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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 <u>c.j.lockyer@strath.ac.uk</u>

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Overview

Outlook and appraisal

The Scottish economy is poised to come out of recession. But there is still uncertainty whether the exit will have occurred in the fourth quarter of last year as it did in the UK economy, all be it weakly. The UK economy went into recession one quarter ahead of Scotland and it may be that Scotland will come out of recession one quarter later than the UK. The survey evidence for the final quarter of 2009, which cast some doubt on the strength of the recovery, certainly leaves that possibility open.

Over the course of the recession total GVA in the Scottish economy has fallen by -6.13% compared to a slightly smaller contraction of -5.73% in the UK. The relative performance of the service sector largely accounts for the bigger impact of the recession in Scotland. Service sector GVA in Scotland fell by -4.76% while the contraction in UK services amounts to -4.59%. Manufacturing sectors have suffered more in the recession both in Scotland and the UK. But Scottish manufacturing GVA fell by -11.28% during the recession, less than the fall of -14.22% in UK manufacturing. Construction output has fallen by -13.08% in Scotland if the start of the sector's recession is dated as 2008q2, which compares with a fall of -14.07% in the UK if the start of the sector's recession is dated as 2008q1 to the trough of 2009q1. However, there is a good case for arguing that the recession, or structural downturn, in Scottish construction began after 2006g3, which was not mirrored in the UK. The loss of output in Scottish construction over this longer period amounts to -15.47%. UK construction, in contrast, has displayed a classic 'V' shape with a sharp and deep downturn followed by rapid recovery of 2.5% between 2009q1 and 2009q3.

One aspect of the present recession is that the labour market outcomes have been appreciably different from the impact on output. While Scottish GVA has fallen by -6.13% over the recession, the number of employee jobs has fallen by only -2.67%. To the extent that it is more easy to cut labour hours via short-time working than it once was, then employers may be less likely to make workers redundant in the short-run. Productivity per hour will not drop by as much as productivity per worker and coupled with lower labour payments competitiveness will suffer less. But it is arguable that a flexible labour market also makes it easier to dispense with the services of workers. If the recession is expected to persist, or the recovery expected to be very sluggish, then job shedding could pick up and unemployment continue to rise.

The UK economy has a large public sector financial deficit and rising net debt levels and interest payment. The increase is largely a consequence of government policy action to deal with the recession as households and firms sought to adjust to high levels of prerecession debt by increasing saving and lowering spending. There is a need for a sizable adjustment in the UK's fiscal position. It is reasonable to argue that the government needs to set out in its March Budget a more credible and more clearly specified programme of fiscal tightening over the next five years than it did in the 2009 Pre-Budget Report.

Yet, there is much uncertainty about household and corporate spending and because of this we have for some time urged caution about the timing of a fiscal consolidation in the UK. The UK and Argentina are the only two G-20 countries to have withdrawn their fiscal stimulus in 2010. The overall fiscal stance in 2010-11 is shown by the 2009 Pre-Budget Report to be negative. In our view this is dangerous given that UK households have the most adjustments to make to their balance sheets than households in other countries because the level of household debt was pre-crisis so high here. If the growth of world trade does start to pick up appreciably and this is likely later this year the UK should benefit disproportionately. Then there will be a real

prospect of what the Bank of England and the government desires: a switch to export and investment led growth. But until that time given relatively flat household and corporate spending, a fiscal tightening in 2010, the ending of further quantitative easing this month, and the likely continuing sluggishness of bank lending, increases the risk of a double-dip recession this year.

Some commentators have suggested that the UK is much the same as Greece in terms of risk of default on its debts. But despite some superficial similarities, such as the relative size of the budget deficit, the UK fiscal position is much stronger. Nevertheless, there is a lesson to be learnt from the Greek experience and it is this: allowing countries/regions within a larger monetary union to retain fiscal autonomy may threaten the monetary union. It runs the risk of a fiscal crisis because the financial markets will not discipline fiscal laxity in any one country/region sufficiently early enough. The discipline needs to come from the political centre and that means that complete fiscal autonomy is ruled out, although some degree of fiscal devolution is clearly feasible.

We are forecasting that Scotland will return to positive growth in 2010. But the recovery over the year is weak whilst household spending strengthens overall it continues to fall. Exports to the rest of the world continue to recover and at a faster rate than predicted in November. This along with some recovery of investment, though still negative, helps raise the forecast to 0.6% growth compared to our prediction of 0.1% in November. Recovery is weaker in Scotland than in the UK for the reasons that were well rehearsed in the previous Commentary and we see no basis for altering that view. Scottish GVA growth is better than the UK on the High growth scenario only. Trend growth is realised on our Central scenario in 2012. Employee job losses are forecast to continue from 2009 into 2010, with a net 96,000 jobs lost in those two years and not fully matched by job gains of 63,000 in 2011 and 2012. ILO unemployment is expected to peak at

216,000 or 8.1% this year falling to just under 186,000 or 7.3% in 2011 and further to 144,000 or 6.3% in 2012. However, if the recent trend in Scottish unemployment continues, which we think less likely, the rate could rise on our low growth scenario to 9.9%, or 264,000, this year.

Recent GDP performance

GDP data for the Scottish economy for the third quarter of 2009 became available in late January. The Scottish economy continued in recession in the third quarter with output falling by -0.2% and -4.6% over the year, much the same as the UK. But the contraction in quarterly output is clearly getting less – see Figure 1.

Scotland's GDP has therefore contracted by -6.13% over the five quarters since the recession began in second quarter of 2008. This is a somewhat greater loss of net output than the drop in the UK as a whole, which amounts to -5.73% over the *six* quarters from the start of recession in the first quarter of 2008. The decline in GDP in Scotland continues to mirror the decline in the UK as Figure 1 shows but nonetheless, on the data so far, the recession in output continues to be slightly more severe here. In the 4th quarter 2009, the UK economy came out of recession growing by 0.1%. Scottish GDP figures for the fourth quarter are not available until April but the graph above does suggest that the economy is moving in the right direction.

In the 3rd quarter 2009 output in the *service sector* – accounting for 74% of overall GVA – fell by -0.3% in Scotland and by -0.2% in UK – see Figure 2. However, while the service sector performed less well in Scotland than in the UK in the third quarter, *manufacturing* (14% of GVA) did better. Manufacturing GVA *rose* by 0.8% in Scotland against a *fall* of -0.2% in manufacturing in the UK - see Figure 3.

The *construction* industry in Scotland continued to contract with GVA falling by -1.6% in the third quarter compared to an *increase* of 1.9% in the industry in the UK – see Figure 4.

Within services, the main sectoral drivers of contraction in the second quarter were *hotels & catering* (3% of overall GVA), *real estate & business services* (REBS) (18% of GVA) and *financial services* (8% of GVA). Activity in hotels & catering fell by -2.3%, compared to a contraction of -2.1% in the sector in the UK. This again confirms, perhaps, that tourism to Scotland has not benefited by much from the decline in value of the pound sterling and by the "Homecoming Scotland" events. REBS output fell by -1.5% in Scotland compared to a fall of -0.4% in the UK. This contrasts with the previous quarter where REBS output rose by 0.9% after falling for four successive quarters. Clearly, the notion that the recession had ended in this key sector was illusory. Financial services contracted by -1.3% in Scotland compared to a greater fall of -2.0% in the sector in the UK – see Figure 5. On this evidence the recession in financial services appears to be easing somewhat in Scotland but not so in the UK, although the sector went into recession much later in the UK.

Two service sectors experienced positive growth in the third quarter: *retail & wholesale* (11% of GVA), and *transport & communication* (7% of GVA). GVA in transport & communication services rose by 0.5% in Scotland, a little worse than the 0.7% increase experienced in the UK. Retail & wholesale GVA expanded by 1.5%, a little more than the 1.4%% expansion in the sector in the UK.

The stronger overall performance of Scottish manufacturing (0.8%) compared to UK manufacturing (-0.2%) in the third quarter was largely down to comparative strength in 4 sectors: food, drink, metals, paper, printing & publishing. Food (1.4% of GVA) grew by 2%, compared to a fall of -0.7% in the UK. The drinks industry (1.6% of GVA) grew by 5% compared to growth of 1.5% in the UK where the sector is relatively smaller (0.4% of GVA). The metals sector (1% of GVA) grew more strongly in Scotland in the quarter, by 1.6% compared to 0.3% in the UK. This stands in marked contrast to its performance in the second quarter when output fell by -8.8% in Scotland compared to a fall of -2.9% in the UK. Finally, paper, printing & publishing (1.4% of GVA) contributed to the overall stronger performance of Scottish manufacturing by growing by 1.6% in the quarter while its UK counterpart contracted by -3.6%. Other manufacturing (1.7% of GVA) contributed positively to overall Scottish manufacturing performance through growth of 2.6% but the sector in the UK also grew strongly, by 2.3%. Refined petroleum products also grew more strongly in Scotland, 5.7%, than the sector in the UK, 1.1%. But the contribution to better manufacturing performance in Scotland was small given its low share of GVA (0.2% of GVA).

The chemicals industry continued to display negative growth in Scotland but with a drop in output of -0.3% compared to a fall of -0.8% in the UK, the significant contraction in output experienced in the 3 previous guarters appears to have halted. Finally, the engineering industry in Scotland (4.9% of GVA) appeared to slip back in the third quarter, with output falling by -2.1% compared to a fall of -0.1% in the sector in the UK. Within engineering, all three principal sectors experienced negative growth. Electronics (2.9% of GVA) cut back production by -3.3% while the sector in the UK contracted by only -0.5%. So any hope that the positive growth registered by the sector in the second quarter heralded the end of recession has been dashed. Mechanical engineering reduced its output by -1.4% in the guarter a better performance than the contraction of -2.9% experienced in the sector in the UK. Finally, transport equipment (1% of GVA) saw a further small fall in production of -0.1% in Scotland compared to growth of 2.4% in the UK.



Figure 1: Scottish and UK Quarterly GDP Growth, 1998q2 to 2009q3

Figure 2: Scottish and UK Services GVA growth at constant basic prices 1998q2 to 2009q3





Figure 3: Scottish and UK manufacturing GVA growth at constant basis prices 1998q2 to 2009q3

Figure 4: Scottish and UK construction GVA volume growth 1998q2-2009q3



Output and employment in the recession

Figure 6 charts the performance of key Scottish sectors over the past 12 years. The chart indicates that almost all of these key growth sectors have been affected by the recession with the exception of the public sector. Some appear now to be recovering: transport & communication; retail & wholesale; other services; and food & drink. But there are likely to be set backs just as there was in electronics and REBs in the third quarter.

Figure 7 indicates that over the course of the recession total GVA in the Scottish economy has fallen by -6.13% compared to a slightly smaller contraction of -5.73% in the UK. The figure makes clear that it is the relative performance of the *service sector* that largely accounts for the bigger impact of the recession in Scotland. Complicating this picture is the fact that some sectors began to recover sooner in the UK such as *construction* and in Scotland, such as *manufacturing* and *other services*.

Service sector GVA in Scotland fell by -4.76% while the contraction in UK services amounts to -4.59%. Within services, the sectors that performed worst over the recession relative to their UK counterparts were: *financial services* (-18.16% in Scotland compared to -6.42% in the UK); *REBS* (-11.60% in Scotland, -6.34% in the UK); and *hotels & catering* (-11.26% in Scotland, -8.81% in the UK). In contrast, 3 service sectors did better over the recession than their counterparts in the UK: *retail & wholesale* (-3.80% in Scotland, -6.45% in the UK); *transport & communication* (-3.72% in Scotland, -6.93% in the UK); and *other services* (-6.64% in Scotland, -10.06% in the UK).

Construction output has fallen by -13.08% in Scotland if the start of the sector's recession is dated as 2008q2, which compares with a fall of -14.07% in the UK if the start of the sector's recession is dated as 2008q1 to the trough of 2009q1. However, there is a good case for arguing that the recession, or structural downturn, in Scottish construction began after 2006q3, which was not mirrored in the UK. The loss of output in Scottish construction, in contrast, has displayed a classic 'V' shape with a sharp and deep downturn followed by rapid recovery of 2.5% between 2009q1 and 2009q3.

Manufacturing sectors have suffered more in the recession both in Scotland and the UK. Scottish manufacturing GVA fell by -11.28% during the recession, less than the fall of -14.22% in UK manufacturing. Within manufacturing, *electronics* lost -15.33% of its Scottish GVA but -17.12% of its UK GVA in the recession. The chemicals industry in Scotland was the biggest affected with GVA dropping by -25.48% in just four quarters compared to the UK where GVA fell by -6.49% in six quarters.

As we noted in the previous **Commentary** these data highlight some of the key dimensions of the present recession: its roots in the bursting of a commercial property and housing bubble and the indirect world-wide consequences for trade significantly depressing manufacturing output due to the much greater importance of export activity in the sector.

One aspect of the present recession is that the labour market outcomes have been appreciably different from the impact on output. This is illustrated in Figure 8.

What Figure 8 shows is that while Scottish GVA has fallen by -6.13% over the recession, the number of employee jobs has fallen by only -2.67%. In these circumstances you would expect the average productivity of workers to fall. There is evidence that this has happened in the UK and that the drop in worker productivity parallels the fall in previous UK recessions (See Myers 2009, cited in Labour Market Review section below.) As that section notes, the apparently smaller impact of the recession on jobs than on output has been linked to the 'flexible' labour market. There is clear evidence that many employers have introduced more flexible working, reducing overtime and, to a lesser extent, implementing short-time working. Some of the impact of this can now be seen in official statistics, with for example, the average weekly hours of work falling in Scotland across most categories of employment. So, the average for all workers has dropped from 32.2 hours to 32 hours, a fall of -0.6%, while the average for full-time workers has dropped from 36.9 hours to 36.7 hours, a fall of -0.5%.

To the extent that it is more easy to cut labour hours via short-time working than it once was, then employers may be less likely to make workers redundant in the short-run. Productivity per hour will not drop by as much as productivity per worker and coupled with lower labour payments competitiveness will suffer less. But it is arguable that a flexible labour market also makes it easier to dispense with the services of workers. If the recession is expected to persist, or the recovery expected to be very sluggish, then job shedding could pick up and unemployment continue to rise. Moreover, given that many workers are now on reduced hours and worker productivity low then a recovery in demand for goods and services and rising output may be met, initially at least, more by a rise in hours worked per worker than an increase in job creation.

Macro policy and the UK and Scottish economies

We hold the view that without the significant injection of demand made possible by a monetary and fiscal policy expansion, the UK and Scotland, along with the US and many other key economies, would in all likelihood have experienced a loss of output comparable to that of the Great Depression in the 1930s. In the UK the programme of monetary expansion, known as quantitative easing, has injected around £200 billion into the UK economy. Yet, as the Governor of the Bank of England, Mervyn King, pointed out in his speech at the University of Exeter on 19 January 2010, the growth in stock of broad money in the UK



Figure 5: Scottish and UK financial services GVA growth at constant basic prices 1998q2 to 2009q3

Figure 6: Growth of key sectors in Scotland 1998q2 to 2009q3



economy, while positive, is still much below the 5% to 10% annual rate of growth experienced in normal circumstances. In the United States the growth of money stock is virtually static and in Europe it is slightly negative. These figures provide an indication of the scale and significance of the contraction in bank balance sheets due to the 'credit crunch'. Without the programme of quantitative easing the monetary squeeze on the UK economy would have been, in the Governor's words, 'potentially disastrous'.

Similarly, the fiscal injection has sought to compensate for the significant drop in private sector demand for British goods and services as households and companies sought to reduce their high indebtedness. The most striking example of this is the rapid rise in the household saving ratio, which is shown in Figure 9. The ratio was negative in the first quarter of 2008 (-0.7%) but as recession started to bite it rose sharply, so that by in 2009 Q3 it had risen by 7.7 percentage points above the same guarter a year earlier to 8.6%. This was, as the Bank of England notes in its February Inflation Report: "the largest four-quarter increase in the saving ratio since records began in 1955." This outcome is further underlined by Figure 10, which shows the financial balances of the public, private and foreign sectors as a percentage of UK national income since 1955. In accounting terms all balances sum to zero. From the figure it is clear that the foreign surplus or deficit on UK current account has persisted for some time, at least since the late 1990s. But the big recent movements are the rapid growth in the public sector deficit as the private sector balance went from negative to positive, paralleling the rise in the household saving ratio. The figure shows that much the same happened in the early 1990's UK recession.

As a result of this, the UK now has public sector deficit that stands at 12.6% of national income and according to IMF estimates the structural, or permanent non-cyclical, component amounts to 7.8% points. A structural deficit of nearly 8% of GDP is clearly unsustainable. UK public sector net debt stands currently just under 60% of GDP and with present assumptions of GDP growth and likely interest rates the net debt position would reach 100% of GDP in 5 or six years. While net debt of 100% of GDP, if stabilised, need not be unsustainable, the level of interest payments on the debt will begin to crowd out other public sector expenditure. On present policies the 2009 Pre-Budget Report UK net debt is forecast to be around 80% of GDP in 2014-15, which as Figure 11 shows is not wholly unusual by historical standards.

Figure 11 reveals that for half of the twentieth century net debt levels were above 80% of GDP. This of course embraces extreme circumstances such as both World Wars but those events led to net debt levels considerably above 100%, which is no way currently in prospect for Britain.

The IMF estimated in November 2009 that on current policies UK net interest payments will rise from 1.6% of GDP in 2007 to 3.1% in 2014. This is not trivial and would

amount to around £50 billion per year from £35 billion in 2009. Yet, the IMF forecasts that 6 of the G-20 countries would have a net interest payment share of GDP in 2014 greater than the UK: Italy (6.2%), India (5.6%), Turkey (5.4%), United States (4.5%), Brazil (4.3%) and France (3.2%). The average for all the advanced G-20 countries is also forecast to be greater (3.5%). (Greece is not included in the analysis). A 3.1% net interest payment share of GDP would according to the IMF amount to 8.3% of UK fiscal revenues. Figure 12 indicates that net interest payments of at least 3% of GDP per annum existed for seventy five years between 1916 and 1991, which should put the present crisis into context. Some experts argue that it is only when debt interest payments rise to 12% of GDP that a government is likely to default (see

<u>http://www.ukpublicspending.co.uk/debt_brief.php</u>). This may be too high and it seems not unlikely that a default could occur before interest payments reached a third of fiscal revenues - the likely analogue of 12% of GDP.

In view of this background we believe it is incorrect, as some commentators have done, to suggest that the UK is in the same category as Greece in terms of risk of default . As the BBC's Economics Editor, Stephanie Flanders, has pointed out, the fact that the UK has a budget deficit that's comparable to Greece is not sufficient to put the UK into the same category as Greece. The main differences are:

- the debt to GDP ratio is currently well over 110% in Greece and under 60% in the UK;
- Greek debt servicing costs are now just under 12% of GDP, in the current debt costs are under 3% of GDP;
- the average maturity of UK sovereign debt is 14 years, compared to 4 years in the US, 6 or 7years in France and Germany, and in Greece it is even lower with 10% of debt maturing in a few months. So, despite the size of the UK budget deficit, Germany, France and Italy, will all issue absolutely more sovereign debt on the markets than the UK in 2010;
- Greece has a severe competitiveness problem, which the country is unable to address independently through a downward exchange rate adjustment. The UK current account deficit stands at only 2.5% of GDP and we have experienced a 25% devaluation since before the recession in mid 2007. Greece has a current account deficit of 11% of GDP and no way of addressing this, if it remains within the eurozone, other than domestic downward adjustment of wages, other costs and prices. The UK has a basis for recovery higher GDP, higher tax revenues and lower public spending on transfer payments, which is denied Greece.

The UK is not Greece. But there is a lesson to be learnt from the Greek experience and it is this: granting full fiscal autonomy to a country/region within a larger monetary union





Figure 8: Output and jobs in the recession



runs the risk of a fiscal crisis that can threaten the union because the financial markets will not discipline fiscal laxity in any one country/region sufficiently early enough. The discipline needs to come from the political centre and that means that complete fiscal autonomy is ruled out, although some degree of fiscal devolution is clearly feasible.

All of this is not to deny the need for a sizable adjustment in the UK's fiscal position. There is a case to argue that the government needs to set out in its March Budget a more credible and more clearly specified programme of fiscal tightening over the next five years than it did in the 2009 Pre-Budget Report. The IMF points out that removal of a structural deficit of the scale present in the UK - just under 8% of GDP - is not unprecedented. More than 20 advanced economies achieved improvements in their structural fiscal balances of 5% of GDP or more at least once in the past 40 years, while 10 countries achieved improvements in excess of 10% of GDP in that period. The UK government can and must do this. But there is room for debate around timing.

As Andrew Sentance of the Bank of England notes, the current problem of an imbalance between a large private surplus on the one hand and a large budget deficit on the other, is very similar to the situation that faced the UK in 1993 after the previous recession. The deficit in 1993 stood at 7.8% of GDP and this was reduced to 2% of national income in 1997 and a small surplus in 1998. A series of budgets raised taxes and restricted public expenditure but the process was also helped by reasonable GDP growth of 3% per annum. A more competitive pound sterling, as now, assisted the recovery along with a strong recovery in domestic private spending. The principle difference between now and then is that private spending is likely to be more constrained now due to the legacy of the financial crisis. The household sector has had to adjust from the significant deficit that emerged in the mid-2000s. It has now moved back to balance, as evidenced by the rise in the savings ratio noted above. But the question is how much further does the sector have to go in building up a financial surplus before it starts to raise its spending relative to income again? This is a key difference from the early 1990s when households were already in surplus having recovered from a move into deficit in the late 1980s. In addition, corporate surpluses are bigger than at the end of the 1990s recession and there is a question to be raised about how long these will be sustained before spending on re-stocking and new investment occurs.

It is because of this uncertainty about household and corporate spending that we have for some time urged caution about the timing of a fiscal consolidation. The UK and Argentina are the only two G-20 countries to have withdrawn their fiscal stimulus in 2010. The UK will still benefit from the effects of the automatic stabilisers but the overall fiscal stance in 2010-11 is shown by the 2009 Pre-Budget Report to be negative. In our view this is dangerous given that UK households have the most adjustments to make to their balance sheets than households in other

countries because the level of household debt was pre-crisis so high here. If the growth of world trade does start to pick up appreciably and this is likely later this year the UK should benefit disproportionately. Then there will be a real prospect of what the Bank of England and the government desires: a switch to export and investment led growth. But until that time given relatively flat household and corporate spending, a fiscal tightening in 2010, the ending of further quantitative easing this month, and the likely continuing sluggishness of bank lending, increases the risk of a double-dip recession this year.

Forecasts

The underlying economic situation has not changed significantly since we last reported in late November 2009. The UK economy crept out of recession in 2009q4. Scottish outturn data for the fourth quarter will not be available until April, so we must rely on surveys for information on the most recent performance.

The Review of Business Surveys section makes clear that the Scottish economy is in a better position than it was a year ago. But the review also makes clear that business sales and optimism trends in the fourth quarter were not as strong as the third guarter. There is concern that the Scottish economy faltered in the fourth quarter and this concern has carried over into the first quarter of this year with weaker retail sales data than south of the border, and unemployment, in the latest data for the final quarter of last year, rising at a faster rate, not only than the rest of the UK, but also western Europe. Mixed messages are also coming from the housing market with both the Lloyds TSB Scotland and Halifax Bank of Scotland producing surveys indicating falling Scottish house prices: -6.8% in the quarter to the end of January compared with a year before in the former, and -7% over the year to the end of December, nearly agrees, in the latter. In contrast, the UK Department of Communities and (English) Local Government announced on the same day that Scottish prices in the year to the end of December had risen by 3.8%.

None of this bodes well for the growth of Scottish household spending, which accounts for 42% of Scottish final demand. It is likely, however, that the Scottish Retail Consortium data for January are much influenced by one-off events such as the reinstatement of the temporary reduction in VAT at the end of the year, which may have led to some spending being brought forward. Moreover, the poor weather after Christmas in the New Year may have curtailed spending in January. But with weak house prices, rising unemployment and many households still seeking to adjust their personal balance sheets through higher saving, it seems unlikely that there will be much revival in spending in the first quarter of this year and perhaps the second quarter as well. We have noted that public spending will begin to tighten this year, although it is not predicted to begin falling until 2011. Investment looks to be weak, although some improvement in investment trends was noted in the latest Scottish



Figure 9: UK household savings ratio 2008q1 to 2009q3 (% of household income)

Figure 10: UK financial imbalances since 1955 – percent of national income



Source: Andrew Sentence speech, November 2009, Bank of England





Figure 12: UK debt interest to GDP 1900 to 2011



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Chambers' Business Survey (SCBS) but not in the CBI and Scottish Engineering surveys. However, there is stronger evidence that exports are beginning to pick up. In the latest Scottish business survey rising trends in export orders are observed, although in the SCBS the trend was weaker in the fourth quarter than in the third quarter 0f 2009.

Our latest forecasts for the Scottish economy have been prepared against the economic and policy background considered above and discussed in considerable detail along with the forecasts in the section on **Forecasts of the Scottish Economy** below. Given the continuing climate of uncertainty and the significant data revisions to both Scottish and First Release UK data, we adopt the practice of recent **Fraser Economic Commentaries** and present three alternative scenarios for growth, employment and unemployment in the Scottish economy: we label the scenario that we feel is most likely "central", with "high growth" and "low growth" as two respectively upper and lower growth alternatives. The "central" scenario is that which is most likely, while the "high growth" and "low growth" act of possible outcomes for the Scottish economy foreseen for future developments from 2009 through 2010 to 2012.

GVA Forecasts

Table 1: Forecast Scottish GVA Growth in Three Scenarios, 2009-2012

GVA Growth (% per annum)			2009		2010		2011		2012
High growth		-4.7		1.7		2.2		2.8	
	November forecast		-4.9		1.6		1.8		2.1
Central		-4.8		0.6		1.6		2.2	
	November forecast		-5.0		0.1		1.1		1.6
Low growth		-4.9		-0.7		-0.3		0.8	
	November forecast		-5.2		-0.7		-0.1		0.5

Table 2: Forecast Scottish Net Jobs Growth in Three Scenarios, 2009-2012

		2009	2010	2011	2012
High growth		-60,488	-9,785	30,253	57,213
	June forecast	-62,827	-23, 152	33,584	45,174
Central		-64,218	-32,264	18,277	44,612
	June forecast	-84,399	-51,451	11,301	26,824
Low growth		-77,861	-57,002	-16,538	13,631
	June forecast	103,579	-66,894	-3,722	6,847

Table 3: ILO unemployment rate and claimant count rate measures of unemployment under each of the three forecast scenarios

		2009		2010		2011		2012
	7.6%		7.3%		5.6%		3.6%	
	7.6%		8.1%		7.3%		6.3%	
Numbers	200,082		216,200		185,700		144,200	
	7.6%		9.9%		10.1%		9.8%	
	4.9%		4.4%		3.4%		2.4%	
	4.9%		5.4%		4.6%		3.7%	
Numbers	136,821		148,000		127,000		99,000	
	4.9%		6.8%		7.0%		6.7%	
	Numbers Numbers	7.6% 7.6% 200,082 7.6% 4.9% 4.9% 136,821 4.9%	2009 Numbers 7.6% 7.6% 200,082 7.6% 4.9% 136,821 4.9%	2009 7.6% 7.3% 7.6% 8.1% 200,082 216,200 7.6% 9.9% 4.9% 4.4% 136,821 148,000 6.8% 6.8%	2009 2010 Numbers 7.6% 7.6% 7.3% 8.1% 200,082 7.6% 216,200 9.9% Numbers 4.9% 4.9% 5.4% 148,000 6.8%	2009 2010 Numbers 7.6% 7.6% 7.3% 8.1% 5.6% 7.3% 200,082 7.6% 216,200 9.9% 185,700 10.1% Numbers 4.9% 4.9% 4.4% 5.4% 3.4% 4.6% 136,821 4.9% 148,000 6.8% 127,000 7.0%	2009 2010 2011 Numbers 7.6% 7.6% 7.3% 8.1% 5.6% 7.3% 200,082 7.6% 216,200 9.9% 185,700 10.1% Numbers 4.9% 4.9% 4.4% 5.4% 3.4% 4.6% 136,821 4.9% 148,000 6.8% 127,000 7.0%	2009 2010 2011 Numbers 7.6% 7.6% 200,082 7.6% 7.3% 8.1% 216,200 9.9% 5.6% 7.3% 185,700 10.1% 3.6% 6.3% 144,200 9.8% Numbers 4.9% 4.9% 136,821 136,821 4.9% 4.4% 5.4% 148,000 6.8% 3.4% 4.6% 127,000 7.0% 2.4% 3.7% 99,000 6.7%

The key forecasts are summarised in Table 1 along with our November forecasts for comparison. We shall primarily focus on our central forecast here. It is clear that we have revised upwards slightly our GVA forecast for 2009 to -4.8%. The narrow gap between the forecasts on the three scenarios for 2009 is mainly due to the fact that we already have three of the four quarters of outturn data. Scotland is forecast to return to positive growth in 2010. But the recovery over the year is weak, household spending strengthens but continues to fall. Exports to the rest of the world continue to recover and at a faster rate than predicted in November. This along with some recovery of investment, though still negative, helps raise the forecast to 0.6% growth compared to our prediction of 0.1% in November. Recovery is weaker in Scotland than in the UK for the reasons that were well rehearsed in the previous Commentary and we see no basis for altering that view. Scottish GVA growth is better than the UK on the High growth scenario only. Trend growth is realised on our Central scenario in 2012.

Employment Forecasts

The key forecasts are summarised in Table 2. Employee job losses continue from 2009 into 2010, with a net 96,000 jobs lost in those two years and not fully matched by job gains of 63,000 in 2011 and 2012. At the sectoral level, services experiences the greatest decline in jobs in 2009 and 2010 with 42,000 net jobs lost. Job losses in financial services accounts for 16,500 of the service sector job losses. Construction job losses amount to nearly 27,000 over the two years and as with services the number of construction jobs in 2012 remains below 2008 levels but there is recovery in 2011 and 2012 of more than 3,000 jobs. Finally, the production sector which principally includes manufacturing sheds more than 17,000 jobs in 2009 and 2010 but through strong export growth net job creation in 2011 and 2012 of 26,000.

Unemployment Forecasts

The key unemployment forecasts are summarised in Table 3 above. On our Central forecast ILO unemployment is expected to peak at 216,000 or 8.1% this year falling to just under 186,000 or 7.3% in 2011 and further to 144,000 or 6.3% in 2012. However, if the recent trend in Scottish unemployment continues, which we think less likely, the rate could rise on our low growth scenario to 9.9%, or 264,000, this year, reaching a rate peak of 10.1%, or 257,000, in 2011 and then falling to 9.8%, or 224,000, in 2012.

Brian Ashcroft 19 February 2010

The Scottish economy

Forecasts of the Scottish economy

Economic background

In the three months since our forecasts in November 2009, several notable developments have occurred which will impact on the short- and medium-term growth prospects for the Scottish economy. Within the Scottish economy, we have continued to see GVA falling, with the most recent data for Q3 2009 confirming six consecutive quarters of declining activity. These data confirm that Scottish GVA has declined 6.1% since Q2 2008, while the UK as a whole down 5.7% over the same period.

These figures have drawn an unprecedented monetary and fiscal response, which we have examined in detail in previous forecasts. In February 2010, the Bank of England (Bank of England, 2010a) kept interest rates at 0.5% (where they have been since March 2009), and announced that it was curtailing its programme of Quantitative Easing (QE) following the purchase of £200 billion of assets funded by the issuance of Central Bank reserves, which was introduced in Spring 2009. The Monetary Policy Committee, charged with maintaining price stability in the UK and with the power to set interest rates to deliver a medium-term inflation target of 2%, voted to stop extending the QE programme in February 2009, after previous meetings had increased the scale of the programme in stages from an initial £50 billion. It noted in the most recent inflation report (Bank of England, 2010a) that broad money growth remained low, although it argued that money growth without the QE programme would have been even lower. The overall assessment of the policy interventions of the Bank is likely to be made only in the fullness of time, however there is some evidence that the slowdown in the growth of money was lower given the slowdown in nominal GDP when compared to previous recessions.

On the fiscal policy side, as well as the temporary VAT reduction being reversed, with VAT returning to 17.5% from January 2010, the Chancellor of the Exchequer announced in November's Pre-Budget Report (PBR) a series of programmes aimed at fiscal consolidation over the medium term (with the stated target of reducing Public Sector Net Borrowing from a forecasted 12.6% of GDP in 2009-10 to 5.5% of GDP in 2013-14). The headline measures announced in the PBR include an increase in the rate of National Insurance by 0.5% from April 2011, as well as a "temporary payroll tax" of 50% on discretionary bonus payments above £25,000, which is forecast to raise £550 million in the current financial year. Of direct relevance to Scotland, as we shall examine in detail later, is the timing and depth of the period over which fiscal consolidation is

projected to occur. This will be of crucial significance for the ability of the public sector to continue to support activity and employment over the short and medium-term. At the start of February, the Scottish Parliament passed the Scottish Government's budget for 2010-11, setting in place spending plans for some £35 billion of Total Managed Expenditure for the coming financial year.

As noted in previous *Forecasts*, part of the significant rebalancing in the economy likely in the medium-term is that government net borrowing is likely to be reduced significantly. In 2009-10 it is forecast to be £178 billion in 2009-10, roughly 57% of UK GDP. Irrespective of the political party which wins the UK general election likely to fall in May 2010, as Bank of England Governor Mervyn King notes, "there is a broad consensus across all political parties on the need later this year to announce more clearly the measures required for fiscal consolidation" (Bank of England, 2010b, p. 16-17).

We discuss the likely implications of this fiscal consolidation for the scale of government spending in Scotland in a later section of this forecast. At this point we note that government spending in Scotland in each of our three scenarios presented forecast to see a real terms reduction from 2011 onwards. This is consistent with the figures presented in the most recent "State of the Economy" presentation by the Scottish Government's Chief Economic Advisor in December 2009. This is likely to have a contractionary impact on Scottish growth and employment compared to the UK, to the extent that public sector employment in Scotland is slightly higher than in the UK as a whole (as the analysis of James (2009) referred to in the last Forecast made clear). Figures also presented by Chief Economic Advisor show that the largest contributions to UK GDP growth from 2010 are predicted to come from Consumption and Investment expenditures, with Government playing a much reduced role.

The "State of the Economy" also noted the important role that the adjustment of personal balance sheets will make a vital contribution to the duration of the downturn. At the household level, paying down debts incurred for expenditure yesterday necessarily reduces spending available for consumption today. There are experimental data for Scottish households which indicate that, in aggregate, Scottish households have curtailed total spending more sharply than UK households as a whole. These data only run to Q2 2009, so the likely path of future consumption growth in Scotland, and that of the UK, remains uncertain. These same experimental data suggest that over the last decade there has been little difference between the growth in household consumption in Scotland compared to the UK as a whole.

It continues to be the case, however, that we might expect the recession-recovery path of Scotland to be different from that of the UK. Indeed, we would be surprised if Scotland was to recover at precisely the same rate as the UK as a whole. As well as the larger public sector in Scotland, with a greater share of employment in public sector than the UK as a whole, this has often been argued to insulate Scottish growth and employment, and so produce "flatter" growth less pronounced troughs and less steep peaks. While this continues to be the case, we are reminded that the nature of the recent recession was profoundly different to any in recent history as it was linked with a shortage of credit availability - the so-called "credit crunch", which peaked in September 2008. This has had profound impacts on sectors where Scotland traditionally held a strong competitive position, including financial services and insurance. Further, Charles Bean (Deputy Governor of the Bank of England) in questions about the recent growth of the UK said that "the downturn that we've gone through is heavily manufacturingcentred, a sharp fall in investment and stocks. And the UK is somewhat less manufacturing intensive than some of our counterparts. That's meant that we didn't suffer as sharp a contraction in activity as, say, Japan's did, but equally the rebound hasn't been quite as strong" (bank of England, 2010b, p. 15). Taking this analogy to the Scotland, Scotland is more manufacturing intensive than the UK as a whole (14.1% compared to 13.3%), and so this could explain the larger fall seen in Scotland than the UK, between Q2 2008 and Q3 2009. The characteristics and features of the recession, and the differing impacts on the UK and Scotland will only become fully apparent in time, as sometimes substantial revisions seen to previous data reduce as more accurate information is available. We note the scale of previous revisions to aggregate GVA growth in Scotland in Box 1.

Across the world, the synchronised nature of this recession is clearly evident with most developed countries experiencing significant lost output through 2009. The OECD in November 2009's *Economic Outlook* project declines in GDP across the OECD countries, with output falling in the US (-2.5%), Japan (-5.3%) and the UK (-4.7%). Australia (0.8%), Korea (0.1%) and Poland (1.4%) are predicted to be the only OECD countries to escape a reduction in GDP in 2009. The recession is thus confirmed as a worldwide downturn, affecting countries in all corners of the world. Interestingly however, the IMF has recently revised up its projections for world growth in 2010 and 2011 (IMF, 2010). World trade is forecast to have contracted by 12.3% in 2009 but is now predicted to grow by 5.8% in 2010.

We discuss these in more detail where we lay out our assumptions about the growth rate for Scottish exports to the rest of the world later in this *Forecast*. For Scotland, it will be crucial that exports are able to recover, although this could well be helped by the significant reduction in the Sterling exchange rate (down about a quarter from mid-2007 levels (Bank of England, 2010a)) improving the competiveness of UK exports. The Bank of England (2010a) report that the contraction in world demand has not been offset by improved competitiveness since "a large part of the depreciation appears to have fed through to higher margins

Box 1: Recent revisions to GVA growth

Revisions to the data on GVA growth for Scotland make forecasting the future path more uncertain, when even in smoother economic waters we would expect forecasted values to differ from the outturn variables observed. Preliminary estimates rely on less data than is available over time so we would expect some revisions. As Mervyn King noted, concerning the UK GDP published by the ONS, "the data published are not... the truth, they are estimates. They are the single best estimate we've got from the ONS of GDP, but inevitably new information comes along with a lag and that leads them to revise their data" (p. 22).

Typically since the start of the recent recession, GVA estimates for Scotland have been revised upwards, with initial estimates being worse that those revealed by later estimates. In the most recent estimates of Scottish GVA (released in January 2010, for instance), Q3 and Q4 of 2008 were revised down 0.1% and 0.2% respectively, Q1 2009 was revised down 0.1%, and Q2 2009 revised up by 0.1% compared to what had been published three months earlier. This had the impact of making Scotland's entry to recession in 2008 more sudden than previously estimated, but reducing the depth of that recession slightly.

Figure 1 shows the differences between estimates of GVA change for Scotland compared to most recent estimates of GVA growth for the same quarter since Q2 2008. Positive changes here show that the GVA change has been revised upwards, while negative changes show that most recent estimates are lower than the first estimates.



Figure B1: Differences between first estimates and most recent estimates of GVA change in Scotland between Q2 2008 and Q2 2009

instead". Over time this should boost exports, and encourage increased supply of goods for export, although this could happen slowly as world demand growth recovers sluggishly.

When thinking about the forecasts presented in this section, we agree with the caution of Mervyn King, who recently stated that "forecasts are not numbers which say this will happen. They are judgements about the relative probabilities of various outcomes occurring. And of course there is always a possibility of these outturns. Many things can happen" (Bank of England, 2010b, p. 11).

The Scottish economy

In the last quarter for which data are available (Q3 2009, published on 20th January 2010), the Gross Value Added (GVA) in Scotland fell by 0.2% from the previous quarter (Q2 2009), which had fallen by 0.5% compared to Q1 2009. Since Q2 2008, GVA in Scotland is down 6.1%, while the UK is down 5.7% over the same period.

Scotland entered recession following the second consecutive quarterly decline in GVA in Q4 2008 and has now seen five quarters of negative GVA growth. The worsening economic performance is perhaps alleviating, with significant negative quarterly growth outcomes receding from view (despite some recent revisions to GVA). Although the future is by no means certain, downside risks remain to Scotland's future growth prospects, we suggest that the size of the downturn seen through 2009 appears to be unlikely to continue through 2010. While the next years will be likely to see a cautious return to growth, it remains to be seen how much the experiences from 2008-2009 will damage confidence across domestic and overseas consumers.

The Scottish manufacturing sector, accounting for 14.1% of Scottish GVA, was up slightly (0.3) over the third quarter of 2009, albeit that this sector has seen a decline of 9.6% over the year to Q3. The manufacturing sector is down 11.9% from its Q2 2008 peak. Within production sectors more generally, the largest yearly decline is in the mining and quarrying industries (down 12.4%) and down 15.8% from Q2 2008.

Construction in Scotland (accounting for 6.5% of GVA) was down 1.6% on Q2 2009, and down 8.9% on the year. In all, the sector was down 13.0% on the peak seen in Q2 2008.

The aggregate Services sector is down 0.3% on the previous quarter, down 3.5% over the year to Q3, and down 4.7% from the Q2 2008 peak. This would suggest that the major impact to date of the Scottish recession has affected on manufacturing and production sectors in the Scottish economy. While the services sector has seen high profile causalities in the banking and business services sector, and the "credit crunch" originated in these industries, it has been the Manufacturing and Production sectors which have, to date, seen the biggest falls in GVA. This would indicate that Charles Bean's assertion that, at the UK level, "the

downturn that we've got through is heavily manufacturing centred, a sharp fall in investment and stocks. And the UK is obviously less manufacturing intensive that some of our counterparts. That's meant that we didn't suffer as sharp a contraction in activity as, say, Japan did, but equally the rebound hasn't been quite as strong" (p. 15). Within the UK, the manufacturing sector is a larger share of activity in Scotland than the UK (14.1% compared to 13.3%) which could be a contributing factor for Scotland performing more weakly than the UK as a whole.

Labour market developments in Scotland to the end of November 2009 (published in January 2010) showed falling employment and increasing unemployment over the year; however the quarterly change was not negative on all measures. Employment of those aged over 16 between September and November stood at 2,511 thousand, down 28,000 (or 1.1%) on the same period one year previously, and actually up 6 thousand on the previous quarter. The employment rate for those of working age (16 to 59 (for women) and 16 to 64 (for men)) was up slightly from the previous three month period, standing at 74.0%, however this was lower than the 75.5% seen in the same quarter one year previously.

Looking at unemployment, the number of people over the age of 16 who were unemployed rose by 9,000 compared to the three months previous, and up 61,000 over the last year, approximately twice the rise reported in the last commentary for the year to April 2009, and as of September to November 2009, the ILO level of unemployment stood at 202 thousand. The preliminary estimate of those receiving unemployment-related benefits stood at 136,200 in December 2009. The claimant count figure is up 36,700 since September 2008, and the claimant count rate has risen from 3.6% at the start of 2009, and now stands at 4.9%. We present our forecasts for the Scottish labour market for 2009, and through 2010 to 2012 later in this section.

Final demand and recent trends

The Fraser of Allander Institute (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

 Data being developed by the Scottish Government through the Scottish National Accounts Project (SNAP) were published on the 5th of February 2010. These showed that Q3 2009 saw a small upward rebound in household expenditure, following three quarters of reductions. These figures are in Nominal terms however, so the real increase in spending will be lower, and may be negative. This confirms the evidence from previous quarters that the reduction in household expenditure is moderating, but it is unlikely that this small positive growth in nominal expenditure is signalling a return to strong positive growth in household consumption expenditure.

- As previously noted in *Forecasts*, household credit facilities have been crucial for the recent growth of expenditure, and the movement of the Scottish economy towards a more service-oriented structure. The decline in the availability of credit facilities to households, as well as households continued reluctance to take on credit in uncertain economic conditions, will continue to dampen household spending. The link between house price growth and household spending is anecdotally important, and recently house prices have fallen by less than in earlier quarters. Total house sales remain weak, with sales down roughly one half.
- Figures released by the Scottish Retail Consortium reported the worst January for four years, with likefor-like sales falling by 0.6% compared to January 2009. Non-food sales were down 1.8% on the previous year. The SRC noted the impact of the reinstatement of VAT after its temporary reduction. with the possibility of sales being brought forward from January to the end of 2009. This, combined with the poor weather conditions for much of January, saw consumers appearing to reduce spending on discretionary items. It will be crucial for the path of the retail sector, and consumer expenditure more generally, that February and future months' figures indicate if January's figures are a blip or part of a longer term correction to household balance sheets. Recent survey evidence, largely capturing small and independent retailers, indicates falling business confidence and expecting declining sales through the first quarter of 2010.

Government spending

As noted above and in previous *Forecasts*, fiscal policy measures provided a stimulus designed to support activity and employment through the declines in growth seen in late 2008 and 2009. The UK stimulus package was estimated by the IMF to be of the order of 1.6% of GDP in 2009. There continues to be considerable uncertainty over the impact that the removal of these packages, necessary to restore confidence in the sustainability of the budgets of governments across the world, will have on economic activity. What will be crucial will be the speed at which private sector and consumption growth can provide a counterbalance to the removal of the government stimulus. A recent report by the IMF noted, for the

G20 countries, 2010 will see the removal of the fiscal stimulus in only the UK and Argentina.

Bearing this in mind, in his December 2009 "State of the Economy" report, Scotland's Chief Economic Advisor noted that for spending controlled by the Scottish Government through the Departmental Expenditure Levels, which make up the principal element of discretionary spending by the Scottish Government, will grow by over 4% in 2009/10, but will fall in real terms in 2010/11. The next three years are within the period of the next Spending Review, but, based on Institute of Fiscal Studies analysis, are predicting real terms reductions of more than 2% from 2011/12 to 2013/14. Work by CPPR, published since the State of the Economy report, forecast real terms reductions in Scottish DEL of 4.2% in 2011/12 on the previous year, with subsequent budgets falling by 3.2% for the next two years in real terms.

Investment

As previously noted, there are no separate national statistics on investment in Scotland. Business investment figures reported for the UK, which may typically be expected to be indicative of the path of investment in Scotland, show continued large declines in investment through 2009. Total business investment in Q3 2009 was down 19.9% on the same quarter one year previously, although Q3 had seen a small upward trend, largely driven by a 10% increase in investment in Distribution services (although business investment was down 27.5% in this sector on Q3 2008). Private sector manufacturing continued to see a decline in investment, down 4.4% in Q3 on Q2, and down 29.9% on Q3 in 2008.

Tourism

Figures from the International Passenger Survey showed that the number of international trips to Scotland was down 0.3% in July to September 2009 compared to the same period in 2008. This is the largest quarter for tourism in Scotland, with almost half of the trips to Scotland in 2009 made in these three months. We noted in November's Forecast that the occupancy figures had been maintained or improved from those from the same periods in 2008, and that this may have been at the expense of discounting of hotel accommodation. The most recent GVA figures for Scotland indicate that there has indeed been a small decline in GVA over the most recent quarter (-2.3%), while GVA in this sector is down 5.2% in the last four quarters on the previous four quarters. The Q3 decline in this sector is less than that seen in Q2 2009, with most recent survey evidence indicating that business optimism in the sector is significantly higher than the same period in 2008.

Table 1: Growth forecasts for top five export markets for	ROW exports from Scotland, % year	on year change, plus
United Kingdom and Euro Area		

				2010			2011
		IMF (Oct2009)	IMF (Jan2010)	OECD	IMF (Oct2009)	IMF (Jan2010	OECD
1	United States	1.5	2.7	2.5	n/a	2.4	2.8
2	France	0.9	1.4	1.4	n/a	1.7	1.7
3	Germany	0.3	1.9	1.4	n/a	1.9	1.9
4	The Netherlands	0.7	n/a	0.7	n/a	n/a	2.0
5	Ireland	-2.5	n/a	-2.3	n/a	n/a	1.0
	United Kingdom	0.9	1.3	1.2	n/a	2.7	2.2
	Euro Area	0.3	1.0	0.9	n/a	1.6	1.7

Sources: International monetary Fund, Regional Economic Outlook: Europe, Securing Recovery, October 2009, and World Economic Outlook Update, January 2010, and OECD Economic Outlook, November 2009.

Table 2: Main forecasts of the Scottish economy (Central scenario), 2009-2012

	2009	2010	2011	2012
Gross Value Added	-4.8	0.6	1.6	2.2
Manufacturing	-10.2	0.9	4.0	5.8
Construction	-8.1	2.8	3.3	1.7
Services	-3.1	0.3	0.8	1.3

Table 3: Forecasts for aggregate GVA growth in the Scottish economy under three scenarios, 2009-2012, %

	2009	2010	2011	2012
High growth	-4.7	1.7	2.2	2.8
Central	-4.8	0.6	1.6	2.2
Low growth	-4.9	-0.7	-0.3	0.8

Table 4: Forecasts of Scottish employment (jobs, 000s) and net employment change in central scenario, 2009-2012

		2009	2010	2011	2012
Total jobs (000s)		2,321	2,289	2,307	2,351
Net annual change (jobs)		-64,218	-32,264	18,277	44,612
% change from previous year	ar	-2.7	-1.4	0.8	1.9
Agriculture (jobs, 000s)		23.2	23.5	24.1	25.1
	Annual change	-9850	309	628	1061
Production (jobs, 000s)	-	240.0	234.6	244.9	260.7
	Annual change	-11971	-5411	10260	15797
Construction (jobs, 000s)	-	121.4	113.3	114.4	116.3
	Annual change	-18577	-8135	1143	1905
Services (jobs, 000s)	-	1936.2	1917.2	1923.4	1949.2
,	Annual change	-23820	-19027	6246	25850

Note: Figures are numbers of employee jobs, by industry, and not the numbers in employment, therefore these figures differ slightly from those reported in the labour market section of the *Economic Commentary*.

Table 5: Forecast Scottish net jobs growth in three scenarios, 2009-2012

	2009	2010	2011	2012
High scenario	-60,488	-9,785	30,253	57,213
Central scenario	-64,218	-32,264	18,277	44,612
Low Scenario	-77,861	-57,002	-16,538	13,631

Table 6: Forecasts of Scottish unemployment, central scenario 2009-2012

	2009	2010	2011	2012
ILO unemployment	200,082	216,200	185,700	144,200
Rate ¹	7.6%	8.1%	7.3%	6.3%
Claimant count	136,821	148,000	127,000	99,000
Rate ²	4.9%	5.4%	4.6%	3.7%

Notes: ¹ = rate calculated as total ILO unemployed divided by total of economically active 16+ population. ² = rate calculated as claimant count divided by sum of claimant count and total jobs. The latest estimates of the 2009 figures forecast in November's commentary were published in January 2010 in the Labour Market Statistics First Release for Scotland. These estimated the ILO unemployment levels and rates for the three months to November 2009 as 202,000 and 7.4%, respectively. We leave the forecasts for 2009 unchanged from that forecast in November's commentary. The same publication gave preliminary estimates of the claimant count and rate for December 2009 as 136,200 and 4.9%. Again, our figures in Table 6 above for the claimant count and rate are left unchanged from those published in November 2009's commentary.

Table 7: 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	7.6%	7.3%	5.6%	3.6%	
Central	7.6%	8.1%	7.3%	6.3%	
Low growth	7.6%	9.9%	10.1%	9.8%	
Claimant count rate					
High growth	4.9%	4.4%	3.4%	2.4%	
Central	4.9%	5.4%	4.6%	3.7%	
Low growth	4.9%	6.8%	7.0%	6.7%	

While demand remains weak, however, Chamber of Commerce respondents indicated that discounting is set to continue in the first quarter of 2010.

Exports to the rest of the UK

 Preliminary estimates of GDP for the UK, published on the 26th of January 2010, revealed that Q9 2009 saw the first quarter of positive growth (0.1%) since Q1 2008, with many analysts and commentators predicting the end of the UK recession. With the rest of the UK being the most important trading partner for Scottish industries, the future for demand for Scottish exports will depend crucially on the path of growth which occurs in the UK. As noted previously, Scottish IO tables for 2004 showed that exports to the rest of the UK were approximately double exports from Scotland to the rest of the World. With regard to the estimate of GDP growth in the UK, we note however, that many analysts were predicting stronger growth in Q4 2009 than the observed 0.1%, and that (as we saw above for Scotland, but also for the UK) there have been sometimes significant revisions to GDP estimates over the last two years.

- Recent forecasts for GDP growth in 2010 in the UK show a strong rebound from the declines seen in 2009. The Treasury's December 2009 forecasts predict growth between 1.0% and 1.5%. This range also includes the median forecast made in the last three months (1.3%), however the range of recent forecasts for the UK is from 0.7% to 2.2%. The range of UK forecasts has been revised upwards from those we reported in November's *Commentary*, while the median new independent forecast has remained the same.
- As noted elsewhere in this edition of *the Fraser Economic Commentary*, Scottish Chamber and CBI respondents reported in Q4 2009 rising trends in expected export orders, although demand from the rest of the UK remains fragile.

Exports to the rest of the world

- The IMF headlined its January 2010 forecasts for the global economy with the statement that "Real activity is rebounding, supported by extraordinary policy stimulus". Their report pointed to rising confidence, with strong signs of the end of destocking and an increase in production, albeit with the recovery being "sluggish" in most advanced economies. World output is forecast to increase by 3.9% in 2010, and 4.3% in 2011, following a decline of 0.9% in 2009. Interestingly, and largely driven by revisions to their forecasts for the US, China and other important economies, these world forecasts have been revised upwards from October 2009's forecasts. World trade as a whole was forecast in October 2009 to increase by 2.5% in 2010, but the IMF is now forecasting a 5.8% increase, with a 1.1% upwards revision to world trade forecast for 2011. The IMF's forecasts for the UK was similarly increased in this period, and now stands at 1.3% - the same as the independent new median forecast discussed above.
- As noted before, Scotland traditionally exports to EU and other "advanced economies", which the IMF forecast will grow by 2.3% in 2010 and 2.4% in 2011. The major traders for Scotland, and the recent forecasts for growth in these areas, are given in Table 1, as well as revisions from recent forecasts.
- Despite these upward revisions for the major (non-UK) destination for Scottish exports, growth continues to be forecast to be relatively slow to

return in 2010, particularly for the EU economies. It is in developing countries that the highest forecasts for growth through 2010 and 2011 are found, and the success of an export-led recovery for Scotland may depend on the speed at which new markets in these previously less important export destinations can be found.

 Experimental statistics have been published by the Scottish Government for manufacturing exports to the rest of the World to Q3 2009. These data showed that Q3 2009 saw the first positive quarterly change in the aggregate real value of exports since Q1 of 2008, and followed five consecutive quarters of negative growth for aggregate exports. Within this aggregate however, the most recent quarter saw growth in exports in the important Food, Drink and Tobacco sector (up 5.5% in real terms), as well as Chemicals, Coke, Refined Petroleum Products & Nuclear fuel (up 9.94%). The important Engineering sectors, however, saw exports decline almost 8% in Q3, and are down almost 19% on Q3 2008.

The forecasts: Background

As with the forecasts published in the last four Economic Commentaries, we give three alternative scenarios for growth, employment and unemployment in the Scottish economy between 2009 and 2012. We give a "Central" case, with "High growth" and "Low growth" as two respectively upper and lower growth alternatives. We intend that these three scenarios capture the range of outcomes that are possible, given that there are considerable uncertainties surrounding any specific single or point estimates to the "Central" forecast. The significant revisions to GVA growth forecasts discussed above and seen over the last year, suggest that using a scenarios approach is sensible when first estimates of growth may be revised (sometimes, significantly) some quarters into the future.

While we do not give explicit probabilities for each of these outcomes, we forecast that the "Central" scenario is that which is most likely, while "High growth" and "Low growth" reveal the range of possible outcomes for the Scottish economy from 2009 through to 2012. We will know the first estimates of Q4 2009 GVA for Scotland when the data are released in April 2010, allowing comparison between our three scenarios for the outturn of 2009 against the real economic data.

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

In the "Central" scenario, we forecast that the significant reduction in Household spending seen in 2009 moderates, but overall expenditure growth remains negative. Aggregate





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



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Household expenditure in 2011 and 2012 is forecast to increase from weak 2010 levels. In "Low growth", household expenditure is damaged through lower consumer confidence and persisting job security fears. Spending falls by more in 2010 in the low growth scenario than the central case, however less than all scenarios saw in 2009, and again falls (slightly) in 2011. It isn't until 2012 that household spending sees a return to positive growth in "Low growth". In "High growth", consumer confidence (and spending) responds faster than in "Central", returning to slightly positive growth in 2010 before seeing a return to pre-2008 trend expenditure growth through 2011 and increasing marginally above trend in 2012. This scenario could be consistent with outturn unemployment increases being lower than anticipate, and household spending recovering through access to, and increased demand for, credit facilities for household spending.

Government

In "Central" we forecast an increase in government spending in Scotland through 2009 on 2008 levels, with a smaller increase in spending seen in 2010. From 2011, we forecast annual real terms reductions in aggregate Government spending in Scotland, which are reduced by over four per cent in 2012 compared to 2011. In "High growth", government spending is still lower in 2011 and 2012 compared to the previous year's total, in part supported by additional economic activity keeping taxation income higher than is assumed in "Central". Across all scenarios however, government spending in Scotland is lower.

Exports

In "Central" we anticipate a slow return to growth in world trade in 2010, with a return to strong positive growth in demand for Scottish exports from the rest of the world returning through 2011 and 2012. Such a response could be indicative of Scottish exports securing markets in developing economies, which are forecast to see high levels of economic growth over the coming years, while more developed countries are predicted to see slower increases in growth. Recent changes in growth forecasts for developed countries, and Scotland's current exports to these countries, are discussed in the section above. In "High growth" and "Low growth", this return to positive growth in exports to the rest of the world from Scotland takes less and more time, respectively. Exports to the rest of UK follow a similar pattern in the central case, returning to slowly positive growth in 2010. In "Low growth" we forecast a small increase in export demand from the rest of the UK in 2010.

Tourism

Tourism is forecast to recover slowly from the challenging conditions seen through 2008 and 2009, largely driven by (non-Scottish) households reducing expenditure on travel and tourism activities (in line with domestic households experiences of reduced overseas travel). In "Central", tourism spending in aggregate is forecast to see a small decline in 2010, seeing a return to growth by 2011 continue through 2012. Under "High growth", small positive growth in aggregate tourism spending is forecast for 2010, reflecting faster than anticipated recoveries in growth in markets important for Scottish tourism.

Investment and stocks

As discussed above, 2009 has seen significant reductions in investment demands. As we have previously stated, the recovery in investment will be partly driven by the supply of credit, but also the demand for credit from companies, which will be linked with returning business confidence. Recent survey evidence for manufacturing, responsible for much of the investment activity in the Scottish economy, give some ground for optimism with more respondents reporting upwards trends in investment than reported downward trends, for the first quarter since Q1 of 2008. This would suggest at the very least that the large falls in investments seen in 2009 will not be seen in 2010. We forecast in "Central" that aggregate investment levels will not recover significantly through 2010, but will begin to increase from 2011 and through 2012. "High growth" sees investment increasing from 2009 levels in 2010, although the increase is forecast to be small.

Results

Gross Value Added

The forecast GVA for Scotland in 2009 under all three scenarios is negative, and significantly so. We forecast the GVA change at the end of the year when compared to the four quarters of the year before. All three scenarios forecast out to 2012, by which time Scottish GVA growth in all scenarios is forecast to be positive. As before, the recovery to positive economic growth occurs faster in the High growth scenario, and more slowly in the Low growth scenario. As stated above, we forecast that the Central scenario represents the most likely outcome for the Scottish economy given the current economic position and outlook at the start of 2010. Scotland is forecast to return to positive growth in 2010 in both the Central (0.6%) and High growth (+1.7%) scenario, but the Low growth scenario sees negative growth in 2010 and 2011 (of -0.75% and -0.3% respectively). As noted above, considerable and multiple downside risks remain to the strength of the expected economic recovery for Scotland.

These scenarios are presented in Figure 1, alongside (for comparison) the average of new forecasts (i.e. those made in the last three months to January 2010) for the UK as a whole in 2009 and 2010. Forecasts for the (medium-term) economic growth of the UK in 2011 and 2012 were collected by HM Treasury in November 2009, and these are also shown in Figure 1.







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

We are forecasting that the Scottish economy will perform better than the forecasts of the UK in 2009 and 2010 under the High growth scenario only, but less well under the most likely Central scenario. The average of recent independent forecasts for growth of the UK economy in 2010 is 1.4%, which, while a strong rebound from the declines seen in 2009, is within our range of forecasts for Scotland. As with previous experience of recessions (discussed in detail in June 2009's *Fraser Economic Commentary*), we anticipate the most likely outcome is for a slower return to growth in Scotland than the UK as a whole, with our Central scenario forecasting lower growth in Scotland than the average of independent forecasts for the UK in each year from 2010 to 2012.

Under the Central scenario, GVA growth returns to positive annual growth in 2010 (+0.6%) and 2011 (+1.6%). In 2012, Scottish growth is forecast to be 2.2%, slightly above longterm trend growth for Scotland. Our central scenario for 2009, and the forecast for the sectors under this scenario are given in Table 2. Table 3 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 in this scenario 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 in the Construction sector between 2009 and 2012.

Across Manufacturing (shown in Figure 2), a recovery from the observed declines in GVA in 2009 occurs in 2010 in the Central scenario, although there is GVA growth of 3.4% forecast for 2010 under the High growth scenario. In 2011 and 2012, all three scenarios forecast positive GVA growth in the manufacturing sector, with growth ranging from 0.0 to 5.1% in 2011 and 2.7 to 6.8% in 2012. As noted in previous *Forecasts*, the speed the growth of external demand for products will be key to the short- and medium-term future for Scottish manufacturing.

Figure 3 shows that Service sector GVA growth across the three scenarios is more insulated to the economic downturn than the Manufacturing figures seen in Figure 2. GVA growth in 2009 ranges from -3.0% to -3.2%, while in 2010 GVA growth is forecast in the range from -0.5% to 1.0%. This range of outcomes has been revised slightly downwards from that presented in November's *Forecast*. As previously noted, the recovery in consumer confidence and household spending (both in Scotland and in major, or new, export markets, particularly the rest of the UK) will drive the speed and duration of the recovery across the aggregate Service sector. One key area within the service sector will

be the future performance of financial services (which together with Business Services is worth almost 25% of Scottish GVA). We forecast this sector sees a small return to positive growth in 2010, although this is also the year when significant job reorganisation is predicted for the aggregate financial services sector. We expect that we will see continuing changes in the size and scope of the financial services sector well into 2011, and the future shape of the sector will be considerably different than prior to 2008.

Figure 4 estimates that declines in GVA in the Construction sector are largest again in 2009, and by as much as -8.2% in the Low growth scenario. Even in 2011 "Low growth" forecasts slightly negative GVA growth with positive growth recovering only in 2012. Vital 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. We noted above, the recent positive trends in construction activity have appeared over recent weeks, and the rate of house price declines has slowed. However, 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. As we have previously stated, it is likely that the housing market will continue to see only slow growth in sales volumes over the next few years as slowly rising house prices restrict householders ability to move, either through lower than necessary equity holdings or through decreased availability of mortgage finance, particularly at previously available loan-to-value ratios.

Employment

Our forecasts for employment for each of the three scenarios are given in Table 4, along with the net aggregate employment change over the year. The employment figures relate to jobs, not FTEs, and are calibrated on the end-year (December) figures from 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 at the end of 2008 as 2,385,000. As we have previously forecast, we anticipate in our Central scenario that total job numbers in Scotland will fall in aggregate in during both 2009 and 2010, and see a recovery to positive job growth in 2011.

In "Central", employment is forecast to decline by 64,200 jobs in 2009 and by 32,300 jobs in 2010. Total job numbers, and jobs in all of these broad industrial sectors, are forecast to then increase in 2011 and 2012. Total jobs in 2012 are forecast to be around 34,000 lower than the jobs total for 2008 (a year when historic highs and lows respectively for the employment rate and unemployment rate were seen in Scotland). With the exception of Construction, the other broad sectors of the Scottish economy are forecast to see employment in 2012 higher than in 2009.

In all scenarios, total job numbers in Scotland are forecast to decline in 2009 and 2010. "Low growth" sees around 77,900 jobs being lost in 2009, and a further 57,000 in 2010.

In that scenario, total jobs lost between 2009 and 2012 are around 137,800, while in "High growth", the recovery in 2011 and 2012 sees job numbers recover towards their previously measured historical highs, and job numbers in 2012 are around 17,193 higher than their level in 2008. Table 5 shows the net annual growth in jobs in each of the three scenarios, and shows how these have changed since our June 2009 forecast. The most recent Economic and Labour Market Review, to September 2009, has jobs in Scotland at 2,331,000, down roughly 56,000 on the situation one year earlier. We are forecasting in our central scenario that the rate of job decline seen through 2009 alleviates slightly in the last three months to December 2009, while in the "Low growth" scenario, this continues through 2009 and into 2010.

Looking at the sectoral breakdown for these employment changes, in all scenarios the Services sector sees the largest decline in job numbers in both 2009 and 2010. Overall, the number of service sector jobs are forecast to fall by 23,800 in 2009 and a further decline of 19,000 in 2010. Financial services is forecast to be especially badly affected, losing almost 16,500 jobs between 2009 and 2010 (with the majority of these lost in 2010), but large job losses in 2009 are also forecast in retail and wholesale.

The Construction sector is forecast to lose around 18,500 iobs in 2009, and a further 8,100 in 2010, and see a slow recovery through 2011 and 2012. As with the aggregate jobs total, the total jobs in construction in 2012 remain below levels of 2008. In the High growth scenario, lob losses in construction are smaller in 2009, and fall by almost 16,000 while recovering to positive annual job growth of 1,800 and 2,500 in 2011 and 2012. As mentioned in previous Commentaries, the construction sector has tended to see both quicker, and earlier, declines than the rest of the economy, and in previous upswings would be likely to see increased activity ahead of much of the economy. The sluggishness of a return to growth in the private housing sector may contribute to the growth of employment in the upswing being less than in following previous recessions in Scotland.

Production jobs fall in 2009 by over 12,000 in the Central scenario, with a range from 11,000 to 13,000 in "High growth" and "Low 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 so falls in employment are forecast in metals and non-metal products (down 1,300), electrical and electronic engineering (down 1,500) and mining and quarrying (down 1,000). Key to the response in the labour market will be the extent to which labour hoarding continues in the face of the recession. Reducing staff working time, and freezing pay increases have arguably contributed to the smaller than previously seen declines in employment for large changes in GVA. It remains to be seen however how long employees are retained before demand begins to recover, and employment growth can be seen. As with

previous forecasts, it may be beyond 2012 before we see the job numbers in Scotland reaching the highs for employment seen before the recent recession.

Unemployment

We present our forecasts for unemployment for 2009-2012 in Scotland, as measured by the ILO definition as well as those claiming unemployment benefit, in Table 6. 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 portion of the available Scottish labour force which is currently in receipt of unemployment benefit.

The forecasts for unemployment in 2009 and through 2010-2012 have been revised upwards from forecasts published in the last *Fraser Economic Commentary*. Until the recent economic downturn, the Scottish labour market had been outperforming that of the UK when measured by the employment rate, and had seen historically high levels of employment and low levels of unemployment. Of crucial importance to the 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. are unemployed but not available for work. The most recent data from February 2010 confirms that unemployment had risen and a rising unemployment level and rate would continue to be consistent with our "low growth" scenario.

References

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Grant Allan 17th February 2010

Review of Scottish Business Surveys

Overall

Three themes have been evident in almost all recent surveys. Firstly, the Scottish economy was 'clearly in a better position at the start of 2010 than it was twelve months ago' (Scottish Chambers' Business survey Q4 2009), 'This final survey of 2009 (is) the most heartening of the year' (Scottish Engineering Q4 2009). The Scottish Retail sales monitor reported 'solid December shop sales'. Secondly, business sales and optimism trends in the fourth quarter were not as strong as the third quarter. The PMI (December data) noted the 'Scottish economy recorded weaker rises in activity and new business in December' compared to November. The Scottish Chambers' Business survey noted 'fewer signs of a sustained recovery in manufacturing', and the CBI Scottish Industrial trends noted 'growth in total new orders was slower than in the previous quarter', however in contrast, Scottish engineering reported better trends for the fourth quarter, although these were less evident for machine shops and metal manufacturing. In retail December like-forlike sales growth was slightly weaker than in August -October, although disentangling the effects of the approaching end of the reduction in VAT and the exceptionally cold weather from overall trends in sales is problematic. Thirdly, 'the Scottish economy is set to emerge from recession and return to weak growth during the first quarter of 2010' (Lloyds TSB monitor).

Data from the Scottish Chambers' Business Survey shows that the net rising trends in business confidence in manufacturing in the fourth quarter were less strong than in the three months to September. In construction net declining trends have remained largely unchanged for the past three quarters. In retail confidence, especially in the non multiple retail sector, remains negative, whilst in tourism confidence remains weak, but the fourth quarter trends were better than in Q4 2008 and 2007. Lloyds TSB noted that whilst the Scottish economy 'has not yet returned to growth (it) is very close to the point of turnaround between decline and growth'.

Pay pressures remained subdued for a further quarter. The percentages of respondents reporting pay increases in the fourth quarter to the Scottish Chambers' Business Survey ranged from 5% of construction to 19% of manufacturing, and average pay increases ranged from 1.5% in wholesale to 2.8% in manufacturing.

Oil and Gas

Data from the new Oil & Gas UK index (latest data 2009 Q3) suggested that overall business confidence had improved slightly in 2009, reflecting the rising price of oil and the

easing access to finance. However, continued low wholesale gas prices were contributing to lower business confidence in the upstream sector and confidence remained weak amongst companies in the offshore oil and gas supply chain. The UKCS and the global oil sector is in a period of declining investment, re-assessment of projects and heightened concerns as to costs. However the recent announcement of tax changes may lead to both improved levels of business confidence and activity. The Aberdeen & Grampian Chamber of Commerce Oil & Gas Survey (published November 2009) noted that activity in the UKCS, at least the short term, has been reduced and business confidence remains frail, although the recent improvement in the oil price was welcomed. The proportion of contractors reporting working at or above optimum levels in the UKCS eased to the lowest levels recorded by the survey, although some improvement is anticipated for 2010.

Skill shortages, a feature of previous years have eased, although this may well be due to a combination of reduced demand and a number of industry wide initiatives. Nevertheless, skill shortages and recruitment difficulties were again reported, although not to the same extent as in previous years. Average pay increase in 2009 eased to the levels reported in 2004, and the percentage reporting increasing pay was lower than in previous years. There was evidence of pay freezes and rate reductions, the ending of bonus payments and some reductions in terms and conditions.

Production

The latest Lloyds TSB Scotland Business Monitor (data to end November 2009) noted a stronger improvement in the production sector in contrast to the service sector which experienced a slight worsening of conditions in the three months to November 2009, with the trends in turnover much better than in either the second or third quarters of 2009.

Manufacturing

The Scottish Chambers, CBI Industrial Trends and Scottish Engineering surveys for the fourth quarter reported net rising trends in business confidence. However, whilst the Scottish Chambers' Business Survey noted the rising trend in business confidence reported in the third quarter eased from a net balance of 32% in Q3 to 15% in Q4, Scottish Engineering and CBI Industrial Trends noted an improvement in business optimism between Q3 and Q4.

Orders and Sales

Scottish Chambers' and CBI Scotland respondents reported that the outturn in total new orders and export orders was weaker than expected in the fourth quarter, as the actual trends in total, Scottish and rest of UK orders remained weak and weaker than in the third quarter. In contrast, Scottish Engineering reported rising levels of orders and the 'overall level of orders is the best since 2008 with large and medium companies reporting rising trends'. Whilst overall risingtrends are forecast for the first quarter of 2010 both



 Table 1: Business confidence (net trends) manufacturing, construction and tourism – Scottish Chambers' Business

 Survey

Source: Scottish Chambers' Business Survey

Table 2: Average capacity used in manufacturing and construction



Source: Scottish Chambers' Business Survey

Scottish Engineering and Scottish Chambers' respondents are more cautious as to the level of improvement in orders.

Once again a declining trend in the level of work in progress was reported by Scottish Chambers' respondents, but the net decline is expected to end over the next twelve months, in contrast CBI Scotland respondents reported a slight improvement. Average capacity used by manufacturing respondents to the Scottish Chambers' Business Survey rose marginally by 0.3 percentage points to 71.9%, although 61% (57% in Q3 and 71% in Q2) reported capacity used was below preferred levels. Pressures to raise prices due to raw material costs and other overheads have been reduced by slowing costs inflation over the past year, but the effective devaluation of the pound has prompted concerns amongst both Scottish Chambers and CBI respondents of rising costs pressures and declining margins in 2010.

Investment

Scottish Chambers' respondents noted an improvement in investment trends as 29% expect to increase investment and 5% anticipate increasing their leasing of equipment over the coming year, this positive trend was not evident amongst CBI Scotland or Scottish Engineering respondents. Scottish Chambers' respondents noted cash flow trends improved compared to the past eight quarters. Respondents are more confident as to rising turnover during 2010, and the net trends are the most positive for eight quarters, in contrast expectations as to rising profitability eased.

Employment

Once again thirty-seven percent of Scottish Chambers' Business Survey manufacturing firms attempted to recruit and there was some evidence in both Scottish Chambers and CBI Industrial Trends surveys, but not in the Scottish Engineering survey, of a temporary rise in employment, although this is not expected to continue through the first quarter of 2010.

Construction

Optimism

Data from the latest Scottish Chambers' Business Survey (Q4 2009) noted business confidence remained weak with only 15% reporting being more confident compared to the previous quarter. The net balance of optimism at -28% was less depressed than a year ago Q4 2008 when a net of -78% was reported. Likewise the Scottish Construction Monitor (Q4 2009) described confidence as 'flatlining' and with many firms still 'fearful' about industry prospects in 2010, with 80% of respondents reporting being less confident or no more confident about the outlook for business in 2010. In sharp contrast recent figures from the annual survey conducted by the Construction Skills Network, forecast that Scottish construction would return to growth of 2.8% in 2010, unlike other parts of the UK, due largely to the more important buoyant infrastructure sector in Scotland.

Contracts

Scottish Chambers' data suggested the rate of decline in the net trend in new contracts eased marginally from -40% in the third quarter to -38% at the end of 2009. The trends in orders from all sectors continued to decline although the rate of decline in domestic/house building orders eased.

Expectations as to turnover trends into 2010 remain depressed, and are forecast to deteriorate further during 2010. A net of -48% (-31%, -37%, -64%, and -65% in the previous four quarters) anticipate declining turnover trends. A net of -60% (-44%, -59% -78% and -78% in the previous four quarters) anticipate declining profitability over the next twelve months and a net of 72% of construction firms anticipate declining tender margins during the same period.

Average capacity declined by eight percentage points to 66%, although bad weather conditions may be a factor here, and almost 50% expect a declining trend in the level of work in progress.

Employment

More than half of firms reduced total employment levels with only 13% reporting an increase in employment and recruitment again remained at very low levels. Only 5% of respondents reported increasing pay in the fourth quarter by an average of 2%.

The service sector

The Lloyds TSB survey noted that service businesses experienced a slight deterioration of conditions during the three months to the end of November 2009, and given the importance of this sector 'may lead to Scottish recovery trailing that of the UK'.

Retail Distribution

Optimism

The Scottish Chambers' Business Survey noted weak trends in business confidence in 2009 Q4, as the trend in business confidence declined from -8% in Q3 to -35% in Q4, reflecting the pressures independent and smaller retailers from weak demand, internet sales and the policies of the major multiple retailers. Nevertheless, despite the decline the overall trend was less depressed than Q4 2008 (-91%) and Q4 2007 (-42%).

Sales

The Scottish Retail Sales Monitor reported solid December shop sales, with like-for-like sales 1.4% higher than in December 2008, total sales were reported as 4.3% up on a year ago. At least half of retailers reported and expect declining sales in the fourth and first quarters. The rate of decline in actual and expected sales accelerated during quarter four although remained less depressed compared to Q4 2008.

Finance

Both turnover and profitability are expected to decline further for a net of retailers over 2010, although the rate of decline is less than that anticipated by firms during quarter three 2009. Two-thirds of retail respondents expect price increases during Q1 2010.

Employment

Most firms reported and expect no change to employment with fewer than 5% increasing or expecting to increase total employment levels. During the three months to the end of December the percentage of firms actively recruiting rose from 23% to 33%. Nine percent of firms increased wages by 2.43%.

Tourism

Optimism

According to the Scottish Chambers' Business Survey the overall level of business confidence became negative for a small net balance of responding firms although trends remained broadly unchanged from the previous quarter, and was significantly less depressed than in the same quarter of 2008.

Demand

The net trend in total demand remained positive in quarter four. The rate of increase slowed although the overall trend was better than anticipated. Domestic demand continued to exhibit stronger trends than demand from abroad and business demand. Average occupancy declined from 72% to 62% (higher than in Q4 2008, but marginally lower than in Q4 2007). The Scottish Occupancy study (data for November 2009) noted average room occupancy at 59%, the same as a year ago, and only one percentage point higher than the average reported for November 2005, 2006 and 2007. Occupancy figures were highest in Edinburgh & the Lothians and Glasgow & Clyde regions and lowest in the Highlands and Islands

Chamber of Commerce respondents report continuing to reduce room rates and the discounting of prices is more marked than during the same quarter a year ago and is set to continue in the first quarter.

Business constraints

An overall lack of demand remained the primary business constraint although hotels were also concerned with competition, exchange rates and poor transport infrastructure.

Employment

Changes in employment levels were reported by half of firms. Net declining trends in full time (-19%), part time (-17%), seasonal (-31%) and overtime working (-52%) were reported.

Outlook

The Scottish Chambers' Business Survey noted manufacturing trends continue to offer the clearest signs of an emerging, but weak and fragile recovery; tourism continues to report better trends than a year ago. The CBI Industrial Trends Survey reported 'In the industrial sector uncertainty about demand is still the factor most likely to limit capital spending.' The trends for 2010 remain uncertain; the fragile recovery will have to contend with a possible weakening in consumer spending, the costs of a harsh winter, the re-imposition of VAT, and pressures on Government expenditure, as the latest Lloyds TSB survey noted 'the recovery will be slow and tentative with many sectors delaying a recovery into growth until well into 2010'. Pressures on margins and likely pressures on raw material and other costs highlight the fragility of the recovery and both Scottish Chambers and Markit PMI Scotland highlighted rising input price inflation coupled with weak demand and the need to discount prices to sustain and improve order levels, although the CBI Industrial Trends survey was more optimistic. The labour market continues to remain weak with few signs of an improvement.

Cliff Lockyer /Eleanor Malloy February 2010

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

- The Confederation of British Industries Scottish Industrial Trends Survey for the fourth quarter of 2009;
- Lloyds TSB Business Monitor 48 for the quarters September – November 2009 and expectations to February 2010;
- Scottish Engineering's Quarterly Reviews for the fourth quarter of 2009;
- The Markit Economics Regional Monthly Purchasing Managers' Index for November and December 2009;
- The Scottish Retail Consortium's Monthly Scottish Retail Sales Monitor for November and December 2009;
- The Scottish Chambers of Commerce Quarterly Business Survey, reports for the fourth quarter of 2009;
- 7. Oil & Gas UK quarterly Index quarter 3 2009;
- 8. Visit Scotland Occupancy Survey November 2009;
- 9. The Scottish Construction Monitor quarter 4 2009;
- 10. The Construction Skills Network Annual Survey 2009.

Overview of the labour market

Inevitably current interest in the Scottish labour market continues to focus on the trends and patterns in the unemployment figures and again in this issue we note recent changes in Scottish labour market trends. However, realisation that unemployment levels have not risen to anticipated levels or as sharply as in previous recessions prompts a reconsideration of the how the 'flexible' labour market has adjusted in the recession.

The CBI (Employment Trends in 2009) noted most firms have either made or are planning changes to working patterns most notably more flexible working, reducing overtime, making less use of agency workers and cutting shifts and, to a lesser extent implementing short term working and increased use of fixed term contracts. The CIPD/KPMG Labour Market Outlook survey (2009) reported some 17% had implemented reduced hours programmes and were planning to ask staff to work shorter hours in 2010. Both the CBI and CIPD surveys in 2009 noted a reduction in spend on training in 2009. The CBI reported approximately 44% of respondents were reducing their spend on training; whilst the CIPD noted median spend on training per employee declined from £300 in 2008 to £220 in 2009.

However, the OECD (Employment Outlook) has been more cautious as to the benefits of flexible employment in terms of whether employees are any better prepared to withstand a period of weak labour demand than in previous recessions. As Myers (2009) comments 'the apparent limited adjustment in labour input during the latter stages of 2008 was surprising givenassumptions that the UK's labour market had increased in flexibility over the past two decades', although Myers notes later evidence suggests labour input adjustment gathered pace by the middle of 2009 (Myers, M. 2009. The impact of the economic downturn on productivity growth. Economic & Labour Market Review vol.3 no. 6 June 2009).

Labour Force survey evidence, for the UK, indicates that average hours worked for full time employees fell from an average of 37.1 (Sept-Nov 2007) to 36.5 hours (Jun-August 2009) and average hours for part-time employees declined from an average of 15.7 (Sept-Nov 2008) to 15.3 hours (June-August 2009).

The CBI (Employment Trends in 2009) noted that more than half of respondents planned a pay freeze in their next review; the CIPD (Labour Market Outlook 2009) noted some 16% planned to implement a pay freeze in the three months to December 2009. Data from the Monthly Wages and Salaries Survey for the UK reported that earnings growth for the whole economy for the year to April 2008 was 3.9%, this declined to 3.4% per annum in January 2009 and reached a low of 1.8% per annum in September 2009 (Jenkins, J. & Leaker, D. The Labour market across the UK in the current recession. Economic & Labour Market Review. Vol. 4 no. 1 Jan 2010). Data from the Scottish Chambers' Business Survey (see the Review of Surveys Section) noted that both the percentages increasing pay and average pay increases were at historic low levels in 2009.

The increasing recognition of the likelihood of widespread job losses in the public sector prompts a consideration of the trends in public sector employment; one estimate is that Local Government faces having to lose some 3,000 jobs, initially by early retirement and other voluntary schemes, in the next financial year (Sunday Herald 31.01.2010), although this figure is likely to rise through 2010.

The latest available data, Q3 2009, indicates 573,800 employed in the Scottish public sector (excluding the those employed by RBS and Lloyds who have been reclassified as UK wide public corporations), of which 44.6% were employed in local government (excluding police and fire services) and 26.5% in the NHS. The numbers employed (full time equivalents) in Scottish local authorities (Q3 2009) are as follows: 56,000 teachers (62,600 headcount), 36,400 other education staff (50,500 headcount); 43,600 in social work (54,500 headcount); 23,800 in police and related services (24,700 headcount); 5,700 in fire services (5,800 headcount) and 85,500 other staff (106,500 headcount).

Table 1: Total public sector employment in Scotland (headcount Q3 2009)

	Headcount %
Total Local Government (ex Police & fire	44.6%
NHS	26.5%
Public Sector Financial Institutions	6.3%
UK Government Departments	5.4%
Police and Related Services	4.0%
UK wide public bodies	4.0%
Devolved public bodies	3.3%
Scottish Government Core, Agencies and	
Non Ministerial Departments	2.9%
Armed Forces	1.9%
Fire and Related Services	1.0%
Scottish Parliamentary Corporate Body	0.1%

A recent CRESC Working Paper (Centre for Research on socio-Cultural Change, Working Paper No. 75, December 2009. The Open University) argues that 'the boundaries between public and private (sector) employment are blurred' (CRECS December 2009:17). Recently, as the Public Sector Employment in Scotland: Statistics for 3rd Quarter 2009 notes, staff have been transferred from Local
Table 2:	Headline indicators of	Scottish and UK	labour market,	October – Dec	ember 2009
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October- December 2009		Scotland	Change on quarter	Change on year	United Kingdom	Change on quarter	Change on year
Employment*	Level (000s)	2,492	-8	-41	28,905	-12	-428
	Rate (%)	73.5	-0.4	-1.8	72.4	-0.1	-1.7
	Level (000s)	206	10	65	2,457	-3	448
Unemployment	Rate (%)	7.6	0.4	2.4	7.8	0.0	1.4
A	Level (000s)	2,697	2	24	31,363	-15	20
Activity	Rate (%)	79.8	-0.1	0.1	78.7	-0.2	-0.5
	Level (000s)	652	3	-3	8,077	72	241
Inactivity***	Rate (%)	20.2	0.1	-0.1	21.3	0.2	0.5

Source: Labour Market Statistics (First Release), Scotland and UK, February 2010

* 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 3: Employee jobs by industry, Scotland, September 2009

								Education
				Minina			Distribution	health.
			Aariculture	Enerav			etc. transport	public
	All iobs		. Forestrv	and Water	Man-		etc. finance	admin and
	(seasonall	All	and	Supplies	ufacturing		and business	other
	y adjusted)	jobs	Fishing	Industries	Industries	Construction	services	services
SIC 2003	, <u>,</u> ,		0					
Section		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	2,389	2,387	35	41	216	138	1,104	852
Dec 08	2,374	2,385	33	41	212	140	1,103	856
Mar 09	2,362	2,354	37	40	206	139	1,075	858
Jun 09	2,340	2,339	29	41	203	130	1,075	861
Sep 09	2,332	2,331	27	40	203	127	1,070	864

Government employment to a privately contracted organisation or charity, yet continue to perform the same roles within Local Government. There is more evidence of councils planning efficiency savings/cuts affecting a range of services currently provided/supported by the voluntary sector. Currently Scottish Voluntary Sector employees approximately 129,000 (83,500 FTEs) and it is estimated that 47% of income is spend on salaries.

Recent trends and statistics

Comparable figures on the labour market¹ between Scotland and the United Kingdom in the quarter October – December 2009 are summarised in Table 2. Labour Force Survey (LFS) data show that in the quarter to December 2009 the level of employment in Scotland fell by 8 thousand, to 2,492 thousand. Over the year to December 2009, employment in Scotland fell by 41 thousand. For the same period, UK employment fell by 428 thousand. The Scottish employment rate – those in employment as a percentage of the working age population – was 73.5 per cent, down 1.8 per cent compared to one year earlier. For the same period the UK employment rate was 72.4 per cent, down 1.7 per cent compared to one year earlier.

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 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 2 shows that for Scotland the preferred International Labour Organisation (ILO) measure of unemployment rose significantly to 206 thousand, between October - December 2009, or by 65 thousand over the year2. The ILO

unemployment rate rose in the three months to December 2009 and now stands at 7.6 per cent. This represents a 0.4 per cent rise over the last quarter and a 2.4 per cent rise relative to the same period a year earlier. The comparable ILO unemployment rate for the UK stands at 7.8 per cent, and is up 0.0 per cent over the most recent quarter, and up 1.4 per cent over the year.

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 2 shows that the level of the economically active rose by 0.4 per cent between October - December 2009. There were 2,697 thousand economically active people in Scotland during October – December 2009. This comprised 2,4921 thousand in employment and 206 thousand ILO unemployed. The level for those of working age but economically inactive rose in the last quarter, up 0.1 per cent on the previous quarter to 652 thousand people. This indicates a decrease of -0.1 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 136.2 thousand in December 2009, up 36.7 thousand or 36.9% over the year. The claimant count rate in December 2009 stood at 4.9 per cent. This is up 1.3 per cent over the year. The UK claimant count rate in December 2009 was 5.0 per cent, but level over the year.

Unemployment data at the Scottish constituency level for December 2009 is available in a SPICe Briefing, with more recent figures available 17th February 2010.

The most recent figures for the number of employee jobs by industrial activity are detailed in Table 3. Employee job figures are a measure of jobs rather than people. Total seasonally adjusted employee jobs for the quarter ending September 2009 (the latest available figures) stood at 2,332 thousand. The number of jobs in the manufacturing industry has levelled out and remains at 203 thousand, and down 13 thousand against the same quarter one year earlier. The number of jobs in the service industry fell by 5,000 over the last quarter to 1,070 thousand, and there are now 34 thousand fewer jobs in the service industry than the same period ending a year earlier.

Table 4 provides some limited indications of the experience of unemployment in terms of claimant count by age and duration. Over the year the claimant count has risen by 33.0% (for the 18 - 24 age group by 31.0%, 25 - 49 age group by 33.1% and for the 50+ by 34.0%). The latest figures suggest that 18,600 have been claiming benefit for more than a year, up 10,000 over the year (up 116.7%), 7,300 18 - 24 year olds have now been claiming benefit for over 6 months and up to 12 months.

 Table 4: Claimant count by age and duration (computerised claims only) Numbers and percentage change over year to January 2010

	All computerised claims	Up to 6 months	Over 6 and up to 12 months	All over 12 months
All 16+ numbers	144,900	97,500	28,000	18,600
All 16+ % change over year	33.0	15.6	77.4	116.7
All 18 – 24 change in numbers (%) over year	9,700 (31.0%)	4,600 (16.9%	3,900 (114.6%)	1,100 (301.3%)
All 25- 49 change in numbers (%) over vear	19,600 (33.1%)	6,500 (14.9%)	6,500 (68.4%)	5,800
All 50 and over change in numbers (%) over year	5,600 (34.0%)	1,700 (14.1%)	1,800 (63.3%)	2,200 (108.8%)

Outlook

In the year to December 2009 the total in employment fell by 41,000 and unemployment rose by 65,000 to 206,000 but the numbers economically inactive fell by 3,000 over the year. In 2010 and 2011 the scale of job losses in finance and the public sector will become be clearer. A new government committed to a more rapid reduction in the fiscal deficit might lead to unemployment rising to higher than expected levels as might the 1% increase in employers' national insurance contributions scheduled for April 2011.

Pay restraint policies seem inevitable, but at this stage it is uncertain as to how widely such restraint will be accepted in the new climate of much more awareness as to pay and remuneration packages for senior executives in both the public and private sectors. As the recent report of the National Equality Panel notes 'Inequalities in earnings and income are high in Britain, both compared with other industrialised countries, and compared to thirty years ago.' (An Anatomy of Economic Inequality in the UK, Government Equalities Office. 2010). The report noted 'Income inequality in Britain has remained much higher than in the 1960s and 1970s; and on some measures it is the highest in last 50 years'. Such inequalities may well hinder efforts to introduce a period of pay restraint.

The employment landscape will change over the next few years, employment levels in the public sector are likely to decline, but the demand for services will remain high. More people will seek to work past retirement age as pension arrangements are perceived to be inadequate, but this trend will impact on measures to reduce youth unemployment. Differing patterns of migration will impact on the longer term Scottish problem, that of an aging workforce.

Endnotes:

¹The 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.

²The 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 February 2010

Economic | perspectives |

Issues on Calman tax proposals still unresolved

Jim Cuthbert Margaret Cuthbert

Introduction

The Commission on Scottish Devolution chaired by Sir Kenneth Calman delivered its report in June 2009. Among its recommendations on transfers of powers to the Scottish Parliament were a set of income tax proposals.

Following the publication of the Calman report (2009), we identified certain technical problems relating to these tax proposals. These were the subject of an open letter we sent to the Calman Commission in July 2009. This note begins with a review of the position on these technical problems, in the light of the publication of the Westminster Government's White Paper on Calman in November, (Cm 7738). Our conclusion is that, far from addressing the technical problems we had identified, the proposals in the White Paper in fact make one of these problems significantly worse. We also consider other significant issues relating to the potential effect of the proposed tax-sharing arrangements on the relations between the Scottish and Westminster governments, and to the potential utility of the new tax raising powers of the Scottish government as an instrument of fiscal policy. We conclude that both the original Calman report, and the White Paper, have failed to address these issues adequately.

Problems identified in original Calman proposals

The basic proposal on income tax in the Calman report can be summarised as follows. All income tax rates in Scotland would be reduced by 10p. At the same time, the Block Grant coming to the Scottish government would suffer a once and for all reduction equal to the amount which the 10p tax cut had cost the Whitehall Exchequer. The Scottish government would then be able to set its own rate of income tax, which would be levied as an addition to the reduced UK rate in Scotland. Hence, if the Scottish government set its rate at 10p, it would, at least initially, return its revenues to their original value. Note that the determination of the income tax bands themselves would remain under the control of Westminster.

What was the expected result of this change? In essence, the Commission was seeking to achieve greater financial accountability for the Scottish Parliament, while at the same time trying to strengthen the UK union. Under its proposal,

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the Scottish government would have to make a definite decision about what rate of income tax it would set. For the first time, the Scottish parliament would be accountable not only for how it spent its money but also for how it raised a major part of the money it wanted to spend. In criticising the existing Block Grant method of funding the Scottish Parliament, the Commission noted that the Parliament "has no fiscal powers that can be used as policy instruments and it does not have a direct financial stake in the performance of the Scottish economy": (Calman report, para. 3.87). We can reasonably assume that the Commission intended its proposal to remedy these defects.

In the open letter which we sent to the Calman commission in July 2009, we identified two technical problems with these proposals.¹ The first of these related to the possibility that there could be an undesirable outcome from the proposed new tax system in that, under certain circumstances, the income tax revenues coming to the Scottish government might move in a different direction to overall income tax revenues collected in Scotland. (As shorthand, we describe this situation as the possibility of an anomalous movement in tax revenues). The second technical problem related to the adverse effects which fiscal drag was likely to have, if the Calman proposals were implemented. We now consider these two problems in more detail.

Possible anomalous movements in tax revenues

Let us assume a Scottish government is operating under the income tax system as originally proposed by Calman. If the Scottish government sets the Scottish rate of income tax as x pence in the £, then it will receive a proportion $\frac{x}{(x + 10)}$ of

the basic rate income tax revenues collected in Scotland, (with corresponding proportions $\frac{x}{(x+30)}$ and $\frac{x}{(x+40)}$ for the

intermediate and highest tax bands respectively). Since $\frac{x}{(x+10)}$ is an increasing function of x, the Scottish

government will receive an increasing proportion of the overall basic rate revenues raised in Scotland, as it increases its tax rate x, (and similarly for the other tax bands). It will receive a decreasing proportion as it reduces x.

A number of different outcomes are possible. Suppose that the Scottish government reduces the Scottish rate of tax, and at the same time, overall income tax revenues in Scotland decrease. Then the Scottish government will be receiving a decreasing proportion of a decreasing total – so that the revenues coming to the Scottish government will clearly be reducing. In this case, the overall income tax revenues collected in Scotland, and those coming to the Scottish government, are moving in the same direction.

Suppose, however, that when the Scottish government decreases the Scottish rate of tax, overall income tax revenues collected in Scotland increase. Then the Scottish government will be getting a decreasing fraction of an increasing total. In these circumstances, it is not possible to say without further information whether the tax revenues coming to the Scottish government will be increasing or decreasing. But in principle, it is clear that, if the increase in overall tax revenues is not particularly large, then the amount of revenue coming to the Scottish government might decrease. That is, total income tax revenues, and the income tax revenues coming to the Scottish government, could move in different directions.

Annex 1 examines the algebra surrounding this situation in more detail. It identifies precisely when the anomalous effect of the Scottish government's income tax revenues moving in a different direction to overall income tax revenues collected in Scotland will occur. The relevant conditions derived in Annex 1 are summarised here:

Within the basic rate band of income tax: if the effect of a unit decrease in the income tax rate in Scotland is to increase the overall income tax revenues from the basic rate, but by less than 5%, then the revenue coming to the Scottish government from the basic rate band will decrease.

Within the higher rate bands: if the effect of a unit decrease in the income tax rate in Scotland is to increase total revenues, but by less than 7.5% for the 40% band, or 8% for the 50% band, then the revenue coming to the Scottish government from the relevant band will decrease.

Two questions therefore become very relevant:

- a) Would it matter if a Scottish government found itself operating in a position where this anomaly held?
- b) How likely is it that the conditions for this anomaly to hold will actually be met?

As regards the first question, we argue that it would matter a great deal if a Scottish government found itself in this position. Suppose that total income tax revenues could be increased by a reduction in the Scottish rate of tax, probably supported by other stimulatory measures. If, however, the tax elasticities were such that the anomaly held, then the Scottish government would have to reconcile itself to suffering a permanent reduction in its own revenues if it wanted to stimulate the Scottish economy by lowering taxes - even though the Whitehall exchequer would benefit from increased revenues. More realistically, at a time of stringent pressure on its finances, a Scottish government operating under these conditions could well find itself forced to raise its tax rates to boost its own revenues - at the expense of deflating the Scottish economy, and also at the expense of the Whitehall exchequer. So if the anomalous conditions actually held, the Scottish government could be forced into actions which were perverse - both from the point of view of the Scottish economy, and of the Whitehall exchequer. By contrast, if the tax elasticities were exactly the same, but the Scottish government's income tax revenues always moved

in the same direction as total income tax revenues raised in Scotland, then a Scottish government could lower its tax rate - to the benefit of the Scottish economy, its own revenues, and the UK exchequer.

This then makes the second question very important. Are the conditions of the Calman anomaly so unlikely that the possibility of their occurring can be discounted: or is there a significant chance that these conditions could actually hold? We do not have a definitive answer to this question, but the following points are relevant.

- a) There is little or no experience of this particular situation. What is relevant is what happens to tax revenues in Scotland, when the income tax rate in Scotland is varied, with the tax rate in the rest of the UK remaining fixed. This is a situation which has never been met with before in the UK.
- b) In practice, a Scottish government would probably deploy a package of measures, as well as a cut in the Scottish rate of income tax, if it were trying to stimulate the economy. Such measures might include, for example, cuts in non-domestic rates, or in water prices. So the relevant question is not what happens to total income tax revenues in Scotland when tax rates are varied while everything else is held constant, (which is the conventional Laffer curve), but what the response would be to an overall stimulus package.
- c) Without attempting an overall literature review, it is relevant to note one piece of evidence. This is the paper by Gagné, Nadeau, and Vaillancourt, (2000), which suggests that in Canada the response to income tax rate changes at the provincial level could well have a negative elasticity in the higher rate tax bands.

Overall, the view we take is that a stimulus package for the Scottish economy, including a reduction in income tax rates in Scotland relative to England, might boost the Scottish economy sufficiently to produce a modest increase in total income tax revenues in Scotland. Given this, we argue that a precautionary principle should be adopted in designing any new taxation system: so that whatever income tax arrangements are eventually implemented for the devolved Scottish government, there should be no possibility of total income tax revenues, and the income tax revenues coming to the Scottish government, moving in opposite directions. The original Calman proposals fail this test. We set out later, for interest, a modification of the Calman proposals which would avoid the problem.

Effects of fiscal drag

If the Scottish government sets a tax rate of around 10p, then it will receive approximately 50%, 25%, and 20%, respectively of the total tax revenues raised in Scotland from the basic rate, intermediate, and highest rate bands. These widely differing proportions would, in practice, give rise to the following two problems:

- a) Because of the effects of fiscal drag, there is likely to be a consistent shift through time in the proportion of overall tax revenues raised from the different bands. Combined with the differing proportions of revenues coming to the Scottish government within each band, this will then lead to a consistent trend in the tax revenues going to the Scottish government, over and above any trend in overall tax revenues. Since the effect of fiscal drag is usually to increase the proportion of tax raised at the higher bands, (from which the Scottish government receives a smaller proportion of the revenues), the expected outcome is that there would be a declining trend in the overall proportion of tax revenues in Scotland actually coming to the Scottish government.
- b) Secondly, whenever the UK government, which is in charge of the UK income tax system, changed the tax thresholds or the structure of the system, there would be a shift in the relative amounts of tax collected in the different bands – and hence, a change in the amount of tax allocated to the Scottish government. At the very least, this would open the Scottish government to the danger of unpredictable and unplanned changes in its tax revenues. At its worst, this situation could be manipulated deliberately by a UK government, if it wished to trim the resources going to the Scottish government. Either way, the Scottish government would be placed in an insupportable position.

A modification to the Calman proposals which would avoid the above problems

In our open letter, we derived conditions which a tax sharing system of the Calman type would have to satisfy, in order to ensure that both of the difficulties identified in the preceding section were avoided. The argument is as follows.

Annex 2 derives the conditions under which, for a general class of tax sharing systems, total tax revenues, and the revenue going to the Scottish government, will always move in the same direction. In words, the key requirement is that, in any tax band, if overall tax revenues drop as the Scottish tax rate increases, then the percentage increase in the share of tax revenues going to the Scottish government should be smaller than the percentage decrease in overall tax revenues. But since the potential decrease in tax revenues (if any) resulting from an increase in the Scottish tax rate is unknown, the only way that it can be guaranteed that the condition will always be met is if the percentage increase in the share of tax revenues going to the Scottish government is zero: that is, within each tax band, if the tax sharing system gives the Scottish government a fixed share of the tax revenues raised in Scotland in that band.

The circumstances under which the fiscal drag problem will be avoided are that the percentage share of the tax revenues from each tax band going to the Scottish government must be the same.

The implication is that, if both the problem of anomalous revenue movements, and the problems associated with fiscal drag, are to be avoided, then the Scottish government should receive a fixed percentage share of the overall income tax revenues raised in Scotland.

Hence a tax sharing system which would always avoid both problems would involve the Scottish government setting its own rate of tax, (as proposed by Calman), but the Scottish government then receiving the same, fixed, percentage share of overall income tax revenues collected in Scotland.

Note that, while this modification of the Calman proposals would solve the identified technical problems, we are not ourselves advocating that this modification should be implemented, for the following reason. Under the modified Calman system, a decision by the Scottish government to change the Scottish rate of income tax would clearly have a direct impact on the revenues received by the UK government: and conversely, any change in tax rate by the UK government would have a direct impact on the revenues of the Scottish government. Successful operation of this system would thus require that the UK and devolved governments were willing to operate in a collegiate manner - being appreciative of, and respecting, the impact that their own actions will have on the revenues of the other parties. The implication is that a successful tax sharing system would have to involve a more federal way of working than is the current practice in the UK. It would be a mistake to introduce such a system unless all the potential ramifications of this had been clearly thought through in advance. (Note that the Calman proposals themselves would have an effect on UK tax revenue, but this would be a second order, rather than a first order effect.)

The White Paper on Calman of 25th November

On 25th November 2009, the UK government published its White Paper with its proposals for taking forward the Calman recommendations. As regards income tax, the White Paper proposed that the Calman recommendations should be implemented virtually in their original form. There is, however, one important exception, which we discuss in this section. This relates to the transitional arrangements proposed in the White Paper. These would in fact have a very significant effect on the operation of the tax sharing system – and in a way which makes the potential for anomalous revenue movement much worse. It is fair to say that the implications of the White Paper's transitional arrangements seem to have escaped general comment.

The transitional arrangements are described in paragraphs 4.18 and 4.19 of the White Paper. It is stated there that the Calman proposals on income tax will need to be phased in carefully "at a time of major fiscal adjustment and economic uncertainty". During the phasing in period, the adjustment to the Block Grant will not be done on a one off basis, but will be calculated afresh for each new Public Expenditure

spending review – that is, every three years. The UK government would forecast tax receipts from Scottish taxpayers for the three years of each spending review, and a sum equivalent to a 10p reduction in the rate of income tax would then be subtracted from the Scottish Block Grant for each of these years.

The White Paper puts no specific time limit on the operation of these transitional arrangements, but says that there would be a move towards the full model proposed by Calman as soon as economic and fiscal circumstances permitted.

Given that current economic uncertainties look set to persist for the foreseeable future, it seems likely that the transitional arrangements would operate for a significant length of time.

Suppose that the transitional arrangements are in operation, and that a Scottish government reduces the Scottish rate of income tax below 10p to, say, 8p. When the Westminster government next comes to adjust the Scottish Block grant, it will subtract from the original Scottish Block grant an amount equal to the estimated yield of a 10p income tax rate in Scotland. Assuming the Westminster government is accurate in its estimate, this will be a larger amount than what the Scottish government gets back from the lower Scottish tax rate it has set. In other words, under the arrangements set out in the White Paper, if the Scottish government reduces its tax rate below 10p, it will always suffer financially. This would happen even if the reduction in the Scottish tax rate was part of a successful package to stimulate the Scottish economy, as a result of which overall income tax revenues in Scotland actually went up.

Conversely, if the Scottish government raises the Scottish income tax rate above 10p, then the Scottish government will always benefit financially – even if the effect of the tax rise had been to damage the economy, leading to a reduction in overall income tax revenues collected in Scotland.

In fact, a stronger result can be proved about the effect of the transitional arrangements. It is not just the case that a Scottish government is worse off by cutting its tax rate below 10p relative to what it would receive if it set a 10p rate: and vice versa if it set a rate above 10p. The stronger result also holds that, for all tax rates which are likely to be feasible in practice, the slope of the curve relating the Scottish government's revenues to the Scottish rate of income tax is positive. This result is proved in Annex 3. It can be seen from the Annex that the conditions under which this result holds are so general as to justify our assertion that the result holds for all feasible tax rates.

What this result means is that, under the transitional arrangements, the Scottish government will always face what is in effect an upward sloping Laffer curve, for any feasible tax rate it might consider setting. The first technical problem we identified with the original Calman proposals

has now actually become much worse. Previously, if the elasticity of overall income tax revenues was sufficiently negative there was still a chance that the elasticity of Scottish government revenues might be negative too. Under the Calman transitional arrangements, there is no such chance.

It is unclear what effect the transitional arrangements have on the second technical problem we identified, relating to fiscal drag. Under one scenario, however, the effect can be predicted. Suppose that both the unadjusted Block Grant, and total income tax revenues collected in Scotland, were rising in line with inflation. Suppose also that the yield of a 10p tax rate in Scotland represents a decreasing proportion of total tax revenues, because of fiscal drag. Then a Scottish government which set a 10p tax rate in the absence of the transitional arrangements would see its revenues rising more slowly than inflation: whereas with the transitional arrangements in place, its revenues would rise in line with inflation. Under this scenario, therefore, the transitional arrangements do indeed overcome one of the major problems associated with fiscal drag. However, this particular scenario is relatively unlikely. Under other, more complicated scenarios, it is not clear what the effect of the interaction of fiscal drag and the transitional arrangements would be.

Important issues not addressed in either the Calman Report or the White Paper

In the section above where we derived a modification to the Calman proposals which would avoid the identified technical problems, we expressed caution about implementing this change, because of the implications it would have for the relations between the Scottish and Westminster governments. This issue, however, is not just confined to this particular modification of Calman. Any system of tax sharing, including the original Calman proposals themselves, is going to have an effect on the relationship, and mode of working, between the different layers of government involved. The Calman report did indeed recommend that the liaison arrangements between the Westminster and Scottish governments would have to be strengthened, in the light of their proposals on tax sharing. But they did not analyse in detail the specific tensions and pressures which the new system would be subject to: hence it is not clear whether Calman's specific proposals on improving liaison would be able to cope.

Among important questions which need to be addressed are the following. Would implementation of the original Calman proposals, (leaving aside their technical flaws), result in fundamental shifts in the relations between the different parties which would institute a dynamic for further change? Is it possible to implement a tax sharing system which is technically acceptable, without moving to something akin to a federal system? These are fundamental questions, which the Calman report, and the White Paper, signally failed to address.

Another important set of questions which were similarly neglected in both the Report and the White Paper relates to how effective the proposed tax varying powers would be as a tool which the Scottish government could use in economic management, and fiscal policy. As we have already noted, the lack of such tools was one of Calman's criticisms of the existing block grant arrangements: and it is reasonable to assume that the Calman Commission hoped that their proposals would remedy this lack. Despite this, neither the report nor the White Paper pay any attention to examining the question of whether their proposed tax varying powers would constitute an effective economic management tool for the Scottish government. In fact, our analysis above suggests that there is a grave risk that the proposed powers would have perverse effects which could gravely damage the Scottish economy - this being particularly the case for the White Paper transitional arrangements. The implication is that the proposed powers would be worse than useless as tools of economic management. We find it very surprising that Calman, having identified the need for fiscal powers that could be used as policy instruments, and for the Scottish government to have a direct financial stake in the performance of the Scottish economy, paid no attention to the question of whether the proposed changes actually fulfilled these requirements. If the Calman Commission had considered this topic, it seems likely that they would have discovered for themselves the anomalous effects, and likely adverse implications for the Scottish economy, which are implicit in their proposals.

If the questions identified in this section are not addressed, and likewise, if the identified technical problems are not rectified, then implementation of the Calman tax proposals could rapidly prove very unsatisfactory for all the parties concerned. This could, paradoxically, weaken the existing union – quite counter to Calman's stated aim of introducing change which would actually strengthen the union.

Conclusions

We draw three main conclusions from the above.

1. The transitional arrangements introduced in the White Paper make the first of the technical problems identified in our open letter significantly worse. The effect is that, with the transitional arrangements in operation, the curve relating the revenues a Scottish government will receive to the Scottish rate of income tax will always be upward sloping. Even if a Scottish government were able to stimulate the Scottish economy by a combined stimulus package involving income tax cuts, and even if this had the effect of increasing overall income tax revenues in Scotland, its own revenues would reduce. Conversely, under the transitional arrangements, a Scottish government could always increase its revenues by raising the Scottish rate of tax, even if this meant severe deflation of the Scottish economy, and a reduction in overall income tax revenues in Scotland. These effects are so perverse, that we argue it would be disastrous if

the White Paper on the Calman proposals on income tax were implemented as they stand.

- 2. The complete absence from the White Paper of any discussion of technical issues relating to tax, and the introduction in the White Paper of transitional arrangements, without any apparent appreciation of the significant effects these would have, both indicate an altogether inadequate level of technical treatment in the drafting of the White Paper. We conclude that any serious attempt to reform the taxation arrangements for the Scottish government should proceed on the basis of a much more informed level of technical discussion. A cynic might say that the absence of consideration of technical issues in the White Paper is more of a political document, rather than a serious attempt to reform the taxation arrangements for devolution.
- 3. The Calman report, and the subsequent White Paper, are alike deficient in the limited attention they pay to analysing the effect which the introduction of their proposals on taxation would have on the way in which the different levels of government interact. There are fundamental questions here which need to be addressed in much more detail. In particular, it is not clear whether it would be feasible to devise a workable system of tax sharing without moving towards a more federal system of government. Similarly, both documents neglect the important question of how effective the proposed tax varying powers would be as a tool which the Scottish government could use in economic management, and fiscal policy. We conclude that any attempt to reform the tax arrangements for devolution should involve a much more detailed assessment of such issues.

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Endnotes

¹(The text of our open letter, together with subsequent correspondence with the Scotland Office, can be found at <u>www.cuthbert1.pwp.blueyonder.co.uk</u>).

Annex 1: The conditions under which anomalous movements in tax revenues occur

Suppose that the original Calman proposals on income tax are in operation.

The basic rate is considered first.

Let T(y) = total basic rate tax revenues in Scotland, when tax levied at rate y:

let f(x) = basic rate revenue going to the Scottish government, when it sets its tax rate at x.

Now when the Scottish government sets its tax rate at x, it will, to a good approximation, receive a proportion $\frac{x}{(10+x)}$ of the

basic rate revenues raised in Scotland when the aggregate rate is (10+x). So the fundamental relationship between f and T is that

$$f(x) = \frac{x}{(10+x)}T(10+x)$$

The anomalous condition that we are interested in occurs, by definition, when the slopes, (that is, the first derivatives), of f(x) and T(10 + x) have opposite signs.

Differentiating with respect to x, we can see that

$$f'(x) = \frac{x}{(10+x)} T'(10+x) + \frac{10}{(10+x)^2} T(10+x)$$
$$= \frac{1}{(10+x)} (xT'(10+x) + \frac{10}{(10+x)} T(10+x))$$
(1)

It follows from expression (1) that $f'(x)>0\,$ whenever $T'(10+x)>0\,$: so the anomaly can never occur when $T'(10+x)>0\,$

It also follows from (1) that

$$f'(x) > 0 \quad \ \ \text{if and only if} \quad (\ xT'(10+x) + \frac{10}{(10+x)}T(10+x)\) > 0\,,$$

that is,

if and only if

$$T'(10+x) > \frac{-10}{x(10+x)}T(10+x)$$

This implies that the anomaly will occur if, and only if,

$$0 > T'(10+x) > \frac{-10}{x(10+x)}T(10+x)$$

Looking at the key "starting position" of x=10 in more detail, it is possible to identify more precisely the conditions under which the anomaly will occur: namely,

if and only if

$$\begin{array}{rl} & 0 > T'(10+10) > & \frac{-10}{10(10+10)} T(10+10) \\ & \text{that is if and only if} & 0 > \frac{T'(20).100}{T(20)} > \frac{-100}{20} = -5 \end{array}$$

The term in the middle of this last expression is approximately the percentage change in overall basic rate tax revenues in Scotland, resulting from a 1p increase in the tax rate: (this can be seen on taking the first two terms in a Taylor expansion). So the anomaly will occur if a 1p increase in the tax rate in Scotland leads to a reduction in total basic rate revenues collected, but a reduction which is less than 5%. An alternative way of expressing the same condition is that a 1p reduction in the tax rate leads to an increase in revenues collected at the basic rate, but an increase which is less than 5%. This is the form of the condition quoted in the text of the paper.

The algebra for revenues coming from the higher rate tax bands is similar, but the numbers are different. Let H(y) represent total tax revenues in Scotland from the middle tax band, (currently the 40% tax band), when tax is levied at rate y: then what the

Scottish government gets from this tax band, when it sets its tax rate at x, is $\frac{x}{(30+x)}H(30+x)$. A similar argument to the

above shows that the critical threshold in this case is 7.5%, (as compared to 5% for the basic rate tax band). Similarly, for the highest rate tax band, (currently 50%), the critical threshold is 8%.

Annex 2: The conditions under which a general tax sharing system will avoid the anomaly

Consider the basic rate.

As in Annex 1, let T(y) = total basic rate tax revenues in Scotland, when tax levied at rate y: let f(x) = basic rate revenue going to the Scottish government, when it sets its tax rate at x. Consider a general tax sharing system, defined by the relationship

$$f(x) = a(x) T(10+x) + c$$
,

where a(x) is the proportion of overall basic rate tax revenues going to the Scottish government when it sets its tax rate at x, and c is a constant, (which could be zero).

It is reasonable to assume $a'(x) \ge 0$.

Again, we are interested in the slope or first derivative of f(x). Now,

$$f'(x) = a(x) T'(10 + x) + a'(x) T(10 + x)$$

f'(x) = a(x) T'(10 + x) + a'(x) T(10 + x),Since

it follows that f'(x) and T'(10+x) will have the same signs if either

 $T'(10+x) \ge 0$, or (i)

(ii)
$$T'(10 + x)$$

T'(10+x) < 0, and a(x)T'(10+x) + a'(x)T(10+x) < 0, that is, if $T'(10+x)\,<\,0\,$, and $\frac{a'(x)}{a(x)}\!<\!\frac{-\,T'(10+x)}{T(10+x)}$.

In words, these conditions mean that the anomaly will not occur if the effect of an increase in the rate of tax is to increase total revenues collected in Scotland: or if the effect of an increase in the rate of tax is to reduce revenues collected, while at the same time the percentage increase in the proportion of income tax revenues coming to the Scottish government is smaller than the percentage decrease in overall revenues.

Annex 3: Under the White Paper transitional arrangements, the slope of the curve relating the Scottish Government's revenues to the Scottish rate of income tax is positive, for all feasible tax rates.

For simplicity, we ignore for the present the higher rates of tax. As in the previous annexes, let T(y) = total basic rate tax revenues in Scotland, when tax is levied at rate y.

Let B = block grant which would have come to Scottish government, if the tax sharing arrangement in Calman had not been implemented. (Both B and T will also be functions of time: but for the purposes of the present argument, we lose nothing by omitting the time variable.)

Let f(x) now represent the total revenues coming to the Scottish government, from both the block grant, and via its share of income tax, assuming the White Paper transitional arrangements are operational, when the Scottish rate of tax is x. Then, if the Westminster government is accurate in its estimate of how much 10p accounts for out of the total tax take in Scotland, what the Scottish government will receive will be B, reduced by the transitional adjustment of 10/(x+10) of T(10+x), plus the amount raised by the Scottish rate of tax, which is x/(x+10) of T(10+x). Thus,

$$f(x) = B + \frac{(x-10)}{(x+10)}T(10+x)$$
(2)
ce $f'(x) = \frac{(x-10)}{(x+10)}T'(10+x) + \frac{((x+10)-(x-10))}{(x+10)^2}T(10+x)$

Hen

$$=\frac{1}{(x+10)}[(x-10)T'(10+x)+\frac{20}{(x+10)}T(10+x)]$$

Looking at the expression within the square brackets, there are then four different cases to consider, as follows: (a) If T'(10+x) > 0, and if x > 10: in this case, f'(x) > 0 always.

(b) If $\,T'(10+x)\!>\!0$, and if $\,x\!<\!10\!:$ in this case, $\,f'(x)\!>\!0$

if and only if $[(x - 10)T'(10 + x) + \frac{20}{(x + 10)}T(10 + x)] > 0 ,$ if and only if $\frac{T'(10 + x)}{T(10 + x)} < \frac{-20}{(x - 10)(x + 10)} = \frac{20}{(100 - x^2)}$ (3)

But the function on the right hand side of this expression is an increasing function of x on the range (0, 10). So condition (3) will always be satisfied if $\frac{T'(10+x)}{T(10+x)}$ is less than the value of the expression on the right evaluated at x=0. But the value of the

expression at x=0 is 0.2. So if the percentage increase in total basic rate tax revenues raised in Scotland stemming from a unit increase in the tax rate is less than 20%, (which under any feasible scenario will always be the case), then the implication is that f'(x) will indeed be positive in case (b).

(c) If T'(10+x) < 0, and if x < 10: in this case, f'(x) > 0 always. (d) If T'(10+x) < 0 and if x > 10, in this case, f'(x) > 0

(d) If
$$T(10+x) < 0$$
, and if $x > 10$: in this case, $T'(x) > 0$

if and only if
$$[(x-10)T'(10+x) + \frac{20}{(x+10)}T(10+x)] > 0 ,$$

if and only if
$$\frac{T'(10+x)}{T(10+x)} > \frac{-20}{(x-10)(x+10)} ,$$

if and only if
$$\frac{-T'(10+x)}{T(10+x)} < \frac{20}{(x^2-100)}$$
(4)

But the function on the right hand side of this expression is a decreasing function of x for x>10. So condition (4) will always be satisfied for x in the range 10 < x < 15, say, if $\frac{-T'(10+x)}{T(10+x)}$ is less than the value of the expression on the right evaluated at

x=15. But the value of the expression at x=15 is 0.16. So if the percentage decrease in basic rate tax revenues stemming from a unit increase in the tax rate is less than 16%, (which under any feasible scenario is always likely to be the case), then the implication is that f'(x) will indeed be positive in case (d), at least for all x in the range 0 < x < 15. It would appear very unlikely that a Scottish government would ever set a Scottish rate of tax which is more than 5p higher than the rate in the rest of the UK.

In each of the four possible cases, therefore, f'(x) > 0 either without any further conditions, or under conditions which are always likely to be met in practice. This justifies our assertion that f'(x) > 0 for all feasible tax rates.

The above proof has been given for the basic rate case. Essentially the same argument goes through, and the same conclusions apply, for the intermediate and higher bands, with the following changes:-

The relevant terms in formula (2) become $\frac{(x-10)}{(x+30)}H(30+x)$ and $\frac{(x-10)}{(x+40)}G(40+x)$ for the intermediate and highest

rate bands respectively, where the functions H and G represent total revenues at these bands.

In case (b), the figure of 20% for the basic rate becomes 13.3% for the intermediate rate, and 12.5% for the highest rate. In case (d), the figure of 16% for the basic rate becomes 17.7% for the intermediate rate, and 18.2% for the highest rate.

Summary paper on the 'carbon accounting' methodology applied to the assessment of the Scottish Government's 2010-11 budget

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The views expressed here are the authors' own, and are not necessarily the views of the Scottish Government. The full report detailing the results obtained from this assessment can be found at: http://www.scotland.gov.uk/Publications/2009/09/17102339/0.

The authors would like to thank participants at the SIRE Environmental and Energy Economics Workshop at Herriot Watt University on 4th December 2009, participants and the discussant, Prof. Kim Swales, University of Strathclyde, at the SIRE Policy Forum at the University of Edinburgh on 25th January 2010, and numerous colleagues who have provided useful comments and suggestions on earlier drafts of this paper.

Abstract

Hailed by WWF Scotland as a "World First", the Scottish Government in late September 2009 published a Carbon Assessment of their draft 2010-11 budget. Undertaken a year in advance of this assessment becoming a statutory requirement under the Climate Change (Scotland) Act 2009, this exercise produced some interesting results and generated a lot of interest. This article is intended to provide an overview of the exercise that was undertaken, and to highlight and address some outstanding issues that surround the assessment.

Introduction

In an address to the Scottish Parliament on 23rd January 2008 announcing his draft budget for 2009-10, John Swinney MSP, Cabinet Secretary for Finance and Sustainable Growth, outlined his proposals to produce

estimates of the green house gas (GHG) embodied in Scottish Government budget spending. "It is a carbon assessment tool that can be applied across all Government spending in Scotland. Taking account of carbon impacts is already part of the best-value duty and it is an auditable requirement in the public sector, but the new carbon assessment tool will be applied to all Government spending in Scotland.¹" There was already by this time, and continued to be thereafter, a substantial amount of work undertaken to fulfil this commitment.

The consultants PricewaterhouseCoopers were commissioned by the Scottish Government to undertake the initial assessment to determine the best tools to employ in producing a reasonable estimate of the Carbon that is 'supported' through the spending contained in the draft budget. Following consultations and an expert workshop held in November 2008, it was decided that the best methodology to employ in the 2010-11 assessment would be to use an environmentally augmented Input-Output (EIO) analysis. In evidence to the Scottish Parliament's Transport, Infrastructure and Climate Change Committee on 29th September 2009, Dr Thomas Wiedmann- Director of the Centre for Sustainability Accounting, and research associate of the Stockholm Environment Institute at the University of York, commented that the methodology employed in the High Level Carbon Assessment was "exactly the right one".² however he cautioned that care needed to be taken in interpreting the results of the assessment. The reason for this qualification will become clearer as we proceed through this article.

The full details of the methodology employed can be found in a paper entitled "Outlining the methodology and issues involved in the Carbon Assessment of the Scottish Government budget for 2010/11"

http://www.scotland.gov.uk/Publications/2009/09/17102339/ 10. The purpose of this article is to give a brief overview of the issues involved, and to highlight some of the criticisms and reactions to the assessment.

The models used

Two separate Input-Output models were utilized in the Carbon assessment of the budget. The first model was an open economy 123-sector Input-Output model for Scotland, augmented with UK emissions intensity data to create an EIO model. The UK pollution intensities that were applied were the GHG intensity of a unit of each sectors output in the UK economy. These GHG-Output coefficients that were calculated were then inflated to the base year of the proposed budget spend (2010-11) using HM Treasury inflators.³ It is worth noting here, that UK GHG intensity data was utilized throughout this assessment due to the lack of comprehensive Scottish GHG data in a form that is compatible with the Input-Output system.

The second model used was a closed economy 123-sector UK Input-Output model. A UK rather than a Scottish closedeconomy model was chosen because the UK economy (and

hence IO model) is broader and therefore more reflective of a world model. For example there are sectors that are not present in the Scottish IO model or economy, such as the tobacco sector, whereas the UK model is broader and encompasses many of the sectors and industries that the Scottish IO system, and hence economy, lacks. Without the utilization of this second closed economy IO model, the first (Scottish) open economy model would not have captured the imports and hence the emissions embodied in imports required to meet the Scottish Government final demand represented in the budget. As a result, the EIO would have underestimated the emissions embodied in the Scottish Government's proposed 2010-11 budget. The methodology applied here in respect of the closed economy model is similar to that adopted by Wiedmann et al (2006) and the interested reader is pointed to their paper for a fuller outline.

The entire analysis was carried out using the Type I and Type II Scottish open-economy and Type I UK closedeconomy Leontief Inverses. The distinction between Type I and Type II Leontief analysis is important. Type I Leontief Inverses treat Households as a category of final demand and thus as an exogenous driver of the Input-Output system. Using Type II Leontief Inverses means that we treat Households as a production sector, using their consumption demands as their inputs and their labour services as their outputs. This type of analysis allows us to consider and calculate what is referred to in the literature as the 'induced emission effects'. That is, given that households receive remuneration for their labour services and then use that remuneration to purchase goods and services, and that this gives rise to the pollution being emitted to meet these consumption demands, we can calculate the emissions that are induced through the initial demand for labour services. In this case, these would be the emissions that result from households employment to meet Scottish Government consumption demands.

Running this model required asking the same question of both of these Input-Output systems: what would the direct, indirect (and in the case of the Scottish domestic model the induced) output/emissions generated by an additional spend of X on the output of a particular industry be? In order to do this within the EIO framework, each spending line in the draft budget (at the chosen level of disaggregation) had to be mapped to a single IOC industry category. (The IOC categories are based on the Standard Industry Classification (SIC) scheme which classifies all the industries in the economy by type, and covers all categories of industry in the economy).⁴ This was done under the pragmatic principle of assigning each spending line to the IOC industry category of the recipient industry. This is not an exact process and there is necessarily an element of approximation in this aspect of the analysis.

Since the EIO employed was an extension of the UK and Scottish IO tables, and the standard 123 industry tables were available for the UK closed economy model and 126 sector tables were available for the Scottish domestic model, these were used in full for the initial analysis. However as with all IO analyses some aggregation was needed to reconcile the economic Input-Output models with the available environmental data, this reduced the resolution of the analysis. There are inescapable difficulties that occur in using this methodology, some of these were subsequently addressed through adjustments to the core methodology and these are discussed later in this article, others are simply unavoidable issues that always occur in the application of the EIO methodology and must be borne in mind by the reader.

The traditional criticism of the use of this type of demand driven framework for modelling analysis is that it assumes that there are no supply constraints. In other words, given that the Input-Output system embodies the interrelations and industrial linkages of the economy in a particular year to meet a particular level of final demand, it is likely to be the case that the composition of the economy would change if it were required to meet a different level of output. Examples of this would include the exploitation of economies of scale by a particular sector, if say, it were faced by an increase in demand for that sector's output. In this case though we are not asking these models to assess the impact of an entirely new increase in final demand, since the total managed expenditure in the Scottish Government budget (which is included in the existing Scottish IO framework) has been fairly consistent, rising from £27.7 billion in 2005-06 to £33.1 billion in 2008-09. So, while this criticism is still important, it applies more to dynamic modelling questions, and is of less of a concern when looking at the emissions impact of actual demand.

Transportation spending and emissions

On the day that the report itself was published, the immediate concern was that it omitted the environmental impact of people using the new roads that the government's budget was planning to build. To explain, assume that the government earmarked money in the budget to build a new road. The high level assessment that was carried out would include an estimate of the environmental impact of the materials purchased and used in the construction, other expenditure on the actual construction of the road and the impact deriving from the spending of the wages earned by the workers as a result of the construction of the road, but not the use of the road by motorists. This omission has been criticised. However these impacts are not, strictly speaking, totally omitted. The misunderstanding here derives from a lack of clarity over what Input-Output analyses does. The high level EIO analysis **does** include some of the emissions from the use of roads- as distinct from the construction of roads- through the induced emissions effect that operates through the impact on household income of Scottish Government spending.

Consider it like this. People don't just drive their cars (and hence emit pollution) because roads are built or exist – although it does seem likely that we would drive much less if there were no roads! People drive because they need to,



Figure 1: Domestic emissions (direct + indirect + induced) by industrial sector (with all local government spending treated as IOC 115)

Figure 2: Domestic emissions (direct + indirect + induced) by industrial sector (with the 'General Revenue Grant' and 'Non-Domestic Rate' expenditure on local government disaggregated into 5 separate IOCs)



Chart 1: Estimated domestic and imported GHG emission of tonnes of CO2 equivalent) by portfolio and generating industry. Scottish Government Draft Budget 2010/11



Domestic (direct, indirect and induced) and imported GHG emissions (thousands of tonnes of CO2 equivalent)

but also because they can afford to. If the government builds a new road people may drive more than before, if say it cuts journey times. However car ownership and distance travelled increase primarily with increases in income.⁵ The 'household' environmental impacts, which in this case derive from the household spending the income they will receive from the proposed Scottish Government budget, are estimated and included in this assessment. This includes household expenditure, and hence emissions, associated with their transportation demands. So the economy wide 'induced' effect of Government spending, which supports emissions indirectly by paying households for their labour which households then spend on goods and services - the production of which causes pollution - **is** included here

It could be argued that the Scottish Government ought to take into account the effects of its actions (in improving infrastructure) on the behaviour of the entire country, or of every user of that infrastructure. That would require its own distinct analysis of the environmental impact of these improvements in infrastructure. However it is important to point out that in terms of responsibility, the high level assessment of the Scottish Budget does include the environmental impact of the Scottish Government spending on labour services (employees- both civil servants and those employed by businesses that provide goods and services to the Scottish Government) based as with this entire analysis on UK GHG economy wide average data.

The budget analysis should perhaps be augmented with this type of individual level assessments, and indeed this is a point for development that is acknowledged in the report itself, but it is incorrect to say that it does not include the environmental impact of the Scottish Government's budget in supporting road use - it does, but only that element of it that it directly supports through household income and employment. As Dr Wiedmann pointed out to the TICC Committee, in this entire exercise "there is a sharedresponsibility perspective, in that the assessment shows the emissions that an activity generates, but the actors who produce those emissions are throughout the economy-they are industry and consumers." ⁶ This encapsulates an important point about the assessment - that it is an evaluation of the Scottish Government's impact on what is ultimately a shared responsibility across the Scottish economy.

Other adjustments made

There were several tweaks to the standard methodology that were applied in the case of particular items of expenditure. This was done to increase the resolution of the analysis and to try to make the analysis as robust as possible. Here we simply summarise the main adjustments that were made to the standard methodology outlined above. The first item that was adjusted was the categorization of the block grant payments to local authorities contained within the budget. These two transfers, the General Revenue Grant (£8.4bn) and Non-Domestic Rates (£2bn), could simply have been classified in the analysis under IOC 115 (Public Administration), as the closest industry classification for these spending lines.

However using the Scottish input-output tables for Scotland, specifically the Local Authority final demand column, these spend lines were split proportionally over the categories of Local Authority final demand. This increased the resolution of the analysis by considering these spending lines as more than block transfers, but as actual spending by local authorities on goods and services. The effect of this disaggregation is shown below. Figure 1 shows the breakdown with all Scottish Government spending put through as IOC 115 "Public Administration", while Figure 2 shows the emissions breakdown with expenditure on Local Authorities disaggregated into the local authority final demand IOC's. It is clear that this disaggregation changes the composition of emissions supported by Scottish Government transfers to local authorities. The overall emissions levels supported by this expenditure changes as a result of this disaggregation from 4.3 MT of CO2 equivalent to 4.6 MT of CO2 equivalent, an increase of nearly 7%.

Other adjustments were made to the high-level assessment. For example, capital spending lines in the budget were 'top sliced' to account for the proportion of capital spending that were estimated to be spent outwith Scotland- this used gross fixed capital formation imports estimates that are calculated as part of the construction of the Scottish Supply and Use Tables. This was to make the assessment better reflect the emissions that the Scottish Government's consumption supports within Scotland. This top slicing occurred only in the vector applied to the Scottish EIO, not the UK Closed Economy EIO for obvious reasons.

The final adjustment that we will cover here was an adjustment made to all the capital spending lines of the budget. Whilst it is correct to assign revenue spending to the industry receiving the money in a final demand model, when dealing with capital spending (which is itself a final demand category within IO tables) it is not appropriate to do so. In a similar way to the Local Authority disaggregation outlined above, all the capital spending lines in the budget were disaggregated over a number of IOCs. Applying the methodology outlined at the start of this paper would have resulted in many of these spending lines being linked in the EIO with IOC 115 (Public Administration) which would have resulted in large amounts of the capital spend being considered (within the EIO) as being spent on items that were not sensible destinations for capital spending, like IOC 98 'Postal and courier services'.

Instead each capital spending line in the budget was disaggregated across the sectoral destination of Gross Fixed Capital Formation (GFCF) spending using *underlying* Gross Fixed Capital Formation estimates (used in the construction of the Scottish Supply and Use Tables to construct the GFCF columns of the Scottish combined use matrix). These underlying data estimate the types of capital

purchases across 29 industry categories. For capital spending items the IOC assigned to the spending line is mapped to one of these 29 broad industry capital spending patterns and the amount allocated across all 126 IOCs accordingly. As would seem reasonable this tends to result in these capital amounts being run through the EIO (mostly) on the construction, computer services and motor vehicles industries.

The results

We do not replicate the full results here; these are available from the full report, which is available at:

http://www.scotland.gov.uk/Publications/2009/09/17102339/ 10. Here we simply summarise and commentate on the main results contained in Chart 1. This chart shows the estimated emissions supported by each portfolio, and also shows the emissions intensity of each portfolio; this is the average level of emissions supported by each Million pounds of spending by that portfolio.

It is clear from Chart 1 that the portfolio whose spending embodies the largest emissions intensity (shown by the black bar on the chart) is the Rural Affairs & Environment portfolio. Similarly the portfolio with the largest total emissions is the portfolio with the largest share of the budget, i.e. Local Government, which in part motivated our earlier adjustment to increase the resolution of the environmental impact of this spending. Further, the lower part of Chart 1 shows the pattern of emissions by emitting industry for each of the corresponding portfolios; these indicate the sectors of the economy that are important in generating the emissions supported by the spending of each cabinet portfolio. So, for example, emissions from the Agriculture, Forestry and Fishing sector is the main source of emissions generated through the spending by the Rural Affairs and Environment portfolio. This may seem strange at first, but when you consider that the classification 'Agriculture, Forestry and Fishing' includes a broad swath of firms that supply and operate in the agricultural sector, it makes sense. A similar analysis can be carried out for each of the other portfolio level results, and the reader is referred to the principal budget document for more information on these.

An interesting result lies in the comparison of the Local Government and Health & Wellbeing emissions estimates above. The total spending in both these portfolios is very similar in size in the draft budget (Health and Wellbeing totals £11,438 Million, and Local Government totals £11,580 Million) however the emissions embodied in this spend is estimated to be quite different. Emissions supported by the spending of the Health & Wellbeing portfolio total 3495.8 thousand tonnes of CO2 equivalent, compared to 4270.5 thousand tonnes of CO2 equivalent for the spending on Local Government in the budget.

The explanation for this difference lies in the nature of the spending patterns across each portfolio. The emissions embodied in spending across the aggregated sectors of the

economy shown in the lower part of Chart 1, show that for these two portfolios the emissions patterns are broadly similar. The main difference is that the Local Government portfolio supports far more emissions from the 'Other Services' category. This is indicative of the fact that in the Local Government portfolio, more money is spent on 'Other services' than in the Health & Wellbeing portfolio, and the 'Other Services' category here includes a number of emission intensive sectors like 'Sewage and Sanitary Services'. So while these two portfolios spend similar amounts in total, the differences in their spending patterns does inform, in a realistic way, the emissions estimates that were produced. (All figures used in this example come from table 2 on page 11 of the Carbon Assessment of the Scottish Governments Budget 2010-11 document, available online at:

http://www.scotland.gov.uk/Publications/2009/09/17102339/ 10.)

Concluding remarks

The use of Input-Output analysis for environmentaleconomic assessments is an important and current area of economic research. The ESRC currently fund a number of researchers looking into the issue of climate change, emissions reductions and carbon assessments from a range of different backgrounds. The Fraser of Allander Institute at the University of Strathclyde currently holds, through Dr Karen Turner, an ESRC Climate Change Leadership Fellowship⁷, to look at this issue from an economic perspective for the UK, including regional and interregional analysis within the UK. The regional analysis that the Scottish Government has done in this assessment is unique in the world at the moment, but it is only one part of the far wider array of applications of economic analysis to issues of emissions analysis and the analysis of the environmental impact of the economy.

The Scottish Government is continuing to work on improvements and extensions to the methodology described in this paper, and the scope and nature of future assessments (which are on a statutory footing from 2010) is still to be determined. To this end they have presented these findings and this methodology to a number of academic and policy forums receiving in the process valuable feedback on both the methodology and ideas for the future developments. Comments, suggestions and feedback on this analysis are still sought and we hope that people, having read this article, will feel encouraged to contribute to the debate.

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³ HM Treasury Inflators latest figures available as at 30 June 2009 from: <u>http://www.hm-treasury.gov.uk/data_gdp_fig.htm</u>

⁴ The standard industry classification (SIC) is the basis of classifications within these Input-Output and Environmental Input-Output models. Reference hereafter to IOC X is a reference to the input-output classification sector x, where the input-output classification follows the SIC. More details on the standard industry classification are available from:

http://www.statistics.gov.uk/statbase/Product.asp?vlnk=14012.

⁵ See Dargay and Hanly (2004), Giuliano and Dargay (2005), Giuliano & Narayan (2003) and the UK Department for Transport 'National Transport Model – Working Paper 3' (available at <u>http://www.dft.gov.uk/pgr/economics/ntm/nationaltransportmodelwor</u> <u>kin3035</u>) which estimates a GDP-Traffic elasticity of 0.53, that is, in their model, an increase in GDP of 32% results in an increase in traffic of 17%.

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Supply constraints on rebound effects of increased energy efficiency: negative multiplier and disinvestment effects

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Introduction

Policies that aim to use increased energy efficiency to reduce energy use may not achieve the desired results due to the likelihood of rebound effects. Research from our current ESRC-funded project on this topic was presented in an article in the last issue of Fraser Economic Commentary titled, 'Energy Efficiency and the rebound effect' (Turner, 2009a). As explained there, the rebound effect occurs when an energy efficiency improvement causes a decrease in the effective or implicit price of energy as an input to production (or consumption) – i.e. the cost of energy required per unit of activity falls as efficiency improves.¹ Moreover, if there is local production/distribution of energy as efficiency improves will put downward pressure on the actual (local) energy price.

Such reductions in prices may lead to increased demand for energy throughout the economy that partially or even wholly offsets the anticipated energy savings from the efficiency improvement. Where the increase in energy use is sufficient to entirely offset the initial energy savings, this extreme case of rebound is known as backfire. In the previous article in the Fraser Economic Commentary (Turner, 2009a), we explained that demand responses that drive rebound (or backfire) take the form of substitution, income, output/competitiveness and composition effects, and that the strength of these relative to the pure efficiency effect will determine the magnitude of rebound. Moreover, the strength of these effects will depend on economic conditions in the economy being studied.

However, we also noted that while most of rebound analyses to date have focussed on these demand side responses, our research has highlighted that it is equally important to consider the supply-side response to changing energy demand and local energy prices. In this article, therefore, we summarise findings reported in Turner (2008, 2009b) and Anson and Turner (2009), which consider the local supply response and identify negative multiplier and disinvestment effects as key factors determining the economy-wide outcome of energy efficiency improvements.

Negative multiplier effects in local energy supply sectors

Multiplier analysis is a familiar term that is commonly used when discussing shocks or disturbances in one area of the economy that have ripple effects throughout the whole economy. For example, by using the Scottish Input Output (IO) tables (e.g. Scottish Government, 2004), published annually by the Scottish Government, interactions and linkages between different production and final consumption sectors can be observed and analysed through simple analytical techniques. Multipliers, as the name suggests, allow us to quantify the magnitude of effect that introducing a change in one area of the economy (usually a change in final demand for the outputs of local production sectors) can have on the wider economic system.

In the context of a change in technology, such as an energy efficiency improvement, there will be a contraction in demand for energy (the pure efficiency effect), which will have knock-on effects throughout the local economy, particularly (or directly) on local energy producers. It is important to note that IO techniques are not ideally suited to modelling the impacts of supply disturbances, such as increased efficiency in the use of energy, particularly because of the lack of consideration of prices (which, as noted above, are the key driver of rebound effects).² For this reason the current project employs more sophisticated computable general equilibrium (CGE) modelling techniques. However, the basic IO reasoning, which focuses on backward linkages between sectors, helps us understand what may happen to local energy supply sectors when increased energy efficiency leads to a reduction in demand for their outputs, and how this will feed through and impact on the magnitude of the rebound effect.

Turner (2008, 2009b) investigates negative multiplier effects in Scottish and UK energy supply sectors as a possible





Source: Turner (2008)

explanation for the finding of negative rebound effects - i.e. economy-wide energy savings that are greater than those suggested by the initial energy efficiency improvement. This finding runs contrary to the basic idea underlying rebound that any extent of (direct or indirect) responsiveness to changes in the implicit and/or actual price of energy will result in positive rebound effects. However, in an IO analysis, where there is no consideration of price effects whatsoever, and where there is local production and/or distribution of energy, negative multiplier effects in energy supply sectors would be the only impact of an energy efficiency improvement. In order to identify a more realistic scenario, Turner (2008, 2009b) employs CGE analysis to simulate a 5% increase in energy efficiency under conditions where there is very limited price responsiveness in the system to examine whether negative multiplier effects are sufficient to generate negative rebound effects. In order to focus on the multiplier effects in energy supply sectors, the analysis excludes these sectors from the efficiency shock itself. The results for the Scottish case (which are qualitatively similar to those reported for the UK in Turner, 2009b) are shown in Figure 1.

What the results in Figure 1 show is that, even with almost zero price responsiveness, there are positive rebound

effects in all (but one) 'energy use' sectors that have been subject to the 5% energy efficiency improvement (i.e. short run reductions in energy consumption are less than 5%). The exception is Construction, but the situation is complicated here by the fact that this sector largely serves investment demand, which, as we will discuss in the next section, are likely to decrease in the area of energy supply when the demand response to falling prices is so restricted.

Instead, the source of the negative rebound effect in this scenario is the reduction in energy use in the energy supply sectors themselves (where there has been no efficiency improvement). This is the result of the direct reduction in demand in the energy use sectors, but also knock-on contractions from the energy supply sectors, where production tends to be very energy intensive.

Disinvestment effects in local energy supply sectors

The negative multiplier effects observed in Figure 1 may carry through to the longer run. However, after the initial reduction in demand from the pure efficiency effect, it is the impact on implicit and/or actual energy prices that drive the substitution, income, competitiveness and composition effects (discussed in the previous article - Turner, 2009a) Figure 2: Percentage change in UK local energy supply prices in response to a 5% improvement in energy efficiency in all production sectors (applied to locally supplied energy)



Source: Turner (2009b)



Figure 3: Impact on capital rental rates in the UK energy supply sectors of a 5% increase in energy efficiency in all production sectors (% change from base)

Source: Turner (2009b)

Figure 4: Impact of a 5% energy efficiency improvement in the Scottish Transport sector on capital rental rates and capital stocks in the Scottish Oil supply sector (% change from base)



Source: Anson and Turner (2009)

that drive rebound. As noted above, these are all demand responses to changing prices. However, Turner (2009b) and Anson and Turner (2009) demonstrate that it is also important to consider the supply response to changing prices, particularly in the case of local energy supply sectors.

The key point to understand is that when the price of a commodity or service falls, if there is not a sufficient demand response then revenues and, in turn, the profitability of the sector that produces these as output will fall, leading investors to relocate their capital where the return is greater. In the context of a decrease in local (actual) energy prices triggered by an efficiency improvement, this will occur in the case of the local energy supply sectors. Turner (2008, 2009b) refers to this process as the 'disinvestment effect'. Unlike negative multiplier effects that dampen rebound immediately after an energy efficiency improvement, the disinvestment effect takes hold as we move into the longer term. However, it is triggered by the (negative) impact on local energy supply prices and capital rental rates immediately after the shock is introduced.

Figure 2 shows the impact of a 5% increase in energy efficiency all production sectors on local energy supply prices of the UK economy from Turner's (2009b) UK CGE

analysis. Note that there is a substantial decrease in the actual price of output in the (both renewable and nonrenewable) electricity supply sectors. Particularly due to the lack of trade in electricity between the UK and rest of the world (i.e. there is very limited external demand response to these decreased prices), the demand response to this drop in prices is insufficient to prevent a drop in revenue in these sectors. In turn, this reduces the return on capital, as shown in Figure 3. This leads to shedding of capital stock (and capacity) in these energy supply sectors. This tightening of energy supply causes local energy prices to rise, which allows the return on capital in these sectors to adjust back to their initial real levels (and equate with the user cost of capital, so that equilibrium can be restored in the economy). This process is illustrated in Figure 2. It is this 'rebound' in local energy prices that leads to the dampening of the longrun rebound in energy use in the UK case modelled by Turner (2009b).

Turner (2009b) finds that disinvestment effects do constrain the rebound effect in the UK under most assumed simulation scenarios (which relate to differing degrees of price responsiveness in the system). However, Turner (2008) shows that, given the different structure of the Scottish economy, and particularly the extent of trade of

energy supply sector outputs, this is generally a less common outcome in the case of Scotland. Generally, Turner's (2008, 2009b) results show that the influence of the disinvestment effect is reduced the more price responsiveness we bring into the system (the next question then, is correctly specifying direct and indirect price responsiveness throughout the system – this is the focus of current research, as noted in the conclusion section).

However, the analyses reported so far are fairly broadbrush in so much as all sectors of the economy are targeted with the same efficiency shock. We have also carried out research at the sectoral level, first in a report to Scottish Government (Allan et al 2008), but later, and with more detailed analysis in Anson and Turner (2009). Here, the (5%) energy efficiency improvement is targeted specifically (and solely) at the Scottish commercial transport sector. Here, even with a fairly flexible degree of price responsiveness on the demand side of the economy, we do observe disinvestment in the Scottish refined oil supply sector (hereafter simply the 'Oil' sector), the major energy supplier to the transport sector. Figure 4 shows the impact on the return in capital in the 'Oil' supply sector and the consequent contraction in capital stock.

The presence of disinvestment in the Scottish 'Oil' supply sector as a result of changes to the Scottish commercial transport sector is illustrative of our argument that rebound and disinvestment effects are specific to the economic structure under observation and the sectors targeted with the efficiency improvement. In fact all our research in this area has shown is that the key drivers of rebound (and also the disinvestment effect) are sensitive to the flexibility and degree of price responsiveness in the economic system being studied.

Conclusions

The two key result of our rebound research to date are that (1) there is positive pressure for rebound effects even where (direct and indirect) demands for energy have a low price responsiveness, but (2) this may be partially or wholly offset by negative multiplier and disinvestment effects that occur in response to falling energy demand and prices respectively. While the empirical analyses presented here are specific to the case studies of Scotland and the UK, we believe that the observation and explanation of negative multiplier and disinvestment effects that act to dampen rebound effects provide a more generic insight. Both will have more general significance in analysis of energy efficiency improvements in other economies where there is domestic supply of energy. Turner (2009b) also argues that the disinvestment effect in particular may be applicable at the global level where, despite OPEC's command of marginal supply, downward demand pressures do exert downward pressure on prices.

Our results also show that the disinvestment effect is a necessary, but not sufficient, condition for rebound effects to be bigger in the short run than in the long run (as short run rebound may also be dampened by negative competitiveness effects), a result that runs counter to the theoretical predictions of Wei (2007) and Saunders (2008). We should note that Wei (2009) has also begun to focus his theoretical analysis on supply side issues, partly in response to Turner (2009b), but considering the supply response to increased energy efficiency more generally (e.g. resource scarcity will also be an important issue in analyses with a wider geographical focus).

In future research we hope to extend our analysis to an interregional framework in order to examine (a) spillover rebound effects (i.e. how energy efficiency increases in one economy may affect energy use in others, and (b) potential negative multiplier and disinvestment effects in energy supply sectors in regions/countries that energy is imported from (e.g. in our Scottish simulations, the supply and price of energy imported from the rest of the UK is exogenous). We attempt an interregional analysis of increased labour efficiency in Turner and Hanley (2009). This work extends on our single region analyses comparing the impacts of increased energy and labour efficiency on the CO2 intensity of GDP in Turner et al (2009).

Finally, we remind the reader that the results summarised here are sensitive to be sensitive to elements of model specification. In particular, further research is ongoing to attempt to accurately quantify some of the key parameters that govern the magnitude of rebound effects, and the occurrence of disinvestment effects.

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Endnotes

¹The rebound argument holds when there is a change of efficiency to any factor of production and not just an energy input. As part of this research project we have also looked at changes to labour efficiency in the UK and Scottish economies. Links to all project outputs to date such papers can be found at http://www.esrcsocietytoday.ac.uk/esrcinfocentre/viewawardpage.a spx?awardnumber=RES-061-25-0010.

²This is also a problem in modelling the impacts of changes in demand.

³Saunders (2008) discusses the possibility of 'super conservation' effects where energy savings are proportionately greater than the initial increase in energy efficiency. However, Turner's (2008, 2009b) CGE

Scottish ferry policy and the Commission decision

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This article is an update of an earlier review of Scottish ferry policy in this Commentary last year ¹ (hence "Fraser Commentary Feb 09") in the light of the outcome of the European Commission investigation into alleged State aid for Scottish ferries. The European Commission announced their investigation² into alleged State aid for Scottish ferry services in May 2008 (hence "EC May 08") and their final Decision³ was published October 2009 (hence EC Oct 09).

This update is intended to be read in conjunction with Fraser Commentary Feb 09 to minimise repetition of facts and arguments set out in that earlier article.

The main conclusion here is that successive Scottish administrations have adopted what might be described an ostrich approach to ferry policy, burying their heads in the sand and hoping that nothing nasty will happen⁴, and that EC Oct 09 has done nothing to rectify this state of affairs. The context is set by arguments I made as far back as 2001 in evidence to the first Parliamentary Inquiry into the tendering of CalMac, that it was well established and accepted practice (as demonstrated in the case of the UK) that in an industry characterized by the provision of an essential services, three essential tools were needed: (a) an independent regulator; (b) a clearly defined Operator of Last Resort able to take over the contract immediately should the incumbent withdraw, or if withdrawal is threatened; (c) a well developed supporting statutory framework. As I noted in Fraser Feb 09, had the problem been properly defined, then policy makers would have been more likely to have anticipated and dealt with public interest issues that have arisen and may well arise in the future. These problems were compounded by other failures in terms of interpretation of EC law which limited what policymakers could and should have done.

These failures have numerous ramifications and we shall concentrate briefly on just six issues of concern as indicative of possible problems, or as major problems in their own right.

1. Altmark and the need to tender

EC Oct 09 confirms (para 165) that "in order to establish that there is an advantage capable of constituting State aid

in the sense of Article 87(1) of the Treaty, the Commission must assess whether the Altmark conditions are fulfilled". The crucial point about this, as noted in Fraser Feb 09, is that I and two other academics had produced papers independently of each other which argued that there was actually no need under EC law to expose the CalMac network to the considerable and recurring delays and costs that a six-yearly tendering process would involve. As Fraser Feb 09 notes, I had pointed out that a coherent alternative to tendering could be fashioned consistent with EC law if the Altmark conditions were fulfilled. But as Fraser Feb 09 also notes, the then Scottish Executive rejected these arguments in 2005 claiming instead that the Altmark criteria were not applicable to such ferry services.

It is small comfort to note that we were right and the government's legal advisers were wrong, because the result has been that the tender process did go ahead, and it is almost certain that such services will continue to be put out to tender. It is not that tendering is necessarily bad, indeed in many contexts it can be in the public interest, but as we shall see below, the failures by the government to accept the relevance of Altmark and alternatives to tendering when combined with other failures noted above raise real dangers and risks for the public interest here.

For the alternatives to tendering cited by us to be revisited at official level would require officials admitting error; would require them to be able and willing to fashion coherent alternatives to tendering under the Altmark conditions; and would require the European Commission to accept radically new proposals fashioned by the same sources that have just been investigated by them for alleged breaches of EC law.

All things considered, there may be thought to be little likelihood of such a reversal of policy taking place. The public interest would at least be served by a serious investigation as to why these failures took place, though that may also be unlikely to happen.

2. Public service obligations and Altmark in Scottish ferry services

As discussed in Fraser Feb 09, public service obligations (PSOs) have a clearly defined role and status in EC law. The imposition of PSOs is stated by the Commission as a precondition for any subsidy for EC ferry services. Yet as noted in Fraser Feb 09, the government echoed its predecessor in rejecting arguments that there was a need for PSOs for any of its subsidised ferry services.

This was at least folly, because it would have been possible to state that the public service contracts (PSCs) contained and helped deliver the requisite PSOs here. They chose not to adopt that solution but to reject PSOs just as the relevance of the Altmark principles had been rejected.

It was therefore not surprising, indeed almost inevitable, that when the Commission made their announcement of





intention to investigate these services for supposed breaches of State aid legislation, that suspected failure to apply clearly specified and justified PSOs and adhere to the Altmark principles figured repeatedly in the EC May 08 charge sheet. Yet EC Oct 09 subsequently found that the government and CalMac were largely innocent of these charges.

If the Commission had found the charges as set out in EC May 08 justified, then in principle it could have led to the bankruptcy of CalMac: The government's opinion as reported prior to EC May 08 was that "If found guilty the commission could request that CalMac, which is wholly owned by ministers and does not have large reserves of money, could be forced to repay subsidy which would potentially bankrupt the company and could leave our most fragile peripheral communities with no links to the mainland - or other island communities."⁵

It is worth noting that the dangers were of government's own making, not only by creating what was seen by the Commission as *prima facie* cases of breaches of EC law, but also for failing to put in place the safeguards (such as Operator of Last Resort) that would guarantee the smooth continuance of these lifeline services to these same vulnerable communities in the event that the incumbent operator was unwilling or unable to continue.

This was an occasion when weakness (on the part of the government) was strength. As I noted at the time⁶ with respect to the potential bankruptcy of CalMac for failing to adhere to EC law, I doubted whether that would be allowed to happen, and so it has proved. The government of the time and its predecessors had put the Commission into an impossible situation where the stark choice was between finding (as charged) that the government had failed to have clearly specified and justified PSOs and adherence to the Altmark principles, in which case the remedy could lead to the collapse of an entire transportation network providing essential services to vulnerable communities; or the Commission could conclude (as they did) that despite having rejected PSOs and the Altmark principles, the government somehow did indeed have properly constituted PSOs across the board and had also adhered to these same Altmark principles.

If the first scenario facing the Commission could have come out of a disaster movie, the second had more the taste of Alice in Wonderland.

Given these two choices, the EC Oct 09 Decision was undoubtedly the right one in terms of the public interest, as I had noted prior to EC May 08; "Were Brussels to close down the ferry services, the outrage would not only be felt in Scotland, but across Europe,"⁷

The problem is that while the Decision was the right one in terms of the alternatives, it does not provide a solution to the

problems that policy makers have created here, and we turn to some of these now.

3. Cherry picking

The most obvious opportunities for cherry picking in ferry services depend on the nature and characteristics of the route in question, but (just as in postal services) will typically target high value and/or low cost services. In an unregulated ferry market this is likely to be cars and commercial vehicles, freight, short crossings, seasonal traffic, and/or highly trafficked routes. The corollary holds; cherry pickers are less likely to be interested in off-season, foot passenger, longer crossing, and/or lightly trafficked routes.

Cherry picking is not automatically against the public interest especially if there can be competition amongst cherry pickers within a given market (as in some cases of postal services). However, in the ferry markets served by CalMac, the likelihood of competition between cherry pickers for particular services on a given route is likely to be small and if cherry picking takes place on a given route it is likely to lead to a local monopoly. There is little if any evidence that such markets are likely to be contestable in practice, especially since there may be incumbency advantages such as sunk costs and timetable slots (for the incumbent) and entry costs (for a possible entrant). The deficiencies outlined in Fraser Feb 09 to the effect that there is no independent industry regulator and statutory framework for this industry means the industry is highly vulnerable to all the adverse effects that unregulated cherry picking and local private monopolies in essential services can entail.

4. Strategic behaviour on the part of bidders

The implications of the Government's failures to adopt normal regulatory safeguards and to have a pre-defined qualified Operator of Last Resort contracted to take over (overnight, if necessary) in the event of the incumbent operator defaulting (or threatening to default) on the contract means that there is no real alternative but to continue with the tender once it is up and running. This will not be lost on future potential bidders for the network.

CalMac will have to defend its right to run the network every six years and if it loses just once in the tendering process this will effectively eliminate it once and for all as an operator - or at least as an operator with the resources and capabilities necessary to run such a network.

Bidders will be well aware of that, and also will be aware of the deficiencies regarding the absence of a pre-designated Operator of Last Resort. There will be an incentive to underbid CalMac on the bidding process (and under EC law the least subsidy bid must be accepted) knowing that once control of the network is secured, the winning bidder will be able to renegotiate terms mid-contract. They will know the government will have no alternative but to pay up or face the cessation of essential services to vulnerable island communities. History suggests that when the market is faced with such opportunities, the market will exploit them.

There are other lessons from history as I noted in Fraser Commentary Feb 08 with respect to NorthLink. This company informed the Scottish Executive that it could no longer realistically deliver its contractual obligations to the Northern Isles over the four years remaining of the contract for ferry services. The Scottish Executive concluded Northlink was heading for insolvency and unless additional subsidy was paid, lifeline services could have been interrupted. Significant additional subsidy of about £43mill was then paid.

There is no suggestion that Northlink was behaving strategically and that its difficulties were anything other than real and not contrived. The important point was that the government had no alternative to pay up because of the situation that was of the government's creation. These failures may not be limited to the Northlink contract in the future, yet these risks have been created and deemed acceptable by policy makers in the face of all that is accepted as good (and indeed necessary) practice in such contexts.

5. Gourock-Dunoon

On 31 December, the Scottish Government issued a tender notice for the Gourock-Dunoon public service⁸. Presently the public service there runs a mixed vehicle and foot passenger service, vehicle-carrying in unsubsidized competition with Western Ferries, a commercial operator. The present subsidy for the public service is for the carriage of foot passengers only. Although the new contract is for a subsidized service on a route classifiable as a public service route under EC guidelines, there is no maximum fare or minimum fare specified in the contract notice as would is permissible with PSOs, and operators are expected to supply their own vessels, unlike other CalMac routes where the government builds and supplies the vessels. Thus obviously precludes bidders opting to build their own vessels since the contracts will only be for six years, which means that they will have to find whatever is available on the second hand market. This by definition is composed of vessels not explicitly designed for that route, and biased towards the obsolete and inefficient.

The official report into the Gourock-Dunoon ferry market ⁹ conducted by Deloitte Touche for the Scottish Executive confirmed that the most efficient and least subsidy method to provide for the subsidized foot passenger market was with combined vehicle and passenger vessels to help to offset the subsidy needed for the low revenue / high cost foot passenger market. However these vessels usually have to be designed and built specially, as is demonstrated in other CalMac routes in Scottish waters, so it is highly unlikely that the two modern vehicle-passenger vessels that the Delloite Touche report identified as needed for this route will be secured by any potential bidder for this tender.

The importance of Gourock-Dunoon can be seen from the map (Figure 1). The Gourock-Dunoon ferries cover a short distance, for much the same reason (and serving much the same function) that the Forth Bridges provide over on the East Coast of Scotland, in transport terms and geographically these ferries are the mirror image of the Forth Bridges. The Gourock-Dunoon ferries are an essential and intrinsic part of the West Coast transport network with the road alternative involving an 84 mile detour.

There is no guarantee as to what, if any, bids will be received for this new tender. The last tender for the service led to no bids at all and CalMac continuing with the public service by default, leading to accusations of the government having failed to abide by EC law.

Given what appears to be (at best) a very thin second hand market for suitable vehicle-passenger ferries, it is entirely possible that the public service route will become passenger-only, giving the private firm Western Ferries the status of sole operator of vehicle carrying traffic Gourock-Dunoon. This in turn raises a range of problems and issues which policy-makers have created, some of which are covered in the next section.

6. Reconciling private interests and public interests

Normally the question of reconciling private commercial interests with the public interest when dealing with an industry providing an essential service is the job of an industry regulator in the context of a dedicated statutory framework with back up from a pre-specified Operator of Last Resort. However, as we have noted, there are no such provisions in Scottish ferry policy.

To consider some of the issues that this has raised, we shall consider possible indicative developments involving just one private company, Western Ferries and some of its publicly stated interests in other ferry routes.

First, Western Ferries have already stated that they are bidding for the Gourock-Dunoon public service, and as we have noted in the previous section even if they are unsuccessful this could still lead to the private firm being the sole operator of vehicle-carrying ferries Gourock-Dunoon.¹⁰

Second, Western Ferries have also recently announced their intention to mount a commercial challenge to CalMac's Addrossan-Brodick public service¹¹, and in the opinion of Professor Alf Baird of Napier's Transport Research Institute, competition between the two operators would be unlikely to be sustainable in the long run¹², raising the possibility that the private operator could crowd out the vehicle-carrying public service operator on this route also.

Third, Western Ferries have a long-standing and publicly stated interest in running a service from Bute to Ardyne Point on the Cowal Peninsula¹³, once the public road and associated infrastructure have been upgraded by the local

council. This route lies between both the Colintraive-Rhubodach and Rothesay-Wemyss Bay CalMac ferry routes from Bute (see figure 1), with Ardyne Point lying on the same peninsula as Colintraive. For most travelers, the route at Ardyne would be a direct substitute for the Colintraive ferry, which could well see a crowding out of that public service for much the same reason that the CalMac Arran service could be crowded out by Western Ferries.

However, the Ardyne service when combined with Western Ferries Gourock-Dunoon service using the Cowal Peninsula as a land bridge could also prove an alternative to the Wemyss Bay / Rothesay service for many travelers from Bute to Inverclyde and Glasgow (less so for travellers from Bute to Ayrshire direction) . Since Western Ferries service would be a commercial service, this could lead to a repetition of complaints that Western have made in the case of Gourock-Dunoon that their commercial vehicle-carrying service was facing unfair competition from the subsidised CalMac service. That again could be seen as legitimising for Bute a repetition of what happened on Gourock-Dunoon where the public vehicle-carrying service was first restricted, and may now be terminated, as a consequence of measures taken by the government to insulate the Western Ferries service from competition from the public service.

I would emphasise I am not commenting on the likelihood of any or all of this happening, this is just reporting Western Ferries publicly declared interests and possible plans, and their possible implications. Nor should this be seen as voicing any opinion on the economic costs and benefits of actual route options such as short crossings. And there are also other scenarios such as the possible extension of the government's pilot RET (Road Equivalent Tariff) scheme into the Clyde routes that would affect these possibilities. However even the most likely and most immediate scenario in which Western absorbed all of CalMac's Gourock-Dunoon vehicular traffic would lead to an outcome in which the private operator on this one route would be carrying about two-thirds the volume of cars carried by what was left of the CalMac network.¹⁴

The fundamental point of concern, of which Western's plans are indicative, is the potential nature and scale of scenarios associated with such plans and possible outcomes. The four public service routes discussed here shown in Figure 1 (Arran, the two Bute routes, and Gourock-Dunoon) carried 451,000 cars in 2008, the rest of the CalMac network carried 662,000 cars in the same year, while Western Ferries carried 588,000 cars.¹⁵

An extreme scenario in which competition from Western Ferries leads to the company absorbing all the traffic from these four CalMac routes would on the 2008 figures lead to Western Ferries carrying 50% more car traffic than would left for the rump of the CalMac network. In such a scenario a commercial firm would be sole operator for several routes classifiable under UK and EC rules as public service routes and so eligible for the imposition of PSOs such as maximum prices and minimum frequency. But since this government and its predecessor have chosen not to make use of the tools that UK and EC law has given it, and set up a proper regulatory framework, it is questionable whether such measures would be implemented.

In such circumstances, there is no suggestion here that Western Ferries and other potential commercial entrants would be doing anything other than pursuing legitimate shareholder interests under the existing law. But as we teach in Economics 101, private interest is not always fully reconcilable with the public interest, especially where the provision of essential services by private local monopolies is concerned. The failures of successive administration to recognize and deal with that simple point are likely to be felt by vulnerable and fragile communities for generations to come.

Conclusion

The Commission Decision on alleged State aid to Scottish ferries has done nothing to mend structural fault lines running through policy-making in relation to public services provided on the Scottish ferry network. The Commission cannot be blamed for these failures which are not their responsibility, but the lack of willingness on the part of successive administrations to deal with these failures raises serious risks to the public interest, most especially for the taxpayer, the users, and the communities who depend on these essential services.

Addendum

The present Scottish Administration has been carrying out a "Ferries Review" of policy in this area, the Review was originally ordered under the previous Labour/LibDem administration. As this Commentary was going to press, the Herald newspaper reported that a government memo made available to the newspaper indicated that the date of publication for the Review was "in reality" likely to be later than the latest date for the next Scottish parliamentary election due May 5, 2011 (CalMac review advises breakup, Herald, 7th February 2010). In short, the present administration will simply have started a Review ordered by its predecessor, and then passed on to its successor any decisions about publication, and any decision or decisions as to what, if anything, should be done about the Review. If any further evidence were needed of the ostrich-like behaviour I describe in my article, this timely example would be difficult to surpass.

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Invitation to submit comments pursuant to Article 88(2) of the EC Treaty

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⁶lbid

⁷lbid

⁸See tender notice at

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Sustainable Glasgow

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The Sustainable Glasgow Initiative aims to help Glasgow become one of Europe's most sustainable cities. For Glasgow sustainability means achieving a mix of objectives – reducing carbon – but also achieving urban regeneration; delivering jobs and training; helping change the city's image; regenerating communities, and tackling fuel poverty.

The initiative has been led by the University of Strathclyde in an innovative partnership between academia, the city council, major energy companies, the regional development agency, and investment interests.

This paper summarises the key findings and recommendations of the Sustainable Glasgow report – and examines the way forward for the initiative.

The initiative started in Autumn 2008 and over the last year has conducted a set of major feasibility studies into understanding Glasgow's carbon emissions, and identifying the technically and financially viable opportunities that would feasibly reduce the city's carbon emissions by 30% within 10 years1. The full report was published on 27 January and is available at www.sustainableglasgow.org.uk.

The policy context

Ambitious targets are being set to reduce carbon emissions at EU, UK and Scottish levels. EU targets require the UK to obtain 15% of all its energy (covering heat, transport and electricity) from renewable sources by 2020. Both UK and Scottish governments have set targets to achieve an 80% reduction in carbon emissions by 2050 – and the Scottish Government's interim target may require a 42% reduction in emissions by 2020. These targets sit within a wider policy context – with governments also aiming to achieve economic growth, and social policy objectives – such as the Scottish government's aim to eradicate fuel poverty by 2016.

There is an inherent tension in reducing carbon emissions whilst simultaneously seeking economic and population growth, and tackling fuel poverty. Economic growth tends to increase carbon emissions, and the UK regulatory system for supporting the growth of renewable energy directly leads to increases in the price of energy charged to consumers. Achieving these targets means delivering more economic output and more useful work (eg more buildings heated) from each unit of energy consumed – as well as radically increasing the amount of low carbon energy delivered (and that must include heat – not just electricity). Glasgow is not alone in this. This is a worldwide issue.

Cities have a vital role to play in delivering a low carbon future – by their nature they are major concentrations of people and resources. UN figures suggest that cities currently contain over half the world's population – and are responsible for the consumption of 75% of the world's energy, and 80% of the world's greenhouse gas emissions. Projections suggest that the share of the world's population living in cities will grow significantly over the next 20 years – particularly in the developing world. In developed countries most of the cities and most of the buildings that will exist in 2050 are already in place. Retro-fitting low carbon technologies and approaches, and integrating these with the existing infrastructure in cities, and with ongoing city development, is therefore one of the major issues facing governments in reducing carbon emissions.

The way we live and work in cities, and the systems that enable cities to operate, must therefore change dramatically if we are to achieve significant carbon emission reductions.

The municipal level creates real opportunities for achieving decarbonised societies and economies. Cities have the necessary scale to make projects viable, to attract investment and possess the political focus and powers that can applied to assist the implementation of a coherent strategic approach.

The vision and the partnership

The Sustainable Glasgow Initiative is a consortium led by the University of Strathclyde, with Glasgow City Council, Scottish and Southern Energy, Scottish Power, Source One Veolia, and Scottish Enterprise.

Glasgow faces a range of issues – including a need to increase levels of economic activity and to regenerate communities, as well as major opportunities such as the Commonwealth Games in 2014 (which will attract a worldwide audience of over 1 billion people). Sustainability in Glasgow must take account of all these factors – not just aim to meet environmental targets.

The vision of the partnership is to make Glasgow one of Europe's most sustainable cities within 10 years - and to do this in a way that will improve the lifestyles and opportunities for Glasgow's people and businesses. For Glasgow sustainability must be delivered in a way that is consistent with the development of a vibrant and growing city, delivering tangible economic and social benefits, and changing the image of the city.

By successfully developing a shared vision of the city's low carbon future Sustainable Glasgow has succeeded in bringing a number of significantly different interests together around a single agenda. This was achieved by deliberately constructing the initiative's objectives and vision so that it takes account of the objectives and agendas of different

public and private organisations – and setting a timescale (10 years) for the delivery of that vision that is both ambitious, achievable., and builds momentum. For the private sector a 10 year timescale shows a long term commitment which is attractive in terms of its scale, and as a demonstration of public sector commitment to policy change that will act to reduce investment risk. The 10 year timescale also means that initiative is very clearly focussed on approaches that are technically and financially deliverable now – rather than on solutions that may become viable at some indefinite point in the future. This clear focus on delivering real projects has made the initiative credible in the eyes of investors.

By building the initiative to the point of "critical mass"; engaging in dialogue with key stakeholders; and delivering a convincing vision and strategy for Glasgow's low carbon future, the initiative's size, momentum, success and reputation has started to attract other partners – from both within the city and internationally.

As well as major commercial entities the partners and stakeholders now being drawn into the initiative include Glasgow Housing Association (Europe's largest landlord), the National Health Service, and the Clyde Gateway programme. These are all major investors in the city – as

well as having important social dimensions to their objectives. This strong social dimension to the Sustainable Glasgow partnership may prove to be a unique differentiator in relation to other sustainable city initiatives.

A new holistic approach

At around 4 million tonnes per annum Glasgow is responsible for around 8% of Scotland's energy related carbon emissions. Glasgow can therefore play a significant role in meeting Scotland's carbon emission reduction targets.

Emissions relating to domestic electricity are higher than would normally be expected – due to a high proportion of electrical heating – particularly in social housing. Commercial and industrial emissions make up a higher proportion reflecting economic activity in the centre of Glasgow. Transport emissions are lower as rates of car ownership in Glasgow are the lowest in Scotland (at 0.25 vehicles per head of population), and the second lowest in the UK – but vehicle ownership rates are increasing quickly and this will act to increase transport energy consumption, as well as having an adverse impact on air quality. Unless action is taken Glasgow's carbon emissions can be expected to increase over time.

Glasgow's carbon footprint totals around 4 million tonnes - 2006/07



Domestic Electricity	17%
Domestic Gas	17%
Industrial/Commercial Electricity	28%
Industrial/Commercial Gas	14%
Personal Transport	12%
Road Freight	7%
Buses	1%
Coal, Oil	4%

The university team used new techniques that allowed the city's carbon emissions and low carbon energy opportunities to be mapped in new ways – allowing the city to be understood holistically, and the spatial relationships between developments, infrastructure, carbon emissions, and low carbon energy resources to be used to identify new opportunities to reduce carbon emissions. This is a radical departure from the conventional approach deployed by planners and utility companies in the UK – which normally considers each development separately, and does not seek

to overcome the barriers that often exist between different organisations. A piecemeal approach fails to identify opportunities to link developments together in ways that make new low carbon energy systems viable.

The map below shows that the city centre of Glasgow has the highest density of energy consumption in Scotland (once power stations and oil refineries are excluded) and this is mainly due to high levels of commercial and retail activity. Glasgow also has a number of significant industrial energy



Sustainable Glasgow main approaches to reducing carbon emissions

Theme	Example measures
Reducing wasteful or unnecessary energy use by end users	 Improved energy efficiency – eg household devices; vehicles; buildings
	Behavioural Change
	Energy management
Improving the efficiency of energy systems	District Heating
	Smart grids
	Demand Management
Reducing use of high carbon fuels	 Phasing out of coal, oil and electrical resistance heating
Exploiting local renewable energy resources	Biomass, solar, wind
Reusing the city's waste for low carbon energy	Capturing waste heat from industry
	Waste to energy
	 Production of biogas from sewage and organic waste

consumers – such as food and drink companies. This geographic analysis allows Glasgow's sustainability strategy to be designed so that it targets low carbon energy measures in the areas where they will have the most impact on Glasgow's carbon emissions.

This geographic analysis has allowed Glasgow's sustainability strategy to be designed so that it targets low carbon energy measures in the areas where they will have the most impact on Glasgow's carbon emissions.

A new energy framework for the city

Sustainable Glasgow proposes reducing the city's carbon emissions through improved energy management and the development of new integrated low carbon energy systems for the city.

By looking at the city in a new way Sustainable Glasgow takes a holistic view of the city and its opportunities – and proposed energy systems are designed so that they support each other, as part of a wider framework, rather than as a series of opportunistic small-scale changes to existing systems. The main opportunities for the city lie in the development of district heating networks; harnessing of waste for energy; biomass energy systems; sustainable transport; energy management; and smart grids. By allowing these different technologies to support each other carbon reductions are maximised and commercial risks reduced.

Delivering city-wide large scale carbon emission reductions requires major change – and this change will need to be delivered by large scale projects and large scale investment that will create a new integrated clean energy infrastructure for the city. Significant changes to create a supportive public policy environment are also necessary. Small scale and emerging renewable technologies also have the potential to make a contribution to carbon emission reductions as well as generating community engagement and direct benefit.

The main themes for reducing the city's carbon emissions related to its energy use are summarised in the table below. The list below is not a hierarchy, all of these opportunities need to be pursued in an integrated fashion in order to maximise carbon emission reductions. No one technology or approach can deliver the levels of carbon emission reduction required.

The systems proposed are in use individually elsewhere in the world already – so their technical feasibility is proven. What is unique is the way these systems have been integrated and designed for sympathetic retro-fitting on a large scale into an existing city. The proposed new systems are shown in the diagram below. It shows how the city will harness cleaner energy sources and use more efficient systems to deliver carbon emission reductions.

- New low carbon energy systems will process the city's sewage and municipal waste using microbes (anaerobic digestion) to produce biogas which can fuel buses and generate heat and power for the city.
- Compost and digestate produced from anaerobic digestion can make the city's vacant land more fertile to help grow urban woodlands.

- Timber from the new urban woodlands and from forests around Glasgow will be used to generate heat and power for the city in biomass energy centres.
- District heating systems will use underground insulated hot water pipes to take the heat from these low carbon energy sources to businesses and communities for heating buildings and providing hot water.
- Highly efficient local energy centres will use natural gas and biogas in Combined Heat and Power systems to generate low carbon heat and electricity.
- The above systems will also allow waste heat and other waste materials from industrial and

commercial premises to be captured and used to provide low carbon energy for the city.

- Wind and microgeneration technologies such as • solar power will also make a contribution to providing low carbon energy.
- Smart grids offer the opportunity to integrate low carbon technologies and manage energy demand through enhanced energy distribution and transmission in ways that offer greater carbon emission reductions.
- New energy efficiency measures and energy management systems are implemented in homes, public buildings, and businesses to improve the efficiency of energy use.



2%

3%

3%

Based on a detailed analysis of the evidence the estimated contribution each approach would make within 10 years to Glasgow's 30% carbon emissions reduction is given below:

- Combined Heat and Power/District Heating 9%
- **Biomass**
- Biogas and Waste to Energy systems 6% 3%
- Other renewable energy systems
- Sustainable Transport systems
- Phasing out high carbon fuels
- Energy management and energy efficiency 6%

The opportunities already identified come to slightly more than the 30% target proposed.

Implementation of these systems will require co-operation from a wide range of commercial and public sector entities and there is already strong interest from investors, developers and utility companies in taking these projects forward.

The map below shows how these opportunities relate to each other. Detailed analysis has allowed projects to be located so that they target areas with the highest carbon emissions; capitalise on the city's low carbon energy


resources; and integrate with major developments in the city.

More than technology

Sustainable Glasgow is not just about technology. The effectiveness of the Sustainable Glasgow initiative in the medium and longer term will depend on achieving changes in behaviour and attitudes amongst Glasgow's organisations and individuals – in homes, in communities, in businesses, and within the public sector. In some cases, this will involve the widespread adoption of sustainable systems (such as district heating and public transport) over alternatives; in others it will be the result of cumulative small-scale actions (eg waste reduction, energy efficiency, and community renewable energy projects). Understanding how to change Glasgow's behaviour towards more pro-environmental actions is thus a critical part of the initiative.

The creation of a supportive regime of public policy measures is a vital step in ensuring that Sustainable Glasgow is successfully delivered over the long term – maximising positive impacts for the city and minimising any negative impacts. The public policy regime will also ensure that Sustainable Glasgow makes a full contribution to delivering a wider range of policy objectives – such as tackling fuel poverty; delivering jobs; regenerating communities; and building a positive image for the city.

For example, Sustainable Glasgow is proposing new measures aimed at creating a supportive planning regime for the development and adoption of strategic low carbon energy systems in Glasgow – as well as protecting the environment and the community, and ensuring compatibility with overall city development plans and objectives. Some of these proposals will also have wider impacts, such as the creation of additional costs for developers and businesses operating the city, though these measures will also deliver benefits. These proposals will therefore need careful consideration and consultation by Glasgow City Council should it wish to adopt them

Business models and investment

Implementing these opportunities will require investment of around £1.5 billion. Most of these projects will generate significant revenues and offer good rates of return on capital investments. Much of this investment is expected to come from the private sector - which even in a recession has remained strongly interested in energy investments that can deliver long term and predictable rates of return on capital. Changes in regulatory structures (such as the Feed In Tariffs and the Renewable Heat Incentive) are being introduced that provide additional subsidies for low carbon energy generation. In addition, by working with existing major investments in the city (such as the Southern General Hospital, the New Campus Project, and the Commonwealth Games village) the initiative is succeeding in levering in additional public investment, and should deliver tangible results more quickly. Sustainable Glasgow is already

having an impact in relation to these projects – with many projects showing an enthusiasm to take on board Sustainable Glasgow's principles and strategic approach.

Business models to finance renewable electricity projects are well understood – with an existing incentive system and grid infrastructure available for connection. Viable projects should therefore not struggle to raise finance. However in urban areas there may be additional merit in employing business models which include community involvement and or community benefit – as community based projects are likely to experience lower levels of public opposition.

However community involvement needs to be considered in line with the need to meet financing requirements. The study recommends that communities are assisted to become involved in smaller scale projects – and that larger scale projects are required to deliver community benefits.

More novel and larger scale infrastructure projects are likely to require different business models. For example, because there is no existing heat distribution system, the heat market is unregulated, the overall size of investment is large, and there is no existing market in heat that the proposed CHP/district heating system would benefit in particular from the creation of a public private partnership to raise capital, implement the infrastructure, regulate the system's operation, and act as a "heat broker" between heat suppliers and customers.

A further option for raising and holding the required capital would be the creation of a public private investment trust which could invest in a whole range of low carbon projects across the city –such as renewable electricity, waste to energy, biogas, urban forests, district heating, and transport projects. This trust structure allows for projects to be combined for financial purposes allowing for investment diversity and decreasing potential investor risk – thus allowing more innovative projects to attract funding.

Next steps

The Sustainable Glasgow initiative is strongly focussed on achieving the delivery of real projects and tangible benefits for local people and businesses.

Coordinating delivery of major new clean energy systems is not a trivial task – but Sustainable Glasgow is already changing the way that people and organisations think about and plan energy systems in the city. Ensuring that the opportunities identified are delivered in reality will require a focussed programme of further activity to bring in the right partners; draw in the necessary funding; resolve regulatory issues; and integrate Sustainable Glasgow proposals into city plans, policies and strategies.

Maintaining momentum will require a continued co-ordinated push from the Council and its partners. Projects around the world have shown that high level political buy in is vital to

Potential Business Structure



Controls wider strategy; Plans, Monitors impacts and opportunities, Revises strategy; develops relationships, ensures projects match public policy objectives; maintains joined up approach; builds support; integrates strategy into public policy and wider plans

Raises funding: develops relationships with potential investors, assesses projects for investment by:

- assessing match to public policy goals
 and overall framework
- financial viability
- matching projects with investor priorities

Implements and operates new low carbon energy systems and infrastruscture to deliver carbon reductions and economic regeneration. Range of potential business models – public private partnerships, publicly owned; commercial or community ownership

building the support of stakeholders and ensuring a lasting positive impact.

New governance structures are currently being put in place. This includes a high level board which will include the heads of key stakeholder organisations in the city – and will therefore include the Leader of the city council and the Principal of the University of Strathclyde (for example). A steering group supported by a number of sub-groups (composed of the relevant partners) will drive forward activity on finance, public policy, planning, and individual projects.

Sustainable Glasgow has successfully identified major opportunities for reducing the city's carbon emissions, growing the city's green economy, tackling fuel poverty, and changing the city's image. These opportunities need further analysis of costs, risks, impacts, future developments and integration with the city plan, to allow production of an overall energy master plan for Sustainable Glasgow that takes account of how the city will change over coming years.

Finally, Government targets make clear that even greater carbon emissions reductions will be required in the future. These systems have been designed so that they have the inherent flexibility to be expanded and to integrate a wider range of low carbon technologies – thus increasing Glasgow's ability to contribute to Scotland and the UK meeting tighter carbon targets in the future. Sustainable Glasgow's strategy will require ongoing monitoring and revision in response to progress achieved; as new opportunities become available, the regulatory environment changes, and changing external factors.

Sustainable Glasgow is not a one-off exercise, it is an ongoing process summarised by the diagram below.

Summary

Many cities across the world have ambitions to become more sustainable. However such initiatives often perform poorly in practice due to having vague and unrealistic objectives; a poor evidence base; no realistic implementation plan; a scattergun interest in new technologies; an undue focus on small scale pilot projects with no plan for further roll-out; a sole focus on the public sector; lack of continuity in leadership, and no clear business and financing model.

Sustainable Glasgow's approach is to develop a clear realistic strategic framework that applies a strong evidence base to identify the main investment and carbon reduction

The Sustainable Glasgow Process

Strategy Development

- Map energy demand and carbon emissions
- Understand the city's resources and infrastructure
- · Identify key stakeholders
- · Identify major carbon reduction opportunities
- · Identify technically and financially viable opportunities
- Join opportunities and projects together so that they support each other

- Monitor impacts
- · Publish progress reports
- · Evaluate new opportunities
- · Bring in new partners
- · Review changing nature of city
- Review wider policy environment
- Revise Strategy

Integrate, Plan and Develop Relationships

- · Create high level coordinating entity
- · Deepen relationships with key stakeholders
- · Consult, raise awareness and develop support
- Ensure projects and initiatives support wider policy objectives
- Integrate strategy into public planning, policy and other initiatives
- Integrate strategy into major investments
- Create integrated development plan

Implement Projects and initiatives

- · Conduct detailed analysis of individual projects
- · Raise investment funding
- Adopt supportive public policy measures
- · Create new project delivery entities as necessary
- · Implement projects and initiatives
- Develop and monitor an agreed set of indicators of progress
- Disseminate the Sustainable Glasgow approach to other cities

opportunities in the city; to integrate these so that projects and technologies support each other; to deliver these in a way that is both technically and financially achievable, to build powerful partnerships, and integrate these proposals with supportive public policy structures and financial mechanisms. Glasgow may present a viable model that other cities can learn from and adopt.

Endnotes

¹This meets the Scottish Government's target of achieving a 42% reduction in carbon emissions by 2020 as this target is baselined against 1990 emission levels.

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