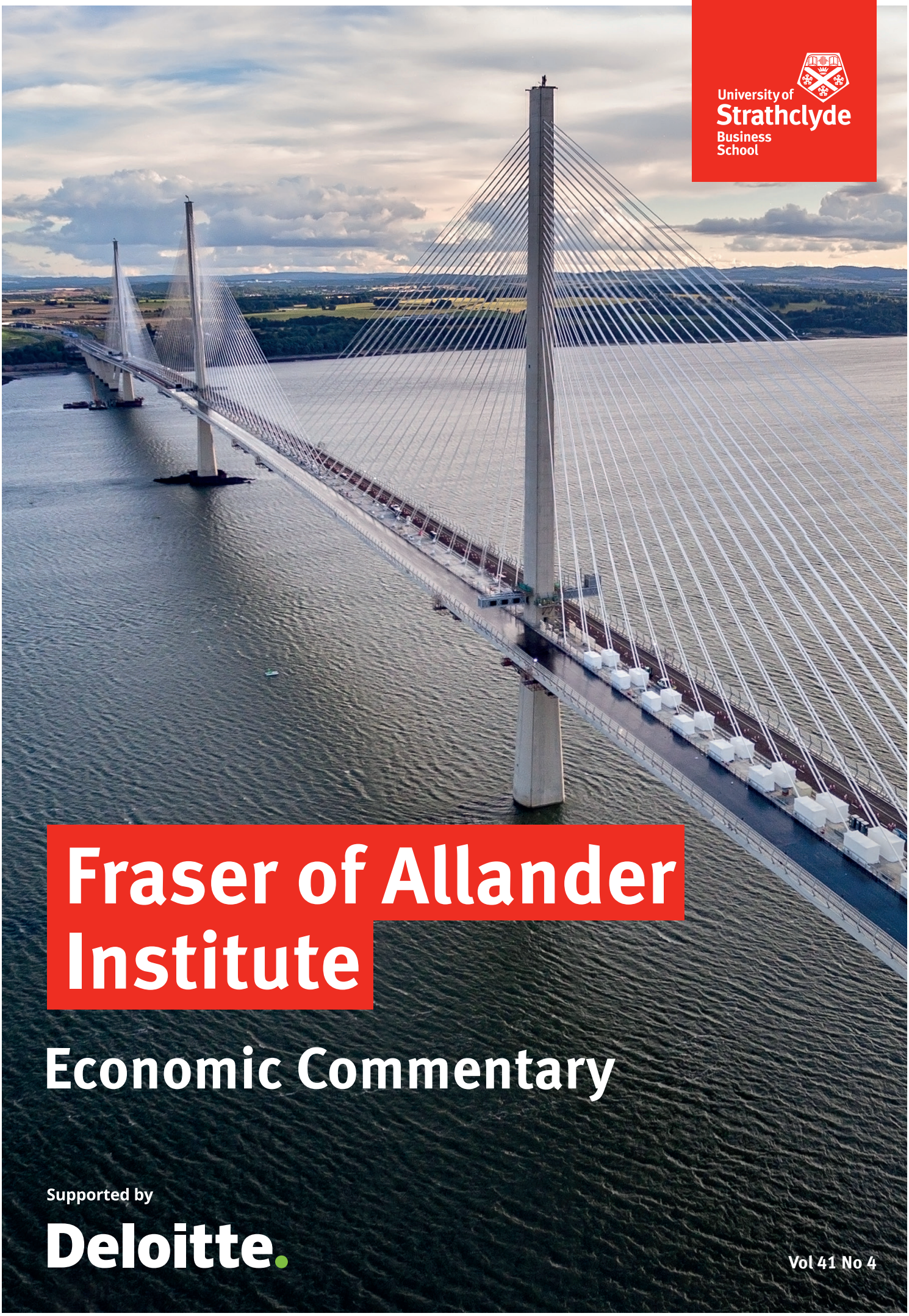

University of Strathclyde Business School

Fraser of Allander Institute

Economic Commentary

Supported by

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Vol 41 No 4

Foreword

Long-term thinking could be key to Scotland's productivity challenge

The past has a funny habit of repeating itself. As the third industrial revolution took hold in the 1970s, we expected to see a dramatic improvement in productivity. But, as the US economist Robert Solow quipped at the time: "you see the computer age everywhere but in the productivity statistics".

Of course, it can take years for economic benefits to become apparent. Yet, as the fourth industrial revolution starts to take off now, we face a similar paradox. Productivity remains a significant challenge to Scotland and the UK as a whole, with the Office for Budget Responsibility last month downgrading its forecasts for the next four years.

Combined with ongoing economic fragility, political uncertainty, and an aging workforce, it's evident that this week's Scottish Budget comes at a profoundly important time for Scotland – a fact reflected throughout this latest Economic Commentary from the Fraser of Allander Institute.

The question is, what can the Scottish Government do to help solve the productivity conundrum and help the economy to grow?

Investment in technology, education, skills, and infrastructure are good places to start.

The Edinburgh City Region Deal, announced earlier this year, was a major step in the right direction.

Within the £1.1 billion package are pledges to create one of the world's leading data innovation centres, train 100,000 data scientists, as well as set up a regional skills development programme – all of which should help boost productivity.

We may also see more initiatives such as the Scottish Government's launch of a £4 million fund to attract the world's brightest entrepreneurs to Scotland and help them develop their ideas for businesses.

This should add to the sense of confidence and purpose we saw from our community of entrepreneurs at this year's Entrepreneurial Scotland Awards in November, an event Deloitte were proud to sponsor once again.

More initiatives like these are likely to follow in the years ahead. But, whatever happens, the Scottish Government has the task of setting the right balance of policies which can tackle the challenges we face. Unlike Solow's witticism suggests, looking beyond the immediate horizon is likely to be part of the answer.

John Macintosh
Tax Partner
Deloitte

December 2017

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Fraser of Allander Institute

Contents

Economic Commentary

Economic perspectives

For regular analysis on the Scottish economy and public finances please see our blog

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Summary

This week's Scottish Budget (14.12.17) comes at a crucial time for Scotland's economy.

With Brexit uncertainty continuing to cast a shadow, plus a gloomier outlook for UK productivity, the Budget provides an important opportunity for the Scottish Government to set out their plans to support the Scottish economy.

The Budget will also mark the first time that we will have forecasts from the new Scottish Fiscal Commission (SFC). The SFC will provide an independent assessment of the outlook for the economy, devolved taxes and social security.

They will do so against a backdrop of ongoing economic fragility. Growth in Scotland slowed to just 0.1% over the 3-months to June. Over the year, growth has been around 1/3 that of the UK. In contrast, employment continues to be close to a record high – at least since the Labour Force Survey started in 1992. The downside has been further falls in productivity.

The latest leading indicators suggest that the economy is continuing to grow, albeit at a relatively slow pace. The Scottish FAI/RBS Scottish Business Monitor for Q3 2017 showed both a rise in business and new orders. Our latest survey of activity in the oil and gas sector shows a further pick-up in optimism, although conditions remain challenging.

With this backdrop, it is vital that the Budget sets out a clear vision for how the government will help take advantage of the significant economic opportunities we know will exist in the future – whether that is boosting entrepreneurship and innovation, supporting the development and use of new technologies or tapping in to growing international markets.

With economic uncertainty likely to remain a dominant feature for the foreseeable future, focussing on where government can make a difference in the long-term is vital.

But with the Scottish block grant for day-to-day spending falling in real-terms over the next two years (at least), and the Scottish Fiscal Commission likely to forecast weaker devolved tax revenues than had been expected this time last year, the Finance Secretary will be forced to take some big decisions, not just on how to balance the budget and support growth, but to deliver on key manifesto commitments. The likely squeeze on unprotected budgets – such as non-ring fenced local government – looks stark. The outlook for capital is much healthier. And the near £1bn of financial transactions announced in the Autumn Budget provides an opportunity to be innovative.

On balance, the combination of over two years of weak growth, a projected decline in Scotland's working age population, and ongoing challenges in the oil and gas sector, mean that Scotland will do well to match UK growth over the next few years.

That being said, we forecast that the Scottish economy will continue to grow over our forecast period (2018, 2019 and 2020). Our latest forecasts are for growth of 1.2% in 2018, 1.4% in 2019 and 1.4% in 2020.

How this weak outlook will impact on the Scottish budget depends, in part, on how the key determinants of income tax – employment and wages – are affected in the short-run.

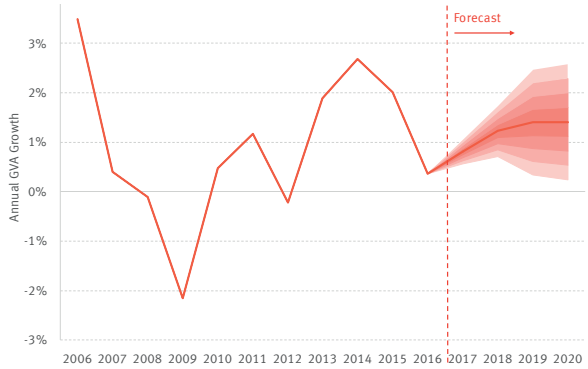
It is not inconceivable that weaker revenue forecasts from the Scottish Fiscal Commission could offset, at least in part, some of any tax hike proposed by the Scottish Government.

Fraser of Allander Institute
December 2017

Fraser of Allander Institute

At a glance

FAI forecast: Scottish GVA growth



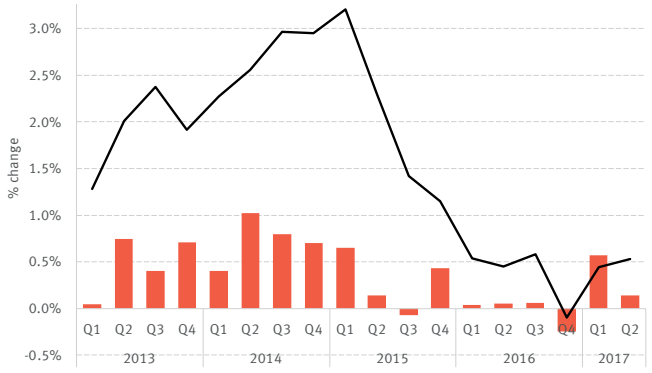
Growth set to continue to 2020 but to remain fragile and below trend

FAI forecast: Scottish GVA growth and by sector

	2018	2019	2020
GVA	**1.2**	**1.4**	**1.4**
Production	1.4	1.6	1.2
Construction	0.7	0.9	0.5
Services	1.2	1.4	1.5

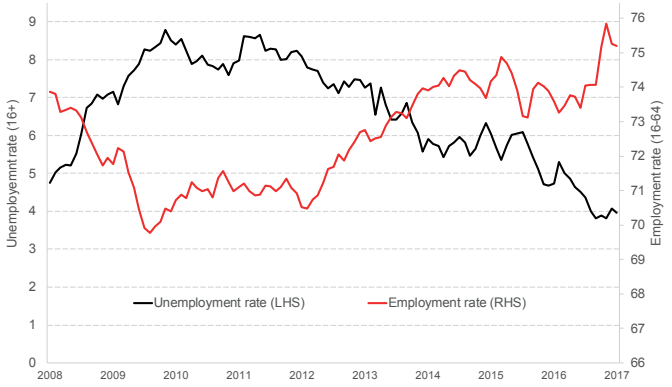
Growth to rise to 1.4% in 2019 but forecasts revised down from Sept

Scottish growth (%)



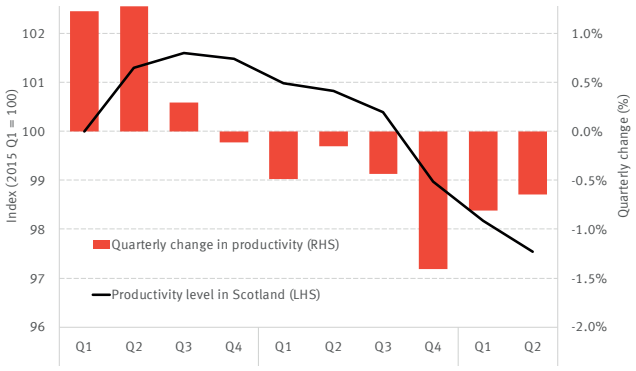
Scottish economy grew just +0.5% over the past year - a third of UK rate

Scottish labour market



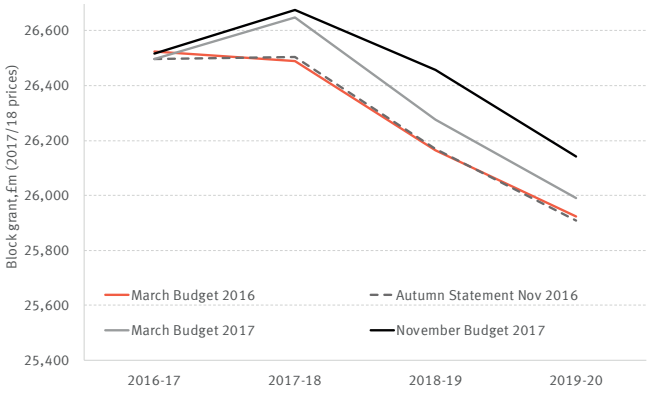
Labour market continues to hold up well with unemployment just 4.0%

Scottish productivity



Productivity has declined for seven consecutive quarters

Scottish Government resource budget



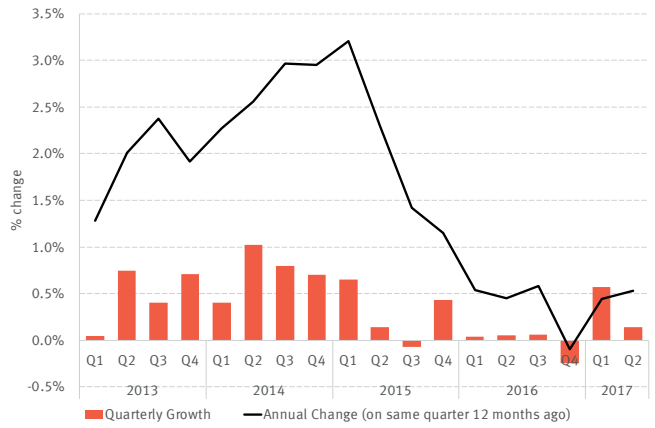
Resource budget to be squeezed by over £350m in real terms by 19-20

Fraser of Allander Institute

Outlook and Appraisal

December's Scottish Budget comes at a crucial time. Growth remains below trend and Brexit continues to create uncertainty. The political focus will no doubt be on any proposed changes to income tax. But with rising demand for public services and tight resources a wider debate is needed about the sustainability of key spending priorities and how to boost economic growth in Scotland.

Chart 1: Scottish economic growth (%), since 2013



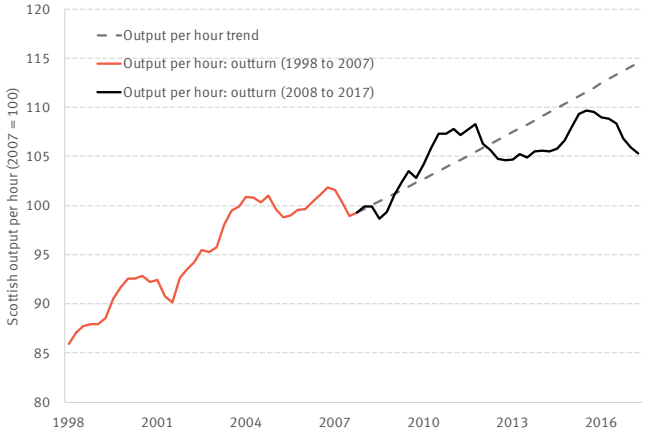
Source: *Scottish Government, Q2 GDP*

Table 1: UK labour market rates, July-September 2017

	Employment (16-64)	Unemployment (16+)	Inactivity (16-64)
Scotland	75.2	4.0	21.6
England	75.4	4.3	21.2
Wales	72.5	4.1	24.2
N. Ire	68.1	4.0	28.9
UK	75.0	4.3	21.6

Source: *ONS, Labour Force Survey (Nov 17)*

Chart 2: Scottish productivity since 1998– trend vs. outturn



Source: *Scottish Government, Q2 Productivity*

Introduction

The Scottish economy grew by just 0.1% in the second quarter of 2017. Annual growth has risen to 0.5%, but is still well below trend and a third of the rate in the UK. (Chart 1)

Conditions remain challenging, but most surveys point to growth – albeit modest – next year.

In contrast, the labour market continues to hold up well, with employment close to a record high. (Table 1)

However with limited growth in the wider economy, Scottish productivity has slipped. Output per hour – the key measure of labour productivity – is down by around 4% since 2015. (Chart 2)

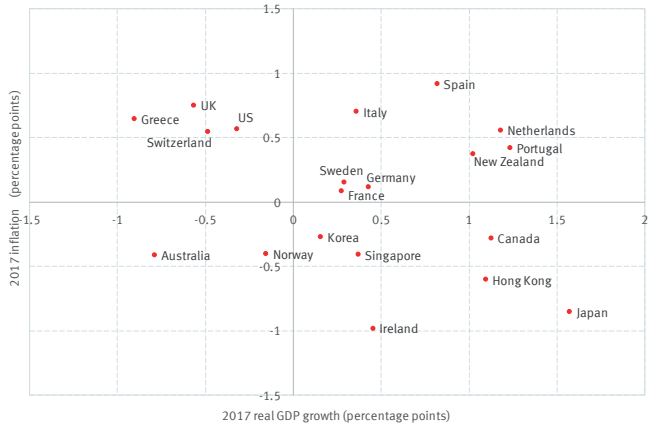
Weak productivity has been a feature of the UK economy since the financial crisis.

The UK Government's Industrial Strategy is an attempt to tackle this with targeted industry support and investment in R&D and new technologies.

The Scottish Government has an opportunity to set out its vision for the economy in the Budget. Following a speech in August when the First Minister signalled a new approach, businesses will be looking carefully at the detail of the Budget, particularly if – as now seems certain – taxes will increase for many.

With devolved finances continuing to be squeezed and expensive manifesto commitments to be paid for in health and education, one-year sticking plasters in the form of tax rises can only help for so long. A strategy for managing demand, prioritising where money is spent and growing the economy is now needed more than ever.

Chart 3: Latest IMF forecasts compared to those made in April 2016 – change in outlook for growth and inflation



Source: *IMF, World Economic Outlook*

Table 2: OECD forecasts for G7 Growth: 2016 (outturn) to 2019

	2016	2017	2018	2019
UK	1.8	1.5	1.2	1.1
US	1.5	2.2	2.5	2.1
Japan	1.0	1.5	1.2	1.0
Canada	1.5	3.0	2.1	1.9
Euro Area	1.8	2.4	2.1	1.9
Germany	1.9	2.5	2.3	1.9
France	1.1	1.8	1.8	1.7
Italy	1.1	1.6	1.5	1.3

Source: *OECD Economic Outlook*

The global economy

This time last year, the outlook for the global economy was very different.

The Euro Area was struggling and there were fears for the stability of some emerging economies – including China. At the same time, the UK was confounding expectations of a post-EU referendum slowdown and was on track to be one of the fastest growing economies in the G7.

Fast forward and we now have a weaker UK economy with higher inflation and lower growth. (Chart 3).

In contrast, global growth is projected to be over 3.5% this year, rising to 3.75% in 2018 – the fastest rate since 2010. (Table 2).

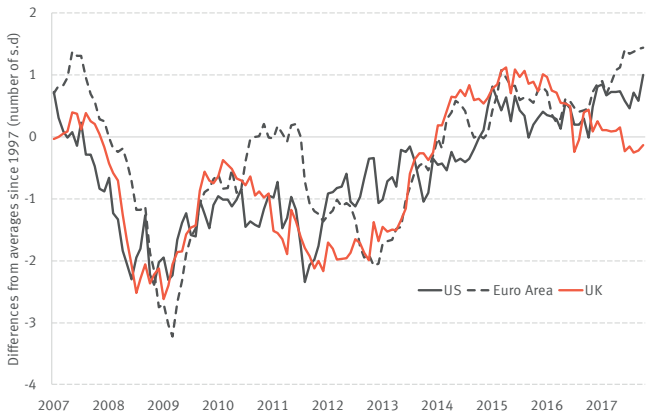
Europe is more buoyant, with confidence at its highest since the financial crisis. (Chart 4)

Two points are worth reflecting upon.

Firstly, it can be easy for the short-term outlook to dominate debates and day-to-day activities. No matter the immediate outlook, for businesses, focussing on the long-term and strategies for value and growth is key.

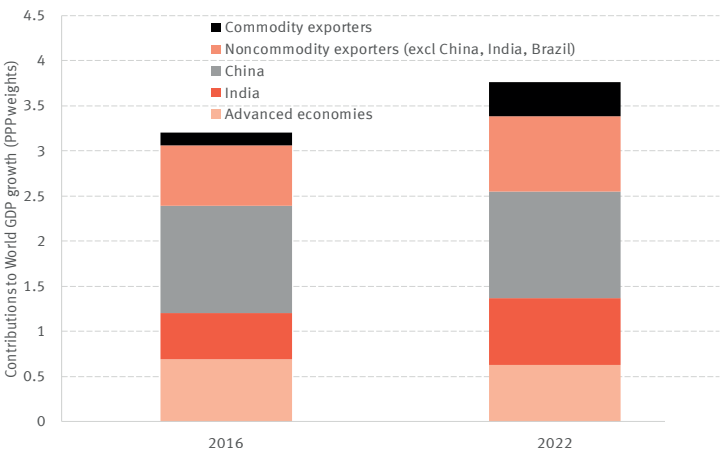
Secondly, there are opportunities for Scotland to tap into renewed global optimism (particularly in emerging economies). We currently export 60% more to Ireland than we do to China and as much to Luxembourg as to India – so there is scope to do much better. (Chart 5)

Chart 4: Rising consumer confidence in Europe – in contrast to the UK where the outlook has turned gloomier



Source: *Thomson Reuters Datastream*

Chart 5: Emerging markets to drive growth over next few years



Source: *IMF, Thomson Reuters Datastream*

Table 3: Scottish employment supported by external demand, 2014 Q3 2016 to Q2 2017

	EU exports	Non-EU exports	rUK exports
Direct	80,300	115,500	337,300
Indirect	33,000	49,700	144,200
Induced	21,100	30,500	82,700
Total	134,400	195,700	564,200

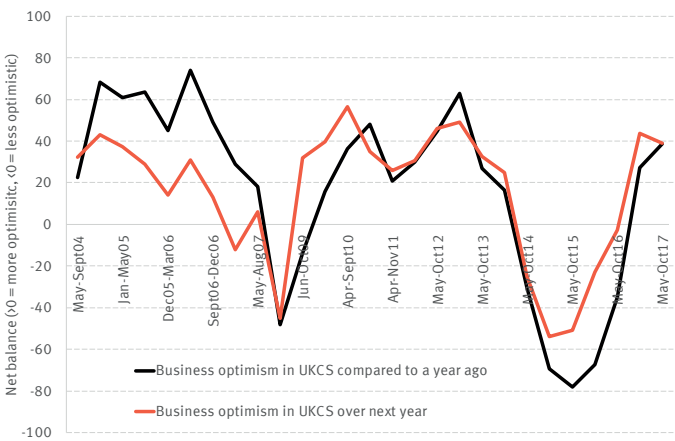
Source: *Fraser of Allander*

Table 4: Top 10 Scottish goods exports to EU – by value and rank

	Scotland		UK
Growth Sector	EU rank	% of sector exports	EU rank
Petroleum & related	1	67.5%	2
Beverages	2	31.1%	20
Fish & crustaceans	3	77.4%	30
General machinery	4	34.2%	6
Electronic machinery	5	51.7%	7
Miscellaneous goods	6	63.4%	4
Chemicals and products	7	83.3%	17
Gas, natural & manufactured	8	83.3%	21
Power generating machinery	9	13.9%	8
Medicinal & pharma	10	53.0%	5

Source: *HMRC Regional Trade Statistics*

Chart 6: Latest FAI/AGCC Oil and Gas Survey: Autumn 2017 – rising optimism amongst firms in the UKCS



Source: *FAI - AGCC 27 Oil and Gas Survey*

Developing new markets is crucial, particularly when UK domestic demand is weak and Brexit poses a challenge to established trade links.

Leaving the EU undoubtedly represents the greatest change for our economy in a generation.

Alongside trade relations, it will undoubtedly have an impact on sources of future investment and the supply of workers. At the same time, future economic and financial policy could look quite different.

There remains significant uncertainty about the costs and benefits of Brexit. Much will depend upon how policymakers react, both within and outwith the UK.

Key points of policy to be agreed include:

1. The terms of (Br)exit
2. The transition to any new arrangement
3. The long-term economic, political and social relationship between the UK and the EU

Significant progress has been made on part 1 - with a deal on finances, EU citizens and the Irish border. However, the scale of the task in ensuring a 'smooth' exit from the EU remains challenging.

For example, around 135,000 jobs in Scotland are estimated to be supported by demand from EU exports, both directly and through the spill-over effects into the wider economy. (Table 3)

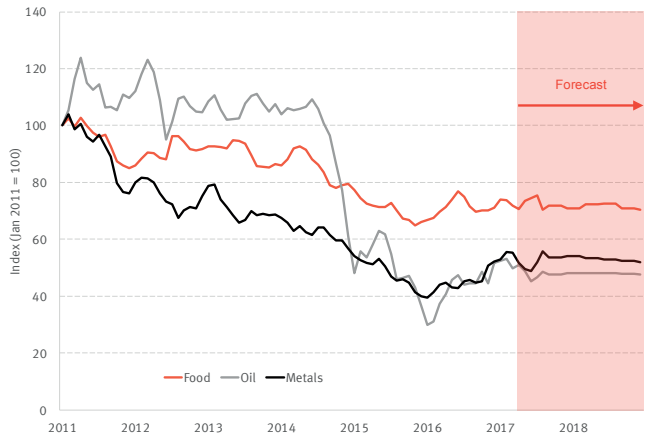
Careful prioritisation of sector needs will be important in any trade deal. The priorities for Scotland and the UK may not necessarily align – with many of the most important sectors for Scotland less significant at the UK level. (Table 4)

As always, the outlook for Scotland will depend, in part, upon the outlook for global oil prices.

The latest FAI assessment of the industry suggests that optimism continues to recover. (Chart 6).

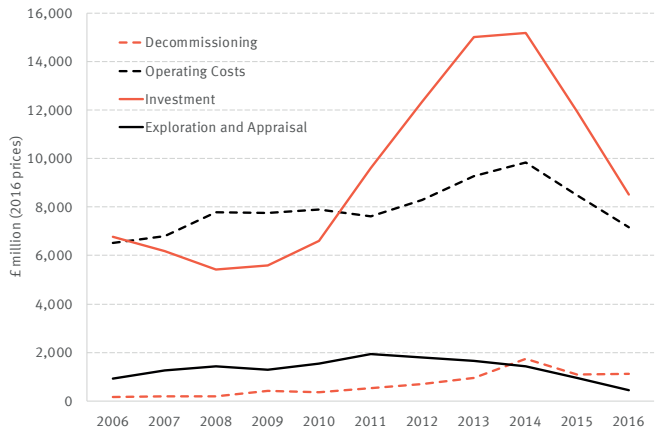
This reflects, in part, the action taken to reduce costs, improve production efficiency and diversify to help support long-term sustainability.

Chart 7: Oil prices to remain subdued: providing stability for the North Sea but limited scope for investment



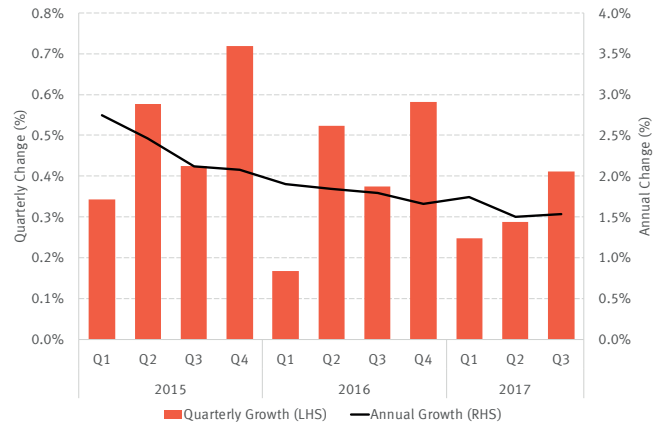
Source: *IMF, Thomson Reuters Datastream*

Chart 8: Expenditure on UKCS North Sea (2006 to 2016): sharp fall in capital investment and operating costs



Source: *Oil and Gas Authority, Income and Expenditure UKCS*

Chart 9: UK economic growth – upturn in Q3 but growth still below trend and annual growth slowing over the year



Source: *ONS, Preliminary Q3 GDP*

The price of oil has risen steadily over the past six months – helping to support profitability across the oil and gas sector. (Chart 7).

This has been helped by sharp reductions in costs. The UK Oil and Gas Authority estimate that average unit costs in the North Sea have fallen by a third from £18 per barrel in 2014 to £12 per barrel in 2016.

For Scotland's wider economy this is a double-edged sword. On the one hand, ensuring the sustainability of the oil and gas sector is clearly a positive, but in the short-term, these reductions in spend – including on wages and salaries – are having a major impact on the economy of the North East.

Looking forward, the outlook for investment – whilst more positive than 12 months ago – continues to remain weak. Only eight appraisal wells were spudded in 2016 (the lowest since 1971) and overall investment is down nearly 50% on 2014 levels. (Chart 8).

The Chancellor's announcement in the Budget on historical tax reliefs provides a further new initiative to try and help prolong the longevity of the sector.

The UK economy

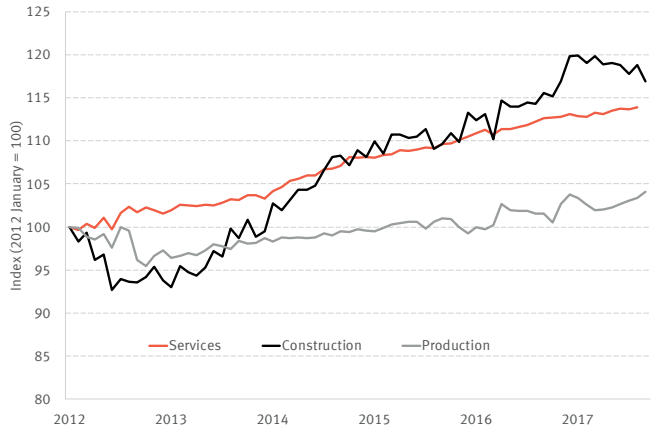
Overall UK growth has slowed in 2017, with annual growth of just 1.5% (below trend of ›2%).

That being said, quarterly growth picked up over the summer (Jul – Sep) to 0.4%. This was faster than the 0.3% growth recorded in each quarter of the first half of the year. (Chart 9).

Back in March, the OBR predicted growth of 2.0% in 2017. Short of a much larger than expected pick-up in Q4 – close to 0.8% – this is now unlikely. The OBR's latest forecast is for growth of just 1.5% in 2017.

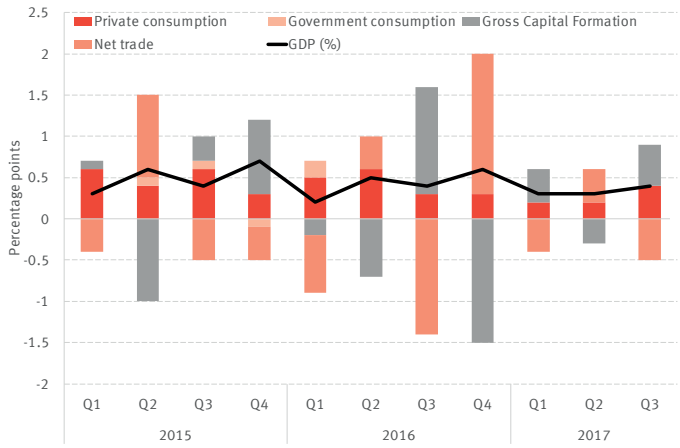
A key driver of this slower growth has been weaker construction sector output (which had been a strong driver of growth since 2013) and higher than anticipated inflation weakening consumer demand. (Chart 10).

Chart 10: Economic performance of broad sectors of UK economy since 2012



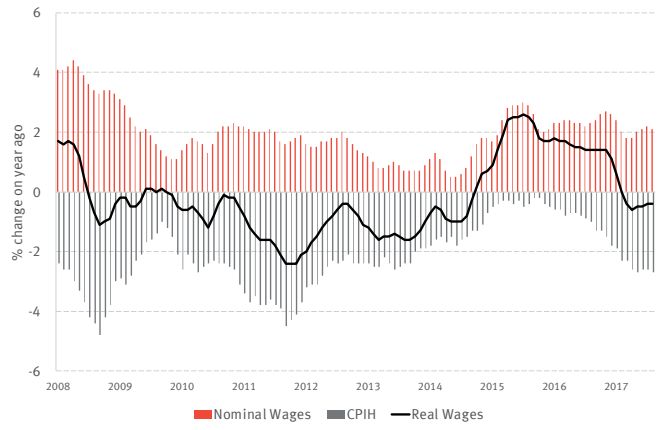
Source: ONS, Thomson Reuters Datastream

Chart 11: Components of UK growth since 2015 – private consumption remains the consistent net driver



Source: ONS, Thomson Reuters Datastream

Chart 12: UK regular average weekly earnings growth: 3-month on a year ago



Source: ONS, Thomson Reuters Datastream

As Chart 11 highlights, consumer spending had been the key driver of growth in 2015 and 2016.

NB: The volatility between Gross Capital Formation and net trade reflects a technical issue regarding the trading of precious metals on the London Bullion market. The UK's non-gold trade position was broadly constant over this period.

The slowdown in consumer spending during 2017 reflects the ongoing squeeze on real wages and household budgets. (Chart 12)

After recovering during 2015 and 2016, the fall in the pound and spike in import prices has meant that real earnings are falling once more.

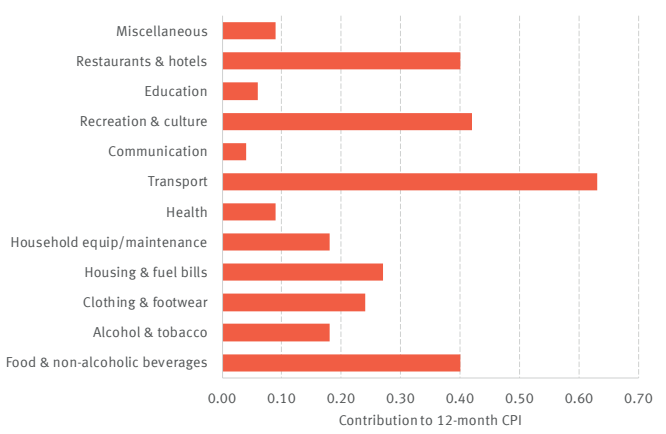
The IFS believe that average real earnings are on course to be £1,400 a year lower in 2021 than was forecast in 2016. They also believe that it will be well into the next decade before earnings return to their pre-financial crisis levels.

CPI inflation is now 3%. Within that, food and non-alcoholic drink inflation is now 4.1%, the highest since 2013. This alongside rising fuel and transport costs are driving the increase in overall inflation. (Chart 13)

Such increases are all the more challenging for those on lower incomes as such purchases make up a larger proportion of day-to-day spending.

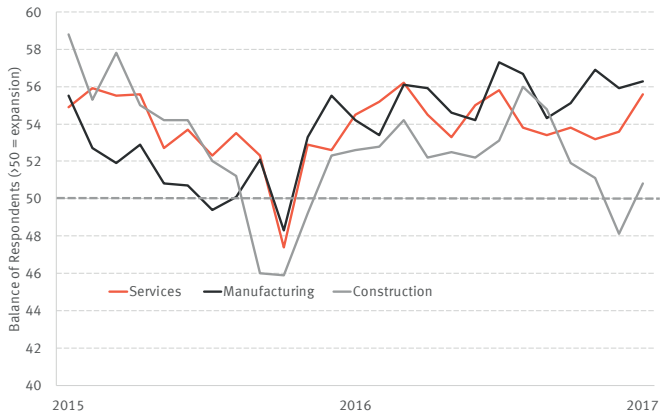
The expectation is that price pressures will start to ease in the months ahead, although – even with the recent increase in interest rates – inflation is on track to be above target for the next 3 years.

Chart 13: Drivers of UK CPI inflation



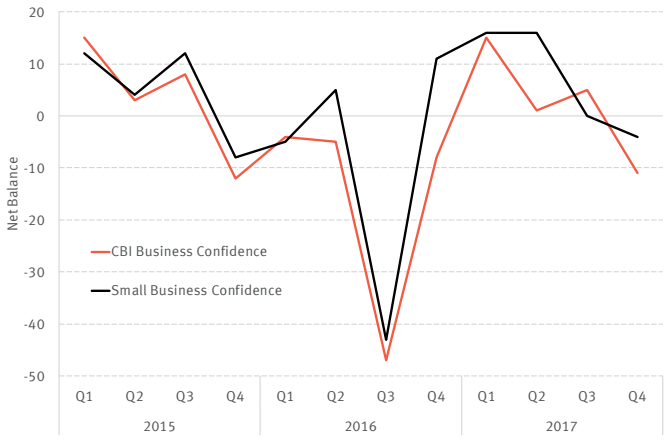
Source: ONS, Thomson Reuters Datastream

Chart 14: Latest UK PMI still shows underlying resilience in economy despite uncertainty (>50 marks expansion)



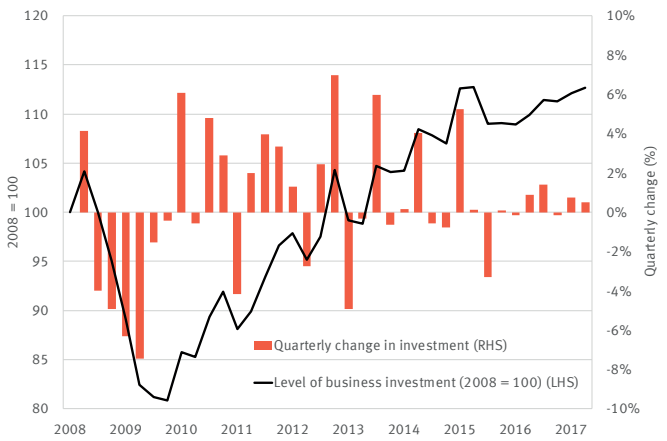
Source: *IHS Markit*

Chart 15: CBI measures of confidence – show heightened nervousness amongst firms large and small



Source: *CBI, Thomson Reuters Datastream*

Chart 16: Official statistics show sustained weak business investment in the UK for over 2 years



Source: *ONS, Thomson Reuters Datastream*

Despite these pressures, current indicators of day-to-day economic activity continue to show resilience.

The closely watched UK Purchasing Managers Index (PMI) for services, manufacturing and construction, all show businesses reporting growth. As with the official statistics, construction is the weakest. (Chart 14)

In contrast however, measures of underlying confidence amongst businesses remains fragile. The latest CBI confidence indicators have once again turned negative – reflecting current perceptions of the Brexit negotiations. (Chart 15)

The ZEW Economic Sentiment Index for the UK also declined further in December.

This suggests that whilst businesses are 'getting on with the job', they remain nervous about the outlook. If this fragility in confidence was to take a further blow, then it may not take much for it to have an impact on the real economy.

One area where weak confidence is showing up in terms of actual activity is investment. Business investment has been treading water in the UK for the best part of two years. (Chart 16)

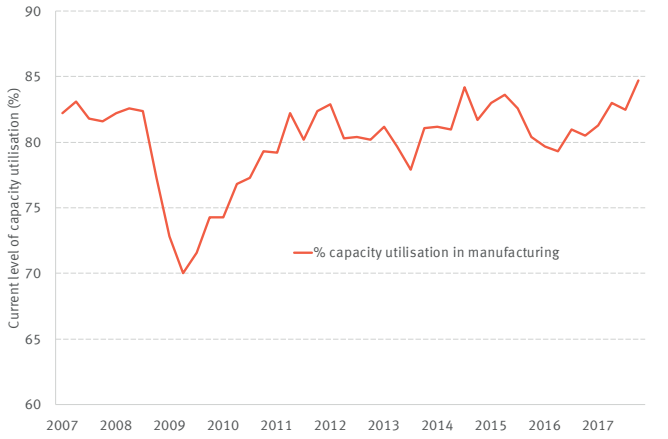
This is clearly a concern as investment is believed to be one of the most important drivers of long-term productivity and competitiveness.

Some of the weakness in investment will undoubtedly reflect Brexit-driven uncertainties weighing on confidence.

But it also appears to be part of a longer-term trend. Tackling this track record of weak private sector investment – remember investment in the UK has been lower than in many other countries for a number of years – will be crucial.

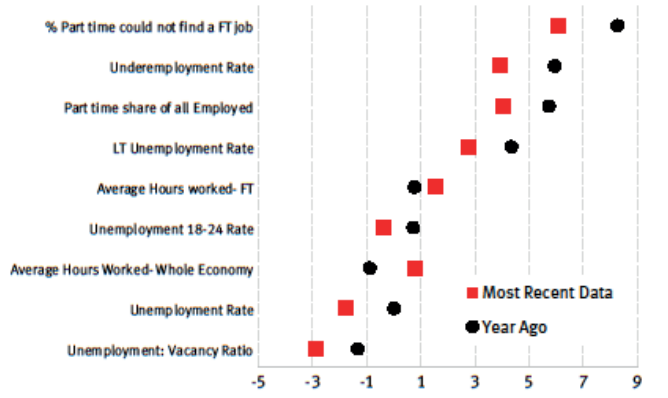
This is one motivation behind the UK Government's industrial strategy and the Scottish Government's plans for a National Investment Bank.

Chart 17: Capacity utilisation (%) in UK manufacturing sector reaches post-financial crisis high



Source: *EuroStat Thomson Reuters Datastream*

Chart 18: Measures of spare capacity in the UK labour market, relative to 2002 to 2007 average



Source: *ONS, LFS*

This low level of investment – coupled with a tight labour market – has led policymakers (including the Bank of England), to believe that even modest growth will erode the remaining spare capacity in the economy. If this was to happen, the pressure on inflation will become even more acute.

For example despite recent weak rates of growth, UK manufacturing is operating at its highest level of capacity utilisation since 2007. (Chart 17)

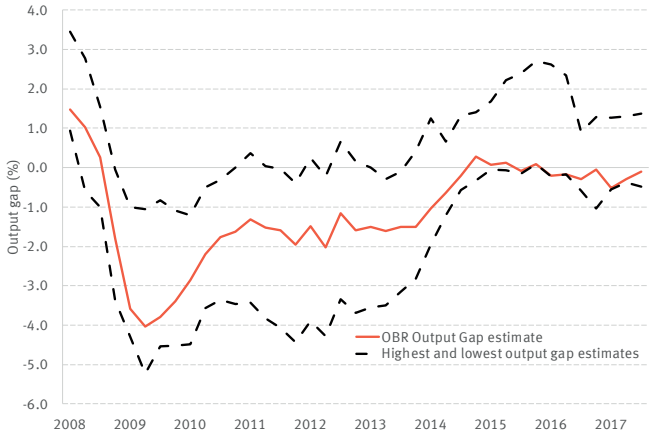
We can see similar constraints in the labour market. Chart 18 shows a range of measures of labour capacity. Data to the left of the vertical axis (negative points relative to the mean) indicate lower-than-average spare capacity (and vice versa).

As the chart highlights, most measures of spare capacity point to labour market tightening over the year. Whilst some indicators – e.g. the number of part-time workers – suggest that there remains some capacity that could be called on, capacity constraints are clearly beginning to bite.

Most economists believe that the UK is close to operating at, or above, capacity. This is demonstrated by the near zero 'output gap' – the difference between actual and potential output – forecast by the OBR and others. (Chart 19)

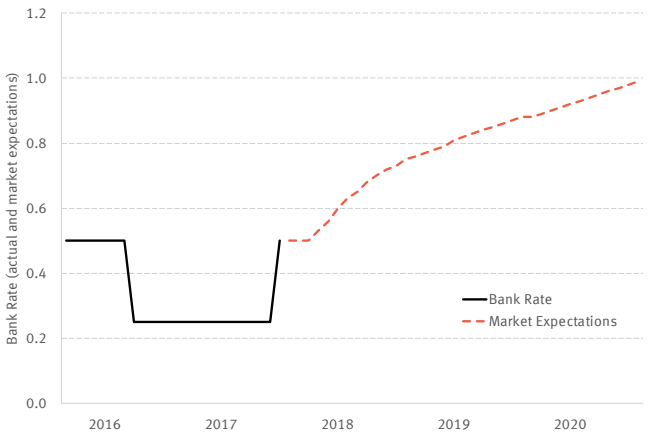
It is the potential for this to lead to higher inflation, coupled with rising indebtedness, that lay behind the Bank of England's decision to increase interest rates (and signal a rise to 1% by 2020) (Chart 20)

Chart 19: Output gap – actual vs. potential output – is estimated to have closed with UK economy near capacity



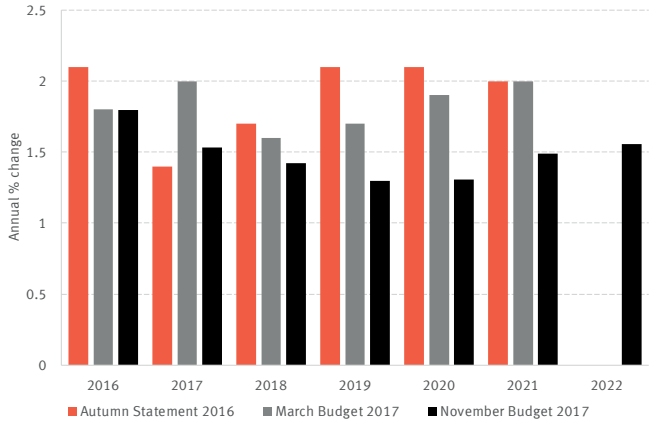
Source: *Office for Budget Responsibility*

Chart 20: Projected path for interest rates – first increase since financial crisis (but planned increases remain small)



Source: *Bank of England*

Chart 21: Evolution of OBR forecasts over last 12 months



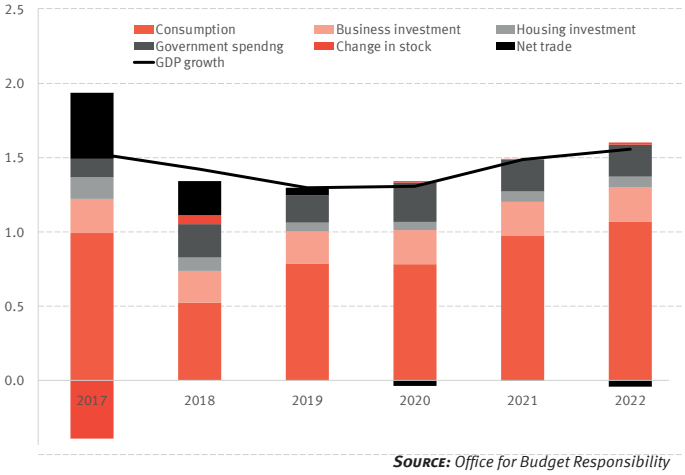
SOURCE: *Office for Budget Responsibility*

Table 5: UK forecasts for GDP and inflation from major independent forecasters

Percent	2017	2018	2019	2020
OBR (Nov)				
GDP growth	1.5	1.4	1.3	1.3
CPI inflation	2.7	2.4	1.9	2.0
Bank of England (Nov)				
GDP growth	1.6	1.6	1.7	1.7
CPI inflation	3.0	2.4	2.2	2.1
EU Commission (Nov)				
GDP growth	1.5	1.3	1.1	
CPI inflation	2.7	2.6	2.1	
OECD (Jun)				
GDP growth	1.6	1.0		
CPI inflation	2.8	2.7		
IMF (Oct)				
GDP growth	1.7	1.5	1.6	1.7
CPI inflation	2.6	2.6	2.2	2.1

SOURCE: *Various*

Chart 22: Composition of OBR UK growth forecasts to 2022



SOURCE: *Office for Budget Responsibility*

The UK economic outlook

Operating at close to – or above – capacity would normally suggest that the UK economy was in good health.

In contrast, most forecasts predict weak growth over the next few years.

The OBR's forecasts are for growth of just 1.4% and 1.3% for 2018 and 2019 respectively. (Chart 21). Indeed the OBR has wiped off £60bn from their UK GDP forecasts for the next 5 years since their previous forecast in March.

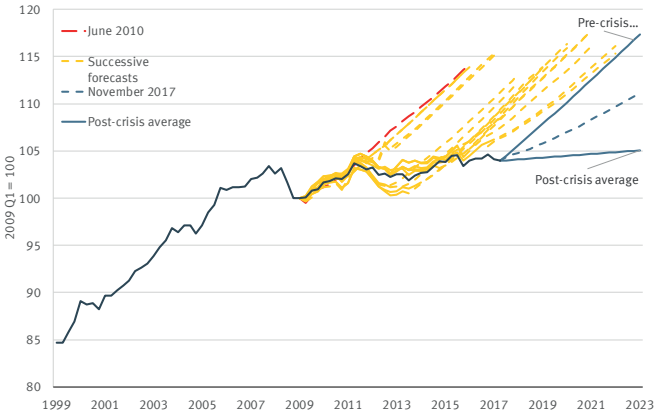
Whilst the OBR are slightly more downbeat than the Bank of England, most independent forecasters share the view that (even assuming a smooth Brexit), UK growth will be fragile over the next few years. (Table 5)

Weaker growth across the board is predicted with consumption particularly constrained relative to historical levels in 2018 and 2019. (Chart 22)

The key driver of these downbeat forecasts is the UK's much weaker outlook for productivity.

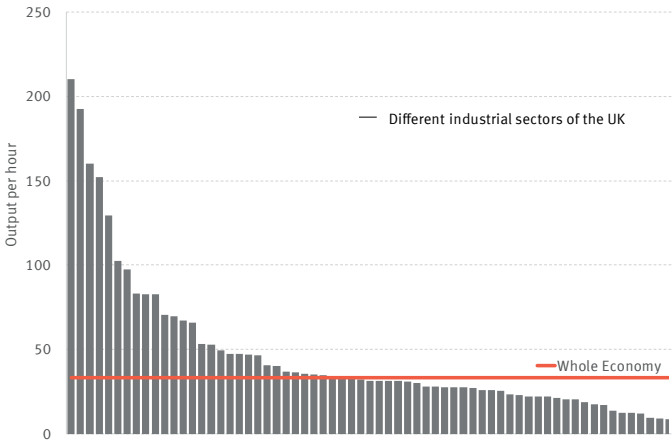
In recent years, UK productivity growth has been much lower than prior to the financial crisis. This 'puzzle' was largely seen as a temporary phenomenon but the OBR have revised this assessment and now believe it to be something more long-term. (Chart 23)

Chart 23: Weak UK productivity has been a feature since 2008: OBR now expect impact to be long-term



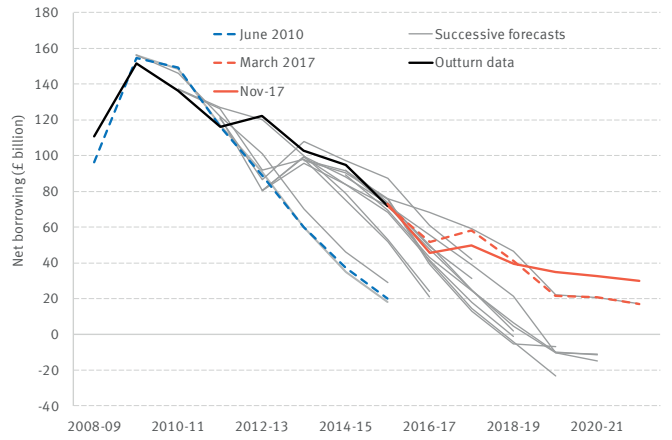
SOURCE: *Office for Budget Responsibility*

Chart 24: UK productivity by industry (over year 2016/17): substantial variation in productivity by industry – long-tail



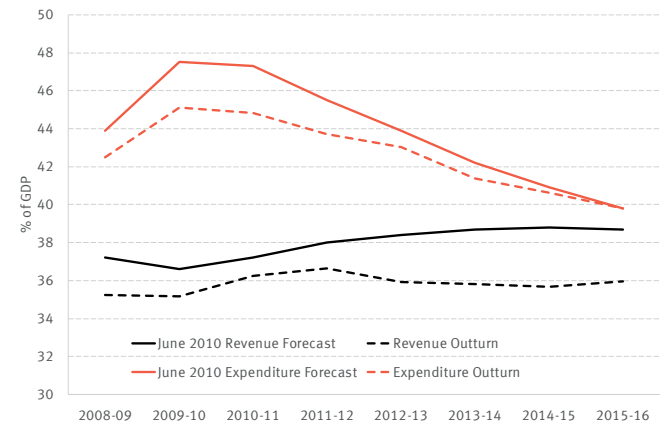
Source: *ONS, UK productivity series*

Chart 25: Revised UK public sector borrowing – with date for end of austerity pushed back



Source: *Office for Budget Responsibility, FAI calculations*

Chart 26: Fiscal outturns compared to 2010 plans – spending on track to meet target but revenues weak



Source: *Office for Budget Responsibility, FAI calculations*

Huge uncertainty exists over the outlook for productivity across advanced economies. Some economists are pessimistic, believing that we have entered an era of weak productivity growth.

It is hard however, to reconcile this with the opportunities that exist from automation and the growth of the digital economy.

As always, the reality is likely to lie somewhere in-between. Legacy effects from the financial crisis (e.g. a mis-functioning banking system) and a cycle of labour hoarding and weak investment, are all still likely to be having some impact and should recede over time.

That being said, it is clear that the UK faces a considerable long-term productivity challenge. More needs to be done – not just to grow high productivity sectors but – to turn around the long-tail of less productive firms and sectors that make up a large proportion of the UK economy. (Chart 24)

Improving levels of investment, R&D, skills and innovation are important. But so is boosting business efficiency, like better management and process innovation. The Bank of England estimates that a third of UK companies have seen no growth in productivity this century.

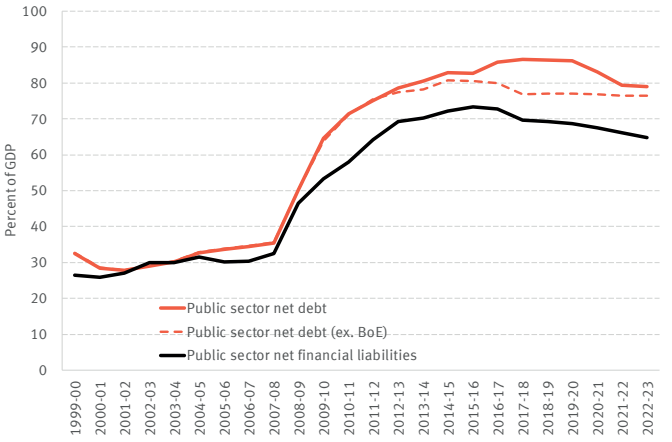
The UK Autumn Budget

This gloomier outlook has – once again – led the OBR to revise up its public sector borrowing forecasts.

Despite this year's borrowing being lower than expected, the OBR now predict higher borrowing across the forecast horizon. (Chart 25)

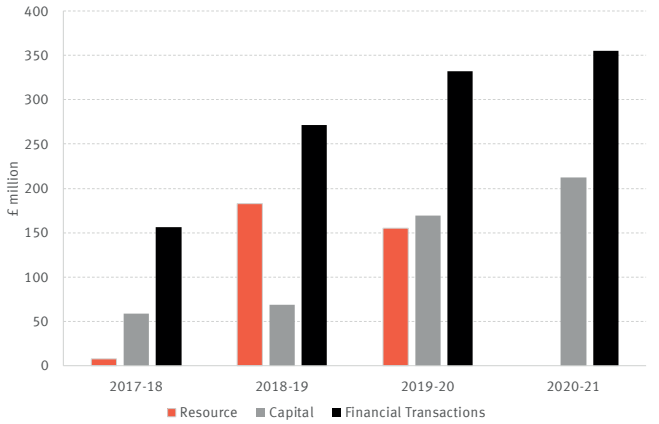
Even before the measures announced in the Budget, the UK Government was expected to borrow over £30bn more by 2021-22 than it planned back in March. Recall that this comes on the back of an additional £100bn of borrowing added this time last year. The reason for this failure to make inroads in the deficit has been the weak performance of tax revenues in recent years. (Chart 26)

Chart 27: UK public sector net debt close to 80% of GDP



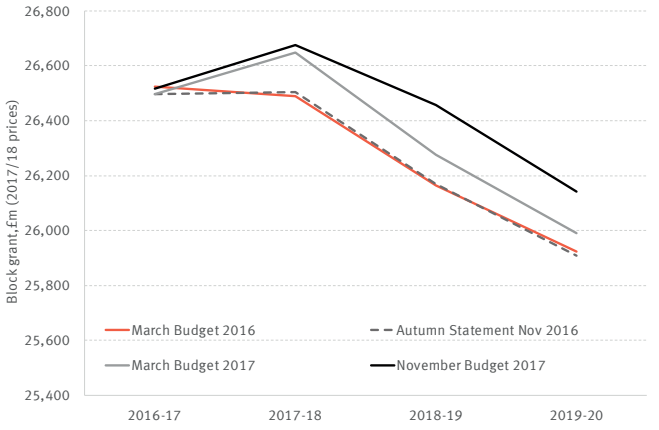
Source: *Office for Budget Responsibility*

Chart 28: Barnett Consequentials for Scottish Budget from Autumn Budget: 2017/18 to 2020/21 (cash terms)



Source: *FAI calculations*

Chart 29: SG Resource budget to fall (in real terms) by over £350m between 2016-17 and 2019-20 - even after series of increases in recent budgets



Source: *FAI calculations*

UK public sector net debt is forecast to stabilise at around 80% of GDP. (Chart 27)

It is the levels of indebtedness that the Chancellor is arguably most interested in both from an economic and political perspective.

Despite UK debt to GDP doubling since the financial crisis, the cost of servicing these debt obligations has remained broadly constant in real terms. This is because although the stock of debt has increased, the interest rates on gilts has fallen to near record low levels.

But should the outlook for government borrowing charges change, either because interest rates rise to combat inflation or investors become nervous about the UK's prospects outside the EU, then the costs of servicing the debt will rise.

The UK Budget's implications for Scotland

The UK Budget contained a number of measures with implications for Scotland – including further tax breaks for the North Sea.

There were also Barnett consequentials of £2bn over the period 2017-18 to 2020-21. £1.6bn – or just over 80% – was in the form of capital spending. (Chart 28)

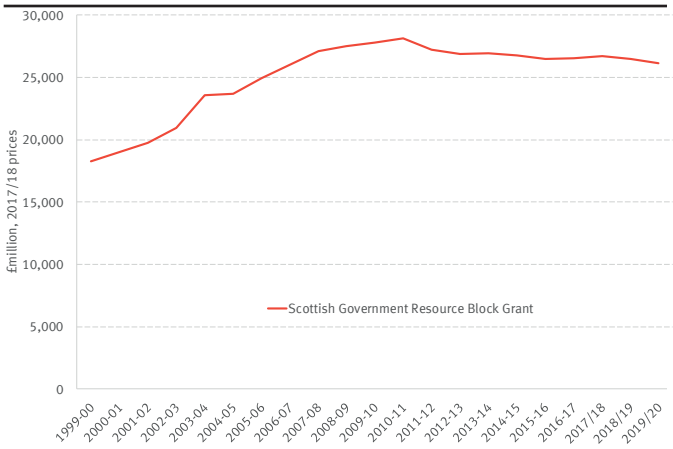
Resource spending is expenditure which covers day-to-day services on things like pay and resources for schools and hospitals. This was boosted by around £350m over 2017-18 to 2019-20.

However, the Scottish Government's resource block grant remains on track to fall in real terms over the course of this parliament. (Chart 29)

This will take spending back to near 2006-07 levels. It should be noted though that Scotland's population has grown since then, making the relative squeeze that bit more intense. (Chart 30)

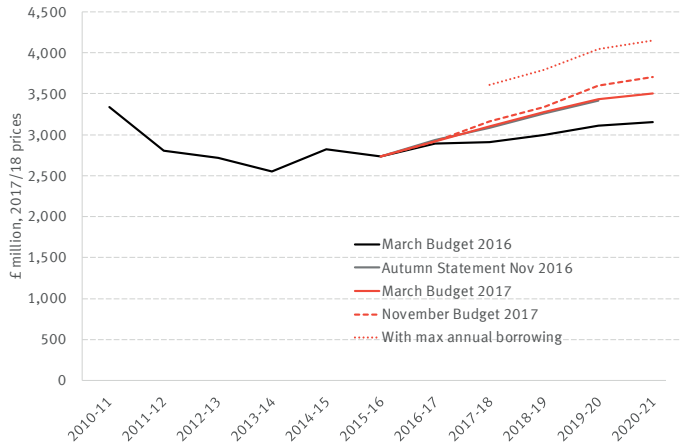
The outlook for capital spending is more positive. (Chart 31)

Chart 30: SG resource block grant since 1999 - taking spending back to around 2006-07 levels



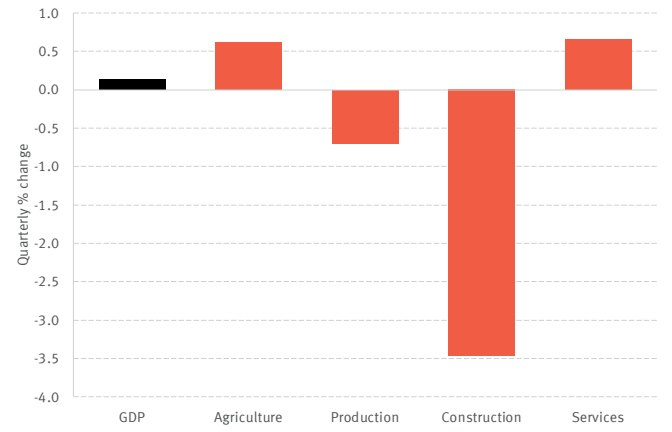
Source: *FAI calculations*

Chart 31: SG capital block grant to 2020-21: outlook more positive than resource and soon above 2010-11 levels



Source: *FAI calculations*

Chart 32: Scottish GDP growth Q2 2017 by broad sector



Source: *Scottish Government, Q2 GDP*

Of the £1.6bn capital uplift, the majority of this was in financial transactions – of around £1.1bn.

Financial transactions are becomingly increasingly common. Whilst they cannot be used to support day-to-day spending or to fund traditional capital building programmes, they support new investment through the provision of government-backed loans and equity to the private sector.

Whilst it is true that financial transactions are different to traditional public sector spending, if used wisely they are an important instrument available to government. Indeed the Scottish Government has made extensive use of them in the past – e.g. via 'help to buy' initiatives.

One area the government may find them particularly helpful is to consider how they might be used to support the creation of the Scottish Government's proposed Scottish National Investment Bank.

Even excluding financial transactions, the Scottish Government's traditional capital budget is on track to increase 6% in 2018/19. And the Scottish Government can now also borrow to support further capital investment. Use of these borrowing powers in full in 2018/19 could take capital spending back to levels not seen since the historic high of 2010/11.

Taken altogether, the Scottish Government's total block grant (resource and capital but excluding financial transactions) is on track to increase by around 1% between 2016-17 and 2019-20.

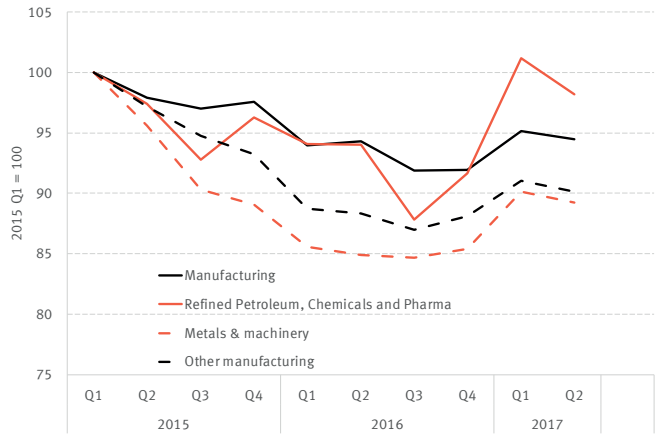
Recent Scottish Economy Data

The latest figures show growth in the Scottish economy of just 0.1% for the 3-months to July.

The downturn was driven by another sharp fall in construction sector activity. In contrast, the all-important services sector had relatively robust growth.

Such weak overall results are hugely disappointing. (Chart 32)

Chart 33: Performance of three sectors (and manufacturing) which drove growth in Q1 2017

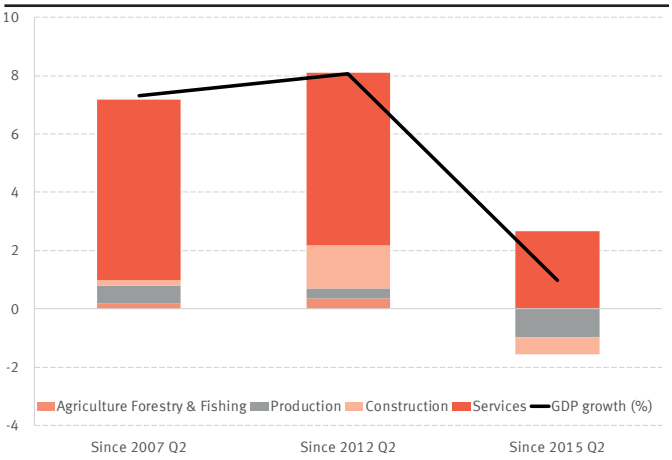


Source: *Scottish Government, Q2 GDP*

Chart 34: Scottish GDP per head vs. UK from 2015

Source: *Scottish Government, Q2 GDP*

Chart 35: Contribution to growth – last 10, 5 and 2 years – construction and production lagging but services strong



Source: *Scottish Government, Q2 GDP*

The results for Q2 came on the back of strong growth for the first three months of 2017 (initially +0.8% but now revised to +0.6%)

When the Q1 results were first posted in July, this led some to argue that the economy was in more robust health than we – and others – believed to be the case.

But as we have pointed out, much of the bounce-back was driven by temporary factors concentrated in a small number of sectors. Just three industries in manufacturing – with a combined value of just 6% of the Scottish economy – contributed around half the net growth during Q1. (Chart 33)

It was a near certainty therefore, that growth would slip back in the subsequent quarter.

As we have said on a number of occasions, it is important not to get too carried away with one quarter's set of results (be they positive or negative).

The Scottish series can be volatile, so focussing on longer-term trends is more relevant. And on this basis, there is no escaping that Scottish growth has been weak. In five of the past six quarters, Scottish growth has been just 0.1% or lower and GDP per capita has been broadly flat since 2015. (Chart 34)

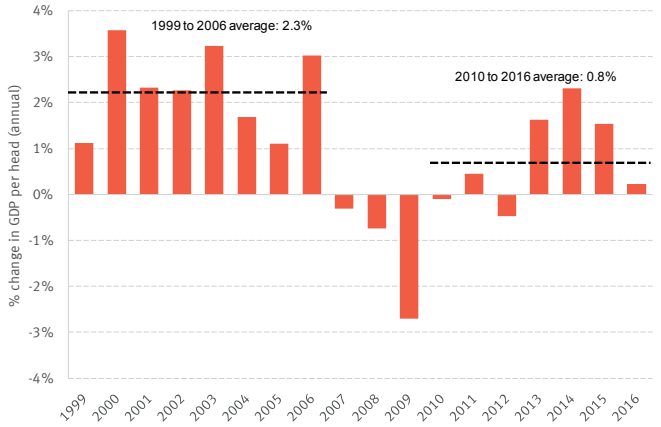
One bright-spot in the most recent quarterly results is the strong growth in services – with growth of 0.7% over the 3-month period to June.

In most instances, strong growth in services would be sufficient to power faster growth given that it accounts for 75% of the Scottish economy.

But this was offset by declining activity in the construction sector – for the sixth consecutive quarter – and activity in the production sector slipping back.

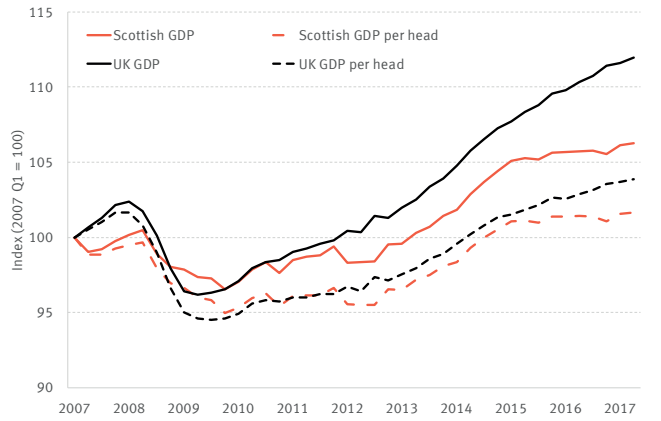
As Chart 35 highlights, over the past two years, both production and construction have dragged down overall growth in the Scottish economy.

Chart 36: Annual Scottish GDP per head growth: 1999 to 2016



Source: *Scottish Government, Q2 GDP*

Chart 37: Scottish & UK economic performance: Q1 2007 to Q2 2017



Source: *Scottish Government, Q2 GDP*

Table 6: Key growth drivers over last decade: average % change

	Average Annual Growth Rates (2006 - 2016)	
	Scotland	UK
Productivity	0.69	0.22
Participation	-0.24	-0.01
Working age population	0.35	0.65
Average hours worked	-0.10	0.01

Source: *FAI calculations*

Over the course of the year, the Scottish economy has grown 0.5% - around a quarter of trend growth.

Unfortunately, this is part of an increasingly consistent story.

Like many other advanced economies, the Scottish economy has been stuck in a cycle of relatively weak growth.

Between 1999 and 2006, reported growth in GDP per head averaged 2.3% per annum. After the financial crisis of 2007 – 2009, annual reported growth has averaged just 0.8%. (Chart 36)

The Scottish Parliament's Economy, Jobs and Fair Work Committee has launched an inquiry into Scotland's economic performance since 2007.

On many key indicators, such as productivity, participation and economic inequality, limited progress has been made in closing the gap with the top performing countries.

For example back in 2007, the Scottish Government set a target to close the growth gap with the UK by 2011. But in the 42 quarters since the start of 2007, the annual growth differential between Scotland and the UK has only been in Scotland's favour on 12 occasions. (Chart 37).

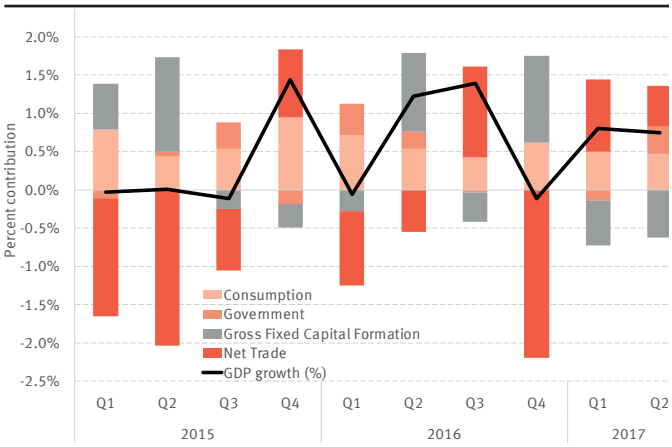
The growth gap with the UK over time is narrower when looking at GDP per head. Much faster population growth at the UK level has been a key reason why overall UK growth has been stronger.

It is possible to examine the key components of growth over time. (Table 6)

Taking the latest decade we have full data for – 2006 to 2016 – productivity grew at a faster rate in Scotland than in the UK as a whole .

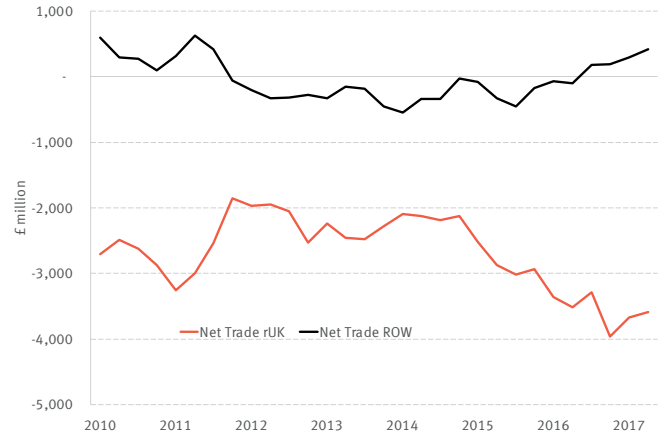
In contrast, for both population and key labour market indicators, the UK economy has out-performed Scotland.

Chart 38: Expenditure components of GDP since 2015 – households remain most important factor



Source: *Scottish Government, Quarterly National Accounts*

Chart 39: Ongoing challenges with Scottish exports – though estimated trade deficit has narrowed



Source: *Scottish Government, Quarterly National Accounts*

Drivers of growth

With the exception of gross fixed capital formation – i.e. investment – the core expenditure components of GDP increased in cash terms over the second quarter of 2017.

Private consumption was again the main contributor – as it has been since 2015. (Chart 38)

Net trade made a positive contribution for the second quarter. Whilst this is a modelled series, and should be viewed with caution, this appears to be driven by two factors.

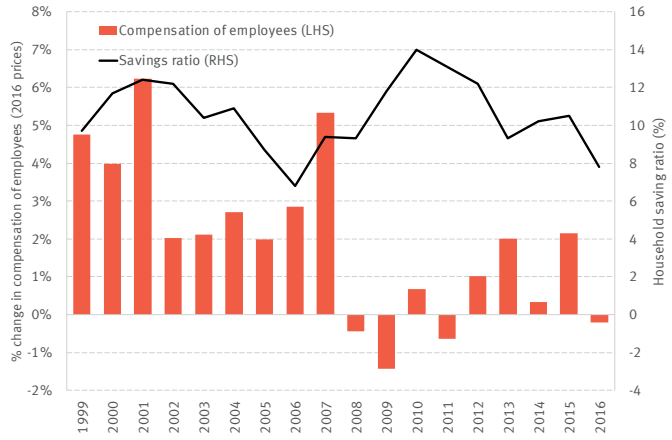
Firstly, an improvement in the international trade balance. Secondly, activity in Scotland which supports the North Sea – i.e. the supply chain such as engineering and services for offshore workers – is (oddly in our view) counted as a rUK export. As the downturn has eased so our notional trade position with rUK has improved. (Chart 39)

Like the UK, consumption growth has eased in recent times. This is unsurprising given the squeeze on household incomes.

Consumers have been compensating for weak growth in employee income by lowering their savings. (Chart 40) The savings ratio has fallen further in 2017 – from 11% in 2015 to 6.4% now.

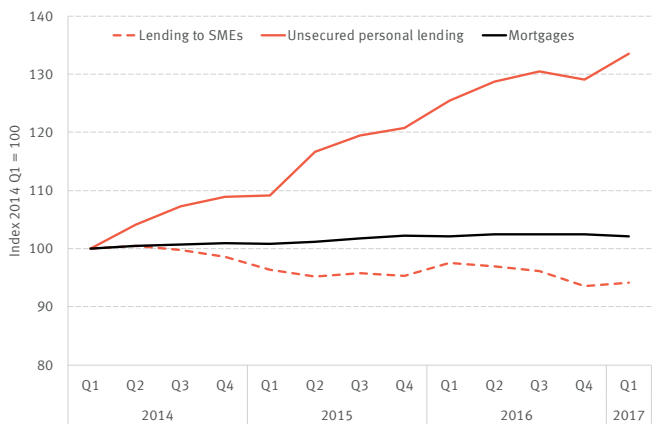
At the same time, the amount of unsecured borrowing has increased. (Chart 41)

Chart 40: Employee income and the savings ratio –downturn in income coincides with fall in savings



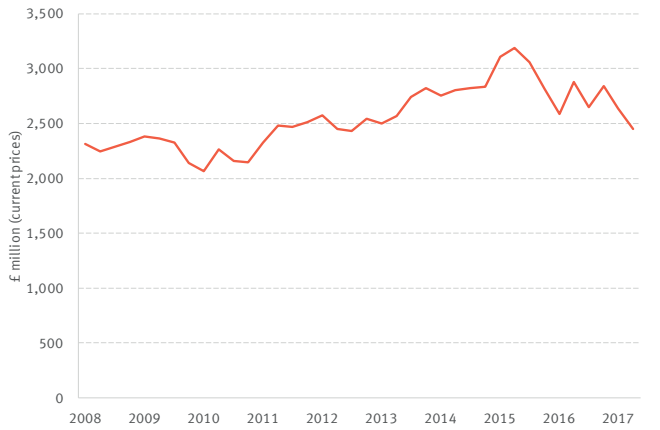
Source: *Scottish Government, Quarterly National Accounts*

Chart 41: Growth in lending types: 2014 to 2017



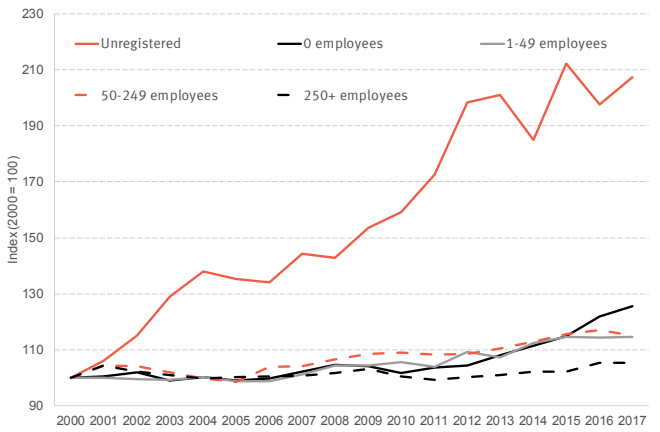
Source: *UK Finance, FAI calculations*

Chart 42: Business investment in Scotland since 2008 – very little growth even in cash terms



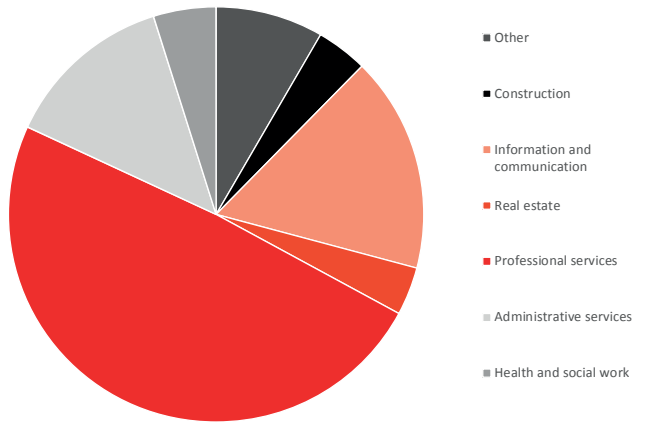
Source: *Scottish Government, Quarterly National Accounts*

Chart 43: Significant growth in new businesses in Scotland since 2000 – but most are small



Source: *Businesses in Scotland, FAI calculations*

Chart 44: Growth in small businesses (<50 employees) since 2010 – composition of growth by sector



Source: *Businesses in Scotland, FAI calculations*

The fall in capital formation was once again driven by weak levels of business investment.

As Chart 42 highlights, business investment has fallen by 14.8% over the year and by nearly 25% in two years.

Note too, that the figures are in current prices (i.e. unadjusted for inflation), so in reality the scale of the weakness in investment is even starker.

How does this square with recent statistics which showed that the number of businesses in Scotland was at a record high? As at March 2017, there were an estimated 365,600 private sector enterprises - an increase of 3.1% on 2016.

But 78% of the increase was in unregistered businesses, with a further 19% registered but having no employees. Unregistered firms tend to be small (primarily self-employed).

As Chart 43 highlights this is part of a longer-term trend, with a sharp increase in un-registered firms.

It would appear that much of the recent pick-up in business activity has not been in more traditional forms of business, but in self-employment and employees setting themselves up as consultants.

Since 2010 nearly 80% of the net growth in firms with 0-49 employees has been in the professional, administrative and information sectors – where consultancy growth has been high. (Chart 44).

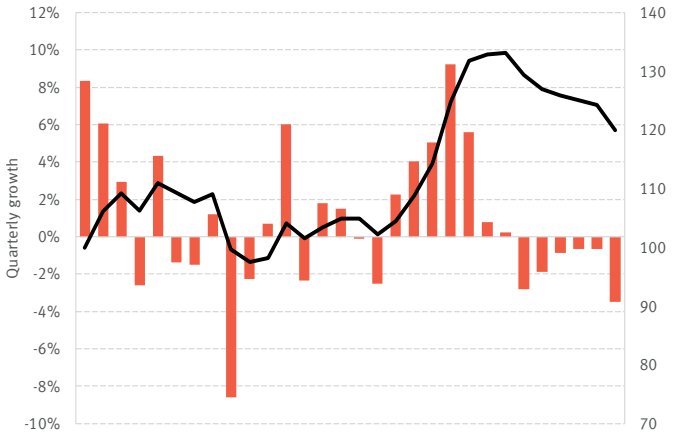
It is also interesting that the vast majority of the growth in larger businesses since 2010 (50+ employees) – has been in firms owned outwith Scotland. (Table 7)

Table 7: Sources of business growth by origin: 2010 to 2017

	Enterprises		Jobs
	Growth	% of total growth	
Scottish owned			
0-49	+ 20,865	99%	+53,280
50-249	+40	20%	+2,260
250+	+15	14%	-3,250
Non-Scottish owned			
0-49	+180	1%	+2,560
50-249	+165	80%	+6,300
250+	+90	86%	+21,670

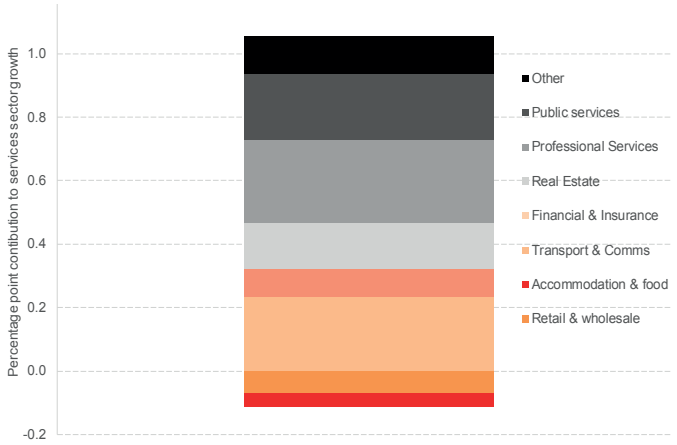
Source: *Businesses in Scotland, FAI calculations*

Chart 45: Construction sector in Scotland since 2010



Source: *Scottish Government Q2 2017 Quarterly GDP*

Chart 46: Contributions to service sector growth over last 12 months



Source: *Scottish Government Q2 2017 Quarterly GDP*

Performance by Sector

As previously highlighted in Chart 35, there is significant variation in sector performance in the most recent growth statistics for Scotland.

Within manufacturing, most sectors witnessed a decline, although food and drink grew by 1%.

Construction continued to act as a drag on overall growth. Activity was down 3.5% over the quarter and 5.5% annually. (Chart 45)

The decline in construction has been driven by a sharp fall in infrastructure spending from record highs in 2015 (when a series of major public projects were being constructed).

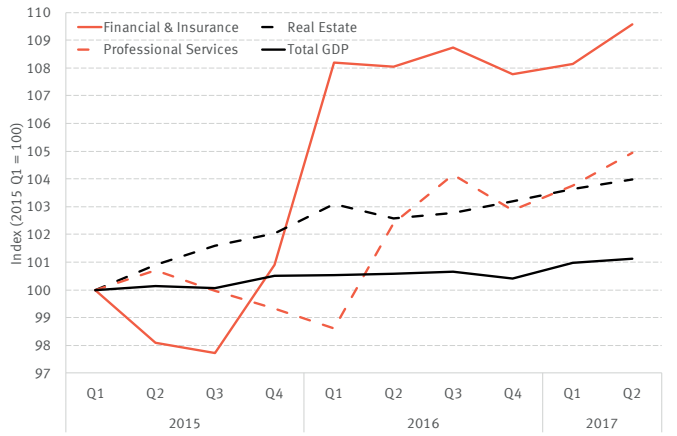
As highlighted above, the one bright spot has been the strength of the services sector – which grew +0.7% over the quarter and by 1.3% over the year.

With the exception of retail and accommodation & food, all major sectors grew over the year, with professional services making the greatest contribution. (Chart 46)

Such 'professional-and related' services, including finance, real estate etc., have grown strongly in recent times – outpacing growth in the wider economy. (Chart 47)

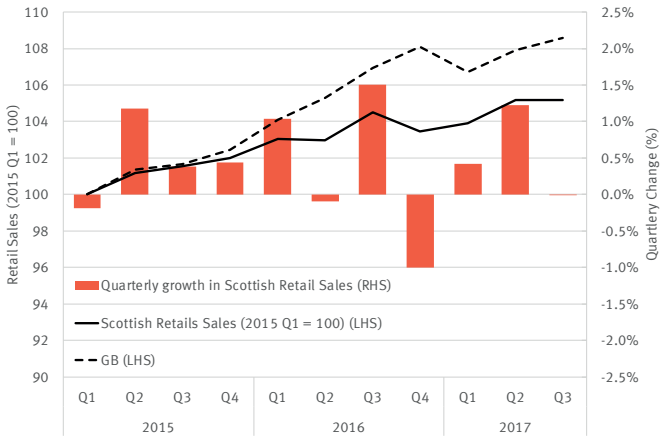
Retail sales were flat during the third quarter of 2017 and grew just 0.6% over the year, providing further evidence of weak consumer confidence. (Chart 48)

Chart 47: Strong growth in 'professional and related' services since 2015



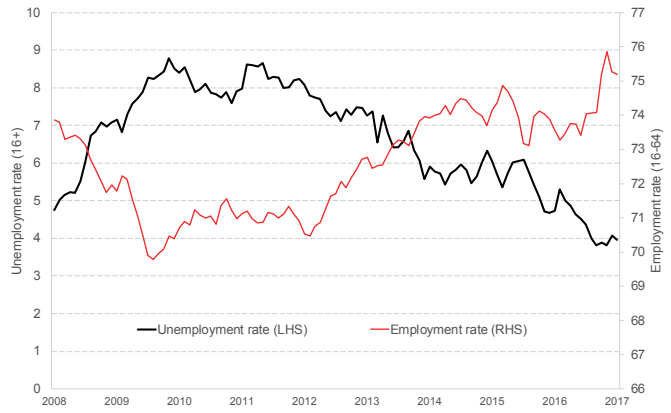
Source: *Scottish Government Q2 2017 Quarterly GDP*

Chart 48: Weak retail sales growth – Q3 2017



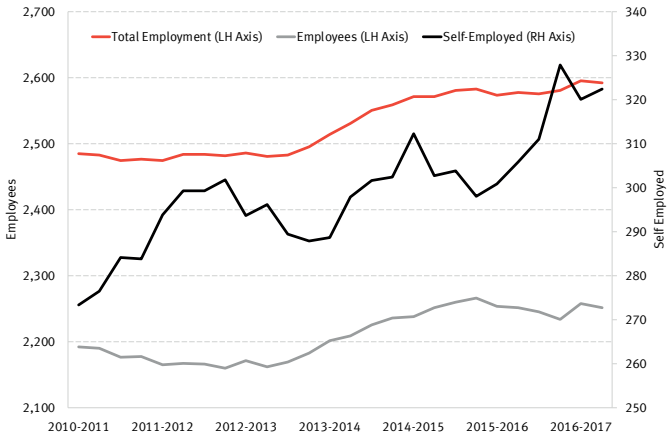
Source: *Scottish Government, Q3 Retail Sales Index*

Chart 49: Scottish employment & unemployment rate since 2008 – near record levels since LFS began in 1992



SOURCE: *ONS, LFS*

Chart 50: Scottish employment & self-employment since 2011



SOURCE: *ONS, LFS*

The Scottish labour market

The labour market in Scotland continues to provide impressive headline indicators – employment is 75.2% whilst unemployment remains low at 4.0%. (Chart 49)

Over the year to September, employment has increased by 46,000. At the same time, unemployment has fallen by around 20,000.

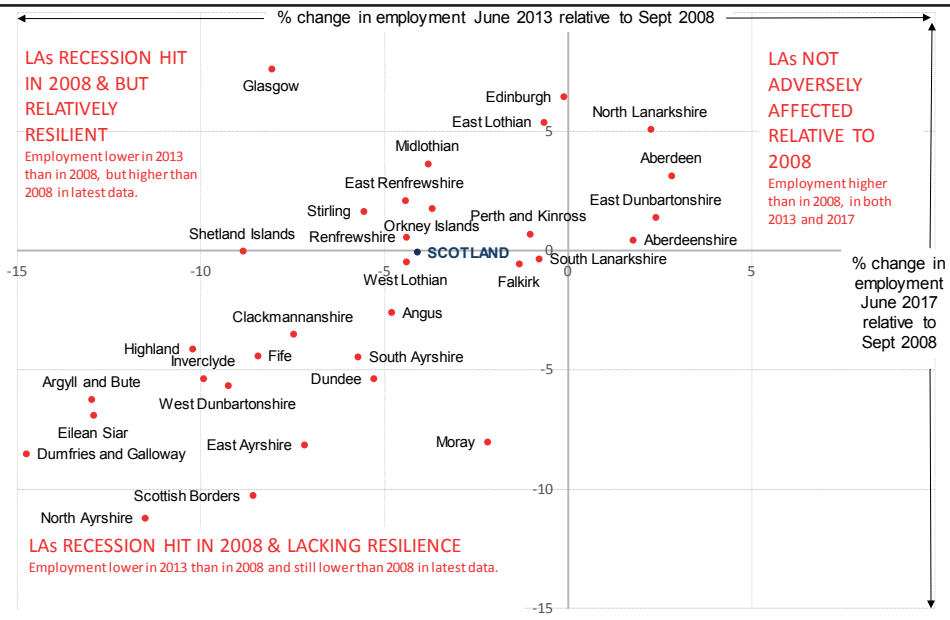
On both, Scotland is slightly better than the UK – although as we have indicated, with confidence intervals of +/1.3% & +/-0.7%-points surrounding these estimates, care needs to be taken when interpreting small differences in headline numbers.

As Chart 50 shows, the recent growth in employment has been driven by rising self-employment. This is consistent with the trends on business formation outlined above.

Regional variations continue across Scotland. Chart 51 shows relative performance by local authority between 2008 & 2013 (the peak of Scottish unemployment) and 2008 and 2017.

Local authorities in the top right have been the most resilient, with higher employment in both 2013 & 2017 compared to 2008. Authorities in the top left initially saw employment fall between 2008 and 2013 but have since recovered. Those in the bottom left still have employment levels below 2008 levels.

Chart 51: Local authority employment changes since 2008

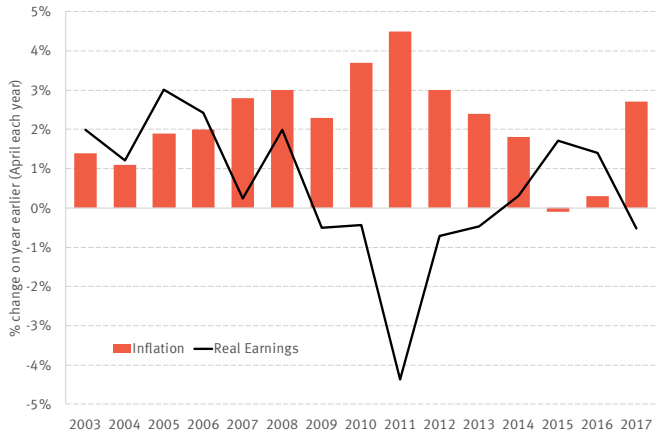


SOURCE: *ONS, APS*

Chart 52: Youth (16 -24) employment and unemployment since 2007-08

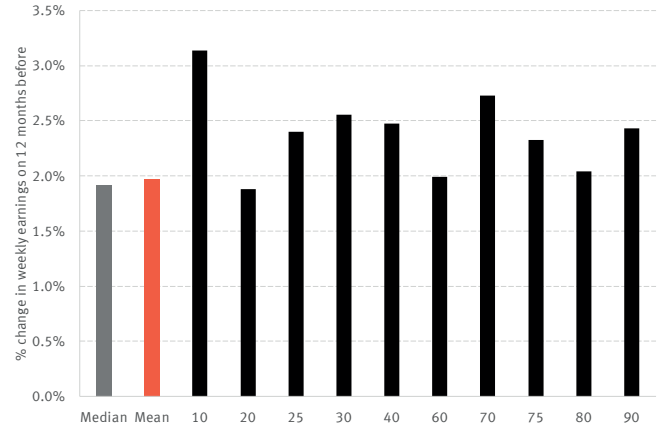
Source: ONS, LFS

Chart 53: Median real earnings in Scotland and UK CPI inflation since 2003



Source: ONS, ASHE

Chart 54: Nominal earnings growth median, mean and by decile, Scotland, 2016-2017



Source: ONS, ASHE

Chart 52 shows the evolution of youth employment and unemployment. Youth unemployment in Scotland is around its record low but the youth employment rate remains below its 2007-08 level.

The latest figures on earnings – which cover the period up to March 2017 – show that household budgets continue to be squeezed. (Chart 53)

With inflation at 3%, real earnings have once again turned negative, meaning that workers are seeing the purchasing power of their pay eroded.

As Chart 54 shows, earnings growth has not been uniform across incomes. While the fastest income growth has been seen among the 10% of the labour force with the lowest weekly earnings, this earnings growth is still barely above the rate of inflation. For all but the bottom 10%, real earnings have declined.

Productivity

Strong labour market outcomes are clearly welcome. Whilst there are concerns about the quality and nature of some of the work created, the overall trend has – on the whole – been positive.

That being said, this is only one dimension of the wider health of the economy.

With relatively weak economic growth, more people in work implies that the average contribution of each person to national output is either growing very slowly or falling.

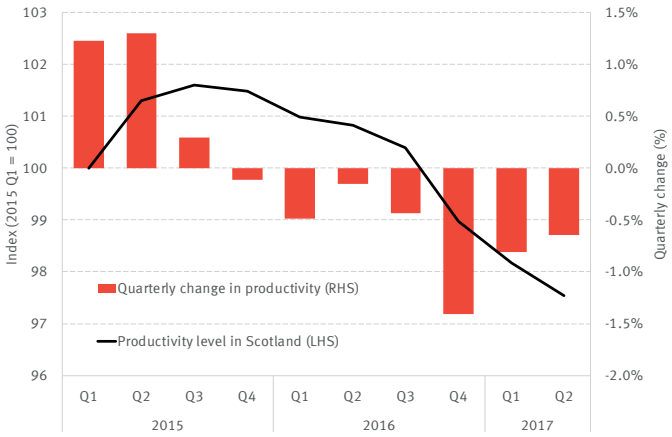
Much has been written recently about the UK's (and by implication Scotland's) productivity performance. In the long run it is key to boosting earnings and growing the tax base.

The latest figures show that productivity in Scotland as measured by output per hour (the preferred measure) was down 2.2% over the year.

Productivity growth has now been negative for seven consecutive quarters. (Chart 55)

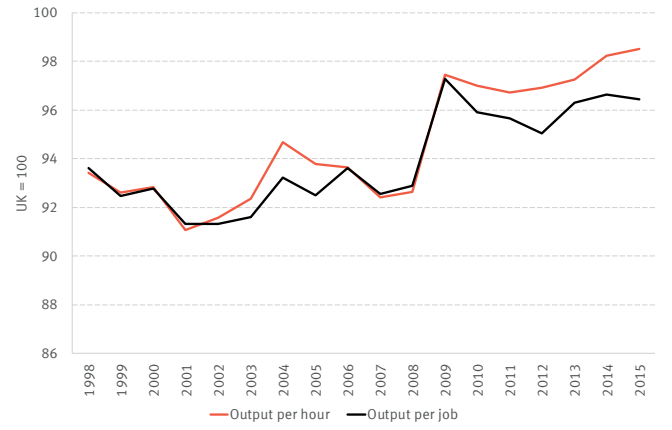
As with Scottish GDP data, one reason for this is the downturn in oil and gas spilling over onto the onshore economy.

Chart 55: Scottish productivity performance (output per hour) since 2015



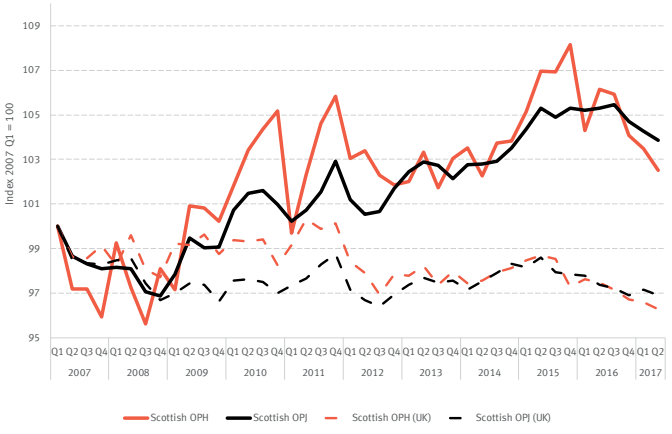
Source: *Scottish Government Productivity Statistics*

Chart 56: Scottish vs. UK productivity (output per hour & output per job): 1998 to 2015



Source: *Scottish Government Productivity Statistics*

Chart 57: Scottish productivity growth under alternative growth scenarios for hours and jobs



Source: *FAI calculations*

This is a concern as many of the sectors in the North Sea supply chain – e.g. in advanced engineering – are highly productive.

Scotland had been catching up with the UK (until 2015). (Chart 56)

Much of this 'catch-up' appears to have not come from strong Scottish-specific productivity per se but because the UK has created jobs at a much faster rate and hence softening productivity growth. Why does this have an impact on productivity measures?

Productivity is the ratio of output to labour input. If the number of people working is increasing faster than the growth in output (either due to population growth or higher participation), the contribution of each worker (or hour worked) will fall. Hence, a country creating fewer jobs, could see its relative productivity 'improve'.

Chart 57 shows productivity on the basis that Scotland had matched the growth in UK jobs and hours worked since 2007 – and compares this to the actual output per job/per hour Scottish series.

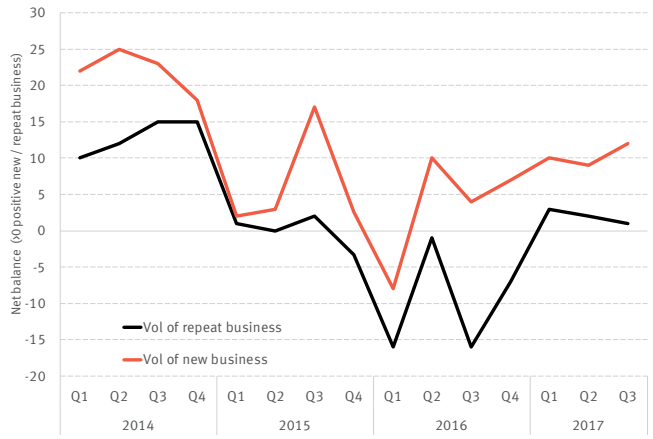
As can be seen, had Scotland matched UK growth in jobs (Scottish OPJ (UK)) or hours worked (Scottish OPH (UK)) – for the same level of output growth, Scottish productivity would have been much weaker.

Therefore, whether or not the form of 'catching-up' that we have seen with UK productivity is a good thing is open to debate.

At least in the short-run, there can sometimes be a trade-off between greater productivity and better labour market outcomes (i.e. more jobs).

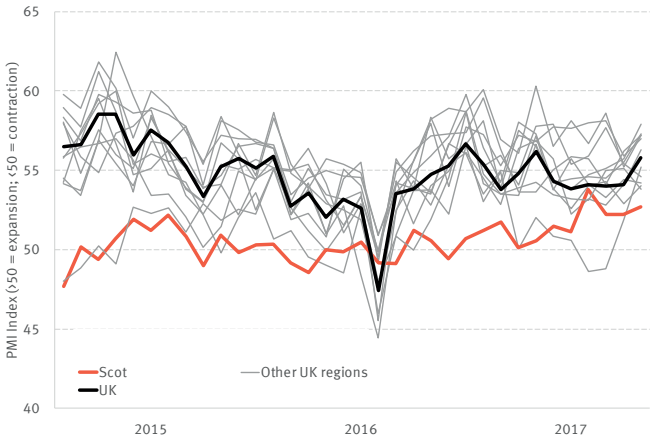
However you choose to view it, one thing that is clear is the importance of looking beyond the headline employment indicators to think about wider labour market issues like productivity, earnings and job quality.

Chart 58: Scottish Business Monitor Q3 2017 – fragile but still positive growth



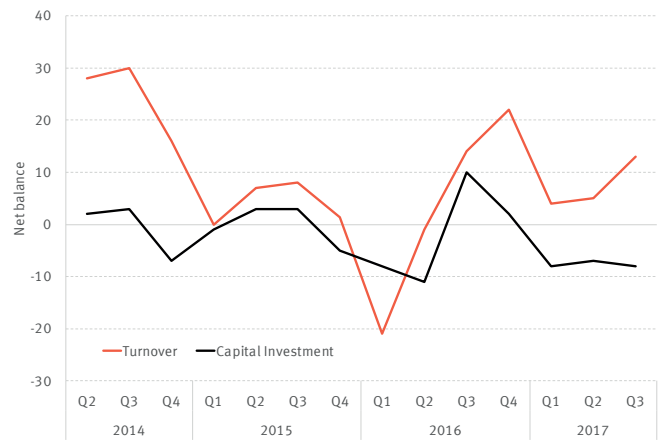
Source: *Fraser of Allander/RBS Scottish Business Monitor*

Chart 59: PMI for different parts of the UK: Scotland lagging the UK



Source: *IHS Markit*

Chart 60: Business investment intentions (and turnover) according to latest Scottish Business Monitor



Source: *Fraser of Allander/RBS Scottish Business Monitor*

Current economic conditions

The emerging economic data over the autumn has been – in the main – relatively positive.

The FAI-RBS Business Monitor for Q3 2017 showed a slight increase in the net balance of firms reporting new business but a slight easing (albeit still positive) in repeat business. (Chart 58)

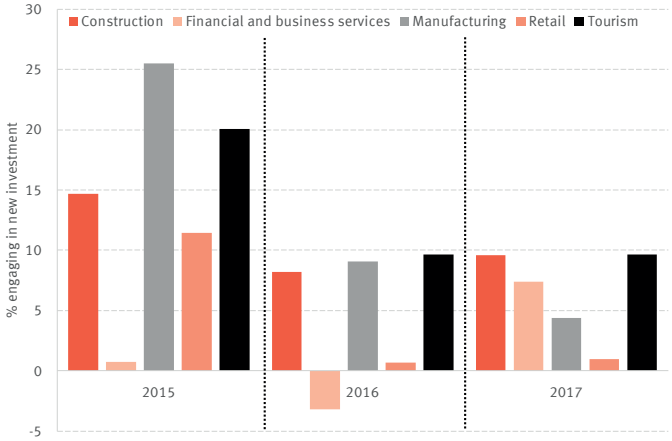
The gap between the Scottish Purchasing Managers Index (PMI) and the equivalent for the UK had been narrowing a little in recent months. But November's PMI for Scotland fell to just 50.2 - the lowest value since March. (Chart 59).

As highlighted previously in Chart 42, low levels of business investment has been an unwelcome feature of recent times and shows little sign of changing.

The latest Scottish Business Monitor reports that more businesses are planning on cutting back investment over the next six months than there are planning to increase it. And this is despite turnover prospects improving. (Chart 60).

A similar result is found in the latest Scottish Chambers of Commerce survey. (Chart 61). Here the percentage of firms engaging in investment has tended to have been lower in both 2017 and 2016 than in 2015. Unsurprisingly, the tourism sector – on the back of a strong 2016 and 2017 is more positive.

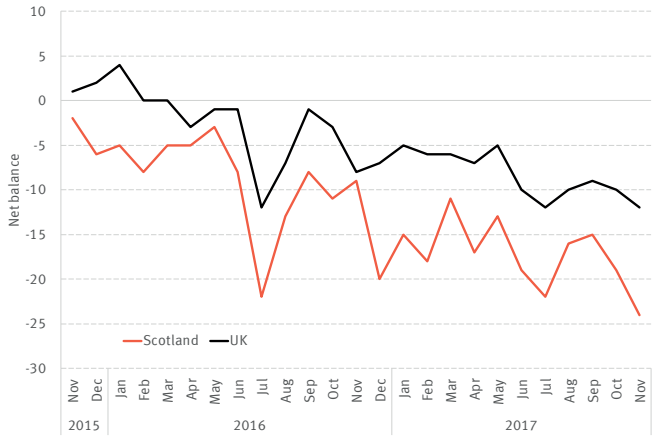
Chart 61: Business investment intentions according to Scottish Chambers of Commerce*



*Figures for 2017 are based on 3 quarter average thus far

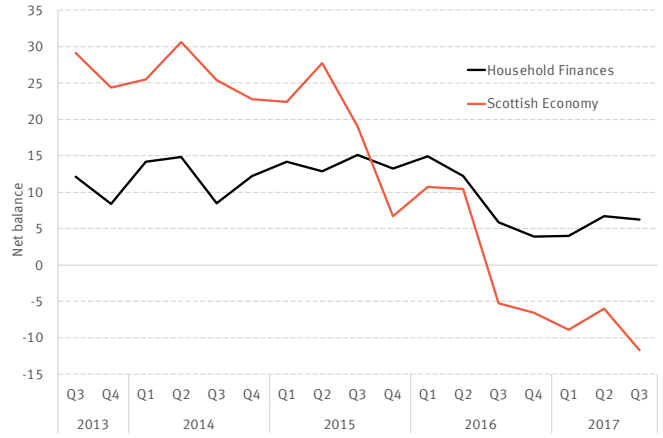
Source: *Scottish Chambers of Commerce/FAI*

Chart 62: Consumer confidence in Scotland – becoming more negative



Source: *GfK*

Chart 63: Scottish Government indicator of household sentiment on economy/household finances also declining



Source: *Scottish Government*

Levels of consumer confidence remain weak. The GfK consumer confidence indicator for Scotland declined further in November to its lowest level in 2 years – and is now well below the UK (Chart 62).

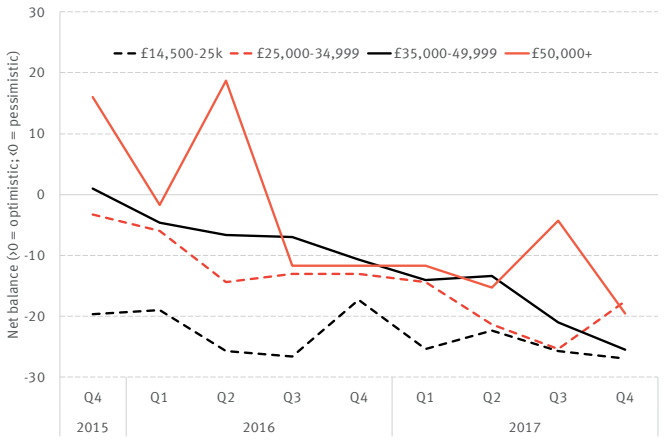
A similar story emerges in the Scottish Government's consumer sentiment measure. In this, Scottish households are asked of their expectations for the next 12 months for both the economy and household finances. Their expectations for the economy remain negative – and are at their lowest since the series began in 2013. Their perception of the outlook for household finances has also weakened. (Chart 63)

Overall, households at the lower end of the income distribution appear to be less confident about the future than better off households. The GfK indicator of consumer confidence has typically been more negative for those earning less than £25,000 for the past two years. (Chart 64)

Whilst households appear pessimistic about the outlook, the demand for labour remains strong. (Chart 65) The Bank of Scotland's labour market barometer – which captures various measures of activity in the Scottish jobs market such as demand for new staff etc. – continues to perform well-above its long-term average.

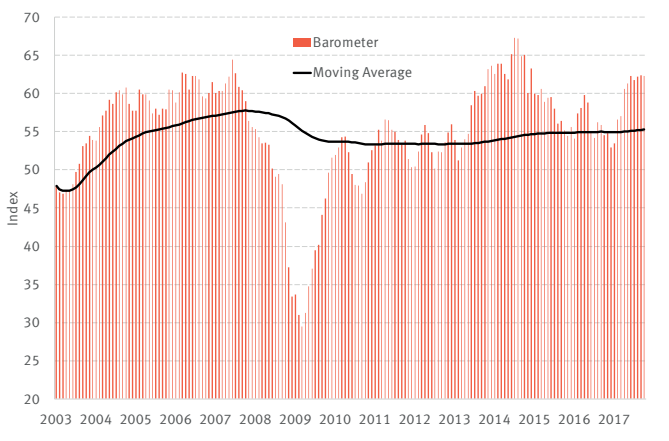
This suggests that the disconnect between a resilient labour market and a weaker economic outlook is likely to continue for some time yet.

Chart 64: Confidence negative across income bands –pessimism highest amongst low earners



Source: *GfK*

Chart 65: Bank of Scotland employment indicator – continues to show robust labour market demand



Source: *IHS Markit/Bank of Scotland*

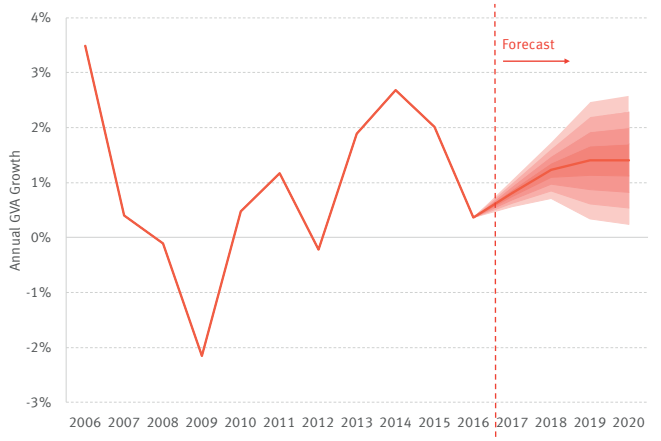
Forecasts

Table 8: FAI forecast Scottish Economic growth (%) 2018 to 2020

	2018	2019	2020
GVA	**1.2**	**1.4**	**1.4**
Production	1.4	1.6	1.2
Construction	0.7	0.9	0.5
Services	1.2	1.4	1.5

Source: *Fraser of Allander Institute*

Chart 66: Growth to remain below trend through forecast



* Actual data to Q2 2017, central forecast with forecast uncertainty for 2018 – 2020. Uncertainty bands sourced from accuracy of past forecasts at different forecast horizons

Table 9: Nowcasts for Q3 2017 and Q4 2017 for Scotland

	Q3	Q4
Quarterly Growth	+0.38	+0.35
Annualised Growth	+1.51	+1.4

Source: *Fraser of Allander Institute*

Table 10: FAI revised forecast %-point change from September 2017 forecast by sector, 2018 to 2019

	2018	2019
GVA	**-0.16**	**-0.30**
Production	-0.11	-0.25
Construction	-0.11	-0.21
Services	-0.16	-0.31

Source: *Fraser of Allander Institute*

As in the past, we report a central forecast but also uncertainty bands that set out a likely range within which we predict Scottish economic growth will lie.

This December issue includes our first estimates of growth for 2020.

We have revised down slightly our forecasts for 2018 and 2019 in the light of a weaker UK outlook and a failure of investment or consumer confidence to pick-up in Scotland.

However, our overall assessment is broadly unchanged. We believe that the Scottish economy will grow next year and the year after, but predict that such growth will remain below trend.

Our revised forecast is for growth of 1.2% in 2018, 1.4% in 2019 and 1.4% in 2020. (Table 8, Chart 66)

Our last forecast for 2017 of 1.2% growth – made in September – is on track to be slightly over optimistic based upon the latest figures published for this year thus far.

Our 'nowcasts' suggests growth of around 0.38% and 0.35% for Q3 and Q4 in 2017 (Table 9).

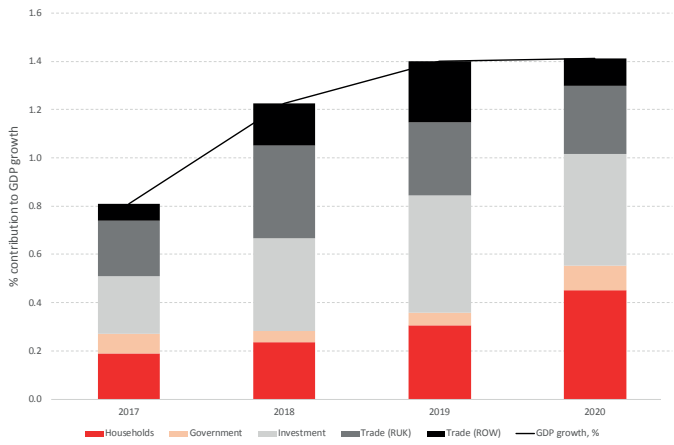
The combination of these nowcasts alongside the revision to Q1 data (from 0.8% to 0.6%) and the weak growth of 0.1% in Q2, means that annual growth for 2017 is currently heading to be 0.8% on a 4Q-on-4Q basis (and 1.4% comparing the final quarter of 2017 with the same period in 2016).

Should this occur, this will take Scotland's average growth rate over the past decade to just 0.7%. It cannot be overemphasised how deeply disappointing this is. The fact that this poor performance is not the focus of more attention remains hugely surprising.

The scale of our revisions for 2018 and 2019 are -0.16 and -0.30 percentage points respectively (Table 10).

As in recent years, services should make the greatest contribution to overall growth, however in absolute terms, growth in production is forecast to be slightly higher. (Chart 67)

Chart 67: Sector components of FAI growth forecasts for 2018 to 2020



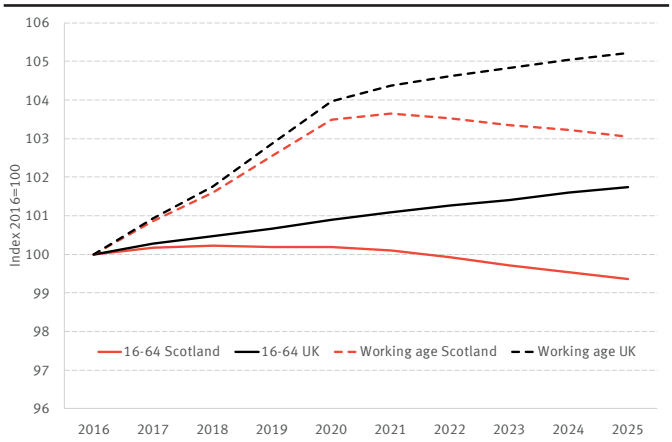
SOURCE: *Fraser of Allander Institute*

Table 11: Forecast UK GDP growth (%) 2018 to 2020

	2018	2019	2020
Bank of England	1.6	1.7	1.7
OBR	1.4	1.3	1.3
NIESR	1.7	1.7	1.6
European Commission	1.3	1.1	n/a
IMF	1.5	1.6	1.7
ITEM Club	1.4	1.3	n/a

SOURCE: *HM Treasury*

Chart 68: Projections for working age population: Scotland vs. UK (different scenarios for pension age)



SOURCE: *ONS population projections*

Weak earnings will mean that household spending – and the industries it supports (e.g. retail) – will continue to be under pressure well into 2018.

However building on recent growth, professional and business services are placed to do better. Tourist facing businesses have had a strong 2017 and this should continue (particularly if Sterling stays competitive).

We expect the outlook for manufacturing to be slightly more positive, particularly as optimism in the North Sea supply chain continues to improve.

The construction sector should start to see more positive growth over the next couple of years. The increase in investment announced by the UK Government should help reverse recent falls in infrastructure spending.

The greatest drag on growth is likely to be weak business investment as Brexit uncertainty continues to put-off firms from expanding.

Our latest forecasts for Scotland put us slightly behind the Bank of England's forecast for the UK economy but ahead of the OBR's UK forecast.

Whilst we do not forecast the UK economy directly, on balance, we believe that Scotland will do well to match forecasted UK growth over the next few years. (Table 11)

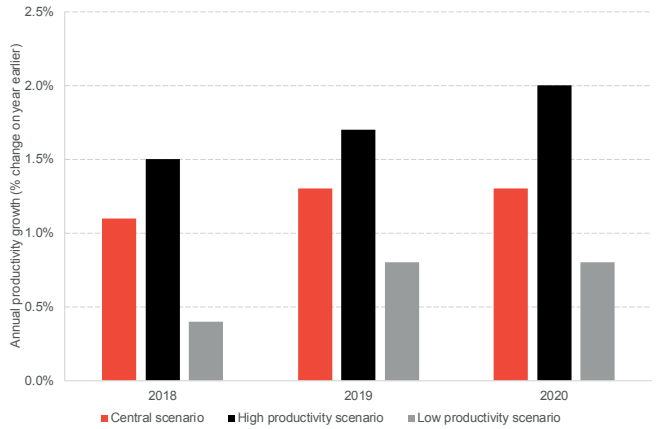
There are a number of reasons for this.

Firstly, the downturn in oil and gas is clearly a structural rather than cyclical challenge. Going forward investment, wages and supply-chain activity will undoubtedly be smaller than in the past.

Secondly, Scotland's 16-64 population is projected to grow more slowly (and then decline). This is in contrast to the UK as a whole. (Chart 68) Note however, to the extent that the pension age continues to rise, this will initially dampen any effect of population ageing in Scotland.

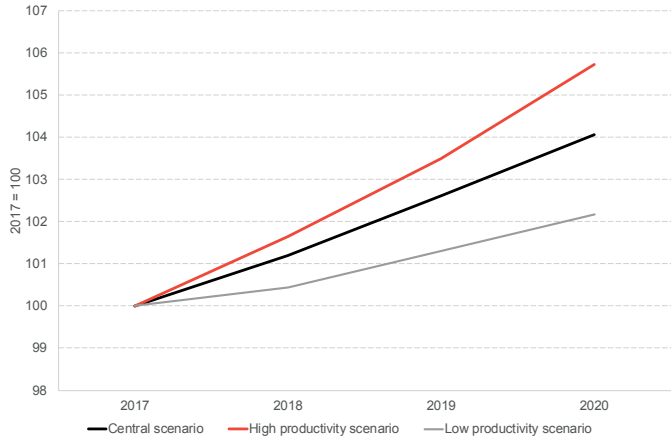
Thirdly, there is little evidence to suggest that Scotland will significantly outperform the UK in terms of productivity over the next few years.

Chart 69: Forecasts for productivity growth: different scenarios



Source: *Fraser of Allander Institute*

Chart 70: Growth forecasts under different outlooks for productivity (central, high productivity, low productivity)



Source: *Fraser of Allander Institute*

Chart 71: Annual earnings growth: Scotland vs. the UK since 2003

Source: *Annual Survey of Hours and Earnings*

Indeed given recent trends, and the downturn in one of Scotland's most productive sectors – the oil and gas supply chain – the outlook for Scotland could be weaker.

Clearly there remains much uncertainty over such forecasts, but our expectation is that productivity will start to pick-up in the coming years (albeit it will continue to remain poor by historical standards).

Chart 69 shows alternative productivity forecasts under two different scenarios. A 'low' scenario assumes that productivity performs broadly as it has done since 2008. The 'high' scenario assumes that productivity returns to 2% growth by 2020.

In the 'low productivity' case, growth remains weak and stuck below 1% over the forecast horizon – growing just 0.5% in 2018 and 0.9% in 2019 and 2020. In the 'high productivity' scenario, whilst growth remains below trend it starts to pick-up and approaches 2.1% by 2020. (Chart 70)

Faced with this outlook, and a decade of growth less than 1% a year, it is vital that the Scottish Government use the Budget to come forward with clear practical policy actions to support business, attract investment and boost productivity. Strategies, action plans and ambitions around inclusive growth will only take us so far.

The Scottish Fiscal Commission (SFC) will publish its first economic and fiscal forecasts alongside the Scottish Budget. A number of points are worth noting.

Based on recent evidence we see no reason to think that they will be anything but cautious in their assessment of the Scottish economy.

Furthermore, weak GDP forecasts will undoubtedly have an impact on expected Scottish revenues (prior to any policy decisions).

But as David Eiser's article in this Commentary points out, changes in aggregate measures of economic performance (such as GDP), at least in the short-run, might not be perfectly correlated with changes in tax revenues.

Table 12: FAI labour market forecast to 2020

	2018	2019	2020
Employee jobs	2,462,900	2,488,850	2,526,500
% employee job growth over year	+0.9%	+1.1%	+1.5%
ILO unemployment	120,350	114,650	116,300
Bank of England - UK	4.3%	4.4%	4.6%
OBR - UK	4.2%	4.2%	4.3%
Rate (%)[1]	4.5	4.2	4.2

Source: *Fraser of Allander Institute*

Notes:

Absolute numbers are rounded to the nearest 50.

1. Rate calculated as total ILO unemployment divided by total of economically active population aged 16 and over.

For example for income tax, what matters most is the outlook for wages and employment.

And here there are reasons to be slightly more optimistic on Scotland's relative performance (at least in the short-term).

On earnings, whilst weak Scottish incomes have tended to keep pace with those in the UK as a whole. (Chart 71). A similar picture emerges in terms of labour market indicators. Our latest forecast is for Scottish unemployment to broadly track that of the UK. (Table 12)

Of course, should Scotland's economy grow more slowly than the UK over time, then the potential risks to devolved budgets are more serious. Even small percentage point differences in tax revenues amount to hundreds of millions of pounds in lost revenues, even over a short number of years.

This is why we believe that this Budget should be judged for what it says about the economy just as much as it will about Scottish taxation and spend.

Policy Context

The Cabinet Secretary for Finance, Derek Mackay, will publish the Scottish Budget on 14th December. As we set out in our Scotland's Budget: 2017 report in September, this will be a tough settlement.

After a small increase in 2017/18, the Scottish resource block grant will fall by just under 1% in real terms next year. This will bring the cumulative real terms fall in the block grant since 2010/11 to almost 7%.

At the same time, the budget comes at a time of heightened economic uncertainty and weak growth.

Meeting spending demands whilst maintaining economic competitiveness requires a careful balance.

It is also worth remembering that Mr Mackay is required to gain the support of one or more party in the Scottish Parliament.

So what are the key policy issues to look for?

The government's spending priorities

Since 1999, successive administrations have chosen to prioritise health spending. In this parliamentary term, the Scottish Government has committed to increase spending on health by £500 million more than inflation.

This might sound generous but it is likely to be sufficient just to keep up with population and demographic trends.

The government hopes that savings can be made by moving to more 'preventative' and 'joined-up' models of service provision - for example, in health and social care. But wider reforms continue to prove difficult to implement and, even then, will only deliver savings in the long-term.

With health protected, other areas of the budget are required to pick-up the burden.

Non-health spending has declined by 10% in real terms since 2010/11. But the population has also been growing. As a result, in per capita terms, non-health spending has declined by 13%, and is on course to fall by almost a fifth by the end of the decade.

A consequence of the increasing prevalence of one-year (as opposed to multi-year) budgets is that the scale of these changes over time – and the relative shift of spending priorities – has gone relatively unnoticed.

In looking to this week's budget and beyond, there are some additional areas that are also likely to be 'protected'.

This includes commitments to protect police spending, expand childcare, and tackle inequalities in educational attainment. On top of this, the government has a number of politically symbolic policies to deliver (like free prescriptions, free university tuition, concessionary travel etc.); a pay rise for public sector workers; borrowing commitments (of around £1 billion); and a new social security agency to establish.

'Non-protected' areas are therefore in line for a challenging budget settlement.

Protecting some services over others is part of the job of government, but there is also a need for strategic choices within unprotected areas.

Tax increases cannot free policymakers from making difficult choices

The pressures on spending means that the government has been quite open about its aspirations to raise revenues through income tax.

The government has advocated the concept of a 'social contract', i.e. access to a range of publicly provided services, including various flagship universal services, funded by higher taxation.

But a policy to increase tax rates clearly carries risks, both politically and economically.

Even a relatively 'bold' policy on income tax (e.g. one that adds a penny to all tax rates but protects those earning below the national median income) is likely to raise not much more than £300 million.

This could help to offset this year's budget cut. However, with consolidation of funding from Westminster likely to continue into the next decade, it will only be a short-term fix.

Of course any proposals to increase tax rates will generate a debate about the potential effects on incentives to work, business competitiveness and Scotland's attractiveness as a place for investment.

In reality, little is known with certainty about the potential economic impacts of changing tax rates within the context of devolution. In the short run, much will depend upon the aggregate net impact of reduced household incomes but higher government spending.

But over the long run, of greater concern to the government could be the impact of higher taxes on business sentiment and Scotland's perceived competiveness relative to the rest of the UK.

If there is one area where the government may be more likely to consider tax cuts, it is in relation to Land and Buildings Transaction Tax. There had been calls to align LBTT rates closer to those in England (properties in Scotland pay higher tax on transactions over £333,000). It may also face pressure to mimic the UK Government's Stamp Duty tax cut for first time buyers.

The risk is that, with the price structure of housing significantly different in Scotland compared to England, replicating the English structure will imply much reduced revenues and would impose a system of rates less relevant to the Scottish market. In the longer term, most economists would argue that a more fundamental restructuring of land and property taxation, encompassing not just LBTT but also business rates and council tax, makes more sense.

Ironically the delay to the devolution of Air Passenger Duty (scheduled for 2018) may alleviate some immediate budget pressures, given the Scottish Government's commitment to reduce rates.

The importance of growth

The economic backdrop to the Budget will be shaped by the first ever forecasts from the Scottish Fiscal Commission (SFC) for both the Scottish economy and devolved revenues. It is likely that the SFC will be downbeat about the immediate prospects for both.

The fragile economy is of course a significant issue for the public finances. A faster growing economy generates larger revenues, while a weaker one generates less.

But whilst it is harder in practice for government to stimulate the economy than is often supposed, both the Scottish and UK governments are certainly not powerless to support growth over the medium term.

With disappointing economic data for two years now, the Scottish Government will need to articulate how it will support the economy. So where can the budget make a difference?

Taxation: One area that businesses will look for clarity is over the government's long term vision for taxation. If taxes rise, businesses will demand a convincing equivalent to the 'social contract': i.e. demonstrable improvements in skills, digital connectivity and infrastructure. Action plans and strategies will not be sufficient.

Spending priorities: The First Minister has said that the government is willing to look at how to 'make the most of the money we already spend' on supporting the economy – around £2bn per annum. That is a significant amount of money – but does it have an equivalent impact? Enhancing the quality of further and higher education, supporting enterprise and skills, boosting R&D and innovation, delivering a workable National Investment Bank are just some of the areas where concrete action could make a difference.

Capital investment and borrowing: As a result of UK Government decisions, the Scottish Government's capital budget is to increase over the next few years. Combined with new borrowing powers, investment could return to levels not seen since 2010/11. In the current economic climate, there is a case for utilising the borrowing powers in full,

but where and how effectively the money is spent is just as important.

Financial Transactions: At the same time, the government now has £1bn of 'Financial Transactions' at its disposal. In theory these could be used to lend to businesses – on generous terms – to support investment in anything from commercial property to R&D. Many would argue that investment in these sorts of projects has the potential to generate a greater economic return than if it were simply used to support borrowing for the residential property market.

The importance of a longer term perspective

The major budgetary and wider policy challenges that Scotland faces cannot be addressed on a year-by-year basis. Implicitly policymakers recognise this.

They are increasingly adopting longer-term targets for policy interventions (the latest is the target to eliminate child poverty by 2030, now enshrined in the Child Poverty (Scotland) Bill).

But despite this recognition of the importance of a longer-term vision, budget planning remains remarkably short-sighted. Unfortunately, another one year budget is likely - at best a two year budget - following single year budgets in 2016/17 and 2017/18.

The short-term perspective means we lose sight both of where we are coming from, but also how long-term challenges can best be addressed.

Part of this reflects the political reality of a minority government. But this cannot be used as an excuse to avoid taking a more strategic approach to the Budget.

Conclusions

In September we discussed how the Scottish Government had set out a new vision for supporting growth and its willingness to change the emphasis of its approach to economic policy.

The Budget offers the first test of the level of the government's ambition.

Economic Perspectives

What might slower economic growth in Scotland mean for Scotland's income tax revenues?

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Abstract

Income tax revenues now account for over 40% of the Scottish resource budget. Under Scotland's Fiscal Framework, the Scottish budget benefits from growth in income tax revenues per capita if they grow faster than the growth in equivalent revenues in the rest of the UK (rUK). Since the beginning of 2015, Scotland's Gross Domestic Product (GDP) per capita has grown significantly slower than the UK's, raising concerns that if this trend continues it may lead to relatively slower growth in the Scottish income tax base and a weaker outlook for the Scottish budget. This paper considers the relationship between GDP per capita and income tax revenues. It argues that, whilst there is a reasonably strong relationship between growth in GDP per capita and tax revenues in the longer-term, the relationship is likely to be significantly weaker in the short-term. Empirically, it finds that whilst Scottish and UK GDP per capita has broadly grown at similar rates between 1999 and 2015, growth in income tax revenues per capita have at times diverged. The paper concludes by considering whether Scotland's recent slower growth in GDP per capita is likely to continue over the next few years, and, if it does, what this might mean for Scotland's income tax revenues.

Key words: Tax revenues, GDP growth and tax, per capita tax, Scottish Fiscal Framework

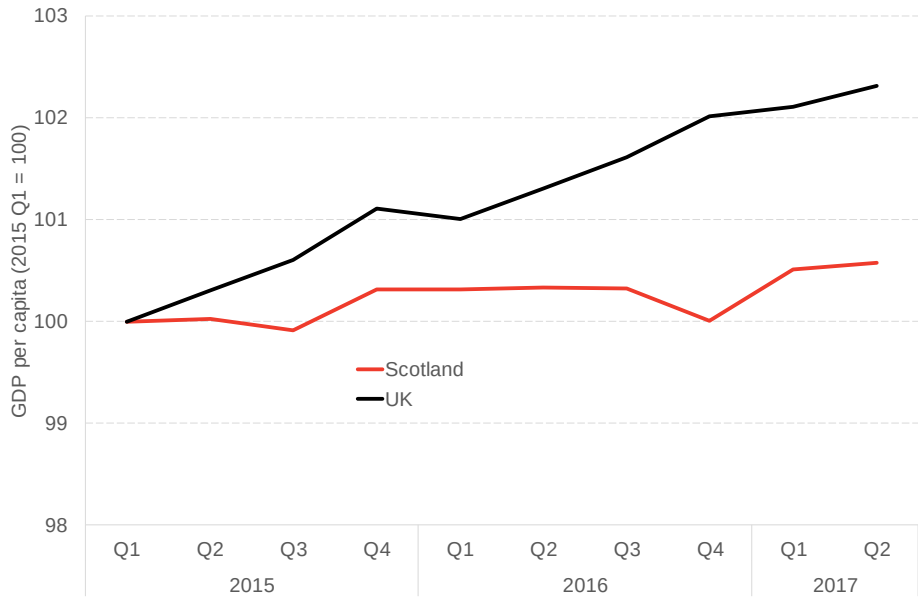
1. Introduction

The recent slowdown in Scotland's rate of economic growth per head relative to the UK has been well documented. Whilst growth in UK GDP per head has been weak, growing at just 2.3% between Q1 2015 and Q2 2017, Scottish growth has been weaker still, with per capita GDP growing at a quarter of that of the UK at just 0.57%, over the same period (Chart 1).

Revenues from non-savings, non-dividend (NSND) income tax now form part of the Scottish budget. Under the Fiscal Framework, the Scottish budget will be better off than it would have been without tax devolution, if revenues per capita grow more quickly in Scotland than they do in the rest of the UK (rUK). Conversely, a slower growth in revenues per capita in Scotland than rUK will translate into a smaller Scottish budget.

A critical question to consider therefore is what slower growth in GDP per capita – in Scotland relative to rUK – might mean for the growth of income tax revenues per capita in Scotland relative to rUK. Does slower growth in GDP per capita necessarily mean slower growth in income tax revenues? How strong is the relationship and what factors might influence it?

Chart 1: GDP per capita (Q1 2015 = 100)



This paper considers the nature of the relationship between growth in GDP per capita and income tax revenues. It is structured as follows. Section 2 considers how GDP per capita and income tax revenues per capita are correlated in theory, in both the longer and shorter terms. In Section 3 we consider the empirical relationship between Scottish income tax revenues relative to rUK revenues, and Scottish GDP per capita growth relative to UK GDP growth since 1999, and consider what factors may have influenced this empirical relationship. Section 4 concludes by considering the outlook for GDP and income tax revenue growth in Scotland in the coming years.

2. The relationship between GDP per capita and income tax revenues

What is the relationship between growth in GDP per capita and growth in per capita income tax revenues?

It is important to note initially that income tax revenues are a function of the *tax base* (the amount of taxable income), and income *tax policy* (allowances, rates and bands). So the first question to consider is the relationship between *GDP and the tax base*.

Clearly, increases in population will tend to increase both the size of economy (GDP) and the tax base (taxable income). To abstract from this relationship, in the rest of this section we will assume that population is constant. How then might changes in GDP (i.e. GDP per capita) effect the tax base?

It is important to distinguish between the long-run and the short-run relationship between GDP and the tax base.

Relationship between GDP and the income tax base in the long-run

Theory (and basic intuition) suggests that there must be a reasonably strong relationship between GDP per capita and the income tax base in the long-run.

GDP is determined by the hours worked and output per hour, i.e. productivity. GDP will increase if more work is done (which could be because workers work more hours, or because a larger proportion of the population enters work), or if workers become more productive.

What about the income tax base? This will grow if there is an increase in hours worked, or in hourly wages. In the long-run, the only way in which average real wages can grow is through increases in productivity: productivity improvements are what enable firms to pay higher wages without increasing prices (Box 1).

This link between productivity and real wages means that the two things that underpin increasing GDP per capita – hours worked and/or higher productivity – are the same two factors that can increase the size of the income tax base – hours worked and wages.

Indeed, this is why the two main determinants of income tax revenues in the Scottish Fiscal Commission's forecasts are the employment rate and the average wage. And this is why recent downward revisions to productivity growth by the Office of Budget Responsibility (OBR) have had such devastating effects on tax forecasts at the UK level.

But even in the long-run, the relationship between growth in GDP per capita and growth in the income tax base is unlikely to be absolutely fixed nor be constant over time (i.e. a 1% increase in GDP per capita is unlikely to lead to an automatic 1% increase in the tax base over prolonged periods). This is partly because the composition of GDP growth can effect average incomes and the way in which they are distributed. For example:

- There might be changes over time in the share of labour as opposed to capital in GDP growth. In most OECD countries, the share of labour (wages and incomes) relative to capital (profits and dividends) in GDP has tended to fall in recent decades. In the UK, the labour share of national income has fallen by around six percentage points between 1970 - 2014 (OECD, 2015). In practical terms, this is one reason why growth of GDP might not precisely match the growth of the income tax base in the long run. The reasons for a falling labour share are debated, but is thought to be at least in part due to technological change[1], and perhaps also because of a weakening of labour's bargaining power (e.g. associated with the decline in trade union membership).

[1] 'New technology' companies like Google or Apple have large capitalisation values but employ relatively few people and have correspondingly lower wage bills.

- The distribution of income across those in employment can interact with the tax system to influence the relationship between aggregate earnings and the tax base. With a progressive tax system like the UK's, wage growth that is disproportionately concentrated on those with higher incomes might strengthen the link between wages and the income tax base, whereas wage growth that is disproportionately focussed on the poor might weaken this relationship.
- Similarly, changes in the composition of employment between self-employment and employees might influence the relationship between economic activity and the tax base, if self-employment is taxed differently from employment[2].

The relationship between productivity and wages might also weaken over time if non-wage benefits become more important relative to wage benefits. For example, increased employer contributions to pensions or to healthcare plans or perks such as company cars might weaken the link between GDP per capita growth and contemporaneous income tax revenues.

Remember too that the income tax base depends not just on the wages and incomes of those in work. Income from State and Occupational pensions and income from some social security benefits is liable to income tax. There is likely to be some kind of relationship between GDP per capita and pension incomes, although this is likely to be fairly weak or at least be subject to long lags (as occupational pension incomes depend partly on lifetime contributions which are themselves a function of lifetime income – together of course with policy and individual savings decisions).

Box 1: How does productivity effect economy-wide wages?

At one level, productivity is a straightforward concept: it is simply Gross Domestic Product (GDP) divided by hours worked. In the context of a manufacturing firm, productivity can be thought of in relation to the number of widgets produced per hour. It is simple enough to imagine how productivity might improve with new technologies or expertise, and it is intuitive that higher productivity will enable the firm to pay higher wages without increasing its prices. But productivity is an abstruse concept in relation to many economic sectors. How should we interpret productivity in the context of a services firm, whether a management consultancy or a hairdressers? What about the public sector? How realistic is it for these sectors to be more productive? But if it is difficult to improve productivity in certain sectors (there must be limits to the number of patients a GP can see per hour, or the number of haircuts a barber can give), does this mean that wages in these sectors will stagnate relative to the sectors in which it is relatively easy to improve productivity? In the long-run, the answer is no. Whilst new technologies or management practices will inevitably enhance productivity more in some sectors than in others, short-term wage increases in one sector should induce changes in the supply of labour to that sector in the longer run, equalising wages. This is why it is average productivity growth that is important in determining average wage growth over the longer term, and not simply whether there is evidence of 'fast' productivity growth in any particular sectors or among particular firms.

[2] In the UK tax system, a self-employed person is liable for slightly higher income tax liabilities than an employee with the same income. This is because the self-employed person pays a lower rate of National Insurance Contributions, and thus their income after NICs (which is used as the basis of the income tax calculation) is actually somewhat higher than an employee's.

Relationship between GDP and the income tax base in the short-run

In the short run however, the relationship between GDP per capita and the income tax base is likely to be weaker, for a number of reasons:

- There can be lags between changes in output (GDP) on the one hand and changes in employment and/or wages on the other. Firms might 'hoard' labour for example during an economic downturn (i.e. retain its workforce despite a slowdown in activity, in order to avoid needing to re-recruit in the upturn), and allow profits to fall instead. During an upswing, firms might be able to return hoarded labour to more productive uses, expanding output without needing proportionate increases in labour.
- As already mentioned, some factors determining the income tax base are not really affected by GDP in the short run. For example, pension income (which accounts for over 10% of Scottish income tax revenues) from year to year is not correlated with GDP in the short run (but in the long run of course, pension income is in large part a function of earnings during working life).
- Some taxpayers have the ability to bring forward or delay income and tax liabilities – weakening the temporal link between when economic activity takes place and when it is taxed.

The role of tax policy

When considering the empirical relationship between growth in GDP per capita and income tax revenues there is a further complication which may muddy the picture: changes to income tax policy.

An increase in the size of the tax base might not feed through to an increase in tax revenues if it coincides with a reduction in the burden of tax. For example, an increase in wages (and corresponding increase in the tax base) might be offset by a proportionately larger increase in the Personal Allowance.

Tax policy changes can thus weaken the relationship between the tax base and tax revenues (even if this doesn't weaken the relationship between economic output and the income tax base).

A note on the geographical level at which GDP and the income tax base are measured in Scotland

A further complication that may weaken the relationship between growth in GDP per capita and growth of the income tax base is that the geographical level at which these things is measured is not consistent.

This is particularly the case in the Scottish context. When we talk about Scottish GDP we are usually talking about 'onshore GDP', i.e. we exclude activity generated by the offshore oil and gas sector in the North Sea etc. But it is quite possible that individuals' working 'offshore' count as Scottish taxpayers for the purposes of determining Scottish income tax revenues.

More significantly, people whose main residence is in Scotland but who work partly or wholly in another part of the UK don't directly contribute to Scottish economic output, but the income generated from this activity will form part of the Scottish income tax base (and vice versa). In

theory therefore, a weakening Scottish economy might not generate a weaker tax base if Scottish residents commute to England to work.

3. The empirical relationship between GDP per capita and income tax revenues per capita in Scotland and UK since 1999

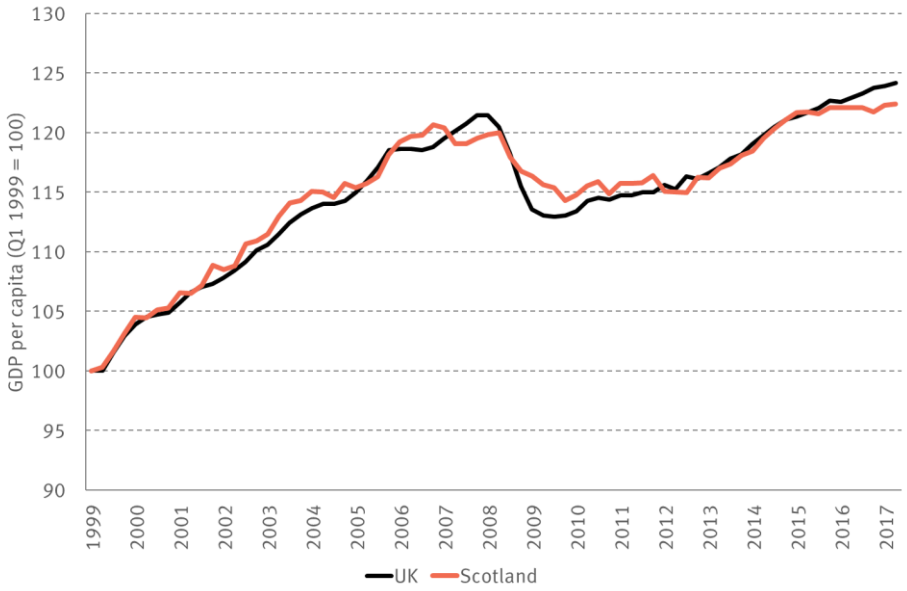
Empirically, how have Scottish GDP per capita and Scottish tax revenues trended over time relative to UK revenues and GDP?

Remember that when it comes to the Scottish Fiscal Framework, what matters for the Scottish budget is how Scottish income tax revenues (per capita) grow relative to rUK income tax revenues (per capita). If Scottish revenues per capita grow more quickly than the equivalent rUK revenues per capita, the Scottish budget will be better off than it would have been without tax devolution.

It is therefore instructive to consider trends in GDP per capita in Scotland compared to the UK, and to see whether this trend sheds any light on the growth in Scottish income tax revenues (per capita) relative to those in the UK[3].

Scottish GDP per capita growth has largely tracked UK per capita growth since 1999 (Chart 2). Scotland experienced a marginally shallower recession, but more recently there is emerging evidence of a de-coupling of Scottish and UK GDP per capita growth, which was alluded to at the start of this article.

Chart 2: GDP per capita (Q1 1999 = 100)



[3] In this empirical analysis we compare Scotland with the UK as a whole. Under the Fiscal Framework however, what matters is how Scotland compares with the rest of the UK (rUK).

Are these trends in relative GDP per capita growth reflected in trends in relative per capita income tax revenues? To answer this, it is useful to distinguish two periods.

1999-2007

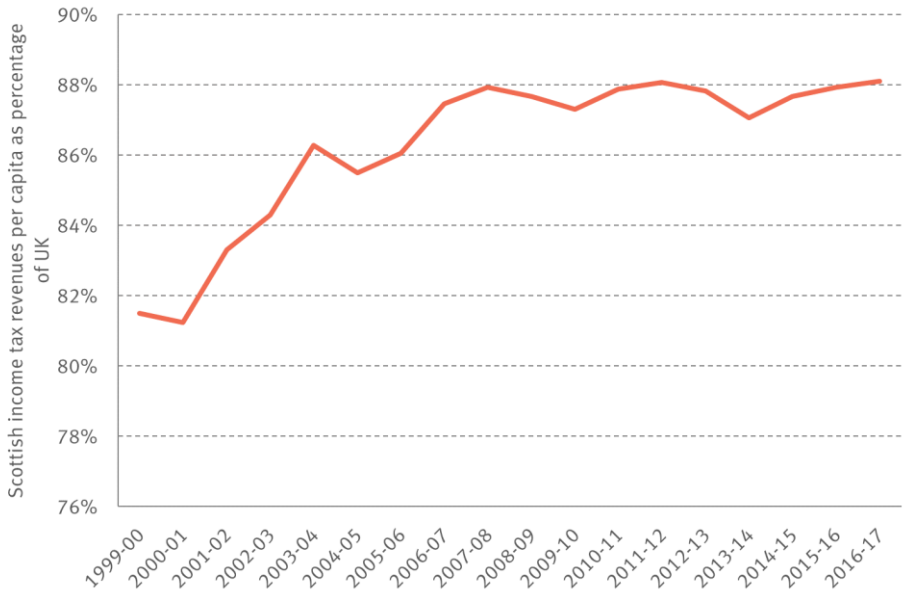
Scottish income tax revenues per capita converged towards that of the UK between 2000 and 2007, but have since remained around 12% lower than in the UK (Chart 3).

Why did Scotland's tax revenues per capita increase relative to the UK's between 2000 and 2007? Two things happened:

- First, Scotland's employment rate rose and closed the gap to, and then surpassed, the UK rate (Chart 4).
- Second, average[4] Scottish wages have converged somewhat to UK wages since 1999 (Chart 5).

So Scottish income tax revenues per capita converged to those of UK between 2000 and 2007, reflecting relatively faster wage and employment growth in Scotland. But as we have seen, GDP per capita essentially grew at the same rate as in the UK.

Chart 3: Income tax revenues per capita, Scotland relative to UK=1



[4] Average earnings are a better indicator of changes in the tax base than median earnings (although median earnings give a better indication of living standards for the typical worker).

Chart 4: Scotland and UK employment rate (16+, seasonally adjusted)

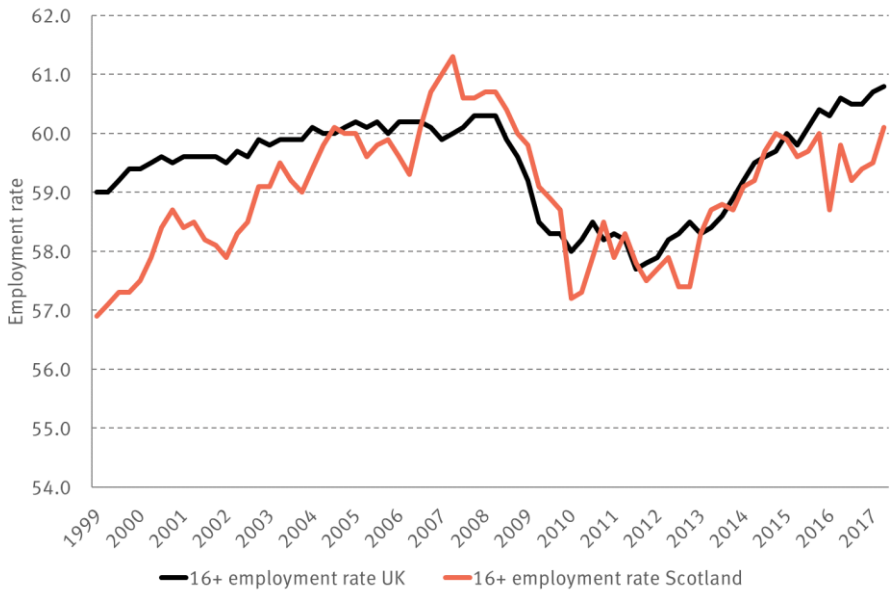
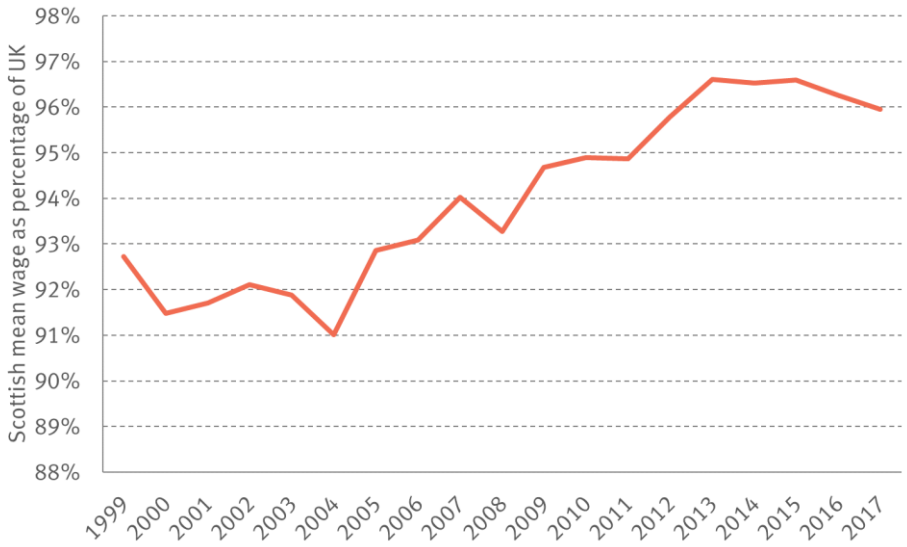


Chart 5: Scotland average weekly wage as a percentage of UK, all workers



Why might it be the case that Scottish employment and wages (and thus relative tax revenues) converged towards UK even when GDP per capita was not converging? The answer to this is, it is not entirely clear.

- Scottish GDP is measured on the basis of 'onshore' activity, and thus 'offshore' economic activity is excluded from the measure of Scottish output. But those working in the offshore sector will count as 'Scottish' in regional earnings statistics. So it is possible that increased employment in the (relatively high paying) offshore sector contributed to wage convergence that was not matched by faster growth in Scottish onshore output. However, on its own this seems an unlikely explanation to explain why Scottish GDP per capita did not converge to the UK, even whilst the income tax base did.
- Similarly it also seems unlikely that (marginally) higher rates of population ageing in Scotland (which might depress GDP per capita growth for a given increase in wages) can on their own explain this trend.

2007 – 2015

In the period since 2007, the Scottish employment rate has (broadly) tracked the UK employment rate, whilst wages have continued to converge somewhat.

But if Scottish and UK wages have converged since 2007, why have revenues per capita not converged? One potential explanation relates to the effects of (UK-wide) income tax policy implemented since 2007.

Two key changes are worth noting. Since 2007/8 the Personal Allowance has increased significantly in real terms. Alongside the real terms increase in the Personal Allowance, tax rates on the highest earners have increased. During the last parliament, the Higher Rate threshold was reduced in real terms by around 13%. Furthermore an Additional Rate of tax was introduced in 2010/11, initially at 50% before being reduced to 45% in 2013/14.

The increases in the Personal Allowance combined with reduction in Higher Rate threshold and introduction of the Additional Rate have together resulted in income tax liabilities becoming increasingly concentrated on higher earners. The proportion of the UK adult population who pay income tax has fallen from 66% in 2007/8 to 56% in 2015/16. The proportion of income tax paid by the top 1% of taxpayers increased from 21.3% to 27.5% between 1999/2000 and 2015/16, whilst the proportion paid by the top 10% increased from 50.3% to 58.9%.

The concentration of tax revenues on higher earners has also resulted in a regional concentration of income tax revenues with those parts of the UK with the highest proportion of high earners (London and the South East) contributing most. It seems likely that these policy changes have limited the convergence in income tax revenues per capita between Scotland and the UK that might otherwise have occurred had tax policy changes been neutral.

2015 – present

Whilst growth in UK GDP per head has been weak, growing just 2.3% between Q1 2015 and Q2 2017, Scottish growth has been weaker still, with per capita GDP growing just 0.57% over the same period.

This might signal bad news with regards to the growth of Scotland's income tax base. Indeed Scotland's 16+ employment rate has faltered relative to the UK rate since 2015 (Chart 3), and Scottish average wages have grown half a percent less than UK wages.

On the other hand, whilst Scotland's labour market performance relative to the UK's has been somewhat weaker since the start of 2015, the difference in labour market performance is marginal compared to the substantial difference in GDP per capita. And the latest labour market figures provide some evidence that – after a poor 2015 and 2016 – Scotland's labour market is showing something of a rebound.

Summary

For most of the period since 1999, Scottish GDP per capita has grown at a similar rate to UK GDP per capita. But the main determinants of income tax revenues, employment and wages, appear to have evolved somewhat independently from GDP.

In the earlier period, 1999- 2007, income tax revenues per capita in Scotland grew more quickly than those in the UK, reflecting a combination of both faster wage and employment growth. Between 2007 - 2015, there was no further convergence in income tax revenues per capita, despite continued wage convergence.

It remains unclear therefore to what extent the significantly slower GDP per capita growth in Scotland recently will be reflected in Scotland having materially slower growth in its income tax base (and thus income tax revenues) in 2017/18[5].

4. Conclusions

There must in principle be a reasonably strong correlation between growth of GDP per capita and growth of income tax revenues per capita. In the current environment of high employment rates, the only way to grow GDP per capita is through improvements in productivity. Similarly, productivity improvements are a necessary (but not in themselves sufficient) condition for real wages to grow.

But a large variety of factors mean that this relationship is likely to be much weaker in the short term. The tax base is determined not only by the wages and income of those in work, but also by income from pensions and other factors that are only weakly linked to contemporaneous economic activity. The way in which growth is shared between labour and capital, and the way in which labour income gains are distributed across the labour force also matters. Changes in tax policy can influence the size of the tax base for a given level of activity. And short term variations in economic activity might not show up immediately in wages or employment.

The relationship between GDP and tax revenues is further weakened due to geographical and temporal differences in the recording of economic activity relative to the receipt of incomes associated with that activity.

[5] 2017/18 is the first fiscal year during which full income tax revenues are transferred to the Scottish Parliament. For the Scottish budget, what is important is how Scottish income tax revenues per capita grow between 16/17 and 17/18, relative to the growth rate of equivalent revenues in rUK.

What matters for the Scottish budget under the new Fiscal Framework is how Scottish income tax revenues (per capita) grow relative to the equivalent revenues per capita in rUK. Two questions of critical importance are therefore:

- First, will the recent slowdown in Scottish GDP per capita growth relative to the UK continue?; and
- Second, if the relative slowdown in GDP per capita growth does continue, what might this mean for Scottish income tax revenues and the Scottish budget?

Growth of UK GDP per capita has been particularly slow since the financial crisis, and the latest forecasts by both the Bank of England and the OBR foresee a continuation of these historically slow growth rates over the coming years. Indeed, the significant downward revisions to both forecast GDP growth and wage growth in the OBR's latest Economic and Fiscal Outlook have as common cause the weak forecasts for productivity growth. The Bank of England, in its November 2017 Inflation Report, argued that the capacity of the UK economy to grow before inflationary pressures mount has fallen to 1.5%, again as a result of weaker productivity growth.

In this context, might the growth capacity of Scotland's economy be materially higher or lower than the UK's? An optimistic argument is that the recent slowdown in Scotland's economic growth will prove to be short-lived, linked primarily to particular challenges facing the offshore sector and the knock-on effects for those parts of the onshore economy linked (directly or indirectly) to the oil and gas sector. A more pessimistic outlook is that the changes to the offshore and financial services industries – two main drivers of productivity growth prior to the financial crisis – are likely to weaken Scotland's growth capacity over a more medium term period, potentially weakening the supply side of the economy further in the process.

But even if we accept the argument that the outlook for economic growth is weaker in Scotland, it is less clear that this will imply that wage growth will be fundamentally lower over the next few years, not least because Scottish wages are likely to be determined to an extent by growth in UK average productivity (and wages) rather than productivity in individual firms or sectors.

From this point of view, slower growth in Scottish GDP per capita without materially slower growth in income tax revenues per capita is not inconceivable as an outcome. This doesn't mean that GDP growth is not important as a measure of long-term trends in average living standards. But it is not the sole (or even the main) determinant of income tax revenues in the short-term.

On the 14 December 2017 the Scottish Fiscal Commission will publish its first ever forecasts for Scottish GDP growth and Scottish income tax revenues over the next five years. It will be interesting to see what judgement the Commission has come to about the relationship between GDP and income tax revenues – and what this means for the Scottish budget.

The transition to a low carbon energy system: insights on the role of the oil and gas sector

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1. Introduction and context

2017 has been significant year for energy activity in Scotland, both on a policy and technological front. Since the start of the year, the Scottish Government has launched its draft Scottish Energy Strategy (Scottish Government, 2017a) and draft Climate Change Plan (Scottish Government, 2017b) underpinning policy actions to address climate and emissions into the early 2030s. Additionally, new energy developments have kept on coming. On the electricity side, the latest data show that renewable electricity generation was 26% higher in the second quarter of 2017 than the same period in 2016. Total renewable electricity capacity rose by 16% over the same period. There were also major "firsts", including Hywind Scotland - the world's first floating offshore wind farm – beginning operation from October 2017 (Statoil, 2017) and the first ever coal-free working day for Great Britain's electricity generation mix in April (Financial Times, 2017).

Firmly embedded in the Scottish Energy Strategy is the view that existing skills and expertise in the oil and gas industry can position Scotland for the transition to a low carbon economy, perhaps especially in the renewables sector. In an important element of the consultation of its draft Energy Strategy, the Scottish Government asked a series of questions about the role for the oil and gas sector in the decades to come, as Scotland moves towards a low carbon economy (Scottish Government, 2017b).

In a speech to the National Economic Forum the First Minister, Nicola Sturgeon, made the connection between current energy sector activities and "know-how", and future opportunities in low carbon technologies: "The oil and gas sector will continue to play an important role in meeting Scotland's future energy requirements. And of course, the industry also supports skills, investment, research and development and infrastructure for the wider energy sector. Because of that, it can play an important part in the development of low-carbon technologies – for example [in] offshore renewable energy." In the foreword to the Scottish Energy Strategy, the Minister for Business, Innovation and Energy – Paul Wheelhouse – notes, "the exploration and production of oil and gas in Scottish waters will continue to provide high-value employment and a stable energy supply for decades to come. Our ambition is that these strengths should also provide the engineering and technical bedrock for the transformational change in Scotland's energy system over the coming decades." (Scottish Government, 2017a, p. 1).

The recent report on the submissions received (Why Research, 2017) identified that some responses stressed the "importance for Scottish Government helping to support and encourage transfer of skills from the oil and gas sector and its supply chain to the renewables sector". This is a fundamental issue, and gets to the heart of the role for the oil and gas sector in contributing to Scotland and the UK's economic objectives for the transition to a low carbon economy.

These recent statements suggest a number of important research questions that this note seeks to shed some new light.

- First, to what extent are firms active in the oil and gas sector considering opportunities in the renewables sector?
- Second, how does the expectation of being involved in renewables activities differ between firms in the sector? And, are there differences across firm *sizes* or between international or domestic (UK) firms?
- Third, are the positive motivations towards renewable activities stronger for firms with more optimistic attitudes towards their future oil and gas activities? Or are oil and gas firms seeking opportunities in renewables to help them diversify over the short-term? This point matters: recent news of the more positive outlook of firms towards the sector *could* lead to firms scaling back from expanding into such renewables markets.
- Finally, how do oil and gas firms' attitudes towards renewables compare to other "non-oil and gas production" activities, namely decommissioning and "unconventional" oil and gas activities? These serve as interesting comparisons – as both are areas where there is expectation that oil and gas expertise can be "carried over" to these new market opportunities.

To help address these questions we use a unique dataset on oil and gas firms active in the UK gathered through the long-running 'Oil and Gas Survey' – a collaboration between the Fraser of Allander Institute and Aberdeen and Grampian Chamber of Commerce. The next section sets out the unique properties of this survey, and the rich dataset it provides, while Section 3 examines the questions raised earlier using data from this survey.

2. The 'Oil and Gas Survey': a unique dataset

This note draws principally from the long-running Oil and Gas Survey, jointly delivered by the Fraser of Allander Institute and Aberdeen and Grampian Chamber of Commerce. This is a postal and online survey of companies with a UK presence and active in the oil and gas industry, and covers areas including business optimism, activities, investment, skills and employment of these firms.

Undertaken twice annually since 2004 – published in the Spring and Autumn of the year – this provides a unique time series on the business activities of oil and gas industry in the UK. The most recent issue of the survey (number 27) was published on 30 November 2017, and

highlighted the current challenges facing the sector (AGCC, 2017). The most recent survey received responses from companies with a total UK employment of over 40,000. With total direct and indirect employment in the UK supported by the offshore oil and gas sector of around 170,000[6], we can see that this survey captures a substantial portion of firms active in the UK oil and gas sector.

Having a time series of data permits a host of other questions to be analysed, and in this note we draw on questions asked in recent years specifically about firms' attitudes to renewables. Specifically, since survey 19 (Autumn 2013) we have regularly asked the question, "Looking to the medium term (three to five years) do you think your organisation will be more involved in renewables?"[7], and firms can chose from five possible answers: "Definitely", "Possibly", "Unlikely", "No" and "Not applicable". Responses to this question, and the other responses given by firms to the same survey, offers a fascinating insight into oil and gas firms' behaviours and attitudes towards renewables. By cross-referencing firms' answers to this question with other questions, we can examine the questions set out above, and – crucially – how these have evolved over time.

3. Results

Question 1: Are oil and gas firms considering opportunities in renewables in the medium term?

The most recent results reveal that 54% of all contractors anticipate becoming more involved in renewables in the medium term, responding either "Definitely" or "Possibly". We focus on contractors here as it is these firms who operate in the supply chain for oil and gas operators whom are most likely to have the expertise which might be carried across to renewables activities. This latest total figure is in line with the 53% of contractors who gave either of these responses in Survey 25, and is only slightly higher than the 51% of contractors giving these responses when the question was first asked in Survey 19.

Despite this almost static headline finding, there are interesting changes when we look at the specific answers to this question over the history of the survey.

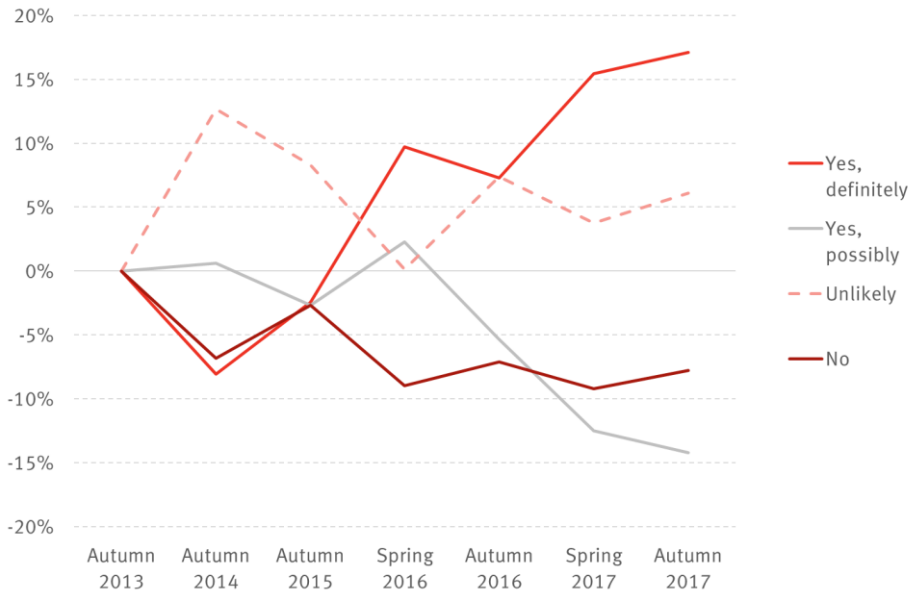
The first time the question was asked (Survey 19), 14% of contractors replied "Definitely", while 37% noted they would "Possibly" be involved in renewables over the medium term. Figure 1 shows how the share of contractors giving each possible response has changed since that first time it was asked, with the change shown relative to the initial values from Survey 19

[6] Oil and Gas UK (2017) estimate that a total of 302,000 jobs in the UK are supported by the offshore oil and gas industry. We compare the UK employment of firms responding to the Oil and Gas Survey to the total of direct and indirect employment as firms which are captured in the survey are unlikely to have employment supported through induced expenditures related to oil and gas activities.

[7] This question has been asked in Survey 19, 21, 23, 24, 25, 26 and 27, covering the period from Autumn 2013 to Autumn 2017.

(i.e. an increase (decrease) above the horizontal axis suggests a growing (declining) share of contractors giving each response to the same question).

Figure 1: Change in the share of contractors selecting each response, relative to Survey 19 baseline



Source: FAI/AGCC surveys (various years) and authors' calculations

We can see two distinct periods in Figure 1. Between Survey 19 and Survey 23 (Autumn 2013 and Autumn 2015), we see that firms' are unsure about their future involvement in renewables. There is little change in the share of those positively motivated towards renewables work - the shares of firms responding either "Definitely", or "Possibly" falls with the only increase in those identifying future renewables work as "Unlikely".

From Survey 24 (Spring 2016) onwards, we see firms making up their minds; moving away from an uncertain position, and towards stronger (i.e. more positive, or more negative) responses. Survey 27 now sees 31% of contractors (up 17 percentage points from the first time this question was asked) reporting that they expect to "Definitely" be involved in renewables in the medium term. This largely mirrors a fall in those saying they would "Possibly" be involved in renewables (down 14%). At the same time, only 11% of contractors feel that they will not be involved in renewables (down 8%).

Question 2: does firm size, or the location of ownership, matter for firms' attitudes towards renewables?

Table 1 shows that larger oil and gas contractors (by number of UK employees) are typically more favourable towards renewables. 54% of firms with more than 100 employees report

either “Definitely” or “Possibly” working in renewables in the medium term, while 82% of firms with more than 500 employees give these responses.

Table 1: “Looking to the medium term, do you think that your organisation will be more involved in renewables?”, % responding by columns, contractors, Survey 27

Number of UK employees	*Yes, definitely*	*Yes, possibly*	*Unlikely*	*No*	*Not relevant*	*Total*	*% responding “Definitely” plus “Possibly”*
1-20	25%	25%	32%	11%	7%	100%	50%
21-99	25%	21%	33%	8%	13%	100%	46%
100-499	36%	18%	27%	9%	9%	100%	54%
500+	55%	27%	0%	18%	0%	100%	82%

Note: Rows may not sum due to rounding. % of contractors.
Source: FAI/AGCC surveys (various years) and authors’ calculations

Question 3: how do firms’ attitudes towards renewables differ between domestic and international firms?

Table 2: “Looking to the medium term, do you think that your organisation will be more involved in renewables?”, % responding by columns, contractors, Survey 27

Number of UK employees	*Yes, definitely*	*Yes, possibly*	*Unlikely*	*No*	*Not relevant*	*Total*	*% responding “Definitely” plus “Possibly”*
UK oriented firms	31%	26%	29%	6%	9%	100%	57%
Internationally oriented firms	33%	11%	22%	28%	6%	100%	44%

Note: Rows may not sum due to rounding. % of contractors. See text for definitions.
Source: FAI/AGCC surveys (various years) and authors’ calculations

In the survey we do not ask firms to identify the location of their headquarters, or where they conduct most of their business. Thus, we cannot be clear on which firms are UK or internationally owned. However, we do know the total employment of each firm, and each firms’ employment both in, and outwith, the UK. We can proxy for ownership/headquarters by identifying as “UK oriented” those firms where a majority of their total employment is in the UK, and “Internationally oriented” firms where the opposite is the case. The results of this categorisation for contractor firms in the most recent survey is shown in Table 2.

There is a more positive expectation for renewables activities among those firms that are UK oriented on this measure. Almost 60% of respondents with a majority of their employment in the UK “Definitely” or “possibly” see renewables work in their medium term future, while the

figure is 44% for "internationally oriented" firms. Similarly, the share of contractors answering "No" is considerably higher for Internationally oriented firms.

Question 3: how do current levels of activity and optimism about the future of UKCS relate to enthusiasm for renewables?

We can compare firms' attitudes towards renewables against current levels of activity – relative to firms' assessment of their "optimum" level of activity – and also against their confidence about the short-term future level of activity (i.e. 12 months into the future). These are shown in Tables 3 and 4 below.

Tables 3 shows the relationship from the most recent survey between firms' current (self-determined) levels of activity compared to their "optimum" levels and their attitudes towards renewables.

We see that attitudes towards renewables are positive across all levels of current activity. A majority of all firms at each activity level respond that they "Definitely" or "Possibly" anticipated being involved in renewables in the medium term.

Table 3: "Looking to the medium term, do you think that your organisation will be more involved in renewables?", % responding by columns, by level of current activity relative to optimum levels, all firms, Survey 27

By level of current activity	*Yes, definitely*	*Yes, possibly*	*Unlikely*	*No*	*Not relevant*	*Total*	*% responding "Definitely" plus "Possibly"*
Above optimum levels	33%	33%	17%	17%	0%	100%	67%
At optimum levels	17%	38%	13%	17%	17%	100%	55%
Below optimum levels	32%	17%	31%	10%	10%	100%	59%

Note: Rows may not sum due to rounding. % of all firms.
Source: FAI/AGCC surveys (various years) and authors' calculations

We can see from Table 4 that – perhaps surprisingly – expectations about "Definitely", or "Possibly" being involved in renewables in the medium term are higher among those firms which are more positive about the business situation in 12 months' time. Thus, our result appear to suggest that oil and gas firms who are more optimistic about the future of the oil and gas industry, are also those expecting to have involvement in renewables.

Table 4 "Looking to the medium term, do you think that your organisation will be more involved in renewables?", % responding by columns, by expectations of the business situation in the UKCS in 12 months' time

More or less confident about the business situation in 12 months' time	*Yes, definitely*	*Yes, possibly*	*Unlikely*	*No*	*Not relevant*	*Total*	*% responding "Definitely" plus "Possibly"*
More	35%	23%	19%	12%	12%	100%	58%
The same	27%	22%	24%	14%	14%	100%	49%
Less	0%	38%	50%	12%	0%	100%	38%

Note: Rows may not sum due to rounding. % of all firms.
Source: FAI/AGCC surveys (various years) and authors' calculations

Question 4: How do firms' attitudes towards renewables compare to other "non-production" activities?

Using the questions from the survey, we can compare oil and gas firms' attitudes towards renewables and – in turn - unconventional oil and gas activities and decommissioning.

Table 5: Question: "Looking to the medium term, do you think that your organisation will be more involved in renewables?", shown in columns, while row Question, "Looking to the medium term, do you think that your organisation will be more involved in unconventional oil and gas activity in the UK?", % of all firms responding to both questions, excluding those indicating "Not relevant", Survey 27

		Involved in renewables in the medium term?			
		Yes, definitely	*Yes, possibly*	*Unlikely*	*No*
Involved in unconventionals in the UK in the medium term?	*Yes, definitely*	6	4	3	0
	Yes, possibly	18	11	16	4
	Unlikely	9	10	8	3
	No	0	1	1	8

Note: % of all firms answering both questions. May not add to 100% due to rounding.
Source: FAI/AGCC surveys (various years) and authors' calculations

We set out firms' *relative* attitudes to renewables and unconventional oil and gas activities in Table 5. Some explanation of the table is in order, however. Summing each row, we can identify the most responses to firms' expectations of being involved in "unconventionals".

Table 3 shows that the most common answer was “Yes, possibly”, with 49% of firms giving this response. Summing each column, we can see that the most common answer for firms’ expectations of being involved in renewables was “Yes, definitely” (33% of firms).

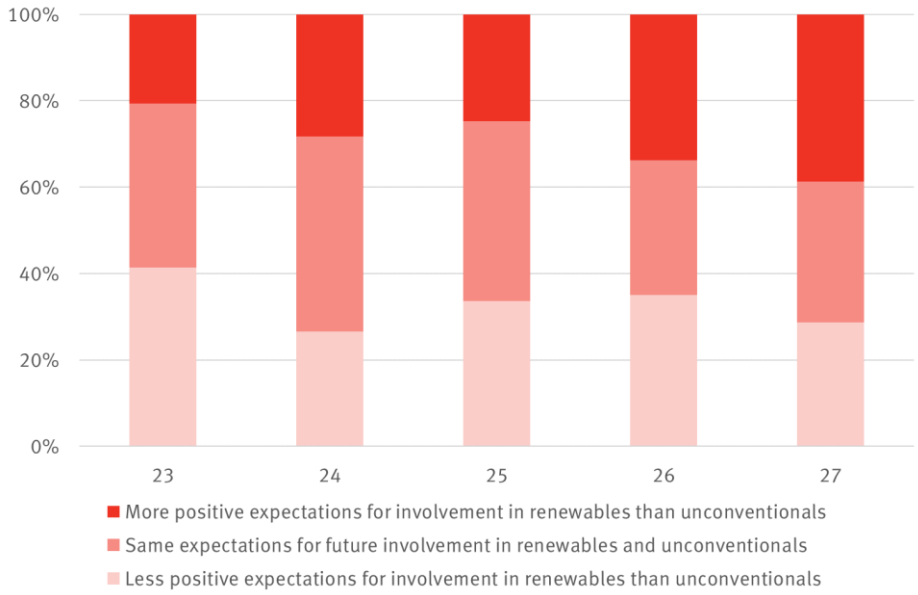
As each firm responded to both renewables and unconventionals questions, we can identify the relative outlook for these opportunities. We can simplify this by identifying three areas (shaded in different tones in Table 4).

The light grey area identifies firms who had equal anticipation of their involvement in renewables and unconventionals. These are on the diagonal entries in Table 4 and capture total 33% of all responses.

The light red area corresponds to firms whose attitudes are more positive towards renewables than for unconventionals. We identify 39% of all firms to be in this area.

Of the alternative case – i.e. those firms more positive about their involvement in UK unconventionals than renewables – we mark these in the dark red shaded area. This group comprises 29% of all firms.

Figure 2: Oil and gas companies’ expectations of involvement in renewables in the next three to five years relative to their expectations of involvement in unconventional oil and gas activity in the UK, % of all firms responding to both questions Survey 23 to 27



Source: FAI/AGCC surveys (various years) and authors’ calculations

The latest results therefore suggest that oil and gas firms are *more* positive towards their future involvement in renewables than unconventional oil and gas work in the UK.

But how has this *relative* attitude between firms' expectations in renewables and unconventional oil and gas changed over time?

Figure 2 shows that the net share of oil and gas firms more positive about their future involvement in renewables compared to unconventionals is at a record high. This reflects a decline in the share of firms being more positive about unconventionals, but also a fall in those firms being equally positive between both activities.

We now repeat this for renewables expectations against decommissioning. We know that there are significant decommissioning activities currently occurring in the UK. Oil and Gas UK (2017) note that there around over 100 north east of Scotland companies involved in the Brent decommissioning project, and that around 85% of project spend to 2025 will be made in the UK.

Table 6: Question: "Looking to the medium term, do you think that your organisation will be more involved in renewables?"

		Involved in renewables in the medium term?			
		Yes, definitely	*Yes, possibly*	*Unlikely*	*No*
Involved in decommissioning in the UK in the medium term?	*Yes, definitely*	20	8	8	4
	Yes, possibly	10	18	15	5
	Unlikely	3	0	0	0
	No	0	1	4	5

Note: % of all firms answering both questions. All cells may not add to 100% due to rounding.
Source: FAI/AGCC surveys (various years) and authors' calculations

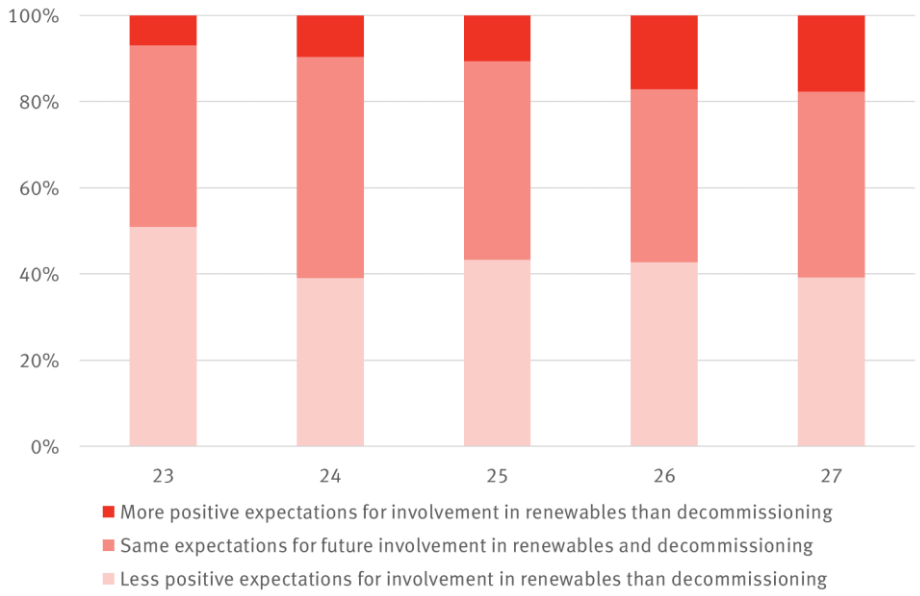
We can see from comparing across row and column totals that firms have higher expectations of being involved in decommissioning than renewables. Summing across the first two rows, we can see that 84% firms expect to be "Definitely" or "Possibly" involved in decommissioning, while (summing down the first two columns) only 57% of firms have the same expectations for renewables.

It is no surprise that more firms have a higher expectation of being involved in decommissioning activities than in renewables: 43% of firms (in the dark red area) compared to 17% (the light red area), with 40% of firms having the same expectations in both activities (i.e. the diagonal in Table 6).

One final point to examine is how attitudes to renewables, unconventionals and decommissioning have changed over the past couple of years. Using the same framework as above, we can show how the share of firms responding to these questions has evolved.

Figure 3 reinforces the view that firms' expectations of involvement in renewables has typically been more muted than for decommissioning. But the current value of 17% of firms more positive about involvement in renewables is another high, and has risen from 7% to 17% of all firms between 2015 and 2017 (Surveys 23 and 27).

Figure 3: Oil and gas companies' expectations of involvement in renewables in the next three to five years relative to their expectations of involvement in decommissioning activity, % of all firms responding to both questions, Survey 23 to 27



Source: FAI/AGCC surveys (various years) and authors' calculations

4. Conclusions

The transition to a low carbon energy system is a major policy focus in Scotland, as is ensuring that economic opportunities in new renewables technologies are harnessed. The opportunity exists that the UK / Scotland can build on the expertise gained over many decades in the oil and gas sector and that oil and gas companies can develop new UK market opportunities in the renewables sector.

To help answer questions round this low carbon transition, we have analysed the responses of oil and gas companies over the past four years in the long-running "Oil and Gas Survey" – a collaboration between the Fraser of Allander Institute and Aberdeen and Grampian Chamber of Commerce - to help shed light on the sentiments of oil and gas companies active in the UK towards their future involvement in renewables activity.

In answer the questions set out above, our analysis of this unique dataset allows us to make the following tentative conclusions:

First, since the start of 2016 there has been an increase in firms "making up their minds" towards their involvement in renewables, and towards stronger (i.e. more positive, or more negative) responses. The most recent data suggest that 31% of contractors "definitely" expect to be involved in renewables in the medium term, up 17 percentage points from 2013 when this question was first asked.

Second, it appears that positive inclinations towards future involvement in renewables is stronger among larger firms (i.e. those over 500 employees), and among firms which are "UK oriented" in their business activities (although the measure of this is necessarily proxied using employment levels – and which might be a poor proxy for the markets in which a firm undertakes activities, or where firms are headquartered/owned).

Third, there is broadly equal support for firms' future involvement in renewables when compared to their current level of activity. Those firms reporting being beyond optimum levels were slightly more positive than those below, but the difference was small. Looking to the next twelve months, firms who are more optimistic about the future of the oil and gas activities in the UK continental shelf are also those expecting to have greater involvement in renewables.

Finally, we see that firms' expectations towards renewables compared to unconventional activities and decommissioning have moved over the past two years. Firms' are now more positive about renewables involvement than at any point previously when compared to unconventional oil and gas work in the UK, while firms' expectations about their involvement in decommissioning remain more positive, reflecting ongoing activities in this activity in the UK.

References

Aberdeen and Grampian Chamber of Commerce (2017), "Oil and Gas Survey: 27th Survey", November 2017, available online at https://www.agcc.co.uk/uploaded_files/27th-OilGas-Survey-2017-comms-20112017.pdf

Financial Times (2017), "UK generates a day's electricity without coal", 22nd April 2017, online at https://www.ft.com/content/8f65f54a-26a7-11e7-8691-d5f7e0cd0a16

Oil and Gas UK (2017), "Economic Report 2017", available online at http://oilandgasuk.co.uk/wp-content/uploads/2017/09/Economic-Report-2017-Oil-Gas-UK.pdf

Scottish Government (2017a), "Scottish Energy Strategy: The future of energy in Scotland", January 2017, available online at http://www.gov.scot/Resource/0051/00513466.pdf

Scottish Government (2017b), "Draft Climate Change Plan – the third report on policies and proposals 2017-2032", January 2017, available online at http://www.gov.scot/Publications/2017/01/2768

Statoil (2017), "World's first floating wind farm has started production", 18th October 2017, online at https://www.statoil.com/en/news/worlds-first-floating-wind-farm-started-production.html

Why Research (2017), "Consultation on a Scottish Energy Strategy: The future of energy in Scotland – analysis of responses", November 2017, available online at http://www.gov.scot/Resource/0052/00527583.pdf

Scotland's Innovation Performance: a review of recent evidence

Jennifer Turnbull & Kenny Richmond
Scottish Enterprise[8]

1. Introduction

This paper summarises recent data on Scotland's innovation performance and how this compares to other countries, using data from the UK Innovation Survey and the European Union's Community Innovation Survey.

The paper assesses the reasons for Scotland's absolute and relative improvement in innovation activity by examining the performance of individual types of innovation. The paper concludes that although Scotland's headline innovation performance has improved, this has been driven more by improved performance of 'organisational innovation' than by companies introducing new products, services or processes. This implications of this for company performance are unclear.

2. Why is innovation important?

The importance of innovation in driving economic growth is well established. Innovation is a critical factor for determining productivity growth, for example new and improved products/services can boost business sales and increase value add, and new processes or better organisation can increase efficiency[9].

Research shows that innovative businesses grow twice as fast, both in employment and sales, as businesses that don't innovate[10].

The proportion of businesses that are innovating is a key indicator in the 'The Scotland Can Do' measurement framework[11].

[8] Scottish Enterprise is Scotland's main economic development agency.
[9] Productivity Handbook, ONS
[10] Business Growth and Innovation, Nesta 2009
[11] http://www.cando.scot/indicators/innovating-business/

3. Innovation data sources

This paper considers the measure of 'innovation active', and performance in 2012-14 compared to 2010-2012. A business is defined as being innovation active if it is engaged in any of the following activities[12]:

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

A key source of internationally comparable data on business innovation activity is the Community Innovation Survey (CIS) that provides information for EU member states and a number of ESS member countries[13]. The CIS is a harmonised survey of innovation activity in businesses with 10 or more employees[14], designed to provide information on the innovativeness of countries' businesses, on different types of innovation and on various aspects of the development of an innovation, such as objectives, sources of information, public funding and innovation expenditures. The CIS provides statistics broken down by country, type of innovation, sector and business size.

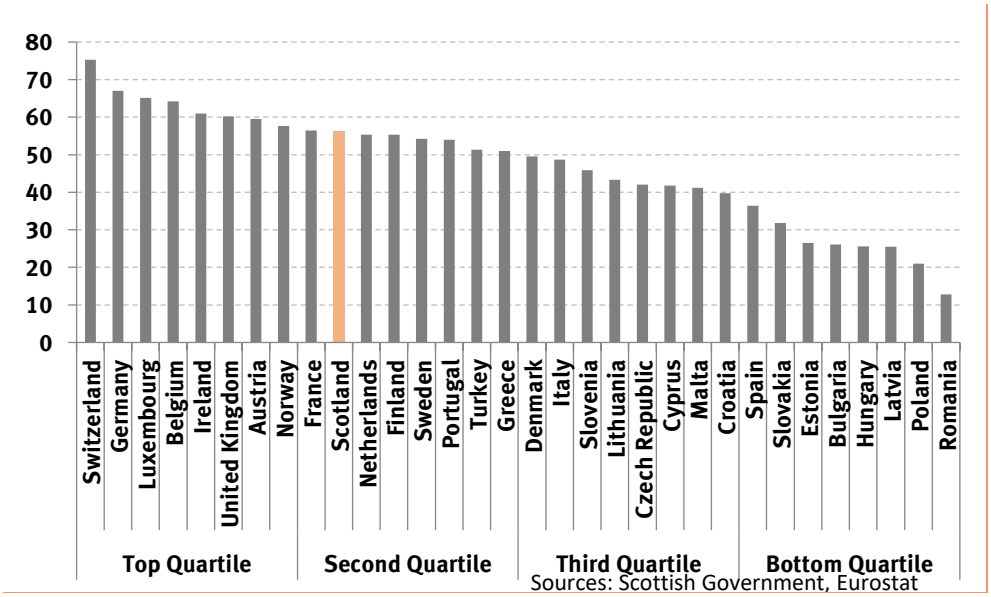
The UK Innovation Survey is the source of CIS UK data[15]. The UK survey includes data for Scotland which can be used to compare innovation performance relative to other UK regions. Given the contribution that businesses with 10 or more employees make to the Scottish economy, they account for around 73% of total employment and 84% of total turnover, the survey provides important evidence on Scotland's innovation performance.

4. Scotland's Innovation Performance

Scotland's innovation performance in the survey period 2012-2014 improved significantly compared to the 2010-2012. In 2010-2012 the proportion of innovation active businesses was 47% with Scotland ranked 19th. This places Scotland in the third quartile of comparator European countries. In 2012-2014, the proportion increased to 56%, with Scotland ranked in 9th equal place (with France) at the top of the second quartile of comparator countries.

[12] This is the EU wide definition of innovation active adopted by Eurostat.
[13] The CIS dataset is included in the Science and Technology Section of the Eurostat Database. See Eurostat description of the dataset
[14] So excludes businesses with less than 10 employees
[15] UK Innovation Survey covering the period 2012 to 2014, BIS

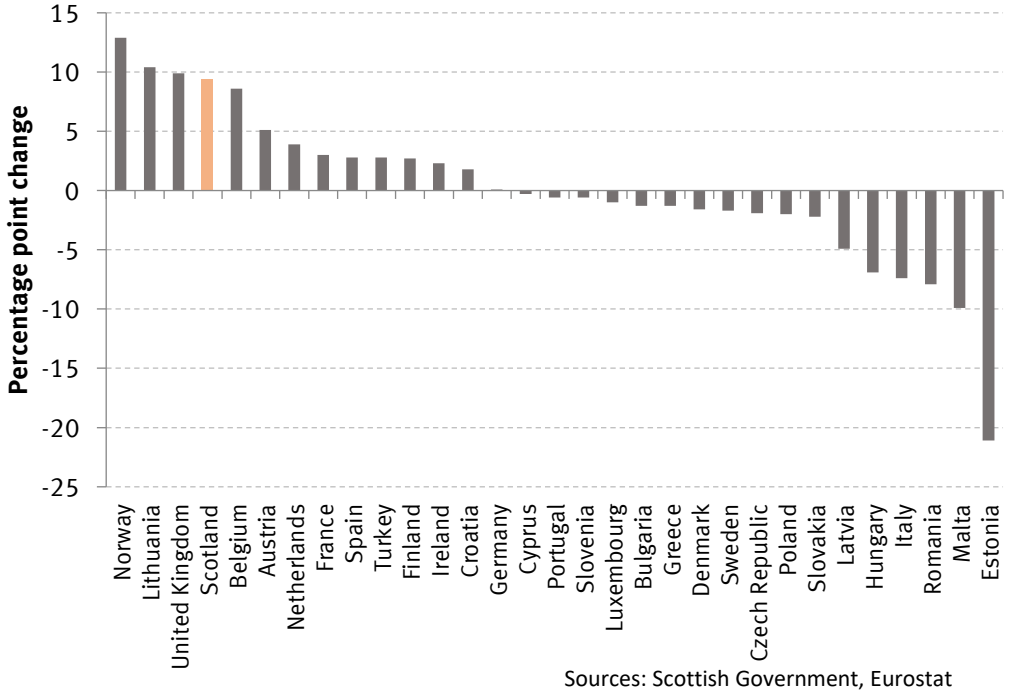
Figure 1: **Innovation Active, % of Businesses 2012-2014**



Sources: Scottish Government, Eurostat

Compared to other countries, Scotland had the fourth largest percentage point increase in the proportion of innovation active businesses between the 2010-12 and 2012-14 surveys.

Figure 2: Growth in % of Innovation Active Businesses 2010-12 to 2012-14



Sources: Scottish Government, Eurostat

5. What types of innovation are driving Scotland's improved overall innovation performance?

In practice, businesses are often engaged in one or more of the activities listed in section 3. The data show that most innovation activity by Scottish businesses is product and/or process innovation, and organisation and/or marketing innovation. The proportion of businesses in Scotland involved in these activities in 2014 is shown in the table below.

Scotland's Innovation Activity

Activity	% of businesses
Innovative Active	56.4
▪ Product and/or process innovation	38.6
▪ Organisation and/or marketing innovation	43.3

A review of more detailed data within these categories helps to highlight specific areas of improvement. As some businesses engage in a single innovation activity only while others engage in multiple activities, the results for both types of innovators are shown below[16]:

- multiple – businesses that are involved in a particular type of innovation activity, as well as other types of activity
- single – businesses that are involved in just one type of innovation only

In the product example below, this shows that 7% of businesses in Scotland are product only innovators (and are not doing any other type of innovation), whereas significant more businesses (25%) undertake product *and* other types of innovation.

[16] see Appendix 1 for an overview of the types of innovation activity

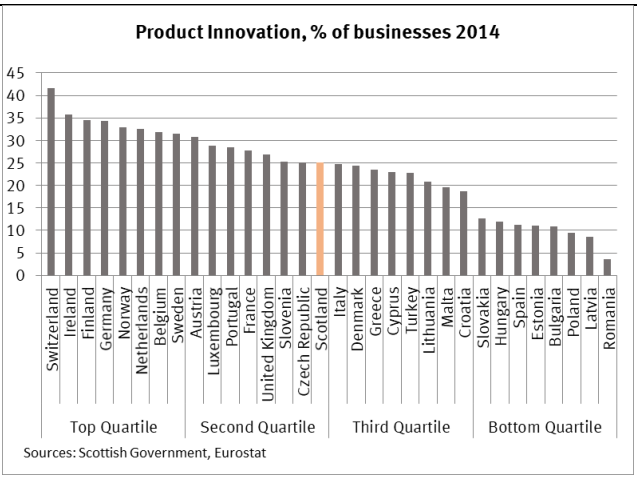
Product innovation

Scotland's quartile 1 performance in product only innovation was broadly maintained between 2012 and 2014, falling by only 0.3 percentage points. This means that overall improvement in product innovation was driven by businesses engaging in product innovation plus other innovation activities, which increased by 4 percentage points.

Scotland's **Product Innovation** performance improved between the 2012 and 2014 surveys. In 2014 Scotland ranked 15th out of 32 countries and moved up to the 2nd quartile of comparator countries.

Product Innovation Performance

	2012	2014
International Rank	18	15
Quartile	3	2

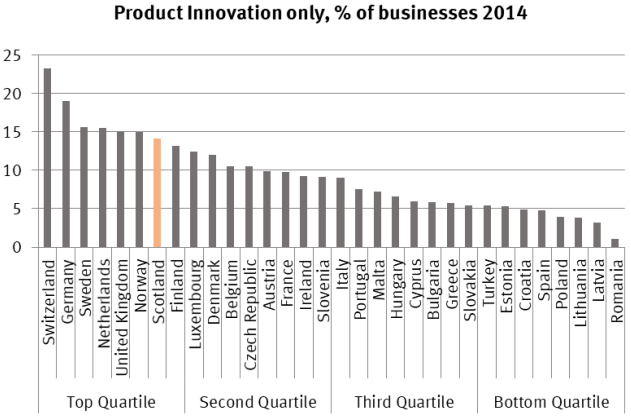


Sources: Scottish Government, Eurostat

The proportion of Scottish businesses engaging in product innovation **only** was broadly the same in 2014 as it was in 2012, and in the top quartile of countries.

Product Innovation Only

	2012	2014
International Rank	4	6
Quartile	1	1



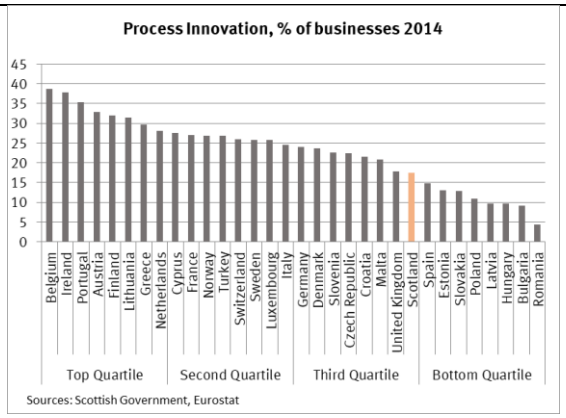
Sources: Scottish Government, Eurostat

Process Innovation

The proportion of Scottish businesses engaging in process only innovation increased by 3.3 percentage points between 2012 and 2014. However, overall improvement was driven by the proportion of businesses engaging in process plus other innovation activity, which increased by 7.7 percentage points.

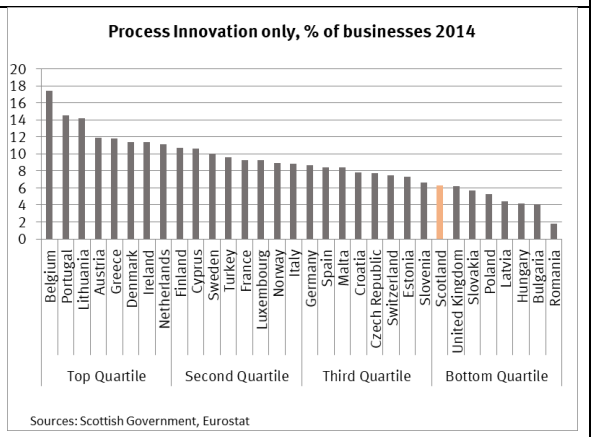
Scotland's **Process Innovation** performance improved between the 2012 and 2014 surveys. In 2014 Scotland ranked 24th out of 32 countries and moved up to third quartile of comparator countries.

Process Innovation Performance	**2012**	**2014**
International Rank	29	24
Quartile	4	3



The proportion of Scottish businesses engaging in process innovation **only** increased by 6 places in the ranking of comparator countries.

Process Innovation Only		
Scotland's	**2012**	**2014**
International Rank	30	24
Quartile	4	3



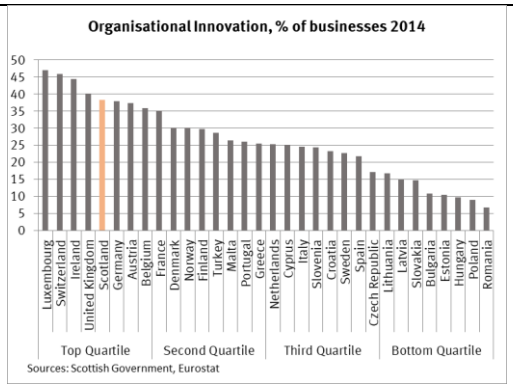
Organisational innovation

The proportion of businesses engaging in organisation only innovations increased by 4.2 percentage points between the 2012 and 2014 surveys. However, the proportion of businesses engaging in organisational plus other innovations increased by 6.8 percentage points.

Organisational Innovation shows the most dramatic improvement in Scotland between the 2012 and 2014 surveys. Scotland's ranking improved to 5th place out of 32 countries and moved to the top quartile of comparator countries.

Organisational Innovation Performance

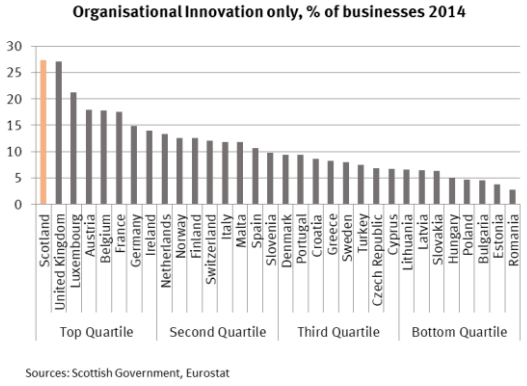
	2012	2014
International rank	12	5
Quartile	2	1



Scotland maintained its top quartile ranking in the proportion of businesses engaging in organisational innovation only between 2012 and 2014.

Organisational Innovation Only

	2012	2014
International Rank	1	1
Quartile	1	1



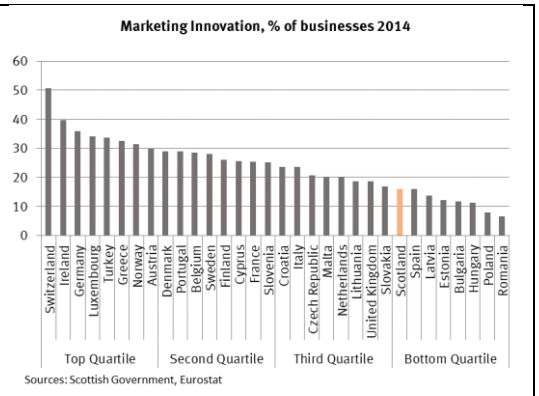
Marketing innovation

The proportion of businesses engaging in marketing only innovation increased by 1.7 percentage points between 2012 and 2014, therefore, most of the overall improvement was due to the 4.3 percentage point increase in businesses engaging in marketing as well as other innovations.

Marketing Innovation performance is weak in Scotland, but some improvement was reported between the 2012 and 2014 surveys. Although still in the bottom quartile of comparator countries in 2014 Scotland's ranking had gone up from 31st in 2012 to 25th in 2014.

Marketing Innovation Performance

	2012	2014
International rank	31	25
Quartile	4	4



Scotland's ranking for the proportion of marketing only innovators increased by 3 places between 2012 and 2014, but also remained in the bottom quartile.

Marketing Innovation Only

	2012	2014
Scotland's Rank	31	28
Quartile	4	4

The data for multiple innovation activities show that Scotland still has relatively poor performance compared to other countries. In Process and Marketing Innovation, and Product Innovation Scotland just makes it into the second quartile of comparator countries while the performance is high for organisational innovation.

Overall, to reach the top quartile of comparator countries for overall innovation active performance, Scotland would only need an extra 250 10+ employee businesses to become innovation active. However, the gap between Scotland and comparator countries engaging in multiple innovation activities is much larger:

Multiple Innovators - Innovation Type	Number of additional 10+ employee businesses required to reach the top quartile
Product Innovation	1,500
Process Innovator	2,700
Marketing Innovators	3,000
Organisational Innovators	0

The data on Scotland's performance by type of innovation activity helps explain Scotland's improved performance for the overall headline innovation active measure. Scotland's ranking has increased from 19th to 9th by improving or maintaining its ranking performance for *all* the component types of innovation activity, except for the proportion of companies that are only involved in product innovation.

The data though also shows that Scotland's overall relatively high innovation activity ranking (9th place) is driven in large part by businesses undertaking organisational innovation only, and that Scotland's businesses are far less likely than those in other countries to be:

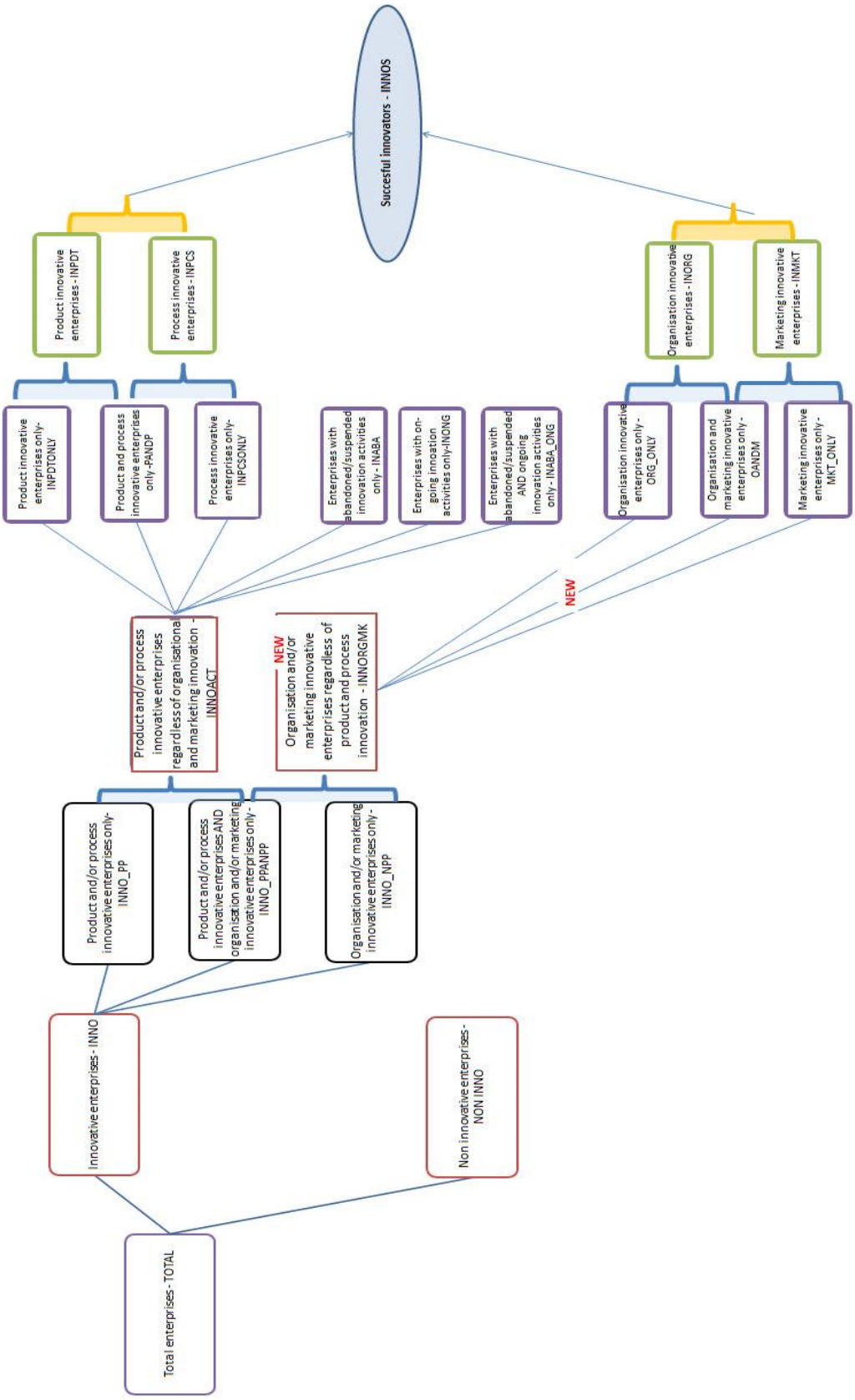
- undertaking process or marketing innovation
- undertaking (or combining) multiple innovation activities

This raises a key question of whether Scotland's dependence on organisational innovation is a weakness. Further research is planned to assess whether there is a relationship between types of innovation activity and business performance, for example in terms of turnover growth and productivity. This will also consider whether there are optimal combinations of innovation activity.

Conclusions

Scotland's overall performance of innovation active business improved significantly between 2010-12 and 2012-14, compared to other CIS European countries. This was due to improved performance in each of the main types of innovation activity. However, it is clear that Scotland's innovation performance is driven mainly by organisational innovation rather than by businesses introducing new products, services or processes. And Scottish businesses are less likely to engage in multiple innovation activities than those in other countries. Further research is required to assess whether this is an 'innovation weakness' compared to other countries in terms of business performance and growth.

Appendix A: Types of Innovators Overview



Source: Eurostat Metadata

The performance of Scotland's high growth companies

Viktoria Bachtler
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Abstract

The process of establishing and growing a strong business base is an important hallmark of any successful economy. The pace of business start-ups and their subsequent growth has challenged policymakers for decades. While there has been a major research focus on entrepreneurship in Scotland, less attention has been focused on how Scotland is doing at the top end of SMEs. This article examines key data on new high-growth companies in Scotland. It first examines the age profile of Scotland's Top 100 companies, especially the extent to which these are new or well-established, and compares this UK and US experience. The article then focuses on Scotland's high growth firms (HGFs), in particular how Scotland performs in producing top high growth firms in relation to the UK. A key question is how many of these firms are amongst the top performing UK high growth companies and whether this has changed over time.

1. Introduction and background

The process of establishing and growing a strong business base is an important hallmark of any successful economy. The pace of business start-ups and their subsequent growth has been something that has challenged policymakers for decades.

Though Scotland ranks 9th in the UK (out of 12 Government Office Regions) in terms of the number of new business registrations each year, there are several examples of Scottish companies growing into major world-players such as Skyscanner, FanDuel and Rockstar.

Though there has been a major research focus on entrepreneurship, regarding new firm formation and SME growth, less attention has been focused on how Scotland is doing at the top end of SMEs. Previous research by Scottish Enterprise, published by the Fraser Economic Commentary, has shown fast-growth firms are important for the economy.[17]

This article examines key data on new high-growth companies in Scotland. First, we examine the age profile of Scotland's Top 100 companies, especially the extent to which these are new or well-established. And we compare this UK and US experience.

We then focus on Scotland's high growth firms (HGFs), in particular how Scotland performs in producing top high growth firms in relation to the UK and other similar sized countries. A study of high growth firms in Scotland undertaken by Scottish Enterprise[18] in 2012 showed that Scotland had higher *rate* than the UK of high growth businesses. However, our interest is to know

[17] https://strathprints.strath.ac.uk/56659/1/FEC_40_1_2016_HopkinsPRichmondK.pdf
[18] https://strathprints.strath.ac.uk/56659/

how many of these firms are amongst the top performing UK high growth companies and whether this has changed over time.

2. How old are Scotland's top companies?

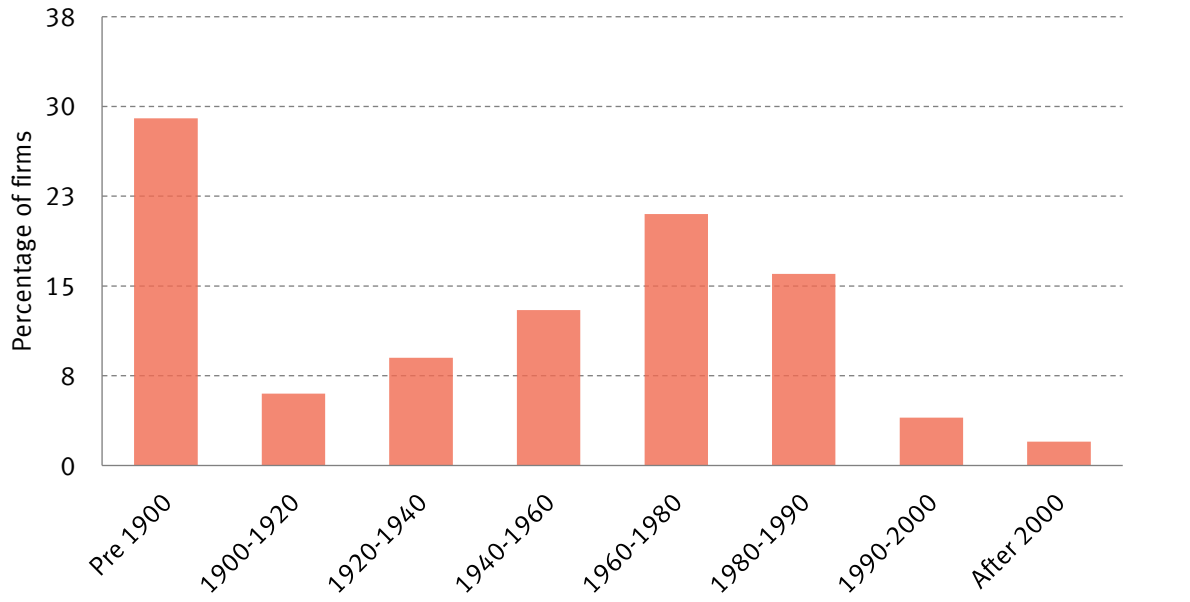
Scotland's Top 100 companies were sourced from the Scottish Business Insider magazine[19], which produces an annual Top 500 list of Scotland's best performing public and private companies.

This list is ranked using a combination of annualised turnover and pre-tax profit. The business sectors vary with some of the largest turnover coming from Banking and Financial Services, Offshore Services, Services & Utilities and Transport.

Each firm was traced back to identify its year of establishment, in order to avoid misreporting company age due to changes in ownership or mergers. If a firm was the result of a merger, the age of the oldest merging firm was used.

Figure 1 shows the age distribution of Scotland's Top 100 companies, which range in age from 11 to 322 years. Very few companies have been created in the past 20 to 30 years, only eight companies in total are 30 years or younger and only two were created after 2000. In contrast, 34% of companies are over 100 years old, mainly companies in Banking & Financial Services, Food & Drink as well as Offshore / Oil & Gas sectors. The average age of a Scottish company in the Top 100 is approximately 87 years old.

Figure 1: Age distribution of the top 100 Scottish firms



Source: Business Insider Top 500 2017

[19] http://www.oascotland.org.uk/wp-content/uploads/2016/09/Top-500-Companies-2017.pdf

It is interesting to speculate why there are so few companies in the Top 100 established in the past two decades. There could be several possible explanations:

a) there are constraints on new Scottish start-ups experiencing the fast growth required to enter the Top 100, whether internal (e.g. management and marketing expertise) or external (e.g. availability of finance);
b) it takes a long time to build up a Top 100 firm in increasingly competitive markets;
c) Scotland has not been establishing companies in fast-growing sectors;
d) fast-growing or successful Scottish companies are taken over given the openness of the UK economy to mergers and acquisitions.

Comparisons can be undertaken with other countries to assess whether Scotland's experience is unique, or not. It should be noted that are always challenges in comparing countries across different databases as each can be compiled in a slightly different way (e.g. revenue and profit or just revenue).

The analysis conducted here therefore is designed to only be illustrative.

For the US, a comparative assessment was undertaken by drawing on company age data from the Fortune 500[20] - an annual list of the top public and private companies in the US by revenue produced by Fortune magazine.

A comparison with the UK was more difficult as there does not appear to be a list which ranks the top UK public and private firms in a single data set.

Therefore, the Forbes Global 2000[21] (a list produced by Forbes magazine which ranks the world's top 2000 public companies by a combination of revenue, profits, assets and market value) and the Sunday Times HSBC Top Track 100[22] (an annual list produced by Sunday Times which ranks the UK's top 100 private firms by revenue) were merged and then ranked by revenue to create a top 100 UK sample.

Figure 2 provides an interesting perspective on the discussion of the age profile of Scottish companies in a comparison to UK and US experience.

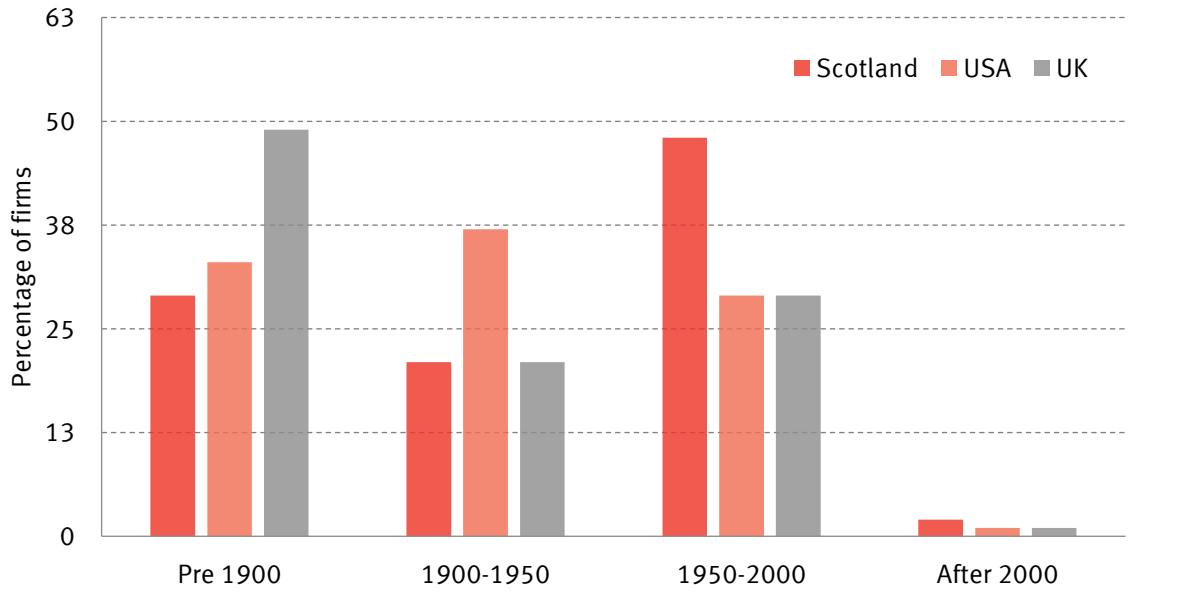
For top UK companies, nearly 50% were founded before 1900. The average age of a UK company in the combined Forbes and HSBC Top Track list is 124 years old.

For the US, the situation is slightly different, with the majority of companies being slightly younger, with approximately 73% have been founded before 1950 with the average age being 101 years.

In comparison, top Scottish companies are younger, with nearly 50% having been established since 1950.

[20] http://fortune.com/fortune500/list/
[21] https://www.forbes.com/global2000/list/#tab:overall
[22] http://www.fasttrack.co.uk/league-tables/top-track-100/league-table/

Figure 2: Age distribution of the top 100 Scottish, US and UK firms



3. Scotland's performance in producing high growth firms (HGFs)

Here we report on Scotland's top performing high growth firms, using the OECD's definition of high growth firms as *'enterprises with average annualised growth in employees or turnover greater than 20 percent per annum, over a three year period, and with more than 10 employees in the beginning of the observation period'*.

As discussed in a 2016 article in the Fraser Economic Commentary[23], although only a small proportion of companies achieve rapid growth, they are key drivers for economic growth and job creation as they generate a disproportionate level of turnover and employment.

The latest available ONS data[24] show that in 2015, Scotland had 1,865 high growth firms, around 1% of total of Scottish firms.

This ONS database records every company in Scotland with 10+ employees and calculates their growth based on both turnover and number of employees over the previous three years. Using growth based on turnover, Scotland had 7.31% of the UK's total high growth firms and 6.81% when using growth based on employees.

Therefore, considering Scotland appears to be near its 'fair share' of high growth firms (which would equate to around 8%), the remainder of this paper explores how many of these Scottish high growth firms are top performing within the UK's top high growth firms. We focus on four key questions:

[23] https://strathprints.strath.ac.uk/56659/1/FEC_40_1_2016_HopkinsPRichmondK.pdf
[24]https://www.ons.gov.uk/businessindustryandtrade/changestobusiness/businessbirthsdeathsandsurvivalrates/adhocs/007659highgrowthenterprises

- Does Scotland have its 'fair share' (i.e. a per capita share) of the UK's top performing high growth firms?
- Has Scotland's performance improved or deteriorated over time?
- Are previously top high growth firms from earlier years still successful?
- How does Scotland's performance in producing HGFs compare to other UK regions?

To assess Scotland's current performance in relation to the UK in producing fast growing companies, two main data sources were used (See Table 1):

Sunday Times Virgin Fast Track 100[25] **–** this is an annual list which ranks Britain's 100 private companies with the fastest growing sales over their latest three years. It covers growth companies from all sectors apart from technology. It has been produced since 1997.

Sunday Times Hiscox Tech Track 100[26] **–** an annual list produced which ranks Britain's 100 private tech companies with the fastest growing sales over their past three years. It has been produced since 2001.

Again there are weaknesses in using just these datasets. In particular, the focus is only on private sector companies. However, they do provide a useful illustration of key trends and performance.

The Fast Track 2016 and Tech Track 2016 lists were analysed separately and then combined. This combined list of the fastest growing 100 Fast Track and Tech Track firms comprises 53 Fast Track Tech firms and 47 Fast Track firms.

Scotland's 'fair share' of the top 100 high growing firms in the UK would equate to around 8% of the UK total.

As Table 1 shows, Scotland's share of such form is lower-than-expected, were the ratio to be in line with a per capita or economy-wide share.

Scotland performed better in the tech sector with seven Scottish companies featured in the UK's top 100 fastest growing technology firms, though it still fell short of a per capita share.

Table 1: Percentage of Scottish firms in top 100 UK lists

	% of Scottish HGFs	Average Growth	UK Average Growth
Fast Track 100 2016	3	58.7%	82.4%
Tech Track 100 2016	7	66.9%	87.9%
Fast & Tech Track 100 Combined 2016	2	107.2%	114.9%

[25] http://www.fasttrack.co.uk/league-tables/fast-track-100/
[26] http://www.fasttrack.co.uk/league-tables/tech-track-100/

Using the combined top 100 UK, only two Scottish companies appear.

Within the UK regions, Scotland has amongst the lowest representation, with Wales (2 companies) and Northern Ireland (no companies). In stark contrast, Greater London has the highest proportion with 41 companies, followed by the South East (14 companies).

The two Scottish companies featured are both tech companies:

- FanDuel, a fantasy sports game developer which has been a very successful company since its foundation in Edinburgh in 2009. However, since this list was compiled, FanDuel has moved its HQ to New York due to its success in the US. It still has many offices in Edinburgh.

- ECS Security, an IT infrastructure consultancy founded in Glasgow in 2008, whose customers include three of the UK's five biggest banks.

Companies which are featured in the individual Fast Track and Tech Track lists include BrewDog (craft brewer), Skyscanner (travel search engine) and RHA (headphone designers).

These companies do not make the top 100 combined UK list but still meet the OECD's definition of a high growth firm with annual growth rates over the last three years well above 20%. Skyscanner appeared in the Tech Track 100 lists for a record seven consecutive years in 2016 but does not featured in the 2017 list as it has been acquired by Chinese company Ctrip, although it is still headquartered in Edinburgh.

Of the 10 Scottish companies featured in the top 200 UK Fast and Tech Track lists, eight of them are located in Scotland's biggest cities Glasgow and Edinburgh. The remaining two are located in areas surrounding Glasgow and Aberdeen. Moreover, at the time of listing in 2016, 8 of them had been founded within the past 10 years.

The average annual growth for the Scottish companies listed is 20% less than the UK average in both the Fast Track and Tech Track 2016 individual lists. The average annual growth for Scottish companies in the combined list is 7.7% less than the UK average, likely due to the fact there are only two companies and one of them (FanDuel) has a very high annual growth over three years of 128.2%. In summary, Scotland has arguably underperformed in both the quantity of HGFs it is producing compared to the UK and also in their average growth rate.

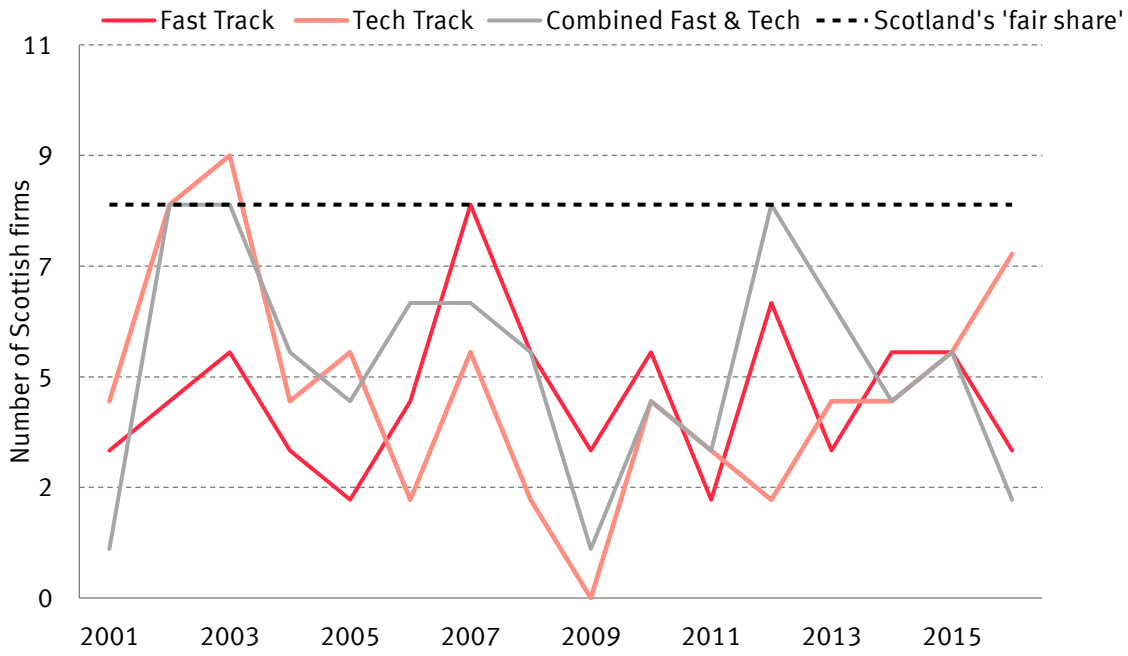
4. Has Scotland's performance improved over time?

The Fast Track 100 league tables have been produced since 1997 and the Tech Track since 2001.

Scotland's performance has fluctuated since 2001. The overall trend in each list appears to be that Scotland has had a below per capita share for most years.

Scotland's performance declined generally after highs in 2002 and 2003, reaching lows around 2009. After 2009, Scotland's performance picked up and companies in each list experienced an increase over the following few years, particularly in 2012.

Figure 3: Number of Scottish firms in each list since 2001



Sources: Sunday Times Fast and Sunday Times Tech Track 2001 - 2016

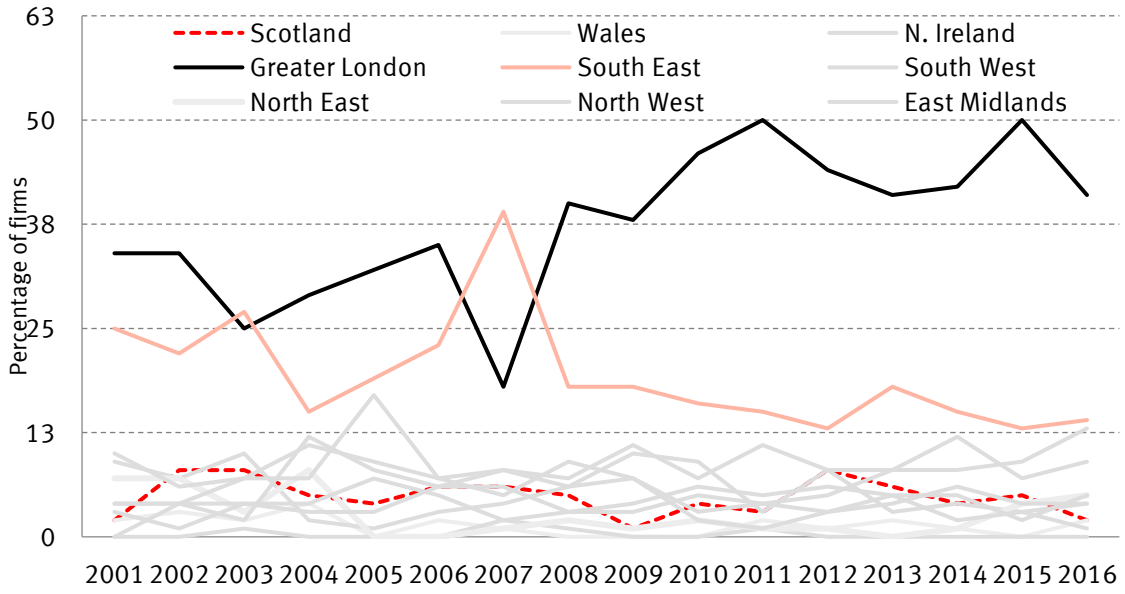
A closer look at the combined top 100 Fast Track and Tech Track list shows Scotland has only had its fair share three times; in 2002, 2003 and 2012. It experienced lows in 2001 and 2009, with only one company featured in each year. 2016 is amongst the lowest represented year with two companies. On average, Scotland has 4-5 companies featured in the UK's top 100.

Comparing Scotland's performance to other parts of the UK shows a mixed picture (See Figure 4). Greater London and the South East of England dominate the UK's high growth lists. Scotland performs averagely in comparison with the remaining UK regions. Since 2011 it has produced similar numbers of top high growth firms as the West Midlands, the South West and Yorkshire and the Humber. Scotland performs better than Wales, Northern Ireland and the North East which have all had no listed companies in several years since 2001.

Since 2001, 50 different Scottish companies have featured in the combined top 100 lists, with some of them appearing in consecutive years. There is a fairly even split of 24 tech and 26 non tech companies. And the geographical location of these companies are fairly similar.

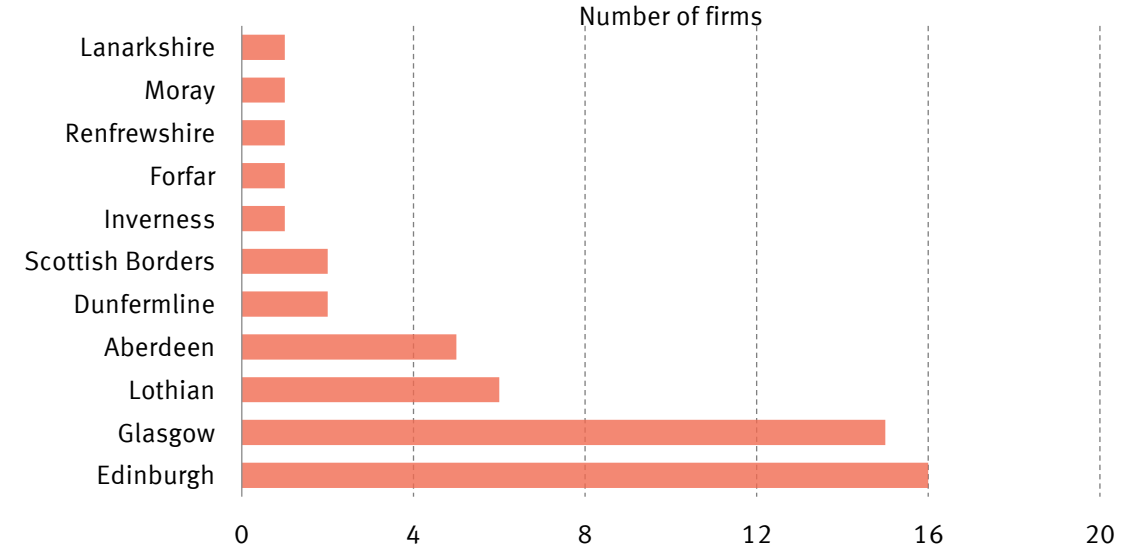
Since 2001, approximately 72% of the Scottish companies on this list have been located in Edinburgh, Glasgow and Aberdeen (see Figure 5), with many of the remaining companies located close to the cities, especially to Edinburgh.

Figure 4: Percentage of high growth firms by region in combined Fast & Tech track lists since 2001



Sources: Sunday Times Fast and Sunday Times Tech Track 2001 - 2016

Figure 5: Locations of the Scottish HGFs listed 2001 - 2016

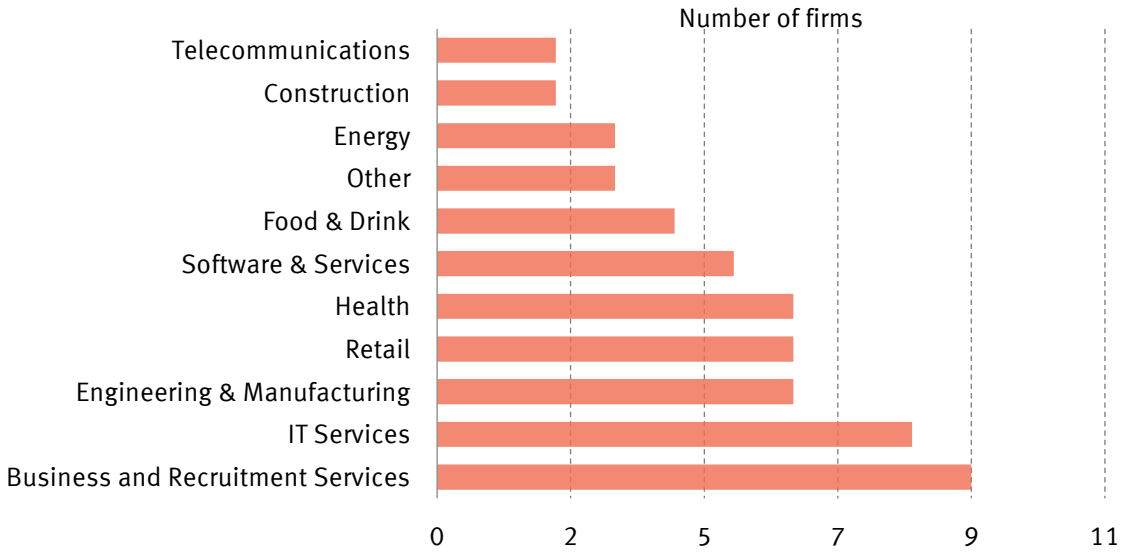


Sources: Sunday Times Fast and Sunday Times Tech Track 2001 - 2016

The Scottish companies featured in this list operate in a variety of sectors and industries. Of the 50 Scottish companies listed since 2001, 24 of them have been from the Tech Track

technology list (see Figure 6). These companies are most heavily concentrated in Business & Recruitment Services, Engineering & Manufacturing, Retail and IT Services.

Figure 6: Sectoral breakdown of the Scottish listed HGFs 2001 - 2016



Sources: Sunday Times Fast and Sunday Times Tech Track 2001 - 2016

Figure 7: UK and Scottish Average annual growth 2001 - 2016

Sources: Sunday Times Fast and Sunday Times Tech Track 2001 - 2016

Both Scotland and the UK as a whole appear to have experienced a steady decline in average annual sales growth in the top 100 companies, although their growth is still well above the 20% growth rate which the OECD definition requires (see Figure 7). Scotland performs similarly to the UK average. However, this is due to there being a smaller number of Scottish companies listed, some of whom have higher growth rates than the UK average.

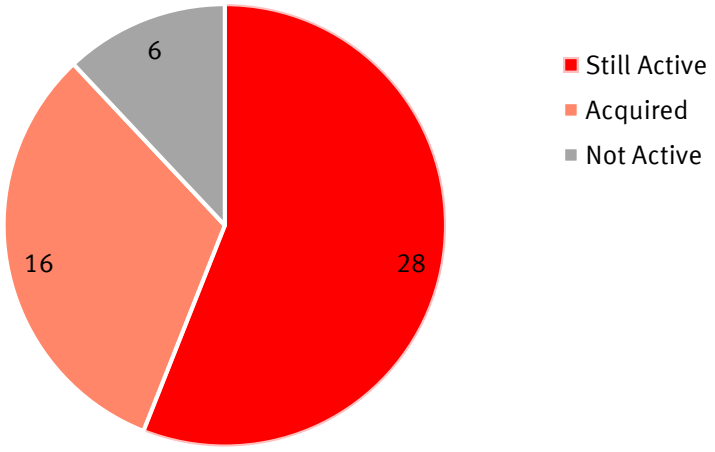
Scotland had its highest average annual growth rate of 164% in 2004, compared to 165% in the UK. Since 2001, its lowest average annual growth rates were in 2008, 2009 and 2012. This again may be linked to the financial crisis in 2008.

The average age of Scottish companies at the time of inclusion on the listing is 10.5 years old. Excluding Hunter Boot, the Wellington boot retailer founded in 1856, and Barrhead Travel agency founded in 1975, all of the companies were founded after 1989. With these exceptions, the average age is just over 8 years old.

5. Where are the high growth firms now?

Many of the Scottish companies featured in the combined top 100 UK lists are still thriving successful companies today - see Figure 8. But of the 50 Scottish companies which have made it onto these lists since 2001, it would appear that over 40% of them have either been acquired by UK or foreign companies or no longer exist.

Figure 8: Current status of the 50 Scottish HGFS listed 2001 – 2016



Sources: Sunday Times Fast and Sunday Times Tech Track 2001 - 2016

The majority of the companies which no longer exist or have been taken over come from the earlier listings. Of the 23 companies listed between 2001 and 2006, approximately 65% of them no longer exist or have been acquired.

6. Conclusions

This article has examined Scotland's performance in producing successful and high-growth companies. Based on the research undertaken, the following conclusions may be drawn.

- Scotland's top high growth companies are relatively long-standing with most having been founded before 1960, and many before 1900.
- Compared to the UK and the US, Scotland has a higher proportion of younger, high growth companies (perhaps as a result of consistent acquisition of Scottish HGFs).
- Scotland tends to have slightly fewer top UK performing high growth firms than its economy-share would suggest.
- The majority of Scotland's top high growth firms are located in Glasgow and Edinburgh (62%).
- The majority (65%) of Scotland's high growth companies are found in Business and Recruitment Services, IT Services, Engineering & Manufacturing, Retail and Health sectors.
- Over a third of Scotland's top high growth companies have been acquired by UK and foreign companies over the past two decades.

Further research on the performance of Scotland's high growth firms (HGFs) could usefully focus on assessing Scotland's performance in a European context, specifically comparing Scotland to similarly sized countries such as Finland, Denmark and Norway.

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