

WHAT WAS / WHAT NEXT?

What the evidence tells us about the next steps
for Scotland's economic strategy

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Executive Summary

This report has been produced by Universities Scotland under guidance from a panel of 11 leading Scottish economists. The report is not a case for greater funding for universities but an attempt by universities to make available some of their analytical capacity in helping to think about future steps for the Scottish economy.

The report has two main aims. Firstly, it aims to make a strong case for the importance of evidence and analysis in developing economic policies to help Scotland achieve economic recovery – far too much current commentary is based only on opinion and assumption. No key argument or assertion was included in the report if it was not supported by every member of the advisory panel and was also supported by multiple pieces of verifiable evidence.

Secondly, it aims to challenge some assumptions about economic policy in Scotland and provide some signposts indicating ways in which policy should develop in the future. It concludes that the (important) work of supporting existing industry sectors has come at the expense of developing new ones, meaning Scotland has no 'jobs replacement strategy'. It also argues that we must be much more careful in how we target public investment, that we need to rethink future skills demand in light of the evidence and that we need to greatly step up activities which will increase the competitiveness and productivity of the Scottish economy, particularly by encouraging much more innovation and more effective deployment of technology and skills.

While some of the conclusions in this report may appear controversial, they are intended as a constructive contribution to the wider debate and we hope it will be received positively. Scotland's economy is at a crossroads and we need all the information possible to help us choose the right path.

The report is divided into four sections each of which give rise to various recommendations for further development of economic policy.

The structure of industry in a global economy

This theme reflects on the rise and decline of different industries in Scotland and identifies competitive advantage as key. It explains why it is essential that we prepare the conditions to encourage new industries to create jobs to replace ones which are lost in the natural economic cycles of the economy.

Investing in our competitive advantage

This evaluates potential areas for Scotland's future competitive advantage and finds there are only a limited range of genuine advantages on which Scotland can build sustainable prosperity. We cannot and should not try to compete on the same basis as less developed countries. There is only one direction of travel for an advanced economy like Scotland.

Labour market and skills needs

An analysis of Scotland's labour market and skills data sets out the facts on our skills levels and explains why 'moving up the value chain' is not a slogan but an economic reality, and one which may well challenge a lot of current assumptions.

Productivity and the deployment of technology, innovation and skills

Finally, we look at the factors that Scotland can influence to improve our productivity rates, again showing that it's about higher-value and not about low-level interventions.

Key findings include:

The structure of industry in a global economy

- Industries rise and fall in their economic importance as they gain and then lose competitive advantage in global markets. The economic problems caused by disappearing or rapidly-shrinking industry sectors have been mitigated by the emergence of new, rapidly expanding industries.
- Each replacement industry had been typified by higher knowledge content than the one it replaces.
- We must extrapolate this forward – if there is unemployment caused by structural change in the economy it will be resolved by jobs created in new industries which may not yet even exist or exist only in embryonic form. We have to plan to stimulate and encourage new industries and be prepared to recognise that they may not take the same form as those which have gone before.

Investing in our competitive advantage

- Global models of competitiveness encourage countries to invest in factors that will have the biggest impact dependent on a country's level of development. For advanced countries like Scotland "innovation and sophistication" factors will offer the best return.
- Scotland has already gained most of the economic advantage it can from the more basic "factor" and "efficiency" level investments. Further investment in these areas will offer diminishing returns. This is borne out by the evidence in areas such as tax cuts, basic infrastructure, mass education and business regulatory issues.
- As Scotland is best placed to compete on innovation and sophistication, less developed countries are better placed to compete in other areas such as labour market efficiencies. There is absolutely no scope for Scotland becoming more competitive on the basis of labour costs or by reducing business costs and we should not attempt a race to the bottom.

Labour market and skills needs

- The skills debate is not well based on evidence or analysis. Data about the labour market is poorly understood and poorly interpreted. Commonly-held perceptions about 'skills shortages' or 'skills saturation' are inaccurate and sometimes a complete inversion of the real situation.
- Rather than skew investment further towards lower- or mid-level education the evidence suggests that Scotland should in fact emphasise the highest level of education – degree and above.
- Labour market projections point to a polarisation of skills – with the growth in demand almost all at degree level skills and above and mid-level skills being squeezed out of the labour market. There are real risks that high-level skills supply shortages could be a major break on economic growth and transformation in Scotland, a risk exacerbated by lack of general awareness.

Productivity and the deployment of technology, innovation and skills

- As well as expanding exports, Scotland's best hope of economic growth is through improvements in our productivity.
- Productivity increases in Scotland will come from better use of skills, innovation and the deployment of technology, not from squeezing more out of workers.
- Incentives and competition will also increase productivity, but mainly when they encourage the type of virtuous behaviour which results in better skills, more innovation and more effective technology.

Introduction

Universities Scotland are making this intervention for two reasons:

- We are concerned about an avalanche of commentary on Scotland's economy which has emerged lately but which is unsupported with either theory or evidence
- We believe that there needs to be some refocusing of Scotland's economic strategy

Firstly, since the depth of the financial crisis became clear there have been a lot of people offering commentary on 'how to save the economy'. Our observation is that a lot of it is underpinned by little more than opinion surveys or extrapolation of crude models which are insufficient to sustain the arguments made. This presentation has been produced with the aid of a panel of leading Scottish economists as advisors. To ensure objectivity and credibility we have included no key argument which is not supported by every member of the panel and have made no key statements we cannot support with credible data or analysis. At times our panel differed on what evidence was most compelling to underpin the key arguments but for reasons of length we have generally restricted ourselves to using only one or two measures. Universities Scotland is a lobby group for the higher education sector and has a direct interest in campaigning for more funding. That is why we have put so much effort into providing objective, verifiable evidence to underpin our arguments. We feel this ought to be the basis on which all discussion on the economy should be made.

Secondly, we feel that this is an important moment at which we need to consider refocusing Scotland's economic strategy. As we shall outline in this presentation we feel there is strong evidence that policy in Scotland should prepare the country for structural change in the economy as well as support and grow the economy we have. There has been a primary focus in Scotland on supporting and growing the business base and while this industrial support strategy is important, we feel that it must be matched with a more forward-looking strategy which considers the conditions which will be necessary to enable Scotland to develop new industries.

This report is heavily evidence based and throughout every section reference will be made to charts, tables and graphs which support our arguments. You can find them at the end of each section.

We will focus on economic factors which the Scottish Parliament can influence. This means that we will not consider monetary factors, fiscal factors outside the control of Parliament, factors relating to the regulatory environment or factors relating to Scotland's position as a regional economy within the wider UK economy.

It is not our aim to criticise successive administrations' approach to the Scottish economy, but we do want to make clear that in our view it is impossible to accept the analysis in this presentation and conclude that strategy and policy in Scotland is adequate. The case we will make is basically that national competitiveness, the development of new industries and the need to improve productivity all require action to move the Scottish economy higher up the value chain with top-level skills and innovation forming an important part of our national competitive advantage. We will argue that to do this we must ensure an export strategy underpinned by innovation and technology, we must favour business development in fields where Scotland has a chance of sustainable competitive advantage, we must ensure a pool of talented people capable of supporting emerging high-tech industries (largely at postgraduate level) and we must target business support investment carefully to get the biggest impact from it.

For the remainder of this presentation we will focus on four big themes which will be the ones which will be decisive in determining future Scottish prosperity

- Structure of industry in a global economy
- Investing in our competitive advantage
- Labour market and skills needs
- Productivity and the deployment of technology, innovation and skills

1. Structure of industry in a global economy

There is a significant focus in current Scottish economic strategy on growing companies. This is of course important, but it fails to take account of the cycle of rise and decline in different industry sectors.

Most of the Scottish economy – 69 per cent in 2004 – is domestic trade. By its nature, domestic trade serves a domestic market and is therefore limited by the size of that market. This means that large sections of the Scottish economy are actually remarkably static over time – for example, in 1901 the construction industry employed 7.7 per cent of the Scottish workforce and by 2006 it employed 5.1 per cent of the workforce. There is a limit to how many buildings can be built in a country like Scotland so there is a limit to how much construction can expand.

“Most of the economy is domestic and is in fact remarkably static over time”

- **Graph 1.1: Proportion of economy which is involved in export**
- **Graph 1.2 Construction & Transport & Communications industries as a proportion of the workforce**

Because export industries serve a global market there is nothing like the same constraint on the size of the available market. This makes it possible to expand export industries rapidly and provides one of the most effective routes for generating rapid and sustainable growth in Scotland. And yet for 30 years (if we exclude North Sea oil) Scotland has suffered a trade deficit. We are under performing as an export economy.

As we will see, export markets are particularly sensitive to competitive change and are therefore nothing like as stable as the domestic economy. For example, at the start of the 20th century one in eight Scottish people were employed in the textile industry. Within 40 years there was barely one in eight Scottish employees working in any form of non-engineering manufacture. In the 1960s there was practically no industry in Scotland but the arrival of IBM in the early 80s led everyone to get excited about the start of a new industry called “Silicon Glen” and the prospect this brought for jobs. But by the late 1990s the industry had collapsed and were employing only half the number at their peak. The impact of this collapse was disguised by the fact that it coincided with a rapid rise in retail and financial service jobs. Had these not appeared, we’d have experienced the 40,000 plus jobs lost as a severe drag on the overall economy.

In each of these cases we can see that where an industry is primarily an export industry it is particularly susceptible to growth and decline. In the cases cited above none of these industries collapsed on a global scale; the jobs simply left Scotland. As we shall see, the reason for these job-flights is an issue of competitiveness – they left because Scotland’s competitiveness in these sectors declined. Scotland lost its competitive advantage because less developed economies with labour cost advantages caught up with Scotland in terms of skills and infrastructure. Each successive industry therefore tends to be characterised by more sophisticated skills levels and more advanced technology. This reinstates a competitive advantage for the more advanced economy – until the rapidly developing economies catch up again.

“Export industries are extremely susceptible to rapid collapse”

- **Graph 1.3: Rise and fall in textiles, shipbuilding, electronics and steel**

In Scotland the service sector has grown in importance as an employer as manufacturing has declined. In the last four years service sector exports, as a proportion of all Scotland’s exports, increased from 21.6 per cent to 29 per cent . In 1997 there were about 30,000 people employed in call centres in Scotland and this had grown to 80,000 within ten years . The most recent data does not show any evidence of a loss of these jobs in Scotland. However, the deployment of ICT means that these jobs have become increasingly mobile and therefore increasingly at risk. even pre-financial crisis there were already clear indicators that external competitive pressures have started to cause some service sector jobs to migrate from Scotland. There has been a significant increase in the proportion of back-office jobs in the financial services sector off-shored to India and China. In the last six years the proportion of major global financial institutions with offshore teams increased from less than ten per cent to more than 75 per cent . This evidence is not conclusive by any means, but that doesn’t mean it can be ignored.

In 1901, 0.9 per cent of the Scottish workforce was employed in banking and finance. By 1991 this had increased to a remarkable nine per cent. Within 20 years between 1970 and 1990 the proportion of the workforce employed in banking and finance in Scotland had trebled. This tremendous rate of growth steadied in the 1990s and early 2000s. Financial services showed all the signs of a rapid-rise exporting sector and there are now signs of a possible rapid collapse. Of course, the reason for the decline in the financial service sector is different from industries like steel and shipbuilding. There were different views from our panel of advisors on the scope for recovering jobs in this sector following recession but there were two consistent views; that recovering financial jobs will not happen without concerted action to reshape the industry and that there is a real chance that there could be major structural decline in financial services in Scotland even with concerted action.

The significance of this rise and fall of industry sectors is central to the World Bank's Global Economic Prospects assessment. It observes the loss of competitive advantage in mass manufacturing to emerging economies, and the apparent trend to off-shore some service sectors to emerging economies which means advanced economies need to refocus on areas that will still offer them a competitive edge, in order to minimise the negative consequences for their own economies. The World Bank is explicit that this means refocusing higher up the skill and value chain.

“Even before the economic slowdown there were warning signs of contraction in Scottish service sector exports”

- **Graph 1.4: Increase in call centre jobs in Scotland 1997-2008**
- **Graph 1.5: Rise & eventual peaking of financial services jobs 1901 - 2006**
- **Graph 1.6: Proportion of global companies with offshore centres 2001 and 2007**

One additional factor in considering a competitive export strategy is diversity. The replacement industries will not necessarily follow the mid-20th century pattern of a small number of very large employers (mills, shipyards, assembly plants or steelworks). For example, the UK remains very competitive in the creative industries and this sector is often typified by large clusters of small, high-value companies. Renewable energy technologies, biotechnology, nanotechnology, data storage and processing and other potential areas for refocusing the Scottish economy may not be typified by small numbers of very large employers. Where public investment was targeted at 'high growth companies' with insufficient reference to long-term competitiveness now it must be targeted at 'competitive companies' which may not always be large. This does not mean that a sector won't be fast growth, but that growth may come from large numbers of smaller entries into the sector rather than just large growth from existing parts of a sector.

“When refocusing strategy, competitive does not necessarily mean big”

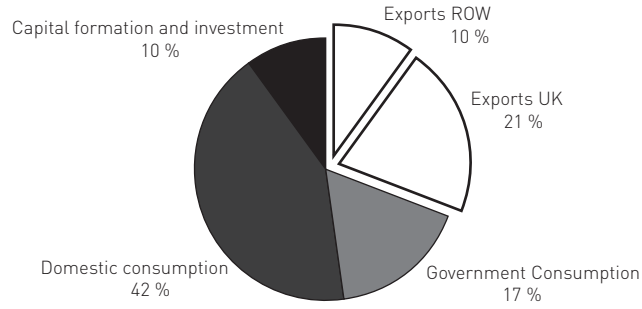
- **Graph 1.7: Comparison of the size and productivity of different Scottish industries**

Conclusions: “Scotland needs an industry replacement strategy”

- Much of the economy is remarkably stable or sees only fairly gradual change.
- Export markets are not limited like this and can grow rapidly and sustainably – but Scotland's export record is not good.
- The economic problems caused by disappearing or rapidly-shrinking industry sectors have been mitigated by the emergence of new, rapidly expanding industries. Both the rise and decline is driven by international competitiveness issues.
- Each replacement industry had been typified by higher knowledge content than the one it replaces.
- We must therefore extrapolate this forward – if there is unemployment caused by structural change in the economy it will be resolved by jobs created in new industries which may not yet even exist or exist only in embryonic form.

“Most of the economy is domestic and it is in fact remarkably static over time”

Graph 1.1 Proportion of Scottish industry involved in export in 2004



Source: Scottish Government, Statistics Publication Notice, economy series, December 2007.

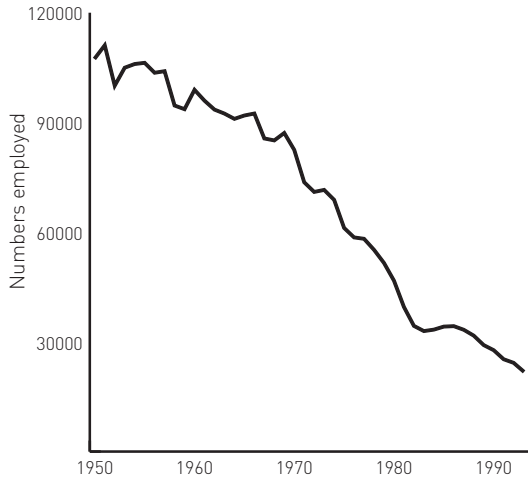
Graph 1.2 Number employed in Scotland's construction industry and transport and communications industry as a proportion of the total workforce, 1901 - 2006



Source: Scotland in the 20th Century, edited by T M Devine and R J Finlay; C H Lee, british regional employment statistics 1847-1971; CSO regional trends (1991); Futureskills Scotland Key Indicators

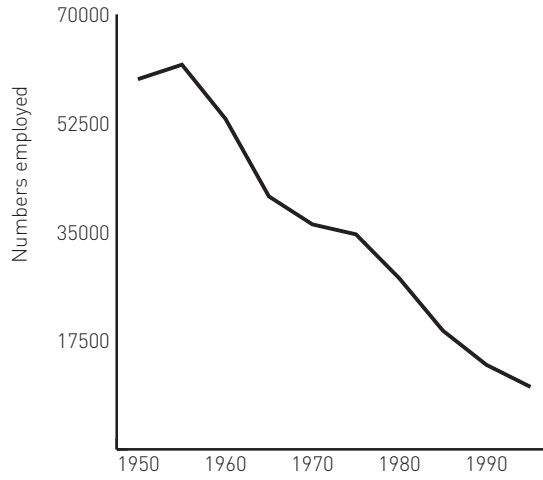
“Export industries are extremely susceptible to rapid collapse”

Graph 1.3a Employment in Scotland's textile industry 1950-1993



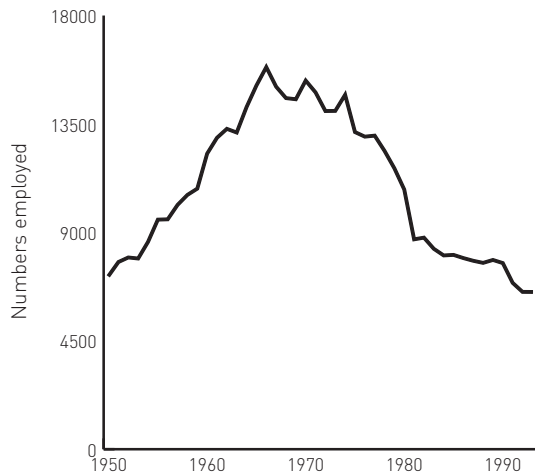
Source: Scottish Register of Employment: number of employees, 1950 - 1993

Graph 1.3b Numbers employed in Scotland's shipbuilding industry from 1950-1995



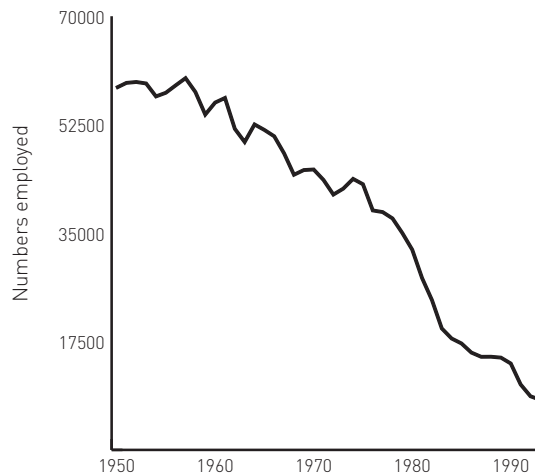
Source: The Scottish Office. Scottish Economic Bulletin. Number 57, September 1998

Graph 1.3c Rise and fall of employment in Scotland's electrical machinery & apparatus industry



Source: Scottish Register of Employment

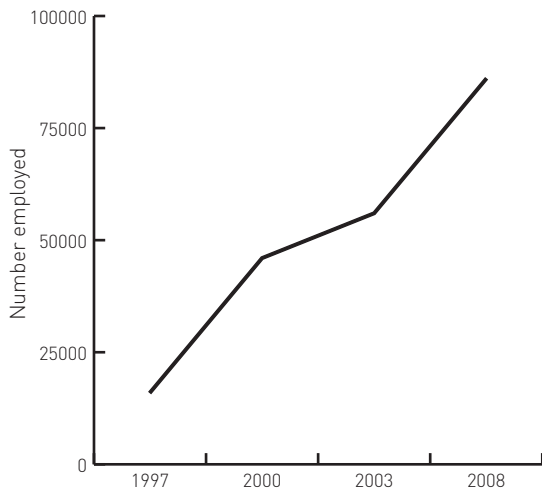
Graph 1.3d Employment in Scotland's basic metals industry 1950 - 1992



Source: Scottish Register of Employment

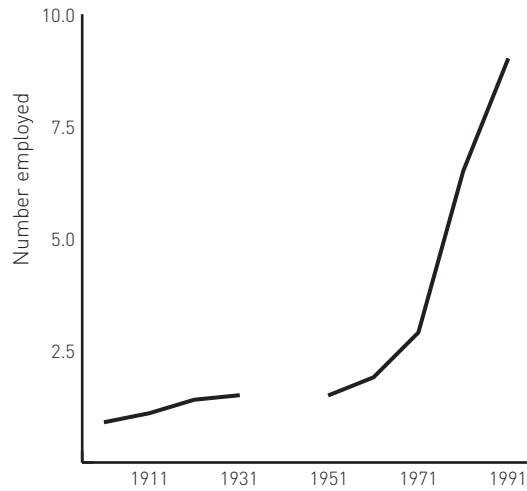
“Even before the economic slowdown there were warning signs of contraction in Scottish service sector exports”

Graph 1.4 Number employed in the contact centre industry in Scotland 1997 - 2008



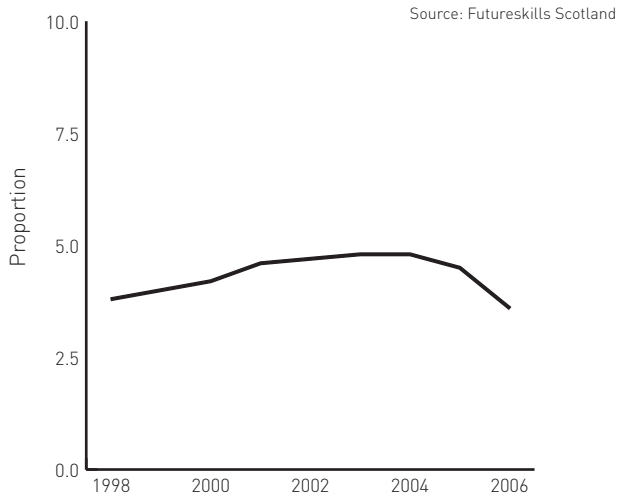
Source: Philip Taylor & Peter Bain (2003) Call Centres in Scotland and Outsourced Competition from India

Graph 1.5a Number employed in banking, finance, insurance, business services & leasing as a proportion of total Scottish workforce (%)



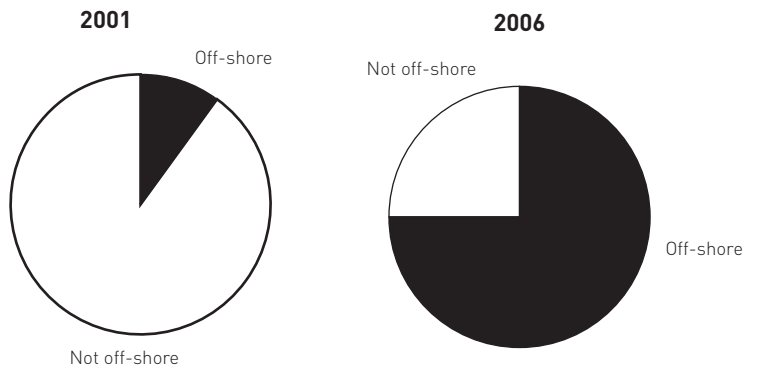
Source: Scotland in the 20th century edited by T M Devine and R J Finlay.

Graph 1.5b Number employed in financial intermediation as a proportion of Scotland's total workforce (%)



Source: Futureskills Scotland

Graph 1.6 Proportion of major financial institutions with some processes off-shore in 2001 and 2006

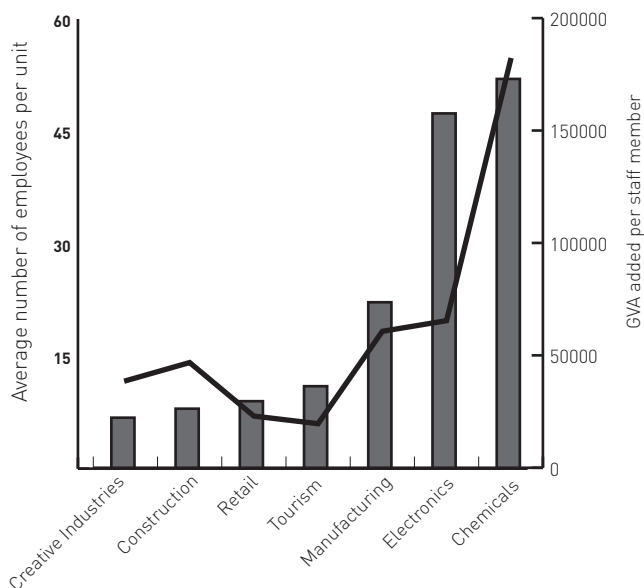


Source: Global financial services offshoring report 2007, Deloitte

“When refocusing strategy, competitive does not necessarily mean big”

Graph 1.7 Comparison of size and productivity of industry sectors

Source: Scottish Government, Annual Business inquiry



This graph shows no direct link between size (number of employees) and productivity (GVA per staff member). Creative industries are more productive than tourism in spite of operating with smaller units. Similarly the electronics industry is half as productive as chemicals despite having similar sized units.

2: Investing in our competitive advantage

If a country is self sufficient, then domestic trade will oil the economy and help increase national income: but it is foreign trade which is likely to drive sustainable GDP growth. If the economy is not self sufficient (as is the case with Scotland) and is dependent on trade, then comparative advantage and competitiveness are extremely important in improving export performance. This is the source of new exporting industries. We need to be honest about Scotland's position – it has had 30 years of non-oil trade deficit and this suggests we are not producing enough goods and services the rest of the world wants to buy. To understand why, we need to think about our competitive position in international markets.

There are a number of frameworks which could be used to explore competitiveness. There were differences of view among members of our panel as to what offered the best explanation and we have chosen to use that produced by the World Economic Forum (WEF) (although some panel members had doubts over certain aspects). However, there was absolutely no disagreement about the key messages.

The following is a very quick summary of the WEF analysis – we have kept it short as the key arguments are fairly self-explanatory. The WEF identifies 12 factors which influence competitiveness, describes three stages of economic development for different countries and then groups the competitiveness factors according to which have the biggest impact on the different types of economy. The conclusion is as follows:

- 'Factor-driven economies' are those which have limited or minimal infrastructure but very low labour costs. They benefit most from investment in basic infrastructure, legal frameworks and primary education.
- 'Efficiency-driven economies' are those which have infrastructure, mass education and secure legal frameworks but lower levels of deployment of technology and innovation. They benefit most from improving the efficiency of their infrastructure – through secondary education, availability of financial markets and greater deployment of technology.
- 'Innovation-driven economies' (Scotland is an example) are those where there is widespread deployment of technology and high-level skills but which have high labour costs. They benefit most from investment in innovation, investment in the highest-level skills and in business sophistication.

"Different types of economy are competitive for very different reasons"

- **Table 2.1: World Economic Forum Competiveness model.**

Of course, economies are not monolithic and there will be parts of an 'innovation-driven economy' which will still have insufficient deployment of technology and so on, but the general framework holds. The important message is that not all investment in factors which improve competitiveness will have the same impact on all occasions. As economies develop and realise the benefits from improving their competitiveness the rate of return on investment in those areas of competition declines rapidly. Put simply, once you have gained the economic benefit from investing in a stable legal framework (for example) you do not repeat that gain by repeating that investment. And once you have gained the benefits of investing in universal secondary education you will not repeat that gain by repeating that investment. For advanced economies the rate of return on investment is likely to be much higher if that investment encourages innovation and 'business sophistication' than on marginal changes in infrastructure (if a small proportion of the very large investment required to marginally improve journey times was instead used to address low levels of R&D by business the impact would be likely to be much larger).

At this stage it is worth pointing out one obvious weakness in the WEF framework; it does not include competitive advantage from natural resources. In Scotland this is important because just as we have and will continue to gain competitive advantage in technology related to oil and gas, so we can benefit from advantages in tidal technologies gained from this national natural resource and so on. We must not forget the physical assets of the country when considering how to develop high-value competitiveness.

There are an awful lot of claims about what kind of investment will have the biggest impact on Scottish competitiveness – transport, education, business rates cuts or income tax cuts. In assessing these it is important to be clear-sighted about the returns for the investment and how those returns should be measured. Opinion-based survey data is entirely subjective and provides no basis for measurement (“327 respondents said they would employ an extra member of staff if...”). Jobs created through public investment is also an unreliable measure – building a road might create 500 jobs but spending the same amount on building a giant statue might create the same number of jobs. Finally, multiplier measures tell us a bit more but these too must be treated with caution – multipliers basically capture the fact that the 500 people employed building the road will then spend their wages creating more jobs. However, while different kinds of investment result in different multipliers (the more spent on Scottish goods and services the more economic impact in Scotland) these are not all that different. Universities Scotland ran a number of different examples through an Input/Output model of the Scottish economy. Universities generate large multipliers because staff costs are a large proportion of expenditure and a large proportion of goods and services are bought locally. But we do not believe this is a sufficient measure of the impact of investment in universities as it captures the primary effects (employing people, buying goods and services) but not the secondary effects (producing a high-skill workforce and world-class R&D).

“Most public expenditure has similar primary economic effects”

- **Table 2.2: Input/Output model of potential impact of public expenditure on different factors.**

So what differences do we find in the secondary impact of different types of innovation and does this match the competitiveness framework above? Let’s very briefly explore three examples of possible investment – in school education, tax reductions and transport infrastructure.

- **School education.** A study of 98 countries over 25 years confirmed the WEF assumption – expansion in different levels of education had impacts directly related to the type of economy. Least developed economies get by far the biggest economic impact from expanding primary education, more developed countries get much more benefit in expanding secondary education and advanced economies get less benefit from expanding either but do get advantages from investment in higher education (see table at 2.4). This does not mean there are no benefits from investment in pre-school, primary or secondary education in advanced economies but the investment has to be very targeted (for example, to encourage more high school pupils to study science). This is because once an economy is saturated with one skill level then further expansion at that level does little to improve economic competitiveness. (As we shall see this is fully supported by Scottish labour market data).
- **Tax.** It is fairly easy to demonstrate that non-targeted cuts in income tax do not improve economic competitiveness in advanced countries – in fact, they are just as likely to harm the economy a study of the 2001 and 2003 tax cuts in the US by the US Congressional Budget Office concluded these cuts would “actually reduce national income over the long run” with an investment of 1.4 per cent of GDP returning less than 0.7 per cent of GDP growth. Reducing business taxes can have a positive effect on the volume of Foreign Direct Investment (FDI) in a country, but even here the relationship between tax cuts and growth is inconsistent, because FDI is influenced by many factors (such as available skilled labour) which may have a much bigger effect in any given case. There have been many studies of the impact of changes in corporation tax and the main conclusion is that there can be a link but that link can also be inverse. The variation in results is so great that neither a positive or negative conclusion is sustainable, certainly without looking at a very much more complex set of factors. In the Scottish context the primary evidence used to support the benefit of corporation tax cuts comes from Ireland – but that evidence has been comprehensively debunked.

“Debunking Ireland myth”

- **Case study 2.3: Ireland provides Scotland no evidence for the benefit of cutting corporation tax**

- **Transport.** We find something similar in transport investment. A review of the evidence on the economic impact of investment in infrastructure found mixed results, particularly in regard to long-term benefits. It found that advanced countries which already have well developed transport networks can actually reach “saturation point”. If this happens, there is little or no return to be gained from investment in new projects. Environmental externalities can also significantly reduce economic gain if they are properly accounted for. The potential range of transport projects is infinite and the evidence is inconclusive. This makes generalisations unhelpful.

What this shows is that advanced economies can improve productivity and their competitive position by investment in factor and efficiency measures, but only if that investment is carefully targeted. Repeating investment which has already delivered economic benefits (creating universal primary education or building the M8) will not repeat the benefits. This should be borne in mind when pleas are made for indiscriminate investment such as ‘build anything’ or ‘cut all taxes’ – the primary effects might appear superficially attractive (and indeed may well help soften the downturn) but they will do little or nothing for long-run competitiveness.

“Repeating investment which has already delivered benefit will not repeat the benefit”

- **Table 2.4: Relationship between investment in education at different levels and economic return**
- **Graph 2.5: Inconsistent link between tax cuts and economic growth.**
- **Table 2.6: Literature review of the economic returns from transport investment.**

The next point is probably clear enough that it is not necessary to spell it out. The reason that factor-type investment often doesn’t work in advanced economies is that it could not be big enough to change the competitive position – the average Scottish salary is ten times the average Chinese salary so no amount of tax cut could close this gap to any meaningful extent. In Europe a marginal difference in salaries doesn’t make exported goods any more competitive – Germany has high labour costs but Europe’s most competitive export market. The more worrying point is that the current advantages Scotland has on skill levels (over China, not Europe where we lag) cannot be assumed any longer – countries like China and India are producing graduates at a rate which (in absolute numbers) is significantly larger than the entire European Union. Marginal changes in labour costs won’t help and complacency about skills would be dangerous.

“Scotland can’t compete with China on cost and decreasingly so on skills”

- **Graph 2.7: Comparison of labour costs, Scotland and China**
- **Graph 2.8: Comparison of skills supply, Scotland and China**

Looking at business costs we can also see why benefits already achieved cannot be replicated. In 2006 business costs in the UK were the third lowest of advanced economies and were lower than the US. In 2008 the UK was sixth and higher than the US. So we can see that the UK is already extremely competitive on business costs meaning that decreases in business costs are likely to have only marginal effects. The second conclusion is that the changes between 2006 and 2008 were almost all a result of changes outside the direct influence of government (such as construction and fuel prices). Arguments about the impact of liquidity or solvency of businesses in Scotland might involve discussion of business costs, but medium- to long-term competitive advantage for Scotland will not be achieved through a business costs strategy. It is also possible to see that business costs do not appear to be a primary factor in export success – if we look at the relative size of country export markets compared with their position on the competitiveness index we can see little correlation between business costs and success in exporting.

“Scotland has already gained most of the competitive advantage it can from business costs”

- **Graph 2.9: International comparison of business costs**
- **Graph: 2.10 Lack of relationship between export markets and business costs**

But if business and labour costs are unlikely to provide Scotland with economic competitiveness, there is evidence that rates of innovation can. If we look at innovation in terms of national spend on R&D we discover a very strong correlation with competitiveness. We will return to this in section four.

“Investment in innovation makes advanced economies more competitive”

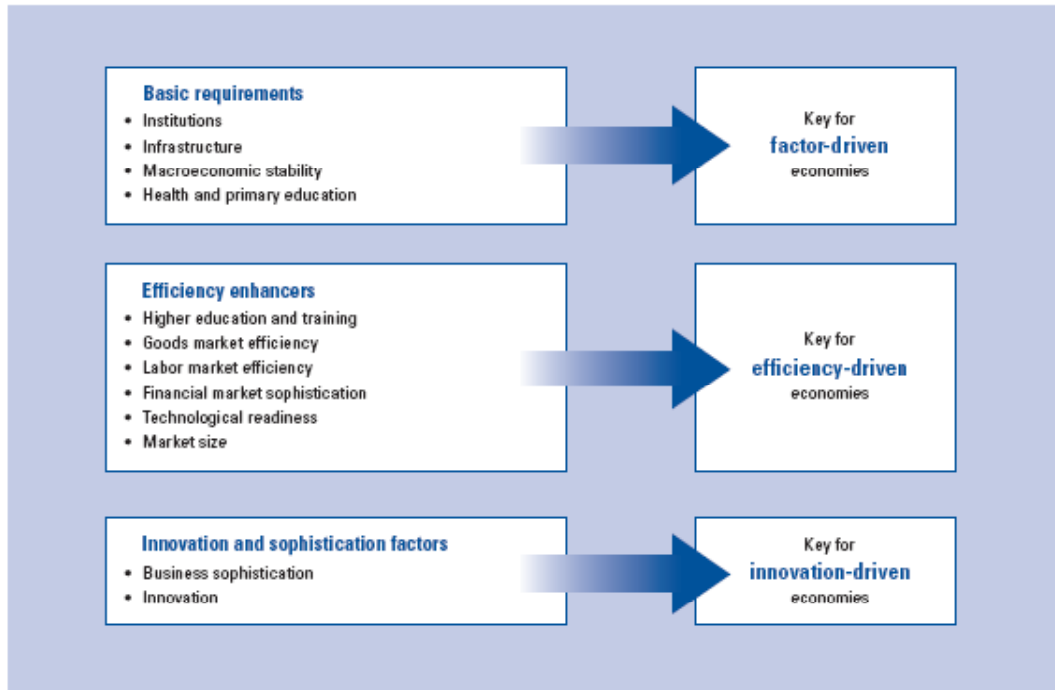
- **Graph 2.11: Relationship between R&D and competitiveness**
- **Graph 2.12: Proportion of firms collaborating in innovation across OECD countries**

Conclusions: Scotland will be competitive because of innovation - or nothing.

- Commonly assumed policy steps to improve competitiveness do not map easily to the evidence
- Tax cuts, basic infrastructure, mass education and business regulatory issues will have only a marginal effect on the competitiveness of an advanced country like Scotland – unless very carefully targeted.
- There is absolutely no scope for Scotland becoming competitive on the basis of labour costs or by reducing business costs.
- The evidence shows that Scotland has gained most of the benefits from factor and efficiency investment but not all of the gains from investment in innovation and high-level skills.

“Different types of economy are competitive for very different reasons”

Table 2.1 World Economic Forum’s twelve pillars of competitiveness



“Most public expenditure has similar primary economic effects”

Table 2.2 I/O model of impact of expenditure on a range of different forms of investment

Investment option	Shock Amount (£ millions)	Secondary Effect (£ Millions)	Total Output (£ Millions)	Output Multiplier	Secondary FTEs Created
Higher education	£500.00	£312.50	£812.50	1.63	3387
Health	£500.00	£233.80	£733.80	1.47	2872
Transport Infrastructure	£500.00	£261.90	£761.90	1.52	3841
TI (Realistic, 5 years)	£107.00	£56.05	£163.05	1.52	768
3p Income Tax Cut	£550.00	£321.10	£871.10	1.58	3726
1p Business Tax Cut	£120.00	£54.80	£174.80	1.46	635

Primary effects are those of salaries and goods directly purchased as a result of Government expenditure. This Input/Output model does not the wider impacts of what the money is spent on.

2.3 “Debunking the ‘Ireland’ tax myth”

In today’s global economy the ease with which capital, particularly foreign direct investment, can move between countries is a very real problem for Governments focussed on economic growth. Many see low corporation taxes as one of the few responses still available to limit the increasing mobility of capital. In recent years Germany, Denmark, the Netherlands and the UK has followed this logic and lowered their rate of corporate tax. In the UK, corporation tax decreased from 30 per cent to 28 per cent in 2008 (see figure 2.3.i). However, just because the corporate tax option is available to government does not necessarily make it effective. A comprehensive review of the literature on the link between corporation tax and flows of foreign direct investment found the evidence: “underdeveloped and inconclusive”.

A recent survey of multinationals found that in their opinion taxes only rank as the 11th most critical location factor in their decisions on foreign direct investment. Only 29 per cent of multinationals rated tax as a “very influential” factor in their location decisions. There are so many factors that influence this type of investment, including commercial and regulatory policies, the education of the workforce and the infrastructure of the host country, that it is difficult to demonstrate causality between corporate tax and foreign investment. Two recent comprehensive studies looking into this question across a range of countries found no relationship between corporate tax and flows of foreign direct investment. Jensen’s study of 19 OECD economies between 1990 and 2000 using a time-series-cross-sectional general error correction model, came to this conclusion as did a study by Hayes (2003) who actually concluded that contrary to the perception of a race to the bottom on tax, there is actually a convergence of effective tax rates in the middle.

Analysis of the Irish example

Ireland is often remembered as a shining example of the level of economic growth that can be achieved as a result of low corporation tax. However it’s now recognised that Ireland didn’t actually experience an economic miracle in the 1980s and 1990s so much as it experienced economic catch-up from its low base and eventually convergence with other countries in the European Union. Not only this but this convergence was not a result of low corporation tax so much as it was a whole host of socio-political, economic, legislative and cultural factors – many of which Scotland is unable to replicate today.

What is true is that Ireland did experience rapid economic growth in the 1980s and 90s. The country’s rate of GDP per person grew from around 60 per cent of the EU average in 1986 to more than equal it in 1998 (fig 2.3.ii). Foreign direct investment (FDI), particularly from the US, was instrumental in this growth. However low rates of corporation tax cannot be singularly identified as the reason for America’s investment in Ireland from the mid-1980s. Ireland actually had a zero rate of corporation tax between 1950-1980 but the country’s growth remained stagnant. Increased levels of FDI from America actually coincided with an increase in Ireland’s rate of corporation tax from zero to ten per cent in 1981 (fig 2.3.iii).

Graph 2.3i Corporate tax rates across OECD countries in 2006 & 2008

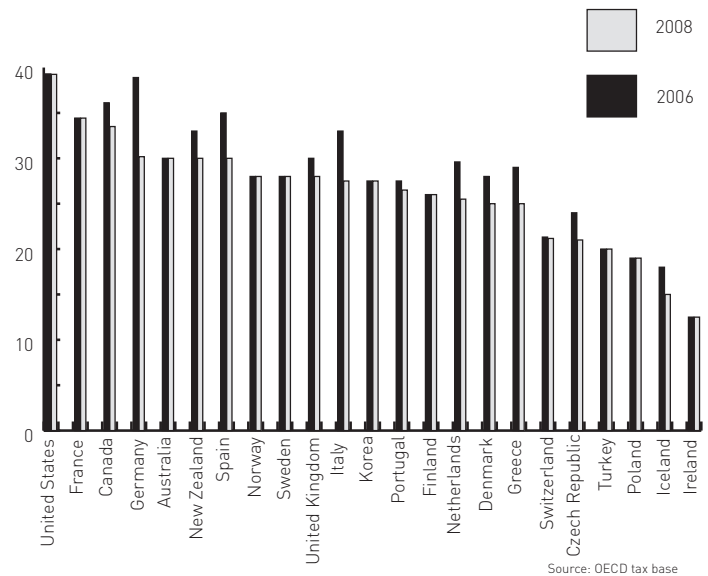


Figure 2.3 ii Ireland’s convergence with EU15 1986-1998

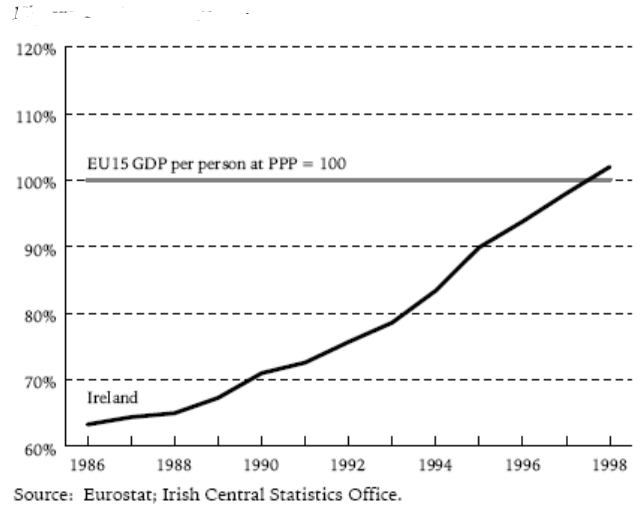
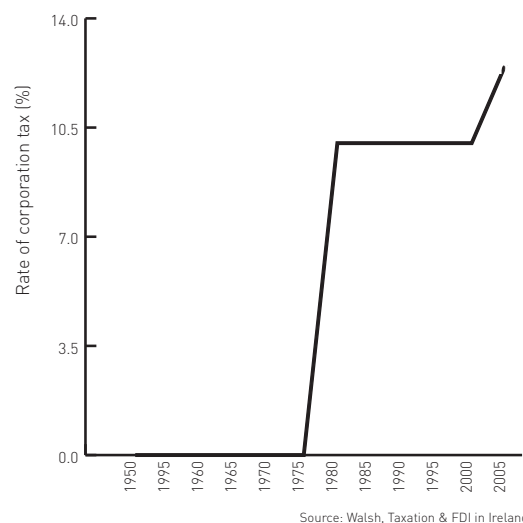


Figure 2.3.iii Ireland’s rate of corporation tax 1950-2005



Graph 2.3 Debunking the Ireland tax myth continued

A full analysis of the "Irish success story" found a host of other factors were significant in encouraging increased levels of FDI, of which a low rate of corporate tax compared to elsewhere in Europe was just one:

1. Currency devaluations of the Irish pound in 1986 and 1993 made Ireland a cheap place to do business.
2. A series of corporatist social pacts from 1987 where Irish trade unions agreed to limit wage increases in return for income tax cuts. These allowed rapid growth without inflation spiralling too high and also enabled rapid employment growth.
3. A rapid expansion in labour supply through demographic changes. The demographic shifts Ireland experienced during this period were unique within the EU, with an even balance between natural growth and in-migration
4. The emergence of a large available pool of educated labour
5. Strong cultural links between Ireland and the USA that were favourably to business.

All well as being clear about the full range of reasons Ireland was attractive to foreign direct investment it's important to evaluate whether high levels of FDI has actually been a positive thing for indigenous Irish industries. The research shows that many of the trans-national companies locating in Ireland have acted as enclaves with limited productivity spill-overs into the indigenous industry base. To at least some extent this has locked Ireland into a dependency on FDI. Another consequence of high FDI has been very low level investment in research and development in Ireland as this has taken place elsewhere in the multinational's supply chain. Ireland's expenditure on research and development was 1.17% of GDP in 2002 compared to an EU average of 1.9% (and a Scottish figure of 1.75% of GDP). This makes Ireland highly vulnerable to increasing shifts in capital across the globe. At a minimum, these findings show that there is no relationship between the common measures of globalization and taxation. Even more importantly, these findings can point to a flaw in the arguments on the relationship between corporate taxation and flows of foreign direct investment. Governments slashing levels of corporate taxation may not be rewarded with higher levels of foreign direct investment.

“Repeating investment which has already delivered benefit will not repeat the benefit”

Graph 2.4 Relationship between investment at education at different levels and the economic return

This is a growth regression analysis using a methodology called ordinary least squares (OLS). This tests the economic impact of the growth of human capital (HC) at different levels of education (primary, secondary and tertiary) for countries at three stages of their development. The figures shown in the table represent the multiplier effect generated a result of the growth of human capital at each level. The boxes highlighted in blue show where investment in education gave the greatest return (multiplier) for countries according to their stage of development. For advanced, OECD countries the growth of human capital educated to tertiary level had the biggest impact on economic growth: a multiplier effect of 5.89*.

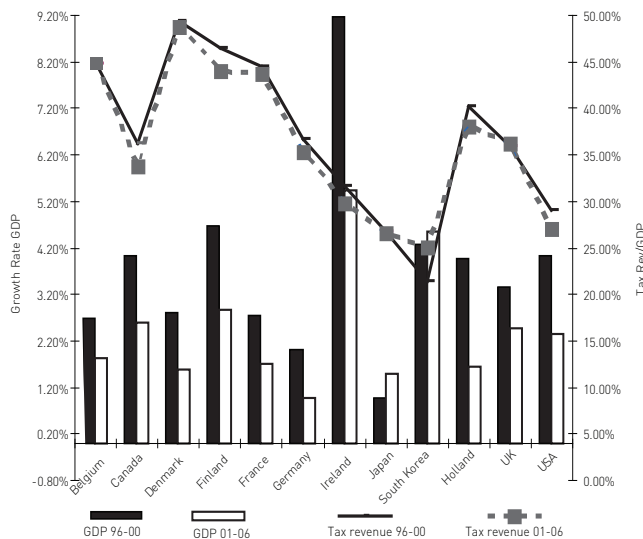
	Impact on the GDP growth per capita (% per annum 1960 -1985)		
Human capital (HC) variables:	poorest LDCs	intermediate LDCs	OECD countries
Growth in primary level HC	4.19**
Growth in secondary level HC	..	2.1	..
Growth in tertiary level HC	5.89*

LDC = less developed countries

*/** = a measure of significance indicating significantly different from zero at 5%/10%

Source: Gemmell, N (1996)

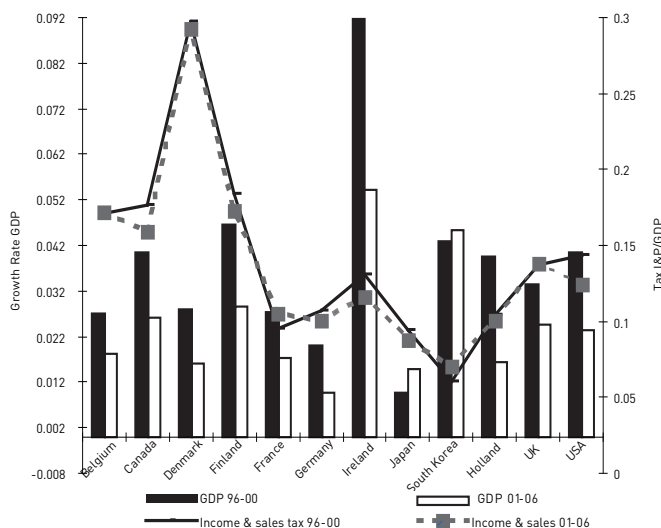
Graph 2.5 Comparison: Average GDP and average tax revenue 1996-2006



Graphs 2.5 and 2.5a look at the impact of tax rates on GDP growth. Graph 2.5 looks at all taxes combined, 2.5a isolates income tax and sales tax (VAT in the UK) in two separate time periods (1996-2000 and 2001-2006).

Changes to tax rates will not have an immediate impact. However, it is realistic to expect to see effects within three to five years as reflected in time periods

Graph 2.5a Comparison: Average GDP and average income tax and sales tax 1996 - 2006



Where tax burden has lowered this has not resulted in increases in GDP growth rates (the exception being income tax rates in Japan)

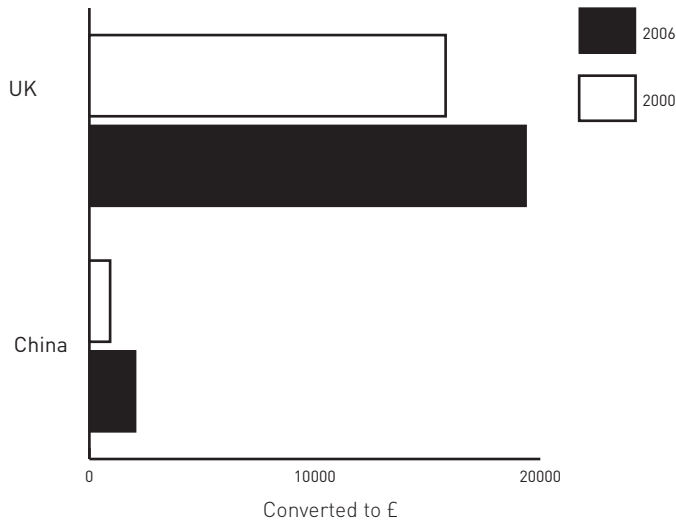
Source: OECD Fact Book 2008

2.6 Literature review of recent evidence on the economic impact of public investment in transport

Publication and/or author	Main findings
<p>The Eddington Transport Study</p> <p>Sir Ron Eddington, commissioned by the office of the UK Chancellor of the Exchequer.</p> <p>2006</p>	<p>Remit was to examine the long-term links between transport and the UK's economic productivity, growth and stability, within the context of the Government's broader commitment to sustainable development.</p> <ul style="list-style-type: none"> • Report is supportive in principle that investment in transport can deliver positive economic impact. • Recognition that the return on investment in transport can vary significantly between initiatives. Recommendation that all projects should be thoroughly assessed to ensure there is a genuine economic case. • Cautions assessments of economic impact of transport projects must include all social and environmental consequences, many of which adversely affect the economic returns, if the assessment is to be robust. This has been absent from impact measures in the past and can lower the stated return on investment by as much as £3-4 per pound invested. • Recognition that in less mature economies investment in transport has been pivotal to rapid economic growth. However for mature economies, that have already established well developed transport connections, other areas offer potential for economic growth. The investment environment and skills are cited as factors for recent growth in Ireland.
<p>Standing Advisory Committee on Trunk Road Assessment (SACTA), UK Department of Transport</p> <p>2005</p>	<p>Remit was to consider the nature and significance of the relationship between transport provision and economic growth.</p> <ul style="list-style-type: none"> • "Available evidence does not support arguments that new transport investment in general has a major impact on economic growth in a country with an already well-developed infrastructure". • "Any contribution to the sustainable rate of economic growth of a mature economy, with well developed transport systems, is likely to be modest". • The review turned up little empirical evidence of statistical or case-study evidence on the size or nature of economics impact of transport. • It found the practice of conducting local impact assessments is "poorly developed, does not offer convincing general evidence of the size, nature of direction of local economic impacts".
<p>Ministry of Economic Development (MED), New Zealand</p> <p>2001</p>	<p>Summary of main findings from the MED's own literature review of the available evidence on linkages between infrastructure and economic impact.</p> <ul style="list-style-type: none"> • A study by De La Fuente (2000) found causal link between infrastructure and economic growth until "saturation point" is reached after which returns decline. • Willoughby (2002), Hulten (1997) and Canning and Pedroni (1999) all posit that there may be an optimal level of infrastructure maximising the growth rate. If infrastructure levels are too high, it diverts investment away from other productive uses to the point where income growth is reduced. • Hulten (1997) believes that new infrastructure construction may not only have a limited effect on economic growth, it may have a perverse effect if it draws scarce resources away from maintenance and operation of existing stocks
<p>Kamps, Christophe "Is there a lack of public capital in the EU?" Kiel Institute for World Economics</p> <p>2005</p>	<p>Following on from the idea that its possible to reach a "saturation point" of transport networks in advanced economies (Willoughy, Hulten and Pedroni & Aschauer in the US) this study reviewed the levels of public capital in 22 OECD countries to see whether optimal levels have been reached.</p> <ul style="list-style-type: none"> • Comparisons of the capital stock estimates for 22 developed countries and linear regression models found no support for the relationship between public capital and economic growth. This suggests that either there is no relationship, or that levels of public capital are at optimal or near-optimal levels in those countries so any growth effect is minimal. • Study concluded that there was no evidence of a shortage or excess of public capital in any of EU counties including UK. If data from the UK was extrapolated forward from a base point of 1997 there may have been a risk of under-investment and sub-optimal levels of public capital in the UK. However the change in UK Government in '97 re-prioritised public investment and delivered a multi-annual spending programme on transport thus avoiding this outcome.

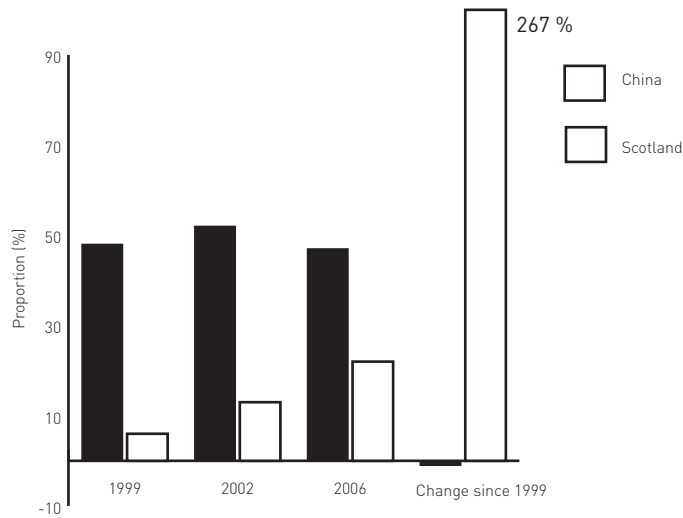
“Scotland can’t compete on cost and decreasingly so on skills”

Graph 2.7 Annual earnings in China and UK 2000 and 2006



Source: 5-16 in Chinese Statistical Yearbook & ONS Annual Survey of Hours & Earnings (ASHE) for all UK employees

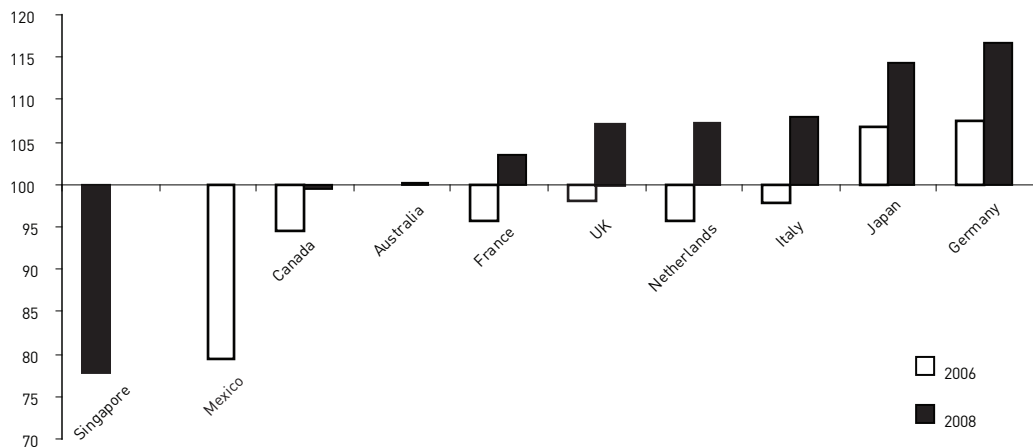
Graph 2.8 Proportion of tertiary age people in tertiary education



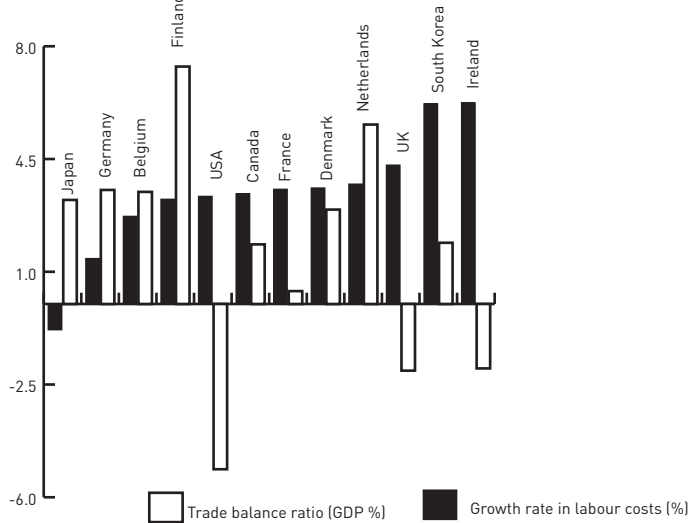
Source: UNESCO Institute for Statistics & API, Scottish Government

“Scotland has already gained most of the competitive advantage it can from business costs”

Graph 2.9 International comparison of business costs 2006 & 2008



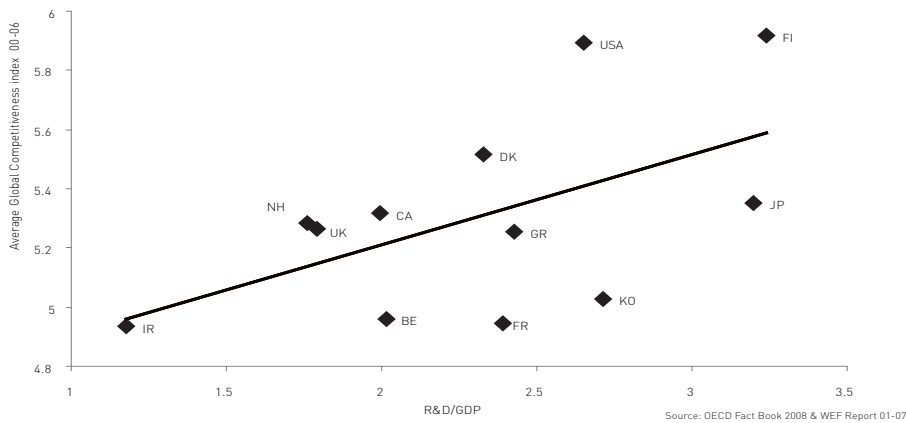
Graph 2.10: Lack of relationship between export markets and business costs



Source: OECD Fact Book 2008 & WEF Report 01-07

“Investment in innovation makes advanced economies more competitive”

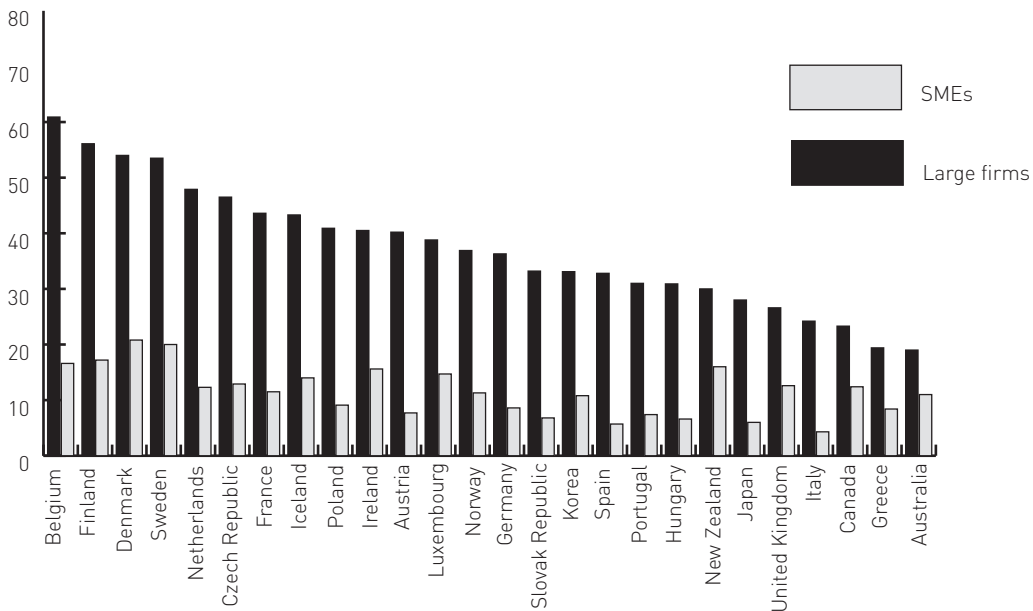
Graph 2.11 Relationship between R&D and competitiveness



Source: OECD Fact Book 2008 & WEF Report 01-07

We tested the strength of the correlation between these two factors. It gave a result of 0.55 per cent. This is highly significant.

Graph 2.12 Firms collaborating in innovative activities 2002-2004



3: Labour market and skills needs

The debate about Scotland's labour market often appears to be confused by misunderstanding of key definitions and data. A "skills shortage" refers to a lack of people in the labour force qualified to fill vacancies. There is no evidence and almost no reporting of widespread skills shortages in Scotland. A "skills gap" refers to workers in employment who lack certain skills needed by that job. This distinction is often reversed in people's minds. For example, the statement 'the skills gaps are mainly at sub-degree level' is often taken to mean that there is a lack of available workers with sub-degree level skills. What it in fact means is that the workers whose skills are insufficient for the jobs they have are mainly people holding sub-degree level qualifications.

"There are no serious skills shortages in Scotland and the workers lacking skills for their jobs and most likely to be non-graduates"

- **Table 3.1: Futureskills Scotland's definitions of key skills terms**
- **Graph 3.2: Employers reporting skills shortages**
- **Graph 3.3: Employers reporting skills gaps**

There is an assumption that we have a saturated graduate jobs market. The evidence points fairly conclusively in the opposite direction.

"The evidence strongly suggests an increasing shortage of graduates not saturation"

- **Graph 3.4: Signs of a graduate shortage: Increase in graduate vacancies and graduate salaries**
- **Graph 3.5: Decrease in graduate unemployment**
- **Graph 3.6: Decrease in graduate under-employment**

People believe that Scotland has a comparatively highly educated workforce. In fact, the proportion of the Scottish workforce holding a university degree is almost exactly the same as the UK and the UK is below the EU and OECD averages for graduate workforce. Scotland's rate of producing graduates is overstated and comparatively recent. Scottish participation rates in higher education are high mainly because of the volume of sub-degree level higher education (HNDs and HNCs) and Scotland's 'higher average skill level' is entirely due to an extremely high proportion of the workforce with post-school, sub-degree level qualifications. If HN provision is removed, Scotland's higher education participation rate is not as high as people tend to assume. Put simply, Scotland has one and a half times as many people with HN qualifications than the rest of the UK but the same skills at other levels. By international standards, Scotland has an extremely high volume of post-school, sub-degree level education.

"Scotland much less university-level education but much more college level education than many other countries"

- **Graph 3.7: Trends in the level of university graduates amongst OECD countries**
- **Graph 3.8: Qualifications profile of the labour force in Scotland compared to England & the UK**
- **Graph 3.9: Qualifications profile of Scotland compared to OECD countries**

This next point is controversial but is important to make. There is sometimes an indiscriminate assumption that all vocational (taken to mean post-school, non-university) education must be good for the economy. In the coming years, the evidence shows that there will be a polarisation of the labour market and the skills needs of the future will be at the highest and lowest levels. There will be little demand for intermediate vocational level skills. There is already strong evidence of saturation and oversupply in Scotland. In Scotland the evidence already shows a poor rate of return for those with intermediate qualifications. A rate of return for a qualification is a measure how highly a qualification is valued by the jobs market. Because the market is saturated with sub-degree qualifications and there just isn't the demand, people with these get a much lower rate of return. The evidence shows female graduates get a return on their qualification twice that of someone with sub-degree, intermediate level skills like an HNC, HND. Male graduates can expect two and a half times more. Further confirmation of the saturation of Scotland's labour market is found by looking at unemployment rates by type and level of qualification. Scottish men with vocational level four qualifications are actually more likely to be unemployed than if they had not undertaken the qualification. People at the next qualification level down are actually marginally more employable than their more qualified peers. The blanket assumption vocational training must be good for the economy is simply not sustained by the labour market or wage premium evidence and increasingly looks like a hangover from a previous age

“Scotland has too many people with vocational level four qualifications”

- **Graph 3.10: Unemployment rates by qualification**
- **Graph 3.11: Rates of return by level of education**

All the labour market projections for advanced economies point to virtually all the net expansion in employment being at graduate level or above. The specific labour market projections for Scotland do not breakdown future demand by qualification but they do project that virtually all the employment growth will be in industry sectors which are typified by very high levels of graduate employment.

“New jobs will be at graduate level or above”

- **Graph 3.12 Changing skills profile of labour market throughout OECD countries**
- **Graph 3.13 Projected future demand for skilled entrants to the labour market in OECD countries**

A large amount of the debate about the Scottish economy is based around talk of skills shortages, the need for more apprenticeships and other vocational qualifications and the saturation of the graduate labour market. This is alarming because all three statements are diametrically opposed to the real-world data. There are no skills shortages. More apprenticeships could only be predicated on increased demand from the construction sector (the opposite of what is likely to happen in the medium- and long-term). Scotland appears to be saturated with 'vocational skills' (particularly at level four) and when an independent study of UK skill levels was commissioned by Skills for Business and published in 2008 it concluded that investment in vocational qualifications in Scotland "could perhaps be usefully shifted towards producing relatively more academic qualifications". And far from suggesting an oversupply of graduates, there is evidence of undersupply. The fact that public discourse is so dislocated from the evidence is worrying. The same applies to the 'NEETs' (not in employment, education or training) and those with no qualifications. It is economically incorrect to think that 'any' education will result in economic benefits – if we take someone with no qualifications and provide them with a qualification but one which is not in demand in the labour market we will fail them twice by failing to get them into employment and alienating them from further study. We have to address the problem of those with no qualifications, but if we seek economic benefit (and to improve their life chances) we must apply the same economic evidence to them as to the educated middle-classes. Tokenism will be counterproductive.

Looking forward, it is wrong to see the economy only in terms of 'people-shaped holes'. If we take an example; the fact that there are no major nanotechnology employers in Scotland other than the universities does not therefore mean that the relevant skills needed by a nanotechnology sector are inherently surplus to Scotland's labour market requirements. Given that from leaving school, those skills would take at least eight years to develop, waiting until the first vacancy advertises before recognising the demand driver would be a decade too late. The replacement industries previously discussed will require high-level skills. The competitive analysis suggests that they will emerge in Scotland only because of high-skill competitive advantage which means that they will probably employ large numbers of postgraduates. But they will not establish themselves and then wait years for the required labour force – they will simply emerge somewhere else. If our strategies for workforce development over the last forty years had been based only on the self-reporting of existing employers we would still be producing shipbuilders. A heavyweight report due for release by the Conference Board in the US is expected to conclude that for America's future prosperity innovation is the answer while skilled labour is the bottleneck. This is not to propose 'central planning' of the economy (it is just as likely that Scotland loses out on nanotechnology but becomes a centre of bioscience, for example) or to make detailed guesses about what is coming next. But it does mean making some informed decisions now on the labour market conditions that Scotland will require in the future, and that means more technology skills and more postgraduate skills.

Finally, it would be wrong not to see this issue in the current context. There are many forms of direct public action which can create or secure jobs during a recession, but that is not the same as preparing for recovery. To give an example, subsidising labour costs in the retail sector might slow down decline in that sector, but it cannot change the structural problems faced by a sector which had grown on the basis of personal debt which was unsustainable. On job creation, it is possible to create lots of jobs by developing programmes of public works, but once the public investment is removed post-recession, not only are these jobs no longer sustainable, the skills developed by those workers will not be in demand by the economy. Of course Scotland has to act now to secure jobs as best we can in the months or years of recession, but a successful recovery will require us to plan beyond that horizon. That means acting now. Graduates are much less likely to be unemployed and when unemployed are so for much shorter periods of time. This is because the skills of graduates are by nature highly-transferable which makes graduates much more competitive in the labour market. This is particularly important as a country emerges from recession because economies with large number of adaptable workers is able to recover much faster than economies with workers trained primarily for industries which have contracted and are unlikely to expand in the short term. If we do no more than fix the holes in the hull of our economic ship in recession we will find ourselves adrift with no engine once the recession is over.

Conclusions: "Scotland is at risk from complacency over skills"

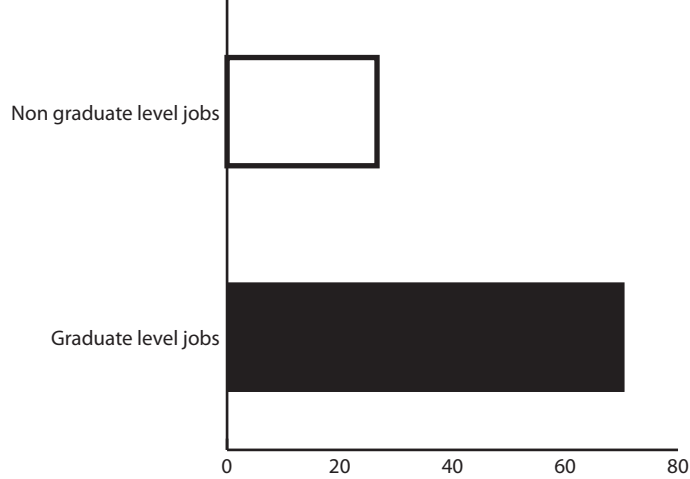
- The skills debate is not well based on evidence or analysis. The reality of the data about the labour market is poorly understood and poorly interpreted.
- Rather than skew investment further towards sub-degree level education the evidence suggests that Scotland should in fact move investment towards university level education.
- There are real risks that high-level skills supply shortages could be a major break on economic growth and transformation in Scotland and this risk is made all the greater by a general unawareness of it.
- Planning for recovery is just as important as planning for recession.

“There are no serious skills shortages in Scotland and the workers lacking skills for their jobs and most likely to be non-graduates”

Table 3.1 Definition of terms (Futureskills Scotland)

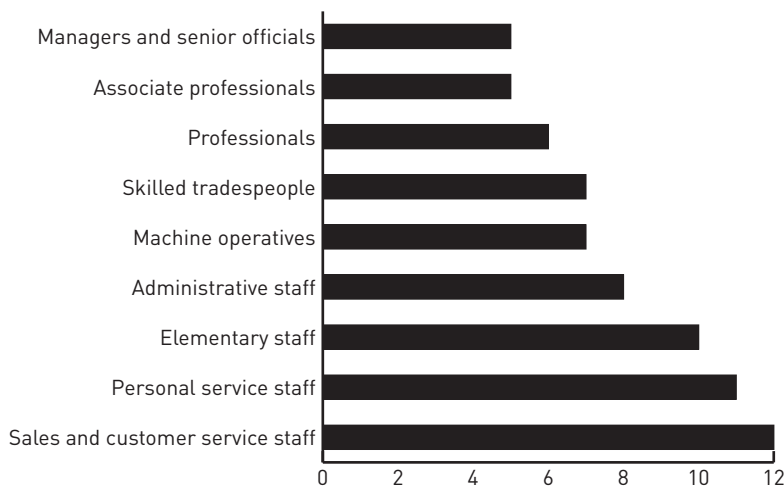
Hard to fill vacancies	This is a vacancy that an employer struggles to fill
Skills shortage	A skill shortage vacancy is a specific type of hard-to-fill vacancy that occurs when an employer can't find applicants with the skills, qualifications or experience to do the job. It is not the same as a hard-to-fill vacancy that occurs because there aren't enough applicants, or because the applicants lack the right motivation or attitude. Skills shortages apply to someone applying for a job.
Skills gaps	A skill gap exists when an employer thinks a worker doesn't have enough skills to perform their job with full proficiency. Skills gaps apply to existing employees

Graph 3.2 Proportion of hard to fill vacancies in Scotland's job market that are attributable to skills shortages by level of occupation



Source: Future Skills Scotland: Skills for Scotland

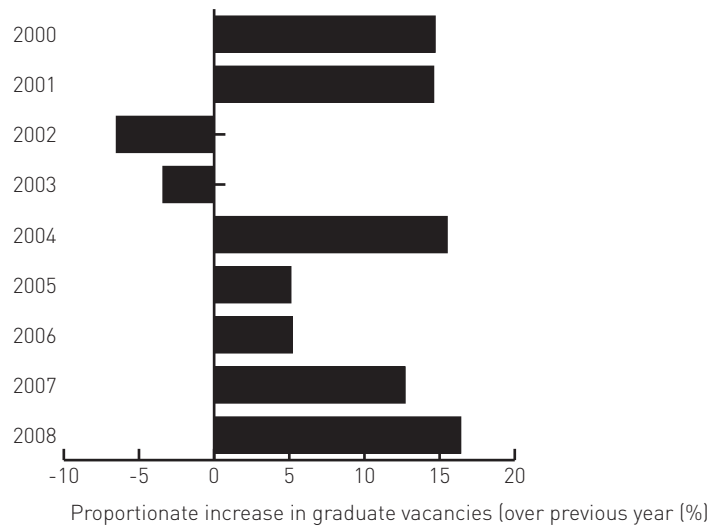
Graph 3.3 Skills gaps as a proportion of employees by occupation (%)



Source: Future Skills Scotland: Skills for Scotland

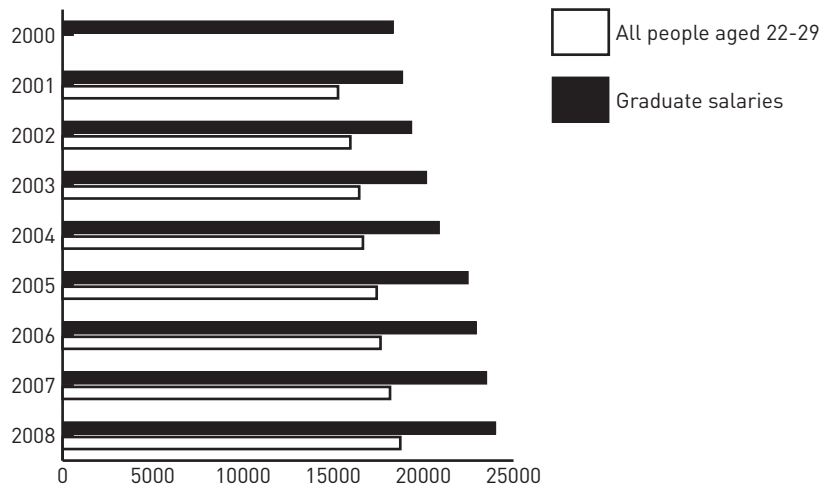
“The evidence strongly suggests an increasing shortage of graduates not saturation”

Graph 3.4a Proportionate increase in graduate vacancies (over previous year) %



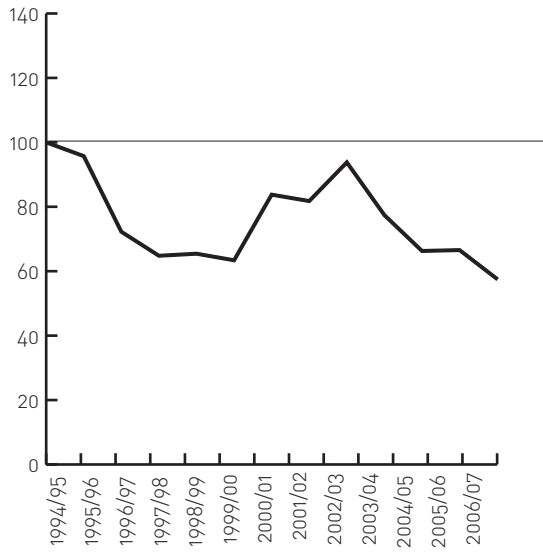
Source: Association of Graduate Recruiters

Graph 3.4b Median graduate starting salary compared against median salary of all UK aged 22-29



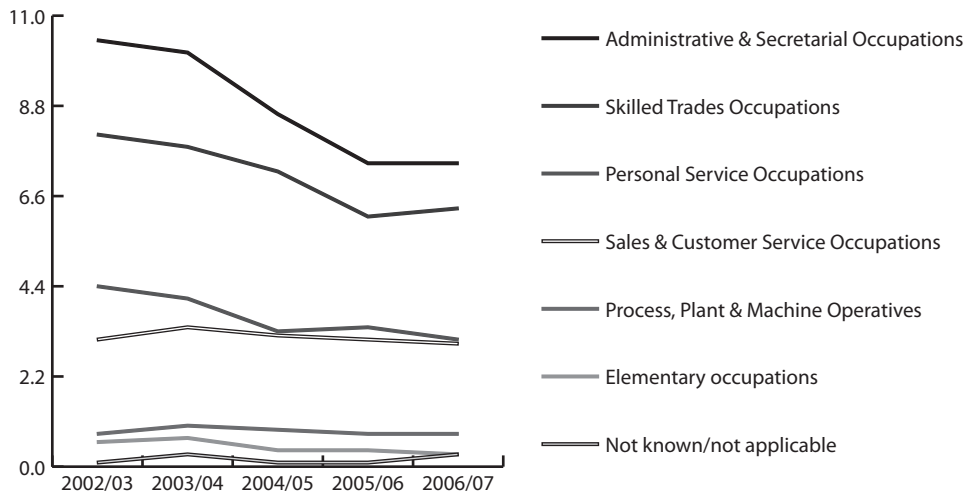
Source: Association of Graduate Recruiters & ASHE (ONS)

Graph 3.5 Proportion of graduates with first degrees from Scottish institutions assumed to be unemployed sixth months after graduation - indexed to 100 in 1994/95



Source: HESA Destinations data (6 months after graduation)

Graph 3.6 The proportion of graduates with first degrees that are underemployed 6 months after graduation (as defined by type of occupation)



Source: HESA destinations

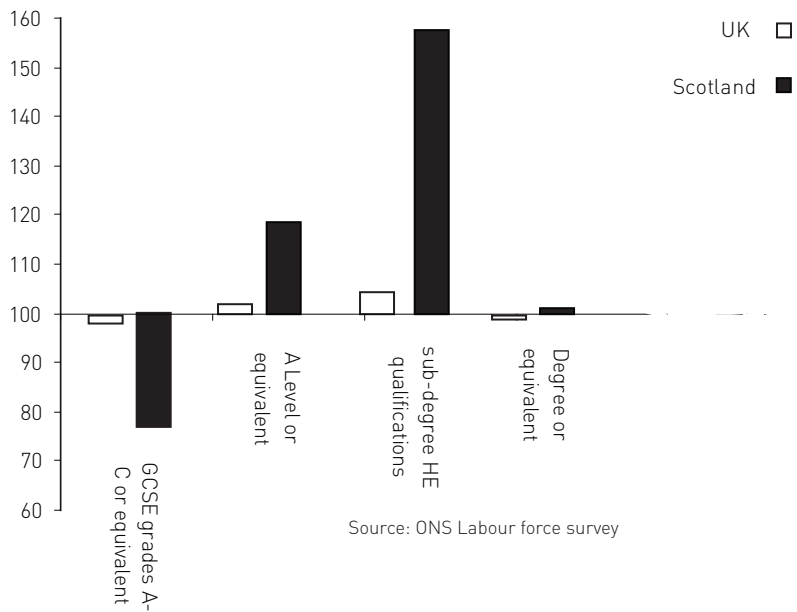
“Scotland much less university-level education but much more college level education than many other countries”

Graph 3.7 Proportion of graduates in the workforce in OECD countries, 2000 & 2006

2000		2006	
New Zealand	50	Iceland	63
Finland	41	Australia	59
Norway	37	New Zealand	52
UK	37	Finland	48
Denmark	37	Poland	47
Australia	36	Denmark	45
Netherlands	35	Netherlands	43
Poland	34	Norway	43
United States	34	Sweden	41
Iceland	33	Italy	39
Ireland	30	Ireland	39
Spain	30	UK	39
Japan	29	Japan	39
Sweden	28	United States	36
Portugal	23	Slovak Republic	35
Italy	19	Portugal	33
Germany	18	Spain	33
Austria	15	Switzerland	30
Greece	15	Czech Republic	29
Czech Republic	14	Austria	21
Switzerland	12	Germany	21
Turkey	9	Greece	20
		Turkey	15

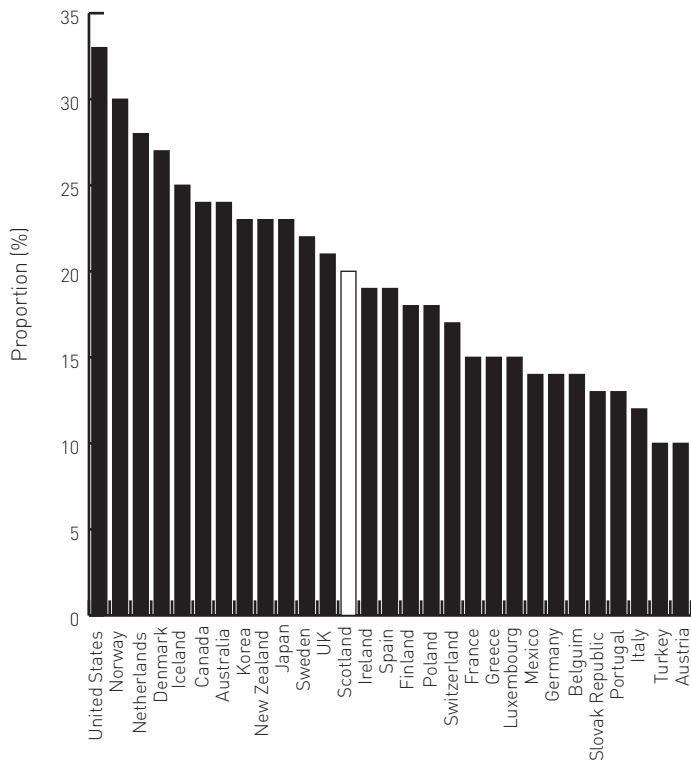
Source: OECD Education at a Glance

Graph 3.8 Qualifications profile of Scotland's labour force benchmarked against England and the rest of the UK (where England is 100)



Source: ONS Labour force survey

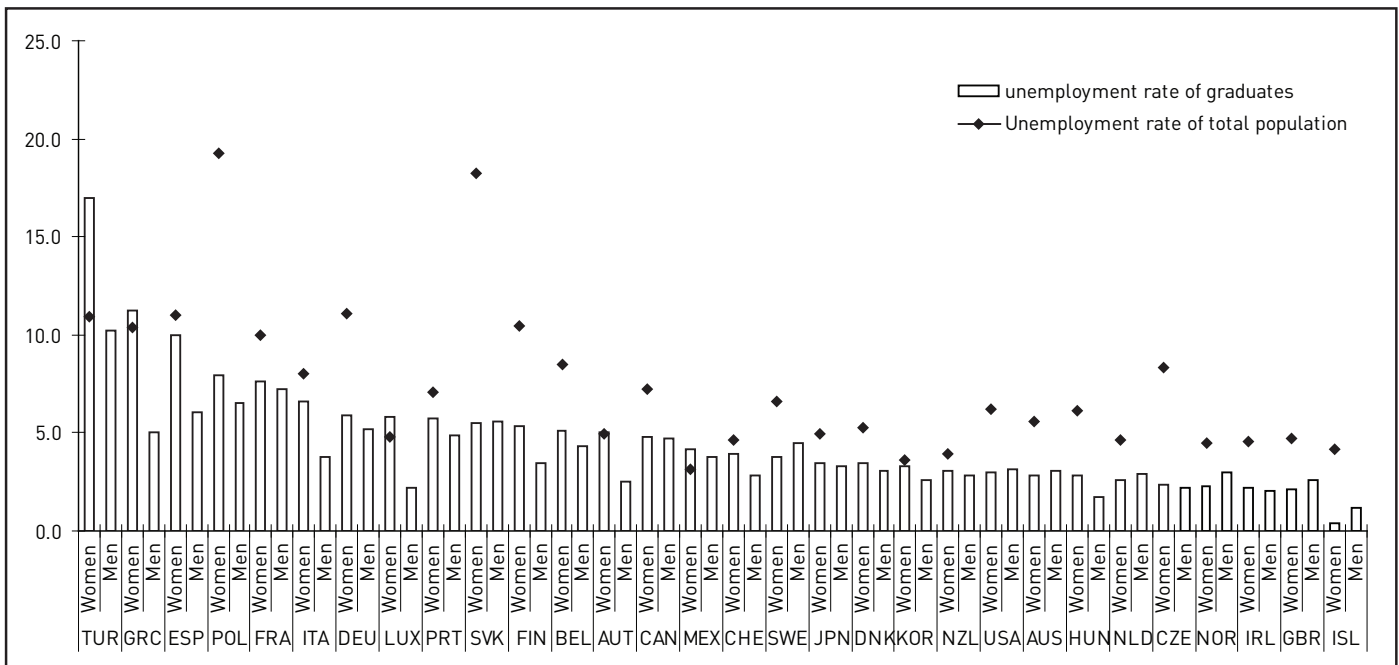
Graph 3.9 Proportion of the adult population (aged 25-64 that has attained tertiary type A education)



Source OECD: Education at aGlance 2008

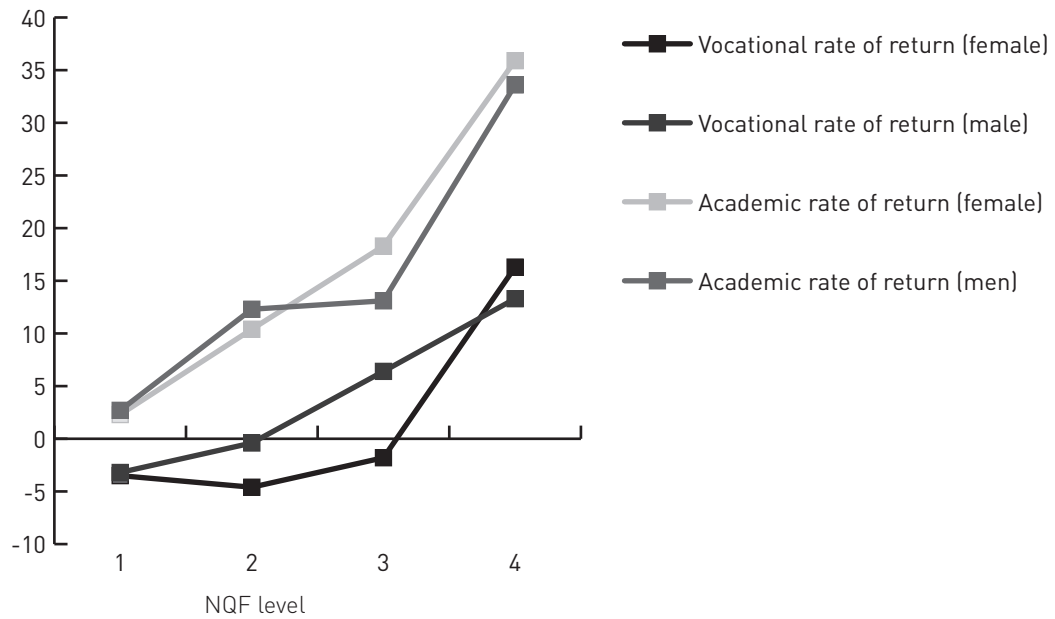
“Scotland has too many people with vocational level four qualifications”

Graph 3.10 Unemployment rates by qualification



Source: OECD Science, Technology and Industry: Scoreboard 2007

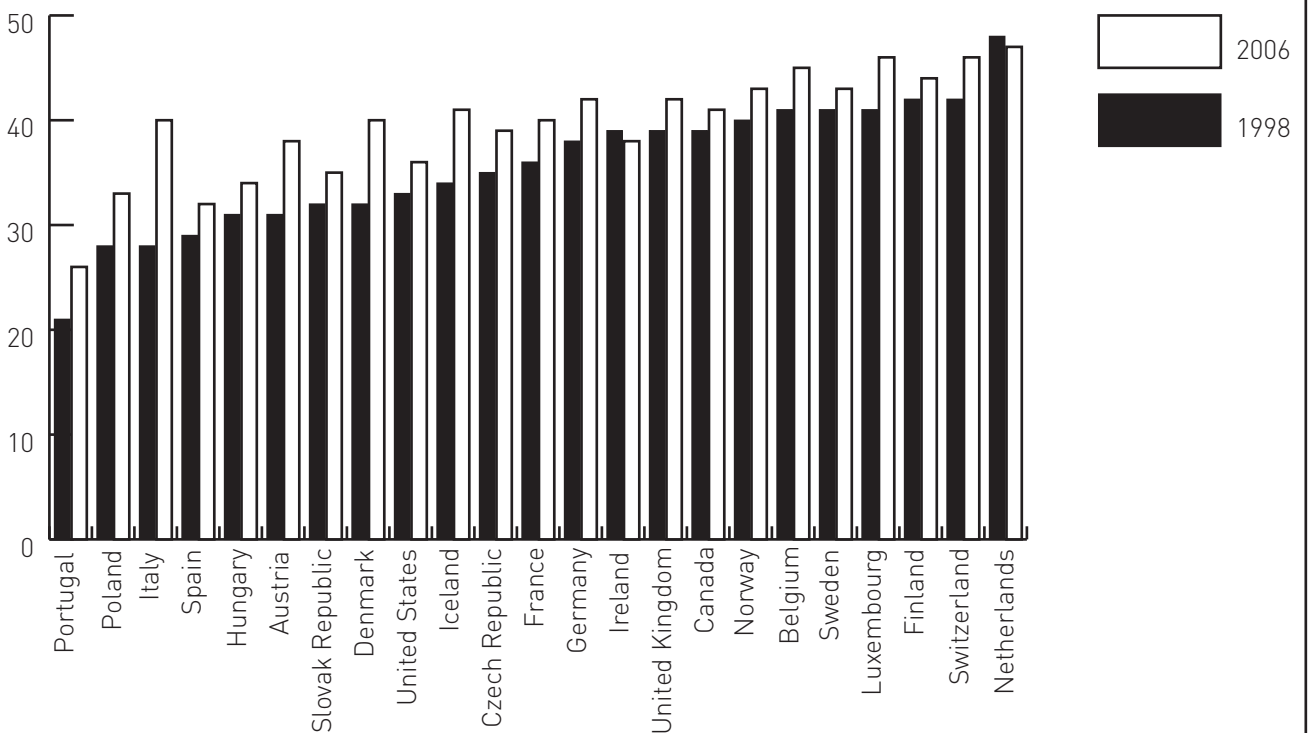
Graph 3.11 Rates of return to academic and vocational qualifications



	Academic	Vocational
1	1 poor standard grade	City and Guilds 1, BTEC
2	5 standard grades	City and Guilds 2, BTEC diploma
3	2 highers	Trade apprenticeship
4	First degree	HND/HNC

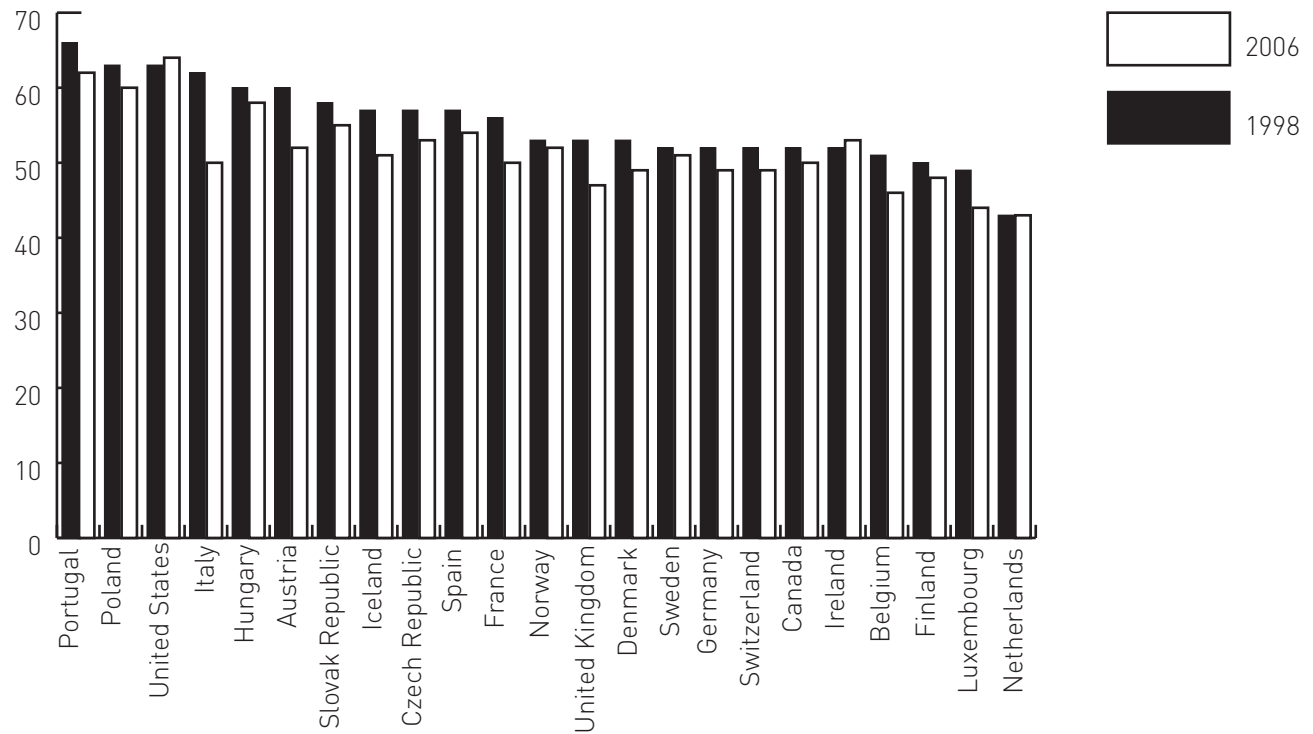
“New jobs will be at graduate level or above”

Graph 3.12a Increase in skilled occupations as a proportion of the total workforce in OECD countries between 1998 - 2006



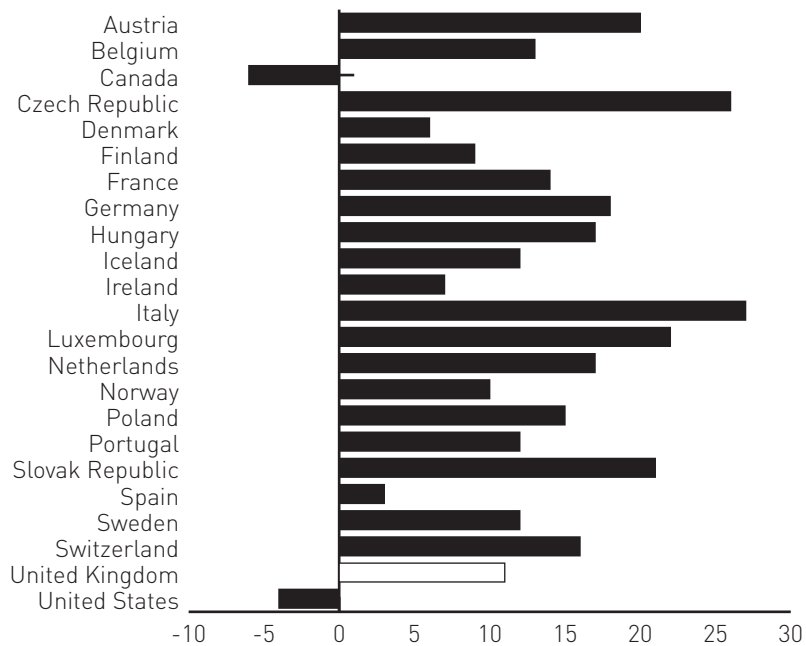
Source: OECD, Education at a Glance 2008

Graph 3.12b Decrease in semi-skilled occupations as a proportion of the workforce between 1998-2006 amongst OECD countries



Source: OECD, Education at a Glance 2008

Graph 3.13 Scope for further expansion of tertiary education based on current skills profile of in-country job market



Source: OECD Education at a Glance 2008

4. Productivity and deployment of innovation, technology and skills

The World Bank identifies productivity, information, and knowledge as the key determinants of growth over the period 2005 -2030. We have already looked at information and knowledge in a number of contexts. Productivity will be the other major factor. The starting situation in Scotland is not as bad as is sometimes assumed – we are above the OECD average on productivity which is much better than our performance on some other measures (as we shall see). It is also worth noting that much of the popular assumption about productivity is flawed – productivity is not about greater exploitation of the workforce or squeezing more value from each hour worked. America has a high rate of productivity allied with long working hours and few holidays. However, France’s productivity is better than the US even with high levels of employee rights and long holidays. Likewise, the US may have low business and personal tax rates but its productivity is below that of Norway which has high taxes.

We must therefore look at the areas in which Scotland has the power to improve its productivity and prioritise. There are four main factors through which Scotland could influence productivity:

“Productivity is complicated – it’s not about squeezing workers”

- **Table 4.1: Comparative assessment of hours worked, leave entitlement and productivity relative to the USA**

The first is innovation. The creation of new ideas, technologies and process can have a significant effect on productivity performance. Innovations often have ‘spill over’ effects that can create wider benefits to the overall economy than simply to the person or firm who created the innovation. These spill overs can be contagious and increase the productivity of all firms as new processes and ideas are copied. Recent new technologies in IT developments have had similar impacts to those of the development of production lines. Innovations can occur with individual firms, or have their roots in research undertaken in the university environment. But Scotland’s performance is poor – our national spend on R&D is better than embarrassing only because of the contribution of universities. Business expenditure on R&D in Scotland is low. Figures for 2005 reveal that expenditure on R&D undertaken by Scottish business totalled 0.59% of GDP, compared with 1.08% in the UK, 1.12% across the EU 25, 2.46% in Finland and 2.92% of GDP in Sweden. Scotland’s performance is not just poor; the UK’s performance is poor and Scotland’s is twice as bad. There has been very little concerted action to address this and this has been flagged up by members of our panel as a significant failure in the Scottish economy which has been tolerated for too long without action. In the UK there was a prevailing view that the indicator on spend on R&D misstated the position and that the UK economy was typified by ‘hidden innovation’. The serious errors in this assumption are only now apparent – the ‘hidden innovation’ consisted primarily of exactly the complex financial ‘products’ which have caused the current economic crisis. The UK has been complacent about its poor R&D record and may now pay a price and Scotland is in a worse position again.

“Innovation is important to productivity but Scotland’s track record is poor”

- **Graph 4.2: Correlation between rates of research & development (R&D) and productivity**
- **Graph 4.3: Expenditure on R&D by business as a proportion of total spend on R&D across the OECD**

The second is skills. The education and skill level of a workforce is of crucial importance to productivity growth, particularly in a developed economy. Improving skill levels contributes directly to productivity performance as it can generate new innovations, technologies and ideas that benefit the economy as a whole. We have already looked in some depth at the skills issues affecting the Scottish economy. The conclusions from that analysis are entirely borne out by an analysis of productivity and skills. If the higher market value of higher level skills identified above is correct we would expect to see clear productivity benefits from higher skill levels. This is indeed what we find. In fact, a graduate contributes between 20

and 48 per cent greater productivity to the labour market than employees holding lesser qualifications. This also holds up at an aggregate level. In twelve studies of the impact of increasing numbers of graduates in the workforce on productivity, all showed a direct positive impact – having more graduates in your economy, other things being equal, improves your productivity.

The third is investment. Investment in capital increases labour productivity by increasing the capital stock that a worker can use, and investment in physical infrastructure complements other forms of government investment in skills and R&D. However, the evidence suggests that it is just as important to target investment in capital as to increase it – in most developed economies the productivity of capital has been declining as investment has increased. UK capital productivity declined from 116.1 in 1990 to 96.9 in 2003 (2000 = 100) a pattern repeated in most OECD countries. For example, as mass manufacturing declines and a country is no longer exporting large numbers of objects, the significance of road networks declines while a service economy will benefit more from investment in ICT. As with everything else, we see greater benefit from emphasising on high-value activity.

The fourth is incentives and competition. The first three drivers of productivity benefit from incentives and competition which encourage improvements in productivity. However, this is not the same as simply suggesting that the lower the business costs the higher the productivity. In fact, quite the opposite is often true. National productivity increases as the natural process of new businesses starting and old businesses closing takes place. As new, more productive businesses or sectors appear they are more competitive than less productive businesses which either have to improve their productivity or they will fail. This ‘creative destruction’ is part of a process which drives up productivity. What this in fact means is that ‘bailing out’ failing businesses will actually harm productivity and not improve it. This is another reason why non-targeted investment in reducing business costs is counterproductive – if a small business needs a marginal cut in its business taxes to survive it is probably not sustainable anyway. So, for example, incentives which encourage investment in R&D are likely to have a much more significant effect on national productivity than the same investment made in reducing business rates.

What we know about productivity reflects and reinforces what we know about the labour market, replacement industries and competitiveness.

“Incentives can be counterproductive if not targeted”

- **Case study 4.4: Analysis of the impact of Regional Selective Assistance grants on Scottish productivity**

Conclusions: Productivity in Scotland is about increasing value.

- Productivity will come from skills, innovation and the deployment of technology.
- Incentives and competition will also increase productivity, but mainly when they encourage the type of virtuous behaviour which results in better skills, more innovation and more effective technology.

“Productivity is complicated - it’s not just about squeezing workers”

Table 4.1 Comparative assessment of hours worked and leave entitlement relative to the USA.

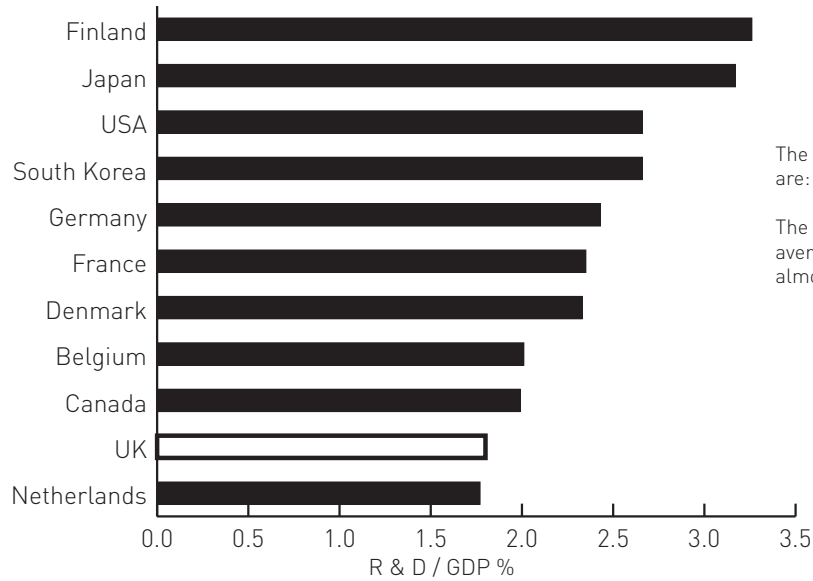
Country	GDP per hour worked * as % of USA (USA=100)	Average hours worked per person in millions	Paid Public Holidays	Paid Annual Leave entitlement
	1	2	3	4
Norway	133.5	1,417	2	25
Ireland	108.4	1,632	9	20
Belgium	104.9	1,566	10	20
Netherlands	102.2	1,392	0	20
France	100.6	1,533	1	30
United States	100	1,705	0	0
Germany	94.7	1,433	10	20
Sweden	87.6	1,615	0	25
Austria	86.8	1,630	13	22
United Kingdom	84.8	1,670	0	20
Australia	83.4	1,730	7	20
Finland	82.2	1,710	9	25
Denmark	82	1,577	9	20
Canada	81.4	1,736	8	10
Switzerland	81.2	1,648	0	20
Spain	80.2	1,635	12	22
Italy	74.9	1,824	13	20
Japan	71.2	1,785	0	10
Greece	60	2,150	6	20
New Zealand	57.1	1,771	5	20
Portugal	52.2	1,728	13	22

Source: OECD employment indicators

* GDP per hour worked is a measure of productivity

“Innovation is important to productivity but Scotland’s record is poor”

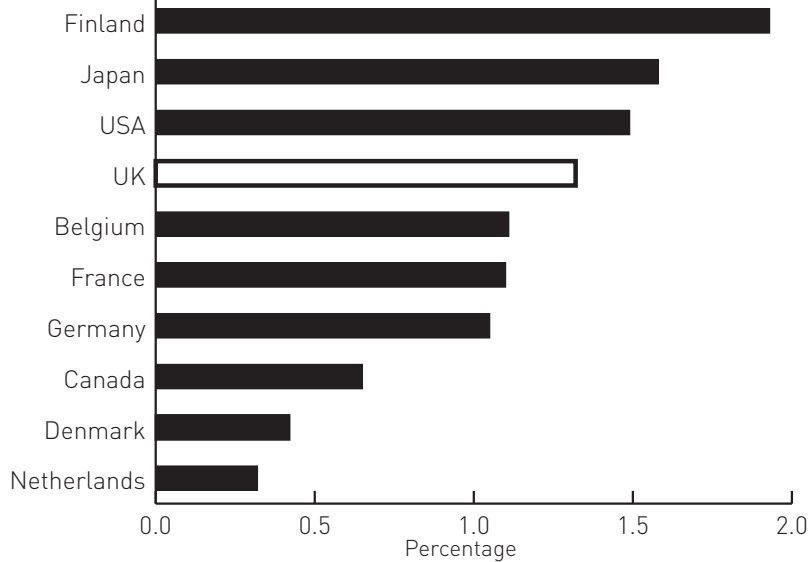
Graph 4.2a Average national expenditure on R&D over period 2000-2006



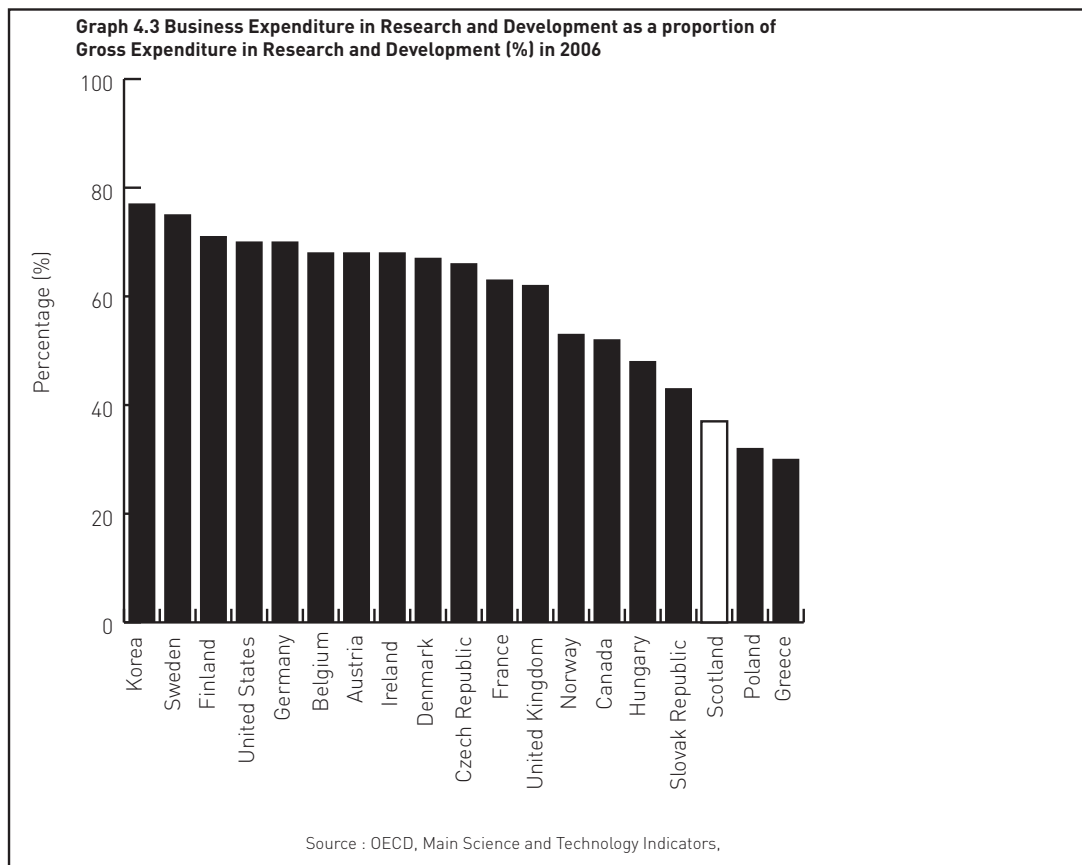
The interpretation for the correlation coefficients are:

The relationship between average R&D and average multifactor productivity is positive and is almost 73%

Graph 4.2b National Growth Rate in Multifactor Productivity



Source: OECD Factbook 2008



“Incentives can be counterproductive if not targeted”

Table 4.4 Case study example of the impact of Regional Selective Assistance grants on Scottish productivity

The Regional Selective Assistance (RSA) scheme was introduced in the UK in the 1990s as a capital subsidy scheme for manufacturing companies in remote and disadvantaged regions. The scheme provided resource to industry to modernise their production processes, introduce more up-to-date technology, and generally increase the competitiveness and viability of the firm. The primary purpose of the scheme was to create and safeguard employment however there was also an explicit obligation to ensure that RSA impacted positively on the economic performance of the industry plants they assisted in order to increase productivity growth in the regions. The success of the scheme can be judged two ways. In terms of employment the scheme was successful as RSA-assisted schemes did have a higher probability of surviving. However the scheme was less successful in its objective to increase productivity growth.

As with any subsidy, there is a danger that uncompetitive firms are supported which otherwise would and arguably should exit the industry. Schumpeter’s theory of ‘creative destruction’ suggests that resources should be surrendered by failing plants and diverted to new, more productive plants in a constant process of churning and productivity improvement. The evidence to support this theory holds up at a national level in this case as the importance of entry and exit of firms to productivity is relatively clear. A total factor productivity (TFP) assessment found RSA-assisted plants generally under-performed vis a vis non-assisted plants, with some exceptions. TFP is the most appropriate measure to capture impact in this case as it captures the impact of all relevant factors; labour, material, fuel, and fixed capital for example. Plants in metal manufacturing, chemicals and electrical/electronic engineering, motor vehicles, instrumental engineering, timber, rubber, and other manufacturing sectors all underperformed in terms of relative total factor productivity growth.

In terms of future policy implications for incentive and subsidy schemes this shows there may be difficult trade-off decisions to make between efficiency, where resources should be allocated according to their most profitable uses, and equity, in terms of securing employment where it may be at risk. The evidence in the case of the RSA initiative is that RSA maintained some of the less productive plants which limited the potential for benefits in line with Schumpeter’s creative destruction. **Source: Harris, R & Robinson, C (2004) The impact of Regional Selective Assistance on sources of productivity growth.**

Overall conclusions

This has been a very quick run-through of some key factors which affect the Scottish economy. We have drawn them apart under four headings to help make the situation clear. But we need to draw them back together again to explain how they reinforce and interact with each other. The following is simply some examples of what that would mean:

- Advanced economies need to replace industries which disappear, especially export industries. Export industries disappear mainly because they become uncompetitive internationally. The competitive position is lost as developing economies can match competitive advantage in skills, technology and infrastructure while maintaining competitive advantage on labour costs. Once lost, a competitive advantage cannot be restored and in particular attempts to regain competitive position by reducing business or labour costs will not work and can at best only slow down collapse.
- New industries will therefore emerge where an economy can identify a new competitive advantage. For an advanced economy with high social costs resulting from high quality of life that advantage will always be found in moving further up the value chain. This has been shown over and over again in industrial development in advanced economies.
- There are two main 'high value' factors available to advanced economies not available to less advanced economies – high-level skills and the ability to produce higher-level innovation. The former of these also enables the deployment of more advanced technology. This is the only place where competitive advantage can be pursued by advanced economies.
- Like a doubter from the 1840s claiming that universal primary education is not only pointless but unachievable, the general understanding of skills needs and positions almost always underestimates the situation. At a macro level, jobs follow skills and not the other way round. Which is to say that the skills must predate emerging industry sectors or those sectors will be unable to function. The current debate on the need for more 'vocational' education is not based on economic evidence and has the potential to become the biggest inhibiting factor on economic growth in Scotland.
- It is because advanced economies can be competitive in skills and innovation that these are the two most important factors in improving national productivity. By contrast, marginal reductions in business costs is likely to inhibit productivity by subsidising for short periods companies which are not sufficiently productive to compete.

The problem with Scotland's current economic position is that these lessons are not adequately reflected in public policy or action, or indeed in much of the commentary on the Scottish economy. The following are some conclusions which can be drawn from the evidence and analysis above about action that must be taken now to position Scotland for recovery and then long-term economic wellbeing:

- We must keep pushing skills levels higher to maintain competitive advantage.
- We need to encourage Scots to consider subjects which can be future sources of competitive advantage such as science, technology, engineering and maths subjects, health and education subjects and subjects linked to the highly-competitive creative industries sector.
- We must be more realistic about the market demand now and in the future for qualifications branded 'vocational' and dismiss the assumption that 'academic' qualifications are less relevant to the economy; this sort of anti-intellectualism is directly opposed to Scottish economic interests.

- We must target economic investment towards innovation of all sorts; incentivise research and development in the business sector to address Scotland's terrible record, invest more money in public research and development and prioritise better linkages with the private sector.
- We must encourage company development based on long-term sustainability and competitiveness, which may not necessarily be the same as short-term growth potential (for example, ten high-tech companies employing 50 people each are likely to provide significantly higher national prosperity than one low-tech company employing 500 people).
- We must target public investment carefully. If we overemphasise untargeted industry support, particularly to industries which are of declining competitiveness, we will at best only slow decline temporarily and it is likely we would decrease productivity and inhibit economic transformation.
- Above all, we must be guided by evidence and avoid the temptation to listen to whomever shouts loudest.

There are elements of the above approaches in current strategies but they are very much secondary to short-term industry support. Scotland can refocus its economic strategy now and prepare for the economic transformation ahead or it can take a 'remedial' approach now only to be forced to change strategy as the decline becomes worse. The financial sector, construction and retail jobs are unlikely to return in anything like the same numbers after this economic downturn. We can either talk about 'what was' or ask 'what next?'. We believe the evidence, data and analysis offer a pretty clear answer to this question.

