



University of  
**Strathclyde**  
Business  
School

# Fraser of Allander Institute **Economic Commentary**

Vol 33 No.1

In association with **PRICEWATERHOUSECOOPERS** 

# Fraser of Allander economic commentary

June 2009  
Vol 33 No 1

© University of Strathclyde, 2009

The University of Strathclyde is a charitable body, registered in  
Scotland, number SC015263

<b>Outlook and appraisal</b> .....	4
<b>The Scottish economy</b>	
Forecasts of the Scottish economy .....	16
Review of Scottish Business Surveys .....	26
Overview of the labour market .....	29
<b>Foreword from the Principal</b> .....	34
<b>Economic perspectives</b>	
Graduate migration flows in Scotland Alessandra Faggian, Qian Cher Li and Robert E Wright .....	35
The impact of higher education institutions (HEIs) on the Scottish economy: New evidence from an HEI- disaggregated input-output approach Kristinn Hermannsson, Katerina Lisenkova, Peter G McGregor and J Kim Swales .....	43
The demographic challenge facing Scottish Higher Education Institutions: a computable general equilibrium Analysis Kristinn Hermannsson, Katerina Lisenkova, Peter G McGregor and J Kim Swales .....	48
Measuring the volume and value of the outputs of higher education institutions Ursula Kelly and Iain McNicoll .....	55
Training and employee use of skills in Scotland: some Evidence John Sutherland.....	60

The Fraser of Allander Economic Commentary was first published in 1975. The new association between PricewaterhouseCoopers and the University of Strathclyde's Business School provides the Fraser of Allander Institute with the support to continue the Commentary, and we gratefully acknowledge this support. The Fraser of Allander Institute is a research unit within the Department of Economics at the University of Strathclyde in Glasgow. The Institute carries out research on the Scottish economy, including the analysis of short-term movements in economic activity. Its researchers have an international reputation in modelling regional economies and in regional development. One-off research projects can be commissioned by private and public sector clients. If you would like further information on the Institute's research or services, please contact the Institute Administrator on 0141 548 3958 or email the Institute at [fraser@strath.ac.uk](mailto:fraser@strath.ac.uk).

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.

PwC support the production of the Economic Commentary but have no control of its editorial content, including, in particular, the economic forecasts. PwC produces its own regular review of UK and international economic prospects, the next issue of which is published on their website:  
[http://www.pwc.co.uk/eng/publications/uk\\_economic\\_outlook.html](http://www.pwc.co.uk/eng/publications/uk_economic_outlook.html)

### **Notes to contributors**

The editors welcome contributions to the Economic Perspectives section. Material submitted should be of interest to a predominately Scottish readership and written in a style intelligible to a non-specialist audience. Contributions should be submitted to Cliff Lockyer [c.j.lockyer@strath.ac.uk](mailto:c.j.lockyer@strath.ac.uk)

Articles accepted for publication should be supplied electronically and conform to the guidelines available from Isobel Sheppard at: [fraser@strath.ac.uk](mailto:fraser@strath.ac.uk)

The copyright for all material published in the Economic Commentary rests with the University of Strathclyde.

If you are interested in receiving copies of press releases and being kept informed of other publications associated with the Commentary please click on the following link <http://www.strath.ac.uk/frasercommentary/registration> and complete the registration form.

Fraser of Allander Institute  
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](mailto:fraser@strath.ac.uk)  
w: <http://www.strath.ac.uk/fraser/>

# Outlook and appraisal

## Overview

The recession in the UK economy may be over. The National Institute for Economic and Social Research in London called the end of the recession as occurring in March and is estimating small positive growth in April and May of this year. Due to lack of data the position in Scotland is much less clear. There is a clear danger of a “false dawn”, since it is not unknown for previous UK recessions to have one or two positive quarters of growth before growth turned negative again. Nevertheless, to the extent that the slowdown in economic activity is moderating and may be past its turning point, three reasons are offered for the turn round: re-stocking after considerable stock run-downs, short-time working and temporary plant closures from late 2008; a more price competitive UK economy due to the 20% fall in the value of sterling since the summer of 2007; and the effect of the significant policy stimulus through monetary and fiscal injections.

But to the extent that a recovery may be emerging in the UK it is likely to be slow and protracted. Households are reducing debt and raising savings so that consumer demand remains weak. Companies similarly faced with high debt levels and declining demand are also running down debt and cutting back significantly on investment. Export markets remain fragile with the IMF forecasting an 11% decline in world trade this year. But even as demand growth recovers there is concern that the banking sector has insufficient equity capital to enable credit to be supplied on a sufficient scale to support the recovery.

In the Scottish economy consumption remains weak, proxies for consumer confidence suggest the possibility of improvement as the decline in house prices which has been less in Scotland than in the rest of the UK appears to be moderating. Government spending is expected to remain strong in the current fiscal year but will begin to decline in real terms in 2010-11. Investment is falling in the UK and in the absence of specific Scottish data we assume the UK experience is mirrored in Scotland as in previous recessions. Tourism in Scotland is

resilient buoyed perhaps by a weak sterling exchange rate, the events associated with "Homecoming Scotland" and the prospect of good weather. Scottish exports both to the UK and the rest of the world have been badly affected as worldwide demand contracted in the recession. There is some survey evidence on exports to the rest of the UK that the rate of decline is moderating. But the overall export position is difficult and likely to remain so for several months, with the benefit from lower sterling levels only beginning to fully emerge once world trade picks up.

Against this background our central forecast is for a decline in GDP/GVA of -2.9% in 2009. Compared with the Treasury's average of new forecasts for the UK, we are forecasting that the Scottish economy will perform in 2009 more strongly than the UK on our central and high growth forecast but slightly worse than the UK on our low growth forecast. Our forecasts for 2010 and 2011 represent an improvement on our February position reflecting the UK evidence that a trough to the recession may have been reached in the first half of 2009. However, for 2012 we are a little less optimistic than we were in February. This is because while we anticipate a recovery in Scottish GDP growth we do not expect it to be robust. Indeed, in the light of the evidence from earlier recessions we are projecting the recovery to be weaker in Scotland on all three scenarios than the average of independent forecasts for the UK. Nevertheless, Scotland returns to weak positive growth on the central scenario of 0.6% in 2011 led by manufacturing and somewhat stronger growth of 1.4% in 2012 but this is still some way below the 1.9% growth trend.

On jobs, our central scenario predicts losses this year and next amounting to nearly 137,000. Net jobs growth returns in 2011 strengthening in 2012 but net job creation over these two years of just over 28,000 indicates the extent to which we expect the recovery to be slow and protracted.

On unemployment, our central forecast is for a rise in the ILO measure to a peak of 212,600 in 2010 or 6.2% of the workforce and then a gradual fall after that. The Scottish labour market has been outperforming the UK when measured by the employment and unemployment rates. But this masks a significant switch from job losses into

labour inactivity, rather than measured unemployment. Scotland's measured and forecast unemployment performance will depend crucially on the extent of this switch in future quarters.

Scotland's economy faces many challenges in successfully recovering from recession and establishing a favourable growth path. Analysis of structural change over the past decade reveals that Scotland became more of a service sector economy as the manufacturing share and electronics production fell. The Scottish economy effectively turned inwards and relied more on financial services, construction, property related and business services, and the public sector as manufactured exports played a smaller part in the demand for Scottish goods and services. Because of this Scotland may have difficulty in adjusting to a situation of higher household savings, lower domestic consumption growth, and severe cutbacks in public spending and/or higher taxation, which will require the economy to become more export and private sector orientated over the medium to long term. The required switch towards exports puts a premium on the competitiveness of manufacturing, since goods still account for the bulk of exports.

A key question here is whether Scottish manufacturing has the size, diversity and capability to take advantage of a recovery. This poses a policy challenge to the Scottish government and its economic development agencies as well as to the private sector in Scotland. New products embodying green technologies, life sciences, digital and creative media, have been mentioned as likely to make a significant contribution to Scotland's export led recovery. But the development of such products may not happen if left to the market alone and, in any event, are unlikely to be sufficient on their own to generate the required growth of the Scottish economy.

The expansion in Scotland's export base necessary to secure the desired increase in growth is unlikely to be achieved without significant successes in attracting inward investment. There are obvious difficulties in the attraction and retention of high quality foreign direct investment. But Scotland won't make the transition from recovery to a higher growth path without it, given that Scotland's domestic business birth rate remains stubbornly low and

business R&D is amongst the lowest in the western world. The issue of how we can attract the required high value, inward investment to rapidly boost our export base should be a key topic of public debate in Scotland over the next few years.

### Recent GDP performance

The latest official government GDP data for the Scottish economy were published on 22 April of this year and refer to the fourth quarter 2008. Overall Scottish gross value added at real basic prices fell by -1.7% in the quarter but rose by 0.5% over the year. This meant that with two successive quarters of negative growth the Scottish economy was technically in recession in the second half of 2008. The deterioration was slightly worse in Scotland than in the UK (Figure 1) with UK GVA contracting by -1.6% in the quarter, while output over the year rose by 0.7%.

The service sector accounts for around 74% of overall GVA and in the fourth quarter Scottish services contracted by -0.8%, much the same rate of decline as in the UK (Figure 2). Over the year, service sector GVA rose by 1% in Scotland compared to 1.5% growth in the UK.

Manufacturing, accounting for 14% of Scottish GVA, contracted significantly in the final three months of last year by -4.6% in Scotland and -4.9% in the UK (Figure 3). This suggests that the incidence of the recession is being born heavily by manufacturing, reflecting the greater export activity in the sector, with Scottish manufacturing output holding up marginally better than in the UK. However, it seems unlikely that demand for Scottish and UK manufacturing products was contracting as rapidly as the GVA figures imply. Other evidence suggests that manufacturers were going through a major process of de-stocking allowing plants to be shut down temporarily and production to be cut back by more than the slowdown in demand. Over the year, to end December 2008 Scottish manufacturing GVA contracted by -0.7% while UK manufacturing suffered a GVA fall of 2.6%. Finally, of the other major sectors, construction, accounting for around 7% of Scottish GVA, contracted significantly in the fourth quarter, with output falling by -4.7% in Scotland and -4.9% in the UK (Figure 4).

Within services, the main sectoral drivers of contraction in the fourth quarter were the important real estate & business services (REBS), and retail & wholesale sectors, which account for 18% and 11% of total Scottish economy GVA, respectively. REBS production fell by an estimated -1.9%, while the output of retail & wholesale fell by -2.1%. The REBS contraction was greater in Scotland than in the UK where the sector contracted by -0.7% in the quarter. Retail & wholesale, in contrast, experienced a somewhat lower reduction in Scotland compared to its UK counterpart where activity fell by -2.4%. Other services (6% of total GVA) contracted by -3.3% during the quarter, a figure identical to that in the sector in the UK. Transport &

communication (7% of Scottish GVA) cut back activity by -2% in Scotland in the quarter compared to a 1% fall in the UK. Of the remaining private service sectors, hotels & catering (accounting for 3% of GVA) grew by 0.5% in Scotland, compared to a fall of -0.6% in the UK and Scottish financial services (8% of GVA) grew by 2.2%. UK financial services, in contrast, exhibited neither growth nor decline (Figure 5).

Within manufacturing, the key sectors driving the fall in output in the fourth quarter were chemicals & man-made fibres (1.3% of total Scottish GVA) where activity contracted by -12.3%, food & drink (3% of total Scottish GVA) where the fall was -3.4% and engineering (5% of GVA) which suffered a 2.1% contraction. The figures for UK chemicals, food & drink, and engineering were -5.2%, -1.4% and -5%, respectively, indicating that engineering production is holding up better in Scotland, while the reverse applies for chemicals and food & drink. However, within engineering, the key electronics sector (3% of overall GVA in Scotland) contracted more in Scotland in the quarter by -2.9% compared to -1.9% in the UK. Conversely, transport equipment (1% of GVA) shrank by 2.8% in Scotland while its UK counterpart suffered a -7.3% drop in production. Similarly, paper, printing & publishing (1.4% of GVA) cut back GVA by -3.7% in Scotland compared to a reduction of -5% in the UK.

### The course of the recession

Figure 6 charts the recent GVA performance of key Scottish sectors. The general impact of the downturn is clearly evident. Figure 7 offers a clearer picture of the course of the recession in Scotland by charting the percentage decline in GVA from the latest peak to the latest data point 2008q4, or the latest trough. Compared to our previous Commentary where the situation was charted up to the third quarter 2008, the addition of a further quarter has increased the number of sectors affected by the downturn, including now several manufacturing sectors, and led to an accumulation of GVA lost across sectors. One must be careful about making forward looking conclusions on the basis of evidence from one quarter but there is a hint in these data that financial services and hotels & catering may have reached the bottom in the third quarter 2008. Both experienced an upturn in the fourth quarter. However, we know that financial services and banking in particular are undergoing restructuring in Scotland, so it would not be unexpected if further output contraction was reported in the first quarter of this year. The hotels & catering sector might have been experiencing a "Homecoming Scotland" effect going into 2009 but this could easily be contradicted by new data. In contrast, as of the final quarter last year, the recession was continuing relentlessly in construction, mining and quarrying, electronics and real estate and business services, while beginning to embrace food & drink, retail & wholesale, other services and chemicals.

Data on first quarter Scottish GDP are not available until July 22<sup>nd</sup>. UK GDP fell by -1.9% in the first quarter of this year, with the result that GDP in volume terms has fallen by about 4.2% since the peak in the first quarter of 2008.

There have been 4 successive quarters of decline to the first quarter of this year. It is highly probable that Scotland's GDP performance in the first quarter will be broadly similar to that of the UK. Scottish manufactured exports declined sharply in the final quarter of last year, by -9.6% in real terms, which equalled and reflected a sharp decline in merchandise trade volumes in the G7 and across the globe<sup>i</sup>. There appears to have been an easing in the slowdown in merchandise trade values in the first two months of 2009 according to OECD data. Nevertheless, the CBI Scotland survey of manufacturing reported the fastest rate of decline in export orders in the three months to April since January 1983. In addition, domestic orders saw their fastest rate of contraction since April 1999, with expectations at their weakest since July 1980. So, we should expect further large falls in Scottish manufactured and non-manufactured exports in the first quarter of 2009 and this is likely to be reflected in the first quarter GVA data.

The situation in the second quarter is much less clear. Our Review of Scottish Business Surveys below suggests that there is an emerging consistency that the pace of the recession is slowing down, especially after February. But we cannot say with any certainty that the recession has bottomed out in Scotland. However, at the UK level the respected National Institute of Economic and Social Research (NIESR) has called the end of the recession as occurring in March with some small degree of positive growth estimated for April and May. NIESR base their judgement on official UK industrial production data, which show that total production rose by 0.3% in April, with manufacturing<sup>ii</sup> growing by 0.2% in both March and April. The monthly series are volatile and one must be careful not to place too much weight on them but the data are persuasive that a turning point of sorts may have been reached. The lack of comparable data makes it harder to form a similar judgement for Scotland.

There are two further caveats. First, the index of production for the UK only accounts for around 18% of total economy-wide GDP. Secondly, if producing firms had begun to restock after the significant de-stocking evident in the second half of 2008 then production would be running ahead of demand with the possibility that the recovery in production could soon cease.

On the first of these, there is some evidence of 'green shoots' outside the production and manufacturing sectors. For example, the Purchasing Managers Index (PMI) for activity in the service sector went above 50 in May – suggesting a return to growth – in both the UK and Scotland, although after seasonal adjustment the Scottish figure remained below 50. The recent buoyancy in UK house prices may also be a reflection of some recovery of

housing demand, which in turn might be expected to support demand generally. But we must not get carried away by these positive signs. The decline in house prices in the UK in the early 1990s was associated with some upward 'blips' against a background of a sustained fall in prices. And as we noted in the November 2008

Commentary, previous severe post war recessions in the UK produced negative growth lasting for 5 to 7 quarters, but not always consecutive quarters.

De-stocking and potential re-stocking also complicates the picture. There is little doubt that manufacturers in the UK ran down stocks considerably during the second half of 2008 and possibly the first of this year as well. It seems unlikely that demand was contracting at an annual rate of around 7% during that period. While shutdowns, short-time working and short-term lay-offs will have protected the cash flow of many firms, stocks cannot be drawn down indefinitely and production would be expected to pick up to restore desired stock levels. Hence, the recent apparent small recovery in production may have preceded any recovery in demand. But that upturn in production will in itself serve to boost demand as the incomes earned in producing additional output are spent. What we need to wait and see is whether current and future indicators of demand reveal that a recovery is underway, or whether the 'green shoots' are soon found to have shallow roots.

We noted in the previous Commentary that it is falling aggregate demand that is driving the contraction of GDP. Moreover, in countries such as the UK and US where there are high levels of household indebtedness the effect of falling asset prices – houses, shares – would be expected to have a significant impact on domestic demand. However, the global nature of the recession meant that countries contributing disproportionately more to world supply would bear the brunt of the global fall in aggregate demand and the associated fall in exports. Conversely as the fall in global demand slows and then begins to pick up the principal exporting countries should benefit. In the UK exports are less important to national income than in Germany, Japan and export 'platforms' such as Taiwan, Ireland and Singapore. This, in part, accounts for the greater fall in output in those economies compared to the UK. But the UK is still an important exporter, underlining the importance of the fall in the value of sterling compared to the Euro and the dollar. Sterling has rallied recently but its value is still around 20% lower than in the summer of 2007. The effect of the decline in sterling, encouraging a switch in domestic and foreign spending in favour of UK produced goods and services, has contributed to a reduction in the extent and depth of the recession here. Moreover, the UK recovery from recession may be quicker than elsewhere if the current sterling rate is maintained, although a competitive price advantage requires growth in world trade and demand for it to be most effective.

A further, and possibly the key, factor serving to mitigate the extent and depth of recession in Scotland and the UK is



the stimulus given to UK domestic demand by the enormous monetary and fiscal policy injections. The Bank of England cut interest rates by 4 percentage points, so that by March this year Bank Rate stood at, and has remained at, 0.5%. The Bank through purchases of Government and corporate bonds introduced a significant programme of quantitative easing with the limit raised from £75 billion to £125 billion in May. Purchases of nearly £80 billion have been made by the Bank since March. The aim of these purchases is to increase the money supply and there is now some evidence that the growth rate of broad money is picking up<sup>iii</sup>. In addition, the significant fiscal injections will contribute to government borrowing rising to more than 10% of national income over the next two years representing a substantial boost to domestic demand.

But as the Bank Governor noted in his recent Mansion House speech, while the rapid decline in activity may be coming to an end the path to complete recovery may be slow and protracted. Households and companies will continue for some time to adjust their balance sheets as debt is reduced and saving increased. This will serve to constrain the rise in private spending to levels sufficient to sustain capacity levels of output. It cannot be guaranteed that there will be a smooth adjustment between the necessary increases in domestic and external private spending and the necessary reductions in government borrowing that will have to occur after 2010-11. In addition, recovery of private spending will be hampered by the continuing constraints on the supply of bank lending. The low levels of equity capital held by the banks are likely to impair their ability to finance a sustained recovery. Banks themselves are finding it difficult to borrow to support lending with some banks, as the Governor pointed out, viewed as a worse credit risk than some of their customers! Further additions to banks' equity capital are likely to be required to enable credit to be supplied on a sufficient scale to support the recovery and this will take time.<sup>iv</sup>

### After the recession

With evidence accumulating that the UK economy may have reached the trough of the recession and while the recovery could be slow and protracted it is reasonable to consider what the economy, and especially the Scottish economy, could look like after the recession. This is valuable in itself but also as a pointer to where policy might have a constructive role to play. The focus should be on Scotland's industrial or sectoral structure, its competitiveness and long-term growth prospects. We can obtain some insights, but no definitive answers, by first examining key trends in the Scottish economy, especially structural trends. Secondly, we then consider the likely impact of the recession on the Scottish economy in terms of its structure and competitiveness. Finally, we look at some of the implications for policy.

Table 1 and Figure 8 indicate the structural changes that occurred within the Scottish economy over the six years between 1998 and 2004. At the broad sectoral level, Table

1 reveals that the share of Scottish value added continued to decline in the production industries of mining and quarrying, electricity, gas and water supply and manufacturing. The share of these 3 sectors fell from 25.4% in 1998 to 17.6% in 2004, a decline of 7.8 percentage points or 31%. Within that aggregate, the important manufacturing sector reduced its share by 6.2 percentage points or 31% moving from 20.3% of total value added to 14.1%. Construction raised its share somewhat, no doubt in part due to the commercial housing and property boom, from 5.8% to 6.5%, while the service sector, constituting the bulk of the economy grew from 67% to 74.3% of Scottish value added. Within that total, both public and private sectors raised their shares of overall value added. The share of private services grew by 4.9 percentage points or 10.4%, while the share of public services grew a little faster by 2.3 percentage points or 11.4%.

Figure 8 provides further detail on the shifts within manufacturing and services. The share of financial services rose by almost 59% from 5.1% to 7.9% while the share of property related and business services rose by 11% from 16.1% to 17.9%. In manufacturing, the main change was the marked contraction in the production of electronics products with its share falling by 41% from 4.9% to 2.8%.

So over the six years to 2004, Scotland became more of a service sector economy, with financial services taking a much greater and public services a slightly greater share of activity both absolutely and compared to the rest of the UK. Construction activity also played a bigger role. As the manufacturing share and electronics production fell, disproportionately affecting Scotland, it is likely that exports played a smaller part in the demand for Scottish goods and services, while domestic demand grew in importance. The Scottish economy effectively turned inwards and relied more on financial services, construction, property related and business services, and the public sector.

The consequences of the recession, through the bursting of the property bubble, banking crisis, credit crunch and expected future contraction in public sector activity as future governments seek to deal with the sharp rise in the burden of government debt, appear to have serious consequences for Scotland's future competitiveness and growth. This should not be exaggerated because financial services in Scotland has so far performed better than expected during the downturn, in part because of the wide range of activities outside banking, including insurance, pensions and fund management. This could change since we must expect some contraction in the scale of banking in Scotland and that should be reflected in the GVA data later this year and next.

Both the Scottish and overall UK economy must adjust to higher household savings and lower domestic consumption growth and become more export and private sector orientated over the medium to long term. A lower level of the sterling exchange rate, which is the outcome of the lost UK financial sector export earnings, will raise export

**Table 1: Share of Scottish Value Added – Broad Sectors 1998 and 2004**

Sector	1998	2004
Agriculture, forestry and fishing	1.8%	1.7%
Mining and quarrying industries	2.2%	1.1%
Electricity, gas and water supply	2.9%	2.4%
Manufacturing	20.3%	14.1%
Construction	5.8%	6.5%
Services	67.0%	74.3%
Of which: Largely Public	20.1%	22.4%
Largely Private	46.9%	51.8%

**Source:** Scottish Government IO tables for 1998 and 2004

competitiveness and help the switch of expenditure away from imports to domestic production. Reduced public expenditure and higher taxes will obviously lead to some shift away from public sector activity.

But Scotland may be less well placed to make the adjustment. The required switch towards exports puts a premium on the competitiveness of manufacturing, since goods still account for the bulk of exports. Scottish manufacturing has lost scale and is relatively smaller than manufacturing in the UK and key international competitors. The key question here is whether Scottish manufacturing in particular has the size, diversity and capability to take advantage of a recovery that will depend more on exporting and less on an allocation of resources to the public sector. But the same question can also be posed of the service sector in Scotland as well as manufacturing. A lower sterling exchange rate favours UK produced goods and services. If Scottish companies fail to take advantage of the opportunities there may be a switch in domestic Scottish expenditure in favour of goods and services produced in the rest of the UK than here in Scotland. Similarly, increased foreign expenditure on UK products may also favour the rest of the UK. The outcome in such circumstances would be a weaker recovery here and relatively lower trend growth.

This poses a policy challenge to the Scottish government and its economic development agencies as well as to the private sector in Scotland. The market and institutional failures and other impediments that disadvantage Scotland's export base need to be better understood and policy developed to deal with them. The public and private effort currently being put in to address the damage to Scotland's reputation in financial services needs to be continued and strengthened. New products embodying green technologies, life sciences, digital and creative media, have been mentioned as likely to make a significant contribution to Scotland's export led recovery. But the development of such products may not happen if left to the market alone and, in any event, they are unlikely to be sufficient on their own to generate the required growth of the Scottish economy.

The expansion in Scotland's export base necessary to secure the desired increase in growth is unlikely to be achieved without significant successes in attracting inward investment. There are obvious difficulties in the attraction and retention of high quality foreign direct investment. But Scotland won't make the transition from recovery to a higher growth path without it, given that Scotland's domestic business birth rate remains stubbornly low and business R&D is amongst the lowest in the western world. The question of how we can attract the required high value, high technology, inward investment to rapidly boost our export base should be a key topic of public debate in Scotland over the next few years.

### Forecasts

The recession in the UK economy could be over. The National Institute for Economic and Social Research in London called the end of the recession as occurring in March and is estimating small positive growth in April and May of this year. Due to lack of data the position in Scotland is much less clear. There is a clear danger of a "false dawn", since it is not unknown for previous UK recessions to have one or two positive quarters of growth before growth turned negative again<sup>v</sup>. Nevertheless, to the extent that the slowdown in economic activity is moderating and may be past its turning point, three reasons are offered for the turn round: re-stocking after considerable stock run-downs, short-time working and temporary plant closures from late 2008; a more price competitive UK economy due to the 20% fall in the value of sterling since the summer of 2007; and the effect of the significant policy stimulus through monetary and fiscal injections.

But to the extent that a recovery may be emerging in the UK it is likely to be slow and protracted. Households are reducing debt and raising savings so that consumer demand remains weak. Companies similarly faced with high debt levels and declining demand are also running down debt and cutting back significantly on investment. Export markets remain fragile with the IMF forecasting an 11% decline in world trade this year. But even as demand growth recovers there is concern that the banking sector has insufficient equity capital to enable credit to be supplied on a sufficient scale to support the recovery.

**Table 2: Forecast Scottish GVA Growth in Three Scenarios, 2009-2012**

GVA Growth (% per annum)	2009	2010	2011	2012
High growth	-1.9	-0.5	1.6	2.1
<i>February forecast</i>	-1.9	-0.4	1.1	1.7
<b>Central</b>	<b>-2.9</b>	<b>-0.9</b>	<b>0.6</b>	<b>1.4</b>
<i>February forecast</i>	-2.6	-1.2	0.5	1.53
Low growth	-3.8	-1.7	-0.2	0.4
<i>February forecast</i>	-3.1	-1.7	-0.1	0.6

**Table 3: Forecast Scottish Net Jobs Growth in Three Scenarios, 2009-2012**

Net job no's	2009	2010	2011	2012
High growth	-62,827	-23,152	33,584	45,174
<i>February forecast</i>	-73,007	-42,400	7,923	25,089
<b>Central</b>	<b>-84,399</b>	<b>-51,451</b>	<b>11,301</b>	<b>26,824</b>
<i>February forecast</i>	-94,179	51,440	3,037	14,476
Low growth	-103,579	-66,894	-3,722	6,847
<i>February forecast</i>	-108,984	-63,064	-6,639	10,734

**Table 4: Forecast Scottish ILO Unemployment in Three Scenarios, 2009-12**

ILO 16+ no's and rate%	2009	2010	2011	2012
High growth %	4.9	4.8	3.8	3.5
<b>Central Nos</b>	<b>186,800</b>	<b>212,600</b>	<b>202,300</b>	<b>207,900</b>
%	<b>5.5</b>	<b>6.2</b>	<b>5.9</b>	<b>5.5</b>
Low growth %	6.0	7.1	7.2	7.4

In the Scottish economy consumption remains weak, proxies for consumer confidence suggest the possibility of improvement as the decline in house prices which has been less in Scotland than in the rest of the UK appears to be moderating. Government spending is expected to remain strong in the current fiscal year but will begin to decline in real terms in 2010-11. Investment is falling in the UK and in the absence of specific Scottish data we assume the UK experience is mirrored in Scotland as in previous recessions. Tourism in Scotland is resilient buoyed perhaps by a weak sterling exchange rate, the events associated with "Homecoming Scotland" and the prospect of good weather. Scottish exports both to the UK and the rest of the world have been badly affected as worldwide demand contracted in the recession. There is some survey evidence on exports to the rest of the UK that the rate of decline is moderating. But the overall export position is difficult and likely to remain so for several months, with the benefit from lower sterling levels only beginning to fully emerge once world trade picks up.

Against this background of extreme uncertainty we again offer three alternative scenarios for Scotland's GDP/GVA growth, employment growth and unemployment over the medium term. We produce a "central" forecast, which is the one we hold with most certainty and this is bounded by "high growth" and "low growth" forecasts. The background to the forecasts and the forecasts in detail are discussed below in the section of the Commentary Forecasts of the Scottish Economy.

### GVA Forecast

The key forecasts are summarised in Table 2 along with our February forecasts for comparison. We shall primarily focus on our central forecast here. GDP/GVA is forecast to decline by -2.9% this year, which represents a downgrading of our February forecast by -0.3% points. Compared with the Treasury's average of new forecasts for the UK, we are forecasting that the Scottish economy will perform in 2009 more strongly than the UK on our central

and high growth forecast but slightly worse than the UK on our low growth forecast. Our forecasts for 2010 and 2011 represent an improvement on our February position reflecting the UK evidence that a trough to the recession may have been reached in the first half of 2009. However, for 2012 we are a little less optimistic than we were in February. This is because while we anticipate a recovery in Scottish GDP growth we do not expect it to be robust. Indeed, in the light of the evidence from earlier recessions we are projecting the recovery to be weaker in Scotland on all three scenarios than the average of independent forecasts for the UK. Nevertheless, Scotland returns to weak positive growth on the central scenario of 0.6% in 2011 led by manufacturing and somewhat stronger growth of 1.4% in 2012 but this is still some way below the 1.9% growth trend.

### Employment forecast

The principal forecasts for net jobs growth are presented in Table 3. On our central scenario employment continues to fall through this year and next by nearly 137,000. Net jobs growth will return in 2011 strengthening in 2012 but net job creation over these two years of just over 28,000 indicates the extent to which we expect the recovery to be slow and protracted.

Even in the high growth scenario, the level of jobs in Scotland is still around 7,000 lower than peak employment in 2008, while on the low growth scenario total jobs lost between 2009 and 2012 amount to 160,000. In all scenarios, the service sector, which is by far the largest part of the economy, experiences the biggest decline in job numbers in 2009 and 2010, with losses of 51,000 and 27,300 respectively. Financial services are especially affected shedding 14,000 jobs in 2009 and 12,400 jobs in 2010. But large job losses are also forecast in real estate & business services, retail & wholesale, and hotels & catering. Significant numbers of jobs are also lost in 2009 and 2010 in construction and manufacturing, around 21,000 in the former and 33,000 in the latter. By the end of 2012 neither sector will have replaced these job losses, with construction just under 20,000 jobs adrift and manufacturing with 21,000 jobs short.

### Unemployment forecast

Table 4 presents our main forecasts for unemployment over the 2009 to 2012 time horizon.

We have revised upwards our forecasts for unemployment compared with the previous Commentary. This is because of our forecast for weaker GVA growth in 2009 and other adjustments. Scottish unemployment on the ILO measure and in our central forecast is predicted to rise to a peak of 212,600 in 2010 or 6.2% of the workforce and then fall gradually after that. The Scottish labour market has been outperforming the UK when measured by the employment and unemployment rates. However, this masks a significant switch, until the most recent quarter, from job losses into increased numbers of ex workers who are not

available for work i.e. labour inactivity, rather than measured unemployment (see Overview of Labour Market section). Clearly, Scotland's measured and forecast unemployment performance will depend crucially on the extent of this switch in future quarters.

Brian Ashcroft

22 June 2009

---

### Endnotes:

<sup>i</sup>G7 exports fell by -9.5% in 2008q4.

<sup>ii</sup> Manufacturing accounts for around 80% of the activity measured by the Index.

<sup>iii</sup> Speech by Mervyn King, Governor of the Bank of England at the Lord Mayor's Banquet for Bankers and Merchants of the City of London at the Mansion House on Wednesday 17 June 2009.

<sup>iv</sup> Mervyn King speech *ibid* page 4.

<sup>v</sup>In the jargon this would be a "W – shaped" recession.

Figure 1: Scottish and UK Quarterly GDP Growth, 1998q2 to 2008q4

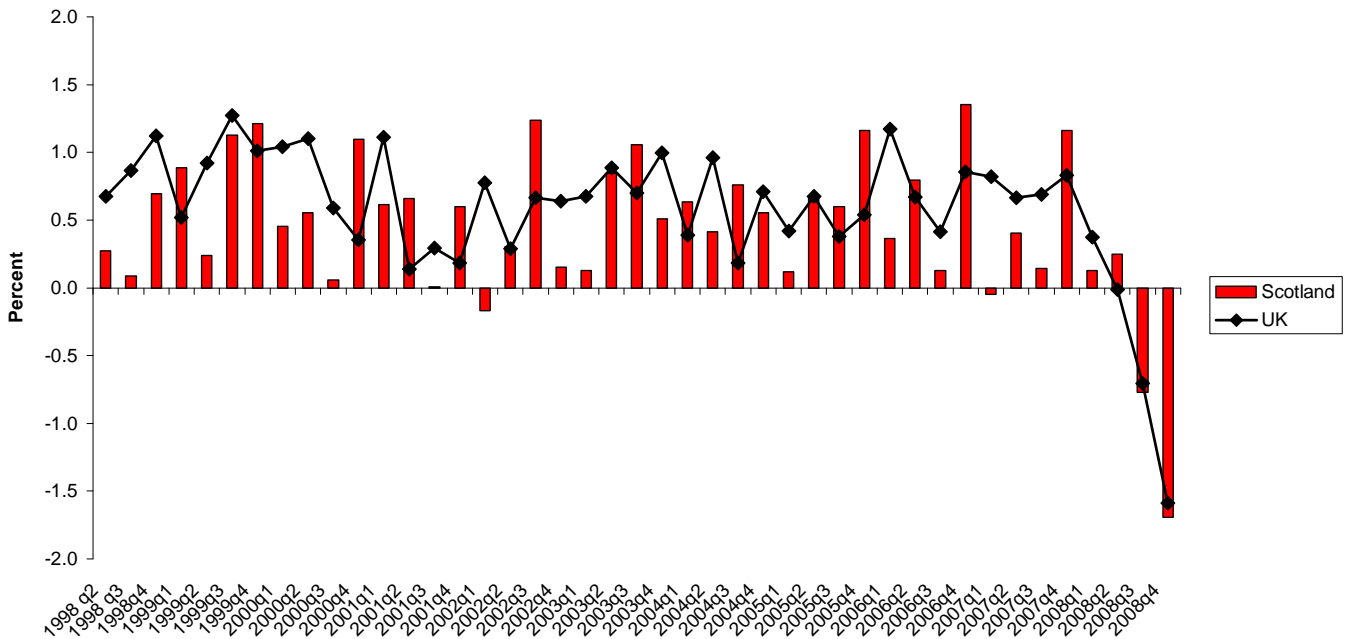
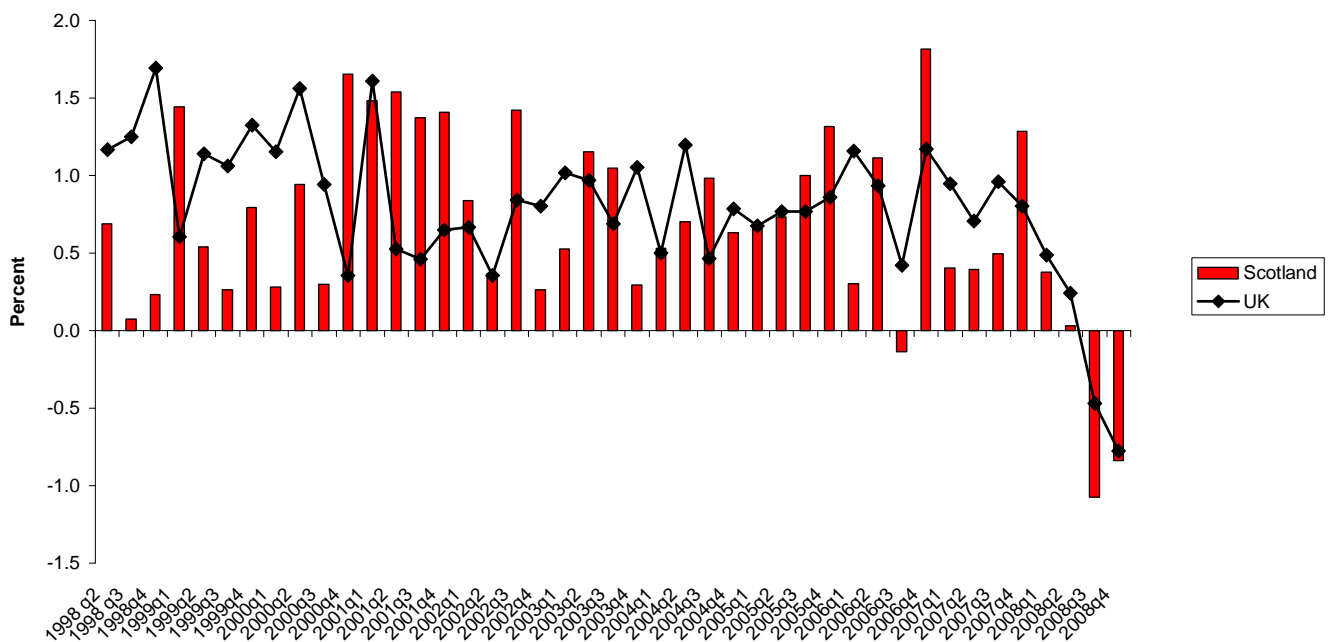
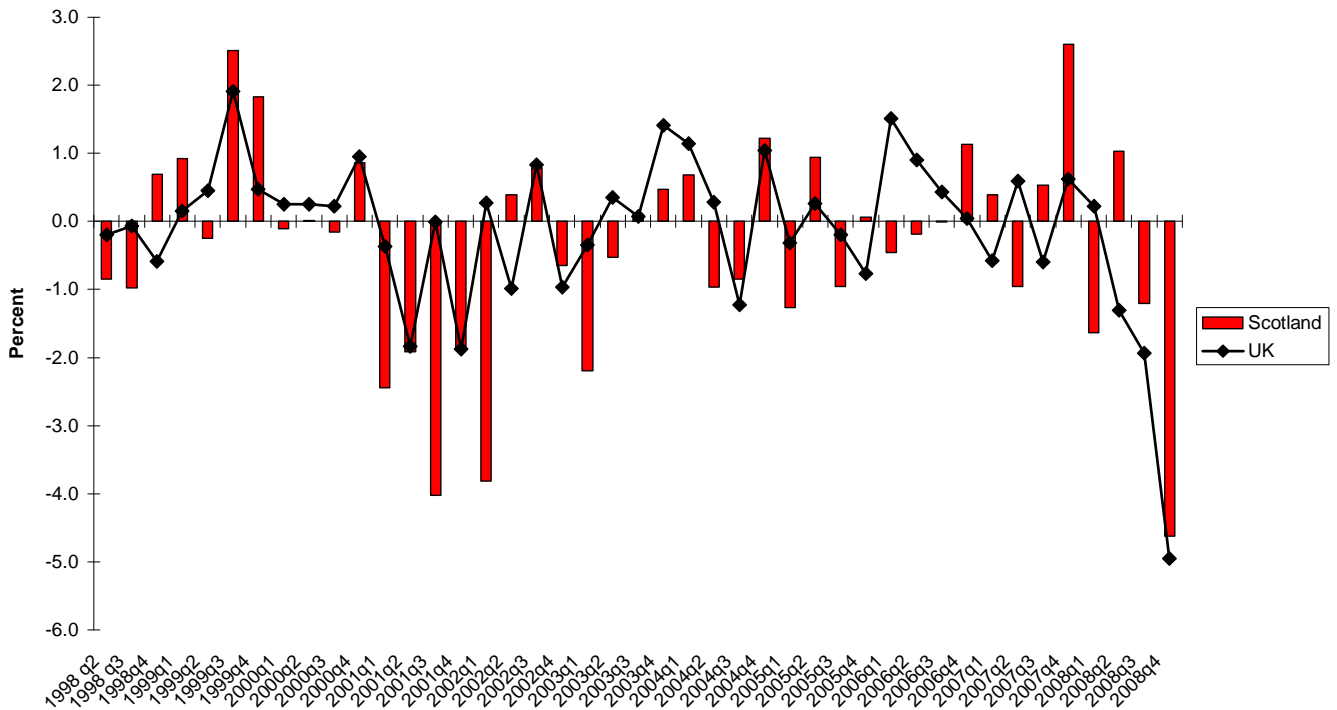


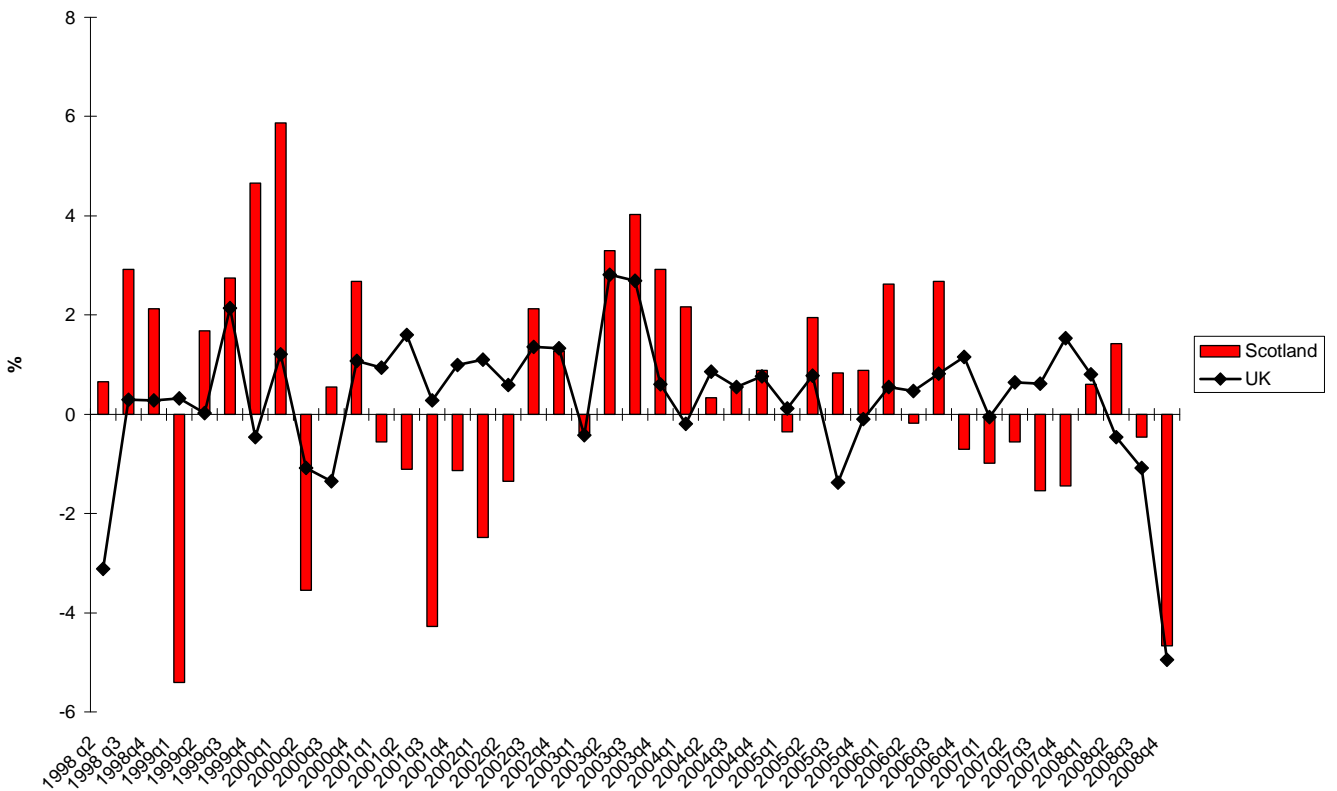
Figure 2: Scottish and UK Services GVA Growth at constant basic prices 1998q2 to 2008q4



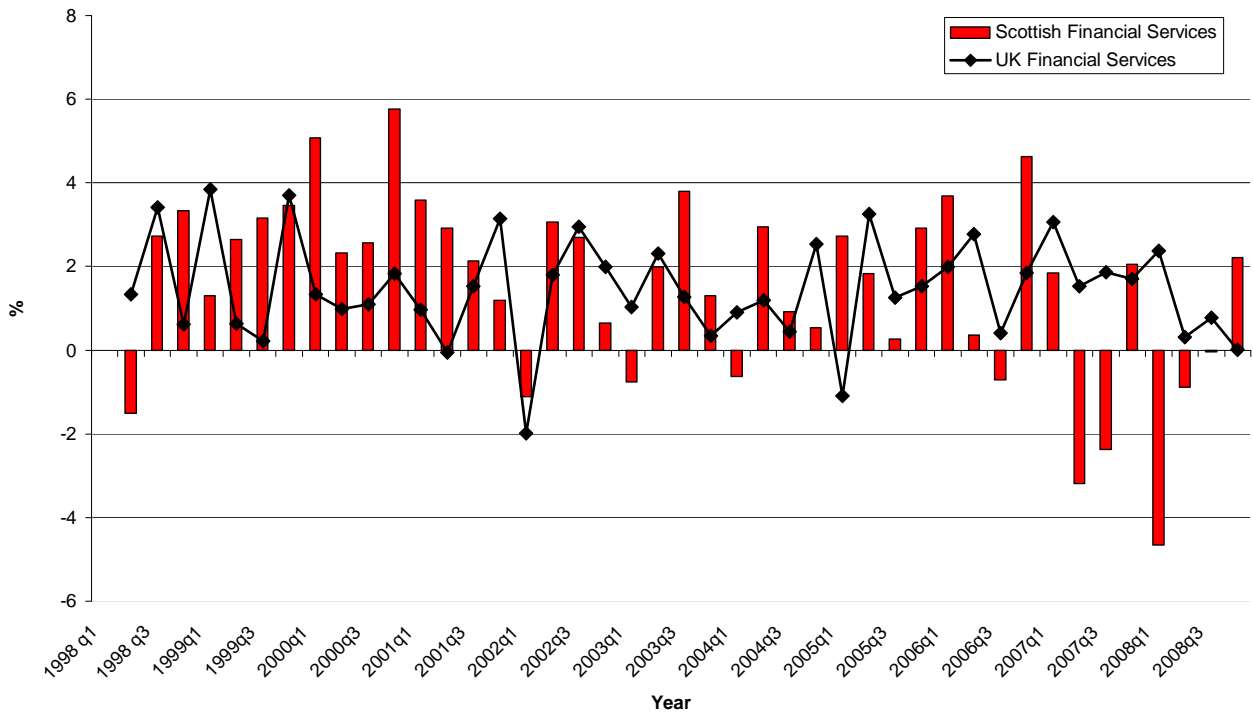
**Figure 3: Scottish and UK Manufacturing GVA Growth at constant basic prices 1998q2 to 2008q4**



**Figure 4: Scottish and UK Construction GVA Volume Growth 1998q2 - 2008q4**



**Figure 5: Scottish and UK Financial Services GVA Growth at constant basic prices 1998q2 to 2008q4**



**Figure 6: Growth of key sectors in Scotland 1998q2 to 2008q4**

**Figure 6: Growth of key sectors in Scotland 1998q2 to 2008q4**

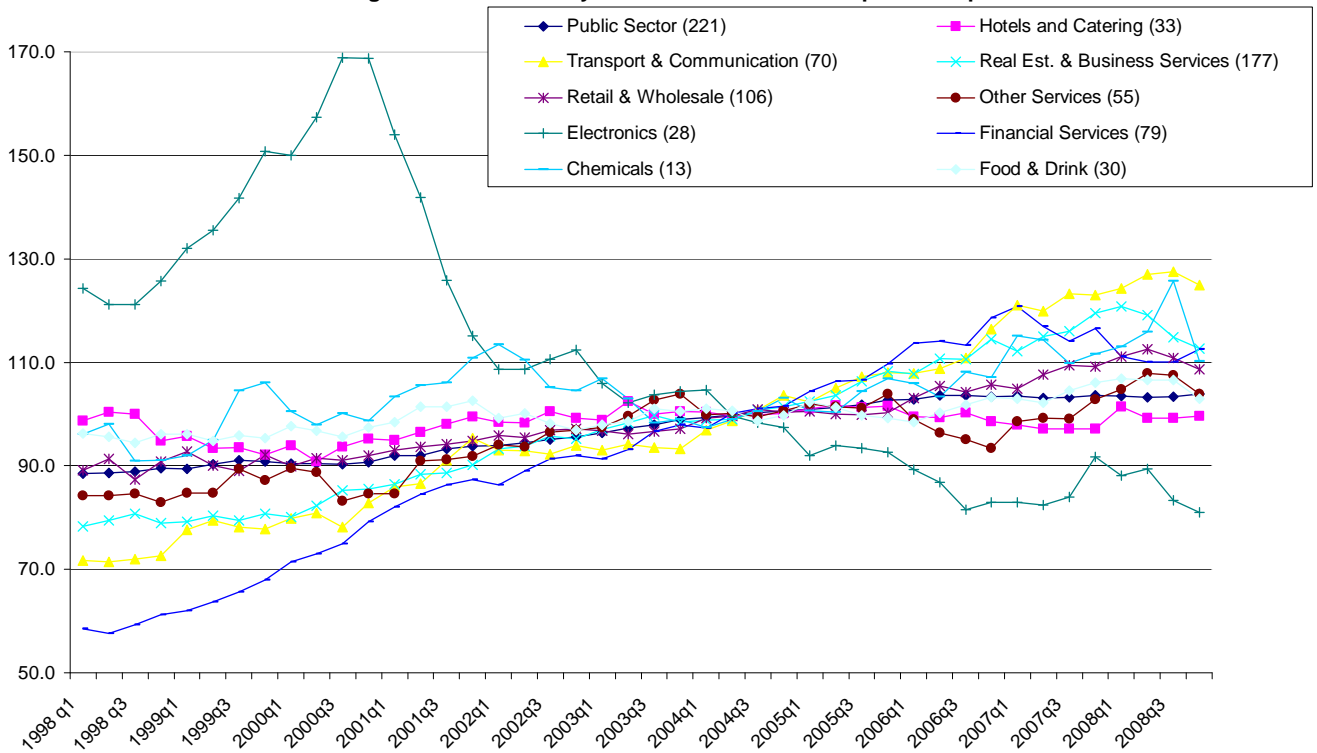


Figure 7: GVA percentage decline to 2008q4, or to trough, from latest peak, by sector

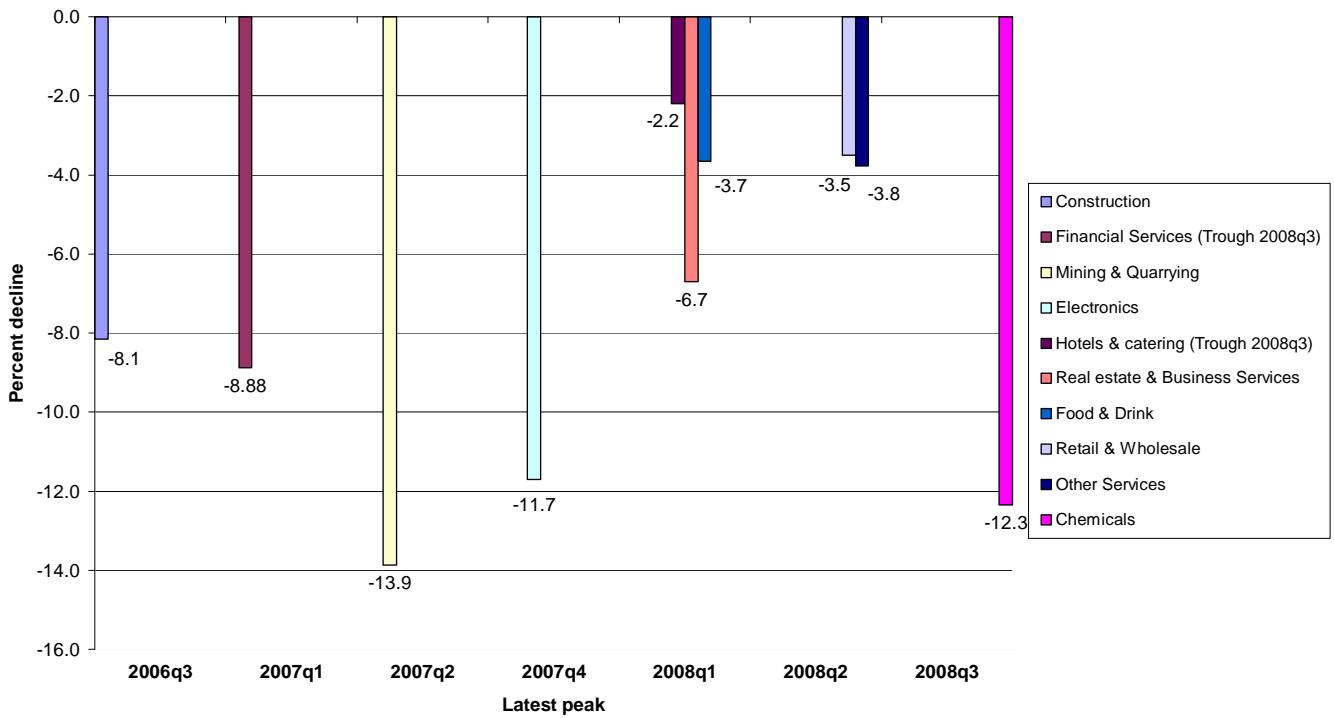
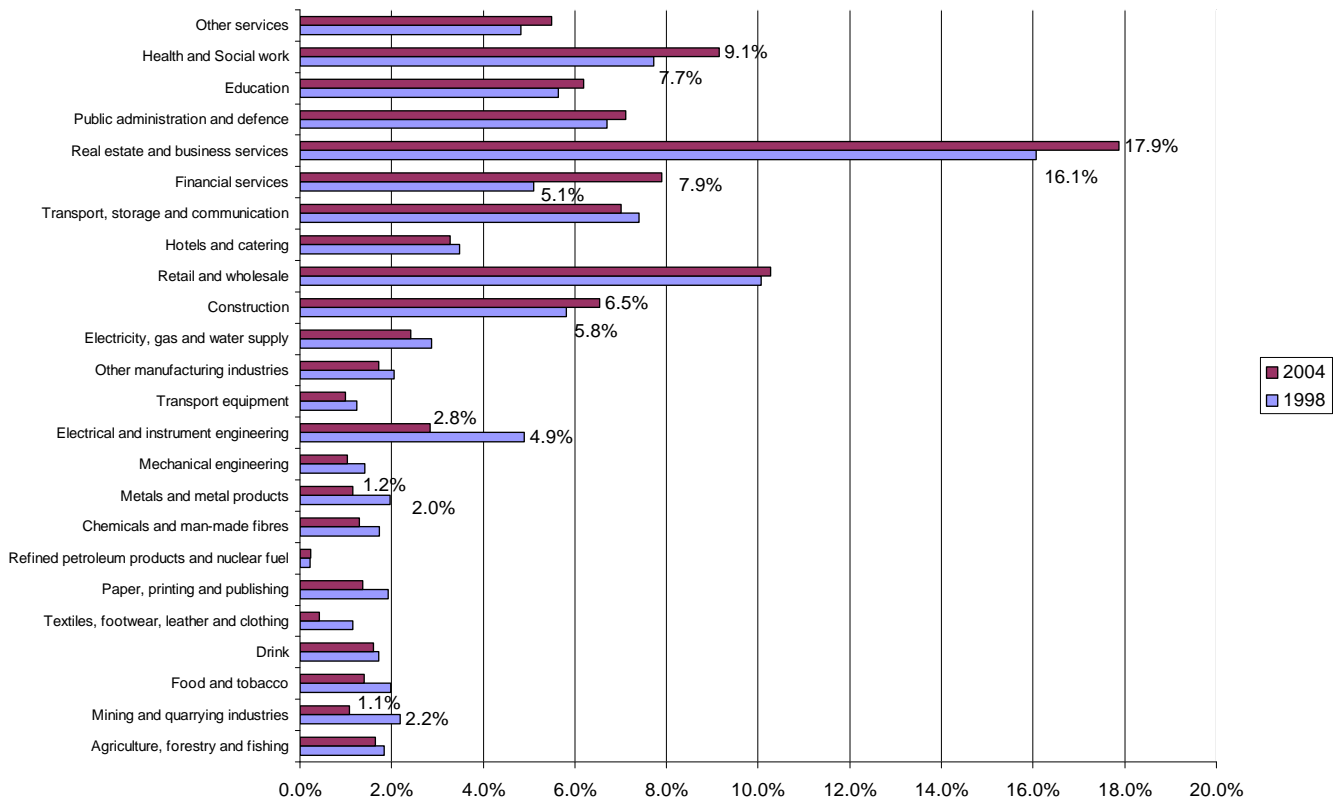


Figure 8: Sector shares of total Scottish value added 1998 and 2004





# The Scottish economy

## Forecasts of the Scottish economy

### **Economic background**

As acknowledged by Scotland's Chief Economic Advisor in his State of the Economy presentation of May 2009, Scotland has been affected by developments in the world economy. It is likely therefore that Scotland's future growth prospects will be significantly affected by the duration of the global downturn, and the speed by which, in some cases unconventional, policy decisions taken over the last six to nine months restore the world economies to a growth trajectory. A largely unprecedented feature of this most recent slowdown is its synchronised nature, with all major advanced economies going into recession over the second half of 2008, and into 2009. The Euro area declined by 1.6% in Q4 2008, making the third consecutive quarter of negative growth, while the recession in the UK was confirmed by a second quarter of declining GDP growth (down by 1.6% in Q4, following a 0.7% decline in Q3 2008). US GDP fell by 1.6% in Q4 2008, after a 0.1% fall in Q3.

The importance of global demands in explaining the observed recession can be seen by the fact that export-orientated countries have suffered particularly badly as world trade volumes have declined sharply. The IMF published their World Economic Outlook projections for 2009 and 2010 in May, and noted that the world economy is experiencing its deepest downturn in 50 years. Their growth projections for 2009 and 2010 from May 2009, were markedly lower than those published in January 2009, showing both the deepening of the recession, and the speed at which growth predictions have been revised downward over the course of a number of months. Their report predicts an 11.0% decline in world trade in 2009, with world output falling by 1.3% over this year. IMF for GDP growth over 2009 for the US, Euro area and UK were lowered to -2.8%, -4.2% and -4.1% respectively. This same report forecasts GDP growth in 2010 for these same three countries of 0.0%, -0.4% and -0.4%.

The monetary and fiscal response of the UK authorities to the worsening economic environment has been swift and, in the use of quantitative easing, unprecedented. On the monetary policy side, the Bank of England cut interest rates in March 2009 down to 0.5%, where it has remained for the last three months. The bank has also begun, and extended, its programme of quantitative easing – issuing Bank funds to purchase up to £125 billion of Government and corporate bonds. In May, the amount of funds set to purchase assets was increased from £75 billion to £125 billion. From March to the most recent announcement,

purchases of almost £80 billion have been made through this facility. The Budget in April 2009 announced the extension of some of the packages introduced in November 2008's Pre-Budget Report designed to provide immediate support, with changes in the tax regime in line with the anticipated reductions on public spending from 2011 onwards. Borrowing is forecast to increase over the next two years at levels above 10% of national income. There will be automatic reductions in tax take owing to slowing economic activity, with borrowing expanding to ensure that government expenditure is maintained through the next two years.

### The Scottish economy

In the last quarter for which data are available (Q4 2008, published on 22<sup>nd</sup> April 2008), the Gross Domestic Product in Scotland fell by 1.7% from the previous quarter, which had fallen by 0.8% compared to Q2 2008. The second consecutive decline in quarterly GDP thus confirmed that the Scottish economy was technically in recession in late 2008.

In Q4 2008, the decline in the service sector continued, with an overall decline of 0.8%, after falling 1.6% in Q3 2008. Within the service sector, other services (-3.3%), real estate and business services (-1.9%), retail and wholesale (-2.1%) and transport, storage and communications all saw declines in sectoral value added, while financial services (+2.2%) and public administration, education and health (+0.5%) saw increases. An apparent strong increase of 2.0% was reported for the banking industry in Q4, however this sub-sector recorded a 0.7% fall in value added over the last four quarters, and the financial services sector as a whole saw value added decline by 5.3% to Q4 2008. Within the production sectors, where an overall decline of 4.7% was seen in Q4, large falls were seen in mining and quarrying (-2.3%), electricity gas and water supply (-6.0%) and manufacturing (-4.5%). There was a small increase in the value added in Q4 in the mechanical engineering sector, and no change in the value added reported by the refined petroleum sector, but these were exceptions. All other production and manufacturing sectors for which data are reported experienced declines in Q4. The construction sector reported a second subsequent quarter of declining value added, falling by 4.7%. The broad-based sectoral nature of this recession is thus confirmed.

Labour market developments in Scotland to the end of March 2009 showed falling employment, and increasing unemployment from what had been historic highs and lows respectively. Employment of those aged over 16 between January and March stood at 2,521 thousand, down 22,000 on the same period one year previous. The employment rate as a percentage of those of working age was down to 74.9% from 76.5% in Jan-March 2008. The numbers of people over the age of 16 who were unemployed rose by 34,000 over the last year, standing at 157 thousand, while those receiving unemployment-related benefits stood at

122,300 in April 2009. The claimant count figure is up 52,400 since April 2008, and up 42,600 since August 2008.

### Final demand and recent trends

The FAI forecasting model acknowledges the drivers of economic activity in the Scottish economy to be consumption, government spending, investment, tourism and exports (to the rest of the UK and the rest of the World). For all three scenarios considered, the recent trends in each of these measures, as well as recent survey evidence, are discussed below.

- Consumption* – The most recent figures from the Scottish Retail Consortium from April 2009 showed that (nominal, i.e. not taking inflation into account) non-food retail spending in March 2009 on a like for like basis was down 3.5% compared to March 2008, the tenth consecutive month of like-for-like sales declining. The Scottish Retail Sales Monitor suggest that overall sales were up 4.2% over the year, however as noted elsewhere this might suggest that the major multiple retailers are securing market share, and are more resilient to the downturn than independent retailers. Sales of large consumer goods appear to be most adversely affected by the tightening of household purse strings, with the Scottish Motor Trade Association reporting new car sales in Scotland in March 2009 were down by 23% compared to March 2008. The fall in sales was greater (-30.5%) across the UK as a whole. The rate of the decline in new car sales will be affected by the UK Government's introduction of a scrappage scheme for cars over ten years old, with a discount on new car purchases. Whether this is sufficient to maintain increased demand for new cars throughout 2009 remains uncertain.
- Experimental statistics on Scottish Household final consumption expenditure, released in April, show that Q4 2008 saw the first decline in current price household expenditure since the series began in 1998. Particularly affected was expenditure on recreation and culture, restaurants and hotels, and transport.
- As a measure of consumer confidence, the most recent data from the Scottish housing market provides some signs that the large scale declines in house prices seen through 2008 are slowing, and the annual decline in Scottish house prices appear to be less than those seen in the UK as a whole. On the Halifax House Price Index, house prices in Scotland showed the smaller decline over 2008, down 2.8%, and short of the declines seen in the UK (-7.9%). It appears, however, to be too early to suggest that the corner has been turned in this market which has important consequences for household wealth.

- Government spending* – Government spending in Scotland during 2009 is predicted to remain robust, given the UK Government's increased expenditure, and the bringing forward of a range of capital expenditure programmes by the Scottish Government at Holyrood. Scotland's Chief Economic Advisor's recent (May 2009) state of the economy presentation notes that spending controlled by the Scottish Government through the Departmental Expenditure Levels will grow by around 4.5% in 2009-10, but decline by 1.7% in 2010-11. As noted in Andrew Goudie's latest assessment, DEL spending makes up the principal element of discretionary spending at the disposal of the Scottish Government.
- Going forward, the UK Budget of April 2009 revealed the extent of the fiscal consolidation which is likely to be undertaken from 2010 onwards, under the next spending review. Independent forecasts from the Institute of Fiscal Studies have forecast average declines of 2.3% per year for the three years from 2011-12.
- Investment* – Sharp declines in investment at the UK level have been a significant factor in the recession. Such changes have in previous recessions mirrored reductions in capital investment in the Scottish economy. Gross capital formation fell by 3.9% over the year to Q1 2009, while overall GDP declined by 4.1% from Q1 2008. Much of this fall has been caused by the running down of inventories, as firms have cut back on production and met orders from production already completed.
- Looking into the future, it is difficult to imagine significant increases in investment demand while business confidence remains weak. While we would expect to see some easing from the steep reductions in investment demand seen at the end of 2008 and into 2009, the pace of recovery will in part be affected by credit conditions facing business, and their abilities to borrow to fund investment. Recent survey evidence indicates borrowing constraints will ease over the next three months for corporate and mortgage lending, but that weak demand will perhaps ensure that investment opportunities are delayed into 2010.
- Tourism* – As is reported elsewhere in the Economic Commentary, the most recent data reports that hotel occupancy in March was demonstrating resilience, although this could reflect ongoing (and perhaps heavy) discounting, and the unusual timing of Easter in 2008 distorting figures for April 2009. Room and bed occupancies for the time of year were comparable to those over the average of 2005-2009, but down on March 2008. Over the year, however, the exchange rate, particularly against the Euro, might divert some holiday makers to travel in Scotland, rather than abroad. The seasonal and high rate of part-time and family workers might be more flexible to respond to any surge in demand linked to a combination of good weather – for example the "barbeque summer" predicted by the UK's Met Office – and a growth in local domestic tourism from events linked to the Homecoming Scotland programme of events.
- Exports to the rest of the UK* – Scottish exports to the rest of the UK fall into the unhelpful position of being vitally important as a destination for Scottish production, but also difficult to measure due to the nature of intra-UK trade. There have been some experimental figures published recently which estimated that in 2007 total trade with the rest of the UK was worth £36 billion. The largest exporting sectors to the rest of the UK in 2007 were financial intermediation (£6.3 billion), and wholesale, retail, hotels and restaurants sector (£5.2 billion).
- Developments in exports to the rest of the UK are not updated with as much regularity due to the difficulty of tracking these sales, but recent survey evidence from the PMI report for March indicates that there is some degree of optimism with regard to future exports to the rest of the UK. The rate of decline in orders from the rest of the UK appears to have begun to ease in Q2 2009. Similar results are seen in the CBI's Scottish Industrial Trends survey, indicating that perhaps there are some most positive (or at least less negative) trends appearing in Q2 2009, in particular industries. It is unlikely that these will translate into positive growth, however before Q3 of 2009.
- Exports to the rest of the world* – The most recent figures on Scottish exports to the rest of the World reveal that in 2007 Scotland exports totalled £20.6 billion, of which £13.6 billion came from the exports of Scottish manufacturing. The largest single sector for exports to the rest of the world was the food and beverages sector, exporting £4.6 billion in 2007, and showing the ongoing importance of this sector for Scottish exports. For data after 2007, we are reliant on the Index of Manufactured Exports, which tracks developments in this most important industry. Recent data suggests that after some slight increases in aggregate sales between 2004 and 2007, in the second half of 2008 there were significant falls. Q4 2008 results show a 9.6% decline in exports to the rest of the world, with an annual fall over 2008 of 2.8%. All broad manufacturing sectors suffered the decline, with the food and tobacco sector

seeing a reported fall of 23.2%, and the drinks sector reporting a fall of 19.9%. Over the year, the other manufacturing sector saw exports increase by 5.2%, but the decline in Q4 2008 in this sector followed a decline in Q3 2008.

- The most important markets around the world for Scottish exports in 2007 remained those which were largest in 2006 and 2005, with exports to France following the USA in first place, and the Netherlands, Germany and Ireland making up the top five destinations for Scottish goods. The downturns in these countries discussed in the introduction, sets the background to some difficult trading conditions for Scottish exports over 2009.

### The forecasts: Background

As with the most recent forecasts published in the last three Economic Commentaries, we have again three alternative scenarios for growth, employment and unemployment in the Scottish economy: we label the scenario we feel is most likely the “central” scenario, with “high growth” and “low growth” as two respectively upper and lower growth alternatives to this scenario. We intend that these capture the range of outcomes which are possible, given that there are considerable uncertainties surrounding any specific single or point estimates underlying the central forecast. The significant revisions to GDP growth forecasts discussed above, suggest that such a scenarios approach is sensible in the current uncertain economic climate. While not presently explicit probabilities for each of these outcomes, we forecast that the central scenario is that which is most likely, while the “high growth” and “low growth” scenarios reveal the range of possible outcomes for the Scottish economy foreseen for future developments from June 2009.

### The forecasts: Detail

In the three scenarios considered, the following features are assumed to influence the factors of demand, and economic activity, across the Scottish economy:

- Household confidence returns from lower than expected job losses in early 2009 not denting household income by as much as was previous predicted. Consumer spending over 2009 falls in aggregate due to large reductions in spending in Q1 and Q2, and a slower decline in the rest of the year.
- Consumer finance sees a small return to some of the previous levels of lending.
- In the Low growth scenario, consumer confidence remains low due to significant job losses suffered in Q1 and Q2 2009, and persistent fears about sustained job losses and widespread redundancies. Consumer spending falls in both 2009 and 2010, and shows a slight fall in 2011. In

- The key export markets for the Scottish manufacturing products see declines in growth through 2009, but by 2010 aggregate export demand from the rest of the world is growing, as world trade levels recover towards previous levels. Scottish strengths in specific fields of electrical engineering see growing demand, while there is strong demand from the rest of the UK and rest of the world for the outputs of the drink, chemicals and refined petroleum sectors continuing through both 2011 and 2012.
- Aggregate tourism spending falls slightly, but hotel occupancy remains robust due to discounting and the success of campaigns encouraging domestic tourism. A particularly good summer of weather leads to increased domestic trips, while a relatively weak pound against the Euro leads to some switching to domestic tourism rather than Scots taking holidays abroad. In the High growth scenario, the Homecoming Scotland campaign and increased domestic tourism increases tourism spending slightly from 2008 levels, while the Low growth scenario sees tourism levels and spending drop as individuals tighten their spending on non-essential items, perhaps switching longer trips for shorter overnight trips, or replace nights in hotel and other accommodation to staying with friends and relatives.
- Government spending grows significantly in 2009, while seeing a small growth in 2010, followed by declines each year in 2011 and 2012. While declines are greatest under the Low growth scenario, all three scenarios assume negative growth in Government spending in Scotland in these last two years of our forecasts. The pressure on government budgets, and the anticipated period of fiscal consolidation after the next spending review will reduce aggregate government spending which will have a knock-on impact on economic activity. This is likely to have a significant impact on the shape of public sector expenditure in Scotland from 2011 onwards.
- Investment demand has seen significant declines over the last year, and all of our scenarios assume that these declines continue over 2009. The High growth scenario sees some recovery of investment demand in 2010, and increasing rates of investment demand back to growth rates of 6% in 2012. In our central scenario, investment demand displays negative growth until 2011, but grows at 5% in 2011. Growing business optimism will serve to bring investment demand changes closer to the High growth scenario than the central

**Table 1: Main forecasts of the Scottish economy (central scenario), 2009-2012**

	2009	2010	2011	2012
Gross Value Added	-2.9%	-0.9%	0.6%	1.4%
Agriculture	-5.7%	-0.2%	1.1%	2.8%
Manufacturing	-7.0%	-2.4%	1.7%	3.6%
Construction	-2.4%	-0.7%	0.4%	1.1%
Services	-2.0%	-0.6%	0.3%	0.8%

**Table 2: Forecasts of Scottish employment (jobs, 000s) and net employment change in central scenario, 2009-2012**

	2009	2010	2011	2012
Total employment (000s)	2,303	2,252	2,263	2,290
Net annual change (jobs)	(84,399)	(51,451)	11,301	26,824
% annual change	-3.54%	-2.23%	0.50%	1.19%
Agriculture (jobs, 000s)	30.8	30.3	30.6	31.5
	(1869)	(589)	339	862
Manufacturing	237.9	223.9	227.9	236.6
	(19351)	(13988)	3978	8855
Construction	125.7	116.1	116.6	117.9
	(12007)	(9609)	497	1241
Services	1908.6	1881.3	1887.8	1903.7
	(51171)	(27265)	6487	15865

**Table 3: Forecasts of Scottish unemployment, Central scenario 2009-2012**

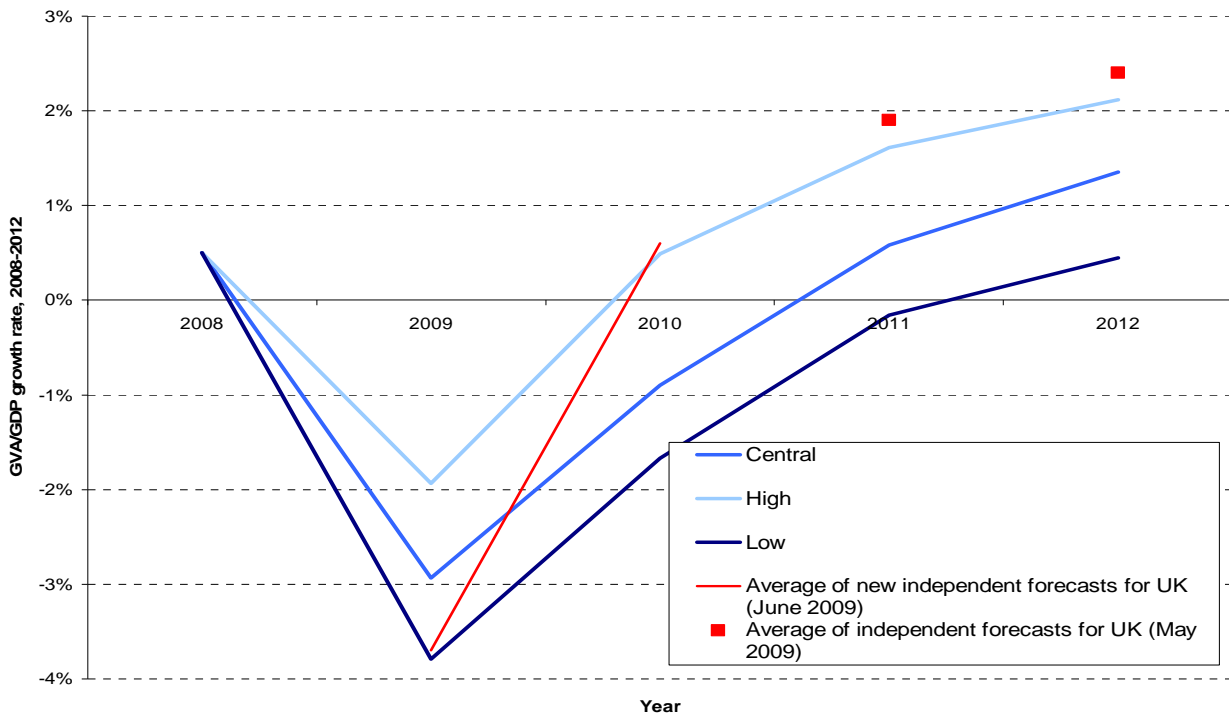
	2009	2010	2011	2012
ILO unemployment (000s)	186,800	212,600	202,300	207,900
Rate <sup>1</sup>	5.46%	6.16%	5.88%	5.49%
Claimant count	110,700	119,500	135,991	129,426
Rate <sup>2</sup>	4.59%	5.04%	5.67%	5.35%

**Notes:** <sup>1</sup> = rate calculated as ILO unemployment divided by total of working age population economically active. <sup>2</sup> = rate calculated as claimant count divided by sum of claimant count and total jobs.

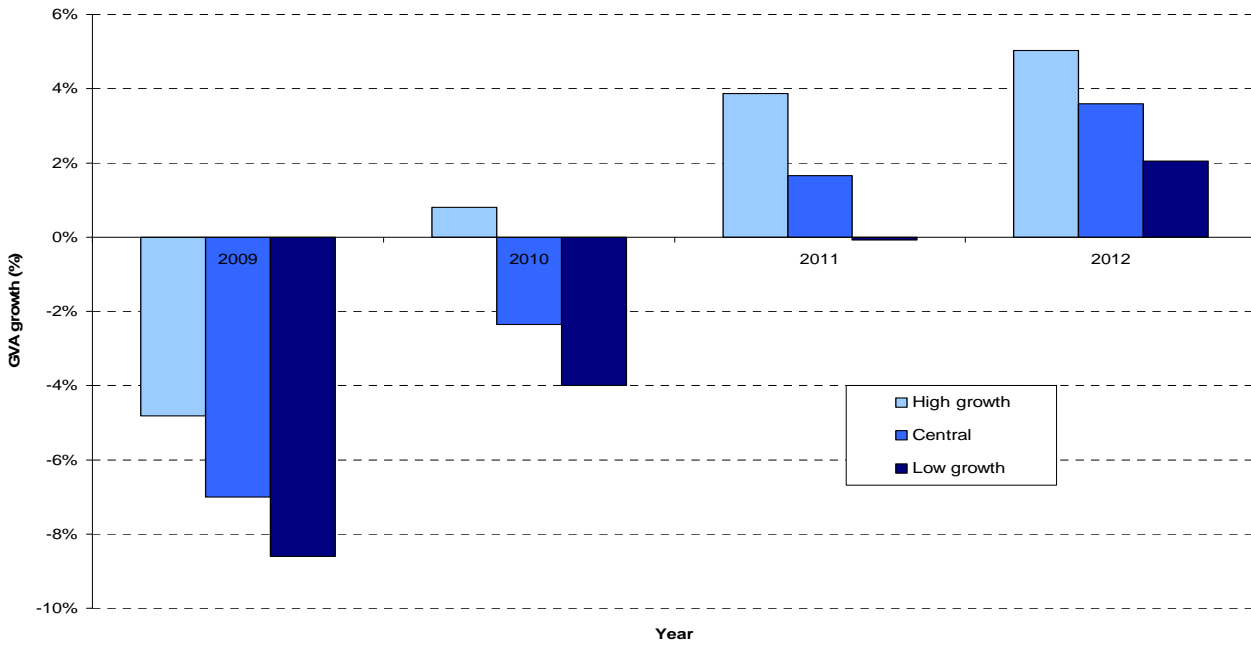
**Table 4: Forecast Scottish Net Jobs Growth in Three Scenarios, 2009-2012**

Net job no's	2009	2010	2011	2012
High growth	-62,827	-23,152	33,584	45,174
<i>February forecast</i>	-73,007	-42,400	7,923	25,089
Central	<b>-84,399</b>	<b>-51,451</b>	<b>11,301</b>	<b>26,824</b>
<i>February forecast</i>	-94,179	-51,440	3,037	14,476
Low growth	-103,579	-66,894	-3,722	6,847
<i>February forecast</i>	-108,984	-63,064	-6,639	10,734

**Figure 1: GVA growth 2008 and forecasts to 2012, Scotland and the UK**



**Figure 2: Forecasts of GVA growth in manufacturing, 2009-2012**



scenario, although we believe the Central scenario to be the most likely outcome for the Scottish economy over the medium-term

## Results

### Gross Value Added

The forecast GVA for Scotland in 2009 under all three scenarios is negative. We forecast all three scenarios out to 2012, by which time GVA growth in all scenarios is forecast to be positive, although the time path of changes is faster in the High growth scenario, and slower in the Low growth scenario. These figures are presented in Figure 1, alongside (for comparison) the average of new forecasts (i.e. those made in the last three months to June 2009) for the UK as a whole. Forecasts for the UK in 2011 and 2012 were collected by HM Treasury in May 2009, and these are also shown for each of these years in Figure 1. Characterised, we are forecasting that the Scottish economy will perform more strongly than the UK in two of the three scenarios (the High growth and Central scenarios) while slightly less well than the average of independent forecasts for the UK in our Low growth scenario. As with previous experience of recessions (discussed in detail in the last Economic Commentary), we anticipate that in all three scenarios Scotland will see a slower return to growth than the UK as a whole, with all three scenarios “flatter” than the average of independent forecasts.

Under the Central scenario, GVA growth is negative in 2009 and 2010, and returns to positive annual growth in 2011. In 2012, Scottish growth is forecast to be 1.4%. Our central scenario for 2009, and the forecast for the sectors under this scenario are given in Table 1. Table 2 shows the GVA forecasts under each of the three scenarios. Under the Low growth scenario, negative growth is also seen in 2009, 2010 and 2011, with the Scottish economy not returning to positive growth until 2012.

We also present forecasts for GVA change in Scotland at broad industry levels for manufacturing and services, as well as the construction sector, under each of the three scenarios – Central, High growth and Low growth. Figure 2 shows the GVA change in Manufacturing under each of these three scenarios, while Figure 3 shows the GVA change in Services. Figure 4 shows the change in forecasted GVA annually in the construction sector between 2009 and 2012.

Across the aggregate manufacturing sector (shown in Figure 2), a recovery from periods of negative GVA growth is not seen until 2011 in the central scenario, although there is a small positive GVA growth forecast for 2010 under the High growth scenario. In 2012, all three scenarios forecast positive growth, with growth ranging from 2.1% to 5.0% in 2012. Key to the speed of this recovery will be the growth of external demand for products, and the time path seen here is in line with current

expectations of significant declines in key Scottish manufacturing export markets continuing through 2009 and into 2010.

The IMF forecast total world trade to fall by 11.0% in 2009, and recover to small positive growth (0.6%) in 2010. Economic growth is forecast to recover across the world into 2010, however markets where Scottish exports are strong are forecast to grow slower than the world economy as a whole. The US recovery, for instance, is forecasted by the IMF to see a 2.8% decline in 2009, and zero growth in 2010, while the other top export markets – the Euro area, and the UK – are predicted to contract in 2010, on top of contraction in 2009. Key sectors, like whisky, refined petroleum and electrical engineering have seen recent large falls in exports to the rest of the world, and recovery in these key industries finding export markets will determine the shape and speed of the recovery of manufacturing exports, and a large portion of Scottish exports.

Figure 3 shows that service sector GVA across the three scenarios is broadly more insulated to the economic downturn. GVA growth in 2009 ranges from -1.3% to -2.6%, while in 2010 GVA growth is forecast in the range from -1.1% to 0.4%. Retail sales activity shows that household spending has fallen in aggregate in the last quarter of 2008, and the recovery in consumer confidence and household spending (both in Scotland and in the key, or new, export markets) will drive the speed and duration of the aggregate service sector. Key within the service sector will be the future performance of financial services. We forecast this to experience falls in GVA in 2009 of 2.1% and return to positive growth only in 2011, although this sector is particularly affected by the future direction that RBS and HBOS banks are taken by their new owners. We expect that we will see continuing changes in this sector over the next couple of years, and that large-scale changes will potentially not arise until later in 2010 and even into 2011. Niche markets for banking will provide some growth areas for new opportunities to arise for some existing and new entrants, but the financial services sector as a whole will continue to be driven by changes to the major retail banking and financial services operations.

Figure 4 estimates that declines in the construction sector are largest again in 2009, and by as much as 3.2% in the Low growth scenario. By 2011 the Low growth scenario forecasts slightly negative GVA growth with positive growth recovering in 2012. Clearly, important for the recovery of this sector will be the pace by which consumer sentiment is restored in the housing market, as well as the demand for public sector investment projects. Major public works projects protect some of the falls in GVA under the High growth scenario, as well as a faster recovery of the growth in the residential housing market from rapidly returning consumer confidence. Some signs of positive trends in construction activity have appeared over recent weeks, and the rate of house price declines has slowed. However

**Table 5: Forecasts of Scottish unemployment, Central scenario 2009-2012**

	2009	2010	2011	2012
ILO unemployment (000s)	186,800	212,600	202,300	207,900
Rate <sup>1</sup>	5.46%	6.16%	5.88%	5.49%
Claimant count	110,700	119,500	135,991	129,426
Rate <sup>2</sup>	4.59%	5.04%	5.67%	5.35%

**Notes:** <sup>1</sup> = rate calculated as ILO unemployment divided by total of working age population economically active. <sup>2</sup> = rate calculated as claimant count divided by sum of claimant count and total jobs.

**Table 6: ILO unemployment rate and claimant count rate measures of unemployment under each of the three forecast scenarios**

	2009	2010	2011	2012
ILO unemployment rate				
High growth	4.9%	4.8%	3.8%	3.5%
Central	5.5%	6.2%	5.9%	5.5%
Low growth	6.0%	7.1%	7.2%	7.4%
Claimant count rate				
High growth	4.3%	4.4%	4.3%	3.4%
Central	4.6%	5.0%	5.7%	5.4%
Low growth	4.9%	5.6%	6.7%	6.8%

given the speed of the decline, and the massive uncertainties regarding the future shape of the sector as a whole, it is too soon to conclude whether the corner has been turned in the housing market

## Employment

Our forecasts for employment for each of the three scenarios are given in Table 3, along with the net aggregate employment change over the year. The employment figures relate to jobs, not FTEs, and are calibrated on the Employers' Quarterly Survey Series, as given in Table 6.06 of the Economic and Labour Market Review, published by National Statistics. This gave total jobs in Scotland over the year 2008, as 2,387,500. As we have previously forecast, we anticipate in our central scenario that total employment in Scotland will fall in aggregate in both 2009 and 2010.

In the central scenario, employment is forecast to decline by 84,399 in 2009 and by 51,451 jobs in 2010. Job numbers begin to increase in 2011 and 2012. Total jobs in 2012 are forecast to be around 90,000 short of the jobs total for 2008. The Low growth scenario forecasts that around 103,500 jobs are lost in 2009, and a further 67,000 in 2010. In that scenario, total jobs lost between 2009 and 2012 are 167,000, while in the High growth scenario, the recovery in 2011 and 2012 sees job numbers recover towards their previously measured historical highs, and job numbers in 2012 are around 7,000 lower than their level in

2008. In all scenarios, total job numbers decline in 2009 and 2010.

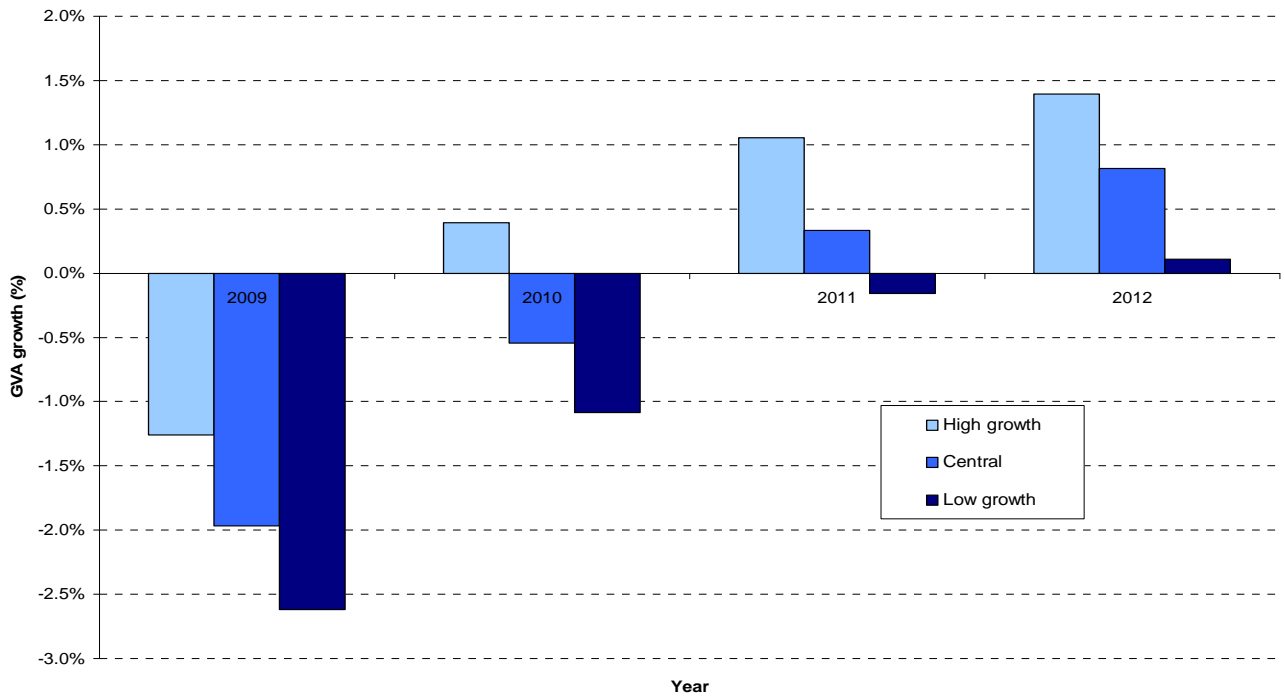
Table 4 shows the net annual growth in jobs in each of the three scenarios, and how these have changed since our February forecast.

Looking at the sectoral forecasts for employment levels, in all scenarios the services sector sees the largest decline in job numbers in both 2009 and 2010. Overall, 51,000 service sector jobs are forecast to be shed in 2009 and a further decline of 27,300 in 2010. Especially badly affected are financial services, which are forecasted to lose almost 14,000 jobs in 2009, but large job losses are also forecast in real estate and business services, retail and wholesale, and hotels and catering sector. The financial services job numbers continue to see declines in 2010, falling by around 12,400, and making up a significant majority of the job losses observed across the services sector. The wholesale and retail sector also sees large declines in employment through 2009 and 2010, down almost 5,700 and 6,300 respectively in these years.

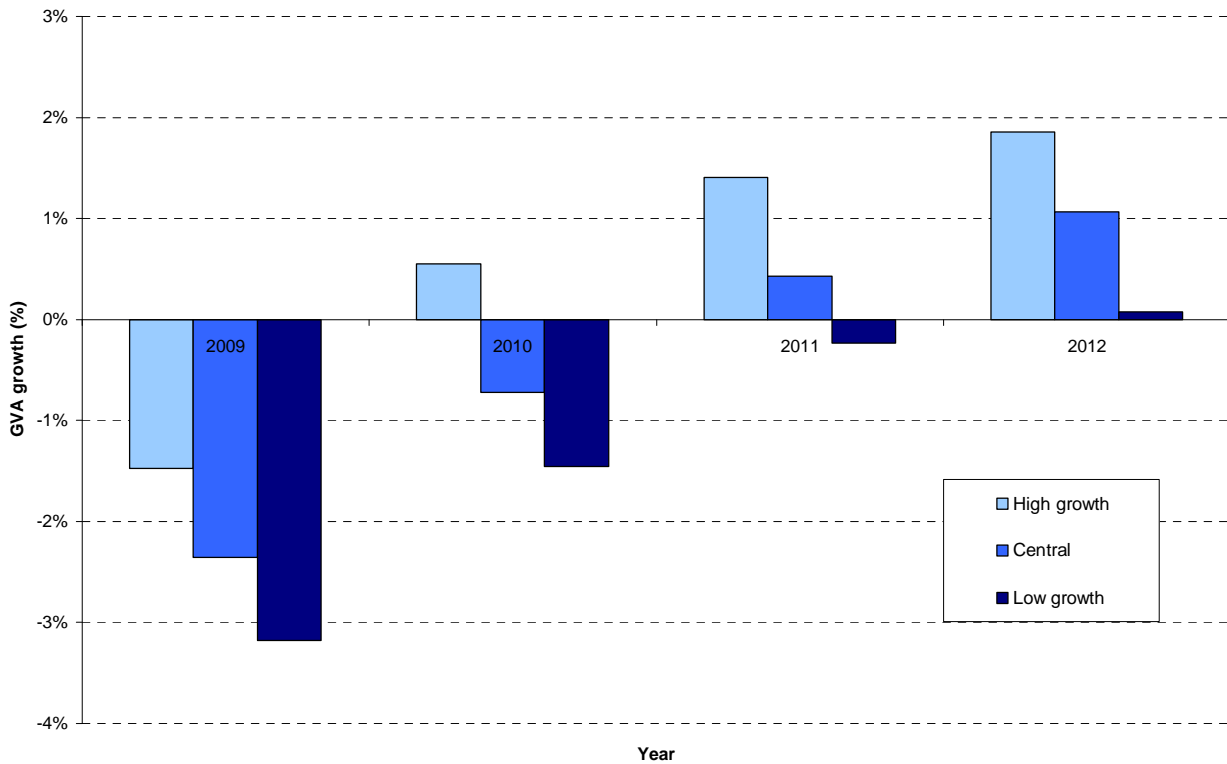
The construction sector is forecast to lose around 12,000 jobs in 2009, and a further 9,600 in 2010, and see a partial recovery through 2011 and 2012. As with the aggregate jobs total, the total jobs in construction remain below levels of 2008 in 2012. In the High growth scenario, job losses are less in 2009, and fall by over 10,800 while recovering



**Figure 3: Forecasts of GVA growth in services, 2009-2012**



**Figure 4: Forecasts of GVA growth in construction, 2009-2012**



and in to job growth of over 2000 in 2012. As mentioned earlier in this section, the construction sector has tended to see both quicker, and earlier, declines than the rest of the economy, upswings would tend to see increased activity ahead of much of the economy. The timing and duration of the downturn in this sector presented here are plausible given the current state of the market, and current expectations of future developments for this sector in Scotland.

Manufacturing jobs fall in 2009 by almost 19,400 in the central scenario, with a range from 24,000 to 13,000 in the Low and High growth scenarios respectively. Within this broad sector, the most heavily hit sectors in 2009 will be those which rely upon export markets for the destination of their output, and as the forecasts for GVA declines, falls in employment are forecast in metals and non-metal products (down 2,400), mechanical engineering (down 2,000) and mining and quarrying (down 2,200). Key to the response in the labour market will be the extent to which labour hoarding occurs in the face of the recession, and large falls in employment in the first half of 2009 would be indicative of low rates of labour hoarding. This might suggest that the impact on jobs could be more significant, with employment being lower than previous historical highs for a number of years into the future.

## **Unemployment**

We present our forecasts for unemployment, as measured by the ILO definition as well as those claiming unemployment benefit, in Table 5. The preferred measure of unemployment is the ILO definition, as given by the Labour Force Survey. This measure is preferred as it reveals the extent of labour which is unemployed and available for work, rather than that which is currently in receipt of unemployment benefit.

The forecasts for unemployment have been revised upwards from forecasts published in the last Economic Commentary, given the speed of the reduction in employment and increasing unemployment observed in the first quarter of 2009, and in line with our revision downwards of our central scenario forecasts for Scottish GVA in 2009. The Scottish labour market had been outperforming that of the UK when measured by employment rate, and had seen high levels of employment and low levels of unemployment. Of crucial importance to realised levels of unemployment will be the extent to which people who lose employment switch into the unemployed, or move into labour inactivity, i.e. unemployed but not available for work.

Table 6 shows the ILO and claimant count measures of unemployment under each of the three scenarios of our forecasts.

Grant Allan  
22 June 2009

# Review of Scottish Business Surveys

## Overall

The extent to which the recession is slowing down, or bottoming has been a popular theme in recent surveys, although, especially for the service sector, the timing of the Easter weekend (in the first quarter of 2008, but in the second quarter of 2009) and significant differences in the weather, should prompt caution as to drawing any firm conclusions between the first and second quarters, evidence of any significant changes in business trends and more generally in the current trends in the Scottish economy. In the retail sector the two latest Scottish Retail Sales Monitors suggest some improvement in April, albeit with considerable reservations, but some slowing down in May.

Nevertheless, there is an emerging consistency in the main manufacturing surveys (PMI, Lloyds TSB and Scottish Engineering anticipated for q 2 2009, and SCBS anticipated for q1 2010) that the pace of the recession is slowing down, especially after February, although from the current surveys it remains unclear as to whether these improvements are mainly the effects of restocking rather than recovery.

## Oil and gas services

Offshore activities in the UK oil & gas sector continue to fall, and exploration operations within the UK Continental Shelf have decreased significantly (by some 78% over the past 12 months according to the Deloitte's North West Europe Review (published April 2009)). To an extent the credit issues affecting both the oil majors and the independents have led to a widespread downward re-assessment of exploration and investment plans, and for the UKCS the issues of exploitation of marginal and ageing fields has become more significant.

Notwithstanding reduced demand for oil and evidence of current surplus stocks, the volatility in oil prices, a feature of the past years, has returned due to a combination of political uncertainty, some speculation in commodities, short term seasonal demand. The latest Cambridge Energy Research Associates reports suggest the upward cost pressures are still evident for oil firms, notwithstanding the current surplus capacity and stocks. The current upward drift in oil prices is likely to be replaced by a more general upward cycle for demand and hence prices in 2012/3, and the continuing shortages of refining capacity may lead to the return of significant rises in oil prices.

Lloyds TSB noted the steepest declines in the volume of business, turnover and export activity were in q4 2008, with the rate/spread of decline easing in q1 2009. Generally cash flow concerns were slightly less in q1 2009, but, and to a degree expected, concerns as to credit availability and late payment were thought to be more evident in the business conditions in the three months to end May 2009. The PMI noted 'operating conditions continuing to deteriorate during May, although signs of a slowing recession continued to emerge'.

## Manufacturing

Results from the Lloyds TSB (February), PMI (April and May) and SCBS (March) suggest some signs of a slowing down in the rate of decline in activity. The PMI noted the weakest falls in production levels in April since June 2008, but noted little improvement in May, whereas the SCBS saw continued sharp declines in total, rest of UK and Scottish orders, but indicated some easing in the rate of decline in new orders in q 2 2009. The PMI (April) noted new orders have fallen for 12 months, but the rate of decline eased further, and noted a further weakening in the rate of decline in export orders, but this improvement seemed to level off in May. In contrast the SCBS export data indicated a less severe weakness, whereas the latest CBI and Scottish Engineering reports are more pessimistic reporting the weakest trends in orders for 10 years, but the Scottish Engineering Survey was the last to report entering the recession and its results seem to lag behind those of the other surveys, nevertheless, it anticipates some easing in the extent of decline in the second quarter.

The May PMI noted a continuation of the weakening trend in work in progress. The SCBS (q1 2009) noted average capacity eased to 66.4%, some 6 percentage points lower than in the previous quarter and 12 percentage points lower than a year ago, and over three-quarters of respondents reported capacity used was below preferred levels. Scottish Engineering reported capacity utilisation and output volume down sharply. The PMI, Scottish Engineering and SCBS noted pressures to raise prices, with the exception of finance costs, continuing to ease. However, the possibility of further price reductions is leading to some deferment of orders.

The SCBS evidence on investment trends noted that these eased again in q1 2009, and only 9% of respondents expect to increase investment, whilst 18.6% anticipate increasing their leasing of equipment over the coming year. Cash flow trends deteriorated further, and the anticipated trends in turnover and profitability over the next 12 months are the weakest recorded in the survey.

Both the PMI and SCBS noted the proportion of firms reducing staff increased significantly to February/March and declining trends in hours worked and expenditure on training were reported. The April PMI data suggested the rate of decline in employment was easing.

## Construction

Whilst house building and commercial work has been substantially reduced PPP funded work has continued, however this will go into decline by the end this of year/next year unless public sector work starts to emerge. There are some signs that some house building is picking up. Nationally there has been a slight increase in the number of approved mortgages, but from a very low base (across the UK approved mortgages were still 34% lower than in March 08 according the Halifax House Price Index), and public sector housing projects have been affected by credit issues.

The Scottish Chambers' Business Survey reported a widespread weakness in business confidence, and the trends in new orders remained at record lows, however some easing in the extent of these downward trends is anticipated in the second quarter, and 22% expect rising trends in the level of new work over the six months to September 2009. Nevertheless, a net of 64% (65%, 37% and 25% in the previous three quarters) anticipate declining turnover trends over the next year. A net of 78% (compared to a net of 3% in q1 2008) anticipate declining profitability over the next twelve months, and a net of 81% of construction firms anticipate declining tender margins over the next twelve months.

SCBS data suggests average capacity declined by three percentage points to 69%, the lowest figure recorded, and a decline of 19.7 percentage points over the year. Seventy-eight percent reported and 67% expect a declining trend in the level of work in progress, again the weakest trends in the history of the survey.

The decline in the construction sector has adversely impacted on the margins, fees, work, confidence and employment in the professional services allied to construction. Across the sector recruitment activity has declined to historic low levels and reductions in employment have been widespread.

## The service sector

### Wholesale distribution

Data from the SCBS suggests that concerns as to the business situation remained high amongst wholesale respondents in the first quarter of 2009 and 60% reported being less confident as to the general business situation. Declines in sales were widely reported and little improvement is expected through the second quarter, suggesting that restocking remains at a low level. The majority still anticipate turnover to decline over the next year, but margins not to be under considerable pressures.

### Retail

Scottish Retail Sales Monitor reported sales up 4.3% compared to April 2008, but noted that Easter and better weather occurred in April 2009, whereas Easter was in

March in 2008. However, the Scottish Retail Consortium noted that if the March and April figures are combined then the average increase over the year is 2.1% and factoring in inflation for food suggests that sales are relatively flat.

The Scottish Retail Sales Monitor noted that overall sales, allowing for increases in floor space, were up 8.2% over the year. It is unclear as to whether this reflects a drift from smaller and independent stores sales to those of the major multiple retailers, who have indicated further plans for expansion and employment this year.

The SCBS measures general sentiment by type of retailer and reflects concerns within the sector as to the pressures on the independent stores from the major retailers, a theme echoed in recent years by the Federation of Small Businesses. The SCBS results suggest business confidence continuing to fall, but at a reduced rate compared to Q4 2008, but more than 60% reporting falling sales and little improvement anticipated for the second quarter. Reflecting the situation of the smaller and independent retailers the SCBS survey noted a net of -52% of retailers anticipate declining turnover over the year to March 2010 (compared to -69% in the previous quarter), and a net of -73% (-72% in the previous quarter) anticipate declining profitability over the next year, suggesting further pressures on margins during 2009.

## Tourism

The Visit Scotland Monthly hotel occupancy study suggested occupancy rates were some 2 – 3% down in February 2009 compared to the same month in 2008. However, by March the downturn appeared more modest with occupancy at 57% (one percentage point lower than in March 2008). April's data suggested average occupancy was marginally higher than in either 2007 or 2008. Occupancy rates appeared to have held up better in Edinburgh/Lothians and Glasgow/Clyde, rather than in other areas. This improvement may reflect a combination of Easter falling in the second quarter in 2009, rather than in the first quarter of 2008, the relative decline of the pound to the Euro, and more people holidaying at home rather than abroad. The PMI data to April 2009 was more pessimistic with demand falling but less so in March and April compared to February, but the latest PMI reported a further weakening in the rate of decline in business activity.

The Scottish Chambers' Business Survey (q1 2009) reported average occupancy (for hotels) at 54%, not too dissimilar than the averages for first quarters in previous years, however, the SCBS noted business confidence remained very low and occupancy was being sustained by extensive cutting of room rates and with some pressures on margins. The SCBS data suggests discounting of room rates will figure widely in the second quarter, the PMI reported more extensive room rate cutting in March, compared to the period November 08 – February 09, but indicated slightly rising room rates/charges in its April

survey. Other data suggests that the sector had recognised that 2009 would not be as good as 2007 and 2008 which had been good years, especially for the major tourist areas. One noticeable feature over recent quarters in the Scottish tourism sector has been the decline in the percentages of firms seeking to recruit staff, with the majority of SCBS respondents reducing both seasonal staff and hours worked.

### Logistics

Data from the SCBS q 1 2009 reported widespread declines in business confidence as a net of respondents reported weakening business trends in all areas, especially long haul, storage and couriering activities, although, and in common with other sectors, an easing of these downwards trends is anticipated in the second quarter. Over the next year pressures on margins are widely expected, and turnover and profitably trends are expected to remain very weak.

### Cost pressures

The SCBS noted cost pressures, except finance costs, continuing to ease across all sectors and expectations of price decreases were reported in manufacturing. Pressures on margins were widely reported in construction, and evident in tourism. In contrast over 70% of retailers anticipate price increases over the next three months. The latest PMI (May) noted some slight easing in the rate of decline in prices charged in the services sector, but the discounting of prices in manufacturing being more evident.

### Pay and employment

SCBS data for the first quarter suggests the percentages of respondents increasing pay in the first quarter ranged from 8% of construction to 21% of manufacturing, and average pay increases ranged from 3.05% in manufacturing to 5.33% in retail. A net of firms in all sectors reported declining net trends in employment and hours worked/overtime levels. Recruitment activity in all sectors was low ranging from 8% in construction, 9% in retail to 38% in tourism and 42% in manufacturing.

Changes in the employment market seem still subdued – in latest PMI (May) 75% of manufacturers reported no change in employment and 77% of services no change in employment levels. In contrast in the earlier Scottish Engineering report (q1 2009) only 50% reported no change in employment.

SCBS data for the first quarter noted average capacity used in manufacturing has declined by 12.2 percentage points and in construction by 19.7 percentage points over the past year. In construction the proportion reporting working below optimum levels has increased from a net of 31% to a net of 86%. In tourism occupancy remained at the same level as in q1 2008, however, occupancy has been sustained only by widespread discounting.

Both the PMI and SCBS noted cost pressures, except finance costs, continued to ease across all sectors and expectations of price decreases were reported in manufacturing. Pressures on margins were widely reported in construction, and evident in tourism. In contrast over 70% of retailers anticipate price increases over the next three months.

Eleanor Malloy/Cliff Lockyer  
June 2009

---

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

1. The Confederation of British Industries Scottish Industrial Trends Survey April 2009;
2. Lloyds TSB Business Monitors for the quarters to February and May 2009 and expectations to August 2009;
3. Scottish Engineering's Quarterly Review for the first quarter 2009;
4. The Royal Bank of Scotland's Monthly Purchasing Managers' Index to end May 2009;
5. The Scottish Retail Consortium's Monthly Scottish Retail Sales Monitor for April and May 2009;
6. The Scottish Chambers of Commerce Quarterly Business Survey, reports for the first quarter of 2009;
7. Deloitte's North West Europe Review published April 2009);
8. The Lloyds TSB Halifax House Price Index;
9. Scottish Hotel Occupancy Survey to end April 2009.

# Overview of the labour market

Current interest in the Scottish labour market continues to focus on the trends and patterns in the unemployment figures, in this issue, in addition to noting recent changes in Scottish labour market trends, we explore a number of the underlying issues in employment, unemployment and activity rates. It is important to remember, as the ONS indicates, that we are exploring and seeking to measure changes generated by sample surveys and the results should be seen in terms of the relevant confidence levels.

Initially, however, the recent tragedies involving North Sea oil and fish farm employees prompt a concern to examine the trends in accidents and fatalities amongst the Scottish workforce.

Data from the Health and Safety Executive ([www.hse.gov.uk/statistics/regions/scotland](http://www.hse.gov.uk/statistics/regions/scotland)) indicates that there were 32 fatal injuries to workers and 5 fatal injuries to members of the public in Scotland in 2007/8. In addition there were 2,721 major injuries and 8,994 over three day injuries to employees in Scotland in the same period. Fatal injuries to workers in Scotland have averaged around 30 – 35 per year since 2004, although in 2004/5 the higher figures reflected nine fatalities from a single incident. It is worth noting that the UK has consistently one of the lowest fatal injury rates (0.75 per 100,000 workers) in the EU, and this should caution those who argue for a general reduction in 'state regulation'.

Nationally agriculture, construction, extractive and utility supply have the highest rate of fatal and major injuries per 100,000 employees, and thus regional figures are influenced by the pattern of industries and occupations. The HSE estimate that the 3.3 million working days were lost in 2007/8 in Scotland due to workplace injury and work related ill health, broadly the same patterns as for 2004 – 2007.

The HSE and a number of sectors, most notably offshore work and utility supply, have long recognised that monitoring accidents and injuries represents a failure of safety procedures, and attention should be paid developing a safety culture and monitoring breaches of safe working procedures or 'dangerous occurrences'. The reinforcement of safe working procedures and a safety culture are equally critical to the service industries, given that they account for more than half of fatal and major injuries to employees in Scotland, and that the construction sector has the highest rate of fatal and major industries per 100,000 employees.

In February 2009 the Association of Graduate Recruiters predicted a decline of some 5.4% in the total number of

graduate positions available in the UK, the first drop since 2003. In Scotland, since the early 1990s, the increasing number of higher skilled jobs and the rising demand for skills has been matched by a rising number of graduates. In 2007/08 there were 30,155 first degree graduates and 21,400 postgraduates in Scotland. The figures understate the numbers in higher education in Scotland. Data for 2005 – 6 indicates that 74,515 students successfully completed a higher education course in Scotland, of whom '40% obtained a first degree, 37% a sub degree and 23% obtained postgraduate qualifications' (Scottish Government data). In recent years the graduate labour market has been fuelled by rising numbers employment in finance, business services and health, social and community work sectors. In recent months anecdotal evidence suggests increasing competition amongst graduates for employment, and signs of increasing difficulty in finding employment, especially in those professions where a qualifying period is required before achieving chartered, or equivalent, status. Given the increasing likelihood of a reduction in the number of jobs in the public sector, and the relative slowness of recovery in the business services sector the graduate market may be entering a period of more competition for a more limited number of job opportunities.

## Recent trends and statistics

Comparable figures on the labour market<sup>1</sup> between Scotland and the United Kingdom in the quarter February – April 2009 are summarised in Table 1. Labour Force Survey (LFS) data show that in the quarter to April 2009 the level of employment in Scotland fell by 25 thousand, to 2,510 thousand. Over the year to April 2009, employment in Scotland fell by 40 thousand. For the same period, UK employment fell by 399 thousand. The Scottish employment rate – those in employment as a percentage of the working age population – was 74.6 per cent, down 1.1 per cent compared to one year earlier. For the same period the UK employment rate was 73.3 per cent, down 1.5 per cent compared to one year earlier.

Figure 2 provides an account of Scottish quarterly LFS employment over a sixteen-year period to the most recent quarter. Employment levels still remain close to historical highs, reached in Q2 2007.

In considering employment, activity and unemployment rates it is important to remember the bases and relationships of these figures. LFS data 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

**Table 1: Headline indicators of Scottish and UK labour market, February – April 2009**

February – June 2009		Scotland	Change on quarter (%)	Change on year (%)	United Kingdom	Change on quarter (%)	Change on year (%)
Employment*	Level (000s)	2,510	-1.0	-1.6	29,108	-0.9	-1.4
	Rate (%)	74.6	-1.0	-1.1	73.3	-0.8	-1.5
Unemployment**	Level (000s)	176	30.3	52.9	2,261	11.4	36.6
	Rate (%)	6.6	1.5	2.2	7.2	0.7	1.9
Activity*	Level (000s)	2,686	0.3	0.1	31,369	-0.1	0.7
	Rate (%)	80.0	0.2	-0.3	79.2	-0.2	0.0
Inactivity***	Level (000s)	643	-1.2	1.6	7,889	1.2	0.4
	Rate (%)	20.0	-0.2	0.3	20.8	0.2	0.0

**Source:** Labour Market Statistics (First Release), Scotland and UK, June 2009

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

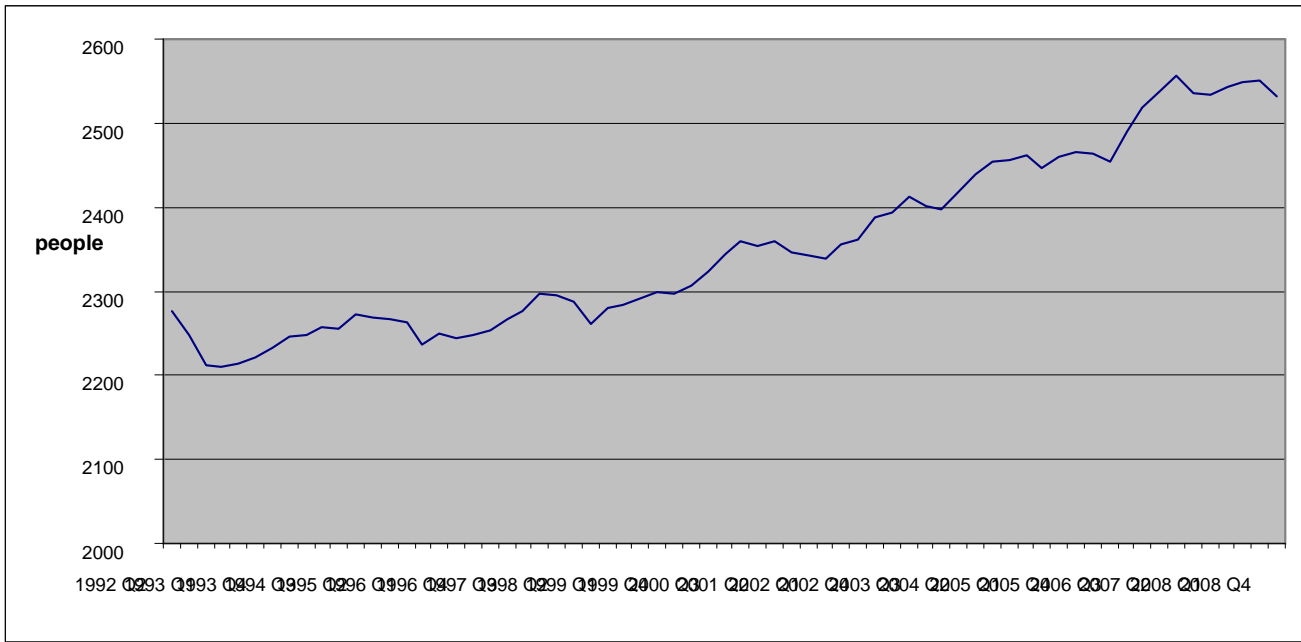
\*\* Levels and rates are for those aged 16+, rates are proportion of economically active.

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

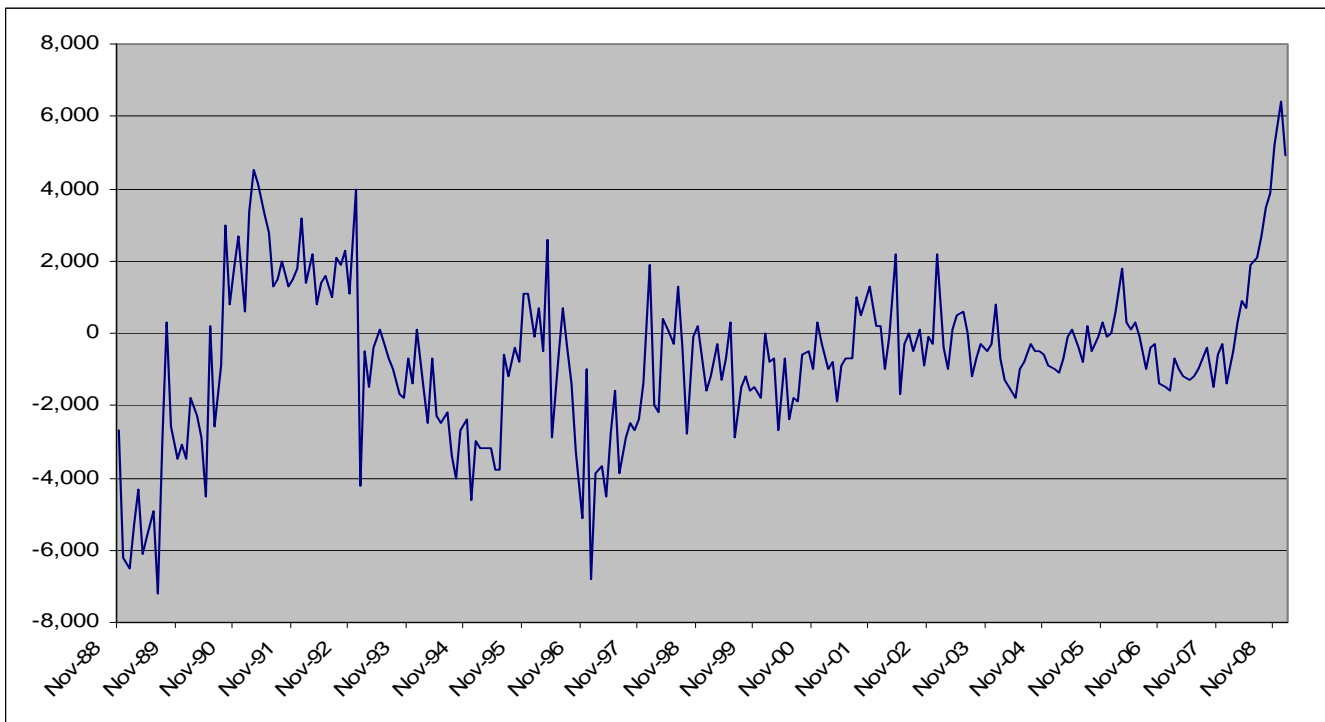
**Table 2: Employee jobs by industry, Scotland, March 2009**

SIC 2003 Section	All jobs (not seasonally adjusted)	All jobs	Agriculture, Forestry and Fishing	Mining Energy and Water Supplies Industries	Manufacturing Industries	Construction	Distribution etc, transport etc, finance and business services	Education, health, public admin and other services
	A-O	A,B	C,E	D	F	H-K	L-O	
Sep 05	2,373	2,373	32	37	232	129	1,102	842
Mar 06	2,376	2,368	31	36	224	135	1,094	848
Sep 06	2,361	2,360	33	38	224	138	1,085	841
Mar 07	2,380	2,371	34	41	222	145	1,082	847
Sep 07	2,389	2,389	33	43	222	139	1,108	844
Dec 07	2,391	2,400	25	42	220	139	1,127	847
Mar 08	2,392	2,382	28	42	218	137	1,109	849
Jun 08	2,396	2,396	35	42	216	136	1,114	853
Sep 08	2,387	2,387	35	41	216	138	1,105	852
Dec 08	2,374	2,385	33	41	212	140	1,103	856
Mar 09	2,363	2,352	37	40	206	139	1,074	858

**Figure 1 Total (16+ employment in Scotland Q2 1992 to Q1 2009, seasonally adjusted**



**Figure 2: Net flows of claimants to Job seekers allowance, November 1998 to April 2009**





inactive – but leads to a higher economically active, employment and unemployment rates but lower economically inactive rates.

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 an emerging pattern, they are categorised as economically inactive, as such the unemployment rate remains unchanged whilst the activity and inactivity rates change.

Table 1 shows that for Scotland the preferred International Labour Organisation (ILO) measure of unemployment rose significantly to 176 thousand, between February and April 2009. This equates to a 52.9 per cent annual increase in the number unemployed under this measure<sup>2</sup>. The ILO unemployment rate rose in the three months April 2009 and now stands at 6.6 per cent. This represents a 1.5 per cent rise over the last quarter and a 2.2 per cent rise relative to the same period a year earlier. The comparable ILO unemployment rate for the UK stands at 7.2 per cent, and is up 0.7 per cent over the most recent quarter, and up 1.9 per cent over the year.

As was noted in the February 2009 issue the patterns of work have changed significantly over the past thirty years as a more flexible labour market and flexible working arrangements have emerged, and there is now a wider consensus that this has contributed to slowing down the rate of increase in unemployment as the economy moves further into recession.

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). Table 1 shows that the level of the economically active rose by 0.3 per cent between February and April 2009. There were 2,669 thousand economically active people in Scotland during Q4 2008. This comprised 2,686 thousand in employment and 176 thousand ILO unemployed. The level for those of working age economically inactive fell in the last quarter, down 1.2 per cent on the previous quarter to 643 thousand people. This indicates an increase of 1.6 per cent in the number of people of working age economically inactive over the last year.

The most recent (seasonally adjusted) figure for Jobseekers allowance claimants in Scotland stood at 125.3 thousand in May 2009, up 3.5 thousand from the previous month. The claimant count rate in May 2009 stood at 4.5

per cent. This is up 0.1 per cent from the previous month, but up 1.9 per cent over the year. The UK claimant count rate in May 2009 was 4.8 per cent, up 0.1% from the previous month and up 2.2 per cent over the year.

Figure 3 shows net flows to Jobseekers Allowance in Scotland between November 1988 and the most recent data (May 2009). The reduction in the claimant count unemployment over recent years can be seen by the greater outflows than inflows over much of this time period. The claimant count in Scotland was 3.9% in May, this was the same as in the previous month (which may reflect a combination of seasonal factors and/or a lessening in the rate of the recession), but 1.7 percentage points higher than in the previous year.

Unemployment data at the Scottish constituency level for May 2009 is available in a SPICe Briefing <http://www.scottish.parliament.uk/business/research/briefings-09/SB09-45.pdf>.

The most recent figures for the number of employee jobs by industrial activity are detailed in Table 2. Employee job figures are a measure of jobs rather than people. Total seasonally adjusted employee jobs for the quarter ending March 2009 stood at 2,363 thousand. The number of jobs in the manufacturing industry continues to fall, and now stands at 206 thousand, down 6,000 on the previous quarter, and down 12 thousand against the same quarter one year earlier. The number of jobs in the service industry fell by 29 thousand over the last quarter to 1,074 thousand, and there are now 35 thousand fewer jobs in the service industry than the same period ending a year earlier.

## Outlook

In the year to May 2009 the total in employment fell by 65,000 and unemployment rose by 60,000 to 174,000 and the numbers economically inactive rose by 10,000 over the year. Scotland's labour market continues to perform reasonably well; but trend in unemployment is increasing and there are signs that the unemployment rate will increase more strongly through the second half 2009.

Over the year to March 2009 the sectors suffering the most losses of employee jobs were distribution, transport, finance and business services (35,000 jobs a drop of 3.2 per cent over the year), manufacturing (12,000 jobs, a drop of 5.7 per cent) and mining, energy and water supplies (2,000 jobs a drop of 4.2 per cent). In contrast in the public sector the numbers of jobs rose, but this is unlikely to continue. Job losses are likely to continue in those sectors which grew rapidly in recent years as a result of the property and financial boom. In the recession of 1980 – 1981 the claimant count rose consistently through 1981 (reaching 262,200 by December 1981), and a general upward trend continued through to January 1987 when unemployment peaked at 334,700 reflecting the declining numbers in mining and manufacturing, in this decade it may well be that unemployment will continue to rise as jobs

are lost in the public sector. In the private sector policies to bring in new professional staffs and ensure the retention of key skills and expertise continue to be a challenge.

---

**Endnotes:**

<sup>1</sup>The Census 2001-consistent population figures at local authority level were released in February 2003. This has allowed the production of interim regional LFS estimates. The population data only cover the periods up to mid-2001. The data presented here are taken mainly from Labour Market Statistics, May 2008 and are consistent with the updated LFS data available on NOMIS from Summer 2004. Labour Market Statistics continue to report data for Scotland at the quarterly level, so this will continue to form the

basis of our analysis of movements in the labour market between quarters.

<sup>2</sup>The Labour Force Survey definition of ILO unemployment takes precedence over the claimant count measure. ILO unemployment is much less sensitive to changes in the regulations governing unemployment benefit, and conforms to a widely accepted standard to allow for more meaningful cross-country comparisons.

Cliff Lockyer  
June 2009

# Foreword from the Principal

As Principal and Vice-Chancellor of the University of Strathclyde I am very pleased to introduce this special issue of the Fraser Commentary which, in addition to the regular forecast and review of the Scottish economy, is focussed on the role of higher education and training in Scotland.

Scotland has always recognised the value and importance of a university education, and today's higher education sector is vibrant, diverse, makes a significant economic contribution to the Scottish economy and plays a pivotal role in Scottish life. One of the papers in this issue estimates that HEIs as businesses support up to £3 billion of economic activity in Scotland (3.3% of GDP) and 61,000 full-time equivalent jobs (3.4% of the Scottish total). In addition HEIs make major contributions to the economy through the skills of our graduates who are employed in Scotland, and through the effects of universities on innovative activity and the knowledge exchange process that connects Scottish businesses with Scottish universities. The mechanisms through which universities impact on economic activity help to provide conditions that facilitate a move out of the current recession. The important contribution of Scottish HEIs to the economy is reflected in the Scottish Government's recent recognition that they form a key economic sector in their own right, one of only seven sectors that the Government regard as having a vital contribution to make to the Government's Economic Strategy.

Scotland faces many challenges and uncertainties in the twenty-first century. Increasing global competition, faster rate of change, the need to be innovative in both traditional and the emerging sectors, to re think our energy production and consumption all require a skilled and imaginative workforce. How can we predict these future demands on higher education and how should higher education respond? What is the right balance of investment between research, teaching and wider engagement through knowledge exchange?

The Scottish Government has asked the higher education sector to align its publicly funded activities more closely to the Scottish Government's strategic objectives. We need to have a better understanding of what is currently being delivered by Scottish universities and how this contributes to the Scottish economy and society before we can agree on what Scotland wants from our universities, taking account of the economic, social and cultural domains.

The research highlighted in this June issue of the Fraser Commentary reflects our commitment to be an international centre of research excellence and a place of useful learning, improving the evidence base for future policy discussions of higher education. As Principal of one of Scotland's most influential universities I welcome this contribution to the debate.

Professor Jim McDonald  
Principal and Vice-Chancellor  
University of Strathclyde

June 2009

# Economic perspectives

## Graduate migration flows in Scotland\*

Alessandra Faggian, University of Southampton,  
Qian Cher Li, University of Strathclyde and  
Robert E Wright \*\*, University of Strathclyde

### Abstract:

*This paper examines the nature of graduate migration flows in Scotland. Migration equation is estimated with micro-data from a matched dataset of Students and Destinations of Leavers from Higher Education information collected by the Higher Education Statistical Agency (HESA). The probability of migrating from Scotland is related to a set of observable characteristics. These logit regressions are estimated separately for Scotland-domiciled and rest-of-the-UK domiciled graduates and separately for under-graduates graduates and postgraduate graduates. The analysis suggests that migration is a selective process with what can be termed "high achievers" having a higher probability of leaving Scotland after graduation.*

### 1. Introduction

One of the key outputs of the higher education sector is the production of skilled labour. It is well known that, on average, the employment rates and earnings of graduates are considerably above those of non-graduates, suggesting that employers to a certain extent value the skills being generated by the UK higher education sector. It is equally well-known that there is a tendency for graduates to stay in the region where they studied. However, there is a considerable amount of movement of graduates between different regions of the UK e.g. between England, Northern Ireland, Scotland and Wales. In order to evaluate the impact that the higher education sector makes on regional economies, it is necessary to estimate the value of human capital generated by the higher education sector along with its regional distribution. One way of achieving this is to consider the regional movement of graduates in an analogous way to the importing and exporting of goods and services.

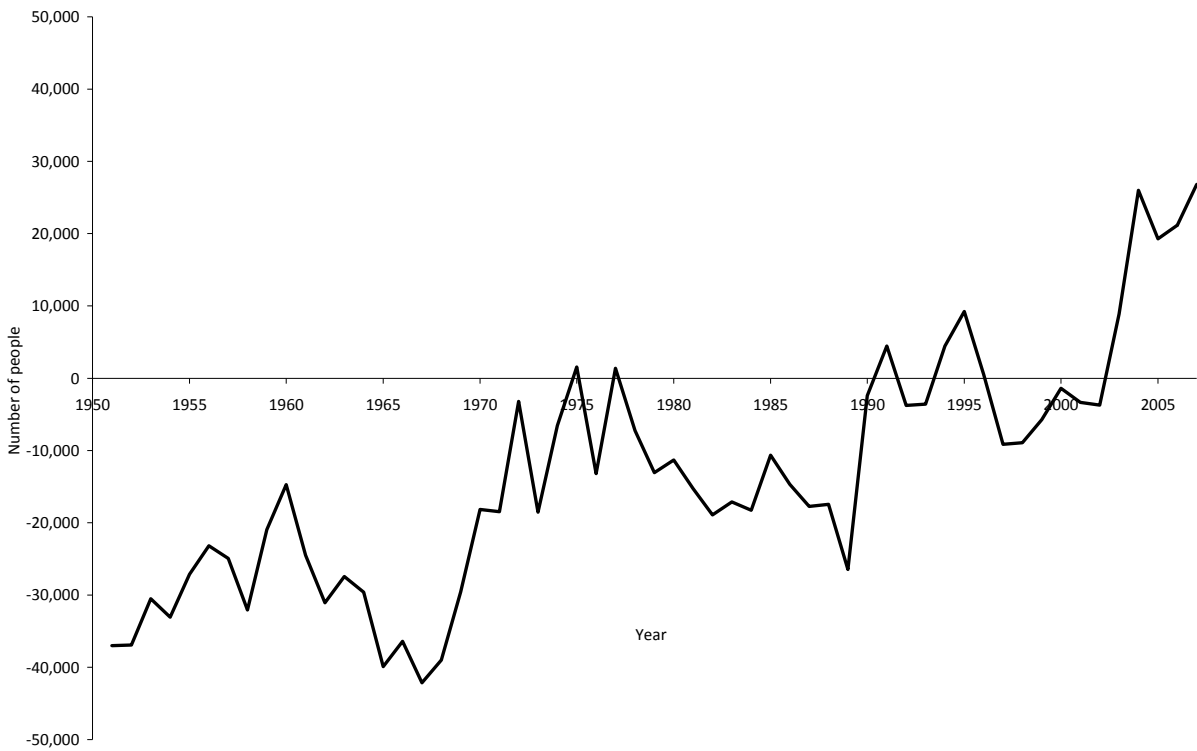
---

(\*) Financial support from the Economic and Social Research Council under grant: RES-171-25-0032, "The Overall Impact of Higher Education Institutions on Regional Economies in the UK" is gratefully acknowledged.

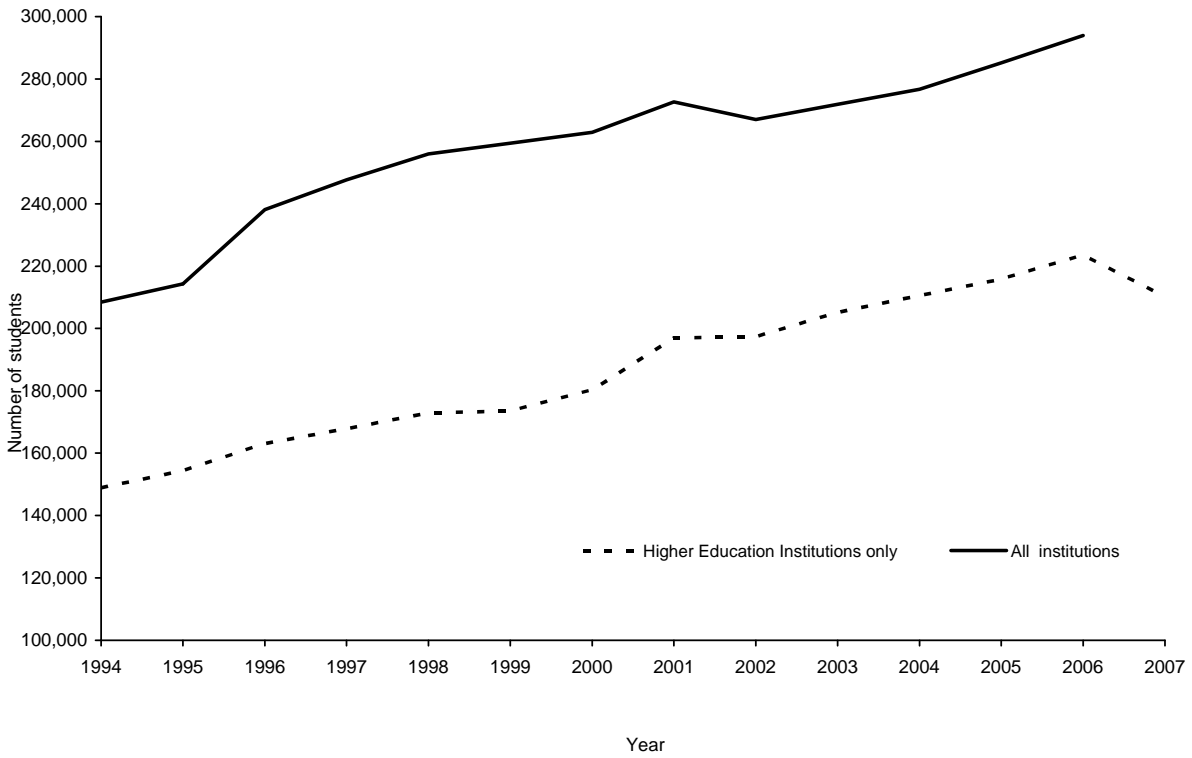
(\*\*) Address for correspondence: Robert E. Wright, Department of Economics, University of Strathclyde, William Duncan Building, 130 Rottenrow, Glasgow, Scotland, G4 0GE, email: r.e.wright@strath.ac.uk, tel: +44 (0)141-548-3861

**Opinions expressed in economic perspectives are those of the authors and not necessarily those of the Fraser of Allander Institute**

**Figure 1: Net-migration, Scotland, 1951-2007**



**Figure 2: Number of Higher Education Students, Scotland, 1994/95-2007/08**



Using this analogy, Scotland has traditionally been a net-exporter of people. Throughout most of the post-war period, the number of emigrants has exceeded the number of immigrants by a sizeable amount (see Figure 1). In the period 1950 to 2000, total net-migration was over 800,000 people, which is a staggering figure remembering that the overall population of Scotland hovered around 5 million in most of this period. However, in the past few years, net-migration has been positive spurred on by a large flow of migrants from the mostly Central European countries that joined the European Union in 2004 (Wright, 2008). A key question is whether these large flows will continue into the future?

There is a widely held concern over the trend of depopulation of Scotland especially in the rural and remote regions. Given the belief that migration flows of graduates might reinforce migration flows of general population, one argument is that the establishment of Further and Higher Education institutions in remote regions will help reverse this trend. Therefore the issues of which factors and to what extent each of these factors determines the migration behaviour of graduates have clear implications for policy making (especially in terms of the retention of Scottish higher education graduates). With this background in mind, the purpose of this paper is to examine the out-migration of higher education graduates from Scotland.

## 2. Higher education trends

According to the Scottish Government (2008), in the academic year 2005/06 (the most recently available estimate) there were 308,085 higher education students in Scotland. Of this total, 244,510 (79.4 per cent) studied at Higher Education Institutions (HEIs); 49,460 (16.1 per cent) studied at Colleges of Further and Higher Education; and 14,155 (4.6 per cent) were enrolled on courses offered by the Open University.<sup>1</sup> It is not surprising that the majority of students studying in Scotland—around 70 per cent—are “Scotland-domiciled” meaning that their “normal residence” is in Scotland. Although the match is not perfect, this implies that most Scotland-domiciled students received at least some of their secondary schooling in Scotland.

It is clear that the number of students participating in higher education has increased over the past two decades in Scotland. Figure 2 shows the number of higher education students from 1994 onwards, excluding Open University students. The trends for “all” higher education students and HEIs-only students are shown. Over this period there has been a gradual increase in the relative share of HEIs-only students, from 71.4 per cent in 1994/05 to 76.0 per cent in 2006/07. The estimate of the total number of higher education students for 2007/08 is currently not available. However, according to data published by the Higher Education Statistical Agency (HESA), which is the official agency for the collection, analysis and dissemination of quantitative information about higher education in the UK, it appears that the number of HEIs-only students fell between 2007/08 and 2006/07 by about 13,000. Our analysis

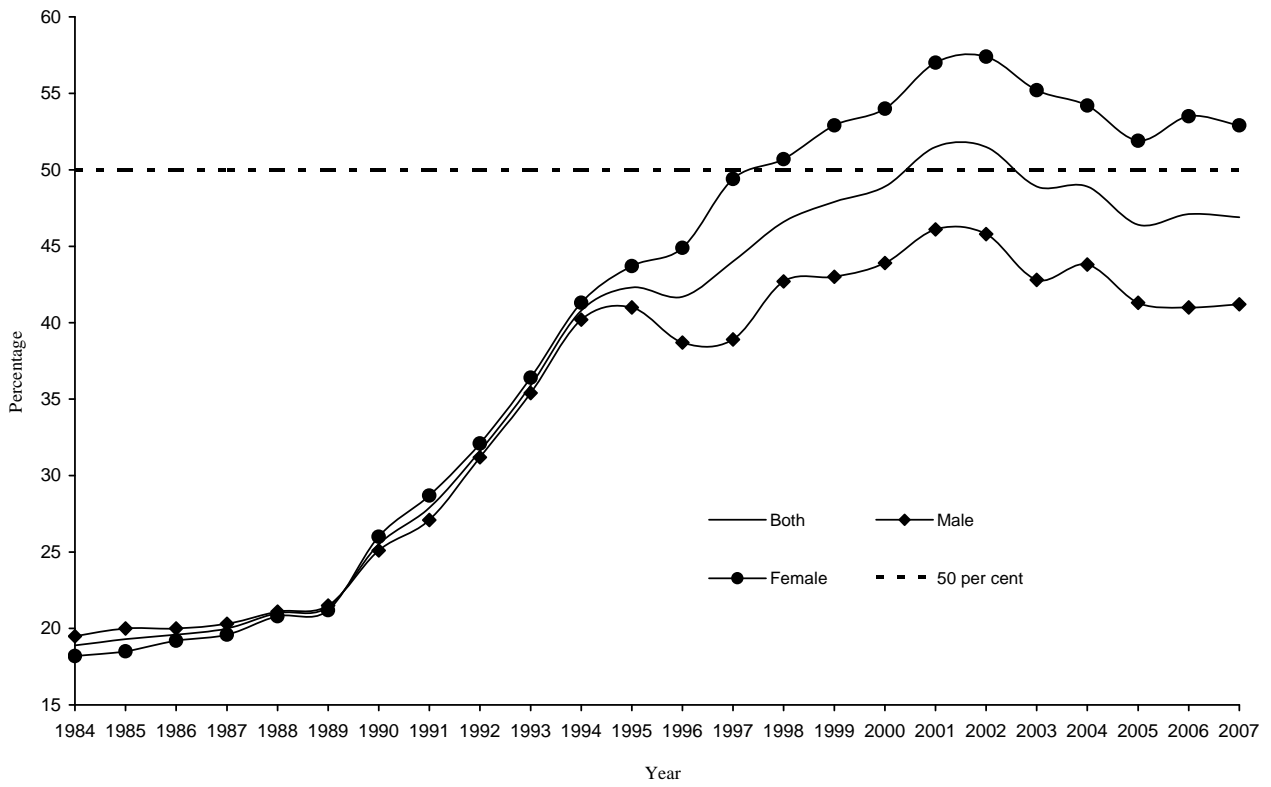
suggests this drop is mainly due to a decrease in Scotland-domiciled and foreign (non-UK) students. The decrease in Scotland-domiciled students is likely explained by the decrease in higher education participation rates since their peak around 2001/02 (see Figure 3).

Despite this recent decrease, longer-term growth across all student groups has been impressive. Evidence in support of this claim is shown in Table 1. This table gives the growth rates of various student groups between 1994/95 and 2007/08 for Scotland and for the UK as a whole. However, the HESA estimates refer to HEIs-only students. The increase in the total number of students in this period was 41.2 per cent, which is lower than the average for the UK of 47.1 per cent. As the table shows, the difference is largely accounted for by a lower growth rate for full-time under-graduates in both science and non-science subjects. The growth rate in foreign and post-graduate students equalled the rate for the UK. However, the growth in part-time students was nearly 50 per cent higher than the UK average, suggesting that much of the increase can be accounted for by this group. Although Scotland performance in increasing student numbers has been below that of the UK as whole, it must be remembered the Scotland-domiciled individuals throughout this period had much higher rates of participation in higher education compared to other countries of the UK, although the gap is closing. In this sense, Scotland started out from a “higher base” in the beginning of this period, so these slightly lower growth rates should not be interpreted as Scotland not being able to keep up.

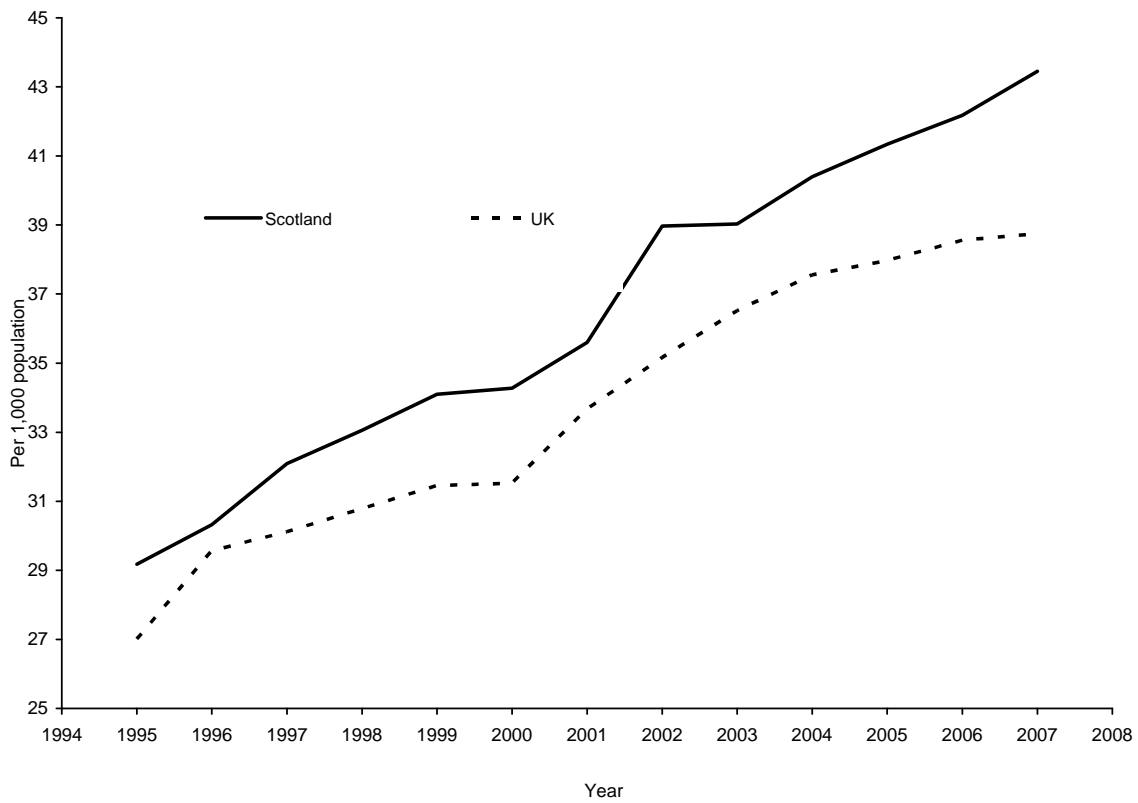
Figure 4 shows the number of higher education graduates expressed per 1,000 population in Scotland and the UK for the same period. When population size is used to deflate these student numbers, Scotland is performing above the average for the United Kingdom. For example, in 1995, there were about 29 students per 1,000 population in Scotland and 27 students per 1,000 population in the UK as a whole. By 2007, this had risen to 43.5 per 1,000 in Scotland and 38 per 1,000 in the UK. It is worth mentioning that the Scottish rate is currently about the same as in Wales (44.2 per 1,000) but considerably higher than in England (38.3 per 1,000) and especially Northern Ireland (23.6 per 1,000).

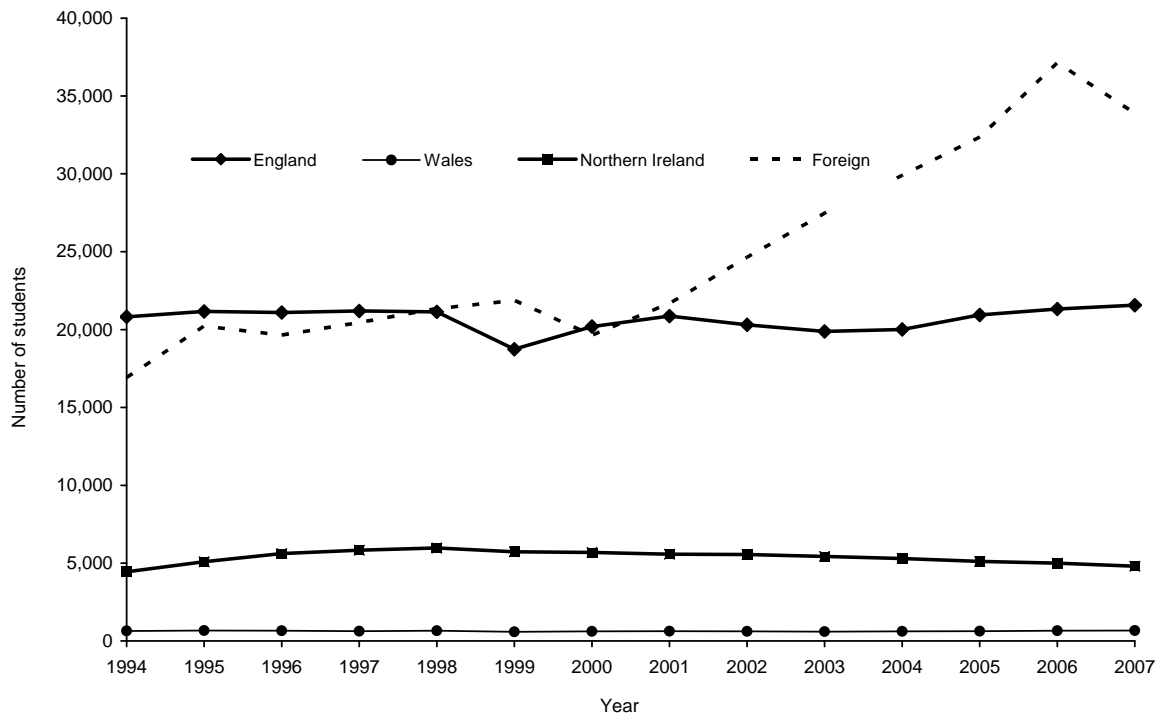
As mentioned above, the majority of students studying at Scottish institutions of higher education are Scotland-domiciled. Table 2 gives the breakdown of HEIs-only students for 1994/05 and 2007/08 while Figure 5 shows the trends in England-domiciled, Northern Ireland-domiciled, Wales-domiciled and foreign-domiciled students. It is interesting to note that the number of students domiciled elsewhere in the UK, both in absolute numbers and relative shares has changed little in this period. However, in this period, there has been a doubling of the number of foreign-domiciled students studying in Scotland, with their share of the total rising from 11.4 to 16.1 per cent.

**Figure 3: Higher education age participation index Scotland, 1983/84 to 2006/7**



**Figure 4: Higher education students per 1,000 population, Scotland and UK, 1994/95-2007/08**



**Figure 5: Place of domicile of non-Scotland-domiciled Students in Scottish higher education insitutions, 1994/95-2007/08**

### 3. Micro-data analysis

About 30 per cent of higher education students in Scotland are rest-of-the-UK or foreign-domiciled, with the split between these two groups being roughly equal (see Table 2). In this sense, it seems fair to conclude that Scotland is successful at attracting students in highly competitive national and international markets. Although the attraction of students is important, one can argue that their retention is even more important, particularly when viewed against the background of demographic decline mentioned above (see Lisenkova and Wright 2009 for a more thorough discussion). In this sense, it is important to identify what are the key factors affecting the migration decisions of graduates.

In order to examine the determinants of graduates' migration choices, we employ the micro-data collected by HESA for subsequent analysis. More specifically, information has been combined from two main data-bases—(1) Destinations of Leavers from Higher Education Institutions; and (2) Students in Higher Education Institutions—for five cohorts of graduates, covering the period 2002/03 to 2006/07. In this merged data-set, there are three key postal addresses of interest: (1) place of domicile; (2) place of study; and (3) place of employment six months after graduation. With these postal addresses it is possible to identify if an individual has moved from their place of domicile to their place of study, and from their place of study to their place of employment.

A series of migration equations have been estimated building on the earlier studies of Faggian and McCann (2006) and Faggian, McCann and Sheppard (2006, 2007a, 2007b). In these equations, the probability of leaving Scotland after graduation is related to a set of observable characteristics with logit regression. The variables considered include: gender, ethnicity, age, mode of study, field of study, class of degree, type of higher education institution attended and whether the individual moved from their region of domicile to study, which are described in more detail in Table 3. These equations are estimated separately for "under-graduate" and "post-graduate" graduates and for various places of domicile. HESA does not collect information of this type for foreign-domiciled graduates or for UK-domiciled graduates who migrate abroad. The details relating to the estimation of these equations, along with a full set of results, can be found in our companion paper (Faggian, Li and Wright, 2009)

In general our analysis suggests that the probability of leaving Scotland after graduation is strongly correlated with certain characteristics. With respect to Scottish-domiciled under-graduate graduates, the probability of leaving Scotland is higher for men than women. It is higher for those who studied full-time compared to part-time. Age is important but its effect is non-linear—"younger" and "older graduates" both have lower probabilities of migrating after graduation. There are also differences relating to ethnicity

There are two main regional effects. The first is that students who moved away from their "region" of domicile



**Table 1: Percentage growth rates of various higher education student groups, 1994/95-2007/08**

Type of Student:	Scotland	UK
Full-time	26.2	37.5
Part-time	99.6	68.3
Under-graduates	38.1	46.5
Post-graduates	51.5	49.4
Foreign	100.4	108.8
Science	55.7	66.4
Non-science	30.3	36.2
<b>All students</b>	<b>41.2</b>	<b>47.1</b>

**Source:** Higher Education Statistical Agency

**Table 2: Place of Domicile of Students at Scottish Higher Education Institutes, 1994/05 and 2007/08**

Place of domicile	1994/05		2007/08	
	Numbers	%	Numbers	%
Scotland	103,426	69.5	148,460	70.6
England	20,819	14.0	21,560	10.3
Northern Ireland	4,443	3.0	4,800	2.3
Wales	645	0.4	675	0.3
Foreign	16,915	11.4	33,895	16.1
Missing	2,660	1.8	795	0.4
All	148,908	100	210,185	100

**Source:** Higher Education Statistical Agency

to study (with regions being defined as shown in Table 3), have a higher probability of leaving Scotland after graduation. The second is that those who studied at a HEI in the Strathclyde region have a lower probability of leaving. Finally, those who graduated with a first class science degree from a Russell Group university also have a higher probability of migrating.

Although many of these factors are significant in a traditional statistical sense, the next issue to consider is how "big" are these effects? One way to attempt to answer this is to use the migration equations to "predict" the probability of migrating based on a set of specific characteristics and compare this to the average probability. The raw data suggest that in the five-year period covered by our data, the "average" probability of leaving Scotland after graduation was 4.6 per cent. The estimates suggest that the predicted probability of migrating for under-graduates who are white males, who studied full-time and graduated with a first class science degree from a Russell Group university, at age 22 is 21.5 per cent. By any standards, such individuals are "high achievers", and it must be worrying that there is a propensity for one-in-five to leave Scotland after graduation.

The results for England-, Northern Ireland- and Wales-domiciled under-graduate graduates are less pronounced. There is no difference between men and women, although those who studied full-time have a lower probability of leaving Scotland after graduation. There is clearer gradient with age suggesting that the individuals who are older at graduation have lower higher probability of leaving. There is little difference by ethnicity. Likewise degree classification is not important except those with degree classification missing have a lower probability of leaving. Students graduating with science or science-led combined degrees have a lower probability of migrating. Finally, there is little difference between England- and Wales-domiciled students. However, the probability of leaving Scotland after graduation is considerably lower for Northern Ireland-domiciled students.

The raw data indicate that the "average" probability of leaving Scotland after graduation for this group was 58.9 per cent. It is of course not surprising that this rate of migration is much higher than for Scotland-domiciled students. If we consider the same "hypothetical individual" as discussed above, the differences associated with the variables included in the migration equation is not as marked as what was found for Scotland-domiciled students. The estimates suggest that the predicted

Table 3: Variables Included in migration equations

<p>(1) Sex</p> <p>(2) Age at graduation</p> <p>(3) Ethnic group:</p> <ol style="list-style-type: none"> <li>1. White</li> <li>2. Black</li> <li>3. Asian</li> <li>4. Mixed-White and Black</li> <li>5. Mixed-White and Asia</li> <li>6. Mixed-Other</li> <li>7. Other or Unknown</li> </ol> <p>(4) Class of degree</p> <ol style="list-style-type: none"> <li>1. 1st</li> <li>2. 2-1</li> <li>3. 2-2</li> <li>4. 3rd &amp; Pass</li> <li>5. Other</li> </ol> <p>(5) Subject area</p> <ol style="list-style-type: none"> <li>1. Arts and Humanities</li> <li>2. Social Science</li> <li>3. Science</li> <li>4. Joint: Arts and Humanities-led</li> <li>5. Joint: Social Science -led</li> <li>6. Joint: Science-led</li> <li>7. Unknown</li> </ol>	<p>(6) Type of HEI</p> <ol style="list-style-type: none"> <li>1. Further/Higher College</li> <li>2. Post-1992 university</li> <li>3. Non-Russell group pre-1992 university</li> <li>4. Russell Group university</li> </ol> <p>(7) Region of domicile</p> <ol style="list-style-type: none"> <li>1. Strathclyde</li> <li>2. Dumfries and Galloway</li> <li>3. Borders</li> <li>4. Lothian</li> <li>5. Central</li> <li>6. Fife</li> <li>7. Tayside</li> <li>8. Grampian</li> <li>9. Highland</li> <li>10. Western Isles</li> </ol> <p>(8) Studied full or part-time</p> <p>(9) Movers i.e. region of domicile is not region of HEI attended as in (7)</p>
---	--

probability of migrating for under-graduates who are white males, who studied full-time and graduated with a first class science degree from a Russell Group university, at age 22 is 62.4 per cent. This is only a few percentage points higher than the average. More generally, the results suggest that the key factors that are likely driving the migration decisions amongst this group are not included in the model.

#### 4. Concluding comments

The statistical modelling suggests that the out-migration of graduate is a selective process with what can be termed “high achievers” having considerably higher probabilities of leaving Scotland after graduation for other regions of the UK (mainly income). The data suggest that in 2006/07, about 12.1 per cent of graduates of Scottish HEI’s had migrated to somewhere else in the UK within six months of graduation. 87.6 per cent of this total had migrated to England. However, while this out-migration can be considered a “loss” to Scotland, it must be remembered that Scotland also attracts graduates from the other countries of the UK and from abroad. Although the HESA data are of little practical use in the analysis of the migration flows of foreign-domiciled graduates, other data sources as well as applications to the so-called Fresh Talent Initiative suggest that a sizeable number of such graduates, at least for a short period of time, stay in

Scotland (see Rogerson, Boyle and Mason, 2006). While Scotland clearly loses graduates it also gains graduates and what is important in the net position. What is not clear is whether or not Scotland gains more than it loses because of graduate migration flows. Analysis along the lines carried out in this paper should be able to provide at least a partial answer to this question.

One weakness with our analysis is that the place of employment is measured only six months after graduation. It is often argued that it takes much longer for graduates to establish themselves in the labour market. This is used by many to explain what appears to be the high level of “over-education” six months after graduation, with over-education being measured by the proportion of graduates being employed in so-called “non-graduate jobs”. This suggests that many of the moves may very well be short-term in nature, with the individual moving again in order to obtain a “graduate job”. Criticisms along these lines suggest that much could be learned about migration patterns by considering the situation several years after graduation.

Fortunately data of this type have recently been collected as part of HESA’s Destinations of Leavers from Higher Education Longitudinal Survey. In this survey the 2002/03 cohort of graduates were interviewed 3½ years later (i.e. in the winter of 2006/07). The descriptive analysis of the data

carried out by National Centre for Social Research suggests there are key differences between what is observed six months after graduation compared to 3½ years after graduation (HESA, 2007). We believe that the analysis of this Longitudinal Survey should be a useful addition to extend current investigation and thus is a future avenue to pursue in our subsequent research.

---

## Endnotes

1. The current list of Scottish HEIs is:

Edinburgh Napier University  
Glasgow Caledonian University  
Glasgow Graduate School of Law  
Glasgow School of Art  
Heriot-Watt University  
Open University in Scotland  
Queen Margaret University  
Robert Gordon University  
Scottish Agricultural College  
University of Aberdeen  
University of Abertay Dundee  
University of Dundee  
University of Edinburgh  
University of Glasgow  
University of Saint Andrews  
University of Strathclyde  
University of Stirling  
University of the West of Scotland  
UHI Millennium Institute

---

## References

- Faggian, A. and P. McCann (2006), "Human Capital Flows and Regional Knowledge Assets: A Simultaneous Equation Approach", *Oxford Economic Papers*, vol. 52, pp. 475-500.
- Faggian, A., P. McCann and S. Sheppard, (2006), "An Analysis of Ethnic Differences in UK Graduate Migration Behaviour", *Annals of Regional Science*, vol. 40, pp. 461-471.
- Faggian, A., P. McCann and S. Sheppard, (2007a), "Human Capital, Higher Education and Graduate Migration: An Analysis of Scottish and Welsh Students", *Urban Studies*, vol. 44, pp. 2511-2528.
- Faggian, A., P. McCann and S. Sheppard, (2007b), "Some Evidence That Women Are More Mobile than Men; Gender Differences in U.K. Graduate Migration Behavior", *Journal of Regional Science*, vol. 47, pp. 517-539.
- Faggian, Li and Wright, (2009), *Graduate Migration Flows: Importing and Exporting Human Capital*, manuscript, Glasgow, Fraser of Allander Institute, University of Strathclyde.

HESA, (2007), *Destinations of Leavers from Higher Education Institutions Longitudinal Survey of the 2002/03 Cohort: Key Findings Report*, Cheltenham/London, Higher

Education Statistical Agency/National Centre for Social Research.

HESA, (various years), *Destinations of Leavers from Higher Education Institutions*, Cheltenham, Higher Education Statistical Agency.

HESA, (various years), *Students in Higher Education Institutions*, Cheltenham, Higher Education Statistical Agency.

Lisenkova, K and R.E. Wright, (2009), *Scotland Demographic Dilemma*, Hume Occasional Paper, Edinburgh, David Hume Institute.

Rogerson, R., M. Boyle and C. Mason, (2006), *Progress Report of the Fresh Talent Initiative*, Edinburgh, Scottish Government.

Scottish Government, (2008), *High Level Summary of Statistics: Trends for Lifelong Learning*, Edinburgh, Lifelong Learning.

Wright, R.E., (2008), *The Economics of New Immigration to Scotland*, Hume Occasional paper, Edinburgh, David Hume Institute.

# The impact of higher education institutions (HEIs) on the Scottish economy: New evidence from an HEI-disaggregated input-output approach

Kristinn Hermannsson†, Katerina Lisenkova†,  
Peter G McGregor†‡, J Kim Swales†‡

## Abstract

*This paper measures the regional demand impacts on output and employment of Scottish Higher Education Institutions (HEIs) based on Input-Output tables for the year 2006. The HEI disaggregated table was developed from existing Input-Output tables using supplementary data from HESA and purchasing data for Scottish universities. We calculate direct, indirect and induced impacts. Most of the existing literature focuses on individual institutions by employing Keynesian Multiplier or Input-Output analysis. This paper adds to the literature by providing the first systematic study of all individual HEIs using a common framework of analysis. The results suggest that HEIs may have substantial regional economic impacts both in terms of output and employment. Furthermore analysis of the HEIs' income sources suggests they are more export intensive than is commonly acknowledged, which motivates a re-evaluation of the appropriate counterfactual in regional impact studies of HEIs.*

*Keywords: HEIs, University Impact, Input-Output.*

This paper is an output of our project entitled The Overall Impact of HEIs on Regional Economies (ESRC, RES-171-25-0032). This project is one of nine that are funded under the joint UK Higher Education Funding Councils and ESRC Initiative on The Impact of HEIs on Regional Economies. (All UK funding councils are involved: Scottish Funding Council, Higher Education Funding Council for England and Wales, and the Department for Employment and Learning Northern Ireland. We also acknowledge supplementary funding from the Centre for Public Policy for Regions (funded by SFC).

## Introduction and background

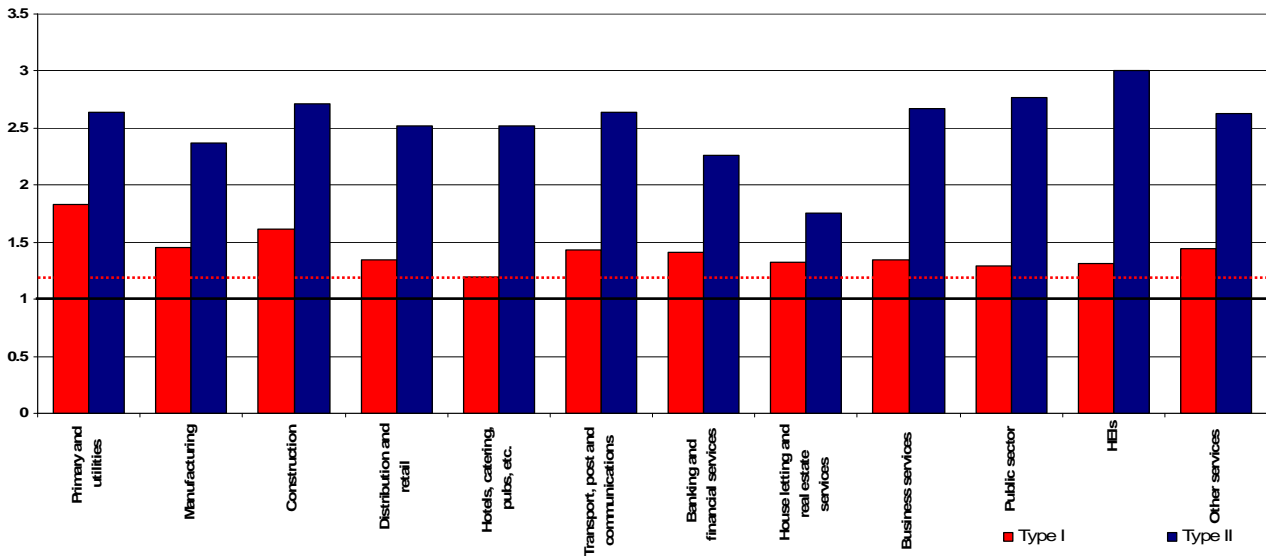
There is now significant, and growing, policy interest in the regional economic impacts of Higher Education Institutions (HEIs) in the UK generally, and in Scotland in particular. The Scottish Government has recently emphasised the important role that it expects universities to play in helping Scotland emerge from the current economic downturn (JFTTU, 2008). Furthermore, the Scottish Government has proposed that universities be recognised as a “key sector” in their own right, in return for ensuring that they align their public-funded activities with the objective of increasing sustainable economic growth. (Universities are the seventh key sector identified by the Scottish Government, the others being: Creative Industries; Energy; Financial and Business services; Food and Drink; Life Sciences and Tourism.) More recently still, Universities Scotland (2009) issued a report that included a review of evidence relevant to assessing the impact of HEIs in Scotland. This paper provides an update of evidence relevant to one important dimension of HEIs, namely their behaviour as businesses, who buy goods and services and employ labour.

There is a considerable body of research on the impact of higher education institutions (HEIs) on their local economies (see for example McGregor et al 2006, Florax 1992). Recently much of this research has focussed on the supply-side impact of HEIs – that is how HEIs affect the productive capacity and competitiveness of their host economy. In this paper, however, we focus exclusively on the more tangible spending, or demand-side, impact of HEIs: that is, how their spending on wages, goods and services affects the local economy. Through the years, several impact studies have been conducted for Scottish HEIs, following the pioneering study for the University of St. Andrews by Blake & McDowell (1967).

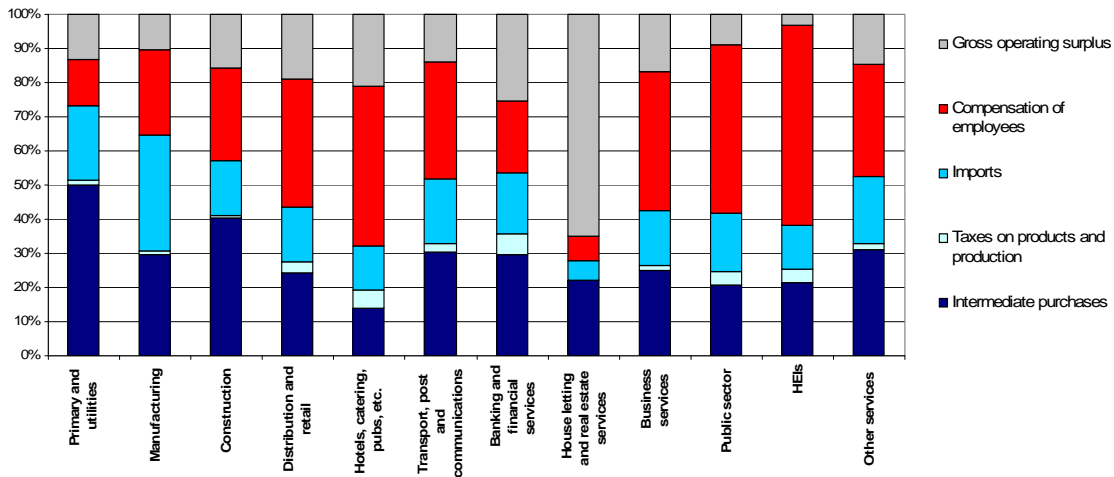
Our analysis is based on an Input-Output table for Scotland, which has been modified to identify individual HEIs as separate production sectors. This allows us to conduct various simulations of the regional impact of all Scottish HEIs, individually and as a group, addressing their economic characteristics systematically within a single framework. When assessing the demand-side regional impact of HEI expenditures we can progress from a quantifiable starting point, the direct spending of the institution and its students, trace this spending through the regional economy and identify an overall impact. From this restricted view, HEIs are usually treated as a source of exogenous demand stimulus to their local economy.

Whether measured in absolute or relative terms Higher Education Institutions (HEIs) constitute a significant industry in Scotland. When everything is included, that is institutional and student spending, and additional knock on effects, the HEIs have a GDP impact of approximately £3bn or 3.3% of total Scottish GDP. This economic activity supports approximately 61,000 FTE jobs, which constitutes about 3.4% of total employment in Scotland.

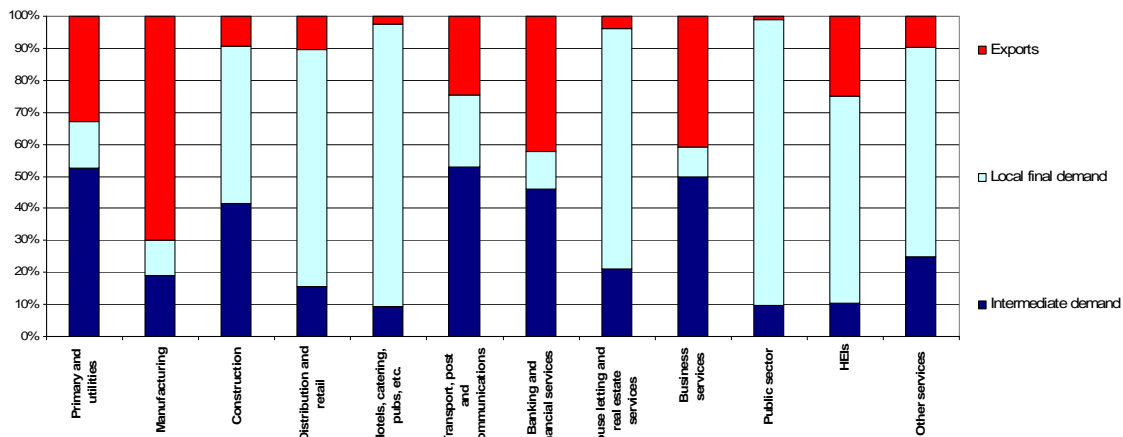
**Figure 1 Output multipliers of Scottish industries at a 12-sector level of aggregation**



**Figure 2 Expenditures of Scottish industries at a 12-sector level of aggregation**



**Figure 3: Income of Scottish industries at a 12-sector level of aggregation**



## Economic characteristics of HEIs

Knock-on effects are important in explaining the economic role of HEIs as their (Type II) output multiplier (which includes the impact of the demand stimulus in increasing employment, incomes and therefore consumption, as well as on intermediate purchases) is among the very highest of sectors in the Scottish economy. When purchases from other Scottish industries and spending of staff are aggregated, they reveal an output multiplier of 3. This means that every one pound spent by a Scottish HEI generates an increase in Scottish output of three pounds.

To put this in perspective, the Type-I and Type-II multipliers for broad Scottish industrial sectors are shown in Figure 1. Type-I multipliers quantify the knock-on effects from local sourcing of intermediate inputs. Their values range from about 1.2 to 1.8. Type-II multipliers also include the knock-on effects of additional wage spending by households and therefore take a higher value. These range from approximately 1.7 to 3, with the HEI sector being at the very top of the range.

The multiplier values are heavily dependent on the extent of initial expenditure leakages from the local economy. Where these leakages are large, the multiplier values are small. Leakages include imports, tax payments and the companies' gross operating surplus, so that in sectors where these expenditures are important, the corresponding multipliers will be low. Typically Type-II multiplier values are high for services whose inputs are to a large extent labour. On the other hand in manufacturing, raw materials and manufactured goods are used intensively as inputs. These are typically more import intensive and therefore leakages occur from the local economy, reducing the multiplier value. Figure 2 shows the expenditure patterns in the economy for the same 12 aggregate –sectors. Examining these data reveals that HEIs expenditure is dominated by wages: little is spent on servicing capital (gross operating surplus), which strengthens the multiplier. Comparing the multiplier of HEIs to the public sector in general indicates that spending on the former results in a bigger overall impact as more expenditure is retained within the local economy.

## Economic impacts

Institutional spending accounts for approximately 80% of the impacts of HEIs, while that of students' forms the remaining 20%. It should be noted however that students' tuition fees contribute to institutional spending (as HEIs income) and are therefore not attributed to student impacts in order to avoid double counting. The spending of students who come to study in Scotland from the rest of the UK and the rest of the World is unambiguously additional to the Scottish economy. However opinions differ as to what extent the impact of local students should be attributed to university impacts. The critical question to answer is what the students would be doing if not studying at a Scottish university. If the answer is that the students would be studying elsewhere, their spending as students in Scotland

is additional to the economy as their expenditure is retained locally instead of being switched elsewhere. If, on the other hand, we assume students would have entered the local labour market instead there is no net-effect on Scotland from their spending as students. No doubt reality typically lies somewhere between these two extreme assumptions. However, in the absence of survey evidence that could be used to motivate the degree of additionality of Scottish students' spending, making the judgement is left to the reader and the impact of each student group is reported separately.

Table 1 shows the demand-side impact of individual Scottish HEIs on Scottish GDP and employment. The figures used here are based on data from the Higher Education Statistical Agency (HESA), which identifies 20 HEIs in Scotland. Recently Bell College and the University of Paisley have merged to form the University of the West of Scotland, but this is yet to be reflected in the statistics. These economic impacts vary widely between institutions, reflecting their scale. Individual HEIs are relatively homogeneous in terms of their expenditure patterns, which are dominated by wages. However their income levels, and therefore expenditure levels, differ significantly. The two biggest institutions, Edinburgh and Glasgow, generate 36% of the total Scottish impact. Adding the next two, Strathclyde and Aberdeen, increases the impact to 54%.

## Exports and the sources of income

Even if HEIs are generally thought of as public institutions (though they are not in fact part of the public sector) there is an element of competition among them for students (and the subsequent funding or tuition fees they bring) and for research funding at a UK, European and international levels. A quarter of HEIs income is from exports to the RUK and the ROW. This income is contingent upon their success in competitive bidding for research funding and in attracting fee-paying students. Comparing the income of Scottish HEIs to the public sector in Scotland reveals a significant difference in that the export earnings of the public sector amount to only around 1% of total income.

In 2006 the export income of Scottish HEIs had a GDP impact of £611 m and supported 13,107 jobs. This source of income is significant for the Scottish economy as it supports 0.63% of GDP and 0.74% of employment. The relevance of these income sources is reinforced by the fact that the amount of export income can vary, and indeed it has. Over a four-year period from 2001/2002 to 2005/2006 it increased by 34%, resulting in an additional 3,326 jobs and £ 155m in GDP. This estimate neglects the further impacts we would expect from the spending of additional foreign students. It is clear that the export success or failure of Scottish HEIs is likely to have significant repercussions for Scotland's economy.

On aggregate 53% of HEIs income is from Scottish Government sources and 22% from other sources, including services rendered. Evidently HEIs' funding from

**Table 1: GDP and employment impact of Scottish HEIs and student spending (£m)**

	GDP £ m					Employment FTE				
	HEI spending	SCO	RUK	ROW	Total	HEI spending	SCO	RUK	ROW	Total
Aberdeen	189	24.97	5.15	11.53	230	4,553	440	91	205	5,289
Abertay	38	8.90	1.12	3.97	52	960	157	20	71	1,207
Bell College	25	10.42	0.07	0.07	36	667	183	1	1	853
Dundee	196	31.04	6.65	10.90	223	4,878	547	118	193	5,736
ECA	18	2.62	1.47	2.22	24	436	46	26	39	548
Edinburgh	498	33.50	21.43	23.56	577	11,274	590	380	418	12,663
Caledonian	119	41.81	2.67	5.64	169	2,783	737	47	100	3,667
GSA	19	2.53	1.46	1.78	25	495	45	26	32	597
Glasgow	375	48.31	7.29	12.81	443	8,140	851	129	227	9,348
Heriot-Watt	116	4.79	2.40	24.25	147	2,625	84	43	431	3,182
Napier	96	21.16	2.26	13.17	133	2,239	373	40	234	2,886
Paisley	69	23.42	0.49	3.46	97	1,693	413	9	61	2,176
QMUC	33	9.62	1.77	3.54	48	794	170	31	63	1,057
Robert Gordon	89	23.05	2.07	10.05	124	2,143	406	37	178	2,764
RSAMD	12	1.48	0.52	0.51	15	316	26	9	9	360
St Andrews	129	8.05	8.61	11.93	158	3,081	142	153	212	3,587
SAC	51	2.11	0.16	0.15	54	1,305	37	3	3	1,348
Stirling	99	17.43	3.18	5.83	125	2,494	307	57	103	2,961
Strathclyde	225	41.86	2.32	16.29	285	5,223	737	41	289	6,291
UHI	28	12.24	0.28	0.56	41	973	373	40	234	1,620
<b>Total impact</b>	<b>2,404</b>	<b>369</b>	<b>71</b>	<b>162</b>	<b>3,026</b>	<b>57,071</b>	<b>6,662</b>	<b>1,302</b>	<b>3,104</b>	<b>68,140</b>
<b>% Of SCO total GDP/employment</b>	<b>2.7%</b>	<b>0.4%</b>	<b>0.1%</b>	<b>0.2%</b>	<b>3.3%</b>	<b>2.9%</b>	<b>0.3%</b>	<b>0.1%</b>	<b>0.2%</b>	<b>3.4%</b>

the Scottish Government is the single most important source of funding, but HEIs differ significantly from the public sector, in general, in terms both of their pattern of income and their expenditures.

## Conclusion

We have explored the impacts of HEIs, considered as businesses, on the Scottish economy as well as the impacts of the expenditure of students. Scottish universities are major employers and some of them attract a significant number of students from outside Scotland. In order to estimate these impacts we use official data to construct an Input-Output table for Scotland for the year 2006 where we have treated individual HEIs as separate sectors. Our estimates show that based on “shut down” or “hypothetical extraction” assumptions the (Type II) GDP impact of Scottish universities is approximately £2.4bn. Furthermore the impact of student expenditures is estimated to be £603m. As was expected, the impacts of individual institutions are closely related to their size, while the impacts from student expenditure depends on the ability of an individual institution to attract students from the rest of the UK and the rest of the world. GDP Impacts of individual

universities range from £12m for the RSAMD to £498m for the University of Edinburgh. Impacts of total student expenditure for individual universities range from £2.4m for the Scottish Agricultural College to £78.6m for the University of Edinburgh. When considering only the impact of incoming students, GDP impact range from £45m for the University of Edinburgh to £0.14m for Bell College. The impact of the HEIs themselves dominates that of student spending in a ratio of approximately 4 to 1, when considering every student, and approximately 10 to 1 if only incoming students are considered.

We have looked beneath the aggregate impact to reveal how changes in different sources of HEIs’ income affect the Scottish economy. Just over half of HEI income comes from the Scottish Government. A little over a quarter of the HEIs’ income comes from sources outside Scotland in the form of research grants and tuition fees of foreign (non-EU) students. The amount of this external income is contingent upon the success of Scottish HEIs at attracting students and winning research grants. We estimate the GDP impact of HEIs external income at £611 m, or equivalent to 0.74% of Scottish GDP.

It is worth recalling that the impacts that we explore here relate to universities as businesses, which focuses attention on their impact on the demand side of the economy. HEIs also exert significant effects on their host regions through supply side impacts, for example, by raising the skill levels of the regional labour force, and through knowledge exchange activities. Our future research will seek to measure these additional impacts of HEIs.

---

## References

Blake, C. & McDowell, S. (1967) A Local Input Output Table. *Scottish Journal of Political Economy*. Vol. 14, pp. 227-242.

Callander, C., Wilkinson, D., MacKinnon, K. & Vegeris, S. (2005). *Higher and Further Education Students' Income, Expenditure, and Debt in Scotland 2004-2005: A report to the Scottish Executive*. London South Bank University & Policy Studies Institute.

Florax, R.J.G.M. (1992), *The University: A Regional Booster?*, Aldershot: Avebury.

HESA – Higher Education Statistics Agency (2007). *Resources of Higher Education Institutions 2005/06*.

JFTTU (Joint Future Thinking Taskforce on Universities) (2008) *New Horizons: responding to the challenges of the 21<sup>st</sup> century*. Report of the Taskforce to the Scottish Government.

Universities Scotland (2009) *What Was/ What Next?*

McGregor, P., Swales, K & McLellan, D. (2006), *The Overall Impact of Higher Education Institutions on Regions: A Critical Review*. In Centre for Public Policy for the Regions's Network on the Overall Impact of HEIs on Regional Economies: Final Report, Centre for Public Policy for Regions, Glasgow.

Scottish Government (2007). *Higher Education Students' income, Expenditure and Debt: A Comparative Study of Students in Scotland and England 2004-2005*.



# The demographic challenge facing Scottish Higher Education Institutions: a computable general equilibrium analysis

Kristinn Hermannsson<sup>†</sup>, Katerina Lisenkova<sup>†</sup>,  
Peter G McGregor<sup>†‡</sup>, J Kim Swales<sup>†‡</sup>

## Abstract

*Higher Education Institutions (HEIs) are generally regarded as important actors in regional economic development. A large literature exists on their demand side impacts as employers and as purchasers of intermediate inputs and, more recently, work has been undertaken to explore their impacts on the supply side, for example, through labour market and knowledge transfer effects. A growing evidence base suggests that HEIs have a positive impact upon the development of their host regions. However the HEI sector faces a challenge that might have significant impact on the fortunes of its host regions and has hitherto received limited attention. The populations of most developed countries are ageing and the age cohort from which university students are traditionally drawn is expected to shrink.*

*This paper uses an HEIs-disaggregated Computable General Equilibrium (CGE) model to simulate the economic impacts of a shrinking student population upon Scotland. In the analysis we use scenarios presented in a recent Universities UK report.*

*This paper is an output of our project entitled The Overall Impact of HEIs on Regional Economies (ESRC, RES-171-25-0032). This project is one of nine that are funded under the joint UK Higher Education Funding Councils and ESRC Initiative on The Impact of HEIs on Regional Economies. (All UK funding councils are involved: Scottish Funding Council, Higher Education Funding Council for England and Wales, and the Department for Employment and Learning Northern Ireland. We also acknowledge supplementary funding from the Centre for Public Policy for Regions (funded by SFC).*

<sup>†</sup> Fraser of Allander Institute, Department of Economics, University of Strathclyde

<sup>‡</sup> Centre for Public Policy for Regions, Universities of Glasgow and Strathclyde

## 1. Introduction and background

In a recent report on the future size and shape of the higher education sector in the UK, Universities UK (UUK, 2008a, 2008b) present projections of student numbers conducted on their behalf. These projections demonstrate that UK Higher Education Institutions (HEIs) face a “demographic challenge” in that the number of 18-20 year olds, who traditionally constitute more than 70% of undergraduate students, is projected to fall markedly between 2009 and 2019 before rising again until 2027. The impact of this decline across UK regions is uneven. Northern Ireland is hardest hit, facing a 13.2% fall over the earlier period that is sustained right through to 2027. England is least at risk with a projected fall in the key age group of 4.8% over the earlier period and a modest increase (of 2.7%) over the period as a whole. Scotland’s 18-20 age group is projected to fall significantly by 10.9% (as compared to a UK-wide fall of 5.9%) to 2019 and to recover to a fall of 8.4% over the whole period to 2027. In this paper we focus on the Scottish projections, although our analysis does, we believe, have implications for other regions of the UK.

Of course, UUK recognises that these purely demographic projections may provide a misleading impression of what is likely to happen to student numbers in each region. This is so even if the population projections are accurate in themselves, an unlikely outcome given their sensitivity to migration assumptions (Lisenkova et al, 2009). UUK explore three main scenarios. These reflect alternative views about factors such as: current trends for more young people to enter higher education; the impact of student debt on participation; pressures on public funding; likely developments in international markets for students and the nature of employer engagement. UUK then identify the likely consequences of these three scenarios for student numbers in the regions of the UK.

In this paper we seek to determine the likely impact of these alternative projections of Scottish HEI student numbers for the Scottish economy. Studies of the overall, system-wide impact of HEIs generally have typically adopted a multiplier approach. While valuable in terms of understanding universities as businesses, they are likely to be rather less useful in evaluating changes at the margin, including variations in student numbers in circumstances where the supply side of the economy is unlikely to be entirely passive. Instead we here use a specially constructed, HEI-disaggregated, computable general equilibrium (CGE) model of Scotland to explore the likely consequences of the projected decline in student numbers. This has the advantage of explicitly building in induced supply-side reactions to the changes in student numbers, though for simplicity here we concentrate on the impact of these changes on the demand side of the economy. In a companion paper we consider the supply-side impacts of HEIs on host regional economies that operate through their impact on the stock of graduates within the region (Lisenkova et al, 2009).

## 2. The demographic challenge

Figure 1 summarises the 2006 Government Actuary Department (GAD) projection for the Scottish population aged 18-20 over the period to 2026/27. The decline between 2010 and 2021 is striking (nearly 17%), although there is a projected recovery to a drop of 11% by the end of the period. Figure 1 also gives UUK projections for Scottish student numbers. These show a more moderate decline in (full time equivalent) student numbers. In their “baseline” demographic-based projection, student numbers decline by 11% to 2021 and by 7% to 2026/27. This reflects a judgement that HEIs will partially compensate for loss of recruitment from the 18-20 age group by increasing recruitment from other age groups (partially through part-time routes) and by increasing the share of foreign students.

The scenarios developed by UUK are summarised in Table 1. All scenarios start from the baseline demographic projections. The difference between scenarios is determined by the reaction of governments, employers and institutions to the demographic challenge.

Scenario 1 is called “Slow adaptation to change”. This can be viewed as a status quo scenario. The key differences from the demographically driven baseline are in age-specific participation rates. There is a modest increase in part-time undergraduate students, post-graduate and international students. Total funding per student remains constant, while there will be a further increase in the concentration of research funding by the councils. These changes will push universities to greater flexibility, investigation of niche-markets and wider introduction of e-learning.

Scenario 2 is labelled “Market-driven and competitive”. There is a significant increase in the demand for the part-time undergraduate education from all age groups. There is also higher demand for post-graduate education. Employers recruit a higher proportion of 18-20 year-olds and finance their part-time studies. This leads to a decrease in the number of full-time students. Public funding per student remains at its current level but total investment in higher education increases. Fees are largely deregulated, which leads to differentiated fee system. A UK-wide credit accumulation and transfer system is introduced. By the end of the period the HEIs are much more differentiated in terms of the type and quality of education they provide. Higher diversity leads to loss of the clear brand of UK higher education and, as a consequence, decreased overall international demand for UK education, except for a limited number of elite institutions.

Scenario 3 is called “Employer-driven flexible learning”. Demographic changes result in greater competition among employers and HEIs for young people. There is a shift to life-long learning. Public funding of higher education significantly decreases and tuition fees are deregulated.

The role of employers in financing higher education increases, they also can influence the distribution of public funds. The difference between full-time and part-time students decreases. Students move in and out of higher education as their circumstances change. Full higher education awards can be constructed from the selection of modules from different HEIs. Virtual learning systems are introduced and allow 24/7 education environment. Apart from several elite institutions UK higher education becomes less attractive for traditional international students. However, e-learning technology allows wide participation in borderless education, although this generates lower margins than traditional education.

The implications of each scenario for student numbers are summarised in Figure 2.

## 3. Analysing the impact of projected student numbers

We would expect that, in general, changes in the ability of HEIs to attract students would have both demand and supply side impacts on the host region. We consider each of these in turn, although our empirical analysis presented in this paper abstracts from supply-side impacts.

### 3.1 Impacts on demand within the host region

Consider first the likely impacts on the demand side of the regional economy. Other things being equal, the smaller the size of the cohort from which undergraduate students, in particular, are drawn, the more difficult it will become for Scottish HEIs to maintain the numbers and quality of undergraduate students. This has a number of implications for the host region. First, the income flow to Scottish universities is driven by a limited number of factors, one of which is numbers of undergraduate students recruited. If these were to fall, then so too would this source of income. In fact, university financial settlements may effectively cap student recruitment, but if HEIs cannot recruit up to this level they lose a source of revenue. Furthermore, financial settlements for HEIs would be adjusted in the face of falling student numbers, so the link to finances is fairly direct. This would in turn impose limitations on Scottish HEIs expenditures and therefore on their impact on demand within the regional economy. We assume, for simplicity, that the loss of even home students reduces demand. In fact, government funds so released may be employed for other demand-generating purposes. Population-driven changes in the Barnett formula complicate matters further, however. (See e.g. Ferguson, et al, 2007.) We shall explore the impact of this issue in subsequent research. This reduction in demand in the economy will have the kind of “knock on” effects that are associated with indirect (occurring through intermediate purchases) and induced effects (occurring through consumption –income linkages) that are associated with traditional “impact analyses” of HEIs. (See Hermannsson et al, 2009 in this issue of the Fraser Economic Commentary.) However, in this case the supply side of the economy is not entirely passive and responds to this demand stimulus. In particular, as demand

declines, this tends to lead to a slacker labour market and so downward pressure on Scottish wages and prices, and therefore to some gain in competitiveness and moderation of the adverse “multiplier” impacts. Over the longer-term however, this is likely to lead to some outmigration and further losses of output.

Furthermore, any decline in home student numbers would appear to reduce demands for Scottish goods from this source, and so further depress regional demand. However, in order to explore this notion properly, we need to: think a bit more carefully about the appropriate treatment of students’ expenditures, and in particular critically review their treatment within past multiplier studies of HEIs; consider the overall impacts of a decline in population. We turn first to the appropriate treatment of student expenditures.

In the conventional IO literature, there appear to be two alternative treatments of students’ expenditures, depending in part upon the students’ region of origin. In most IO studies of HEIs impacts on the host region, home students’ expenditure tends to be excluded from estimates of impacts, because of a presumption that these expenditures would, for some reason, not be lost in the event of a university closure. Only the expenditures of students attracted from outwith the area are included as a stimulus to regional demand on the grounds that these would be lost in the absence of the HEI. However, Harris (1997) takes the opposite perspective and includes all student expenditures in his estimate of the impact of HEIs on Portsmouth economy. In the present context the assumption is that student numbers are varying primarily due to demographics (though also due to some behavioural change in the case of UUK’s baseline scenario), and to changes in the margin in student numbers. In these circumstances the appropriate focus is on all changes in student expenditures, including those of home students. In fact, in this case the impact of student expenditures is very modest, though, of course, negative and we do not discuss it further here.

### *3.2 Impacts on the supply side of the host region*

HEIs may exert a wide range of impacts on the supply-side of regional economies, for example on culture and health, and there are many possible external benefits that could be associated with education in general and higher education in particular (McMahon, 2004, 2009). However, most analyses of economic impacts focus on at most two key issues: the impact of HEIs on regional economies through the skills of their graduates; the potential impact of technology and other knowledge spillovers e.g. through spin-out companies.

A major potential impact is through the contribution HEIs make to the skills of the host region’s labour force. There is a vast literature in this area relating both to microeconomic issues, specifically relating to rates of return to higher education, and macroeconomic, relating, for example, to

the impact of human capital on growth. Both areas have been recently reviewed: e.g. Psacharopoulos and Patrinos, 2004 on returns; Stevens and Weale, 2004, and McMahon, 2004 on growth models. The key issues here include: the ability of the region to retain the graduates of its HEIs and absorb them into the local labour force; the scale of the regional graduate wage premium, and the extent to which the premium genuinely captures productivity differentials. There is now a huge literature relating to knowledge transfer. While much of this is based on case studies and is qualitative and impressionistic, there have been a number of quantitative studies that suggest that HEIs may indeed have important effects on innovation within the host region. However, Faggian and McCann (2006) sound a note of caution in that they find little evidence of an independent effect once graduate migration flows are controlled for. This is not to deny a knowledge transfer impact, but rather to suggest that the main mechanism through which such effects occur is the employment of graduates.

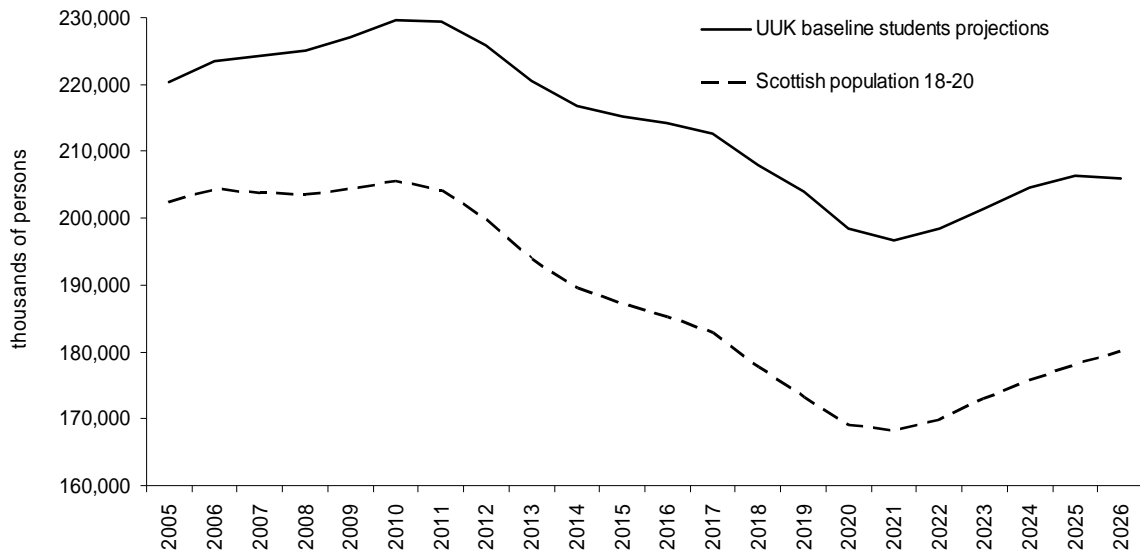
Possible student impacts on the supply-side of host regional economies are typically neglected, as indeed are the possible wider effects of the presence of significant student communities (Munroe et al, 2009). They may have a significant impact on the supply side of host regions’ labour markets, given their high participation rate in part-time employment, for example.

In the present paper we abstract from these potentially important supply-side impacts to focus exclusively on the demand-side disturbance that the projected changes in student numbers may have. (In Hermannsson et al, 2009b, we explore the likely impacts of HEIs through upgrading the skills of the host labour force.) However, we analyse the impact of these disturbances in the context of a model in which the supply side reaction to these disturbances is important.

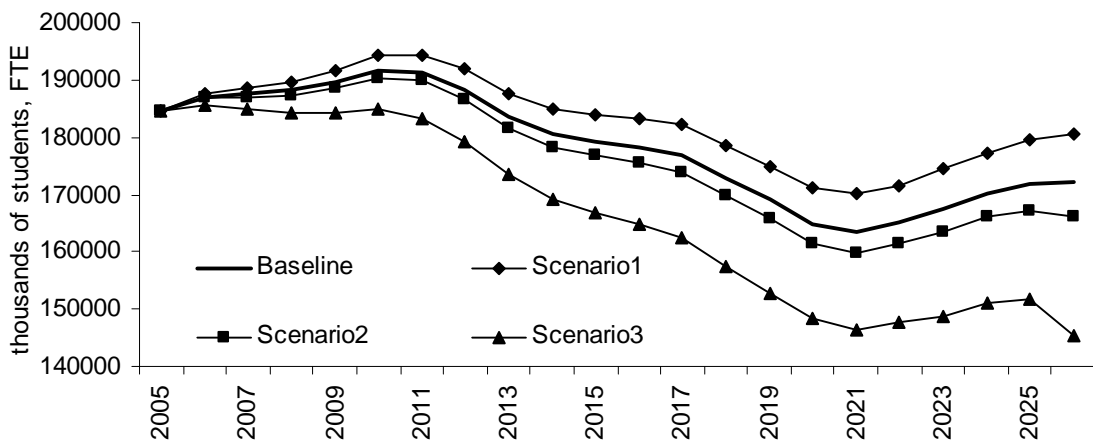
## **4. The CGE model**

For detailed discussion of the model see Harrigan et al (1990). AMOS is a CGE model of Scotland. It is essentially an empirical, regional general equilibrium variant of the Layard, Nickell and Jackman (1991) model where the bargained real wage in Scotland is (negatively) related to the Scottish unemployment rate (the assumption underlying the results reported in Table 2 below). However, we also explore the consequences of “real wage resistance” in which labour bargains simply to maintain the real wage. There are 25 goods markets, which are assumed to be perfectly competitive. Demands are fairly conventionally modelled, with trade flows being sensitive to relative prices (and so regional competitiveness). The model is calibrated on a 2006 Scottish Social Accounting Matrix (SAM) in which HEIs are identified as a separate sector. The model is recursively dynamic with capital stocks updated through sectoral investment functions and the labour force is updated via a Harris-Todaro net migration function according to which in-migration is

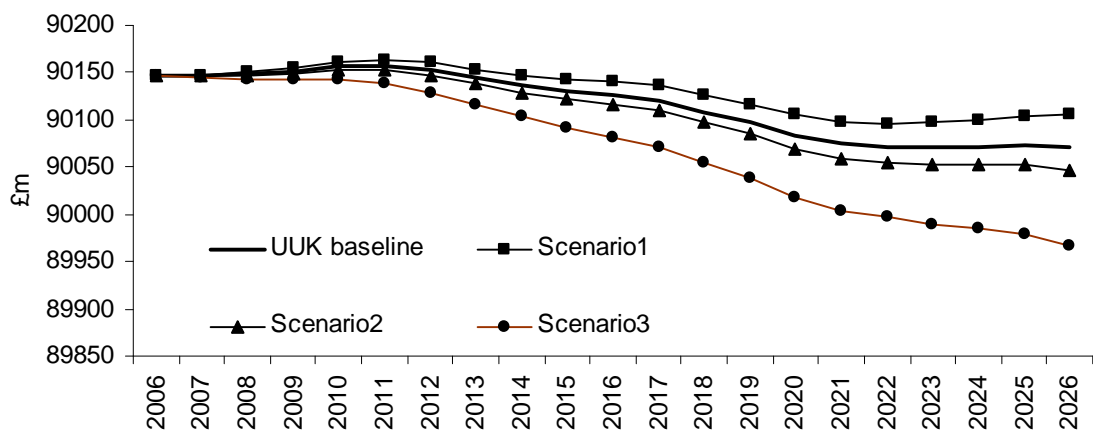
**Figure 1: Projection of the Scottish population aged 18-20, and the total number of (FTE) students in the UUK baseline projection**



**Figure 2: Projected total number of students in Scotland (FTE): UUK baseline and three scenarios**



**Figure 3: GDP impact of the loss of income by HEIs : all scenarios**



**Table 1: Description of the UUK scenarios**

	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
	Slow adaptation to change	Market-driven and competitive	Employer-driven flexible learning
Participation of young people	As now but with some switch from full-time to part-time	Reduced participation in full-time but increased participation in part-time	Substantial reduction in full-time, but on headcount basis participation at current level
Participation of older people	Modestly increased	Substantially increased	Substantially increased
Employer engagement	Modestly change, mainly through increased influence on the curriculum	Increased but not necessarily primarily with publicly funded HEIs	Substantially increased – employers are the primary drivers of large proportion of public funding
Competition (UK)	Increased competition amongst publicly funded providers	Significant expansion of the range of private providers – fierce competition for UK students	Highly stratified and polarised system with only limited competition
Competition (International)	UK HEIs compete effectively despite increased competition	UK HEIs compete less well	With the exception of elite HEIs, UK HEIs compete less well. However, they engage with technology-based borderless education
Technology-based learning	Some increase in e-learning, but face-to-face learning is the predominant mode	Substantial increase in e-learning	E-learning is the predominant mode
Academic staffing	As now with academic staff undertaking teaching and research	Two streams: one – research and teaching in large HEIs, the other – teaching in small HEIs	Flexible academic workforce. Increased movement between academia and business. Significant part of academic staff becomes self-employed, contracting work at several HEIs

**Table 2: Impact of the loss of income by HEIs: all scenarios**

	<b>2006</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2026</b>
<b>UUK baseline</b>						
GDP (£m)	0.000	10.434	-15.325	-62.043	-73.158	-74.869
<b>Employment ('000)</b>	0.000	0.261	-0.378	-1.633	-2.020	-2.051
CPI (%change)	0.000	0.016	-0.029	-0.063	-0.017	-0.016
<b>Scenario1</b>						
GDP (£m)	0.000	15.015	-2.767	-40.618	-42.942	-39.913
<b>Employment ('000)</b>	0.000	0.379	-0.042	-1.057	-1.210	-1.123
CPI (%change)	0.000	0.022	-0.019	-0.052	-0.004	0.002
<b>Scenario2</b>						
GDP (£m)	0.000	7.359	-23.555	-75.941	-93.255	-98.651
<b>Employment ('000)</b>	0.000	0.182	-0.598	-2.007	-2.558	-2.680
CPI (%change)	0.000	0.012	-0.035	-0.070	-0.025	-0.029
<b>Scenario3</b>						
GDP (£m)	0.000	-3.808	-53.704	-127.030	-165.986	-179.044
<b>Employment ('000)</b>	0.000	-0.104	-1.402	-3.380	-4.506	-4.822
CPI (%change)	0.000	-0.003	-0.059	-0.097	-0.055	-0.065

positively related to real wage differentials and negatively to unemployment rate differentials.

Compared to conventional models of HEI impacts, this model is distinctive in having a fully specified supply side. However, in circumstances where the supply side would be expected to be passive e.g. for a highly open regional economy in the long-run, the model converges on what is essentially an extended input-output system.

## 5. The results

The disturbances that we model here reflect anticipated changes to Funding Council Grants and fees from EU and non-EU students. These are taken to be proportional to the numbers of students projected for each category in the baseline and alternative scenario simulations. These changes in revenue affect the resources available to Scottish HEIs and thus their demands for labour and other inputs, as explained above. We now consider the likely impacts of these changes on the Scottish economy by simulating the impact of reduced HEI expenditures.

The likely economy-wide impact of the student numbers projected in the UUK baseline is summarised in the first three rows of Table 2, for selected years, though these effects relate solely to the anticipated changes in HEI incomes and do not include the impact of changes in student expenditures (the impact of student expenditure is very small compared to the impact of the change in HEI income). Note that initially, to 2010, Scottish GDP and total employment actually increase since student numbers are projected to rise over this period. The implied demand stimulus tends to increase the real wage and CPI slightly given the tightening of the Scottish labour market. However, by 2015 there is a contraction in aggregate demand in Scotland as a consequence of the projected declines in student numbers, and the unemployment rate rises above its base level, and employment and GDP fall. Notice that, even though student numbers have begun to recover by 2025, GDP and employment contractions are worse than in 2015: it takes time for the full effects of the demand change to work through the system as, for example, capital stocks take time to adjust.

Table 2 also summarises the results of the main scenarios. The ranking of the scenarios in terms of their likely economic impact is exactly as we would expect. Under Scenario 1, slow adaption to change, employment and GDP losses are significantly lower than in the UUK baseline. Scenario 2 generates results that are universally more pessimistic than the UUK baseline, and Scenario 3 implies worse news, with a loss of nearly 5,000 in total employment and a contraction in GDP of nearly £180 million.

Figure 3 summarises the basic impact of the baseline case and the various scenarios on Scottish GDP. This reinforces the message that GDP impacts vary across scenarios in a systematic way. However, inspection of the scale of the

vertical axis serves as a reminder that we are dealing with relatively moderate impacts.

Under the real wage resistance hypothesis the contractionary impact on GDP is up to 20% greater as in this case labour insists on maintaining the real wage despite the fall in demand, so there are no induced beneficial effects on competitiveness to mitigate the adverse consequences for the economy.

## 6. Conclusions

The macroeconomic consequences of the demand-side impacts of UUK's projections of student numbers entering Scottish HEIs appear fairly modest, though unambiguously bad news over the period to 2020 and 2025. Even under the worst UUK scenario, total employment falls by less than 5,000 and GDP by less than £180 million, and UUK's baseline suggests falls of well under half these levels. These effects are smaller than would be revealed by conventional "impact" or "multiplier" analyses, in which wage and price flexibility would be unable to insulate the real economy, as it does in this case at least to a degree, from demand side changes. However, recall that in this paper we do not include the adverse supply-side impacts of the projected contraction in student numbers, which we might expect to predominate over the longer term as these are reflected in the level of skills in the host region, and in the scale of knowledge transfer effects. In this respect, at least, the estimates represent a minimum estimate of the likely macroeconomic consequences of UUK's projections. In future research we intend to explore the supply-side consequences of the "demographic challenge" facing Scottish HEIs. It will also be interesting to investigate the impacts on a regional basis, since the scale of the challenge varies significantly among the regions of the UK. Furthermore, the focus of this paper on host economy impacts neglects the potentially important interregional effects that are likely to be present in an integrated economy and HEI system. Finally, we intend to explore the wider economic and social impacts of HEIs.

## References

- Faggian, A. and McCann, P. (2006) "Human Capital and Regional Knowledge Assets: a Simultaneous Equation Model", *Oxford Economic Papers*, Vol. 58, No. 3, pp. 475-500
- Ferguson, L., Learmonth, D., McGregor, P.G., Swales, J.K., and Turner, K. (2007) "The Impact of the Barnett Formula on the Scottish Economy: Endogenous Population and Variable Population Proportions." *Environment and Planning A*, Vol 39, No. 12, pp3008-3027.
- Harris, R. (1997) "The Impact of the University of Portsmouth on the Local Economy", *Urban Studies*, Vol. 34, No. 4, pp. 605-626
- Hermannsson, K., Lisenkova, K., McGregor, P. and Swales, K. (2009) "Is Higher Education Important for Stimulating Productivity? A CGE Analysis of Supply Side Impacts of HEIs in Scotland", Conference paper, Triple Helix

Layard, R., Nickell, S. and Jackman, R. (1991), *Unemployment: Macroeconomic Performance and the Labour Market*, Oxford University Press.

Lisenkova, K., McGregor, P., Pappas, N., Swales, K., Turner, K. and Wright, R. (2009) "Scotland the Grey: A Linked Demographic-Computable General Equilibrium Analysis of the Impact of Population Ageing and Decline", *Regional Studies*, forthcoming

McMahon, W.W. (2004). *The Social and External Benefits of Education*. In Geraint, J. & Johnes, J. (eds.) *International Handbook on the Economics of Education*. Cheltenham: Edward Elgar.

McMahon, W. (2006) "Education Finance Policy: Financing the Non-Market and Social Benefits", *The Journal of Education Finance*, Vol. 32, No. 2, pp. 264-284

McMahon, W.W. (2009). *Higher Learning, Greater Good: The Private & Social Benefits of Higher Education*. Baltimore: John Hopkins University Press.

Munro, M., Turok, I. and Livingston, M. (2009) "Students in Cities: A Preliminary Analysis of Their Patterns and Effects", **Environment and Planning A**, forthcoming

Psacharopoulos, G. and Patrinos, H.A. (2004) *Human Capital and Rates of Return*. In G. Johnes and J. Johnes (eds.) *International Handbook of the Economics of Education*, Cheltenham, Northampton, Edward Elgar Publishing, pp. 1-57

Stevens, P. and Weale, M. (2004) *Education and Economic Growth*. In G. Johnes and J. Johnes (eds.) *International Handbook of the Economics of Education*, Cheltenham, Northampton, Edward Elgar Publishing, pp.164-188

Universities UK (2008) *The Future Size and Shape of the Higher Education Sector in the UK: Demographic Projections*, Research report, London

Universities UK (2008) *The Future Size and Shape of the Higher Education Sector in the UK: Threats and Opportunities*, Research report, London

# Measuring the volume and value of the outputs of higher education institutions

Ursula Kelly, University of Strathclyde and Iain McNicoll, Emeritus Professor of Strathclyde

## 1. Introduction

One of the key issues facing the Scottish Government and Scottish Funding Council is how to assess the contribution made to Scotland's economy by Scotland's higher education sector. In Scotland (as well as in the rest of the UK) it is widely accepted that higher education institutions (HEIs) have an observable economic impact through their activities as large businesses and that they generate output and employment. HEIs are important export earners through their attraction of international students together with internationally funded research and consultancy.

There is also interest in how higher education can support wider economic growth and development through 'knowledge transfer' from universities to the wider region, including through students and graduates as well as through fuller exploitation of the results of university research. An emphasis on universities' role in the economy has grown in tandem with a desire from government to maximise the return on public investment in higher education. Higher Education's contribution to the economy and society at large is viewed as providing one of the most important justifications for government expenditure on higher education. The Scottish Government has recently expressed an explicit desire for universities to demonstrate that the public funding provided to universities is used in ways that are aligned with the Government's strategic objectives, particularly its economic and skills strategies with the contribution to the economy being one of the most important areas ("New Horizons" Taskforce Report 2008.)

However, while the belief that higher education is important to economic growth underpins the policy approach to much of the higher education sector's activity, there is a paucity of robust quantitative evidence against which related resource allocation decisions aimed at encouraging economically valuable activity can be made.

The Scottish Funding Council (SFC), which distributes the largest share of the public funds received by Scottish Universities, has invested considerable effort into identifying aspects of higher education activity that could be defined as being primarily concerned with 'knowledge

transfer' to businesses and the wider community; it has sought to encourage such 'knowledge transfer' activity through resource allocation mechanisms (SFC "Knowledge Transfer from Scotland's Higher Education Institutions" 2005.) However taking higher education activity as a whole there has been no practical, valid, way to analyse the economic value of what universities do, or to compare the value thus created with that generated by other activities in the economy. Indeed, as the emphasis on the importance of higher education to the economy grows, there is an increasing need for more in-depth knowledge of HEI activity and hard quantitative evidence of HEI impact on the economy and society. Therefore, further analysis of HEI operations and interactions is key to understanding which elements of higher education activity may be most valuable.

## 2. Objectives and guiding methodological principles

Fundamentally the Scottish HEI sector is an industry, comprised of enterprises using economic resources to produce economic outputs. The overall objective of this paper is to show how the development of a framework with comprehensive and detailed quantitative measures of the outputs of HEIs in both volume and value terms can enable a holistic analysis of higher education institutions' economic value.

Producing a set of comprehensive quantitative measures of higher education institutional outputs would:

1. Allow assessment of the 'size' of the contribution of the HEI sector to the Scottish economy in terms comparable with those of other industries
2. Provide information for the evaluation of the efficiency (both technical and allocative) of the Scottish HEIs in production; i.e. "value for money" calculations
3. Assist in the creation of appropriate signals/incentives to encourage the HEIs to achieve technical and allocative efficiency
4. Create a statistical data set for the HEIs equivalent to that likely to be required in due course for Scottish and UK public sector and third sector bodies (Atkinson 2005.)

The present paper draws on initial case study research supported by the Nuffield Foundation which was further elaborated in two substantive reports to the Scottish Funding Council. The initial case study work of a Scottish HEI (Kelly & McLellan 2004) explored the potential for defining and identifying all the case study HEI outputs; the subsequent study (Kelly, McNicoll & McLellan 2005) assessed the feasibility of extending this approach to all Scottish HEIs. The 2005 report gave a comprehensive exposition of how the principles of welfare economics could be applied to Scottish higher education institutions to enable the outputs of the Scottish HEIs to be identified,



quantified and valued in ways that are economically valid and policy meaningful. The conceptual framework was further developed in Kelly, McNicoll & Brooks (2008) and a pilot study undertaken applying the principles to selected sub-sections of HEI outputs.

The approach devised for estimating the economic value of Scottish higher education institutions is rooted in the fundamental principles of welfare economics. It is consistent with national and international best practice as exemplified in the UN System of National Accounts (SNA1993) and the European System of Accounts (ESA 1995). It is also consistent with developments in the Office of National Statistics and government statistical services for productivity measurements of non-marketed services (see Atkinson 2005.)

There are 3 key procedural steps involved:

1. **Identification** of the outputs of HEIs (what HEIs actually produce.) This should include all meaningfully separable outputs of the HEIs, covering all activities, not only conventional 'Teaching and research'
2. **Quantification** of the volume of HEI outputs (how much they produce). This involved defining one or more natural units of volume measurement applicable to each of the outputs identified in (1) above.
3. **Pricing** the outputs to impute value. This involves identifying appropriate prices or unit values to be applied to each of the volume measures in (2) above.

The application of (1) and (2) would provide volume measures of HEI outputs. These can be used, for example, to derive indices of production and for analyses of growth, productivity and cost/technical efficiency.

Application of all steps, from 1 through 3, provides value measures of HEI outputs.

$\text{Value} = \text{quantity of output produced} \times \text{price per unit of output}$
--

Application of all steps can provide size and growth measures in terms of GDP, etc and can also inform both cost/technical and allocative efficiency calculations. Application of all 3 steps would be an essential precursor to a full cost-benefit analysis of the activities of the HEIs.

### 3. Key issues

#### *Outputs and outcomes*

Current discussion regarding the contribution of higher education to the economy and society is frequently

expressed in language that relates to 'desired outcomes' such as 'a higher skilled workforce' or 'improved social cohesion'. These tend to be outcomes desired by 'society' or by 'government' acting on behalf of society.

Evaluation of government investments is usually focussed on the relevant investments' impact on the government's overall desired outcomes. Such evaluation is usually undertaken within a 'policy cycle' framework which considers 'Rationale, Objectives, Appraisal, Monitoring (Implementation), Evaluation, Feedback (ROAMEF) (HM Treasury Green Book 2003.) From a government perspective, investment in higher education fits into this framework in the same way as investment in any other commissioned programmes and services. It forms part of the Implementation phase and government's main concern is properly focussed on achieving final desired outcomes such as 'sustainable economic growth', a 'Wealthier & Fairer', 'Smarter', 'Healthier', 'Safer', 'Greener' society etc (Scottish Government National Performance Framework Outcomes 2007.)

Within the ROAMEF framework higher education institutions (which are not part of government but are third party organisations) are on the supply side of the production boundary and not on the commissioning side. They can be asked to deliver outputs( they can teach an agreed number of students, work with local businesses, spin out companies, run workshops for schoolchildren from disadvantaged areas) that contribute to government objective outcomes, but they cannot actually deliver or guarantee the outcomes ( a Wealthier and Fairer society' etc.) Overall desired outcomes are dependent not only on the work of the HEI but on a range of factors over which the HEI may have little or no control (this could include, for example, the willingness or ability of students to learn, the degree of real interest from local business, the willingness of schools or parents for schoolchildren to participate in workshops etc.)

**Figure 1: Example of HEI output and possible related outcome**

HEI Input	HEI Activity	HEI Output	Societal Desired Outcome
Lecturer time	Teaching	Hours of teaching delivered to X number of students	A more highly ed-ucated and productive population

To summarise: outputs are what an HEI can actually produce. Outcomes are more generic societal results or "the eventual benefits to society" (HM Treasury Green Book 2003) to which the HEI outputs may partly contribute but cannot guarantee. Making a clear distinction between

outputs and outcomes is essential for assessment of the value of the work of higher education institutions and particularly when considering performance indicators to assist decisions on resource allocation for higher education institutions. Any value indicator needs to relate to things over which the HEI has control and can do something about. Otherwise there is the risk of penalising HEIs for things they cannot help or rewarding them for things they did not do. It may eventually be possible to estimate the degree to which HEI outputs contribute to overall desired outcomes but in the first instance at least there must be much more thorough analysis of HEI outputs i.e. what they actually produce.

### *Higher education institutional outputs: value and pricing*

#### *1. Financial value*

This relates to the actual revenues which the HEIs receive in exchange for supplying their outputs and is basically what appears in the HEI accounts. It relates to the financial viability of HEI operations: i.e. whether they break even, make a surplus or go into deficit. The information is essential for accounting purposes but may be of limited value for economic analysis.

#### *2. Economic value*

This is the value obtained when the prices applied to HEI volume outputs are economic efficiency prices. In many cases these can be approximated by 'free market' prices and in others can be estimated from economic principles. This information is essential for assessing the true 'worth' of the HEIs to the economy, for efficiency calculations and for informed incremental resource allocation decisions.

#### *3. Social value*

This could be interpreted in terms of the application of 'social prices' to HEI volume outputs, but is better interpreted as being the modification of HEI economic value by the application of appropriate social weights. These weights will generally be determined by government agencies reflecting Scotland's chosen social welfare function (e.g. related to desired outcomes such as 'a fairer society'.) HEI social values can be used for similar analysis to economic values, notably for resource allocation decisions, but with the emphasis on contribution to general social welfare rather than the economy per se. The use of social weights could be a way of translating HEI outputs into desired societal outcomes.

This paper is focussed on the holistic analysis of the economic value of HEI outputs ( the wider application of other measures of value, particularly social value, is further elaborated in Kelly, McNicoll & Brooks 2008.) In order to impute an economic value to higher education institutional outputs, the relevant outputs need to be priced. The prices to be identified should relate as closely as possible to the

'economic efficiency' price (which could be loosely referred to as the 'free market' price.)

Identifying the prices to be applied to higher educational institutional outputs is not always a straightforward procedure, particularly because Scottish HEIs do not operate within an entirely market-based framework and there are numerous outputs which have no actual 'price' attached. However a range of 'shadow-pricing' techniques can be adopted where actual prices are either not appropriate (clearly below or above free market prices) or do not exist.

Every identified output can be subjected to a 'price analysis', where the first step is to assess the financial value, or the actual price received by the HEI, and whether or not this is a 'market' price. If it appears to approximate a market price ( for instance the non-EU tuition fee rate in Scottish Universities appears to be very close to free market rates) that can be used as the value. If the output does not appear to be market-based (for instance domestic tuition fee rates) or is not priced at all ( for instance open public lectures), then a system of shadow-pricing can be operated. This can include a wide range of economic techniques such as contingent valuation, time cost etc. Sometimes a number of different techniques may be feasible; triangulation of the results could produce the most suitable price figures.

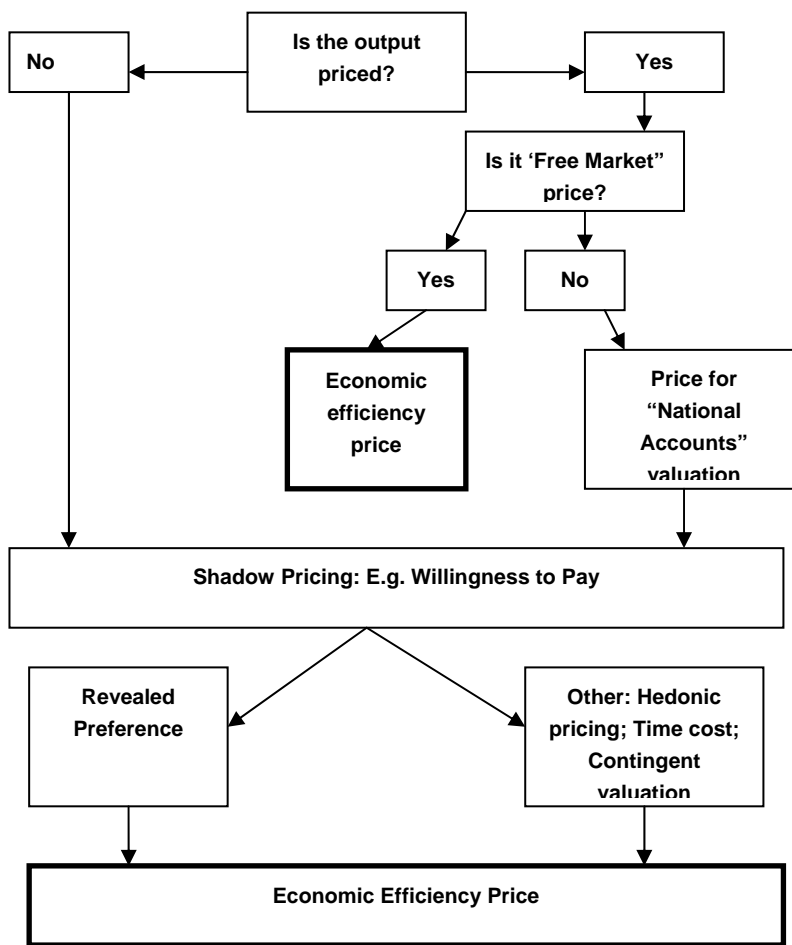
While the primary mission of Scottish higher education institutions is usually described as 'teaching and research', Scottish HEIs are in fact involved in a very wide range of activities, some of which are related to or spring from their 'teaching and research' mission but not all of which are obviously or easily classified. However the initial case study work found that it is possible to identify a comprehensive and detailed set of HEI outputs which are meaningfully separable in both statistical and policy-relevant senses. In the detailed case-study institution this set contained over 220 separate outputs allocated into six major groups:

- Teaching
- Research
- Consultancy/Advisory
- Cultural Outreach
- Community Outreach
- Other ( this included, for example, Library, Career and sports services or facilities provided to external parties)

#### *4. Observations from initial empirical case-study work*

In terms of pricing data however, the only "price" information held by the HEIs relates to financial values. Estimation of efficiency prices needs to be done by third-party desk based research ( this is probably desirable in any event, in the interests of objectivity.) In the case study and pilot work, it was observed that application of

**Figure 2: Price Search Strategy**



economic techniques could in most cases provide price estimates. Almost by definition, social weight values will be given by external third parties, notably public sector bodies (for instance the HM Treasury Green Book gives explicit sets of social weights.)

In some areas of activity (teaching of domestic students, advisory work for government and third sector bodies and cultural outreach) there are early indications that economic values of HEI outputs differ significantly from financial values. This emphasises the need for the type of analysis envisaged in the present paper. In each of the areas mentioned the economic value is greater (sometimes significantly so) than financial value, but there is no general presumption that this will be the case in all areas. In terms of estimating both output volumes and economic prices, the most difficult area appears to be “research”. There needs to be further consideration of the extent to which some research outputs (e.g. a seminar paper) are

intermediate rather than final outputs. A wide range of outputs which are research-related such as, say, a newspaper article explaining a piece of research to the general public, are not always recorded or recognised within the institution as a research output and hence it would be difficult to obtain reliable data on these. Reliably pricing or shadow-pricing academic journal articles is difficult.

However the advance of the ‘open access’ movement and establishment of digital repositories (where all university staff deposit copies of their research work – articles, reports and other forms of output) to make them openly accessible over the internet could potentially be helpful in the future in relation to both harvesting output volume data and also, by providing usage (download) statistics, possible ways to impute value through tracking actual research output usage.

**Figure 3: Example HEI outputs**

Output Type	Measurable	Possible natural unit measurement	Possible appropriate pricing to be applied
Teaching: MSc International Marketing	Yes	Number of FTE students	Non-EU fee rate
Research: Articles published	Yes	Number produced	Possibly Commercial NUJ rates for written articles
Consultancy /public policy /Advisory work e.g. serving on UK Gov committees	Yes	Number of staff hours involved	Commercial consultancy rate for equivalently qualified personnel
Cultural Outreach e.g. Chamber Choir performance	Yes	Number of Performances x attendees x hours spent	Time cost
Community Outreach e.g. public lectures	Yes	Number of events x no. of attendees x hours spent	Time cost
Other e.g. Sports Centre facilities provision to local communities	Yes	Number of hours hired	Equivalent rates for similar commercial sports facilities

## 5. Concluding remarks

Implementation of something like the programme outlined in the present paper would seem to be necessary and desirable if policy discussion about Scottish HEIs is to evolve in a productive and progressive manner. Certainly, informed rational resource allocation decisions with regard to the HEIs require estimates of at least economic value, if not social value.

There can be initial hostility in some parts of the HE sector to quantitative analysis of HEI outputs. In the course of the pilot work undertaken, for example, the view was sometimes expressed by participants that the importance of HEI cultural activities is beyond economic evaluation and that attempts should not be made to assign monetary values to cultural outputs. However this discomfort was to the most part overcome once participants more fully understood the scope and broader purpose of economic valuation (in particular the difference between financial and economic valuation.) In any event, to the extent to which activities of a 'cultural' nature use resources that would otherwise be applied elsewhere (building a Chemistry lab, for example, or paying health worker salaries), they have an opportunity cost and therefore will always have an economic dimension.

Pragmatically, it is likely that the HEIs will have to produce at least volume estimates of output in the near future in the light of national and EU legislation regarding statistical requirements from public bodies and non profit-making (third sector) bodies.

Implementation of the programme would not appear to be excessively expensive, and would be particularly cost-effective if:

data generated for the programme could be used to replace or subsume other questionnaires and surveys, and the price and social weight estimates derived could be used for non-HEI government funded projects and programmes.

## References:

- Atkinson, A.B, (2005) "The Atkinson Review: Measurement of Government Outputs and Productivity for the National Accounts".
- European System of Accounts (ESA 1995).
- HM Treasury (2003) The Green Book.
- Kelly, U., McNicoll, I., & McLellan, D. (2005) "Towards the estimation of the economic value of the outputs of Scottish Higher Education Institutions".
- Kelly, U., McNicoll, I., & Brooks, R. (2008) "Towards the estimation of the economic value of the outputs of Scottish Higher Education Institutions: Next Steps".
- UN System of National Accounts (SNA 1993).
- The Scottish Funding Council (2005) "Knowledge Transfer from Scotland's Higher Education Institutions – Progress and Prospects"
- The Scottish Government (2007) "National Performance Framework"
- The Scottish Government (2008) "New Horizons: responding to the challenges of the 21st century The Report of the Joint Future Thinking Taskforce on Universities".

# Training and employee use of skills in Scotland: some evidence<sup>1</sup>

John Sutherland  
Centre for Public Policy for Regions (CPPR)  
University of Glasgow

Increasing labour productivity is considered to be the most important means by which the Scottish Government will achieve its principal economic objective of increasing sustainable economic growth (Scottish Government, 2007a, p.1); and the policy assumption is that labour productivity will increase, directly and indirectly, as a consequence of increasing workforce skills levels (Leitch Review of Skills, 2007: Scottish Government, 2007b, p6). However, increases in human capital investments, especially over the last two decades, have not been translated into improvements in labour productivity. As the Scottish Government (2007a) itself acknowledges: "... strong performance on skills and qualifications does not feed through effectively enough to productivity" (p14).<sup>2</sup>

There are several, not necessarily competing, arguments forwarded to explain why historically significant, predominantly publicly funded, increases in education and training have not materialised into improvements in labour productivity, an outcome which is not unique to Scotland (cf. Keep et al, 2006; Wolf, 2004). This paper reports research (Sutherland, 2008) which examined two of these.

One argument is related to the important distinction between 'qualifications' and 'skills'. Whereas the labour market continues to receive on-flows of increasingly well qualified new entrants, nonetheless, the argument proceeds, too many firms fail to provide the necessary complementary job specific training. The second argument contends that individuals do possess skills – for example, the 'broad' skills and 'generic' skills to which Felstead and Green (2008) refer. The problem, so this argument proceeds, is that too many firms make inadequate and inefficient use of these skills, and workers' skills are under-utilised as a consequence.

The research undertaken made use of a matched workplace-employee data set which had its origin in the 2004 Workplace Employment Relations Survey, and

examined responses to questions in the Survey of Employees. The principal findings of the research were twofold: first, that almost one in three employees in Scotland had received no training during the last 12 months; and second, that more than half of all employees claimed that the skills levels they possessed were higher than those required to do their present jobs. In other words, there is some empirical substance to both of the arguments identified above.

The remainder of this paper proceeds as follows. The next section describes the data set used in the study. The following two sections examine the issues of training and skills under-utilisation, respectively. A final section concludes and draws some policy implications from the findings of the study.

## The data set

The empirical investigation made use of a matched workplace-employee data set which has its origin in two elements of the Cross Section component of the 2004 Workplace Employment Relations Survey (WERS 2004), the fifth in a series of equivalent surveys which map the contours of employment relations in Great Britain (Kersley et al, 2006).

The initial unit of analysis in the survey is the workplace, defined as "the activities of a single employer at a single set of premises" employing at least five workers. The population of workplaces sampled is drawn randomly from the International Departmental Business Register (IDBR) maintained by the Office for National Statistics. The sampling unit is the IDBR's 'local unit', which conforms to the definition of the workplace used. The population from which the sample is drawn constitutes 700,000 workplaces (33 percent of the Great Britain (GB) total) and 22.5 million employees (89 percent of the GB total). The sample selected is stratified by workplace size and industry, with workplaces being randomly selected from within size bands and industries. Larger workplaces and certain industries (e.g. utilities) are given a greater probability of being selected across the sample, to ensure comparability with smaller firms and other industries, respectively. Establishment and employment weights are applied to ensure that the final achieved sample is representative of the survey population from which it is drawn.

The first element of WERS 2004 used was the 'Cross Section Survey of Managers', the questionnaire responses of the senior manager at the workplace responsible for employment relations on a day-to-day basis. This provides information, inter alia, on the structural characteristics of the workplace, such as the number of employees employed; the number of employees who are female; the number of employees who work part time; its corporate status; its Standard Industrial Classification; and the human resource management policies in operation. In the original survey, this generated 2,295 observations.

**Table 1: Question: “Apart from health and safety training, how much training have you had during the last 12 months, either paid for or organised by your employer?” Percentage distribution of responses**

<i>Days of training received</i>	<i>Percentage</i>
None	32.33
Less than 1 day	9.95
1 to less than 2 days	15.16
2 to less than 5 days	22.74
5 to less than 10 days	11.39
10 days or more	8.42
Number of Observations	2,493

**Table 2: Question: “How satisfied are you with the following aspects of your job? The training you receive?” Percentage distribution of responses**

<i>Response</i>	<i>Percentage</i>
Very satisfied	8.60
Satisfied	40.09
Neither satisfied nor dissatisfied	27.09
Dissatisfied	16.67
Very Dissatisfied	7.55
Number of Observations	2,477

**Table 3: The number of days of training received by employees, by the size category of the workplace at which the individual was employed (row percentages)**

Size Category	None	Less than 1 day	1 to less than 2 days	2 to less than 5 days	5 to less than 10 days	10 days or more	Total number of observations
Employing 10 or fewer	65.00	6.25	11.25	8.75	6.25	2.50	80
Employing 11 – 25	30.33	8.06	14.69	24.17	15.17	7.58	211
Employing 26 – 50	34.11	8.36	16.72	23.41	12.37	5.02	299
Employing 51 – 100	35.61	12.95	12.59	20.14	10.07	8.63	278
Employing 101 – 200	24.48	9.11	15.36	26.82	13.80	10.42	384
Employing 201 – 500	36.49	10.90	14.69	24.17	7.11	6.64	211
Employing more than 501	31.39	10.13	13.92	25.57	10.38	8.61	395
Total	32.94	9.74	14.53	23.63	11.36	7.80	1,858

Person chi-square (30) = 76.1653 Pr = 0.0000

**Table 4: Question: “How well do the work skills you personally have match the skills you need to do your present job?” Percentage distribution of responses**

<i>Response: My Own Skills Are:</i>	<i>Percentage</i>
- Much higher	19.14
- A bit higher	34.15
- About the same	42.39
- A bit lower	3.48
- Much lower	0.84
Number of Observations	2,498

Eighty-six percent of the workplaces which participated in the survey of managers agreed to distribute a self completion questionnaire to a random selection of up to 25 employees. This 'Survey of Employees' constituted the second element of WERS 2004 used. This survey collects information, again inter alia, on employees' experiences at the workplace, such as the number of days of training received in the past 12 months; their work-related perceptions, such as the extent of their satisfaction with the training received and the extent to which their skill levels match the skill levels required to do their present jobs; and personal information relating to age, gender, pay, tenure etc.. In the original survey, this generated 22,451 observations.

WERS 2004 is statistically representative for the spatial area of 'Great Britain'. Making use of two regional identifiers – the Government Office Region and the Standard Statistical Region – it is possible to disaggregate the data set geographically. Doing so for Scotland generates a workplace data set of 223 observations and a matched workplace-employee data set of 2,515 observations.<sup>3,4</sup>

### **The amount of training received by employees**

One of the questions in the Survey of Employees asked: "Apart from health and safety training, how much training have you had during the last 12 months, either paid for or organised by your employer?" One in three received no training of the type described: one in ten received less than one day. On the other hand, 8.42 percent received 10 days or more (cf. Table 1). Employees were also asked how satisfied they were with the training they received. This question is somewhat ambiguous, failing to identify 'satisfaction' with what? For example, the quantity of training received?: its quality?: the manner in which it was delivered? Nonetheless, almost half reported that they were either 'satisfied' or 'very satisfied'. Almost one in four, however, reported degrees of dissatisfaction (cf. Table 2).

Given the manner in which the question was worded, the training reported is more likely to be formal training, and, therefore, more in accord with the training policies to be found in larger workplaces. Typically, in smaller firms, training is informal, on-the-job, and more embedded into the immediate context of work. Here, skills tend to be acquired subconsciously, as it were, by a process of osmosis (Keep, 2007). Indeed, a statistically significant association between the quantity of training an individual received and the size of the workplace at which he/she is employed is confirmed in Table 3.

This table also demonstrates the extent to which individuals employed in the smallest workplace (ie employing 5 -10) received less training than those employed in workplaces employing more than 10. 65 percent of those employed in the smallest sized workplace received no training of the type described, whereas the

percentage of workers who received no training in workplaces larger than this is always less than 37 percent. Further, the percentage of workers in the smallest workplace who received the different amounts of training identified is always lower than the corresponding percentages of workplaces of relatively larger sizes. However, it is not as if small workplaces per se provide no training. The percentages associated with the three other workplace size categories employing 100 or less equals – and sometimes betters – the percentages associated with the three largest workplace sizes employing more than 100, across all sets of training days received. Moreover, more than three in 10 of employees in the largest workplace size category received no training.

The size of the workplace at which an individual is employed, however, is only one of several variables which may explain the amount of training an individual received. Accordingly, an ordered logit model was estimated, which had three distinct sets of independent variables. The first set reflected individual work-related and non-work-related personal characteristics (such as tenure, contract type, age, and gender); the second, reflected the structural characteristics of the workplace at which the individual was employed (such as its size, the percentage of employees who are female/work part time, corporate status and standard industrial classification); and the third, reflected the Standard Industrial Classification (SIC) of the workplace.<sup>5</sup>

In this more sophisticated micro-econometric analysis, there was no statistically significant evidence that the size of the workplace at which the individual was employed was an important determinant of the amount of training that an individual received. Rather, the amount of training an individual received was explained best by his/her personal characteristics and the industrial sector of the workplace at which he/she was employed. No training was likely to be given to women, those in low waged jobs, older workers, and those with long tenure. Further, training was less likely to be given to individuals employed at workplaces in Manufacturing, Hotels and Restaurants and Other Business Services. Conversely, training was more likely to be given to males, those in higher paid jobs, younger workers, those relatively new to the workplace and those employed on fixed term contracts.

### **The use made by employees of their skills**

Another of the questions asked in the Survey of Employees was: "How well do the work skills you personally have match the skills you need to do your present job?" In the original research, responses to this question were interpreted in two ways. When individuals reported that their skills levels were lower than those required, this was assumed to be a manifestation of a 'skills gap': and when individuals reported that their skills levels were higher than those required, this was assumed to be a manifestation of 'skills under-utilisation'. The percentage distribution of the responses is presented in Table 4.

'Skills gaps' refer to situations in the internal labour markets of firms/workplaces, where employers report that the skills profiles of their existing employees – or some subset of them – are inadequate to meet the skill demands of the jobs they do. Futureskills Scotland (2007) reported that although 'skill shortages' are now uncommon, 'skills gaps' remain prevalent. Table 4 presents contrary evidence. It illustrates the limited extent of the skills gap from the perspective of the employee; in that only 4.32 percent of respondents reported that the work skills they possess are either 'a bit lower' or 'much' lower than the skills needed to do their present job.<sup>6</sup>

In contrast, more than half of respondents reported that the work skills they have are either 'much higher' or 'a bit higher' than the skills needed to do their present jobs, evidence of considerable skills under-utilisation.

A binomial logit was estimated to identify the determinants of the probability that an individual reported that his/her skills levels were higher than those required to do his/her present job. Again, the explanatory variables sought to reflect personal characteristics, the structural characteristics of the workplace at which the individual was employed and the SIC of the workplace. On this occasion, Wald tests established the joint significance of each of these three sub sets within the vector of explanatory variables.

The probability that an individual reported skills under-utilisation was more likely when: the individual was disabled; possessed the highest vocational/professional qualification<sup>7</sup>; and had reported dissatisfaction with the training received. On the other hand, the probability that an individual reported skills under-utilisation was less likely when he/she had received training of varying amounts. There was a co-relation between the probability of reporting skills under-utilisation and the size of the workplace at which the individual was employed, with the probability of reporting skills under-utilisation being more likely in relatively larger establishments (although not all of these results were statistically significant). Finally, the probability of reporting skills under-utilisation was less likely if the individual was employed in the Manufacturing, Construction, Hotels and Restaurants, and Health sectors of the economy.

## Conclusions and policy implications

This paper has reported research of relevance to the Scottish Government's policy objective of increasing labour productivity, of central importance to achieving its principal economic objective of increasing sustainable economic growth.

It is facile to prescribe optimum training targets, for the individual, the establishment/enterprise or the economy as a whole. Nevertheless, there must be some dismay among policy makers that so many employees received no training of the type described. By way of contrast, policy makers

may take some comfort from the absence of skills gaps, no doubt attributable to past policy successes in enhancing the skills profiles of, most especially, new entrants to the labour market. The major concern, however, must be the extent to which employees consider that their skills levels are not fully utilised by workplace/enterprise management, because the micro-econometric analysis suggested that, other than because of disability, the origin of skills under-utilisation is not to be found in circumstances which may circumscribe an individual's labour market participation. Furthermore, there are important workplace size and sectoral dimensions to the incidence of skills under-utilisation which cannot be ignored.

The Scottish Government maintains that: "A skilled and educated workforce is essential to productivity and sustainable economic growth. Not only are more skilled workers potentially more productive in their own right, but the skill level of the workforce is likely to impact significantly on the effectiveness of capital investment and the ability of employers to adopt innovative work practices" (Scottish Government, 2007b, p6). This skills agenda is eminently compatible with the UK policy perspective of the Leitch Review of Skills (2007) which maintained: "To achieve world class prosperity and fairness in the new global economy, the UK must achieve world class skills.... where skills were once a key driver for prosperity and fairness they are now the key driver" (p9, italics in the original).

The principal results of the research reported in this paper expose the inherent limitations of this exclusively supply based policy perspective. Whereas, in general, the education and training sectors in Scotland have succeeded in equipping the workforce with higher skills, the Scottish economy has not expanded at a rate commensurate with making best use of the skilled labour now available.

Even if post-Leitch policy and structures, such as the UK Commission for Skills which replaces the system of employer-led Sector Skills Councils – to which the Scottish Government subscribes – succeed in convincing firms of the efficacy of training, the consequential impact upon labour productivity will be negligible if management continues to fail to make effective and efficient use of the labour they employ.

It is not that the policy of continuing to improve the education and skills profiles of the Scottish workforce – and potential entrants to it – is unnecessary. Rather, this policy agenda on its own is insufficient. Supplementary policies are required, which focus upon what the Scottish Government (2007a) itself has identified as the "economic pull" factors (p5). In essence, policies are required which are designed to increase organisations' demand for skilled labour, for example by changing the economic parameters within which managers think about their business models and the relative opportunity costs of the resources they have at their disposal. To paraphrase Keep (2007, p6), the



trick is to ensure that the 'economic development horse' precedes the 'skills cart'.

## References

Felstead, A. and Green, F. (2008) *Work Skills in Scotland: The Workers' View*. Glasgow: Futureskills Scotland.

Futureskills Scotland (2007) *Skills in Scotland 2006*. Glasgow: Futureskills Scotland.

Keep, E. (2007) *Key Future Labour Market and Skills Issues in Scotland (and Beyond)*. Glasgow: Futureskills Scotland.

Keep, E., Mayhew, K. and Payne, J. (2006) *From Skills Revolution to Productivity Miracle- Not as Easy as it Sounds*. *Oxford Review of Economic Policy*, Vol. 22, No. 4, pp 539 -559.

Kersley, B., Alpin, C., Forth, J., Bryson, A., Bewley, H., Dix, G. and Oxenbridge, S. (2006) *Inside the Workplace: Findings from the 2004 Workplace Employment Relations Survey*. London: Routledge.

Leitch Review of Skills (2007) *Prosperity for All in the Global Economy: World Class Skills. Final Report*. London: HM Treasury.

Scottish Government (2007a) *The Government Economic Strategy*. Edinburgh, The Scottish Government.

Scottish Government (2007b) *Skills for Scotland: A Lifelong Skills Strategy*. Edinburgh, The Scottish Government.

Stata (2005) *Stata Survey Data Reference Manual, Release 9*. College Station, Texas, USA: Stata Press.

Sutherland, J. (2008) *Training and Skills in Scotland: Further Evidence*. Centre for Public Policy for Regions Discussion Paper No. XX: Glasgow: University of Glasgow.

Wolf, A. (2004) *Education and Economic Policy: Simplistic Theories and their Policy Consequences*. *Oxford Review of Economic Policy*, Vol. 20, No. 2, pp 315 -333

## Endnotes:

<sup>1</sup> The author acknowledges the (former) Department of Trade and Industry, the Economic and Social Research Council, the Advisory, Conciliation and Arbitration Service and the Policy Studies Institute as the originators of the 2004 Workplace Employment Relations Survey data, and the Data Archive at the University of Essex as the distributor of the data. The National Centre for Social Research was commissioned to conduct the field work on behalf of the sponsors. None of these organisations bears any responsibility for the author's analysis and interpretations of the data.

<sup>2</sup>This observation reflects similar sentiments appearing previously in "Skills for Scotland: A Lifelong Skills Strategy" : "...Scottish investment in education, for at least the last 30 years, has been higher than in the rest of the United Kingdom (UK) and this has resulted in a well qualified population ... Scotland's skills profile has also been improving faster than that of the UK.... Scotland has

not, however, matched the UK economic growth rate despite its positive skills profile" (p. 6).

<sup>3</sup> The author acknowledges the (former) Department of Trade and Industry, the Economic and Social Research Council, the Advisory, Conciliation and Arbitration Service and the Policy Studies Institute as the originators of the 2004 Workplace Employment Relations Survey data, and the Data Archive at the University of Essex as the distributor of the data. The National Centre for Social Research was commissioned to conduct the field work on behalf of the sponsors. None of these organisations bears any responsibility for the author's analysis and interpretations of the data.

<sup>4</sup> This observation reflects similar sentiments appearing previously in "Skills for Scotland: A Lifelong Skills Strategy" : "...Scottish investment in education, for at least the last 30 years, has been higher than in the rest of the United Kingdom (UK) and this has resulted in a well qualified population ... Scotland's skills profile has also been improving faster than that of the UK.... Scotland has not, however, matched the UK economic growth rate despite its positive skills profile" (p. 6).

<sup>5</sup>Workplace human resource management policies and practices (such as whether or not there is an equal opportunities policy in operation, the workplace is Investor of People accredited etc.) were not included, because of a problem of multicollinearity. The workplace size variable made use of a series of dummy variables. Hence, dummy variable depicting human resource management policies such as these illustrated, invariably present in larger workplaces, proved collinear with the dummy variables of the larger workplace size categories. That said two dummy variables of this type were included, successfully. A dummy variable relating to whether the workplace stated that it offers 'long term employment' on recruitment – a policy assumed to be central to the other workplace recruitment and training policies in operation. And a dummy variable relating to whether the workplace experienced 'change' over the last two years (such as a change in its pay systems, computerisation, working time arrangements, the organisation of work etc.), factors which may prompt the implementation of 'change-related' training policies on the part of management, indicators of what Keep (2007, p. 5) refers to as possible "drivers of training". Often, similarly high degrees of collinearity were found between the dummy variables reflecting the corporate status of the workplace and its SIC e.g. between a workplace in the public sector and the Health SIC. On this occasion, however, it was decided to retain both.

<sup>6</sup>There was little variation in the incidence of skills gaps by workplace size. The variation of the incidence by SIC was greater, with skills gaps being more evident in Electricity, Gas and Water; Hotels and Restaurants; Financial Services; and Public Administration – perhaps because of the nature of job specificity within these sectors. However, these results were not statistically significant in the micro-econometric analysis undertaken. Again, see Sutherland (2008) for details.

<sup>7</sup>The sign on the corresponding highest academic qualification was also positive, although this coefficient was not statistically significant.

# SCOTTISH *Affairs*

Scottish Affairs is the definitive forum for comment and debate on Scottish politics, society and current affairs. It is published in book form every quarter and is independent of political parties and pressure groups. Each year, one of the issues focuses on a particular theme. These have included:

Scotland, Quebec and Catalonia

Gender and National Identity

Understanding Constitutional Change (a complete special issue)

The Northern Ireland Agreement

Social Inclusion

Annual Subscription (four issues):

£27.50 (individuals), £45 (institutions)

Published by and further information (including how to join our electronic mailing list) from:

Unit for the Study of Government in Scotland

University of Edinburgh

Chisholm House

High School yards

Edinburgh

EH1 1LZ

Tel: 0131 650 2456

Fax: 0131 650 6345

Email: [Ladams@ed.ac.uk](mailto:Ladams@ed.ac.uk)