employment - see Figure 2 in *Labour Market Overview* below. In those numbers there lies hidden, unused labour reserves.



Forecasts

Background

The preliminary estimate for UK GDP growth in the third quarter - published on 25 October - was a rise of 0.8% in UK GDP. This followed an increase of 0.7% in the second quarter, a 0.4% rise in the first quarter of this year, and a -0.3% fall in the final quarter of last year. Growth in the UK between the third quarter of 2012 and the third quarter of 2013 is reported as 1.5%. But in the third quarter last year the Olympics were held in London and this boosted UK GDP growth. It is therefore better to estimate annual growth as the latest 4 quarters over the previous 4 quarters. When we do this growth is 2.05%, a better approximation of where the economy is. With improving growth over the past 3 quarters in the UK, it seems clear that we have a more stable and, to use the jargon, that it is beginning to have 'traction'.

The preliminary estimate for the third quarter is output-based, so no estimates are provided of the contribution of the individual components of aggregate demand to growth. What the release does highlight is that output increased during the quarter in all four main industrial groupings within the economy: agriculture, production, construction and services. Output rose by 1.4% in agriculture, 0.5% in production, 2.5% in construction, and 0.7% in services. Given the dominance of services - 78% of the economy - the sector provided the main driver to overall growth. Moreover, this quarter's data is notable because GVA in the sector in the third quarter rose above its previous peak for the first time since the recession began 5 years ago in 2008. We must go to the UK quarterly national accounts for the second quarter to get an appreciation of the contribution of the individual components of aggregate demand to growth. These reveal that investment, household spending and government consumption were the three drivers of the 0.7% GDP growth reported in the quarter. Net trade made a zero contribution. However, within the investment figures, business investment made a negative contribution to growth and the growth of inventories was positive. Nevertheless, the ONS argued that "this suggests an improvement in investment appetite in the most recent quarters." But it is not much of an improvement and follows three quarters of negative growth in investment.

In Scotland, we will not have third quarter GDP until mid-January 2014. In the second quarter as we note above, real GDP rose by 0.6% in Scotland while rising by 0.7% in the UK. The economy has now been growing for the last 5 quarters with some indication that the growth rate is rising. The latest business

surveys - see *Review of Scottish Business Surveys* below - suggests that the recovery maintained and strengthened in the third quarter. But all this begs the question:

Will the recovery be sustained?

The recovery has a better chance of being sustained if growth is broadly-based. Unfortunately, this is not the case up to the first quarter. From the latest *Scottish National Accounts Project* (SNAP) data - published with corrections on 29 August 2013 - Scottish GDP in *current market prices* rose by 1.1% in the first quarter. When we disaggregate this change into the contribution of the different (expenditure) components of aggregate demand, we obtain Figure 21 below.

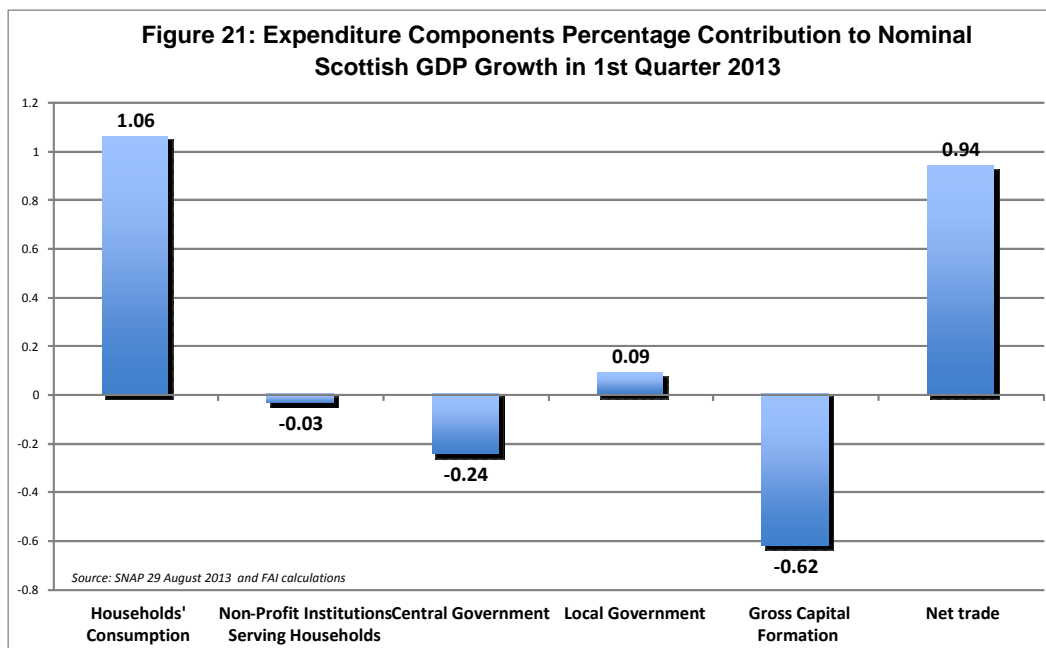


Figure 21 shows that both consumption and net trade made a positive contribution to growth in the first quarter. The positive contribution of net trade is somewhat encouraging given the need, reported in previous *Commentaries* to rebalance growth away from private domestic consumption to external demand and capital investment. This is certainly not happening with respect to investment, although we saw that investment was starting to make positive contributions to UK growth in the second quarter and to a lesser extent in the first quarter after three quarters of negative contributions. Moreover, the positive contribution of net trade only occurs because the trade deficit fell in the first quarter, so the dampening effect of the trade deficit on growth was reduced. The Scottish Government reports that this narrowing of the trade deficit was due to growth in current prices of the value of exports totalling 3.0%, largely to the rest of the UK, while the value of imports grew by only 1.6%. Whether this stronger performance of exports relative to imports will continue remains to be seen. Net trade made a negative contribution to UK growth in the second quarter as we noted above.

Some encouragement on the trade front is provided by the recent performance of manufacturing exports. In the second quarter, manufacturing exports grew by 3.5% at constant prices, although over the year to the second quarter the volume of manufactured exports fell by 1.8 per cent. Since July 2013, the methodology underpinning the series has been updated and improved, with revised outturn figures for previous quarters. The Scottish Government in its *Statistical Bulletin* reports that the pickup in exports was primarily due to an upturn in overseas sales of manufactured goods from Engineering & Allied Industries, and to continued growth in international exports of Refined Petroleum, Chemical & Pharmaceutical Products. The Bulletin notes that these are two of Scotland's largest export industries, respectively accounting for 26.5 per cent and 24.3 per cent of total sales of manufactured goods to the rest of the world. With nearly a quarter of manufacturing exports coming from Refined Petroleum,

Chemical & Pharmaceutical Products, we can see just one indicator of how much the Scottish economy is at risk were the Grangemouth petrochemical plant and refinery to close. (See Box 1 for a discussion of the impact on GDP, jobs and employment income of the closure of Grangemouth.)

Box 1: Impact on the Scottish economy of the closure of Grangemouth

The announcement by Ineos on 23 October 2013 of the closure of its petrochemicals plant at Grangemouth and the possible closure of the adjacent refinery would be a major blow to the Scottish and even the UK economy. Though this has now been averted, it is useful to consider what the scale of the closure would have been on the Scottish economy.

The plant employs some 1370 direct jobs on the site, with 800 in the petrochemicals plant and 570 in the refinery and perhaps c.2,000 sub-contractor jobs. Refined petrol and chemicals account for nearly a quarter of Scottish manufactured goods sold to the rest of the world. The loss of Grangemouth would remove most of those exports.

We can use this data, plus some plausible estimates and Type II multipliers from the 2009 Scottish Input-Output tables published by the Scottish Government, to estimate the likely impact of closure on GDP/GVA, jobs, and employee income in the Scottish economy.

The monetary values and ratios to GDP and employee income are in 2009 prices, while jobs and jobs share relate to current 2013 figures. The I-O tables have a sector 27 which comprises coke, petroleum and petrochemicals. We have assumed that Grangemouth accounts for 75% of the value of output in this sector. We also assume that GVA is divided between the refinery and the petrochemicals plant in the same proportion as employment. This is an assumption and could be erroneous but we hope not by much.

This exercise suggests that closure of the *petrochemicals plant* would result in an economy-wide impact of: -0.7% of GDP; -4,240 jobs (0.2% of total employment); and -0.3% of employee income. For the *refinery*, the comparable numbers would be: -0.5% of GDP; -3,021 jobs; -0.1% of employment; and -0.2% of employee income.

Closure of the *whole Grangemouth site* would lead to: a -1.2% fall in Scottish GDP, the loss of 7,261 jobs (0.3% of employment) and a loss of 0.5% of employee income: a very significant impact on the Scottish economy, from what is a single – albeit very large – industrial site.

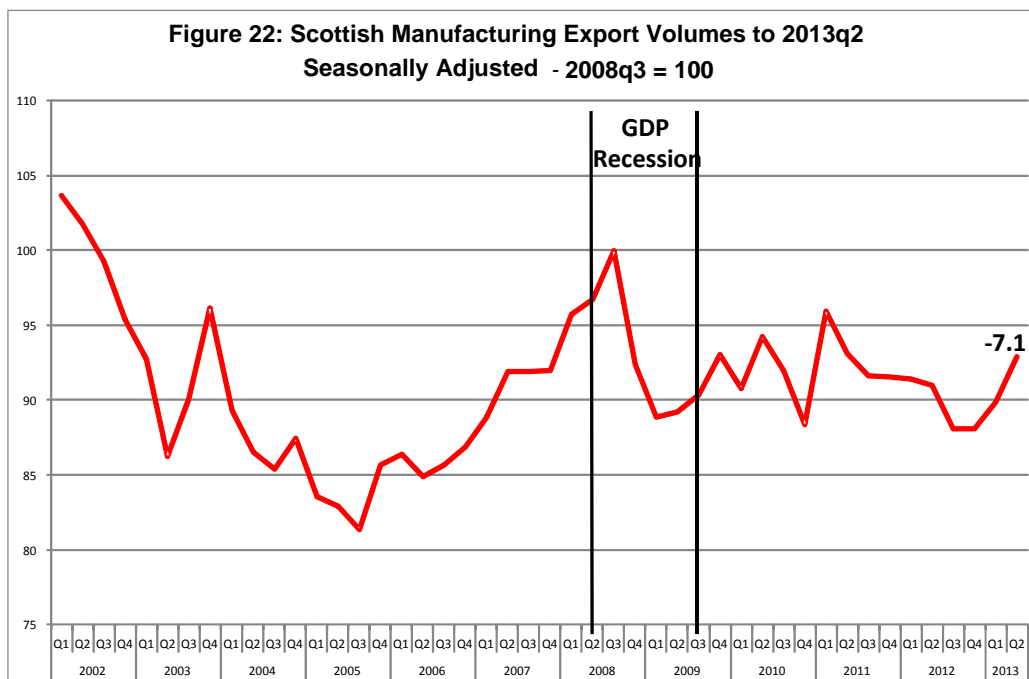
Figure 22 depicts the recent trends in manufacturing exports during recession and recovery in relation to the pre-recession peak in 2008q3.

After falling by just over 11% in the recession, export volumes have behaved erratically with no sustained recovery. However, recent growth during the past two quarters means that they now stand just over -7% below their pre-recession peak. It is to be hoped that this improvement continues.

So, what is clear from Figure 21 and the above is that household spending remains the main driver of growth, although investment is beginning to figure in the UK and net trade in Scotland. But the main drivers of household spending remain weak - see *Forecasts of the Scottish Economy* section below.

The growth of private sector pay in the UK - and presumably in Scotland - remains low with growth of 1.2% over the year to July 2013. This is less than the rate of inflation and so indicates a continuing fall in real wages, which in turn must affect household spending. The housing market continues to be weak. Lending to both first time buyers and existing owner occupiers is rising slowly but is significantly below peak. Both starts and completions of new build are still in decline. And Scottish house prices continue to fall as prices begin to rise elsewhere in the UK. With no growth in house prices there is no boost to household wealth and increased spending. Equity prices are rising again and remain high compared with 2012. But it is unlikely that this will have much impact on consumer spending because of the relatively low levels of share ownership in Scotland. The Scottish household saving rate remains high at 8.1% and nearly 4 percentage points higher than in the UK. This suggests that debt continues to be paid down.

However, the household savings ratio has been falling in Scotland over the past year: by more than 4 percentage points from 12.3% in the first quarter of 2012. Anecdotal and some statistical evidence suggests that households in Scotland as in the UK are borrowing more. Scots and others in the rest of the UK are buying more new cars: new car registrations in Britain rose by 12.1% for the 19th consecutive month in September. And a greater proportion are being bought on credit of one form or another. But if real incomes continue to fall and asset prices - mainly housing - remain flat, it is difficult to see how such borrowing and spending can be sustained. One way is highlighted by the growth of pawnbrokers on Scottish high streets, cash generators and pay-day loan operations. Impressionistically, it appears that many people are selling assets - cameras, electronic equipment, and musical instruments - to raise funds for current spending. This readymade mechanism for rapidly transferring assets into cash could be giving a boost to the economy. But it is hard to see how it can last, without rising real incomes and asset values; the amount of saleable assets held by households is obviously finite.



This lack of *real* household income growth combined with negative or weak investment, a weak net trade position and the burden that continues to be imposed upon the UK economy by the Coalition Government's programme of fiscal consolidation, with more than £70 billion still to be taken out of the economy, raises a large question mark over whether the recovery can be sustained. The Deputy Governor for Monetary Policy of the Bank of England Charlie Bean argued in a speech on 22 October that the nascent resurgence in growth that we have seen this year will be sustained principally because first, UK banks are now well-placed to provide the credit necessary to support a recovery, due to improved capital positions and lower bank funding costs, and second, because the 'existential' crisis in the eurozone has ended. But for these changes to boost growth they have to impact on the key components of aggregate demand: household spending, investment and net trade. While the crisis in the eurozone does appear to have abated (somewhat), there are still question marks over the long-term future of the euro in its present form. The eurozone is still in, or just emerging from, recession so while we might expect some boost to the demand for UK exports in the coming year it is unlikely to be rapid. Moreover, a greater propensity to lend on the part of the banks in the UK needs to be met by a willingness to borrow. Large companies appear to be sitting on large cash reserves and are still unwilling to undertake major investments (presumably based on their low expectations of future growth). Households are borrowing more and may be induced to borrow more by a greater willingness of lenders to lend. But household spending can only be sustained if there are increases in *real* household incomes and the value of assets held, no matter what the banks do.

It is against this background that we have prepared our latest forecasts.

GVA Forecasts

For our latest GVA forecasts we continue the presentational procedure adopted in earlier Commentaries. We present only a central forecast but use estimated forecast errors to establish the likely range within which the true first estimate of the growth of Scottish GVA will lie.

Table 1 presents our forecasts for Scottish GVA - GDP at basic prices - for 2013 to 2015. The forecasts are presented in more detail in the *Forecasts of the Scottish Economy* section of this Commentary below.

Table 1: Fraser of Allander Institute Forecast of Scottish GVA Growth, 2013-2015

GVA Growth (% per annum)	2013	2014	2015
Central forecast	1.3	1.8	2.1
<i>June forecast</i>	<i>0.9</i>	<i>1.6</i>	<i>2.1</i>
UK mean independent new forecasts (October)	1.4	2.2	na
Mean Absolute Error % points	+/- 0.287	+/- 0.516	+/- 1.204

Source: Fraser Economic Commentary Vol. 37, No. 2

Table 1 shows that our GDP forecast for 2013 at 1.3% has been revised upwards from our June and March forecasts of 0.9%. For 2014 we have also revised up our forecast from 1.6% in June to 1.8%, while for 2015, we retain the same 2.1% prediction as in June. The forecasts for 2013 and 2014 are higher than in June because of better than expected outturn data on the growth of household spending and increasingly optimistic surveys during the summer and early autumn. But we are still predicting below trend growth next year reflecting the continued relative weakness of domestic demand, in particular government spending and consumer expenditure, and only slowly rising growth in eurozone markets but stronger growth in the rest of UK to which Scottish exports are so reliant. After 5 years since the start of the Great Recession we are now witnessing a much stronger recovery. But as discussed above there are good reasons to be hesitant about whether the recovery can be sustained.

Table 1, also compares our GVA forecasts with the median of latest independent forecasts for the UK in, 2012 and 2014 and the average of the new independent medium-term forecasts for 2015 that are published by the UK Treasury. These show that we expect Scottish growth to continue to be a little weaker than UK growth this year and next year. So, we are now forecasting growth of 1.3% in 2013, 1.8% in 2014 and 2.1% in 2015. Given our previous forecast errors the lower and upper bounds for growth in 2013 are expected to be 1.01% and 1.59%, for 2014, 1.28% to 2.32%, and for 2015, 0.90% to 3.30%.

Production and manufacturing continue to be the major sectors exhibiting the fastest growth in 2013, 2014 and 2015. In 2013, production is projected to grow by 1.5%. Services and construction display positive growth this year at 1.2% and 1.0% respectively. This relative performance continues in both 2014 and 2015 as forecast growth across all sectors increases. Production grows by 2.2% and 2.5% in 2014 and 2015, while service growth is projected to be 1.7% and 2.0%. The construction sector

continues to lag but picks up to 1.4% and 1.3%. We have therefore revised up the forecast of growth in all the major sectors in 2013 and 2014.

Employment Forecasts

Table 2 presents our forecasts for net employee jobs for the years 2013 to 2015 in terms of a central and upper and lower forecast.

Table 2: Fraser of Allander Institute Forecast of Scottish Net Jobs Growth in Three Scenarios, 2013-2015

	2013	2014	2015
Upper	27,900	38,100	68,750
<i>June forecast</i>	<i>22,600</i>	<i>50,500</i>	<i>64,300.</i>
Central	21,200	27,200	38,400
<i>June forecast</i>	<i>14,150</i>	<i>28,200</i>	<i>38,700</i>
Lower	15,750	16,450	11,400
<i>June forecast</i>	<i>2,450</i>	<i>4,450</i>	<i>16,400.</i>

Source: Fraser Economic Commentary Vol. 37, No. 2

We have generally raised our forecasts for job creation in 2013 compared to our June forecast. This reflects the stronger jobs performance noted in the recent data and our raised GVA forecast. On the central forecast, we are now forecasting that net jobs will rise by 21,200 in 2013, rising to 27,200 in 2014 and 38,400 in 2015. This year, we now expect just over 19,000 service sector jobs will be created, with small numbers of net jobs added in production due to expected productivity increases given the growth in output, and somewhat stronger jobs growth in agriculture. A slight fall in construction jobs is anticipated this year. In 2014/2015, the bulk of the jobs created are expected to be in the service sector with an additional 24,000 to 30,500 jobs forecast, with 400 to 4,250 added in production, 1,800 to 2,150 in agriculture and 950 to 1,550 in construction.

Unemployment Forecasts

The ILO rate is our preferred measure since it identifies those workers who are out of a job and are looking for work, whereas the claimant count simply records the unemployed who are in receipt of unemployment benefit. Our unemployment forecasts have been revised down again from June, reflecting higher employment given the growth of output. We also now see many workers re-entering the labour market as job prospects improve. This lowers our estimate of 'real' unemployment but may tend to raise measured unemployment as jobs are being created. The upshot is that unemployment may not fall as much as the job creation figures might suggest. Our projection for unemployment on the ILO measure at the end of 2013 is now 204,550 (7.6%). We continue to expect the unemployment position to deteriorate slightly in 2014 compared to 2013 due to relatively weak output and employment growth. Unemployment is now forecast to be 224,800 (8.4%) by the end of 2014 but then falls back to 186,450 (7.0%) by the end of 2015 as growth in the economy strengthens.

The key unemployment forecasts are summarised in Table 3.

Table 3: Fraser of Allander Institute Forecasts of ILO unemployment 2013-2015

	2013	2014	2015
<i>ILO unemployment</i>			
Rate (ILO un/TEA 16+)	7.6%	8.3%	6.9%
June forecast	7.9%	8.4%	7.0%
Numbers	204,550	224,800	186,450

Source: Fraser Economic Commentary Vol. 37. No. 2

Prof. Brian Ashcroft
Fraser of Allander Institute
25 October 2013

Forecasts of the Scottish economy

Summary

The Scottish economy has shown signs of growth through the first half of 2012, exceeding our expectations so far through the year and has grown slightly less than the UK economy as a whole in this period. In part, this appears due to higher than expected contribution from household spending growth. While survey indicators suggest firms are optimistic about prospects for the second half of the year, we are uncertain about the extent to which a recovery on the back of households facing slow income growth is sustainable. In particular, the recent evidence on the Scottish housing market suggests that any wealth effect from increasing house asset prices is not being felt across all regions of the UK. Recent Scottish export figures show the importance of a swift and positive resolution of the (on-going at time of writing) future of the Grangemouth chemicals and refinery facility for the Scottish economy.

Fiscal policy

The UK Chancellor, George Osborne, will make his 2013 Autumn Statement on the 4th of December 2013, however it is projected that government spending in Scotland will see real terms reductions for each of the next four years. As is noted in August 2013's State of the Economy report by Gary Gillespie, the Chief Economist at the Scottish Government, this "confirms the programme of fiscal consolidation is now expected to last 8 years. This will continue to constrain the impact of Government demand in the economy".

CPPR (August 2013) examined the recent UK Spending Review and, as part of their conclusions, calculated that the current year (2013-14) sees the realisation of 57% of the total fiscal consolidation in the Scottish Government budget over the period between 2009-10 and 2017-18. As understood before, with the major reductions in the initial period of consolidation falling largely on the capital budget, over 100% of the expected capital spending reductions have already taken place, while only 40% of the spending reductions on current spending have been made to date. The scale of reductions to current spending projected in 2016-17 appear to match or even exceed those in the "first wave" of fiscal consolidation in the early part of this decade.

In real terms, CPPR project Scottish current spending in 2017-18 to be £2.7 billion below its value in the current financial year. CPPR analysis suggests that since the Spending Review covered only an additional year, large reductions in spending are projected for the final two years in current UK government plans. Although it states that, it is possible that tax rises rather than spending reductions, post-election, could bring the shape of the fiscal consolidation closer to the Government's planned 80:20 split between spending reductions and tax increases.

The UK government has brought forward its Help to Buy Scheme, which provides government-backed guarantees for house equity for up to 15% of a property value, in exchange for a fee from the mortgage lender. The intention of the policy is to encourage people back into the property market without needing a deposit of more than 5% of the property value. While not targeted at new house purchases, or first time buyers, it appears that the policy offers limited scope to specifically target the areas of the property market to have been worst hit since the credit crunch and financial crises of the last five years. Property prices appear to have responded positively to this scheme, but many commentators have warned about the sustainability of a second house price bubble, the limited scope that this policy has to encourage the supply-side of the housing market through new building, and the regional pattern of recent house price changes. ONS figures suggest that Scottish house prices in the year to July 2013 fell by 2.0% while growing by 3.3% in the UK as a whole (and by 9.7% in London). While the policy is "spatially-blind" across the UK, it appears that (for instance) quite different dynamics are occurring in the London housing market than in the other regions of the UK. Scottish house prices remain around 8% below their 2008 peak, while UK prices have regained most of their ground, according to ONS figures.

Through the new "financial transactions" measures recently announced, the Scottish Government has introduced its Shared Equity scheme for New Build programme, which provides a Scottish-specific programme with similarities to the Shared Equity Scheme in England. These are both schemes in which the Government takes up to 20% equity stake in a new build property and so can allow buyers to

purchase with a mortgage of 80%, and so lower risk to the mortgage lender and encourage lending and new buyers into the property market.

However, there are differences between the English and Scottish new build shared equity schemes. In Scotland, £220 million has been set aside over three years, while the England scheme has total funding of £3.5 billion; in Scotland co-owners can purchase the equity stake of Government in a minimum of 5% increments following a fair market valuation of the property, while in England it is 10%; the maximum property value in Scotland which can use the scheme is £400,000 while in England it is £600,000; additionally, in Scotland there is no charge for the equity scheme, while householders in England will face charges from year 6 onwards. Both maximum value figures are set so as to cover around 90% of new builds in those areas. Given current prices for new builds in Scotland, it appears likely that – while this directly addresses the issue of demand for new build properties – the scheme will help up to the low thousands of new home purchases over its duration (2013-2016). This compares to the approximately 13,500 new house starts annually in 2011 and 2012.

Monetary policy

When the Monetary Policy Committee (MPC) of the Bank of England met in October 2013, it noted that the CPI inflation rate had fallen to 2.7% in August 2013. This is slightly down from its previous figure and earlier expectations. This fall was partly explained by a fall in sterling oil prices of 8% in the month, suggesting that this important input would not contribute to price pressures over the next twelve months. They also noted the potential for domestic energy price increases to offset this. As of the time of writing, three of the big six energy have proposed increases in domestic energy prices above the 5% that the MPC had assumed in August.

In its latest meeting the MPC decided to keep interest rates at 0.5% and the size of the Quantitative Easing programme unchanged at £375 billion. It noted that under the redesigned – “forward guidance” – framework for monetary policy instigated under the new Governor of the Bank of England, Mark Carney, none of the three “knockouts” to its policy had been delivered. The current stance on forward guidance suggested by the Governor is that the Bank Base Rate will not be raised in the absence of unemployment rate below 7% for the UK, so long as those three conditions are not breached. These conditions are expectations for inflation exceeding 2.5% in 18-24 months; medium term inflation expectations becoming unstable; and financial stability becoming affected by the monetary policy stance.

Households

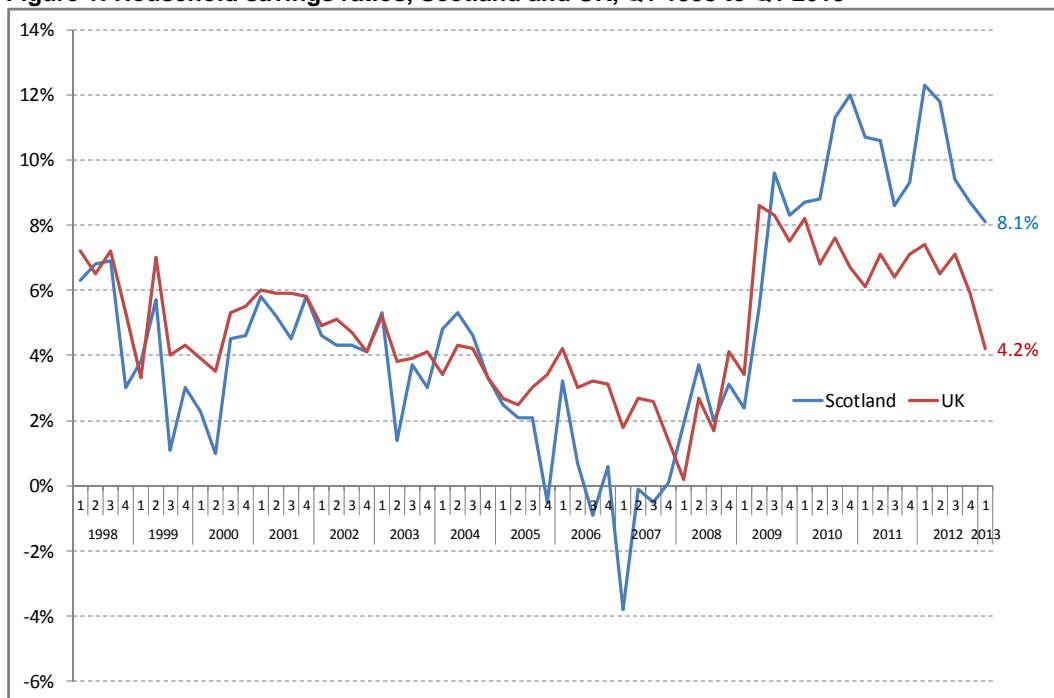
The latest pay figures for the UK show that in the last twelve months, private sector incomes had grown by 1.2% to July 2013. Figures for the whole economy for income growth below the rate of inflation suggest a continued worsening of real incomes for households through the second half of 2013. Without strong wage growth, absent from recent data for Scotland and the UK, the squeeze of real incomes will continue through 2013 and into 2014.

Figures from the Council for Mortgage Lenders report that household demand for credit for house purchase and re-mortgaging has strengthened through 2013, while the latest quarter has seen quarterly and annual increases in the number of advances for home purchases in Scotland. These are largely driven by strong growth in the number of first time buyers entering the housing market, albeit from a base that is much reduced on previous levels. Housing affordability has also improved with lower house prices and continuing low interest rates, although barriers to first time buyers in terms of deposits required remain significant.

The latest Markit Household Finance Index for the UK in October was published on the 21st of this month. While remaining firmly in “downbeat” territory (below the neutral 50.0 mark), it remains close to the “relative” high seen at the start of 2012, but still under pressure through to the end of 2013. Expectations for the next twelve months were for households finances to deteriorate, however those at the highest income quintile were most bullish about their prospects, with the opposite true for those on the lowest income group.

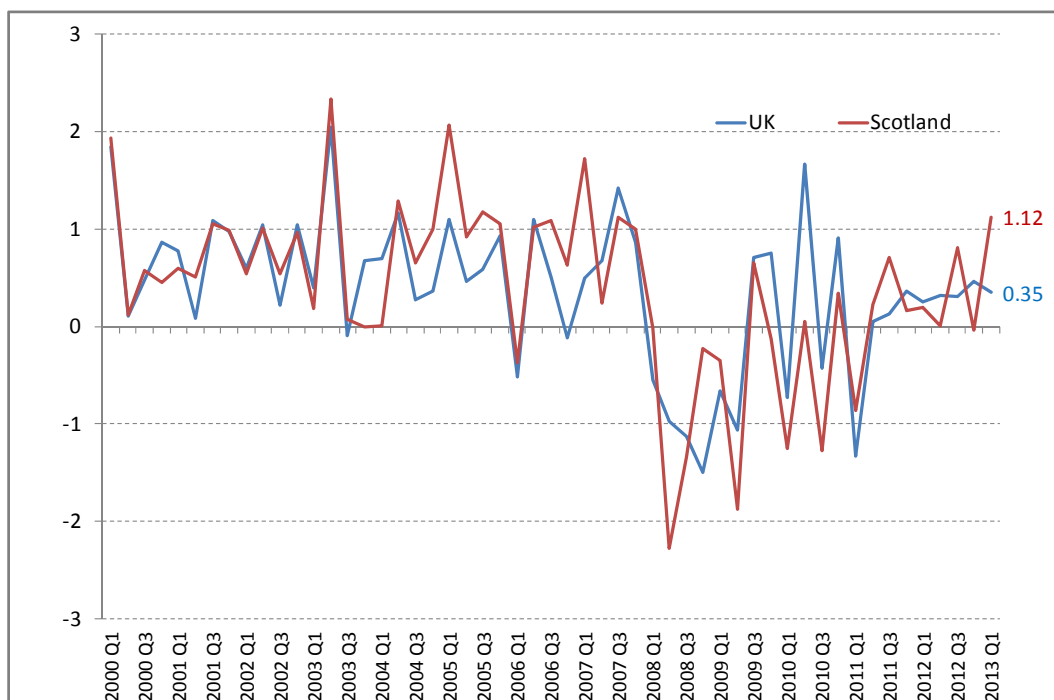
Figure 1 shows how the household savings ratio has evolved to the first quarter of 2013 in Scotland and the UK. These data imply that Scottish households have made more significant adjustments to their savings pattern than UK households. While through 2011 the gap between Scottish and UK savings ratios was closing, in the first half of 2012 this widened further. It has not yet reached the same gap as during the end of 2010, although the current savings ratio of 8.1% in Scotland is 3.9 percentage points higher than in the UK.

Figure 1: Household savings ratios, Scotland and UK, Q1 1998 to Q1 2013



Sources: (Experimental) Scottish National Accounts Project data (Scottish Government) and UK Quarterly National Accounts (National Statistics).

Figure 2: Household real consumption spending growth, Scotland and UK, Q1 2000 to Q1 2013



Sources: (Experimental) Scottish National Accounts Project data (Scottish Government) and UK Quarterly National Accounts (National Statistics) and FAI calculations.

Comparable Scottish and UK data on household income and consumption growth are available up to the end of the first quarter of 2013. These show that after a real terms contraction in Q2, spending in Q3

grew by 0.9% in the quarter. UK consumer spending grew by only 0.23% in the same quarter (See **Figure 2**). Relative to their pre-recession spending peaks, Scotland and the UK are respectively 4.5% and 3.8% below the peak seen in the final quarter of 2007.

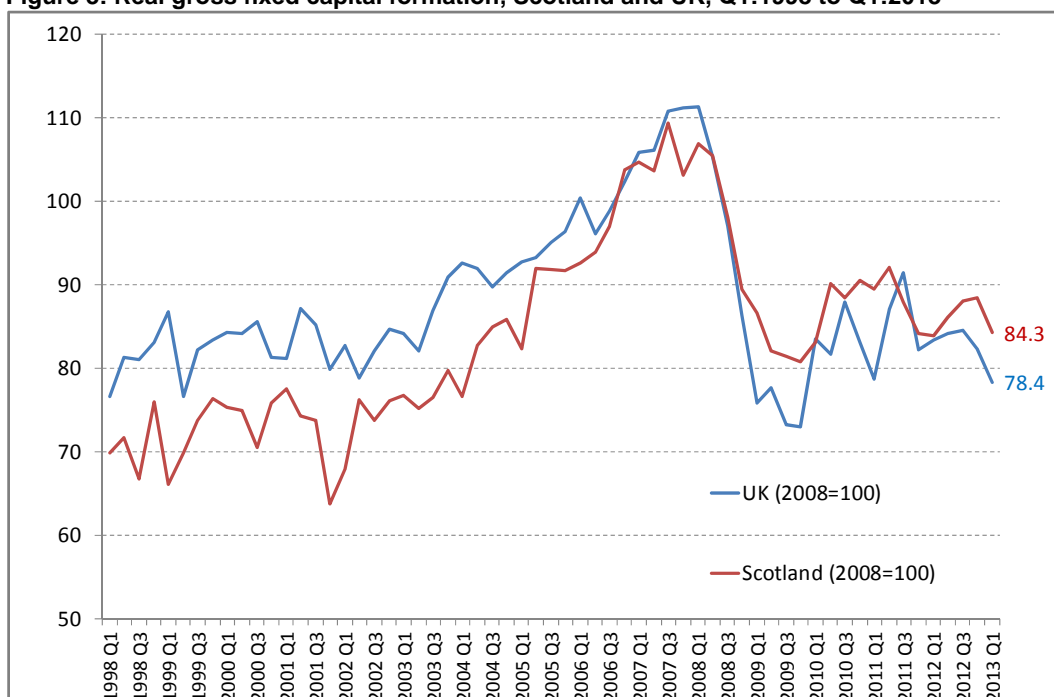
The latest Scottish Retail Sales Index shows a second consecutive quarter of real terms growth in the volume of sales in the second quarter of 2013. While growth was again lower than in Great Britain as a whole, the positive trend suggests some signs of a potentially returning consumer confidence, however there is no detailed breakdown of these purchases in the official series. Positive trends in car sales have been widely reported, with a 14% growth in new car registrations in Scotland in September 2013 (on September 2012). This was higher than growth in the UK as a whole (12.1%). Without further information on the bodies making these registrations – and “live” indexes of car purchases either by individuals or companies for fleet purposes – it is difficult to unpick the content of these as a measure of consumer confidence.

The Scottish Retail Sales Monitor for August 2013 reported an exceptional summer performance continuing into August, and suggesting a strong Q3 2013 is likely. While some of this is weather driven, the trend in like-for-like sales exceed its 12-month trend indicating that the sector continues to grow, albeit at levels slightly below that seen in the UK in the last month. An itemised breakdown suggests that food purchases rose strongly, while there were mentions for strong growth in non-food items including furniture and flooring. The report noticeably warned of retailers “hoping that the uplift in consumer confidence is sustainable”.

Box 1: Accounting for the economic impacts of the 2014 Commonwealth Games

Many Scottish households will have found out whether they were successful in obtaining tickets for next year’s Commonwealth Games in Glasgow, which run from the end of July into August 2014. Although tickets are being purchased in the final quarter of 2013, standard national accounting practice means that this does not show up in the GDP measures for Scotland until the event takes place – and the “product” (i.e. the event) occurs. This will mean that Q3 of 2014 will see an uptick in GDP due to the Commonwealth Games occurring then. That doesn’t mean that there have been, or are no impacts, on the Scottish economy before then, as a direct result of the Commonwealth Games. Firstly, construction of stadia and the athletes village will have impacted on GDP in the quarter in which that activity took place. Secondly, there may be some impact on GDP in the current quarter to the extent that there were transactions fees on the purchases of tickets for the events. These are likely to be small in aggregate however, and significantly lower than the value of ticket sales themselves.

Figure 3: Real gross fixed capital formation, Scotland and UK, Q1:1998 to Q1:2013



Sources: (Experimental) Scottish National Accounts Project data (Scottish Government) and UK Quarterly National Accounts (National Statistics) and FAI calculations.

Investment

Figure 3 shows that real investment spending (including public and private spending) remains significantly below its pre-recession values. The relative reduction from peak is around 6 points more in the UK than Scotland. While it appeared that the Scottish economy had seen rising investment through 2012, the latest figures suggest that the fall in UK investment in the last two quarters has spread to the latest quarter of Scottish data. Overall investment levels remain stubbornly close to their trough at the end of 2009.

The latest figures from the Scottish Chambers' Business Survey and Scottish Construction Monitor see improvements in construction sector activities and optimism, despite continued net balances below the 50% no change level. New build activity remains a weakness, although there is increasing optimism consistent with the house funding schemes encouraging new activity in the sector. Increasing recruitment and recruitment difficulties in attracting staff at all levels (supervisory and junior) point to evidence of less pessimistic sentiment in the sector.

Trade

The most recent figures on Scottish exports were released on the 23rd of October. The Index of Manufactured Exports results for the second quarter of 2013 revealed growth of 3.5% in real terms on the first quarter of 2013, the second consecutive quarter of positive growth of exports in real terms (and following a quarter of zero per cent growth). On a "rolling annual" basis exports of manufactured goods had declined by 1.8%. This index is the most timely official estimate of overseas trade for Scottish products, although it does not cover non-manufactured goods, it still captures of the order of 60% of all exports from Scotland to the rest of the world.

Quarterly growth in the series of 3.5% in the last quarter is the highest quarterly change since the first quarter of 2011, and indeed the third highest quarterly change since the second half of 2008. On a sectoral basis – despite the small sample and therefore high volatility to these figures – the food and drink sector was the only category to see a reduction in its exports, driven by a contracting in food exports in the quarter. Over the last year however, that sector has been an important driver of Scotland's export performance, and is responsible for of the order of 30% of Scotland's overseas (i.e. non-UK) exports. The volatility of the series for another major exporting industry in Scotland – Refined petroleum, chemical and pharmaceutical products – itself worth almost a quarter of Scottish exports to the rest of the world, is evident from the recent series.

The threatened closure of the Ineos petrochemicals facility could have impacted on the Scottish economy through a number of channels, which are discussed in the Outlook and Appraisal. The consequences for Scottish exports could have additionally been critical. The latest Input-Output tables (for 2009) show that around two-thirds of the output of the "Coke, petroleum and petrochemicals" sector is sold to markets outside Scotland.

This uptick in exports to the rest of the world is consistent with improving activity indicators for Scotland's major export markets through 2013.

Table 1 shows the latest growth forecasts for Scotland's major (non-UK) export markets in 2013 and 2014. The picture has improved since our June forecast, with the latest IMF forecasts for some of these markets improving, while the downward revisions to US and China growth are relatively small (but clearly important given the scale of these economies, and their positions as the two largest economies in the world). While China is forecast by the IMF to see slower growth in 2014 than 2013, this is the exception among the areas reported in Table 1.

Markit's Eurozone Composite PMI survey for September 2013 rose to 52.2, up from its August value of 51.5, with figures below 50 indicating a contraction. This has typically been a good predictor of Eurozone GDP activity, albeit that some of the most recent movements appear to be tracking GDP measures with a slight lag. This index has moved up steadily since March 2013 and has been above the 50.0 mark of expansion throughout the third quarter of 2013, giving the strongest quarterly growth rate since the second quarter of 2011.

Across the manufacturing and service sectors this index showed consistent movements, with expansion indicated in both measures, underpinned by a rise in new orders. Of the major economies of the Eurozone, only Spain (49.6) had an index in contraction and there were signs of stabilisation in both

France and Italy. Germany economic expansion continued to drive the recent growth of the Eurozone as a whole, although these data suggest that the other major economies will pick up towards the end of 2013.

The latest minutes of the MPC commented on the mixed evidence from the US economy over the last month, after some stronger signs earlier in the year. With some strengthening in the manufacturing index, and some signs of slowing in US consumer spending growth the picture was mixed. The federal shutdown showed the potential for political uncertainty to impact on economic activity – as it will when figures for the final quarter of 2013 are available, but its overall impact is likely to be small. Prospects in Japan appeared to be stronger than previously anticipated, with strong upswings in business confidence. However, the MPC notes that inflation expectations had rose, as intended, and that structural reforms to the labour market would be required to strengthen the Japanese economy in the medium term.

Table 1: Economic growth forecasts for 2013 and 2014 for major Scottish export markets, plus UK, China and Euro area (including % changes from earlier forecasts where available)

	2013			2014		
	IMF (October 2013)	Revision from July 2013	OECD (June 2013)	IMF (October 2013)	Revision from July 2013	OECD (June 2013)
USA	1.6%	-0.1%	1.9%	2.6%	-0.2%	2.8%
Netherlands	-1.3%	n/a	-0.9%	0.3%	-	0.7%
France	0.2%	0.3%	-0.3%	1.0%	0.1%	0.8%
Belgium	0.1%	n/a	0.0%	1.0%	-	1.1%
Germany	0.5%	0.2%	0.4%	1.4%	0.1%	1.9%
Ireland	0.6%	n/a	1.0%	1.8%	-	1.9%
UK	1.4%	0.5%	0.8%	1.9%	0.4%	1.5%
China	7.6%	-0.2%	n/a	7.3%	-0.4%	n/a
Euro area	-0.4%	0.1%	-0.6%	1.0%	0.0%	1.1%

Source: World Economic Outlook, International Monetary Fund (October 2013) and Economic Outlook, No. 93, OECD (June 2013).

Forecasts for the Scottish economy: Detail

The latest GDP, trade and major business confidence survey figures for Scotland point to improving economic conditions in Scotland into the second half of 2013. However, surveys also highlight the weaknesses remaining in a sustainable recovery continuing to gather momentum. The expected “surge” out of recession from rebounding investment and business confidence continues to prove elusive, while evidence from anticipated “rebalancing” away from domestic to non-Scottish markets appears weak, albeit that since we last forecast in June the leading indicators for the UK as a whole (Scotland’s largest trading partner) have tended to move in a positive direction. Such developments – positive movements in reported indicators and business survey figures through the third quarter of 2013, but continued wariness about the strength of the recovery – underpins our revisions to forecasts for growth and unemployment in the Scottish economy over the next few years.

The Bank of Scotland PMI results for September continue to suggest a strengthening performance through 2013 for private sector activity, reporting a recovery “gaining momentum” between the second and third quarters of the year. The survey indicated a rise in export orders and new business orders for manufacturing, however the same results suggested a decline in the rate of growth of manufacturing in the same period, partly driven by a significant fall in backlogs of new work. It appears that the survey picture would support a view that growth appeared to be returning to some parts of the economy, however downside risks remain as the drivers of that growth appear to be uncertain and potentially unsustainable.

On the domestic side of the economy, with extended fiscal contraction at the Scottish level projected to 2017-18, and some 60% of the reduction in Scottish Government current spending still to occur, we must focus on the outlook for household and investment expansion. Household spending growth

appears to have increased over the last few quarters, however this appears to be alongside slow growth in real incomes and declining savings ratio. These suggest that a consumer-led recovery is far from sustainable over the medium-term. In our central forecast, we have revised up our forecast for household consumption growth through 2013, but held steady our forecast for household consumption growth in 2014. Government expenditure is forecast to fall in real terms over the forecast horizon and beyond.

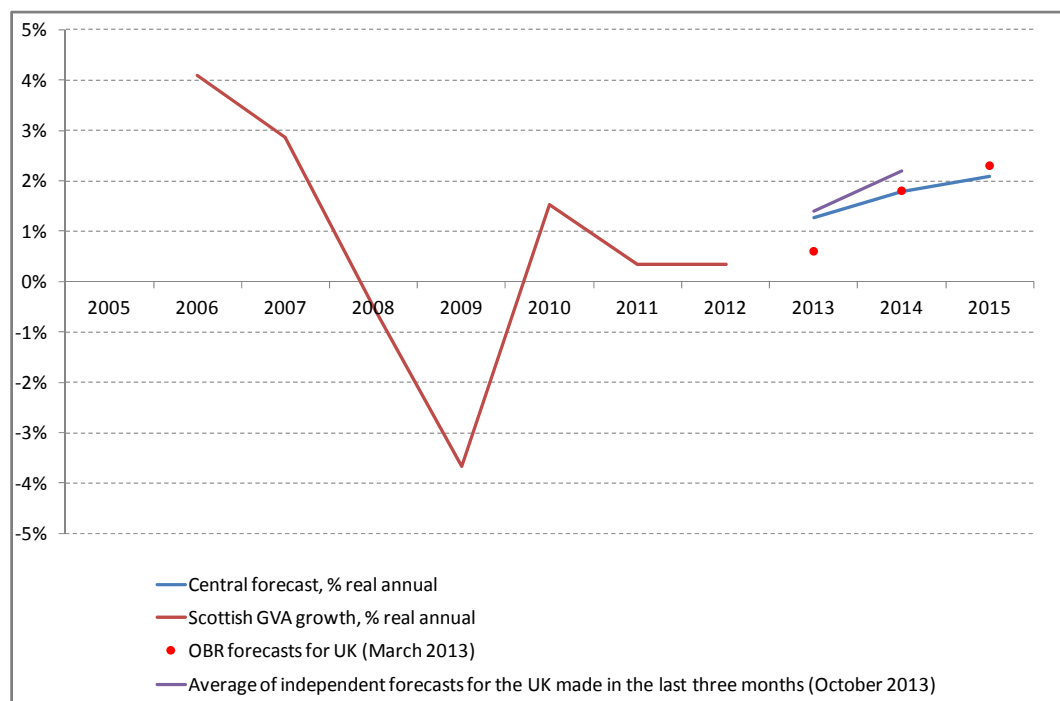
The latest results from surveys suggest that there are continued weaknesses in the short term outlook for investment intentions. Export markets overall show some signs of improvement through 2013, although the recent performance of the Scottish economy in generating products for exports remains weak, despite some promising figures in the second quarter of 2013. The Eurozone economies appear to be slowly recovering, but there are continued downside risks from the strength of the recovery across the major economies of Euro, with the exception of Germany. The robustness of the recovery in the UK as a whole, which is the largest market for Scottish goods and services, will be critical for the ability of Scotland's economy to generate exports and grow. With the possibility of disruption to chemical and refinery exports, or at worst closure to Scotland's largest manufacturing facility, there is significant potential for the level of Scottish exports to adjust rapidly through the end of 2013 and into 2014.

Results

In this issue of the *Commentary*, we are forecasting year-on-year real growth in key economic and labour market variables, including aggregate Gross Value Added (GVA) and employment and unemployment, over the period 2013 to 2015. The model used is multi-sectoral, and where useful, results are reported at the sectoral level.

We begin with the (central) forecasts for growth in the Scottish economy. Our new forecasts for 2012, 2013 and 2014 are shown in **Figure 4**. This also shows for comparison purposes only, a number of different sources' forecasts for the UK over the same period. These sources are the Office for Budgetary Responsibility (OBR) which last forecast in March 2012, and will release new forecasts later in November 2012 and the median of recent forecasts produced by professional forecasts for each year of the forecast window.

Figure 4: Forecast annual real GVA (%) growth for 2013 – 2015: Scotland and UK



Sources: *Fraser of Allander Institute forecasts*, Office for Budgetary Responsibility and HM Treasury (various months).

Our forecasts for real GDP growth in Scotland in 2013 and 2014 are now 1.3% and 1.8% respectively, up from our June forecasts of 0.9% and 1.6% respectively. However, these new forecasts are higher than our forecasts from earlier in 2013 in part due to better than expected outturn data on household

expenditure growth, and increasingly optimistic surveys for growth through 2013. The forecast for growth in 2015 has been held at 2.1%.

In addition to the aggregate growth forecasts, Table 2 presents our forecasts for GVA growth for each year by broad industrial grouping, i.e. for the “production”, “services” and “construction” sectors of the Scottish economy.

Table 2: Scottish GVA growth (%) by sector (2013 to 2015)

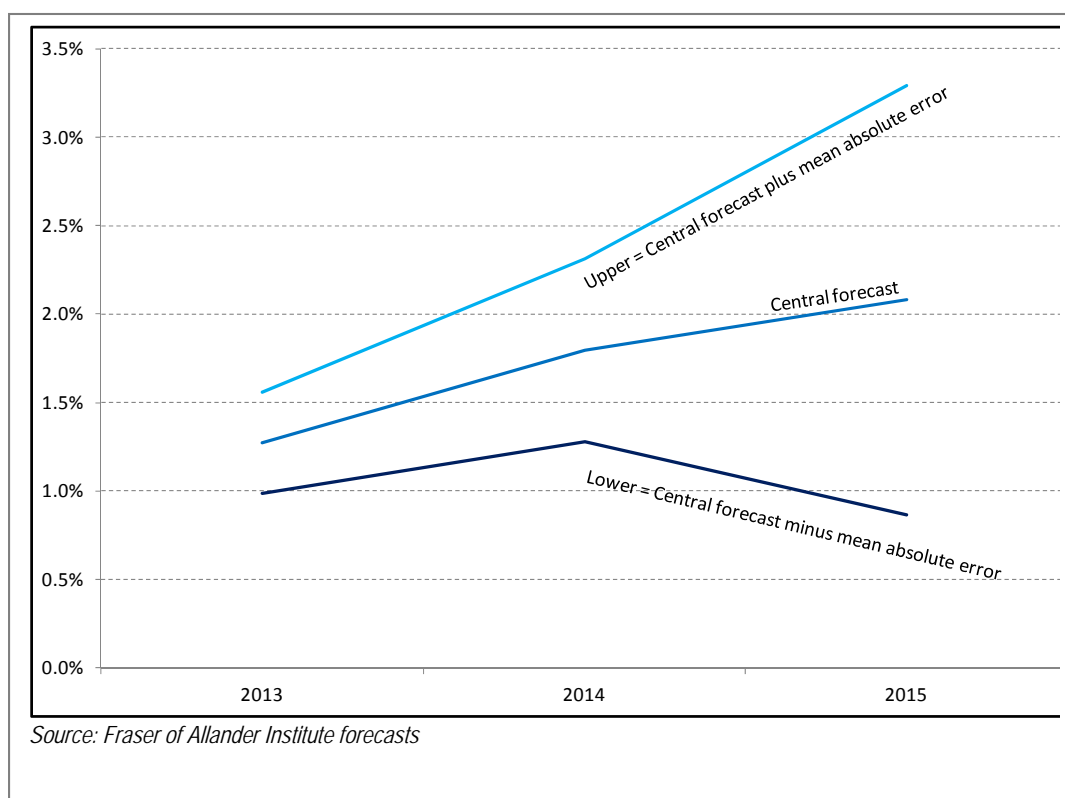
	2013	2014	2015
GVA	1.3%	1.8%	2.1%
Production	1.5%	2.2%	2.5%
Construction	1.0%	1.4%	1.3%
Services	1.2%	1.7%	2.0%

Source: Fraser of Allander Institute forecasts, October 2013

We use our calculated historical forecast errors (e.g. the difference between aggregate growth forecasts and what outturn figures were) to show the potential range of outcomes around our central forecast.

For forecasts made in the autumn (September to December) period of year, FAI forecasts of the first estimates of GVA growth in that year have had an average absolute error of 0.287 percentage points (i.e. 2013 in this case). While for the following year (i.e. 2014 in this case), our autumn forecasts have an average absolute error of 0.516 percentage points. Again, we use the mean absolute error for the longest forecast period for the longest forecast – in this issue, to 2015 - as we do not yet have a long history of forecasts of growth made over a three year horizon. These historical errors give the ranges around our central estimates of Scottish GVA growth shown in Table 2. The estimated range around our central forecasts of GVA growth in each year is shown in **Figure 5**.

Figure 5: GVA growth for Scotland, 2013 to 2015, possible range of outturn growth



Employment

Detailed commentary on recent developments in the Scottish labour market can be found in the *Overview of the Scottish Labour Market* section of this Commentary. Here we focus on the forecasted trends and levels for the number of employee jobs in the Scottish economy.

The most recent data show that in the second quarter of 2013, there were 2,343 thousand employee jobs in Scotland, an increase of 31,000 on the end of 2012. It also showed that on a seasonally adjusted basis, the number of such jobs declined in the first quarter of this year.

Our forecasts for employee jobs at the end of 2013, 2014 and 2015, including a breakdown by broad sectoral groups, are shown in Table 3. The number of employee jobs is forecast to increase by just over 21,000 over the year to the end of 2013, to rise to 2,332 thousand. This is up from our June 2013 forecast of employee job numbers rising by just over 12,000 during the year. As with previous forecasts, and outturn data for employee jobs in Scotland, much of the increase in the forecast period is anticipated to come in the service industries. Through 2014 and 2015 we expect the number of employee jobs to increase each year (by 1.2% and 1.6% respectively), which is in line with our latest forecast. The higher base for employee jobs means that the absolute number of jobs created in each year is slightly raised from our forecasts from Summer 2013. The employee jobs forecast consistent with our central, upper and lower growth forecasts are given in Table 4.

Table 3: Forecasts of Scottish employee jobs ('000s, except where stated) and net change in employee jobs in central forecast, 2012 to 2014

	2013	2014	2015
Total employee jobs (000s), Dec	2,332	2,359	2,398
Net annual change (jobs)	21,200	27,200	38,400
% change from previous year	0.9%	1.2%	1.6%
Agriculture (jobs, 000s)	29	31	33
Annual change	1,100	1,800	2,150
Production (jobs, 000s)	248	248	252
Annual change	650	400	4,250
Construction (jobs, 000s)	121	122	123
Annual change	-50	958	1,550
Services (jobs, 000s)	1,935	1,959	1,989
Annual change	19,500	24,050	30,450

Note: Absolute numbers are rounded to the nearest 50.

Source: Fraser of Allander Institute forecasts

Table 4: Net annual change in employee jobs in central, upper and lower forecast, 2013 to 2015

	2013	2014	2015
Upper	27,900	38,100	68,750
Central	21,200	27,200	38,400
Lower	15,750	16,450	11,400

Note: Absolute numbers are rounded to the nearest 50.

Source: Fraser of Allander Institute forecasts

Unemployment

We present our forecasts for unemployment at the end of 2013, 2014 and 2015 in our central forecast in Table 5. In line with the forecasts from June 2013, we report the forecasted level (number) of those unemployed by the ILO definition. This is preferred to the claimant count measure, for example, as it

gives a more complete indication of the extent of labour resources available for work but unable to find work, and so is a better measure of the level of spare capacity in the labour market.

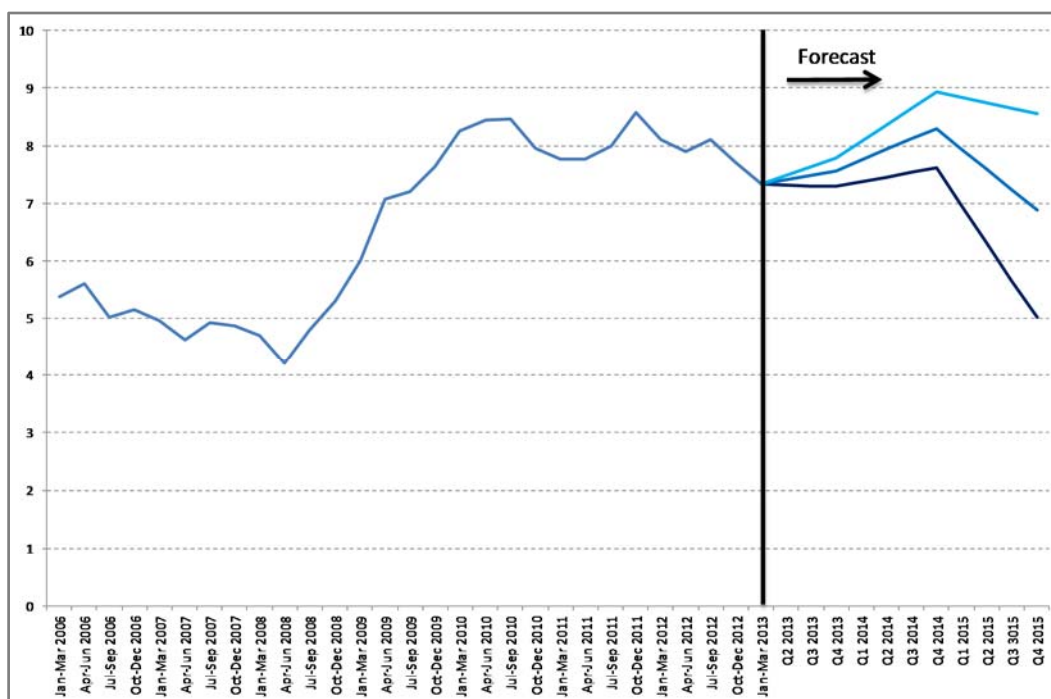
We have revised these down from our latest forecast, and are now forecasting a level of ILO unemployment at the end of 2013 of 7.6% (down from 7.9% forecast in June) and 8.3% and 6.9% in 2014 and 2015 (down from 8.4% and 7.0%) respectively. We show the history of the ILO unemployment rate since 2006 and our central and upper/lower forecasts for this variable to 2015 in Figure 6.

Table 5: Forecasts of Scottish unemployment in central forecast, 2013 to 2015

	2013	2014	2015
ILO unemployment	204,550	224,800	186,450
Rate (%)	7.6%	8.3%	6.9%

Notes: Absolute numbers are rounded to the nearest 50. ¹ = rate calculated as total ILO unemployment divided by total of economically active population aged 16 and over. The most recent labour market figures are detailed in the *Labour market* section of the *Fraser Economic Commentary*.

Figure 9: Scottish ILO unemployment rate, history and forecast: 2006 to 2015



Source: Fraser of Allander Institute forecasts

Grant Allan
Fraser of Allander Institute
22nd October 2013

Review of Scottish Business Surveys

Overall

Recent business surveys, in the main, have been optimistic and many indicate that the Scottish economy is at last moving in the right direction and that the worst of the recession is over. Most surveys show growing confidence and rising expectations for the coming quarters.

Oil and gas services

The revival of the oil and gas sector in the UKCS continued with rising confidence, investment and activity. The UKCS continues to benefit from record investment in new developments and improvement to existing assets and infrastructure, the strongest for more than three decades' (OGUK 2013:3).

The latest Aberdeen Chamber Oil and Gas Survey (No 19 Spring 2013) reported that with the latest projections for oil & gas output being for 'flat out' production to 2017; record levels of investment in new fields are forecast for 2013. A net balance of both operators and contractors reported working at or above optimum levels. Firms, on balance, continued to work above planned levels and a record 97.8% of contractors were seeking to recruit staff. More than half of contractors and operators reported increases in the total number of staff with a strong demand for permanent staff.

Oil and Gas UK, in their latest index reported that business confidence in the UK offshore oil and gas industry in the first quarter of this year remained unchanged from the Q4 2012. The index remained static at 60, indicating the continuing general positive outlook of the industry. Contractors were more positive while confidence among operators eased.

Private sector

The Bank of Scotland's latest PMI for September 2013 showed 'survey-record equalling' rates of growth in both output and new business in Scotland's private sector economy. Donald MacRae, Chief Economist at Bank of Scotland, said: "September's PMI showed the private sector of the Scottish economy continuing to expand across both manufacturing and service sectors providing further evidence of the strengthening of the recovery. Output and new business rose at survey-record equalling rates accompanied by growing employment and rising new export orders. The PMIs of the last six months suggest the Scottish economy not only grew in quarter two this year but saw that growth accelerate in quarter three. The recovery is gaining momentum."

The June PMI reported that growth in the private sector in Scotland had accelerated sharply and the July survey showed a further strong expansion in business activity. The August PMI reported that growth had consolidated further and gained momentum.

The September PMI reported sustained strong growth in business activity and in the level of new business. Employment in Scotland's private sector also rose during September, most notably among service sector firms. The report noted that backlogs of work had accumulated at businesses during September and that the latest increase was more marked than in previous months.

Production

The Bank of Scotland Scottish Business Monitor (SBM) reported a rise in turnover in the production sector, the overall net balance in the three months to end August 2013 was +24%, in stark contrast to the -5% of the previous quarter and the -2% of the same quarter of 2012. Expectations for turnover in the next six months were positive with a net of +21% of respondents expecting a rise. The SBM reported that total

volumes of business showed the second largest rise of any indicator in the Monitor with a net balance of +24%, a large improvement on the -4% of the previous quarter and the -6% of the same quarter one year previously.

The SBM reported that concerns over credit availability increased and concerns over credit costs fell. The Monitor also noted that the importance attached to the exchange rate increased dramatically for production businesses at the end of 2008 but fell back to the levels of four and a half years ago; however there was a slight increase in the level of importance attached to the exchange rate in the latest quarter.

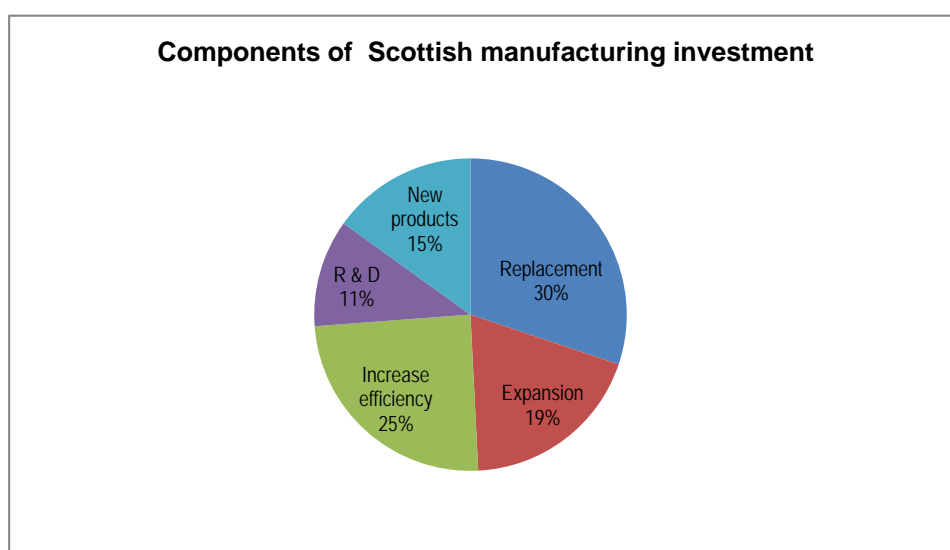
Manufacturing

During the third quarter of 2013 business confidence continued to improve for a net of 18% of Scottish Chambers' Business Survey (SCBS) respondents, a significant improvement from the -21.8% for the same quarter of 2012. Only 12% of SCBS firms were less confident compared to Q2 2013. Scottish Engineering respondents reported that business optimism generally improved during Q3 2013.

During the three months to the end of September a net balance of 16.7% of SCBS respondents reported a rise in total orders (the highest net balance since the third quarter of 2007); more than a third of firms reported a rise in total new orders and fewer than a fifth reported a decline. SCBS respondents remain optimistic as to the trends in orders for Q4 2013 (+19.1%). Average capacity utilisation rose by one percentage point over the quarter and was more than two percentage points higher than during the third quarter of 2012. The number of firms reporting working below optimum levels continued to decline. Expectations for both turnover and profitability over the coming 12 month period remain positive for a net balance of SCBS firms.

Scottish Engineering firms reported that the total order intake increased during the third quarter. Within the sectors only non-metal products experienced a negative trend and all other sectors (notably mechanical equipment and fabricators) were positive. Engineering respondents reported that UK orders maintained a healthy level and expectations are that orders will generally remain positive. Export orders in general improved in Q3 and predictions for the next quarter, in general remain positive. Scottish Engineering firms reported that for the vast majority of companies, prices were unchanged but a net balance reported an increase.

The trends in investment in plant/machinery improved during Q3 for a net balance of SCBS manufacturing respondents (+8%). New investment continues to be directed towards replacement (53%) or to improve efficiency (33%). Capital investment plans were more positive than in the previous quarter for Scottish Engineering firms and training investment plans also continue to grow.



Source: Scottish Chambers' Business Survey Q3 2013

During the three months to the end of September a net balance of SCBS firms reported a rise in total employment levels (+13%), the highest net balance in two years. A fifth of firms increased pay during the three months to the end of September and the average increase was marginally up from the previous quarter at 3%. A third of SCBS reported seeking to recruit staff compared to 39% in Q2, and slightly fewer than a third of these recruiting firms reported difficulties. Staffing levels remained positive for a net balance of Scottish Engineering firms and forecasts for Q4 are that the upward trends will generally continue.

Construction

The decline in business optimism among SCBS firms continued (-3.7%) compared to the previous quarter although once again, at least 80% of firms reported a rise/no change to optimism levels. The Scottish Construction Monitor recorded the first overall positive rating since the Survey began in 2008 reporting that industry confidence had improved by 31 points in Q3, (a fifth consecutive period of improving confidence since the Q2 2012 survey). Half of Construction Monitor respondents were more confident about their future prospects compared to just over one fifth remaining less confident.

As forecast by respondents from the previous Survey, the trend in total new orders/contracts declined for SCBS firms in Q3, although the net balance (-18.5%) was better than in Q3 2012 (-33.3%). A net of 14.8% expect a further decline in Q4. Capacity utilisation eased marginally from 81.4% to 80.8% and despite the marginal decline this was higher compared to the same period a year ago (74.6%). Public sector orders continued to decline (although the decline is expected to ease marginally towards the end of the year) and domestic/house build orders (-26.1%) also continued to decline. The upward trend in private commercial orders (+8.3%) continued.

The Scottish Construction Monitor focused their investment question on the training and development of managerial and supervisory staff and reported that just under one third of respondents reported that investment levels were adequate to meet their business needs. Whereas slightly more than one third of respondents reported that investment in this area was not currently a priority for their business and the remaining one third of respondents said a lack of confidence in their future work pipeline and/or a lack of finance was restricting the amount they were able to invest in training and development of managers / supervisors.

Cash flow trends deteriorated for SCBS construction respondents (-22.2%) and the decline worsened from the previous quarter (-3.6%). Turnover (-7.4%) and profitability (-18.5%) are still expected to be weak over the next 12 months together with continued pressure on margins. More than half of responding firms continue to expect tender margins to worsen during the coming year.

There was a net rise in total employment levels in Q3 and a net balance of SCBS firms (-7.7%) expect a further rise in Q4. Recruitment activity strengthened (from 29% to 38%) as did recruitment difficulties (from 19% to 23%). Average pay increases decreased marginally from 3.3% in Q2 to 3.2%.

Services

According to the SBM, service businesses showed an improvement in turnover in the three months to August 2013 and the survey reported a significant rise in the total volume of business. Expectations for turnover in the next six months are showing an overall net balance of +18%. Concerns over credit availability and credit costs were unchanged for firms in the services sector. The importance attached to late payment increased slightly among service firms in the latest Business Monitor and concerns over cash flow were unchanged.

Since late 2008 there has been a widespread fall in the importance attached to staff availability according to the SBM this is widely thought to reflect a lower rate of staff recruitment and a low level of business confidence. In the latest Business Monitor, the importance attached to staff availability over the next three months increased significantly for service firms.

Wholesale/logistics

The downward trend in business optimism amongst SCBS wholesalers eased further from -43.7% in Q1, -21.4% in Q2 to -13.3% in Q3. The downward trend in sales eased from 42.9% in Q2 to -6.7% in the current quarter and the net balance in sales was better than expected. A net balance expect the decline to worsen (-15.4%) in the fourth quarter.

More than three-quarters of SCBS wholesalers (78.6%) continued to report increased pressures from transport costs and to a lesser extent, firms also remain under pressure from raw material costs (40%) and pay settlements (40%). More than half of firms (60%) expect to increase prices over the next three months. The downward trends in both turnover and profitability continued in Q3. Two thirds of firms reported no change to investment plans; and for the first time since 2011 the trend was upward (+6.7%).

SCBS wholesale respondents, as expected, continued to report a net decrease in overall employment levels during Q3 although the decline was not as steep as forecast. More than half sought to recruit staff (60%) and 42% of these firms reported recruitment difficulties. The average pay increase in Q3 was 2.3% compared to 2.0% in Q2.

Retail distribution

Business confidence among SCBS retailers improved from -24.5% to +2.1% (the first positive net balance since Q4 2006). This is also a marked improvement compared to Q3 2012 (-42.4%). The recent negative trend in overall sales ended, with a net of 4.3% of SCBS firms reporting an increase compared to a net of -36% reporting a decline in Q2. Encouragingly, a further rise is anticipated for Q4 (+2.3%).

Retail figures from the Scottish Retail Sales Monitor conducted by the Scottish Retail Consortium (SRC) reported that after a strong summer, sales slowed in September when compared to recent months but the three-month average (3.1%) was up compared the twelve-month average (1.2%). The figures in August had been the strongest for four years and the July figures showed an increase of 4%. The SRC concluded that despite consumer confidence holding up in September the slowdown in sales may indicate that consumers are saving for Christmas.

Cost pressures for SCBS firms remain historically high and continued to increase in the three months to the end of June. Utility costs and raw material prices continued to be of particular concern. Pressures on margins eased considerably in Q3. A net balance of 15% expect a rise in turnover (compared to -13.6% in the previous quarter) and a net of -10.4% expect a decline in profitability (compared to -17.8% previously) – the highest net balances since Q3 2007.

The trend in total employment levels unexpectedly rose in Q3 and almost 80% of SCBS retailers expect no change in Q4. Fewer than a quarter of firms reported increasing pay, and the average increase rose from 2.8% in Q2 to 5.3% in the current quarter.

Tourism

The good summer weather had a positive impact on Scottish hotels as business confidence rose for a net balance of SCBS firms (+27.8%) in the three months to September 2013. This was the highest balance of optimism since 2006. As expected a net balance of SCBS hotels reported a rise in visitors and a net balance of 15% anticipate a further rise in Q4.

Average occupancy improved from 69% to 75%, up 7 percentage points compared to Q3 2012 (68%). During the third quarter of 2013 trends in bar/restaurant trade and conference/ function facilities declined although firms expect a small net rise in bar/restaurant use. A net balance (+20.4%) reported a rise in the average daily room rate, although a fall is expected (-3.6%) in the three months to the end of December. The Scottish Accommodation Occupancy Survey (SAOS) is commissioned by VisitScotland and carried out by research agency TNS, found that in the period January to August 2013 average occupancy increased by 5 percentage points compared the same period of 2012.

63% of SCBS hotel respondents (compared to 74% previously) reported the lack of tourist demand as the primary business constraint. Competition, poor transport infrastructure, high fuel costs and weak marketing of the area also remained a concern to hotels.

Over 60% of SCBS hotels sought to recruit staff and only 14% of these hotels reported recruitment difficulties. Employment trends improved, although the decline is set to resume in Q4.

Outlook

Many of the surveys conducted over the summer have reported the best set of results since the start of the recession – and many of the surveys showed better results than had been anticipated. Nevertheless the outlook remains challenging and doubts remain as to how sustainable or fragile this recovery is, and can the good results be maintained or even consolidated or are these figures an aberration?

According to the Bank of Scotland the PMI surveys for the last six months the Scottish economy grew in quarter two this year, and growth accelerated in quarter three. The latest Bank of Scotland Business Monitor (SBM) showed a turnaround in performance of the Scottish economy with an acceleration into growth in the summer months of June, July and August and expectations are high for this surge in growth to continue for the next six months.

One of the main drivers of the Scottish economy is consumer spending and whilst retail figures improved over the summer (partly buoyed by the good weather), there has been no real rise in household incomes for some time and the September retail figures showed a slowdown. Rising energy bills and limited wage increases resulting in a lack of disposable income could add to the fears that the recovery to lose some of its momentum.

Eleanor Malloy
Fraser of Allander Institute
October 2013

Current trends in Scottish Business are regularly reported by a number of business surveys. This report draws on:

1. *Oil & Gas UK Index Q 1 2013*
2. *Lloyds TSB Business Monitor Issue August 2013 –November 2013;*
3. *Scottish Chambers' Business Survey Q3 2013*
4. *Scottish Engineering's Quarterly Review Q3;*
5. *The Bank of Scotland Markit Economics Regional Monthly Purchasing Managers' Indices for June – September 2013;*
6. *The Scottish Retail Consortium's KPMG Monthly Scottish Retail Sales Monitors for August and September 2013.*

Overview of the Scottish labour market

Interest in the Scottish labour market continues to focus on the trends in employment and unemployment and in this issue we return to these themes. This section provides an overview of key labour market data in Scotland, contrasting it with both UK performance and providing selected time-series data, from a range of the latest labour market data for Scotland and the UK, to Q3 2013.

Recent trends and statistics

The latest comparable figures on the labour market between Scotland and the United Kingdom in the quarter to September 2013 are summarised in Table 1. Labour Force Survey (LFS) data show that in the quarter to September the level of employment in Scotland rose by 37 thousand, to 2,548 thousand. Over the year to August 2013, employment in Scotland rose by 58 thousand. For the same period, UK employment rose by 279 thousand. The Scottish employment rate (16 – 64) – those in employment as a percentage of the working age population – was 72.8%, up 1.6% from one year earlier. For the same period the UK employment rate was 71.7%, up 0.4% compared to a year earlier. Scottish unemployment, in the quarter to September, fell by 3 thousand to 201 thousand, a fall of 20 thousand over the year.

In considering employment, activity and unemployment rates it is important to remember the bases and relationships of these figures. LFS data (estimated) is provided for: (1) all aged 16 and over and (2) for all aged 59/64. The first measure (all aged 16 and over) leads to higher numbers in employment, in the total economically active and economically inactive – but reduces the economic activity rates and unemployment rates, but at the same time increases the economically inactive rate. Conversely the second measure (all aged 16 to 59/64) leads to lower numbers economically active, in employment and economically inactive – but leads to a higher economically active, employment and unemployment rates but lower economically inactive rates. Figures derived from the Labour Force Survey differ slightly from those derived from the Annual Population Survey.

Table 1: Headline indicators of Scottish and UK labour market, Jun – Aug 2013

		Scotland	Change on quarter	Change on year	United Kingdom	Change on quarter	Change on year
Employment*	Level (000s)	2,548	37	58	29,869	155	279
	Rate (%)	72.8	0.9	1.6	71.7	0.3	0.4
Unemployment**	Level (000s)	201	-3	-20	2,487	-18	-40
	Rate (%)	7.3	-0.2	-0.8	7.7	-0.1	-0.2
Inactivity***	Level (000s)	722	-28	-36	8,954	-83	-88
	Rate (%)	21.3	-0.8	-1.1	22.2	-0.2	-0.3

Source: ONS Labour Market Statistics, Scotland and UK, October 2013

Notes: * Levels are for those aged 16+, while rates are for those of working age (16-59/64)

** Levels and rates are for those aged 16+, rates are proportion of economically active.

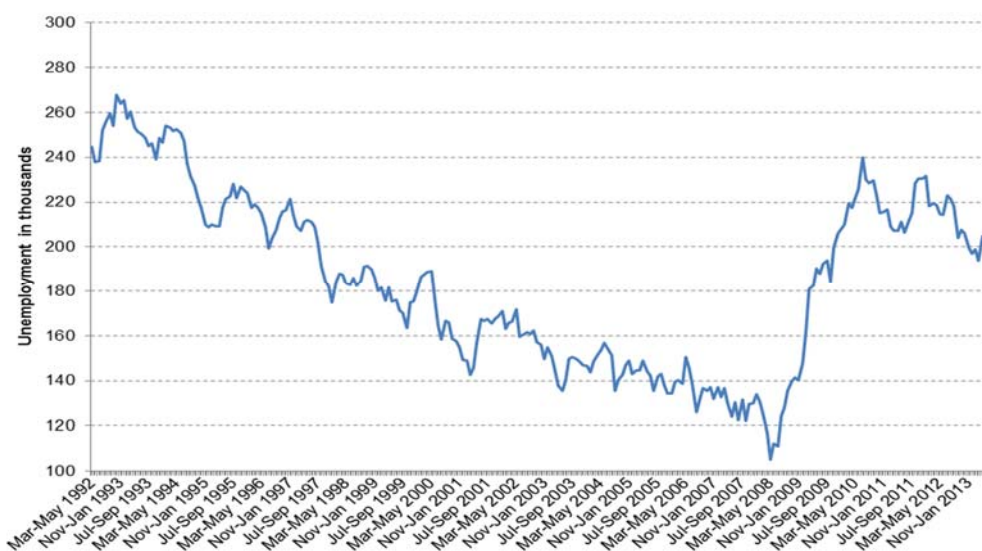
*** Levels and rates for those of working age (16-59/64)

The relationships between employment, unemployment, totally economically active and inactive are important in appreciating changing levels of employment and unemployment, and changes in the

employment rates should be seen in conjunction with changes in the activity rates. If people leave employment and become unemployed (but are still economically active) the unemployment rate increases, but the economically active rate remains unchanged. However, if people leave employment and do not seek employment, as seems to be a continuing pattern, they are categorised as economically inactive, and as such the unemployment rate remains unchanged whilst the activity and inactivity rates change. Equally the changing pattern between full and part time employment is of interest and once again we return to this issue later in this section. This is clearly shown in Table 1. Over the year to August 2013, the numbers employed rose by 58 thousand, whilst unemployment fell by 20 thousand – and the numbers of those aged 16-64 who are economically inactive fell by 28 thousand and the numbers economically active rose by 30 thousand.

Table 1 shows that for Scotland the preferred International Labour Organisation (ILO) measure of unemployment fell to 201 thousand, between June – August 2013, a fall of 20 thousand over the year. The ILO unemployment rate fell in the months to August 2013 and now stands at 7.3%. This represents a 0.2% fall over the last quarter and a 0.8 per cent fall over the year. The comparable ILO unemployment rate for the UK stands at 7.7%, and is down 0.1% over the most recent quarter and also down 0.2% over the year.

Figure 1: Trend in Scottish unemployment 1992 – June-August 2013 (thousands)



Source: ONS Labour Market Statistics, Scotland, October 2013

Table 2: Employment rates (%) by age and selected age cohorts, July 2004 – June 2013

(In %)	All 16+	16 - 64	16 - 17	18 - 24	16-24	25 - 34	35 - 49	50 - 64	65+
Jul 2004 - Jun 2005	59.4	72.6	43.4	69.1	63.4	79.3	82.0	62.1	5.1
Jul 2005 - Jun 2006	59.7	73.0	43.1	68.1	62.7	79.5	82.9	63.0	5.0
Jul 2006 - Jun 2007	60.6	73.9	43.1	68.7	63.2	81.1	83.7	64.2	5.6
Jul 2007 - Jun 2008	60.8	74.2	39.4	68.5	62.2	81.6	83.9	65.5	5.7
Jul 2008 - Jun 2009	59.8	72.8	38.0	65.9	60.0	80.3	82.3	64.8	6.6
Jul 2009 - Jun 2010	58.3	71.0	30.4	62.2	55.6	78.3	81.0	64.4	6.5
Jul 2010 - Jun 2011	58.2	70.9	33.6	61.2	55.6	79.0	81.5	63.3	6.7
Jul 2011 - Jun 2012	58.0	70.9	29.0	59.9	53.7	79.6	81.3	64.2	7.1
Jul 2012 - Jun 2013	57.6	70.6	29.8	59.1	53.2	79.2	81.1	64.0	8.1

Source: ONS Labour Market Statistics, Scotland, October 2013

Note: Denominator = all persons in the relevant age group

Figure 1 illustrates the trend in unemployment in Scotland since 1992. Unemployment peaked in October – December 1992 at 268,000, it took almost five years - to August - October 1997 - to be consistently below 200,000 and a further five and a half years - to February – April 2003 - to be below 150,000 and reached the lowest number (111,000) in May – June 2008. Unlike the pattern of the previous recession unemployment has fallen more rapidly to just above 200,000, this may reflect the more rapid rise in part time and self-employment (see Figure 2 and Table 5).

Table 3: Employment, unemployment, inactivity and claimant count rates by Local Authority Area, July 2012 – June 2013

(In %)	Employment rate 16 - 64	Unemployment rate	Econ inactivity rate 16-64	Claimant count rate
SCOTLAND	70.6	7.8	23.3	4
Aberdeen City	75.6	4.6	20.1	1.9
Aberdeenshire	79.5	3.1	18.1	1.2
Angus	72.8	6.3	21.4	3
Argyll & Bute	71.7	6.1	24	3.4
Clackmannanshire	64.4	9.8	27.5	5.2
Dumfries & Galloway	68	8	25.2	3.7
Dundee City	64.3	11	27.6	5.7
East Ayrshire	67.6	11	23.6	5.9
East Dunbartonshire	77.1	5	19.5	2.5
East Lothian	73.9	6.4	21.1	3.1
East Renfrewshire	72.5	5.8	22.7	2.3
Edinburgh, City of	73.1	6.7	21.5	3.3
Na h-Eileanan an Iar	70.8	6.4	24.3	2.9
Falkirk	74.1	7.8	20.1	4.3
Fife	68.7	9.2	23.2	4.5
Glasgow City	59.9	11.5	32.7	5.7
Highland	73.6	5.3	22.6	2.6
Inverclyde	66.9	10.2	25.3	5.2
Midlothian	73.9	6.3	23.4	3.9
Moray	79.6	4.8	16.4	2.3
North Ayrshire	61.7	13.1	27.9	6.6
North Lanarkshire	70.7	10.1	20.8	5.2
Orkney Islands	82.8	3.3	14.2	1.3
Perth & Kinross	74.5	5.3	20.7	2.2
Renfrewshire	70.8	8.4	23.3	4.8
Scottish Borders	74.4	5.5	21.6	3
Shetland Islands	77.2	3.4	21	1.4
South Ayrshire	69.3	8.4	23.7	4.4
South Lanarkshire	74.5	7.4	20	4.5
Stirling	69.1	8	23.7	3.1
West Dunbartonshire	67	10.8	25.1	6.3
West Lothian	73	7.7	20.4	3.8

Source: First Release October 2013 (Annual Population Survey, Job Centre administrative system, BRES)

Notes: Claimant count averaged for 12 month period

The economically active workforce includes those individuals actively seeking employment and those currently in employment (i.e. self-employed, government employed, unpaid family workers and those on

training programmes). Between June – August 2013 the numbers economically active (16+) rose by 33 thousand and the activity rate rose by 0.7 to 64%. There were 2,749 thousand economically active people in Scotland during June – August 2013. This comprised 2,548 thousand in employment (2,472 thousand aged 16 – 64) and 201 thousand ILO unemployed. The level for those of working age but economically inactive fell by 28 thousand in the latest quarter, and decreased further by 36 over the year thousand to 722 thousand people.

Economic inactivity for men aged 16 – 64 rose by 0.7% over the year, but fell by 2.8% for women over the year. In the year to December 2012 the changes in the reasons for inactivity were: student up 3 thousand, looking after family/home up 8 thousand, retired down 9 thousand and long term sick up 4 thousand. The numbers temporarily sick rose by 2 thousand. The majority 587 thousand did not want a job – but 204 thousand were inactive but wanted employment.

Data on employment by age, derived from the Annual Population Survey, is available up to June 2013. In the year to June 2013 employment rates fell for those aged 18 – 24, but rose for those aged 50 and over. Table 2 illustrates the changing employment rates by age group for July 2004 onwards.

Table 3 indicates the continuing significant variations in employment, unemployment and inactivity rates at the local authority level. In the year July 2012 to June 2013 employment rates varied from over 80% in Shetland to between 65 - 70% in six local authority areas and below 65% in three local authority areas. Likewise unemployment rates varied from 3.1% to 13.1%.

Table 4 provides some indications, although with reservations, of the changing pattern of employment since July 2006/June 2007 for different occupational groups.

Total workforce job figures are a measure of jobs rather than people. Total seasonally adjusted workforce jobs for June 2013 (the latest available figures) stood at 2,643 thousand, 2,343 thousand employee jobs, 282 thousand self-employed jobs, HM forces and supported trainees 19 thousand. Table 5 indicates the sectoral breakdown and provides some indication of both the impact of the recession and the recovery on sectors, although the trends need to be considered with some caution.

Table 4: Percentage in employment by Standard Occupational Classification (SOC), 2006 - 2013

(In %)	Jul 06- Jun 07	Jul 07- Jun 08	Jul 08- Jun 09	Jul 09- Jun 10	Jul 10- Jun 11	Jul 11- Jun 12	Jul 12- Jun 13
Managers, directors and senior officials	8.3	8.7	8.9	8.9	8.6	8.3	8.6
Professional occupations	17.6	17.8	18.5	17.7	18.4	19.0	19.9
Associate prof & tech occupations	12.4	12.5	12.7	12.6	13.0	12.9	13.0
Administrative and secretarial occupations	12.1	11.9	11.5	11.6	10.9	10.9	11.0
Skilled trades occupations	11.8	12.1	12.0	11.8	11.6	11.4	11.1
Caring, leisure & other service occupations	9.5	9.4	9.0	9.6	9.8	9.8	9.0
Sales and customer service occupations	8.9	8.8	8.7	9.1	9.3	9.2	9.0
Process, plant and machine operatives	7.4	7.3	7.2	6.8	6.8	6.6	6.4
Elementary occupations	11.9	11.2	11.2	11.5	11.4	11.5	11.3

Source: Annual Population Survey, NOMIS

Notes: Rounding means totals do not add to 100

Table 5: Total workforce jobs* by industry, Scotland, June 2006–2013

Industry (in thousands)	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13
Agriculture, forestry & fishing	52	59	58	54	60	50	52	50
Mining & quarrying	28	30	30	30	30	29	33	34
Manufacturing	228	229	214	204	186	187	202	202
Electricity, gas, steam & air conditioning supply	10	13	12	16	21	20	20	17
Water supply, sewerage, waste & remediation activity	18	17	19	16	14	17	17	15
Construction	196	203	202	187	168	176	173	172
Wholesale & retail trade; motor vehicles/cycles repair	388	386	402	392	379	372	372	381
Transport & storage	117	121	121	117	111	111	119	119
Accommodation & food service activities	195	192	196	193	172	179	191	183
Information & communication	74	81	70	76	70	67	71	66
Financial & insurance activities	114	99	107	102	91	90	89	87
Real estate activities	31	32	34	34	27	31	29	29
Professional scientific & technical activities	156	163	175	176	173	177	199	190
Administrative & support service activities	179	191	198	196	195	189	193	207
Public admin & defence; compulsory social security ²	177	181	177	162	160	154	154	152
Education	209	203	207	197	198	208	202	205
Human health & social work activities	398	382	395	368	376	381	392	399
Arts, entertainment & recreation	79	74	83	70	77	86	92	94
Other service activities	63	65	62	58	65	61	50	41
People employed by households, etc.	10	7	5	3	5	2	2	1
All jobs	2,720	2,727	2,766	2,650	2,577	2,587	2,653	2,643

Source: ONS Labour Market Statistics, Scotland, October 2013

Notes: * Workforce jobs are a measure of jobs rather than people
There are extensive revisions from previous figures

Table 6 outlines the changing patterns of full time and part time employment, and highlights the growth in the numbers of part time workers in Scotland, the latest data (July 2012 – June 2013), over the past year indicates that the number of employees has fallen by 5 thousand whereas the numbers of self-employed have decreased by 4 thousand.

Table 6: Trends in total, full-time, part-time, self-employed and temporary employment etc and those unable to find a full-time job.

All in employment (in thousands)	Total	Emp- loyees	Self employed	Full- time workers	Part- time workers	Workers with second jobs	Temporary employees	Could not find full-time job
Jul 2006 - Jun 2007	2,519	2,237	263	1,880	637	95	134	60
Jul 2007 - Jun 2008	2,544	2,254	271	1,912	629	98	125	61
Jul 2008 - Jun 2009	2,515	2,235	264	1,880	632	103	123	73
Jul 2009 - Jun 2010	2,464	2,181	265	1,804	657	99	126	96
Jul 2010 - Jun 2011	2,471	2,181	274	1,796	672	95	131	114
Jul 2011 - Jun 2012	2,473	2,156	299	1,779	687	100	118	115
Jul 2012 - Jun 2013	2,468	2,151	295	1,782	675	94	130	115

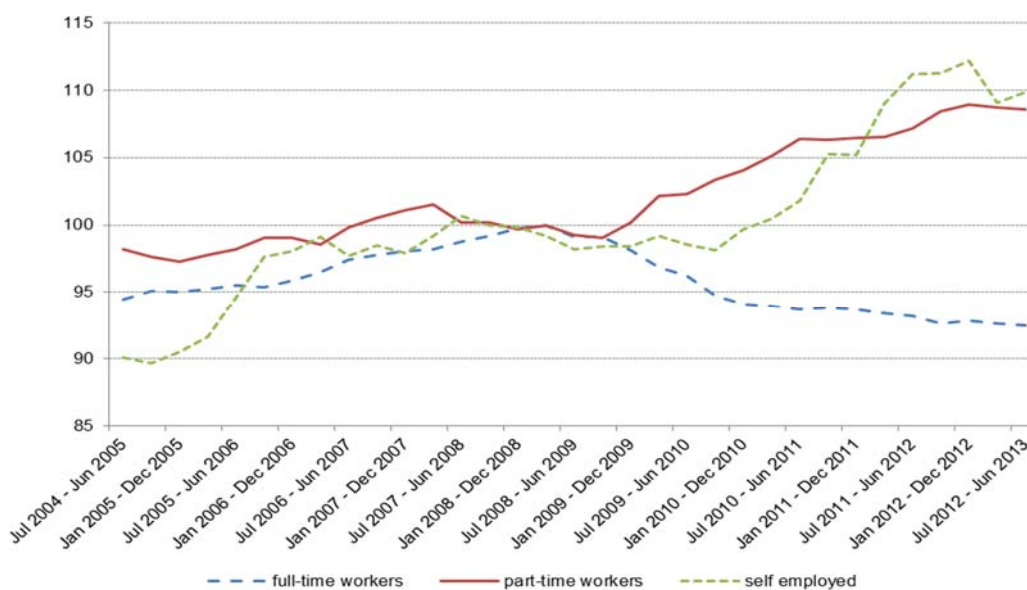
Source: ONS Labour Market Statistics, Scotland, October 2013

Notes: 1. Includes people who did not state whether they worked part time or full time
2. The split between full time and part time employment is based on respondents' self-classification

Table 6 indicates the numbers of full time workers in Scotland since July 2006 – June 2007 declined by 98 thousand whilst part time employment numbers recovered very quickly and are now 37 thousand higher and self-employed 33 thousand higher. The changing trends in full and part time employment since October 2007 – September 2008 are shown in figure 2. The rising number of self-employed indicates some substitution of self-employment for employment. The number of those working part time because they could not find a full time job is 55 thousand higher since July 2006 – June 2007, suggesting that increasing numbers of workers are taking part time employment in the absence of full time work.

Figure 2 illustrates how the employment ‘recovery’ continues to be driven by an increase in part time work and self-employment. This changing pattern of employment may help to explain why the link between employment and GDP seems different to previous recessions.

Figure 2: Trends in full, part time and self-employment 2004 - 2013 (Oct 2007 – Sept 2008 = 100)



Source: ONS Labour Market Statistics, Scotland, October 2013

Table 7 provides some limited indications of the experience of unemployment in terms of claimant count by age and duration. The latest figures suggest that 35.5 thousand have been claiming benefit for more than a year, down 3 thousand over the year and 18.9 thousand have been claiming for more than 2 years, up 6.6 thousand (or a change of 53.4%) over the year.

Table 7: Total claimant count and computerised claims by age and duration (Numbers in September 2013 and percentage change over year to September 2013)

(In thousands)	All computerised claims	All computerised claims Up to 6 months	All computerised claims Over 6 and up to 12 months	All computerised claims All over 12 months
All 16+ numbers	115.9	59.9	20.4	35.5
All 16+ % change over	-14.4	-18.1	-13.8	-7.8
All 18 – 24	30.1	19.5	4.9	5.7
All 25- 49	65.0	31.5	12.0	21.5
All 50 and above	20.3	8.6	3.5	8.3

Source: ONS Labour Market Statistics, Scotland, October 2013

Public sector employment in Scotland continues to decline, although at a slower rate than previously. The latest data at the time of writing this section (Q2 2013) indicates that there were 578,600 (549,300 excluding public sector financial institutions) employed in the public sector in Scotland, a decrease of 6,000 (1.0%) over the year. It must be noted that this level is now similar to that seen in 2003. Employment in the devolved public sector declined by 3,000 (0.6%) to 486,000, due mainly to declines in employment in local government.

Andrew Ross
Fraser of Allander Institute
October 2013

A post-Independence Scottish immigration system: how it might be shaped by European Union requirements *

Professor Robert E. Wright, University of Strathclyde

Abstract: This paper examines how the SNP Government's "double desire" of independence and European Union membership would impact on its ability to design and deliver an effective immigration policy. Most EU legislation is concerned with refugees and asylum seekers and says little about how economic immigrants and family reunification immigrants are selected. As such, the main conclusion is that EU legislation will not impact unduly on an immigration system designed by a post-Independence Scotland. However, the expectation is that Scotland would be obliged to join the Schengen Area - and leave the current Common Travel Area. This view is contrary to that of the Scottish Government whose current stated preference is that an independent Scotland should remain in the Common Travel Area, with the Rest of UK (RUK) and the Republic of Ireland. The positive benefits of Scotland joining the Schengen Area have not been, as yet, fully explored by either the Scottish or UK Government.

* I am grateful to Dr. Mariarosalba Angrisani, University of Naples, Federico II, for her research assistance. However, all remaining errors, shortcomings and omissions are entirely the responsibility of the author.

1. Introduction

Scotland's independence referendum will take place on 18 September 2014. If the majority of the population aged 16 and older vote "yes", it is accepted by the Scottish and UK Governments that this would be a mandate for Scotland to leave the UK and become a "new" European Union (EU) member state. If Scotland does achieve independence it will need to construct institutions that it currently does not have. This goes well beyond deciding what currency to use, or how to pay out pensions and welfare benefits, or what tuition fees should be charged to English students wishing to study at Scottish universities. The focus of this paper is how an independent Scotland will deal with immigration. Immigration is currently a "reserved power", which means that immigration policy is decided by the UK Government and the immigration system is managed by the Home Office UK Border Agency. Currently, the Scottish Government plays no significant role in immigration matters. Therefore, an independent Scotland would need to put in place an immigration system and formulate an immigration policy that focuses on Scotland-specific needs and interests.

To a certain extent, Scotland "taking control" of immigration may well be welcomed by a majority of Scots and for a variety of reasons. One reason may be that it will allow Scotland to significantly reduce if not "stop" immigration and in a sense pursue a policy in line with what the Prime Minister David Cameron wants for the UK as a whole. Another view is that it would allow Scotland to use immigration strategically as a source of lower-cost labour to help provide services for the domestic population, without having to grant residence and pay welfare benefits. What would happen in reality will almost certainly be somewhere between these two views, with immigration policy being geared to both economic and humanitarian considerations.

What is clear is that Scotland will not be able to do entirely what it wishes with respect to immigration if it is serious about being a member state of the EU. The EU has clear expectations on what is required of "new" member states with respect to immigration. These rules and regulations are embodied in the so-called *Lisbon Treaty*. This legislation is enforced by Directives and Regulations, which are the most important forms of binding EU Law issued by the European Union Council of Ministers and the European Parliament. The author does not wish to enter into the debate about whether Scotland will be able to make a smooth transition - or will have to re-apply - to be the 29th EU member state. However, the working assumption used here is that either outcome will require an independent Scotland to "toe the line" with respect to current EU legislation.

This paper is organised as follows: Section 2 argues that an independent Scotland could (quite easily) build an effective immigration system based around five general classes of immigrants. Section 3 considers how such an immigration system would be shaped by EU legislation, while Section 4 considers the implications of the *Schengen Agreement*. Conclusions follow in Section 5.

2. Immigrant Classes

There is a large body of research in the field of population economics concerned with designing immigration systems aimed at meeting specific economic and social criteria (see Constant and Zimmermann, 2013). In addition, detailed data has been collected relating to the effectiveness of immigration systems in a variety of countries. This includes countries with “points-based” selection mechanisms that emphasise employability (e.g. Australia, Canada and the UK) as well as countries with selection mechanisms based on other criteria like family reunification (e.g. the United States). It is the author’s view that it would not be a difficult task to design and implement an immigration system in an independent Scotland that is based on Scottish economic and labour market considerations.

In order to focus this discussion, assume that Scotland becomes an independent country *outside* the European Union. If this was the case, then Scotland could put in place an immigration system that builds on the good practices developed in countries that “manage” their immigration. In addition, Scotland would not be required to following the good - or bad -practices prescribed by a dominant and larger political entity, be that the UK or EU.

Such a system might be based around five general immigrant types or classes. The first class is *Economic Migrants*, who migrate almost exclusively for reasons of employment and earnings. Within this class, there are three sub-classes: the (1) “high-skilled”; (2) “low-skilled”; and (3) “entrepreneurs”. A points-based immigration system, not dissimilar to that currently in place in the UK, could be used to “select” low-skilled and high-skilled immigrants (see Mosca and Wright, 2009). With respect to entrepreneurs, a set of relevant thresholds could be set: the amount of money to be invested in the Scottish economy and/or the number of jobs to be created in new enterprises.

The second class of immigrants is *Refugees and Asylum-seekers*. With only three international airports, and sea ports far from the main refugee source countries, it seems unlikely that Scotland would attract a large number of individuals applying (directly) for asylum at its ports of entry. However, as a good global citizen Scotland would likely wish to be a party to the *United Nation’s 1951 Convention and 1967 Protocol on Refugees* (see United Nations, 2011). This would require that Scotland grant asylum to a given number of refugees on an annual basis. Given the experience of other countries that are party to the Convention and respond to the global refugee challenge, it is estimated that this would translate into Scotland accepting about 400 people per annum. This is a very small number of immigrants when compared to Scotland’s population of 5.3 million and net-migration that over the past few years has averaged between 20,000 to 25, 000 per annum.

The third class is *Family Reunification Immigrants*. An example would be a non-Scottish citizen who marries a Scottish citizen. A key question here is what other “relatives” - if any - would be treated as family reunification immigrants: mothers, fathers, sisters, brothers, cousins etc.? In addition, a points-based system could be configured to allow the allocation of points for having a relative or relatives who are citizens living in Scotland (as is done in Australia and Canada). Deciding how far down the family tree family reunification would “count” in terms of points, however, can be a tricky issue.

The fourth class of immigrants is *Students*. Most would be studying at higher education institutions. Whether it is appropriate to refer to international students as “immigrants” *per se* is debatable. Scotland has a large higher education sector compared to England and many other high-income countries and it is, in effect, an important ‘export’ sector of the Scottish economy. International students make a significant contribution both in terms of their tuition fees and costs-of-living expenditure to the Scottish economy (see Bell et al., 2013). It is all too forgotten that most students return to their country of origin on graduation so their migration is “temporary”. However, there does seem to be demand amongst international students to stay in Scotland after graduation to gain practical work experience in an English-speaking environment. This was permitted by the “Fresh Talent Initiative” introduced by the then Scottish Executive and First Minister Jack McConnell in 2004 and the system was later adopted by the UK as a whole. This has now been abolished across the UK by recent UK immigration policy reforms. However, lumping students in with the other classes of immigrants (as is current practice) seems inappropriate since they are very different in nature to other classes of immigrants.

The fifth class of immigrants is immigrants who do not fit into any of the other four classes. This is in a sense a residual category, which can simply be referred to as *Other Immigrants*. It would include temporary workers who come to Scotland to work in a specific job for a specific time period (e.g. in agriculture or fish processing). It would also include foreign nationals who are employed by a foreign-owned company or multi-national. Such immigrants could be dealt with through a system of visas and work permits.

In addition to the criteria that define each of these classes of immigrants, a Scottish immigration process should contain, for obvious reasons, some form of criminal background and medical health checks. The

expenses associated with both could be recouped in an application fee (as is common in most countries). Scotland would need to create an institution similar in function to the *Home Office UK Border Agency* to manage the system. Discussion now turns to how EU requirements would impact on the design and delivery of a Scottish immigration system were Scotland to become an EU member state.

3. Immigration and EU Legislation

There is no precedent for a “region” within an EU member state forming a new country and therefore, there is no precedent of a “region” within an EU member state forming a new country and becoming a new EU member state. Much of law (and practice) is based on precedent, and as a consequence it is to be expected that many EU member states are watching very carefully what is happening in Scotland given their own domestic political circumstances. However, there are many historical examples of countries that have split up and formed new countries - sometimes a large set of new countries (eg the Soviet Union). There are also examples of countries that have split up into new countries and then joined the EU as member states (e.g. Czechoslovakia split into the Czech Republic and Slovakia). There are also former countries (e.g. Yugoslavia) that have split up into several countries, some of which have become EU member-states (e.g. Croatia) and others who have not (e.g. Bosnia and Herzegovina, Macedonia, Montenegro, Slovenia and Serbia).

In the event of a “yes” vote, the UK Government’s view is that an independent Scotland would be considered a “successor state” (see HM Government, 2013). This is consistent with international law and based largely on the fact that London would remain the capital of the rest-of-the-UK (RUK). As a successor state, an independent Scotland would need to create a new set of international relationships while already established UK international relationships would remain with what remains of the UK (RUK). The President of European Commission, Jose Manuel Barroso has made his position clear about what an independent Scotland would need to do: “The UK would continue to exist as before, with only Scotland as a new state. Any new independent country would have to apply to join the EU”. The bottom-line is that an independent Scotland is not guaranteed “automatic” EU membership.

It is the author’s view that Scotland’s scope to negotiate with the EU would be negligible and the interpretation of Barroso’s position is that Scotland would need to agree to and adopt fully current EU legislation as embodied in the *Lisbon Treaty*. That is, were Scotland to wish to make a smooth transition from being a part of an “old” EU member state to being a “new” member state, at minimum, Scotland would have to adopt ALL the provisions of the *Lisbon Treaty*, including those relating to immigration. The *Lisbon Treaty* is an agreement that represents the set of rules and requirements that both specify and determine EU membership. These rules are enforced by Directives and Regulations, which are the most important forms of binding EU Law issued by the EU Council of Ministers and the European Parliament. Put slightly differently, a country wishing to join the EU must agree to these requirements and once a member state it must follow these requirements as rules of law and hence practice. It is not possible to view such requirements as a list of “recommended” principles from which a country wishing EU membership can simply “pick and choose”.

Historically, some EU member states have been able to “opt-out” from EU legislation. Likewise some EU member states have been allowed to “opt-in” to only certain aspects of EU legislation. This effectively means that such member states do not have to follow policies agreed by the other EU member states. It should therefore not be surprising that opt-outs are in fact rare: Denmark and the UK have four opt-outs each; Ireland has two opt-outs; and Sweden has one “de facto” opt-out (relating to the use of the euro currency as it did not participate in the so-called “ERMII” currency arrangement, which fixes the exchange rate between the domestic currency and Euro for two years prior to adoption, so “technically” Sweden did not meet a key requirement). Since 2004, thirteen countries have joined the EU, almost doubling its total membership. In the same period, of these 13 countries, only one has been allowed one opt-out: Poland. (The Czech Republic had reached agreement with the European Commission about a future opt-out, however, this was recently voted down by the European Parliament).

In order to better understand what the EU would require of Scotland to follow with respect to immigration attention turns to three specific areas of the *Lisbon Treaty* as included primarily in:

- *Articles 26, 77, 78 and 79 of the Treaty on the Functioning of the European Union;*
- *Title V: Area of Freedom, Security and Justice, Chapter II: Policies on Border Checks, Asylum and Immigration.*

More specifications are provided for by the *Protocols Additional to the Treaty*:

- *Protocol No. 19 on the Schengen acquis integrated into the framework of the European Union. This is the former Protocol No. 2 integrating the Schengen acquis into the framework of the European Union;*

- *Protocol No. 20* on the application of certain aspects of Article 26 of the *Treaty on the Functioning of the European Union* to the United Kingdom and to Ireland;
- *Protocol No. 21* on the position of the United Kingdom and Ireland in respect of the Area of Freedom, Security and Justice.

Table 1 presents a summary what the author believes are the main EU regulations relating to immigration. The table also shows whether the UK has opted into or opted-out of these regulations.

EU Legislation	Opt-In	Opt-Out
1. Directive 2004/38/EC on The Free Movement	Not fully implemented	
2. Directive 2004/58/EC on Citizenship	X	
3. Directive 2003/9/EC on Asylum Reception Conditions	X	
4. Council Regulation (EC) No 343/2003 (Dublin II System)	X	
5. Directive 2004/83 on Refugee Qualification	X	
6. Directive 2005/85/EC on Asylum Procedures	X	
7. Directive 2001/51/EC on Carriers Sanctions	X	
8. Directive 2001/55/EC on Temporary Protection	X	
9. Directive 2003/86/EC on the right to family reunification		X
10. Directive 2003/109/EC on a long-term resident status for non-member nationals		X
11. Directive 2004/114/EC on the admission of students		X
12. Directive 2005/71/EC for the facilitation of the admission of researchers into the EU		X
13. Directive 2008/115/EC for returning illegally staying third-country nationals		X
14. Directive 2009/50/EC concerning the admission of highly skilled migrants		X

With respect to the five immigrant classes discussed above, there is little in EU law that restricts the way “economic immigrants” are selected. For example, the author can find nothing that, for example, is contrary to the UK’s current points-based system. There is a Directive relating to international students that refers mainly to conditions of admission of third-country nationals for the purposes of studies, pupil exchange, unremunerated training or voluntary service. However, these requirements are not inconsistent with current UK and Scotland practice since the *Bologna Accords* have been adopted. These two immigrant classes will most certainly be important economically and culturally in an independent Scotland and EU legislation will not impose on how such individuals are selected (see Coldwell, Lisenkova and Wright, 2011). There appears to be no EU requirements concerning family reunification immigrants. Finally, EU member states have the right to have a national system of visa, residence permits and work permits as long as such holders do not have the right to reside (and hence work) in other EU member states. However, a clause in Article 77 states that the EU should pursue a “... policy on visas and other short-stay residence permits”. There is considerable legislation surrounding Refugees and Asylum-seekers and in the longer-term their aim is to move forward in a step-by-step manner to create a European Asylum System, something much in the news given recent tragic events in Lampedusa, Italy. The UK has opted-out of several of these requirements while opting-in to others. As mentioned above, EU requirements for refugees and asylum-seekers would not likely impinge much on Scotland, mainly because the expected numbers would be very small. Much of this legislation is concerned with establishing the minimum standards in the ways in which those seeking asylum should be treated. These requirements are very specific and detailed. It is the author’s view, however, that current UK practice is above these minimum standards.

An independent Scotland would be expected to join the *Blue Card*. This is a system to attract highly-qualified immigrants by supporting member states and EU companies' efforts to fill gaps in their labour markets that cannot be filled by their own citizens, other EU citizens or legally-resident non-EU citizens. Once a member state grants a *Blue Card* to an immigrant, after two years that person can move to a job in another member state in an unrestricted manner (i.e. before obtaining EU citizenship). It is clear that the *Blue Card* system will result in an independent Scotland ceding some control over this class of immigration. However, it is the author's view that the flow of *Blue Card* immigrants to Scotland would be small, especially relative to the numbers of EU citizens moving from other member states to Scotland. In addition, Scotland would likely lose immigrants to other member states but not to what remains of the UK since the UK is not a member of the *Blue Card* system. It is unclear whether Scotland would be a net-loser or net-gainer in the two-way flow of *Blue Card* holders.

4. The Schengen Agreement

A controversial EU requirement relates to the so-called *Schengen Agreement*. The "Schengen Agreement" led to the establishment of the "Schengen Area". The Schengen Area is a group of countries where there are no internal borders between them. One outcome of this is that individuals are able to travel between countries without a passport and border controls. Individuals do have to carry some form of *bona fide* identification and are not exempt from border checks. Citizens from outside the Schengen Area need to apply for only one visa when visiting several countries in the Schengen Area, instead of applying for one for each of the countries they will visit. Non-EU countries can also apply to be a member of the Schengen Area. Membership in the Schengen Area requires that border forces and police agencies across the Schengen Area be more integrated and work more closely together.

The *Schengen Agreement* has been incorporated into the European Union's legal framework by the *Treaty of Amsterdam* (1997), and is consequently part of the *Lisbon Treaty*. A Protocol attached to the *Treaty of Amsterdam* incorporates the developments brought about by the *Schengen Agreement* into the EU framework. The Schengen Area is now within the legal and institutional framework of the EU and is now, and has been for some time, a key feature of EU membership.

There are 22 EU member-states that take *full part* in the Schengen Agreement: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and Sweden. There are 4 non-EU countries that take *full part* in the Schengen Agreement: Iceland, Liechtenstein, Norway and Switzerland. There are 4 EU member-states are *bounded* to be part of the Schengen Agreement but not yet entitled to accede to the Agreement: Bulgaria, Croatia, Cyprus and Romania. There are only 2 EU member-states who are *not full members*: the United Kingdom and the Republic of Ireland.

The cases of Bulgaria, Croatia, Cyprus and Romania are informative. These countries have agreed to join the Schengen Area but currently must follow border practices similar to those EU member-states that border on non-EU countries. This decision was made by the European Commission and not by the individual countries applying for membership, so it is ABSOLUTELY NOT an example of these countries somehow "opting-out of Schengen". The Commission's decision was based on its assessment as to whether a country is ready at the time of entry to fulfil the practical obligations and requirements of the legislation and not by any means a "choice" made by the country seeking entry. The main reason these countries failed to comply is that they have "leaky borders" with non-EU countries. More specifically: Bulgaria with Macedonia, Serbia with Turkey; Croatia with Bosnia and Herzegovina and Serbia; Cyprus with Turkey (or more correctly the Turkish Cypriot-administered area); and Romania with Moldova and the Ukraine.

In addition, the EU was concerned that the border forces in these countries were not developed enough to effectively carry out the required responsibilities due it said to: too few border guards and officials, inadequately trained border guards and officials; poor management practises and corruption. However, there has been heavy investment by these countries and the EU aimed at bringing these countries up to the required standard. Timetables for each of these countries have been set indicating when these member states will become full members of the Schengen Area. The current UK Government has stated categorically that it has no intention of joining the Schengen Area in the foreseeable future.

The UK along with the Republic of Ireland forms the *Common Travel Area* (CTA). This agreement dates back to the creation of the Irish Free State (1923), when the UK Government was removed as Ireland's colonial power. In practice, it works in a similar manner as Schengen Area, allowing unrestricted movement of residents between mainland UK, Northern Ireland, the Republic of Ireland, Isle of Man and Channel Islands.

The SNP Government has stated that it will opt-out of the *Schengen Agreement*, since its preference is to remain part of the CTA. It is difficult to think of a set of circumstances that would allow Scotland to opt-out and not be part of the Schengen Area as this is now the norm in the EU with only two outliers (i.e. the UK

and Republic of Ireland). One view is that Scotland will be required by the EU to leave the CTA and join Schengen Area in order to be admitted as an EU member state. The UK is isolated in its opinion that membership of the Schengen Area is both problematic and undesirable. Evidence in support of this claim is simply that Liechtenstein, Iceland, Norway and Switzerland are members of Schengen but not members of the EU. In addition, there have been no opt-outs of Schengen since Ireland and the UK in 1997. It is now a given that new member states will (eventually) become members of the Schengen Area, although the length of time that this might take could be considerable. It is the author's view that the European Commission will stand firm on this matter.

Even if one were to accept the view that joining the EU is a "process of negotiation", one must ask what would give Scotland a strong negotiating position. Scotland represents about 1.5 per cent of the total EU population and it generates slightly less than 1.5 per cent of the total EU output (GDP). Furthermore, it is by no means guaranteed that even were agreement reached between Scotland and the European Commission (to opt-out or not of Schengen) it is a fact that membership into the EU can still be vetoed by another EU member state. An independent Scotland may very well set a dangerous precedent for other member states that have regions with strong secessionist aspirations. Such member states may not be enthusiastic about Scotland becoming a new EU member. Though one may ask how likely this is, it is too often forgotten that France, under De Gaulle, vetoed the UK's application to join the then European Economic Community in 1963; so, nothing is guaranteed.

Were an independent Scotland to decide to join the Schengen Area, then what remained of the UK (RUK) would continue to be part of the CTA along with Ireland. The UK has an opt-out and is not the succeeding state. As such, Scottish independence by definition would mean that what is currently an "internal border" between Scotland and England would become an "international border". This scenario would result in an EU member state in the Schengen Area having a border with an EU member state not in the Schengen Area. Another current example of this is Slovenia and Croatia. The *Schengen Border Code* stipulates what is required when a Schengen country borders a non-Schengen country. A strict interpretation of this Code is that there would need to be some form of "hard border" between Scotland and England. The Code stipulates in considerable detail what is required based on geography (e.g. water or land border) and other factors. However, the usual minimum requirements are: the operation of checkpoints and border guards, the patrolling of the border, the use of documents (usually a passport) for border crossing and potentially the construction of a fence or some other physical barrier.

A recent report by the UK Government (HM Government, 2013b) concluded that the transformation of the Scotland-England border from an internal to an international border would generate significant negative "border effects". A border effect is the welfare loss caused when a border is built (or a current border in place is strengthened) as it reduces the trade in goods and services. There is very little disagreement amongst economists that border effects do exist in theory, however, there is no agreement on how important they are since the empirical evidence testing for their size and relative importance is very mixed. Even if one were to believe the UK Government's conclusion that "negative" border effects would make an independent Scotland a poorer place, it does not discuss - far less assess - any "positive" border effects generated by Scotland being a member of the (much larger) Schengen Area. Joining the Schengen Area implies a "weakening the borders between the current 26 EU member states and Scotland. The benefit to Scotland of being in the Schengen Area - and out of the CTA - is thus a trade-off for Scotland between making *one* border less transparent and *twenty six* other borders more transparent.

One final point. There are reasons to believe that Ireland could very well benefit from leaving the CTA and joining the Schengen Area. Ireland is more "pro-Europe" than the UK: it is in the Eurozone and it is unclear whether Ireland is committed to the CTA *ad infinitum*. The author's view is that much of Ireland's commitment is historic and has little to do with current economic cost-benefits and rather more with the politics of being seen to keep the border between the Republic and Northern Ireland "open at all costs". Ireland certainly does not have security concerns, which seem to be the main reason the UK Government offers for opting out of the Schengen Area. However, an independent Scotland in the Schengen Area might cause Ireland to rethink its position. Were Ireland to join the Schengen Area then what remains of the UK (RUK) would be the *only* EU member state which has not adopted the *Schengen Agreement*. What would remain of the CTA would be what remains of the UK, including the Isle of Man and the Channel Islands. This would make the UK even more isolated with respect to EU practice. In the opinion of the author, such isolation could create considerable pressure for the UK to join the Schengen Area.

5. Conclusions

This paper has examined how the SNP Government's "double desire" of independence and EU membership would impact on its ability to design and deliver an effective immigration policy. Its main conclusion is that the EU would not unduly restrict the ability of an independent Scotland to do so as most EU legislation is concerned with refugees and asylum seekers, which are not likely to be numerically important in an independent Scotland. Likewise, EU legislation says little about how economic migrants

and students should be selected; two groups that will be extremely important both numerically and economically to an independent Scotland.

There is broad consensus amongst political parties in Scotland that the current UK-wide immigration system (and recent UK-wide immigration policy) is not serving Scottish interests. It is the author's view that these interests would be better served were Scotland to be an EU member state. However, this opinion does NOT mean that these interests could not be served just as well (and perhaps even better) were Scotland to remain part of the UK. The author is convinced that the UK immigration system could be adapted to better serve Scottish interests (see Mosca and Wright, 2009). There is no need to go over old ground about how this might be achieved, suffice to say that it would require the Scottish and UK governments to work more closely on matters relating to immigration. In other words, independence is NOT the ONLY way for Scotland to deliver an effective immigration policy that meets its needs.

The *Schengen Agreement*, however, complicates matters considerably with respect to immigration. Membership in the Schengen Area is a key feature of EU legislation and policy and hence there is an expectation that all new EU member states will (eventually) join. It seems unlikely that Scotland will be given an opt-out to stay in the CTA and not join the Schengen Area. The author's view is that Scotland would benefit from being a member of the Schengen Area, even if what remains of the UK stays in the CTA. The author finds it surprising that there has been no discussion to date of the benefits of an independent Scotland joining the Schengen Area. The SNP Government has decided - even though it is not in its gift - that an independent Scotland will stay in the CTA. As noted above, the ultimate decision about an independent Scotland's membership of the EU will be made by the European Union Parliament and not by the Parliaments of Scotland or the UK.

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Nowcasting with Google Trends: a keyword selection method

Andrew Ross ⁱ, Fraser of Allander Institute, University of Strathclyde

Abstract

Search engines, such as Google, keep a log of searches entered into their websites. Google makes this data publicly available with Google Trends in the form of aggregate weekly search term volume. Aggregate search volume has been shown to be able to nowcast (i.e. compute real-time assessment of current activity) a variety of variables such as influenza outbreaks, financial market fluctuations, unemployment and retail sales. Although identifying appropriate keywords in Google Trends is an essential element of using search data, the recurring difficulty identified in the literature is the lack of a technique to do so. Given this, the main goal of this paper is to put forward a method (the “backward induction method”) of identifying and extracting keywords from Google Trends relevant to economic variables.

Introduction

The growing use of the internet has made available a number of new data sources. For example, the increasing use of the internet as an information finding tool has led to the creation of new data sources to measure consumer sentiment and behaviour. Search engine providers, such as Google, keep a record of searches entered in their websites (McLaren & Shanbhogue, 2011). Google has made some of this data available by publicising aggregate search volumes for specific search terms.

Data on search term volume can be used to analyse a variety of issues and variables. For example, the query volume for ‘dishwashers’, ‘fridges’, or ‘flat screen televisions’ can be used to explain demand for durable goods. The major catalyst in this area of research, however, was the research conducted by Ginsberg et al. (2009), who used query volume of influenza and flu related search terms (e.g. flu symptoms) to monitor flu outbreaks in real time.

Given the availability of aggregate internet search data, there is now the possibility to add a further method of economic analysis, which attempts to explain current, rather than future activity. Internet search data is therefore mainly used to provide real time assessment of current activity i.e. to nowcast rather than forecast (Aruoba & Diebold, 2010).

Policy making relies upon the availability of accurate and timely micro, sub-macro, and macro-level data. Yet, the majority of official data is published with a reporting lag of several weeks, and may subsequently even be revised (Choi & Varian, 2009a). Even though there are numerous methods and econometric models employed to provide for timely economic analysis, the lag in official data may delay and distort rational policy making. Real-time policy making is particularly significant in times of structural change or economic uncertainty where the predictive power of models can break down (Castle et al., 2009).

At such times, it is necessary to obtain timely high-frequency data which remains robust during structural changes. Thus, the main advantage of using internet search data is that it is made available without lags (maximum of one week) whilst covering a representative sample of the population. Internet search data is therefore mainly used to provide real time assessment of current activity.

Using internet search terms to nowcast economic variables requires the selection of explanatory keywords. Although economic intuition can be used to identify keywords explaining sales of flatscreen TVs, for example, when it comes to nowcasting complex economic variables such intuition, however, may not be sufficient. Thus, the main difficulty when using search term data is the selection of individual search terms in Google Trends (GT) ⁱⁱ that are significant in explaining the economic variable investigated.

Google Trends

In 2008 Google made aggregate query data freely available through GT. Aggregate search logs (query volumes) are accessible and downloadable from 2004:M1 onwards. Queries are 'broad matched' so, for example, queries such as 'Strathclyde University' are accounted for in the query index for 'Strathclyde'. Thus, it must be stressed that relying on single keywords may not yield robust findings as the data used may be contaminated (or contain significant amount of noise) by queries unrelated to the topic investigated.

GT data is available as a query share index. That is, the total popularity of a search term is determined by the volume of a search term in a geographic region, divided by the total number of queries within the same location and time parameters (op.cit.).

GT data is normalised i.e. no absolute data is given, so that regions generating the highest search volumes do not always rank on top. Google divides the sets of data by a common variable to cancel out the effect of the variable on the data. Following the normalisation, each data point on the graph is divided by the highest value and then multiplied by one hundred. GT therefore provides aggregate data that is normalised and made available on a scale from zero to one hundred. If required, GT data can be further filtered by time period, geographically, and/or by category (Google, 2011).

GT data 'indicates the likelihood of a random user to search for a particular search term from a certain location at a certain time' (op. cit.). With GT data being computed on a daily basis by a sampling method, results vary from day to day by a few per cent (op.cit.). This adds additional noise to the data due to the sampling errors. GT data is made available on a weekly basis (a week being from one Sunday to the next) giving a maximum lag of one week.

Even though GT data is widely considered to be unbiased (i.e. unknowingly provided by Google users) it is prone to manipulation. This weakness has not been identified in the current literature. It is extremely difficult to identify 'unnatural' changes in search volumes as they can be due to public campaigns, changes in trends, or due to automated queries i.e. manipulation by automated queries submitted by "robots". Thus, Goodhart's lawⁱⁱⁱ has to be taken into account when using GT to underpin policy decisions.

With widespread use of the internet being a rather new phenomenon, data obtained from search engines has a short back-run compared to other economic indicators. Also, internet usage tends to remain highly correlated with factors such as age and income, leaving the sample not representative of the population. Even though Google holds a large proportion of the search engine market, the sample could still be skewed by the fact that different users prefer different search engines. Also, different users interested in the same topic use different search queries (and vice versa), and queries can be made with entirely different intentions. Therefore significant noise in the search data can be present through e.g. queries made out of curiosity rather than the intent to take the according action.

It must also be kept in mind throughout that whilst query volumes are good indicators of future consumer activities, such as attending movies or purchasing video games, there is wide variability in the predictive power of query data (Goel et al., 2010). Even though several possible reasons for this have been identified, such as size of relevant population and making searches to inform rather than take action, this area of research still remains largely unexplored and unexplained.

As identified by Askitas and Zimmermann (2009), and others, keywords used underlay significant dynamicity, i.e. keywords and websites searched for may come into and go out of existence. Moreover, search behaviour is a constantly evolving process where for example, search patterns can be predominantly 'one word' queries today, and 'multiple word' queries tomorrow. Keyword dynamicity is impacted by, among other things, generational patterns, linguistic developments, and social and economic levels.

Given the limitations and caveats identified, GT datasets used in research would either have to be constantly evolving where search queries are constantly added/removed, or more realistically, a core set of keywords must be identified which have the power to predict/nowcast selected economic variables. This again emphasises the need for a reliable process in identifying keywords.

What can query data "predict"

Research in the field of epidemiology, where researchers were able to link query data with influenza outbreaks (e.g. Ginsberg et al., op.cit.; Chan et al., 2011), provided the foundations. Their findings

suggest that the relative frequency of certain queries (e.g. related to influenza symptoms) correlates with the percentage of physician visits in the US. Also, they found that it is possible to accurately estimate the current level of influenza activity, with a reporting lag of one day, when using GT data as an independent variable. This research was used to make available estimates of flu ^{iv} and dengue ^v trends around the world.

These findings and the newly available data through GT stimulated research in the area of Economics. Choi and Varian (2009b) provided significant findings when using GT data to “predict” economic unemployment, retail sales, automotive sales, home sales and travel plans. Their research found that GT data does not necessarily predict the future, but it does help to predict the present i.e. to nowcast. Their nowcasting model and the findings from Ginsberg et al. (op. cit.) provided a catalyst for further research.

Building upon these findings, a large body of research has evolved using GT data to nowcast a vast array of diverse variables. Amongst others, GT data was used to nowcast trading volatility (Vlastakis & Markellos, 2012), consumer sentiment indices (Penna & Huang, 2009), private consumption (Schmidt & Vosen, 2012), and inflation expectations (Guzman, 2011).

Importantly for this research paper, Askitas and Zimmermann (op. cit.) examined the correlations between keyword searches and unemployment rates. The research found a strong correlation, and suggested that GT data is particularly useful in times of economic crisis where decision makers require faster flows of information. Similar findings were made by McLaren and Shanbhogue (op. cit.) and Baker and Fradkin (2011), who also found that employment related queries contain relevant information for explaining changes in the labour market.

The recurring difficulty identified in the literature is the lack of a scientific technique to identify appropriate keywords in GT. For example, McLaren and Shanbhogue (op. cit.) point out that deciding which queries to consider is a crucial element of using search data.

The nowcasting methodology

Bank of England researchers suggest using GT data for the keyword ‘jsa’ (a short form of the UK labour market assistance programme ‘Jobseekers Allowance’) to nowcast unemployment (McLaren and Shanbhogue, op. cit.). The keyword ‘jsa’ is subsequently used as a benchmark when assessing the power of the “backward induction method” in selecting statistically significant keywords from GT.

Monthly UK unemployment data $\{U\}$ was sourced from the ONS (2012) with the time-frame analysed being between 2004:M1 and 2012:M4. Weekly GT query volume for the keyword ‘jsa’ was downloaded, for the same time period, restricted to UK data only. GT data was aggregated from weekly to monthly observations. GT weekly frequencies are in sets of Sunday to Sunday, so that some weeks overlap two months and findings may therefore contain some additional noise.

The baseline model (1) is set up as a simple autoregressive model, where only changes in unemployment in previous months $\{U_{t-1}\}$ and $\{U_{t-2}\}$ are used as explanatory variables. Monthly GT data $\{x_t\}$ for the keyword ‘jsa’ is then added (2), and compared to the baseline model.

$$\log(U_t) = \alpha + \beta_1 \log(U_{t-1}) + \beta_2 \log(U_{t-2}) + \varepsilon_t \quad (1)$$

$$\log(U_t) = \alpha + \beta_1 \log(U_{t-1}) + \beta_2 \log(U_{t-2}) + \phi x_t + \varepsilon_t \quad (2)$$

To measure the fit of the model, in-sample criteria are used (adjusted R^2 and AIC). The model providing the better fit has the higher adjusted R^2 and the lower AIC. Out-of-sample observations of forecasts and forecast errors are used to determine whether GT data helps to predict the variable investigated. To determine this, a series of one-month ahead predictions are made and the prediction errors are computed. From this, the RMSE and the MAE are computed. The preferred model is the one with the smallest out-of-sample RMSE or MAE.

The unemployment regression results for model (1) and (2) are summarised in **Table A**. GT data for the keyword ‘jsa’ has not been found to be statistically significant in explaining changes in unemployment.

Also, improvements in error reduction and adjusted R^2 are only marginal compared to the baseline model. It must be noted, however, that sample errors in GT and the aggregation of the data may have caused these results to be statistically insignificant. This is further explored in the following sections

where different unemployment indicators and additional keywords (selected by the “backward induction” method) are tested.

Table A: Unemployment regression results

Independent variables	Baseline	‘jsa’
α	0.02791 (0.514)	0.03024 (0.622)
$\log(U_{t-1})$	1.44649 (0.000)	1.44629 (0.000)
$\log(U_{t-2})$	-0.44976 (0.000)	-0.44989 (0.000)
x_t	- -	0.00001 (0.960)
Adjusted R²	0.99643	0.99639
AIC	-557.53450	-555.53610
MAE	0.01020	0.01020
RMSE	0.01365	0.01365

P-values for heteroskedasticity robust standard errors (HC3) are shown in parentheses.

Keyword selection process

GT categories provide a strong starting point when selecting keywords to nowcast economic variables. These categories are classifications of industries or markets, and are commonly referred to as verticals (Google, 2012a). The category: All Categories > Jobs and Education > Jobs, for example, includes keywords such as ‘jobs’, ‘resume’ and ‘careers’.

Additionally, Google Correlate^{vi} can be used (essentially GT in reverse). In GT a specific query is typed in to obtain a time-series dataset of query activity. In contrast, in Google Correlate a data series can be entered (the target) to obtain a list of queries whose data series follows a similar pattern, i.e. correlates (Google, 2012b).

There are, however, situations where both GT categories and Google Correlate fail to suggest relevant keywords. In this case, a third method, the “backward induction method” is suggested. It must, however, be emphasised that this method should not be considered as the panacea to the keyword selection problem as it should be used in addition to the methods previously outlined. More specifically, the appropriate method depends solely on the needs of the researcher and the variable investigated.

Backward induction (generally used within Game Theory) is the process of reasoning backwards, starting from the end of a problem or situation. This backward reasoning can be applied to the keyword selection process, where the approach is taken that relevant keywords have already been selected. That is, keywords have been selected by people using search engines, and these simply need to be identified and extracted.

People searching for websites, for example, to find employment related websites, will search for ‘jobs’ or ‘career’ for example, to then be presented with a website (e.g. website *A*) offering the requested products or services. Reasoning backwards, top referring keywords (top keywords used by people to find a specific website) from website *A* can therefore be extracted and used to obtain variable relevant GT data.

Instead of selecting keywords by economic intuition, this approach extracts top keywords employed by search engine users in trying to find specific goods/services/information. This ensures that these keywords are actually being used, and secondly ensures that these are relevant to the economic variable investigated. This is, however, best outlined by means of an example. In the following, an example is given, assuming the need to identify keywords relevant in explaining the job search market.

The first step would be to select a representative number of dominant websites within the area investigated. This can be done by using directory services such as Open Directory Project, Yahoo

Directory or Alexa categories. Alternatively a search for 'jobs', for example, in Google will present a number of relevant websites.

Following the identification of dominant job search related websites, top keywords employed by users to find these websites can be extracted. Keyword extraction can be done by means of several online services (some of which require subscription). The ones tested within this research were Alexa, Semrush, Sistrix, and the AdWords Keyword Tool. Keywords extracted from Sistrix (2012) seemed to be most promising as they did not contain a large amount of noise created by non-relevant, or domain related keywords. Also, in contrast to Alexa and Semrush, Sistrix provides for both subpage and subdomain keyword information.

Being able to identify keywords used for subpages and subdomains is a significant advantage and is indispensable when using backward induction and GT data to nowcast economic variables. Being able to extract these keywords allows identification of specific keywords used to find subpages (e.g. <http://direct.gov.uk/en/Employment/Jobseekers/>), instead of extracting keywords used to find the main webpage (e.g. <http://direct.gov.uk>). This allows for more topic-specific keyword extraction.

As such, keywords used to find the UK's Job Seekers Money, tax and benefits website^{vii} can be obtained through Sistrix (2012). **Table B** summarises keywords which seemed promising in explaining changes in unemployment.

Table B: Unemployment related keywords

'made redundant'	'job seekers allowance'	'jobseekers allowance'	'job centre'	'jobcentre'
'job centre plus'	'unemployment benefits'	'employment support'	'job seekers'	'jobseekers'

Nowcasting Unemployment

Keywords extracted using the backward induction method were added to the model derived in the previous section (see equation 1 and 2). To reduce data volatility, and thereby provide more stable and robust findings, the average of the data generated is taken from keyword data downloaded on seven consecutive days. Thus, GT data was obtained for the time period 2004:M1 to 2012:M4, restricted to UK data only, downloaded once a day for seven consecutive days starting on July 26, 2012. Importantly, the data for each keyword was downloaded individually instead of downloading the maximum of five keywords at a time, as the dominant keyword degrades the query volume of the less dominant keywords.

Regression results are summarised in **Appendix A**. Similarly to what was found in the previous section, the results are not very promising. The keywords 'made redundant', 'job seekers allowance', 'jobseekers allowance' attained the highest significance, within this data set, of only 5 per cent. The keyword 'job centre' attained a significance of 10 per cent, whilst the remaining keywords are statistically insignificant in explaining unemployment growth (including the hurdle keyword 'jsa').

Most noteworthy, however, is that the majority of keywords identified using backward induction outperform the baseline model, and the second hurdle set by the keyword 'jsa' in terms of significance and out-of-sample nowcasting ability. This makes a strong case for the backward induction method in its ability to identify and extract a set of relevant keywords.

Nowcasting the Claimant count

With unemployment results lacking robustness, the same keywords were applied to nowcast an alternative unemployment measure. That is, the Claimant count, which measures the number of people claiming unemployment-related benefits, is analysed. This data set was obtained from the ONS (2012) for the time period 2004:M1 to 2012:M4. The model outlined above (see equation 1 and 2) is applied, where only changes in the Claimant count $\{CC\}$ in previous months $\{CC_{t-1}\}$ and $\{CC_{t-2}\}$ are used as explanatory variables. GT data for each of the keywords $\{x_t\}$ is then added separately.

Regression results are summarised in **Appendix B**. All keywords (except 'jsa' and 'job centre') attained a significance of at least 10 per cent. The keywords 'made redundant', 'job centre plus' and 'employment support' are significant at a 1 per cent level, thus providing robust results. Moreover, the out-of-sample results also show that the majority of selected keywords were able to produce smaller errors than the

baseline model. Therefore, the selected unemployment-related keywords are able to explain a significant amount of changes in the Claimant count.

With the exception of 'job centre' all keywords identified using backward induction outperformed the baseline model and also the additional hurdle set by the keyword 'jsa' in terms of significance and also, partially, in the out-of-sample testing. This again underpins the ability of the backward induction method to provide robust and significant keywords.

The tests are repeated using GT data for the first week of each month to assess whether it is possible to forecast the monthly Claimant count using GT data for only the first week of the month. The Claimant count is the t -th month, denoted as $\{y_t: t = 1, 2, \dots, T\}$ and the GT data is the k -th week of the month, denoted as $\{x_t^{(k)}: t = 1, 2, \dots, T; k = 1, \dots, 4\}$.

Regression results are summarised in **Appendix C**. The majority of keywords attained the minimum significance of 10 per cent. The keywords 'jobseekers allowance', 'jobcentre' and 'job centre plus' attained a significance level of 1 per cent. Keywords 'made redundant' and 'employment support' attained a 5 per cent significance, 'job seekers' and 'jobseekers' attained a 10 per cent significance, whilst the remaining keywords continued to be statistically insignificant in explaining Claimant count growth.

The significant keywords showed strong results within the in-sample and out-of-sample tests of predictability. This indicates that GT data for the selected keywords for only the first week of a month contain a significant amount of information to enable forecasts of the monthly Claimant count.

Summary

With growing use of the internet as an information finding tool, new data sources such as GT have become very appealing for policy makers, for example, as a proxy to monitor economic activity and sentiment. Even though there is no agreement in the literature on the ability of GT data to "predict the future", there is unanimous agreement that GT data is highly useful in nowcasting economic variables.

It was found, however, that the significance of GT data may be limited due to the short back-run, and the amount of noise the data contains due to the sampling method employed by Google. Within the results of this research it was, however, found that large amounts of data volatility, due to sampling errors, can be reduced by downloading GT data for each keyword individually, and over several consecutive days.

The major recurring difficulty identified in the literature is the lack of a technique to identify appropriate keywords in GT. The selection of keywords is, however, a crucial element of using search data. Currently, keywords are mostly selected in GT on the basis of economic intuition, rather than by following a set of strategies or guidelines.

Thus, the core of this paper describes and tests the backward induction method which identifies relevant keywords by extracting these from variable relevant websites. To evaluate and examine this method, this research tested the keywords identified using the backward induction method against keywords identified in the literature review (the benchmark).

This backward induction method was applied to nowcast UK unemployment growth using a small set of keywords. The majority of keywords identified using the backward induction method outperformed the baseline model and the benchmark in terms of in-sample and out-of-sample tests of predictability indicating that the backward induction method is effective in identifying relevant keywords.

When nowcasting unemployment growth, it was found that several keywords (including the benchmark keyword) lacked robustness in terms of statistical significance. To provide further evidence that the backward induction method is applicable, the same set of keywords was successfully tested to nowcast growth in the monthly UK Claimant count. Notably, the initial research was also able to successfully nowcast house price inflation and individual insolvencies using the backward induction method. This has shown that, even though relevant keywords can now be extracted using the backward induction method, the issue still remains that the right questions have to be asked, using the right model, and the right data.

"Prediction is very difficult, especially if it's about the future" - Niels Bohr (1885-1962)

Acknowledgements

The initial research was supervised by Professor G. Koop^{viii} and was submitted in 2012 in partial fulfilment of the requirements for the degree of MSc in Economic Management and Policy in the Department of Economics at the University of Strathclyde.

ⁱ Andrew Ross: <http://andrewross.de>

ⁱⁱ Google Trends: <https://www.google.com/trends/>

ⁱⁱⁱ When a measure becomes a target, it ceases to be a good measure (Goodhard, 1975).

^{iv} Google Flu Trends: <https://www.google.org/flutrends/>

^v Google Dengue Trends: <https://www.google.org/denquetrends/>

^{vi} Google Correlate: <https://www.google.com/trends/correlate/>

^{vii} Directgov Money, tax and benefits: <http://www.direct.gov.uk/en/moneytaxandbenefits/>

^{viii} Professor Gary Koop: <http://personal.strath.ac.uk/gary.koop/>

Appendix A
Unemployment regression results

Independent variables	Baseline	made redundant	job seekers allowance	jobseekers allowance	job centre	Jobcentre	job centre plus	unemployment benefits	employment support	job seekers	jobseekers	jsa
α	0.02791 (0.514)	0.22886 (0.015)	0.15850 (0.029)	0.15189 (0.020)	0.02813 (0.507)	0.03649 (0.475)	0.03085 (0.564)	0.04872 (0.403)	0.01867 (0.876)	0.08329 (0.144)	0.08190 (0.113)	0.03024 (0.622)
$\log(U_{t-1})$	1.44649 (0.000)	1.32114 (0.000)	1.38966 (0.000)	1.37823 (0.000)	1.39349 (0.000)	1.44726 (0.000)	1.44696 (0.000)	1.42505 (0.000)	1.44682 (0.000)	1.43116 (0.000)	1.42762 (0.000)	1.44629 (0.000)
$\log(U_{t-2})$	-0.44976 (0.000)	-0.35207 (0.003)	-0.41147 (0.000)	-0.39940 (0.000)	-0.39785 (0.001)	-0.45182 (0.000)	-0.45066 (0.000)	-0.43145 (0.000)	-0.44882 (0.000)	-0.44234 (0.000)	-0.43864 (0.000)	-0.44989 (0.000)
x_t	- (0.014)	0.00034 (0.014)	0.00022 (0.044)	0.00028 (0.015)	0.00013 (0.090)	0.00003 (0.803)	0.00001 (0.938)	0.00010 (0.411)	-0.00001 (0.932)	0.00010 (0.250)	0.00012 (0.147)	0.00001 (0.960)
Adjusted R²	0.99643	0.99666	0.99650	0.99656	0.99650	0.99639	0.99639	0.99642	0.99639	0.99642	0.99643	0.99639
Akaike information criterion	-557.53450	-563.24250	-558.57850	-560.41960	-558.71310	-555.60110	-555.54090	-556.47780	-555.53890	-556.29570	-556.79530	-555.53610
MAE	0.01020	0.00994	0.01012	0.01005	0.01035	0.01018	0.01019	0.01006	0.01020	0.01016	0.01011	0.01020
RMSE	0.01365	0.01312	0.01344	0.01331	0.01343	0.01364	0.01365	0.01358	0.01365	0.01360	0.01356	0.01365

P-values for heteroskedasticity robust standard errors (HC3) are shown in parentheses.

Appendix B
Claimant count regression results

Independent variables	Baseline	made redundant	job seekers allowance	jobseekers allowance	job centre	Jobcentre	job centre plus	unemployment benefits	employment support	job seekers	jobseekers	jsa
α	0.04317 (0.047)	0.17382 (0.017)	0.14809 (0.021)	0.12314 (0.015)	0.04117 (0.061)	0.07450 (0.007)	0.07809 (0.005)	0.06343 (0.015)	0.19516 (0.005)	0.11253 (0.026)	0.08826 (0.014)	0.08122 (0.050)
$\log(CC_{t-1})$	1.85895 (0.000)	1.72286 (0.000)	1.80949 (0.000)	1.80078 (0.000)	1.84959 (0.000)	1.85564 (0.000)	1.85854 (0.000)	1.80773 (0.000)	1.83853 (0.000)	1.83124 (0.000)	1.83859 (0.000)	1.85135 (0.000)
$\log(CC_{t-2})$	-0.86500 (0.000)	-0.74863 (0.000)	-0.83195 (0.000)	-0.81967 (0.000)	-0.85568 (0.000)	-0.86707 (0.000)	-0.87042 (0.000)	-0.81744 (0.000)	-0.86729 (0.000)	-0.84825 (0.000)	-0.85182 (0.000)	-0.86336 (0.000)
x_t	- (0.043)	0.00033 (0.043)	0.00024 (0.049)	0.00025 (0.040)	0.00004 (0.395)	0.00016 (0.007)	0.00016 (0.003)	0.00019 (0.054)	0.00027 (0.007)	0.00017 (0.063)	0.00014 (0.034)	0.08122 (0.050)
Adjusted R²	0.99831	0.99848	0.99837	0.99838	0.99830	0.99835	0.99835	0.99838	0.99839	0.99835	0.99833	0.99831
AIC	-594.56720	-604.50110	-597.59240	-598.20480	-592.95350	-596.23760	-596.13170	-597.74390	-598.31490	-596.06220	-595.27210	-593.81200
MAE	0.00676	0.00637	0.00650	0.00643	0.00676	0.00634	0.00635	0.00687	0.00638	0.00655	0.00654	0.00665
RMSE	0.01130	0.01063	0.01101	0.01098	0.01128	0.01109	0.01110	0.01100	0.01097	0.01110	0.01114	0.01123

P-values for heteroskedasticity robust standard errors (HC3) are shown in parentheses.

Appendix C

Claimant count regression results (using $x_t^{(1)}$ only)

Independent variables	Baseline	made redundant	job seekers allowance	jobseekers allowance	job centre	Jobcentre	job centre plus	unemployment benefits	employment support	job seekers	jobseekers	isa
α	0.04317 (0.047)	0.12873 (0.013)	0.13600 (0.044)	0.15137 (0.002)	0.04311 (0.049)	0.07700 (0.005)	0.07869 (0.005)	0.05411 (0.023)	0.22828 (0.011)	0.11494 (0.042)	0.08971 (0.021)	0.08181 (0.088)
$\log(CC_{t-1})$	1.85895 (0.000)	1.76183 (0.000)	1.82345 (0.000)	1.79064 (0.000)	1.84814 (0.000)	1.85732 (0.000)	1.85975 (0.000)	1.83246 (0.000)	1.83845 (0.000)	1.83675 (0.000)	1.84075 (0.000)	1.85467 (0.000)
$\log(CC_{t-2})$	-0.86500 (0.000)	-0.78078 (0.000)	-0.84397 (0.000)	-0.81392 (0.000)	-0.85461 (0.000)	-0.86909 (0.000)	-0.87167 (0.000)	-0.84051 (0.000)	-0.87216 (0.000)	-0.85408 (0.000)	-0.85416 (0.000)	-0.86673 (0.000)
$x_t^{(1)}$	- (0.040)	0.00021 (0.101)	0.00020 (0.101)	0.00031 (0.003)	0.00005 (0.454)	0.00016 (0.006)	0.00015 (0.006)	0.00010 (0.127)	0.00032 (0.019)	0.00017 (0.094)	0.00013 (0.055)	0.00011 (0.256)
Adjusted R²	0.99831	0.99837	0.99833	0.99841	0.99829	0.99834	0.99834	0.99833	0.99842	0.99833	0.99833	0.99830
AIC	-594.56720	-597.64120	-595.23420	-599.77380	-592.93640	-595.73600	-595.51550	-594.72290	-600.22300	-594.97540	-594.85670	-593.42810
MAE	0.00676	0.00643	0.00660	0.00622	0.00673	0.00632	0.00633	0.00673	0.00624	0.00660	0.00647	0.00662
RMSE	0.01130	0.01101	0.01115	0.01089	0.01128	0.01112	0.01113	0.01118	0.01087	0.01116	0.01117	0.01125

P-values for heteroskedasticity robust standard errors (HC3) are shown in parentheses.

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Scotland's business innovation performance 2008-10

Jennifer Turnbull and Kenny Richmond, Scottish Enterprise

Abstract

This paper examines Scotland's innovation performance relative the UK, using the latest 2011 UK Innovation Survey. The analysis shows that Scotland has a smaller proportion of businesses that are 'innovation active' than the UK average and lies in the bottom quartile compared to other European countries. The data highlight some key differences between Scotland and UK innovation performance in areas such as markets, motivation for innovation and investment. The analysis helps identify some areas where further research should focus.

Introduction

This paper examines the published Scottish results of the latest UK Innovation Survey, which was undertaken in 2011 for the period 2008 to 2010. The latest results show that Scotland has a smaller proportion of businesses that are 'innovation active' than the UK average and lies in the bottom quartile compared to other European countries. Although it is not possible to directly compare the survey results over time due to definitional changes in the main innovation measures, Scotland also had smaller proportions of innovation active businesses than some other economies in earlier surveys.

As well as innovation activity, the data highlight a number of other differences between Scotland's business performance and that of the UK as a whole. For example, differences in the location of firms' markets, the rationale for innovation and expenditure on innovation are particularly apparent.

Recognising that innovative companies are drivers of productivity and competitiveness, a key question arising from the analysis is the reasons for Scotland's differing performance. A potential explanation is the size and structure of the Scottish business base compared to the UK as a whole. However, a number of evidence gaps have been identified which would have to be addressed to achieve a better understanding of Scotland's performance.

Innovation and Economic Growth

There are many different theories and models of economic growth but they are consistent in identifying the role that innovation plays as a driver of growth, with empirical research showing that innovationⁱ is a core condition for both business competitiveness and the wider growth of the economyⁱⁱ.

The positive effects of innovation on productivity, employment and turnover have been widely reported. For example, the 2010 Annual Innovation Report estimated that innovation accounted for 63 per cent of annual labour productivity growth in the UK between 2000 and 2008ⁱⁱⁱ. NESTA research suggests that innovation is a key source of growth for the UK's highest growth firms and that innovative firms grow twice as fast, both in employment and sales, as firms that fail to innovate^{iv}.

Innovation is considered to be an essential component of improving Scotland's competitiveness and economic performance. In 2007, the Scottish Government's Economic Strategy noted that Scotland's average GDP growth rate had lagged the UK and comparable small European economies for 30 years. Recognising the contribution that innovation makes to growth, this prompted the development of a strategic framework for innovation in Scotland that set out the Scottish Government's approach to support innovation to improve Scotland's capacity to stimulate and support greater demand for innovation^v. More recently, the refreshed Scottish Government Economic Strategy (2011) reaffirmed the importance of innovation in boosting economic growth^{vi vii}.

The UK Innovation Survey

The main official data source for measuring innovation is the biennial UK Innovation Survey. The survey provides a consistent set of results across the UK, enabling analysis of Scotland's performance

benchmarked against the UK and the other UK government office regions. The data ultimately feeds into the Community Innovation Survey (CIS), which allows Europe's innovation progress to be monitored and Scotland to be compared with other European countries.

The UK Innovation Survey is conducted every two years by the Office for National Statistics (ONS) on behalf of the Department for Business, Innovation & Skills (BIS)^{viii}. It is a voluntary survey of a sample of UK businesses with 10 or more employees.

Scotland's Innovation Performance

This paper is based on an analysis of UK Innovation Survey 2011 data^{ix}. It outlines the headline Scottish results, which cover the three-year period from 2008 to 2010. The 2011 UK Innovation Survey was the third survey run on a biennial cycle. Prior to 2007, surveys were undertaken every four years.

The survey was funded and developed by the Department of Business, Innovation and Skills (BIS) and administered by the Office for National Statistics (ONS) with assistance from the Northern Ireland Department of Enterprise, Trade and Investment (DETI). It sampled more than 28,000 private sector enterprises across the UK with 10 or more employees^x, including more than 1,000 in Scotland. Response rates for Scotland and the UK are shown in table 1 below:

Table 1: 2011 Survey Response Rates, Scotland & UK

	Number Surveyed	Responses Received	Response Rate
UK	28,079	14,342	51.1%
Scotland	2,179	1,093	50.2%

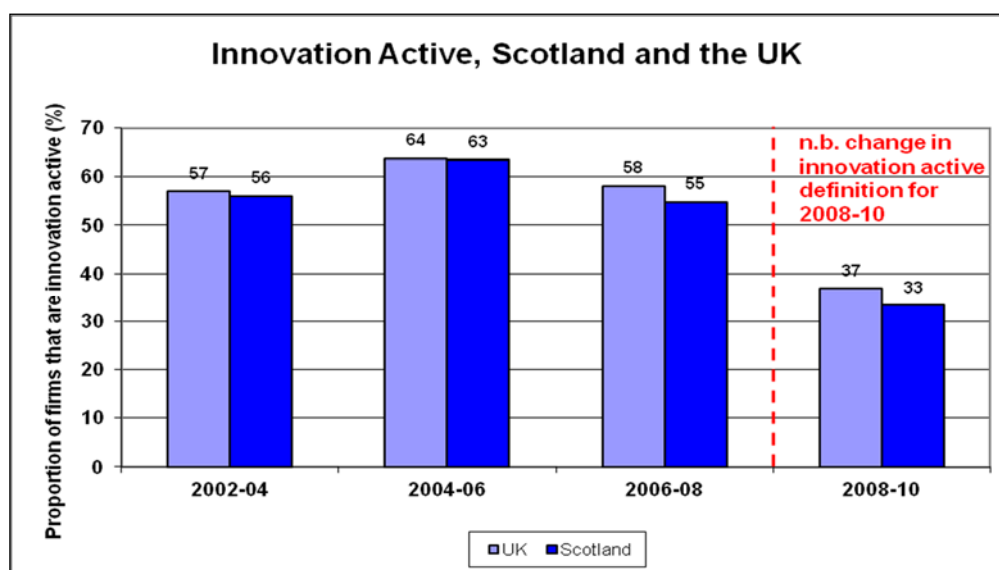
Source: BIS, UK Innovation Survey 2011 Statistical Annex

Innovation takes place via a number of business practices such as resources allocated to innovation and introducing new or improved products and processes^{xi}. The definition of 'innovation active' used in the 2011 survey follows that adopted by Eurostat:

- Introduction of a new or significantly improved product (goods or service) or process;
- Engagement in innovation projects not yet complete or abandoned;
- New and significantly improved forms of organisation, business structures or practices and marketing concepts or strategies.

The measure of 'broader innovation' includes all of the above plus activities such as internal research and development, training, and the acquisition of external knowledge or machinery and equipment linked to innovation activities.

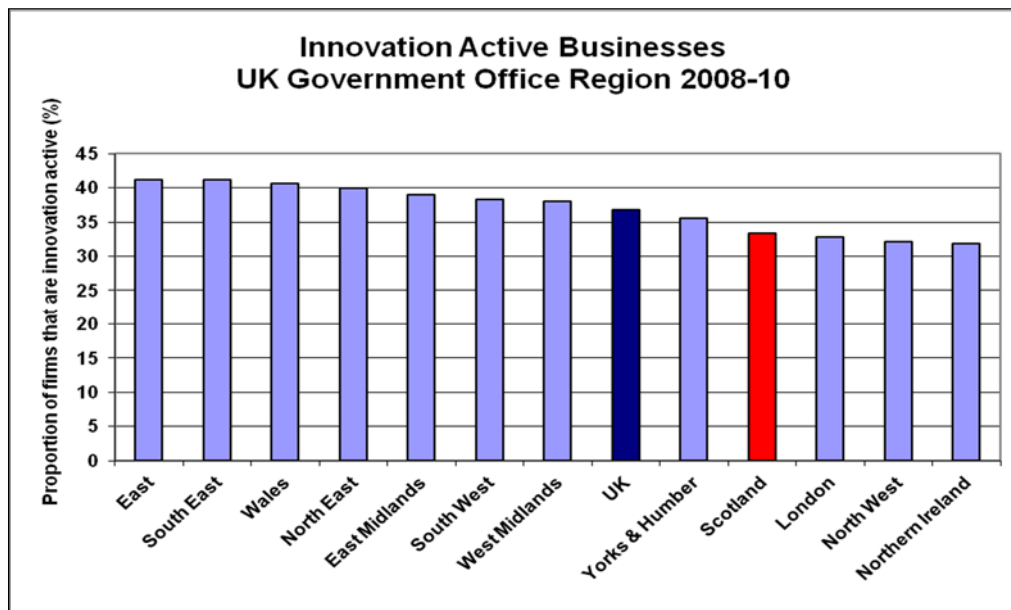
Figure 1: Innovation Active Businesses, Scotland and the UK, 2002-2010



Source: UK Innovation Survey 2011

Scotland lies in the third quartile of the 12 UK regions (figure 2) and the bottom quartile of other European countries (Figure 3) for innovation activity.

Figure 2: Innovation Active Businesses in UK Government Office Regions

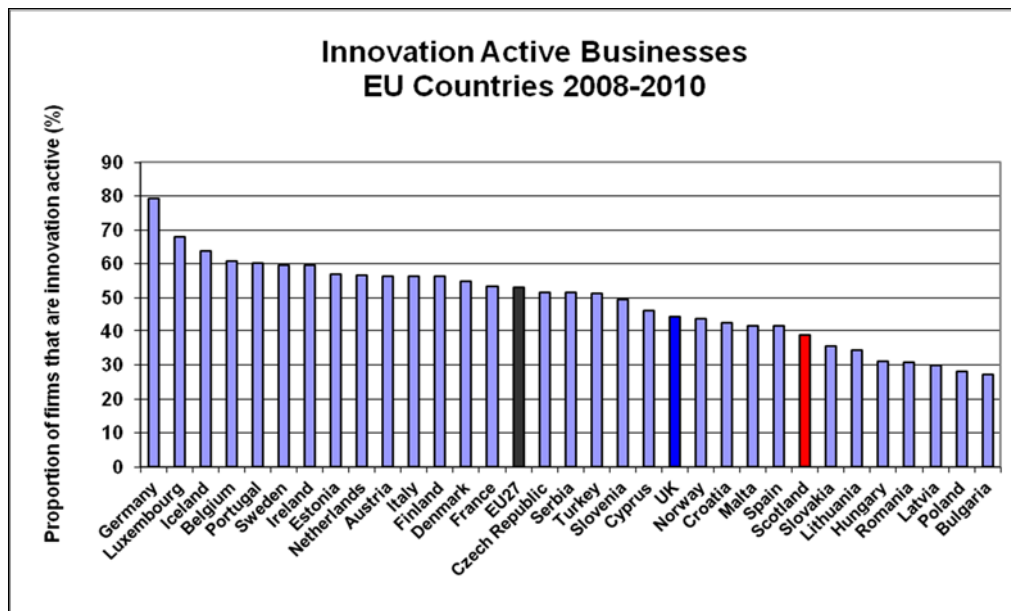


Source: UK Innovation Survey 2011

UK Innovation Survey 2008-10 Results

Changes in the definition of innovation active for the 2011 survey mean that it is not possible to compare the survey results over time^{xii}. However, relative to the UK average, Scotland still has a smaller proportion of businesses (33%) that are innovation active than the UK as a whole (37%), as figure 1 shows.

Figure 3: Innovation Active Businesses in EU Countries



Source: Community Innovation Survey 2011^{xiii}

Scottish versus UK Performance

Compared to the UK average, the performance of Scotland’s businesses lagged that of the UK’s for all the main survey indicators over the period 2008-10.

Overall, if Scotland's innovation activity rate was to match that of the UK then Scotland would need an additional 500 innovation active companies:

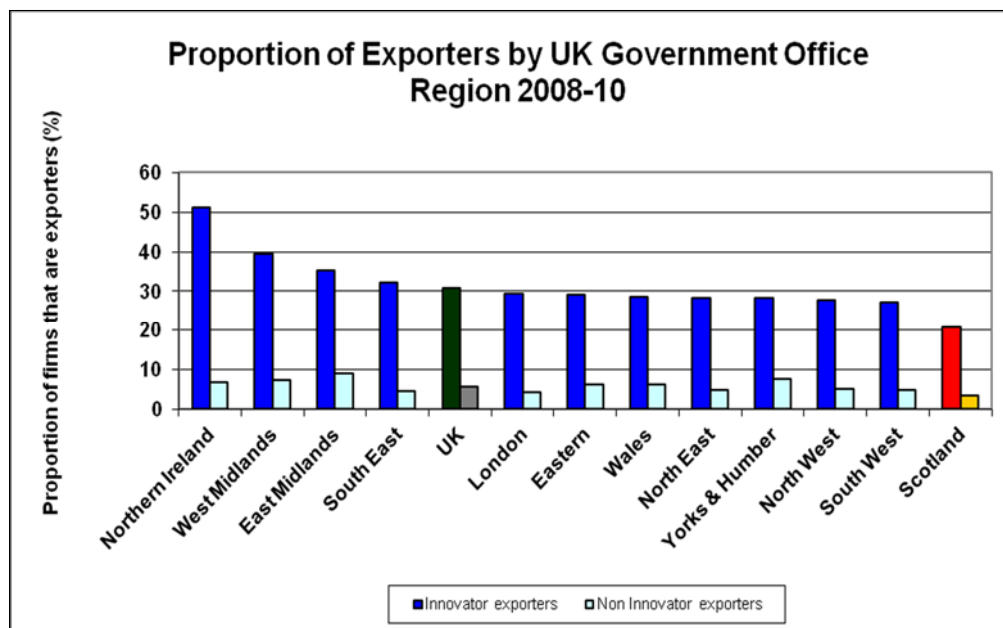
- Scotland % innovation active firms 33.3
- UK % innovation active firms 36.8
- Scotland 10+ companies* 3,665
- Number of Scottish 10+ employee innovation active companies 4,500
- Number of 10+ companies if Scotland = UK 5,000
- Number of **additional 10+ employee companies** to match UK rate **500**

Markets, Innovation and Exporting

An important theme arising from this and previous Innovation surveys is the tendency for Scottish firms to trade in local and domestic rather than international markets. A higher proportion of Scottish firms have local markets: 78.9% of Scottish businesses have markets within approximately 100 miles of the business (compared to 67.5% of UK businesses). Scotland also has a lower proportion of firms that are overseas exporters than other UK regions.

Wider research has highlighted the link between innovation and exporting^{xiv}, with innovating companies more likely to sell overseas. The UK Innovation survey confirms this as in all UK regions a higher proportion of exporters are innovators than non-innovators. However, compared to other regions Scotland has the lowest proportion of exporters that are innovators (figure 4)^{xv}.

Figure 4: Proportion of exporters by UK Region 2008-10



Source: UK Innovation Survey 2011

A key question is what is driving these results? Does Scotland have fewer innovators because it has fewer exporters, or are there fewer exporters because there are fewer innovators?

Table 2: Proportion of exporting firms, Scotland and the UK

Measure	Value
Proportion of Scottish firms that are exporters (%)	9.4
Proportion of UK firms that are exporters (%)	15.3
Scottish proportion of UK exporters (%)	4.9
Scottish proportion of UK export value (%)	7.8
Average export value of Scottish innovators (£m)	9,399
Average export value of UK innovators (£m)	5,871

Source: UK Innovation Survey 2011

The Innovation Survey suggests that the average value of exports per company tends to be higher in Scotland than the UK. This may be related to the types of exports to which the data refer. For example, if exports are from relatively high value sectors and a relatively small number of companies account for a large proportion of exports, then this would increase the average export value per firms. However, further research would be required to try and identify for the reasons this. The published export details from the UK Innovation Survey are provided in table 2.

Differences in Motivation for Innovation

The results show quite a large divergence between Scotland and the UK in businesses' motivation for innovation. The emphasis for businesses in Scotland is on updating products, cost reduction, reducing environmental impact and meeting regulatory requirements, as shown in Table 3 below. A much lower proportion of businesses in Scotland are innovating to increase their ranges of goods or services.

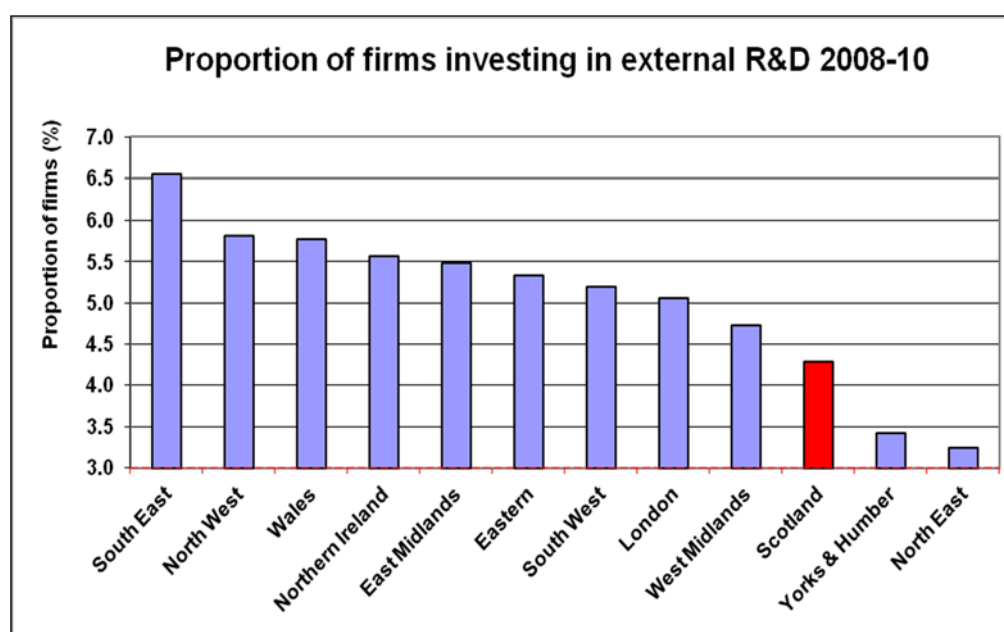
Table 3: Motivation for Innovation, Scotland relative to the UK

Motivation for Innovation	Scotland Relative to UK = 100
Increasing range of goods or services	82
Entering new market	98
Increasing market share	97
Improving quality of goods or services	100
Improving flexibility for producing goods or services	101
Increasing capacity for producing goods or services	100
Increasing value added	96
Reducing costs per unit produced or provided	120
Improving health and safety	104
Reducing environmental impact	115
Replacing outdated products or processes	112
Meet regulatory requirements (including standards)	115

Source: UK Innovation Survey 2011

The key question is why is there such divergence in some of the motivating factors? Potentially, this could be related to the more local nature of Scottish firms' customer base (i.e. less need to cater for differing customer needs in overseas markets). Again, this is an evidence gap that needs to be explored.

Figure 5: Proportion of firms investing in external R&D by UK Region 2008-10



Source: UK Innovation Survey 2011

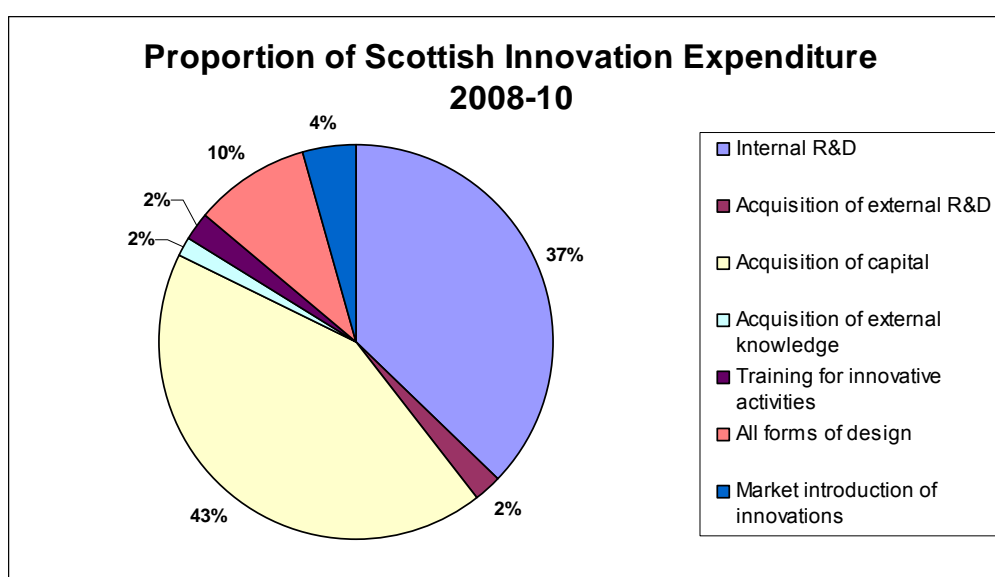
Differences in Innovation R&D Investment

The third main difference between the Scottish and UK results is in investment in innovation. Generally, compared to the UK, a smaller proportion of Scottish companies invest in external R&D (4.3% of Scottish companies compared to 5.2% of companies in the UK over the survey period) (Figure 5).

Considering the distribution of innovation expenditure from the Innovation Survey results, the differences are even greater. Only 2.3% of Scottish expenditure was on external R&D compared to 23.8% of UK expenditure. A greater proportion of Scottish innovation expenditure is invested in machinery, equipment and software (capital) than the UK average (42.7% of expenditure in Scotland compared to 30.3% in the UK). Figure 6 shows that 80% of Scottish expenditure was on internal R&D and acquiring capital over the survey period compared to 64% for the UK.

This is broadly consistent with the latest Business R&D statistics (BERD 2011)^{xvi}. Figure 7 shows that Scotland was below the UK average for business R&D expenditure as a proportion of GDP in 2011 (ranked in eighth place out of 12 UK regions).

Figure 6: Distribution of Innovation Expenditure in Scotland, 2008-10



Source: UK Innovation Survey 2011

Overview

Generally, comparing Scotland and the UK, Scotland has:

- Persistently performed below the UK average for innovation activity;
- A smaller proportion of exporters, although Scottish exports tend to have a higher value;
- More businesses whose innovation focus is to reduce costs, reduce their environmental impact and meet regulatory requirements than on increasing their range of goods and services;
- Lower levels of business investment in innovation and spends a greater proportion of total innovation expenditure on machinery, equipment and software.

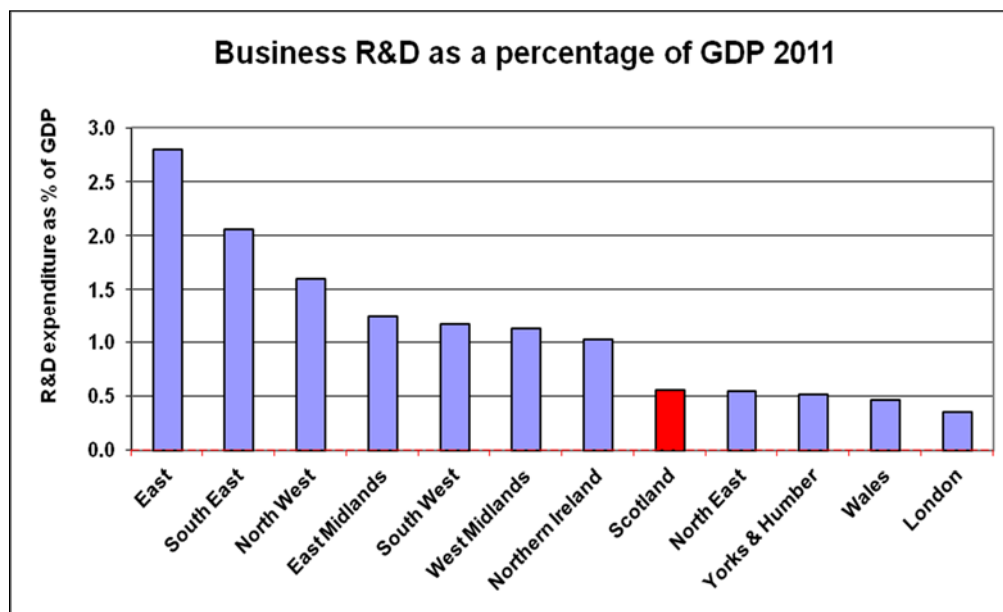
Explaining Scotland's Performance

Business Size Structure

Analysis of the data that are currently available helps to throw some light on Scotland's innovation performance. At the UK level, the data suggest that innovation performance varies by firm size and research undertaken by Scottish Enterprise indicates that performance also varies by firm size in Scotland.

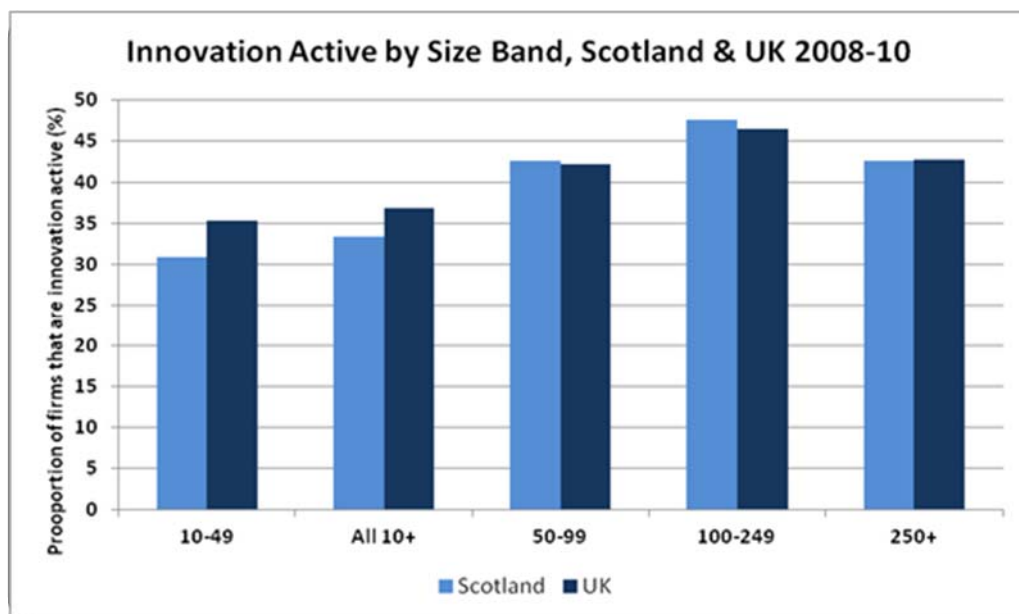
Across the UK and in Scotland the proportion of firms that are innovation active increases as the size of the firm increases. As smaller businesses account for a majority of the UK's business base^{xvii}, this has the effect of reducing the overall proportion of innovation active businesses, as figure 8 illustrates.

Figure 7: Business R&D as a percentage of GDP by UK Region 2011



Source: BERD

Figure 8: Proportion of UK Innovation Active Firms by Size band 2008-10



Source: ONS^{viii}

It is worth noting that the two top performing UK regions for innovation activity (the East and South East of England) have a lower proportion of small businesses in their business base than the UK average (10-49 employee businesses account for less than 8% of their business bases compared to the UK average of 8.7%). Scotland, on the other hand, has more than 10% of its business base that is small, and having a larger proportion of small businesses that are less likely to be innovation active could have a negative impact on Scotland's overall performance.

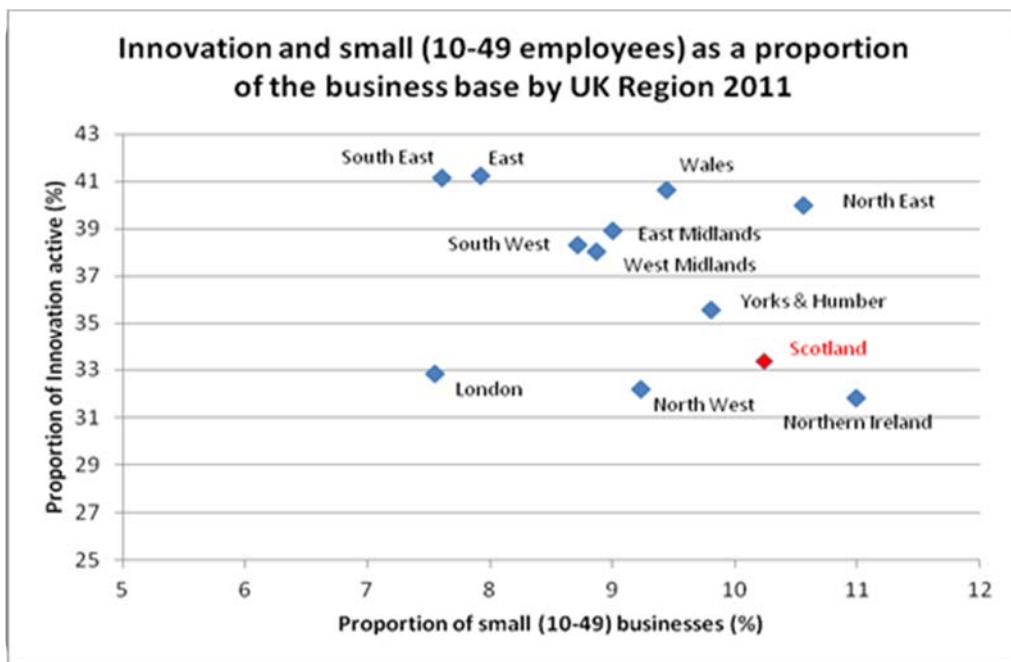
Figure 9 illustrates a tendency for regions which have a higher proportion of small businesses to have lower proportions of innovation active firms overall (for example, Northern Ireland, Scotland and Yorkshire). Conversely, regions with a lower proportion of small business tend to have a higher proportion of innovation activity overall (such as the East and South East of England). Nevertheless, it is notable that London also has a lower than UK average proportion of small businesses but is one of the lowest

performing regions for overall innovation activity. This suggests that factors other than business size are also important, such as the sector makeup of the business base.

Sectoral Innovation

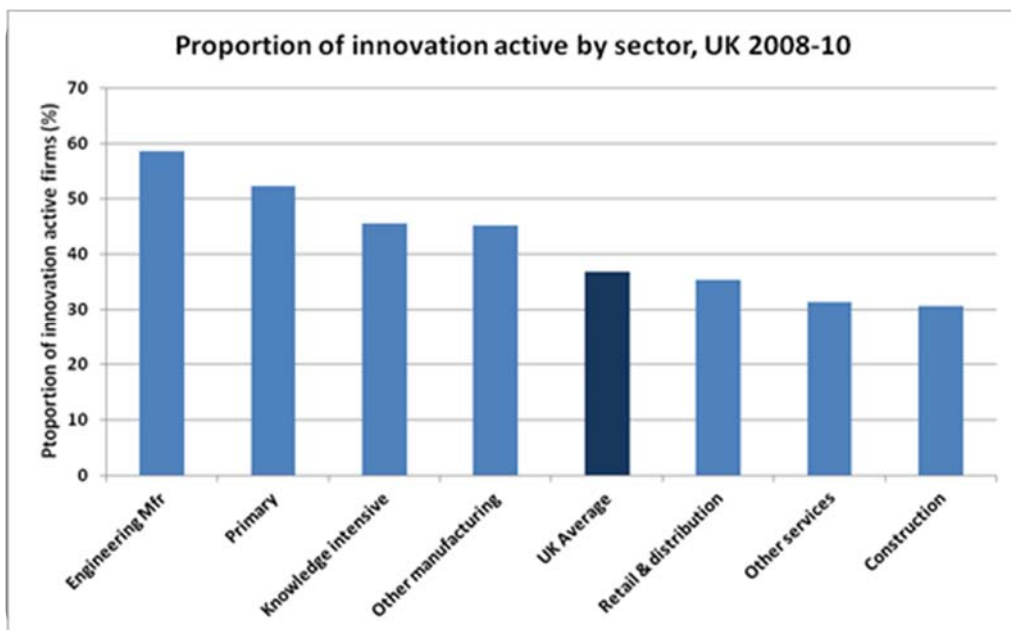
At a UK level, innovation performance varies by sector. Engineering-based manufacturing, the primary sector (mining & quarrying), knowledge intensive services and 'other manufacturing' have above average proportions of firms that are innovation active; retail & distribution, other services and construction have lower proportions of innovation active firms, as Figure 10 shows.

Figure 9: Proportion of Innovation Active Small Firms by UK Region 2011



Source: UK Business: Activity, Size and Location 2011, UK Innovation Survey 2011

Figure 10: Proportion of Innovation Active Firms by Sector 2008-10



Source: UK Innovation Survey 2011

Scotland tends to have a lower proportion of its business base in sectors where innovation activity is high (at the UK level), so its business structure may explain part of the innovation difference with the UK as a whole.

Table 4 details the proportion of firms in Scotland's business base compared to the UK, for the five highest and lowest innovation active performing sectors. This highlights the extent to which Scotland, compared to the UK, has relatively more businesses within its business base that are in sectors that are less likely to be innovation active, and the extent to which it has a lower proportion of businesses in some of the sectors that are more likely to be innovation active.

Table 4: Business Base and Sector Innovation Performance

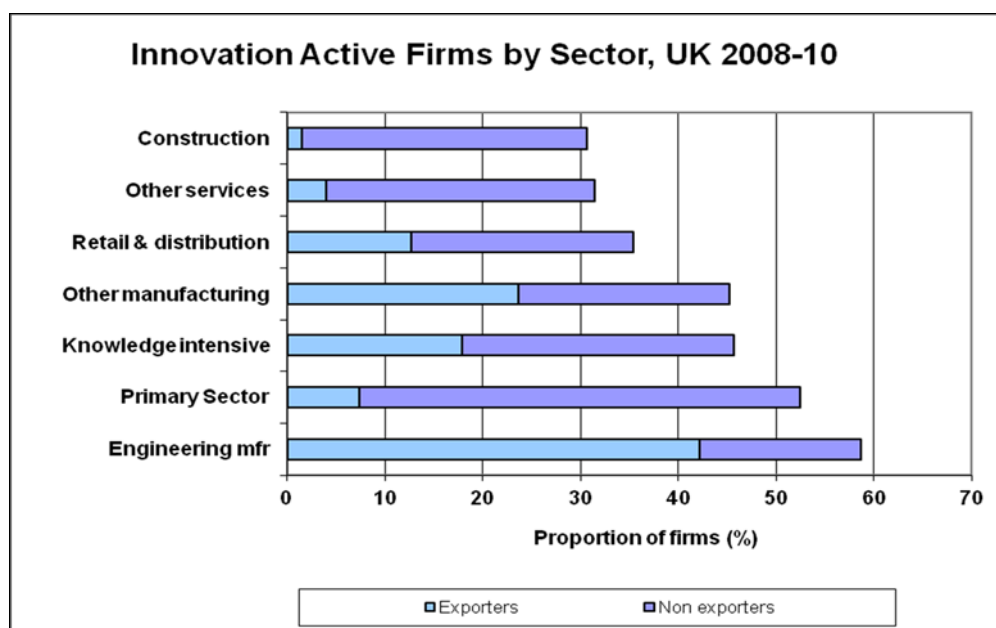
	% innovation active firms by sector in UK	Proportion of firms in Scotland's business base relative to UK = 100
Five highest innovation active sectors		
Electrical and optical equipment	61.6	77
Telecommunications	59.0	60
Research & experimental development	56.3	106
Electricity, gas & water supply	55.9	100
Computer and related activities/ICT	54.0	57
Five lowest innovation active sectors		
Construction	30.6	129
Transport	28.5	116
Retail Trade	28.5	107
Hotels & restaurants	28.4	145
Renting of machinery, equipment etc.	26.0	132

Source: UK Innovation Survey 2011

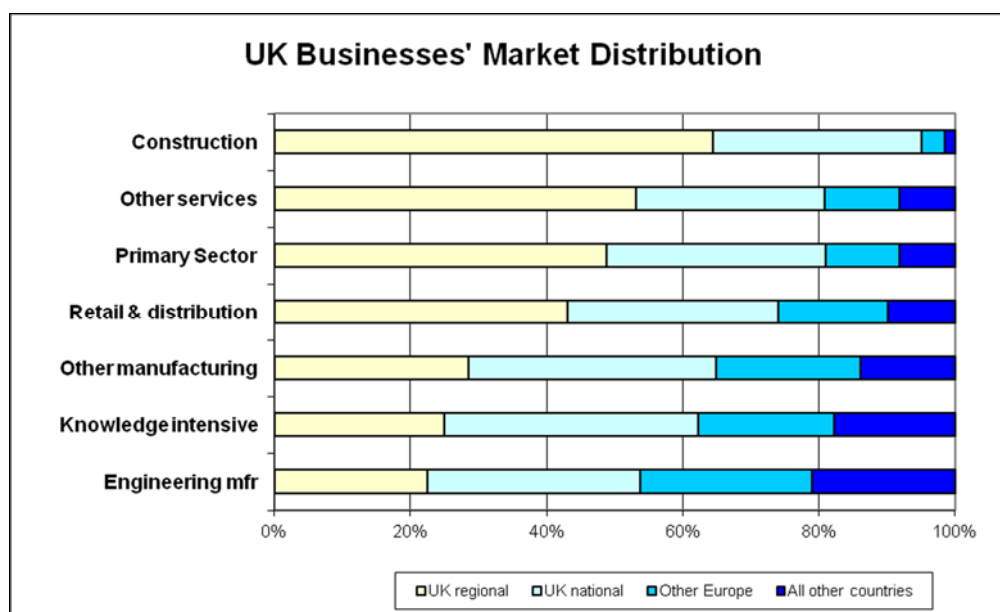
Innovation and exporting

As outlined above, the latest results show that Scotland has a lower proportion of firms that are overseas exporters than other UK regions, and data for the UK suggest strong links between innovation activity and exporting by sector. Figure 11 highlights that a large proportion of innovation active companies in engineering-based and other manufacturing companies are exporters; and figure 12 highlights the extent to which engineering-based manufacturing, other manufacturing and knowledge intensive sectors' markets are focused outside the UK.

Figure 11: Proportion of Innovation Active Exporters and Non Exporters by Sector 2008-10



Source: UK Innovation Survey 2011

Figure 12: Distribution of Firms Markets by Industry Sector 2008-10

Source: UK Innovation Survey 2011

Evidence gaps and further research

Overall these findings raise questions such as:

- What are Scotland's most innovative sectors? Are they the same ones as for the UK as a whole?
- What is the impact of business size on Scotland's innovation performance?
- Does Scotland's business / industrial structure help explain its innovation investment activity/levels?
- Does Scotland's industrial structure help explain differences in the motivation for innovation compared to the UK?
- How do Scotland's sectors perform relative to those of other UK regions?
- What Scottish sectors are both innovators and exporters?
- Why are Scotland's exports of higher value? Could this be due to industry structure, given the importance of high value add sectors such as whisky and chemicals in Scotland?

Clearly, there are a number of evidence gaps and further analysis of the Innovation Survey data is planned to answer these questions.

Scottish Enterprise and Innovation

To stimulate innovation, Scottish Enterprise works with companies to help them become more competitive, successful in international markets and achieve additional revenues. Its approach to company innovation is well developed through its Innovation Support, SMART and R&D grant programmes^{xix}.

Working collaboratively with partners, Scottish Enterprise is taking forward a number of other actions to boost Scotland's innovation performance. This includes ensuring its knowledge transfer, innovation and commercialisation activity is aligned with that of the Scottish Government, the Scottish Funding Council, and Highlands and Islands Enterprise. This will see the development of sector-based Innovation Centres to improve links and knowledge exchange between universities and businesses, particularly SMEs. Scottish Enterprise's 'Team Scotland' approach also focuses on maximising the potential offered by the current programmes supported by the European Union. In addition, SE is exploring how Scotland can better utilise high levels of public procurement from bodies such as the NHS to help stimulate more demand-driven company development

By improving Scotland's innovation performance, we can make a considerable difference to the long term growth of our economy since innovative companies and sectors are key drivers of productivity and competitiveness and economic growth.

Summary/Conclusions

Innovation is a key driver of economic growth with innovative firms growing faster than non-innovators; however, analysis of the latest data shows that Scotland is underperforming relative to the UK as a whole and to other European countries.

The data highlight some key differences between Scotland and UK innovation performance in areas such as markets, motivation for innovation and investment.

Analysis of the data that are currently available by firm size and sector for the UK helps to throw some light on Scotland's performance.

However, further research and analysis is required to gain a better understanding of Scotland's innovation performance. This analysis has helped to identify some of the areas where further research should focus.

ⁱ In the form of performance improvements in products, processes, services and systems

ⁱⁱ [BIS, Economics Paper 15: Innovation and Research Strategy for Growth](#)

ⁱⁱⁱ [BIS, Annual Innovation Report 2010](#)

^{iv} [NESTA, Business Growth and Innovation](#)

^v [Scottish Government, Innovation for Scotland 2009](#)

^{vi} [Scottish Government Economic Strategy 2011](#)

^{vii} [National Performance Indicators](#)

^{viii} [ONS, UK Innovation Survey](#)

^{ix} [BIS, UK Innovation Survey 2011, Statistical Annex](#)

^x Survey covered a representative sample of businesses with 10 or more employees in sections B-N of the Standard Industrial Classification 2007 and excluded public sector and membership organisations.

^{xi} [Economic & Labour Market Review, Vol 4, No 3 March 2010: First findings from the UK Innovation Survey 2009](#)

^{xii} Previous surveys defined innovation activity as enterprises engaged in the introduction of a new or significantly improved product (goods or service) or process; incomplete or abandoned innovation projects; or expenditure on internal R&D, training, acquisition of external knowledge or machinery and equipment linked to innovation activities while broader innovators were firms that had introduced new and significantly improved forms of organisation, business structures or practices.

^{xiii} Figures from Eurostat from the Community Innovation Survey are based on a smaller sectoral coverage than the UK Innovation Survey, therefore, differ from the UK figures. However, the definition of Innovation active is now comparable

^{xiv} See for example <http://enterpriseresearch.ac.uk/research-themes/research-theme-5-sme-innovation-exporting-and-growth/>

^{xv} This could be due to the high numbers non-responses to the export survey question in the Innovation Survey, so exporting activity is underestimated. However, as the results for all regions of the UK were also affected by non-responses Scotland's relative position remains the same. The Scottish Small Business Survey suggests that around 22% of small businesses (10-49 employees) and 37% of mediums sized businesses (50-249 employees) export, higher than the figure suggested by the UK Innovation survey

^{xvi} [Scottish Government, BERD 2011](#)

^{xvii} 90% of firms in sectors covered by the survey had less than 10 employees and 10% had more than 10 employees. Firms in the small (10-49 employees size band) accounted for 9% of firms, therefore, only 1% of firms had 50 or more employees.

^{xviii} This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates

^{xix} <http://www.scottish-enterprise.com/grow-your-business/innovation.aspx>

Underemployment: a skills utilisation perspective

John Sutherland, University of Strathclyde

Abstract

More than half of all employees believe that the skills they possess are higher than those required to do their present jobs. This is one of several findings reported in a research paper on 'under-employment' in the current edition of the University of Strathclyde's Fraser of Allander Review published today. According to the author of the paper, John Sutherland of the Scottish Centre for Employment Research at the university, this provides further evidence that 'under-employment' is as important a policy problem as 'unemployment'.

The Context

Underemployment has become accepted as a major labour market policy problem. Statistics on underemployment now frequently accompany statistics on the unemployment rate and the activity rate when comment is made about the performance of the labour market. In April 2013 underemployment was the subject of the 6th Report of the Economy, Energy and Tourism Committee of the Scottish Parliament (Economy, Energy and Tourism Committee, 2013).

The International Labour Office defines underemployment as individuals 'willing and able to work more adequately'. Therefore, the concept has both quantitative and qualitative dimensions. The former is reflected in the number of hours an individual works and the latter is reflected in the extent to which he/she fully utilises the skills possessed working in his/her present job.

Measuring hours is the more tractable. Consequently this has been the focus of most research. In the UK, this research has made use of data available in the quarterly Labour Force Surveys (LFS) since 2000. These data provide information on the number of individuals who wish to work more hours. Since the advent of these data, there have always been individuals identified as hours constrained. What has been observed of late, however, is that the number in this category increased by 1 million between 2008 and 2012, with most of this increase occurring in the 12 months of the 2008-9 recession (ONS, 2012). At present, approximately 1 in every 10 workers wants to work more hours. There is an argument, therefore, that aggregate changes in this quantitative dimension of underemployment are likely to be related to the economic cycle.

As measured in this way, underemployment is seen to vary across the devolved countries of the UK and the regions of England. It is highest in the East Midlands, Yorkshire and the Humber and the North East regions of England. It is lowest in the South East region of England (ONS, 2012). There are also (sometimes wide) intra country/region variations. For example, in Scotland it is highest in Dundee City and the Shetland Islands and lowest in Eilean Siar (Western Isles) and Aberdeen City (Economy, Energy and Tourism Committee, 2013).ⁱ Using the micro data available in the LFS, the incidence of underemployment is seen to be more likely for part time workers rather than full time workers; workers in the private sector rather than workers in the public sector; workers in the Distribution and Hotels industrial sector rather than workers in the Energy and Water industrial sector; women rather than men; and younger workers rather than older workers (Bell and Blanchflower, 2011: 2013).

However, this relatively more visible perspective of underemployment gives only a partial perspective of the nature and extent of the phenomenon and, therefore, its potential impact on individuals, organisations, local communities and regional and national economies. As Felstead (2012) argues, wasted skill resources also have negative consequences for all the principal actors in the labour market. The operational problem in this respect is the absence of appropriate and regular data sets suitable to measure the extent and examine incidence of skills underutilisation.ⁱⁱ

This paper addresses this research lacunae. The research reported is an analysis of a matched workplace-employee data set which contains responses to the question: "How well do the work skills you personally have match the skills you need to do your present job?" Therefore, the paper presents evidence on the extent of skills underutilisation and how its incidence varies across individuals. The extent of skills underutilisation – and therefore underemployment from a more qualitative perspective – is seen to be considerable, constituting more than half the respondents. Its incidence across individuals is seen to be explained by factors which reflect both the personal characteristics of the individual and the characteristics of the workplace at which he/she is employed.

The Data set

The data set used in the research investigation is a matched workplace-employee data set which has its origins in the 2011 Workplace Employment Relations Study.ⁱⁱⁱ The 2011 Workplace Employment Relations Study (WERS 2011) is the sixth in a series of workplace surveys which map the changing contours of employment relations in Britain (Brown et al, 2009). The survey population is all workplaces in Britain that have five or more employees operating in Sections C-S of the 2007 Standard Industrial Classification (i.e. Agriculture and Mining is excluded). A workplace is defined as comprising the activities of a single employer at a single set of premises.

The WERS 2011 sample design had two aims. The first was to obtain interviews at 900 of the 2,295 workplaces which had participated in the cross section sample of the 2004 study, the most recent of the previous studies. These were to constitute a 'panel sample'. The second was to obtain interviews at a further 1,800 workplaces, selected as a stratified random sample from the Inter Departmental Business Register maintained by the Office for National Statistics. These were to constitute a 'refreshment sample'. When taken together, therefore, the 'panel sample' and the 'refreshment sample' constitute the 'combined sample'.^{iv}

There are four components to the 2011 study: the Survey of Managers; the Survey of Worker Representatives; the Survey of Employees; and, for workplaces in the trading sectors, the Financial Performance Questionnaire. This investigation makes use of a data set which merges responses to the survey of managers and the survey of employees.

At each participating workplace, the most senior manager responsible for employment relations was interviewed. Prior to this interview, this manager was asked to provide a demographic profile of the workplace. The management questionnaire sought information on the following: workplace/organisation characteristics; the management of personnel and employment relations; recruitment, training and the organisation of work; consultation and communication; representation at work; payment systems and pay determination; collective disputes and procedures; fair treatment at work; workplace flexibility; workplace performance; and workplace change.

Permission was sought from this manager to distribute a self-completion questionnaire to employees at the workplace. If the manager agreed, 25 employees were selected randomly from a list of all employees and invited to complete the questionnaire. At workplaces with fewer than 25 employees, each employee participated. In addition to asking questions which relate to the personal characteristics of the individual, the survey of employees sought information about the individual's job; the workplace at which he/she was employed; personal views about working at this workplace; and representation at work.

For the particular purpose of this investigation of skills underutilisation, the timing of the WERS 2011 study is important. Fieldwork took place between March 2011 and June 2012, therefore, some 3/4 years after the financial and economic crises of 2008. During the recession consequential of these crises, the decrease in the level of aggregate employment was comparatively small given the corresponding fall in output, especially so when compared to previous recessions (Gregg and Wadsworth, 2011). Bell and Blanchflower (2011) compare and contrast the level of employment with aggregate hours worked by individuals and illustrate the manner in which adjustment during this period was associated more with changes to the latter rather than changes to the former i.e. organisations adjusted to the demands of the recession by changing their utilisation of labour rather than the size of their labour stocks. In this way, organisations were seeking to 'survive' through the recession, where these employment based survival strategies were facilitated, perhaps, by labour market de-regulation which had created the opportunities for this type of labour market flexibility.

By 2012 employment had recovered its pre-recessionary level, nationally if not across all the constituent parts of the UK. There were, however, substantial compositional changes to the stock of workplace jobs in the interim, principally attributable to respective governments' contrasting fiscal stances in response to these crises. Whereas employment in the private sector decreased during 2008 -2009, employment in the public sector increased. Thereafter, whereas employment in the private sector increased, employment in the public sector decreased.^v

It is to be expected that these changes in the labour market environment had some probable, if incalculable, effects on the nature of skills match/mismatch in many workplaces. To illustrate, confronted with the need to make some staff redundant, management prefer to retain the more highly skilled, irrespective of the skills requirements of the jobs the retained workers subsequently do. Similarly, confronted with the need to hire, and presented with a choice between job applicants, management prefer to engage the more highly skilled, again irrespective of the skill requirements of the jobs the new recruits do, thereby generating considerable displacement effects in the labour market as a consequence.

The Estimation model

The focus of the investigation is responses to one of the questions put in the survey of employees: “How well do the work skills you personally have match the skills you need to do your present job?” The frequency and percentage distributions of the responses are reported in Table 1. To different degrees, 11,275 individuals (i.e. 51.67 per cent of the total) claimed that the skills they had were higher than the skills required for the job of work they did.^{vi}

These responses were recoded and a binomial probit was used to determine the probability that an individual reported that the skills possessed were higher than the skills required for the job of work done. The model was of the conventional sort viz:

$$y_{iw} = X_{iw}\beta + \varepsilon_{iw}$$

where y_{iw} is the recoded response of an individual (i) in a workplace (w); X_{iw} β and ε_{iw} are, respectively, a vector of independent variables, a set of coefficients to be estimated, and an error term (cf. Cameron and Trivedi, 2010; Long and Freeze, 2006). In the estimation, $y_{iw} = 1$, if an individual reported that he/she possessed skills higher than the skills required for his/her present job (and = 0 otherwise).

The independent variables in the model were of two sorts. The first related to the personal characteristics of the individual. Illustrative examples include: gender; age; work status; tenure; pay grade; and qualifications. This information had its origin in the survey of employees. The second related to the characteristics of the workplace at which the individual was employed. Illustrative examples include: its size; the (2007) Standard Industrial Classification (SIC) of the principal activity undertaken at the workplace; and its legal status. This information had its origin in the management questionnaire. Details about the complete set of independent variables used in the estimation model – and how they appear in it – are to be found in column 1 of Table 3 and the footnotes of this table.

When observations which had an incomplete set of all the variables used in the estimation were dropped from the data set, the resulting working data set had 18,422 observations.^{vii}

The Results

The results are reported in two tables. Table 3 presents the results of the probability that an individual reports that his/her personal work skills are higher than the skills needed in his/her present job, for the more salient independent variables. The sign of the coefficient (column 2 of Table 3) denotes the qualitative nature of the relationship between the independent variable and the dependent variable. Positively (negatively) signed coefficients denote that an individual is more (less) likely to report this outcome. The value of the average marginal effect (column 5 of Table 3) denotes the magnitude of the relationship. Table 2 reports statistical tests of the joint significance of sets of associated categorical variables, for example the 9 individual variables associated with a person's age; and the 3 variables associated with his/her work status.

There is a statistically significant gender difference in the probability of reporting that skills possessed are higher than skills required.^{viii} Females are 7 per cent less likely to do so than males. This outcome is contrary to expectations. Conventionally, female labour supply is assumed to be constrained, for diverse reasons. Therefore, there is a corresponding consequential assumption that the jobs occupied by women are less likely to make full use of the skills they possess.

The 9 variables associated with the age factor are jointly significant. Three age category variables are statistically significant. Relative to the omitted reference category (aged 20 – 21), an individual aged 50 - 59; 60 - 64; and 65 and over is 8 per cent; 15 per cent; and 14 per cent, respectively, more likely to report that the skills possessed are higher than required for the job done. These results are much as expected. Skills, often tacit skills, are acquired and developed with age. Consequently, for many older workers, the skills possessed become greater than the skills required in the jobs they currently do. Less expected are the positive signs of the coefficients associated with some of the younger age categories, although these results are not statistically significant. If anything, the expectation is that these coefficients would be negatively signed, relative to the reference age category. That they are not may be attributed, perhaps, to

the low skilled/no skilled nature of the jobs available to many in these age groups, relative to the skills these individuals perceive they possess.

The 3 variables associated with the work status factor are not jointly statistically significant. Further, neither of the coefficients of the individual variables associated with work status is statistically significant. That there is no statistically significant difference between these variables with respect to reporting that the skills possessed are higher than the skills required may be attributable, perhaps, to the increasing frequency with which individuals holding permanent contracts and individuals holding temporary or fixed term contracts are no longer complements in the workplace but substitutes.

The 5 variables associated with the tenure factor are jointly statistically significant. Further, 2 of the coefficients of the tenure category variables are statistically significant. Relative to those in the omitted reference category (of being employed at the workplace for 2 to less than 5 years), an individual with tenure of 5 to less than 10 years; and an individual with 10 years or more is 4 and 6 per cent, respectively, less likely to report that the skills possessed are higher than those required for the present job. This outcome is surprising. The conventional assumption is that with time at the workplace, and with learning by doing, skills are enhanced. Consequently, the expectation is that for many the skills possessed tend to become greater than the skills required in the jobs held. That this is not observed may be attributable, perhaps, to the skills content of the jobs being done currently also increasing, and at a proportionately greater rate, perhaps indicative of work re-organisation as another strategic response to difficulties encountered at some workplaces during the recession. The negatively signed coefficients associated with the shorter duration tenure categories are more in accord with expectations. None of them, however, is statistically significant.

The 14 variables associated with the pay grade factor are jointly statistically significant. Two observations are to be made about the results pertaining to the individual pay grade variables. The first is to note the negatively signed (and statistically significant) coefficients associated with the 4 highest pay grades. An individual earning £27,041 - £33,800 per year; £33,801 - £42,640 per year; £42,641 - £54,600 per year; and £54,601 and over is, respectively 4 per cent; 9 per cent; 9 per cent; and 16 per cent less likely to report that the skills possessed are higher than the skills required to do his/her present job, relative to the omitted reference pay grade category of earning £11,441 - £13, 520 per year. These results may be explained, perhaps, by the skills dimension of the 'demands of the job' associated with individuals in these higher earnings echelons. The second observation to note is the positively signed coefficients associated with the variables denoting relatively lower pay grade categories, although none of them is statistically significant. That individuals in these pay grade categories report that the skills they possess (and human capital theory would suggest that these skills must be relatively limited at these low pay grades) are nonetheless higher than the skills they require to do their present job may be indicative of the low/no skills content of many of these low paid jobs.

The 3 variables associated with the union status factor are not statistically significant. Further, neither of the two coefficients associated with the variables denoting union status is statistically significant. This result may be attributable, perhaps, to the increasing irrelevance of individual union membership in many sectors of the economy on matters germane to skills utilisation, indeed skills in general.

There are 3 separate variables associated with qualifications. Each is statistically significant and each accords with expectations. An individual with graduate status, relative to an equivalent individual who does not have a degree, is 7 per cent more likely to report that the skills he/she possesses are higher than the skills required in his/her current job. This outcome concurs with previous research about the contemporary nature of employment for some graduates, often reflected in the phrase 'over-education' (McGuinness, 2006). An individual with no academic qualifications, relative to an equivalent individual who has some academic qualifications, and an individual with no professional or vocational qualifications, relative to an equivalent individual who has some professional or vocational qualifications, is 7 per cent and 12 per cent, respectively, less likely to report that the skills he/she possesses are higher than those required to do his/her present job.

The 6 variables associated with the workplace size factor are jointly statistically significant. However, only one coefficient of the relevant variables is statistically significant. An individual in a workplace with 500 or more employees, relative to an individual employed in the omitted reference workplace size category (i.e. employing between 20 -49) is 4 per cent more likely to report possessing skills higher than those required in his/her present job. Although not all of the results are statistically significant, it is noteworthy that the signs of the coefficients of the variables associated with an individual employed in relatively smaller workplaces are negative, whereas the signs of the coefficients of the variables associated with an individual employed in relatively larger workplaces are positive.

The 17 variables associated with the SIC of the activity undertaken at the workplace are jointly statistically significant. However, the coefficients of only two variables (viz. Accommodation and Food Service and Arts, Entertainment etc.) are statistically significant. Whereas an individual in the former sector is 12 per

cent more likely to report that the skills possessed are higher than the skills required, the corresponding percentage for an individual in the latter sector is 10, where both magnitudes are relative to an individual in the omitted reference SIC category of Wholesale and Retail. It may be concluded, therefore, that, in general, there is little by way of statistically significant differences between individuals across the industrial sectors of the economy with respect to the skills underutilisation issue under investigation. This result differs somewhat from the earlier one reported by Bell and Blanchflower (2011), although a different measure of the concept of underemployment is being examined.

The 3 variables associated with the workplace type factor are jointly statistically significant. Relative to the omitted reference category of the individual at a workplace which is a single independent establishment, the individual at a workplace which is part of a multi-establishment organisation is 3 per cent more likely to report that he/she possesses skills higher than those required for the job. Notably, the sign of the coefficient for the workplace being the sole UK establishment of a foreign organisation is negative, although not statistically significant.

Finally, the 12 variables associated with the formal status of the workplace factor are not jointly statistically significant. Further, not one of the coefficients which relate to these variables is statistically significant. In the context of whether an individual is more likely to possess skills higher than those required for the job done he/she does, the formal (i.e. legal) status of the workplace, therefore, is of no consequence.

In essence, therefore, the extent of skills underutilisation is considerable, constituting more than half the respondents, and its incidence across individuals is to be explained by factors which reflect both the personal characteristics of the individual and the characteristics of the workplace at which he/she is employed.

Conclusions

Just more than half (i.e. 51.67 per cent) of the employees surveyed in the 2011 Workplace and Employment Relations Study reported that, to different degrees, the skills they possessed were higher than the skills required to do their present jobs. Further, the probability that an individual reported that he/she possessed skills which were higher than those required in his/her present job were explained by variables which reflected both who the individual is and the workplace at which he/she is employed. Skills under-utilisation was *more* likely to be reported by: individuals in the older age categories; and graduates. However, in contrast, individuals who were: female; with relatively long tenure at the workplace; in the highest pay grades; and with neither no academic qualification nor no professional or vocational qualification were *less* likely to report that the skills they possessed were higher than the skills required to do their present jobs. The size of the workplace at which the individual was employed; its SIC; and its type were also of consequence in explaining this outcome. However, often there was little by way of statistical differences between the individual variables within these three sets of factors.

This analysis of skill under-utilisation provides a partial, qualitative perspective of underemployment undertaken at what may have been an atypical point in time.

It is a partial perspective to the extent that it is a survey of employees in employment. As such, it ignores the self-employed, an increasing proportion of the employed workforce in the post-recessionary period. Traditionally, one motivating factor underlying an individual's decision to move from being an employee to being self-employed was to make better use of his/her skills. Although this may continue to be the case for many, what is not known is how many of those who have made this transition in recent years have done so opting for self-employment rather than unemployment. The 'new' self-employed do appear to have quite different characteristics from those in self-employment before the recession, not least the tendency to work on a part time basis.

It is a qualitative perspective because its focus has been upon the relatively less visible skills dimension of underemployment. This, however, is the major contribution of the research investigation reported because there is much less evidence which relates to the skills underutilisation dimension issue than to the hours constrained dimension.

Finally, the point in time may be atypical, therefore perhaps less than conducive to examining the problem of skills utilisation/underutilisation. The analysis has its origins in a cross section survey undertaken between March 2011 and June 2012, months during which many workplaces must still have been adjusting to the traumas of the financial and economic crises of 2008 and its consequences. Most likely, many of these adjustments focussed upon the internal labour markets of the workplace, with incalculable effects for person- job skills matches.

There are, nonetheless, a number of policy implications which follow both from this research and the other research to which it relates which, collectively, challenge the conventional dichotomy between 'working' and 'not working'.

The first is that it would be futile to attempt to design and implement policies to address the problem of underemployment per se. Hours constrained underemployment may not be caused only by inadequate demand for labour. However, the level of labour demand prevailing within the economy at present undoubtedly exacerbates the magnitude of the current problem. Increasing the demand for labour, therefore, would go some way towards mitigating this dimension of underemployment. As Bell and Blanchflower (2013) argue, currently, there is substantial spare capacity in the labour market. Consequently, were demand to be higher output could be higher without exerting any significant upward pressure on wages. That said, merely addressing the problem of aggregate demand for labour will not necessarily remove the problem of hours constrained underemployment. There is evidence to the effect that, if to a lesser extent, this also existed prior to the recession.

The second is that the hours dimension of underemployment provides only a very partial, quantitative perspective of the extent of the problem. There is also a qualitative perspective, manifest, for example, in skills underutilisation. To a certain degree, skills underutilisation will always exist. However, opportunities within the labour market will allow some who believe that they are not fully utilising their skills to quit their current workplace voluntarily in favour of another where better use may be made of their skills. What is disconcerting is the extent to which skills underutilisation appears to exist even in non-recessionary years, as reported in the Employee Skills Survey series (Felstead et al, 2007; Felstead et al, 2013). In this context, the policy requirement is more one comparable with that outlined – if not necessarily fully implemented – in *Skills for Scotland: A Lifelong Skills Strategy* which emphasises the importance of stimulating the demand for skills on the part of employers and, thereby, improving the utilisation of skills at the workplace (Payne, 2009).

Finally, to the extent that there is significant underemployment within the economy – of both a quantitative and qualitative nature – it is important to recognise that when the recovery does come, employers are more likely to meet the associated increase in labour demand by first making use of their existing personnel, rather than making new hires, with manifold consequences for unemployed job seekers and potential new entrants to the labour market.

John Sutherland is a Visiting Researcher, Scottish Centre for Employment Research (SCER), Dept. of Human Resource Management, Strathclyde Business School, University of Strathclyde

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Statistical appendix

Table 1.
Responses to the Question: “How well do your personal work skills match the skills you need in your present job?”

Response	Frequency	Percentage
Much higher	4,111	18.84
A bit higher	7,164	32.83
About the same	9,670	44.32
A bit lower	714	3.27
Much lower	161	0.74
Total	21,820	100.00

Table 2.
Statistical Test Results for the Joint Significance of Selected Sets of Factor Variables

Factor Variables	Df	F	P > F
The set of variables associated with AGE	8	4.22	0.0000
The set of variables associated with WORK STATUS	2	0.34	0.7116
The set of variables associated with TENURE	4	4.54	0.0012
The set of variables associated with a WAGE GRADE	13	3.19	0.0001
The set of variables associated with UNION STATUS	2	1.37	0.2551
The set of variables associated with the SIZE OF THE WORKPLACE (measured by number of employees)	5	2.72	0.0185
The set of variables associated with the SIC (2007) OF THE WORKPLACE	16	3.37	0.0000
The set of variables associated with the TYPE OF WORKPLACE	2	4.64	0.0097
The set of variables associated with the FORMAL (i.e. LEGAL) STATUS OF THE WORKPLACE	11	0.85	0.5899

Table 3.

Probit Results for the Probability than an Individual Reports That His/her Personal Work Skills are Higher than the Skills Needed in His/her Present Job

Variable	Coefficient	Linearized Standard Error	P > t	Average Marginal Effects
Female	-.1861	.0340	0.000	-.072
Age, in years				
16 – 17	.0571	.1782	0.749	.022
18 – 19	-.2320	.1352	0.086	-.088
20 - 21 *				
22 – 29	.0831	.0956	0.384	.032
30 – 39	.0822	.0979	0.401	.031
40 - 49	.1608	.0984	0.102	.062
50 -59	.2011	.1000	0.044	.077
60 -64	.3912	.1133	0.001	.150
65 and over	.3768	.1464	0.010	.144
Work status				
Permanent *				
Temporary	-.0576	.0733	0.432	-.022
Fixed Period	.0151	.0790	0.847	.005
Tenure, in years				
Less than 1	-.0939	.0529	0.076	-.036
1 to less than 2	-.0428	.0513	0.404	-.016
2 to less than 5 *				
5 to less than 10	-.0978	.0399	0.014	-.037
10 or more	-.1673	.0403	0.000	-.064
Pay Grade, in pounds per annum				
£3,120 or less	.0724	.1012	0.474	.027
£3,121 - £5,200	.0238	.0880	0.787	.009
£5,201 - £6,760	.1232	.0913	0.177	.046
£6,761 - £8,840	.0245	.0817	0.763	.009
£8,841 - £11,440	.0619	.0671	0.357	.023
£11,441 - £13,520 *				
£13,521 - £16,120	-.0374	.0645	0.562	-.014
£16,121 - £19,240	.0004	.0642	0.994	.000
£19,241 - £22,360	-.1039	.0645	0.107	-.040
£22,361 - £27,040	-.0892	.0648	0.169	-.034
£27,041 - £33,800	-.0999	.0670	0.136	-.038
£33,801 - £42,640	-.2449	.0707	0.001	-.094
£42,641 - £54,600	-.2245	.0840	0.008	-.086
£54,601 or more	-.4148	.0907	0.000	-.159
Union Membership				
Currently a member *				
No, but have been in the past	.0560	.0433	0.196	.021
No, and have never been	-.0105	.0366	0.774	-.004
Has graduate status	.1791	.0356	0.000	.069
Has no academic quals.	-.1751	.0715	0.014	-.067
Has no prof./vocational quals.	-.3160	.0640	0.000	-.122

Table 3. cont.

Variable	Coefficient	Linearized Standard Error	P > t	Average Marginal Effects
Workplace Size				
Between 5 – 9 employees	-.0780	.0651	0.231	-.030
Between 10 – 19 employees	-.0768	.0474	0.105	-.029
Between 20 – 49 employees *				
Between 50 -99 employees	.0435	.0419	0.299	.016
Between 100 -499 employees	.0373	.0399	0.350	.014
500 or more employees	.1019	.0462	0.028	.039
Standard Industrial Classification (2007)				
Manufacturing	-.0936	.0651	0.150	-.036
Electricity, Gas etc.	-.2623	.1518	0.084	-.101
Water Supply, Sewage etc.	-.0631	.1356	0.642	-.024
Construction	-.0578	.0848	0.495	-.022
Wholesale and Retail *				
Transportation and Storage	.0779	.0859	0.365	.030
Accommodation and Food Service	.3108	.0765	0.000	.117
Information and Communication	-.0520	.0875	0.552	-.020
Financial and Insurance Activities	-.1504	.1092	0.169	-.058
Real Estate Activities	.0569	.0947	0.548	.022
Professional, Scientific etc.	-.0774	.0820	0.343	-.030
Administrative and Support etc.	-.0591	.0941	0.530	-.023
Public Admin. and Defence	-.0021	.0783	0.978	-.000
Education	-.0858	.0728	0.239	-.033
Human Health and Social Work	-.0527	.0682	0.440	-.020
Arts, Entertainment etc.	.2691	.0898	0.003	.102
Other Service Activities	.0304	.0919	0.740	.011
Workplace Type				
Part of multi-establishment organisation	.0713	.0343	0.038	.027
Single independent establishment *				
Sole UK establishment of foreign organisation	-.1264	.0830	0.128	-.049

Table 3. cont.

Variable	Coefficient	Standard Linearized Error	P > t	Average Marginal Effects
Formal (i.e. legal) Status of Workplace				
Public Limited Company	.0287	.0620	0.643	.011
Private Limited Company	.0090	.0562	0.873	.003
Company Limited by Guarantee	.0180	.0952	0.850	.007
Partnership/Self-proprietor	-.0961	.0750	0.200	-.037
Trust/Charity	-.0222	.0549	0.685	-.008
Body established by Royal Charter	-.1540	.1467	0.294	-.059
Co-operative/Mutual/Friendly Society	-.1888	.1464	0.197	-.073
Government Owned Limited Company (Nationalised Industry)	.0626	.0902	0.487	.024
Public Service Agency	.0995	.0733	0.175	.038
Other Non-trading Public Corporation	.1405	.1561	0.368	.054
QUANGO	.0702	.2244	0.754	.027
Local/Central Government *				
Constant	.1500	.1647	0.362	
Number of Observations =	18442			
Population Size =	84.2264			
Design df =	18441			
F (75, 18367) =	4.42			
Prob > F =	0.0000			

Footnotes to Table:

*indicates the omitted reference category, where applicable.

Additionally, the estimation included the following: a scalar variable denoting the number of hours usually worked; factor variables denoting marital status; a factor variable denoting whether the individual had a dependent child/dependent children; a factor variable denoting ethnic grouping (i.e. 'British' or 'other'); a scalar variable denoting the percentage of males employed at the workplace; and a scalar variable denoting the percentage of part time employees employed at the workplace.

John Sutherland is a Visiting Researcher at the Scottish Centre for Employment Research (SCER) in the Department of Human Resource Management, Strathclyde Business School at the University of Strathclyde. Email address: john.sutherland@strath.ac.uk.

ⁱ The nature and extent of some of these spatial variations would seem to challenge the perspective that changes in underemployment are attributable wholly to changes in labour demand.

ⁱⁱ The series of Employee Skills Surveys is 'appropriate' in this context. However, unlike the quarterly LFS, these surveys cannot be described as 'regular'. Sutherland (2010) makes use of the 2006 data set to examine the qualifications/jobs mismatch in Scotland. For the purpose of this survey, the numbers surveyed in Scotland were boosted, thereby allowing an analysis of a statistically representative sample of employees in employment in Scotland.

ⁱⁱⁱ The Workplace Employment Relations Study, 2011 was sponsored by: the Department for Business, Innovation and Skills (BIS), the Economic and Social Research Council (ESRC), the UK Commission for Employment and Skills (UKCES), the Advisory, Conciliation and Arbitration Service (ACAS) and the National Institute of Economic and Social Research (NIESR). The principal investigators were: BIS, ACAS, and NIESR. The data were collected by NatCen Social Research. The data were deposited at the UK Data Archive (UKDA) by BIS. The data were accessed via UKDA. Crown copyright is held jointly with ESRC, UKCES, ACAS and NIESR. Crown copyright material is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland. None of the above parties bears any responsibility for the analysis of the data set undertaken or any interpretation made from this analysis. The bibliographic citation for this data collection is: Department for Business, Innovation and Skills, Advisory, Conciliation and Arbitration Service and National Institute of Economic and Social Research, Workplace Employee Relations Survey, 2011 [computer file]. Colchester, Essex: UK Data Archive [distributor], February, 2013. SN: 7226, <http://dx.doi.org/10.5255/UKDA-SN-7226-1>

^{iv} The resulting 'combined sample' is not representative of the total population of workplaces of this size in Britain. Hence, analysis needs to make use of the appropriate weighting factor for each component of the survey, partly to account for the bias in the original survey design and partly to account for varying rates of non-response in its components. For this investigation, the employee weight variable was used.

^v See Sutherland (2013) for a discussion of the changes which occurred in the labour market in Scotland during this period.

^{vi} As an aside, it would appear that 'skills gaps' (i.e. situations in which some individuals do not possess the skills required for the jobs they do) no longer constitute a major problem within most workplaces, at least from the perspective of employees. Managers, of course, may be of a different opinion.

^{vii} This explains the difference in the number of observations which appear in Table 3 from Table 1.

^{viii} Statistical significance is assumed to be determined when the value of $(P > |t|)$ (cf. column 4 in Table 3) is < 0.05 .



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