



University of  
**Strathclyde**  
Business  
School

# Fraser of Allander Institute

## Economic Commentary

Supported by

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Vol 42 No 2

# Foreword

## Signs that Scotland's economic tide is finally turning

Since 2015 Scotland's economic growth has failed to garner much in the way of significant momentum, a trend that has been compounded more recently by a decline in construction and sluggish growth in services. Yet there are now some signs that Scotland's economic performance is improving. Progress is slow and continues to lag behind the UK. However, there are grounds for cautious optimism with 2018 projected to be an improvement on the previous year.

The country saw considerable growth in exports in 2017. It enjoys an excellent reputation in food and drink. Furthermore, sentiment in the North Sea is at its highest level for five years, in what is welcome news for an industry emerging from a downturn more lean and efficient, and now hinting at resurgence.

What is important now, is that businesses across the board, from food and drink to Fintech and everything in-between, are primed to embrace, swiftly, the opportunities that will arise, and tackle any challenges head-on. For some time, an inability to improve productivity has been a barrier to strengthening the prospects of our economic growth. While the core reasons for sluggish productivity growth are difficult to identify, there is little doubt that continuing investment in areas such as innovation, digital and technology are vital to enable continuing progress in how work is done.

Similarly, it is also important that our business leaders and workforce have the ability to adapt to a rapidly evolving economy which has an increasing emphasis on digital. As our Digital Disruption Index from May this year shows, there is consensus that greater investment is required to ensure employees have the digital skills required to implement an organisation's digital strategy. Such skills and strategies are much needed to truly maximise the benefits of technology, particularly emerging technologies such as artificial intelligence, virtual and augmented reality, and blockchain. A productive, highly trained workforce is pivotal to the strength of a relatively small and open economy such as Scotland's.

Brexit remains the most immediate and complex of the challenges we face and the onus is on businesses to prepare as thoroughly as possible for a range of possible outcomes in the face of these circumstances.

Scotland has a resilient economy that has endured a tough few years. With improving confidence in business and a determination to capitalise on opportunities and prepare for challenges on the way, we should be confident the economy can improve on its growth rate in the next few years.

John Macintosh  
Tax Partner  
Deloitte

June 2018

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Deloitte's Digital Disruption Index was published in May 2018. For further information please see [www.deloitte.co.uk/digitaldisruption](http://www.deloitte.co.uk/digitaldisruption)



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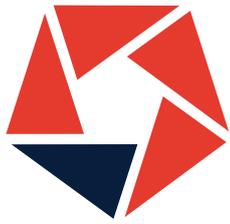
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For regular analysis on the Scottish economy and public finances please see our blog

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# UNIVERSITY of STRATHCLYDE

## FRASER OF ALLANDER INSTITUTE

## Summary

2017 was another year of weak growth in the Scottish economy. Output expanded by just 0.8% over the 12 month period, well below trend.

The near future remains challenging, with Brexit continuing to cast a shadow of uncertainty over the outlook.

That being said, we are cautiously optimistic about growth prospects for this year. Why?

While the UK Government still lacks a credible and coherent vision for life outside the EU, the agreed 2020 timetable for the UK's exit has helped shore up confidence amongst business in the short term.

More generally, indicators of household / business sentiment have picked up in recent times. And whilst UK economic growth is slowing, global growth remains strong.

Closer to home, the bad weather in March is likely to significantly dampen the Q1 Scottish growth figures, particularly for construction.

This should be temporary. It will be important therefore not to read too much into next week's GDP data but to wait until figures for Q2 are published. Only then will we have a full picture of the underlying health of the Scottish economy so far this year.

We forecast the Scottish economy will grow by around 1.2% in 2018 and by 1.3% in 2019 – still well below trend but more positive than the forecasts of the Scottish Fiscal Commission.

The Commission's recent revisions to their devolved tax forecasts, whilst small at the aggregate level, carry significant implications for the Scottish Budget.

The combination of lower tax revenues and a higher block grant adjustment has opened up a £389m gap in the government's finances for 2018/19 beyond its original plans.

Under the Fiscal Framework for the Scottish Budget, the effect of this is not immediate as monies have already been allocated. But it will have to be addressed at some point with contingency plans no doubt now being made.

This challenging outlook for the Scottish Budget will make the task of delivering on key policy priorities all that more challenging.

The new Scottish Government '5-year financial strategy' published last month sets out ambitious spending growth in key areas like the NHS, attainment, early years and social security.

But with the Strategy envisaging a decline in the resource budget in real-terms, other areas will have to bear the brunt. Unprotected areas are on track to be cut by around 8% in real terms over the course of this parliament (16/17 to 21/22). This picture is unlikely to change significantly, despite the recent announcement of additional spending by the UK Government.

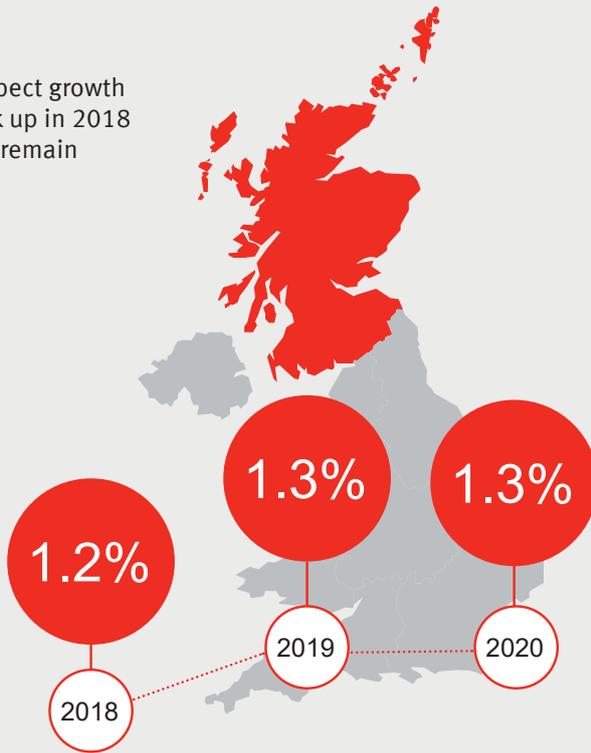
The greatest risk to the economic outlook remains Brexit. With just 9 months to go until the UK leaves the EU, the apparent lack of agreement within the UK Cabinet on basic issues like membership of the Customs Union is a major concern.

But Brexit cannot be used as an excuse for all our economic challenges. Hopefully the recent debates on Scotland's economic future sparked by the Sustainable Growth Commission and others have illustrated the value of fresh thinking and new ideas irrespective of the constitutional settlement.

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June 2018

## Scottish growth forecast

We expect growth to pick up in 2018 but to remain fragile



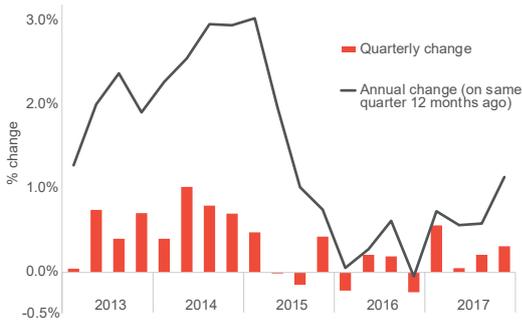
## Unemployment forecast



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# At a glance

**Chart:** Scottish growth (since 2013) – year and quarter



**Chart:** Scottish employment & unemployment rate, 2008 – 2018



**Chart:** FAI forecast Scottish economic growth range



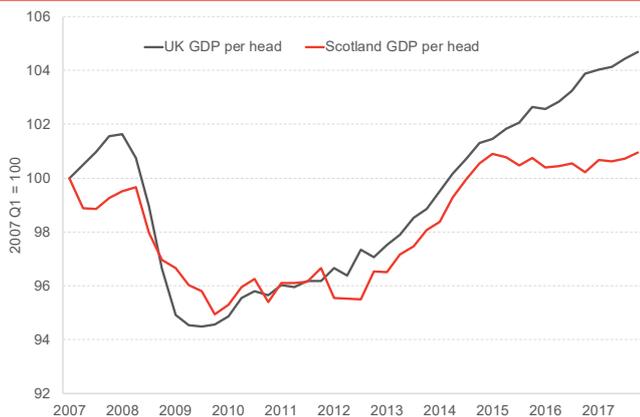
**Table:** FAI forecast Scottish economic growth (%), 2018 – 2020

|              | 2018        | 2019        | 2020        |
|--------------|-------------|-------------|-------------|
| <b>GVA</b>   | <b>1.2%</b> | <b>1.3%</b> | <b>1.3%</b> |
| Production   | 1.4%        | 1.5%        | 1.5%        |
| Construction | 0.8%        | 0.9%        | 0.9%        |
| Services     | 1.2%        | 1.3%        | 1.2%        |

# Outlook and Appraisal

The Scottish economy continues to lag behind the UK and to grow much more slowly than in ‘normal’ times. Whilst Brexit risks remain, and a combination of bad weather and poor construction sector figures may have a temporary impact on GDP during the first few months of the year, we believe that there are grounds to be cautiously optimistic for the rest of 2018.

**Chart 1:** Scottish and UK economic performance (GDP per head) since 2007



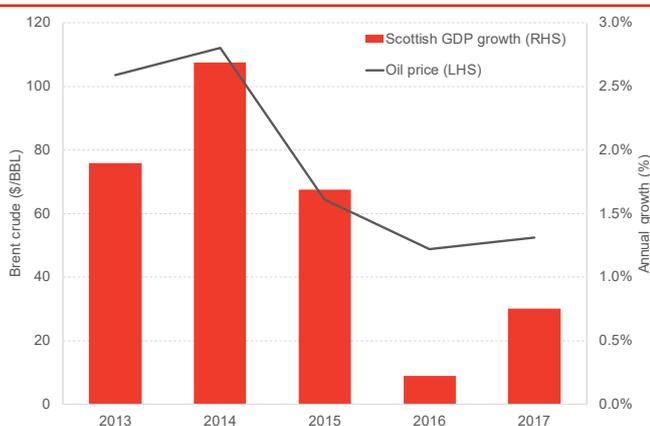
Source: Scottish Government

**Table 1:** UK labour market, Feb-Apr 2018

|            | Employment (16-64) | Unemployment (16+) | Inactivity (16-64) |
|------------|--------------------|--------------------|--------------------|
| Scotland   | 75.2               | 4.3                | 21.4               |
| England    | 76.0               | 4.2                | 20.6               |
| Wales      | 73.3               | 4.4                | 23.2               |
| N. Ireland | 69.7               | 3.3                | 27.9               |

Source: ONS

**Chart 2:** Scottish GDP growth and average annual oil price since 2013



Source: Scottish Government & Thomson-Reuters Datastream

## Introduction

The latest data shows the Scottish economy grew by just 0.8% during 2017 – marking the 3rd year of weak growth. (Chart 1)

The Scottish Fiscal Commission predicts growth of just 0.7% in 2018 and for it remain below 1% until at least 2024.

Whilst we share the view that the outlook remains fragile and uncertain, we are slightly more optimistic about Scotland’s near-term prospects.

Our central view is that – on balance – the Scottish economy is showing signs that it will grow more quickly this year than last but is likely to still remain below trend. Why?

First, whilst there are structural headwinds facing our economy we believe that the labour market will provide much needed resilience in the short-term with capacity still not fully utilised. (Table 1)

Second, the outlook for oil and gas in 2018 – and its all-important supply chain – is more positive than it has been in almost three years. (Chart 2)

Third, there are signs that businesses and consumers are relatively more positive about the outlook. This should help boost demand.

Growth is still likely to be modest by historical standards and there remain significant risks. Chief amongst them is Brexit. With 9 months until the UK leaves the EU, the lack of clarity over even the basic elements of our future relationship with the EU is a concern.

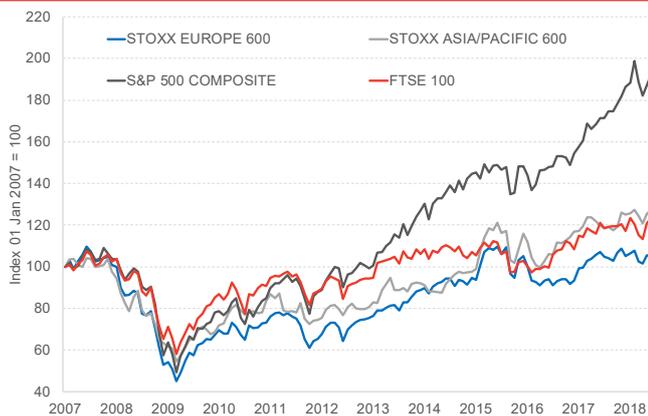
Whilst the agreement for a transition period up to 2020 has helped alleviate some immediate fears, the longer term damage to our economy from a ‘Hard Brexit’ would be significant. The need for effective economic leadership at the top of government has never been more urgent.

**Table 2:** OECD forecasts for G7 Growth: 2017 (outturn) to 2019

|           | 2017 | 2018 | 2019 |
|-----------|------|------|------|
| UK        | 1.8  | 1.4  | 1.3  |
| US        | 2.3  | 2.9  | 2.8  |
| Japan     | 1.7  | 1.2  | 1.2  |
| Canada    | 3.0  | 2.1  | 2.2  |
| Euro Area | 2.6  | 2.2  | 2.1  |
| Germany   | 2.5  | 2.1  | 2.1  |
| France    | 2.3  | 1.9  | 1.9  |
| Italy     | 1.6  | 1.4  | 1.1  |

Source: OECD

**Chart 3:** Global stock market resilience since 2007



Source: Thomson-Reuters Datastream

**Chart 4:** Global trade and industrial production, 2013 – 2018



Source: IMF, World Economic Outlook

## The global economy

As we documented in March’s Economic Commentary, the global economy has been performing strongly in recent times.

At 3.8 percent, global growth in 2017 was ½ percentage point higher than in 2016 and the strongest since 2011. (Table 2)

Most projections are for world growth to continue at around 4% for the next few years – with the outlook positive for both advanced and emerging market economies.

Europe is on course for its best performance in a decade.

Unemployment is projected to continue to fall, with the OECD average on track to hit its lowest rate since 1980. Stock markets have returned to growth following their correction in February. (Chart 3)

A feature of the recent pick-up in global activity has been the focus on investment and trade.

Global exports, for example, have risen sharply over the past 12 months helping to boost industrial production. (Chart 4) This should help ensure that the recent gains are sustained.

These developments should prove positive for Scotland’s economy.

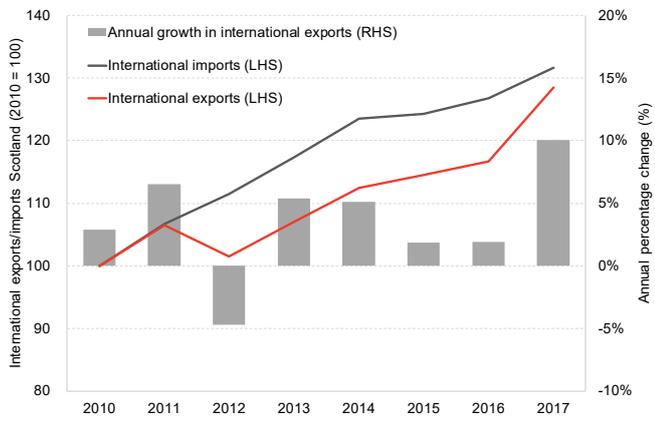
With Sterling trading around at 15% below its November 2015 peak, and with inflationary pressures easing, there is an important window for Scottish firms to take advantage of the buoyancy in global growth by exporting into new markets and expanding sales. (Chart 5)

**Chart 5:** Depreciation of Sterling, 2015 – June 2018



Source: Thomson-Reuters Datastream

**Chart 6:** Growth in Scottish international exports and imports since 2010



Source: Scottish Government

In contrast to recent years, Scottish exporters had a better year in 2017.

Imports from outside the UK had been growing faster than exports since 2011, eroding Scotland's international net trade balance. But last year marked a turnaround in fortunes, with Scottish international exports rising by 10%. (Chart 6)

This positive outlook for trade is, however, once again threatened by political uncertainty.

The US decision to impose tariffs on steel and aluminium might be politically appealing for some US voters, but it risks sparking a minor – or possibly major – trade war.

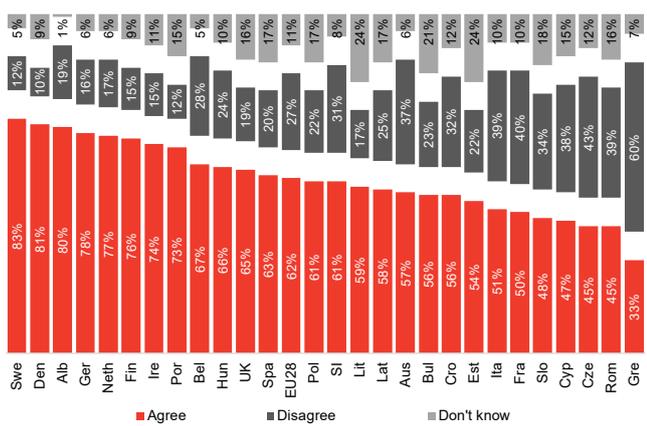
Given our industrial structure, the Scottish economy should be relatively immune from any immediate impact. The potential, however, for the dispute to escalate is a more serious concern. The US is Scotland's largest single international destination for exports and a key market for major industries like whisky.

It is not just international trade where there are risks, but also those from rising political uncertainty in Europe, e.g. Italy. Whilst the EU economy is now more resilient than it was five years ago, there remains a hangover.

In particular, the lack of meaningful progress in economic prospects for a large proportion of Europe's population means that trust in the global economic system remains weak. (Chart 7)

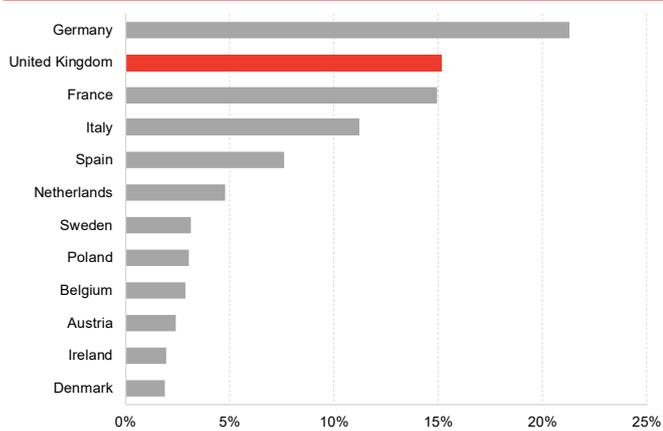
Of course, we do not have far to look for our own uncertainty to act as a drag on growth in the UK. (Chart 9)

**Chart 7:** To what extent do you agree or disagree – 'Globalisation is an opportunity for economic growth', December 2017



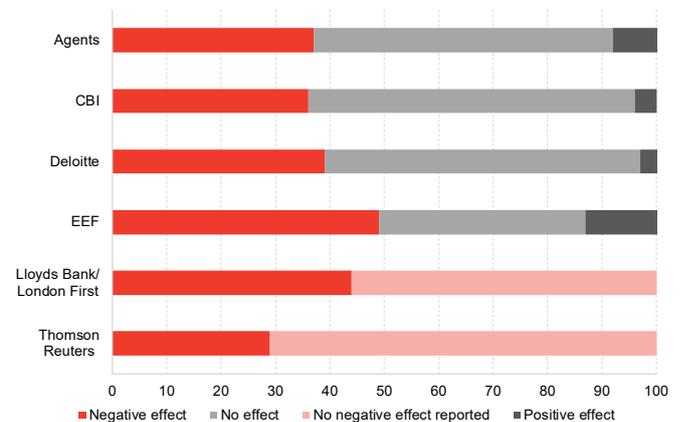
Source: European Commission

**Chart 8:** Percentage of EU GDP by country



Source: Eurostat

**Chart 9:** Surveys of the impact of Brexit on investment



Source: Bank of England

**Chart 10: Weakest UK quarterly growth since 2015**



Source: ONS

**The UK economy**

UK economic growth was just 0.1% in Q1 2018 – the weakest since the end of 2012. (Chart 10)

Annual growth has slipped to 1.2%. To put this in context, the UK economy grew by 3.1% in 2014 and had been one of the stand out performers in the G7 as recently as 2016. (Chart 11)

The poor performance at the start of 2018 was driven by a sharp decline in construction (-2.7%) and sluggish growth in the manufacturing sector. Growth in services also slowed. (Chart 12)

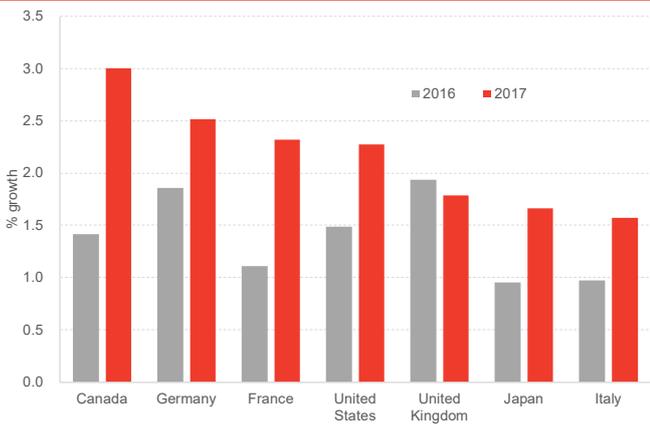
Some of this can be attributed to the ‘beast from the east’ shutting down the economy for a couple of days. But overall, ONS believe that wider factors also played a role.

As we have argued before, reading too much into one data release should be avoided. However, these latest figures are consistent with a more general trend pointing toward a slowing UK economy. In April, manufacturing output fell by its fastest rate since 2012.

Such a challenging trading environment will require businesses to be resilient and to focus upon the long-term drivers of productivity that they can control, such as investing in new plant and machinery, effective management and staff development.

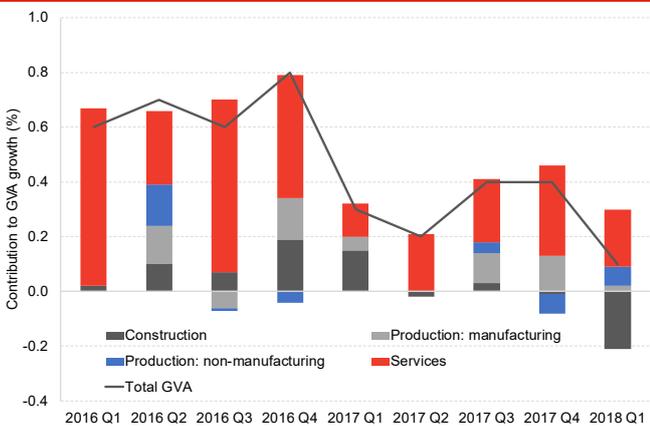
One positive has been rising real wages. For the first time since 2015, the mix of growing nominal earnings and falling inflation has boosted household budgets. (Chart 13)

**Chart 11: G7 GDP growth in 2016 and 2017 – only UK slowing**



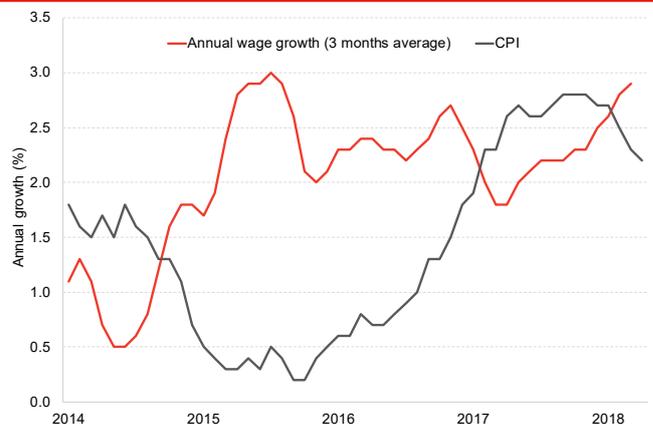
Source: ONS & OECD

**Chart 12: Decline in output driven by sharp decline in construction alongside weak growth in most other areas of economy**



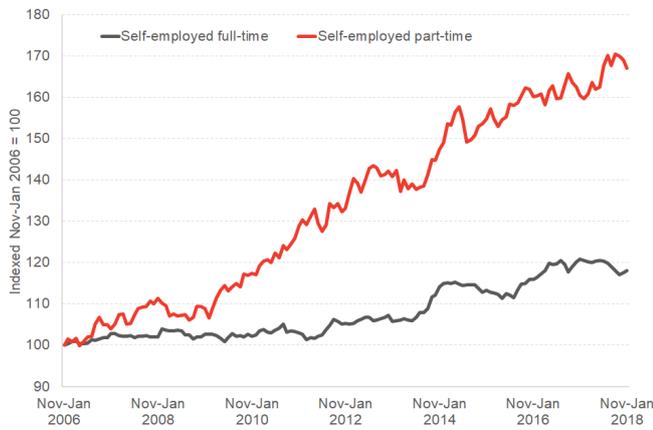
Source: ONS

**Chart 13: Annual wage growth and CPI, 2014 – 2018**



Source: ONS

**Chart 14:** Full-time and part-time self employment in the UK



Source: ONS

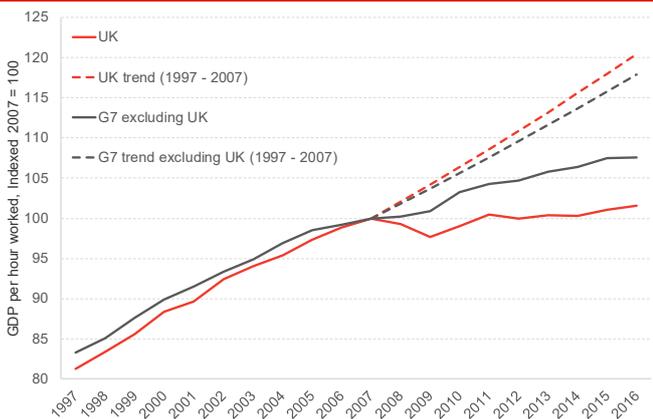
This improvement in wages is one aspect of a UK labour market that continues to hold up remarkably well, with high rates of employment and low unemployment.

However, as we have discussed before, underneath these headline figures there are signs of fragility.

For example, much of the recent growth in UK employment has been in the form of self-employment. And as Chart 14 reveals, part-time self-employment has been growing particularly quickly.

As we discuss in detail later, productivity growth in the UK (and Scotland) has been a constant source of concern.

**Chart 15:** UK and G7 productivity since the financial crisis



Source: ONS & OECD

Productivity continues to lag behind key competitors. (Chart 15)

There had been some optimism that UK productivity may have started to turnaround in 2017 with strong growth recorded in the 2nd half of the year. But output per hour fell once again at the start of 2018. (Chart 16)

This weakening in economic performance has spread through to the latest business surveys.

For example, whilst all three UK PMI indicators – for services, manufacturing and construction – point to growth continuing, they are all lower than their historical averages. (Chart 17)

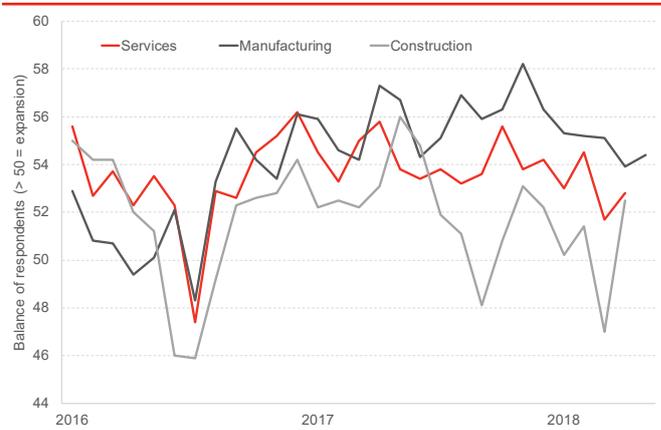
At the same time, the CBI's monthly tracker of industrial orders turned negative in May – and recorded its lowest value since 2016. The CBI's small business assessment of confidence was also negative.

**Chart 16:** UK productivity quarterly growth, Q1 2016 – Q1 2018



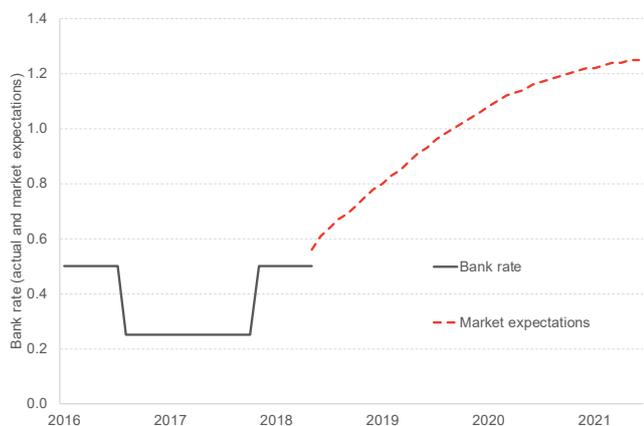
Source: ONS

**Chart 17:** UK Purchasing Managers Index (>50 indicates expansion)



Source: IHS Markit

**Chart 18:** Bank of England interest rate and market expectations



Source: Bank of England

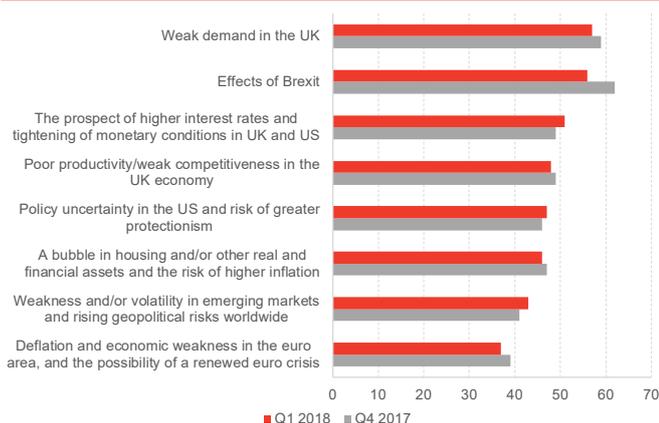
The speed of the deterioration in performance caught many economists by surprise. It was undoubtedly a key reason why the Bank of England chose to delay the widely trailed rise in interest rates which many had pencilled in for May.

Expectations are still for interest rates to rise in the near future but there is uncertainty over *when* this will occur. (Chart 18) In a speech at the Fraser of Allander Institute in April, Michael Saunders of the Monetary Policy Committee outlined his view that interest rates should rise gradually and at a pace that ‘need not be glacial’.

The prospect of weak demand in the domestic economy now dominates the risk register of many UK firms. (Chart 19)

Most forecasters predict that the UK economy will grow by around 1.4% in 2018 and by 1.5% in 2019. Long-term growth in the UK is typically between 2 to 2.5%. (Chart 20)

**Chart 19:** Risk to business by factor, 100 = highest possible risk

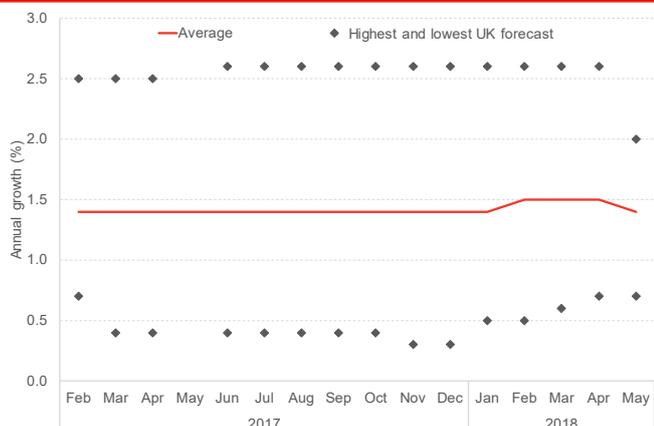


Source: Deloitte CFO Survey

Of course, Brexit looms on the horizon. To an extent, the planned transition period now agreed between the UK and the EU has improved optimism amongst businesses and has acted to help ward off any immediate uncertainties. (Chart 21)

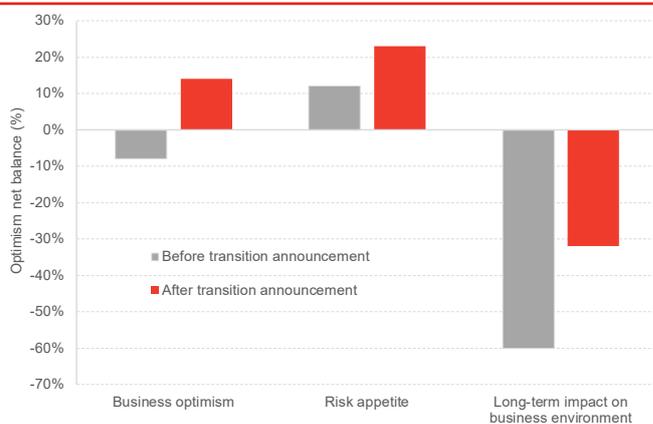
But the lack of clarity about the UK’s future relationship with the EU remains a major concern for many businesses.

**Chart 20:** Evolution of independent UK forecasts for 2018



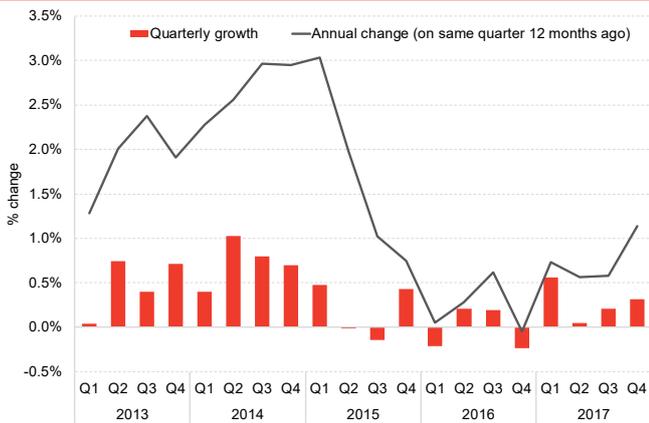
Source: HM Treasury

**Chart 21:** Impact of the Brexit transition announcement, net % of respondents



Source: Deloitte CFO Survey

**Chart 22: Economic growth in Scotland since 2013**



Source: Scottish Government

**The Scottish economy**

The Scottish economy grew by 0.3% in the final three months of 2017 – marking another quarter of below trend growth. (Chart 22)

Annual growth was just 1.1% (or 0.8% on a 4Q-on-4Q basis). This was slightly weaker than our forecast of around 1.2%.

The downturn in oil and gas has clearly been a driver of Scotland’s recent weak economic performance – with many of the manufacturing sectors tied to the North Sea experiencing a sharp recession.

As Chart 23 highlights, the decline in these production industries had a material impact on headline Scottish growth in both 2015 and 2016.

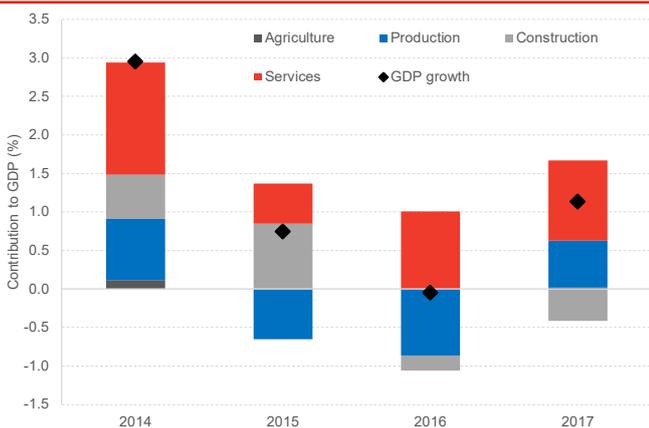
But in recent times, these sectors have stabilised. Instead, it has been a sharp fall in construction activity that has held back growth – see below for a further discussion.

At the same time, activity in services have been muted. In a number of industries – including professional, finance, retail and wholesale services – activity during 2017 was weaker than in 2016. (Chart 25)

One exception was health and social work. This is a peculiar sector from an economic statistics perspective and is largely made up of the NHS and related activities. It is also difficult to measure.

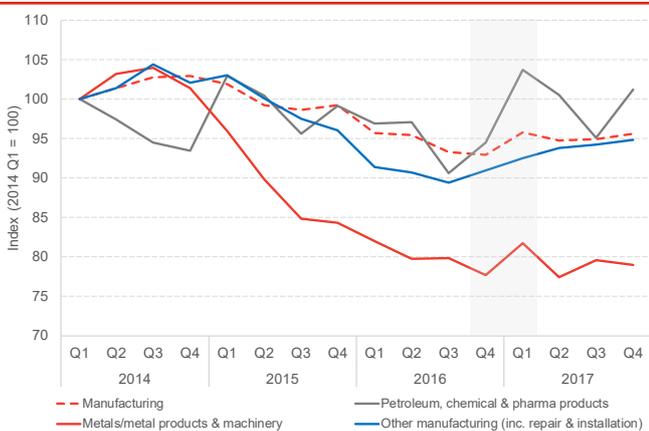
For a sector that makes up around 9% of the economy, it has apparently seen remarkable growth in recent times – not just on its own but relative to sectors like education and public admin. (Chart 26)

**Chart 23: Drivers of growth in Scotland by sector, 2014 - 2017**



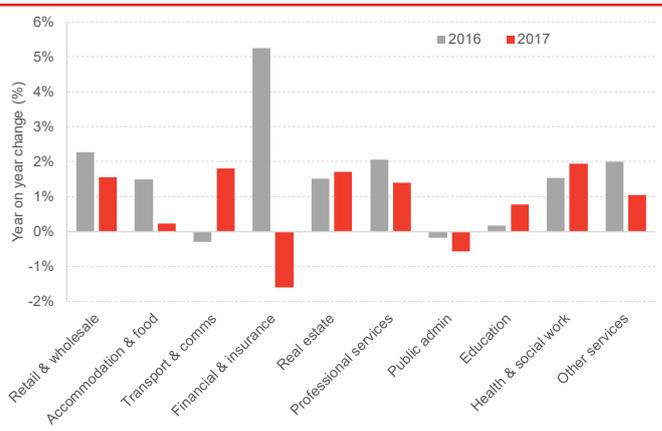
Source: Scottish Government & FAI

**Chart 24: Performance of manufacturing sectors tied to North Sea Supply Chain since fall in oil price**



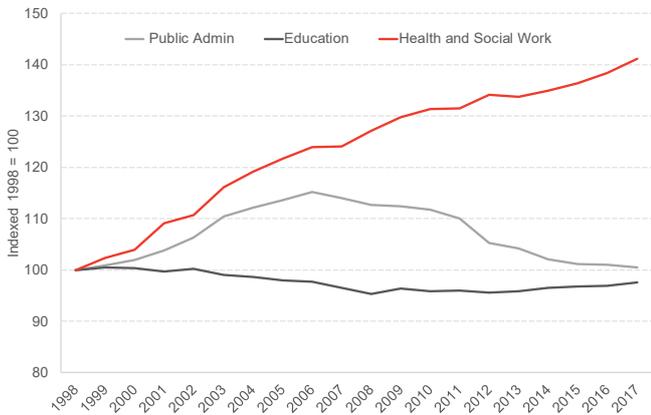
Source: Scottish Government & FAI

**Chart 25: Services in Scotland: 2016 vs. 2017**



Source: Scottish Government & FAI

**Chart 26:** Growth in ‘public services’ GDP in Scotland since 1998



Source: Scottish Government & FAI

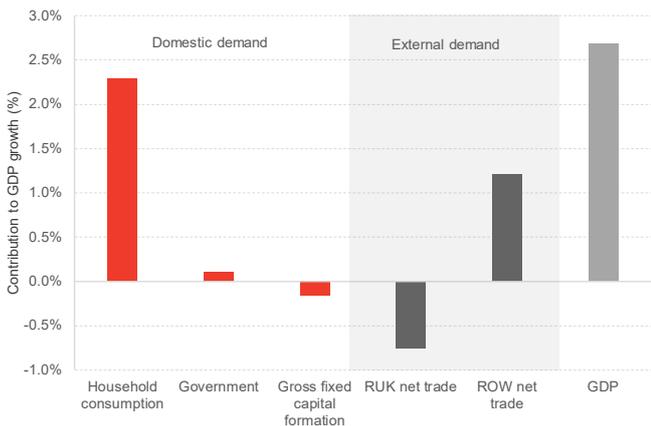
As highlighted above, international trading conditions have been positive in recent times and this has helped to boost Scottish exports.

As a result, with rest of world (ROW) exports growing faster than imports, Scotland’s economy has been supported by growing external demand – although net trade with the rest of the UK (RUK) has weakened further. (Chart 27)

The source of Scotland’s strong export performance has been from traditional sectors.

International manufactured exports are up 30% on 2010 levels (in real terms). Key to this success has been strong growth in food & drink, petrochemicals and engineering. (Chart 28) These three sectors account for over 80% of Scottish manufactured exports.

**Chart 27:** Domestic vs. external demand in Scotland for 2017 (nominal terms)

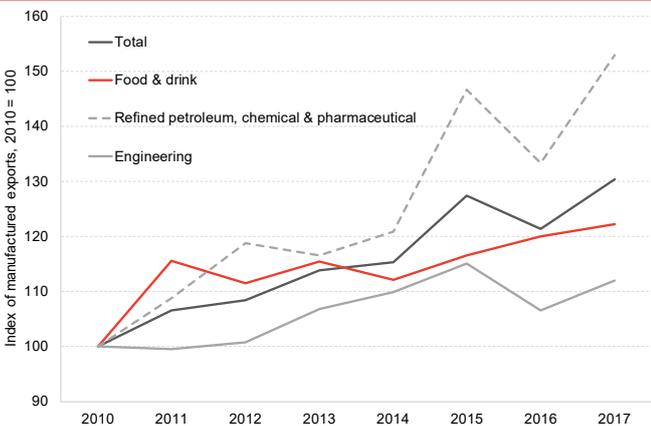


Source: Scottish Government & FAI

In sharp contrast, one area of ongoing concern is the continued decline in business investment which fell by a further 10% in 2017. In real terms, annual business investment in Scotland is some 25% below 1998 levels. (Chart 29)

It is hard to argue that this is linked to Brexit and not instead a more structural problem within the Scottish economy. The new Scottish National Investment Bank may help at the margins, but its funds are small and it seems it is a lack of demand for finance – rather than supply – that is the greatest barrier to investment.

**Chart 28:** International manufactured exports since 2010



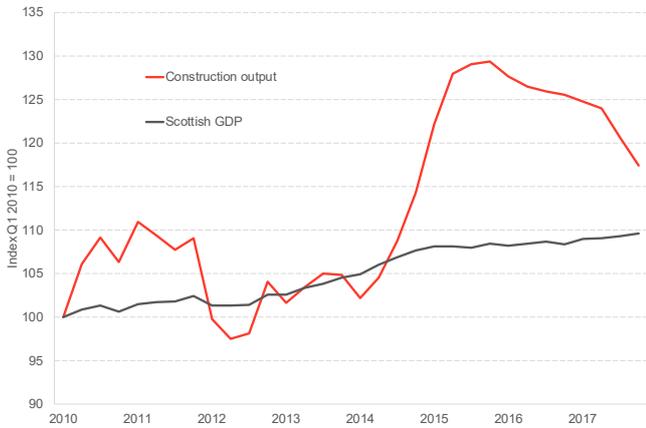
Source: Scottish Government & FAI

**Chart 29:** Business investment in Scotland as a share of GDP



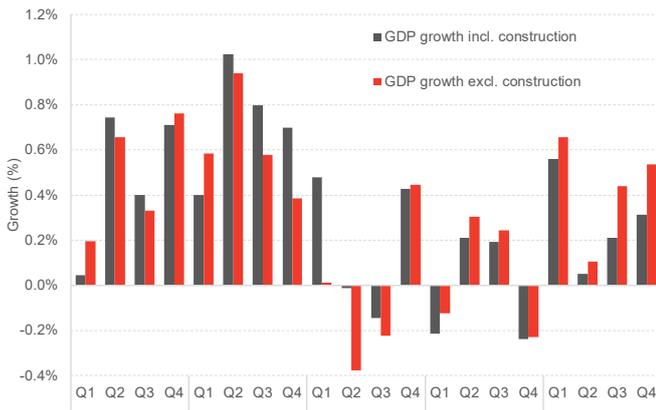
Source: Scottish Government & FAI

**Chart 30: Growth in Scottish GDP and construction sector GDP since 2010**



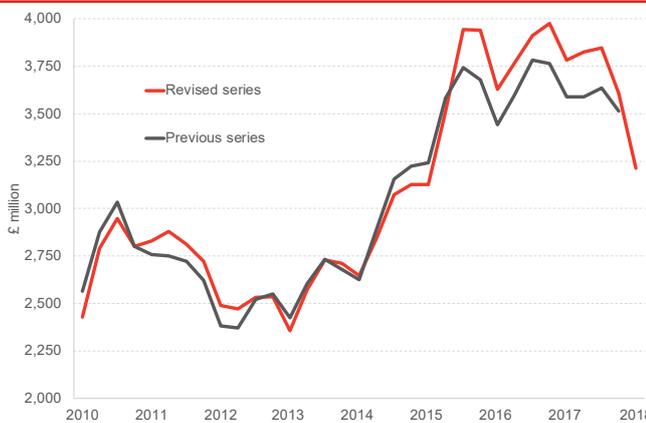
Source: Scottish Government & FAI

**Chart 31: Scottish GDP performance since 2013, with and without construction**



Source: Scottish Government & FAI

**Chart 32: Revisions to Scottish construction series**



Source: ONS

**Construction**

As highlighted above – and raised in our previous Economic Commentary – one of the key drivers of the weak performance of the Scottish economy in 2017 has been the sharp fall in construction activity. (Chart 30)

According to the most recent data, over the past 12 months construction output fell by 6.5% – and is nearly 10% below its 2015 peak.

As the chart highlights however, all of this is on the back of a sharp spike in activity during 2014 and 2015 (where output rose 27%).

The scale of these changes have had a material impact on Scottish growth rates.

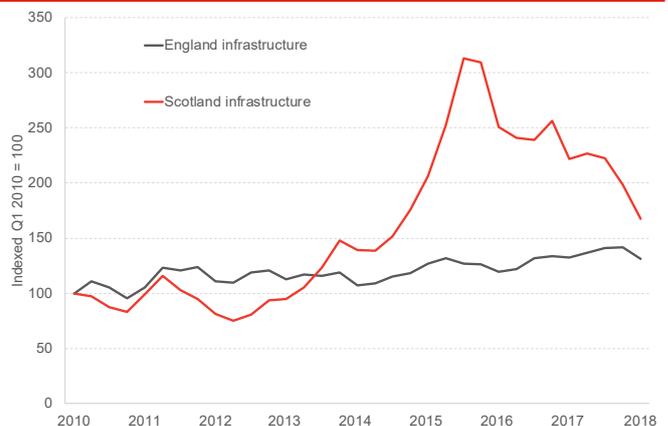
Indeed, if we remove construction then overall growth would have been 1.7% for 2017 as opposed to the 1.1% reported. To put this in context, UK growth in 2017 was 1.4%. (Chart 31)

New data published in early June from the ONS suggests that such trends are likely to continue in the new data to be released next week.

As Chart 32 highlights, even with a revised methodology to track construction activity across the UK, the sharp rise and subsequent fall in Scottish construction remains.

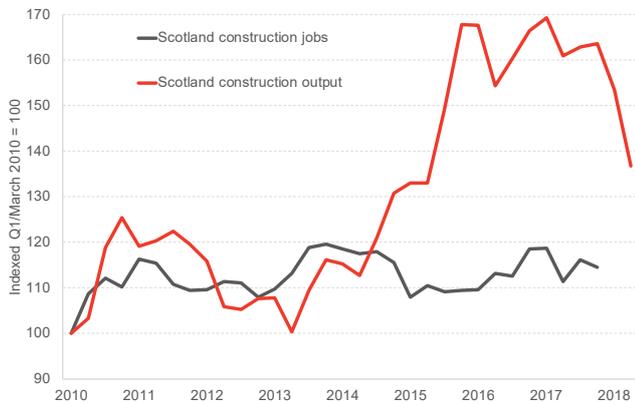
The key driver of this volatility has been the profile of infrastructure spending. Chart 33 shows the ONS series for infrastructure in Scotland vis-à-vis England. The difference is striking.

**Chart 33: Infrastructure new work in Scotland and England, Q1 2010 = 100**



Source: ONS

**Chart 34:** Output growth in the construction sector vs. job growth in the construction sector since 2010



Source: ONS

At the same time, we see nothing like this pattern for Scotland in the construction employment figures. (Chart 34)

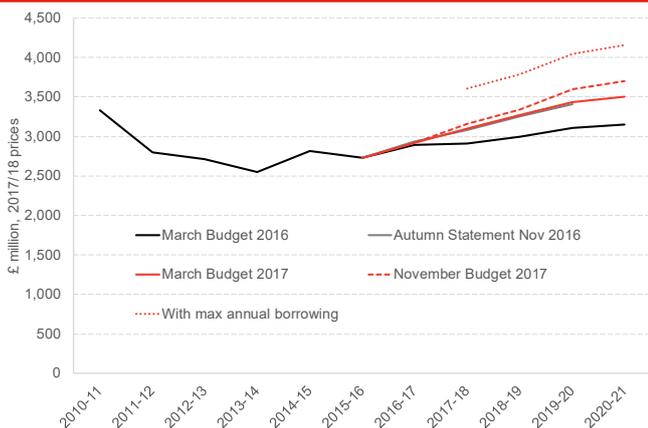
So what explains this?

We know of a small number of private infrastructure projects which will have boosted activity – e.g. £800m gas plant in Shetland (2016) and £300 million Beaulieu-Denny grid upgrade (a couple of years earlier). But these cannot explain the scale of movement in the official statistics.

The government has suggested that the completion of large and iconic public projects – e.g. the Queensferry Crossing and M8 corridor – could also be a factor.

Whilst a possibility, it can only tell part of the story. Whilst these projects have been delivered, the amount of money the government is actually spending on public infrastructure is rising. (Chart 35)

**Chart 35:** Outlook for Scottish Government capital budget

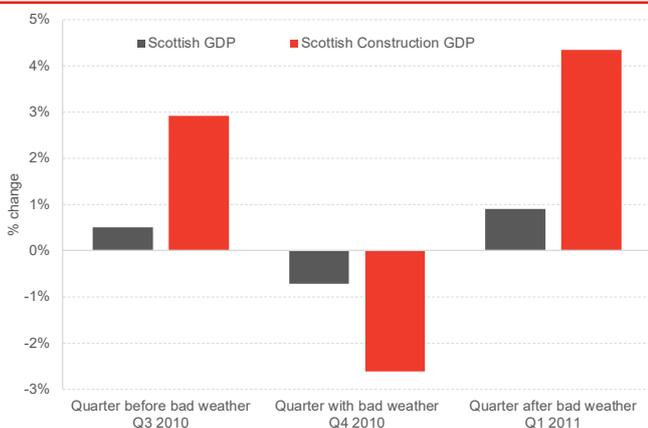


Source: FAI

One more plausible explanation might be the impact of the re-classification of NPD projects by the ONS. The subsequent re-profiling of spend and loss of additionality in public investment may be behind part of the slowdown.

But all things considered, we still find the recent statistics on construction very puzzling. We have yet to see a convincing explanation from either the ONS or the Scottish Government. We cannot help but think that there is something with the methodology being used to measure activity in Scotland that is skewing the figures.

**Chart 36:** Construction activity during bad weather (Q4 2010)



Source: Scottish Government

Irrespective of this, one thing that we can conclude with certainty is that based upon past methodology, next week's construction GDP figures will show a further sharp fall.

According to the ONS, the value of construction sector output in Q1 for Scotland is down 15% in a year.

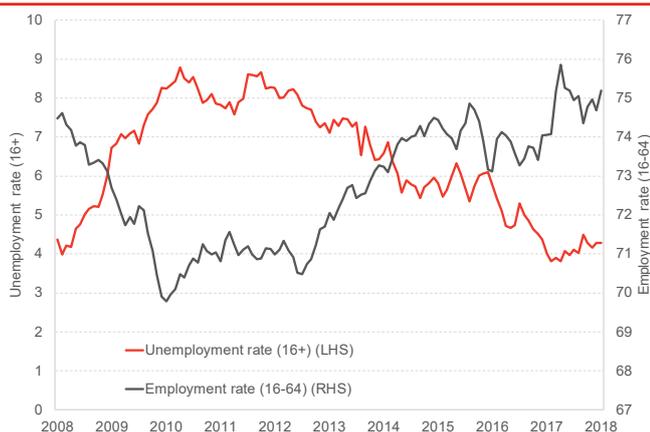
The collapse of Carillion in January may be a factor. But like the bad weather in March, any impact is likely to be temporary – as was the case back in 2010. (Chart 36)

**Table 3:** Scotland and UK labour market, Feb-Apr 2018

|                       | Employment rate (16-64) | Unemployment rate (16+) | Inactivity rate (16-64) |
|-----------------------|-------------------------|-------------------------|-------------------------|
| Scotland              | 75.2%                   | 4.3%                    | 21.4%                   |
| Quarterly change (pp) | 0.4                     | 0.0                     | -0.5                    |
| Annual change (pp)    | 1.1                     | 0.3                     | -1.3                    |
| UK                    | 75.6%                   | 4.2%                    | 21.0%                   |
| Quarterly change (pp) | 0.3                     | -0.1                    | -0.2                    |
| Annual change (pp)    | 0.8                     | -0.4                    | -0.5                    |

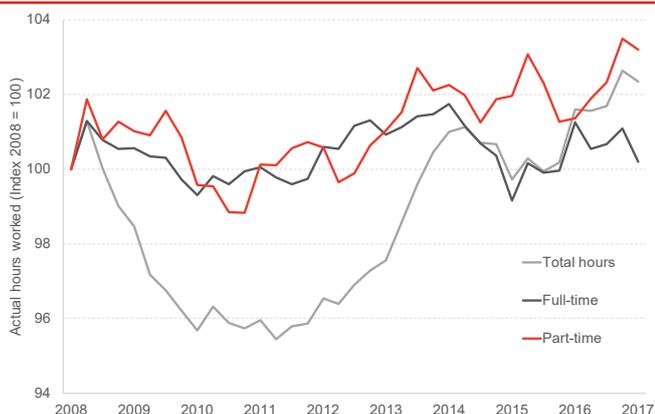
Source: ONS

**Chart 37:** Scottish employment & unemployment rate since 2008



Source: ONS

**Chart 38:** Growth in average weekly hours worked by employment status since 2008



Source: ONS

## Labour market

The latest data illustrate that the Scottish labour market continues to remain relatively robust with high employment and low unemployment. (Table 3)

There are 18,000 more people in work than a year ago but 9,000 more people in unemployment than a year ago. (Chart 37)

The quarterly unemployment rate was maintained at 4.3% over the period Feb-Apr, with the employment rate rising by 0.4% points over the same 3 months.

Scotland now has an unemployment rate slightly above that of the UK and an employment rate nearly half a percentage point lower. Although as we have discussed before, such small variations are not statistically significant.

With increased flexibility in the labour market, we continue to see changes in working hours and the type of employment being undertaken.

Chart 38 shows that part-time workers have seen their hours grow, on average, by around 3% over the past decade. In contrast, the hours worked by full time workers are now back to 2008 levels. So the rise in hours worked in the Scottish economy is coming from increases via part-time rather than full-time workers.

While self-employment remains a relatively small proportion of those in employment in the Scottish labour market, it is growing.

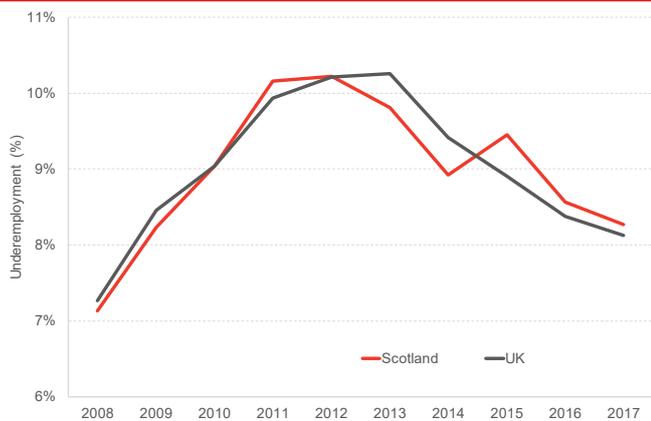
Indeed, 70% of the growth in employment over the past two years has stemmed from self-employment. (Chart 39)

**Chart 39:** Number of self-employed in Scotland, 2012 – 2017



Source: ONS

**Chart 40:** Underemployment (in terms of hours worked) in Scotland and the UK since 2008



Source: ONS

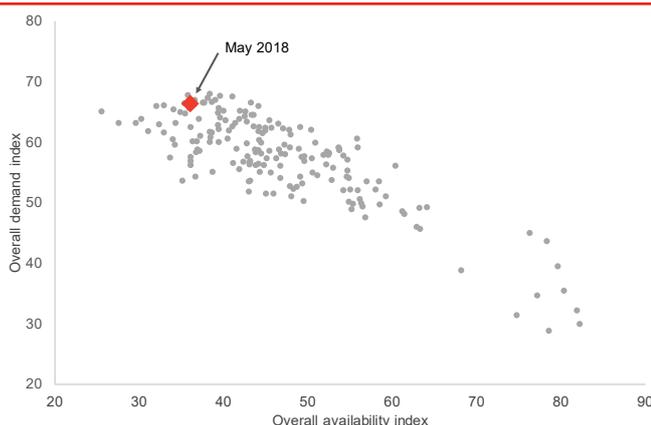
This changing pattern of labour market activity is one reason why we believe that there is perhaps more capacity to be utilised than others.

Underemployment continues to fall, but remains above pre-financial crisis levels. (Chart 40)

Similarly, despite an apparently tight labour market we continue to see little in the way of substantial wage pressure building up in the Scottish economy. (Chart 41)

Taken together – and even though data such as Chart 41 appear to show high demand and low availability of workers – we still believe that there is scope to achieve better outcomes (particularly for those in work).

**Chart 41:** Demand and availability index for Scotland since 2003



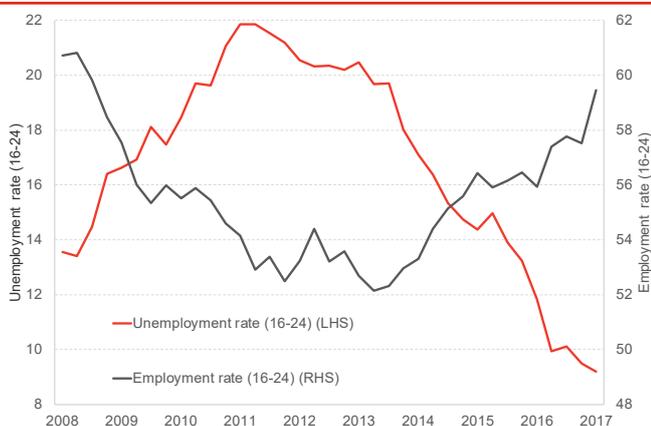
Source: Bank of Scotland & IHS Markit

One of the most notable trends over the past two years has been the substantial falls in youth (16-24 year old) unemployment.

Over 2017, youth unemployment hit a record low of 9.2%. This is less than half what it was five years ago. In 2012, youth unemployment was 20.5%. (Chart 42)

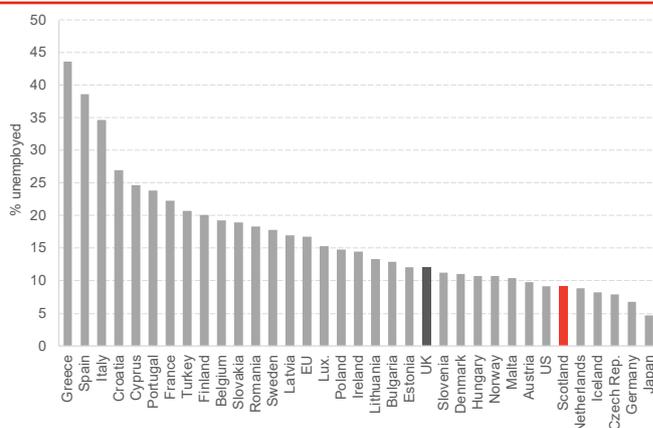
Scotland's record low rate of youth unemployment is impressive in its own right, but particularly so when compared to other parts of Europe and beyond, only a handful of which have youth unemployment rates lower than Scotland's. (Chart 43)

**Chart 42:** Youth (16-24) employment and unemployment since 2008



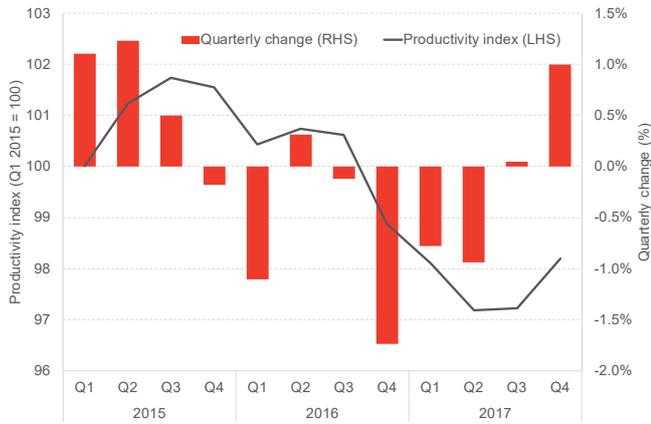
Source: ONS

**Chart 43:** 16-24 year old unemployment rate by country, 2017



Source: ONS & Eurostat

**Chart 44: Scottish productivity performance since 2015**



Source: Scottish Government

**Productivity**

The latest data shows that productivity in Scotland fell again in 2017 – and is now over 3% lower than in 2015. (Chart 44)

The reason for this – with the exception of the final quarter of 2018 – has been that the number of hours worked in the economy has been increasing at a faster rate than overall economic growth. (Chart 45).

In other words, it is requiring ever more effort simply to keep production at the same level.

Much has been made of the fact that Scotland’s productivity has ‘caught-up’ with the UK – and this is indeed the case.

But as Chart 46 highlights, the reason for this can be effectively traced back to the performance of the Scottish labour market during the financial crisis when Scotland lost more jobs than the UK as a whole. As a result, our productivity ‘improved’.

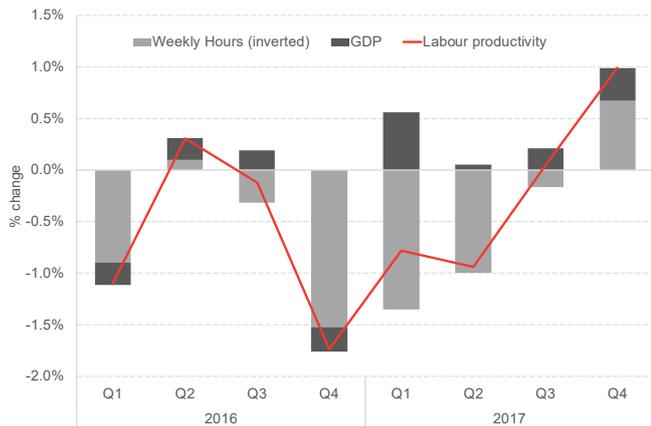
Whether or not this can be viewed as ‘catching-up’ with the UK is open to question.

Even then, catching up with the UK is not something to write home about. The UK – and its constituent parts outside of London – lags behind many of our key competitors in Europe. (Chart 47)

Boosting productivity is a key goal of policymakers.

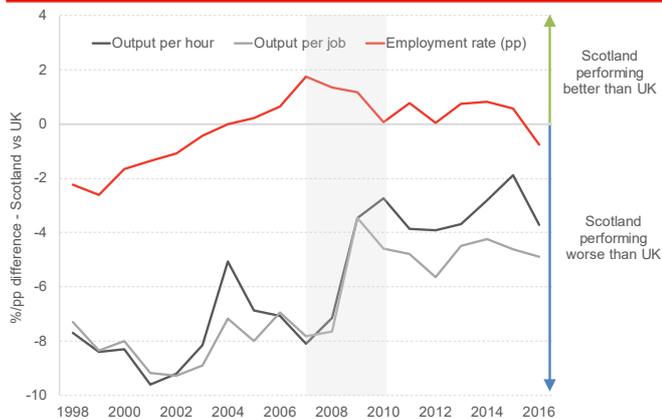
Much of the policy focus tends to be on high-end productivity improvements – e.g. so-called frontier firms or initiatives to boost innovation, R&D and university activities.

**Chart 45: Sources of change in productivity in Scotland since 2016**



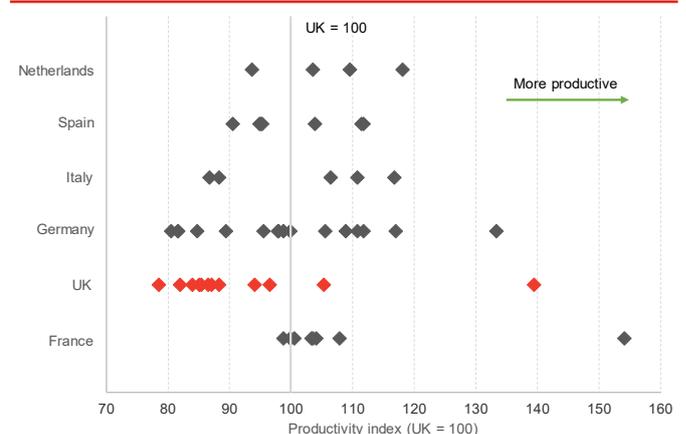
Source: Scottish Government

**Chart 46: Scotland and UK % / pp difference in employment rate and productivity since 1999**



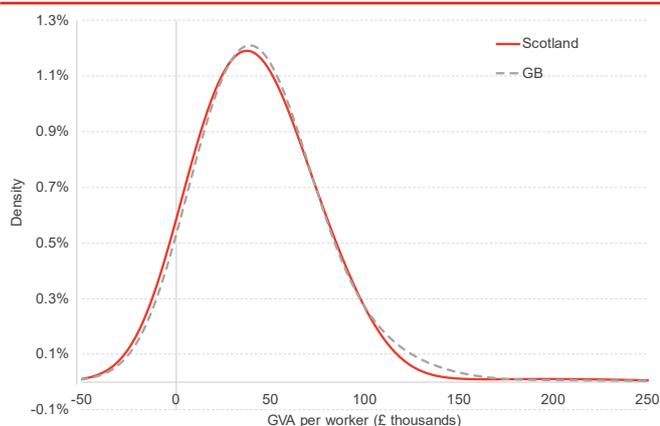
Source: FAI, Scottish Government & ONS

**Chart 47: Labour productivity in 2014 by region, UK average = 100**



Source: ONS & Eurostat

**Chart 48:** Distribution of labour productivity by firm, Scotland 2015



Source: ONS

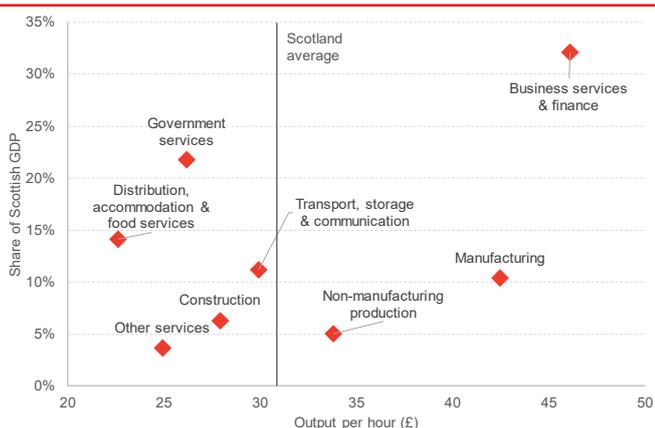
Whilst valuable, it is important to remember that the vast majority of firms in Scotland share broadly the same level of (low) productivity.

Modest improvements amongst this group, e.g. through better connectivity, improved skills, process innovation and better management arguably have greater potential to boost overall productivity in Scotland. (Chart 48)

Similarly, the make-up of the Scottish economy itself drives productivity.

As Chart 49 highlights, manufacturers tend to have amongst the highest levels of productivity in Scotland.

**Chart 49:** Relative productivity and size of sector in Scotland



Source: FAI & Scottish Government

But services make up a much greater share of our economy. So alongside boosting levels of manufacturing, improving productivity in labour intensive service sectors is just as crucial.

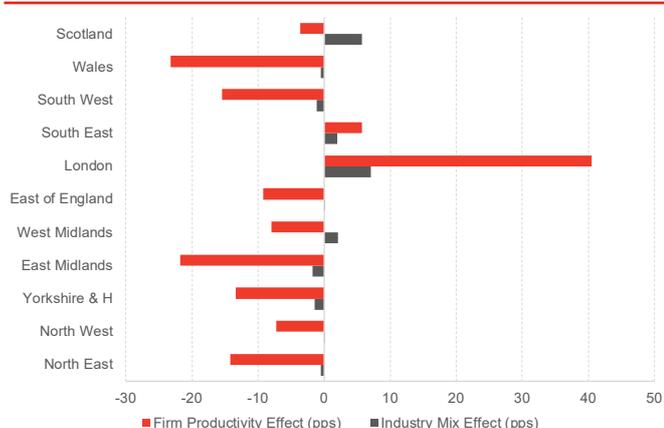
The scope for many of these local services' productivity improvements will be limited, but that is not to say that more cannot be done.

New data from the ONS aims to split up UK productivity data according to differences by –

- differences in the productivity of firms in each industry and,
- the mix of different industries in the economy.

A higher value of 'Firm Productivity' than the UK average suggests that individual firms in a given industry tend to be more productive than elsewhere. A higher value of the 'Industry Mix' implies that the UK's more productive industries tend to be located in a given locality.

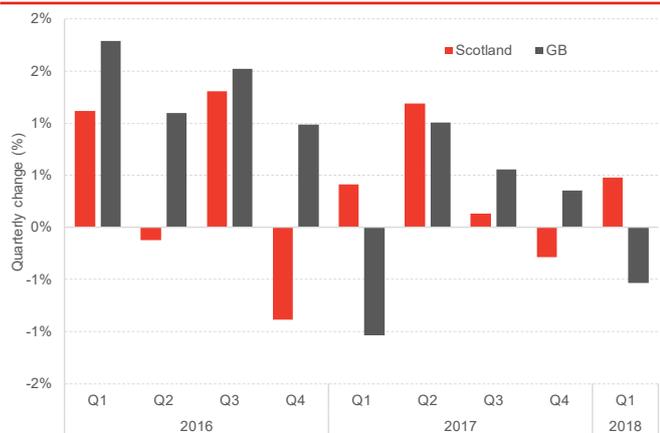
**Chart 50:** Firm productivity and industry-mix effects on average productivity, 2015



Source: ONS

For Scotland we see that compared to the UK average, like most parts of the UK at a firm level, our businesses tend to be slightly less productive than average, but we do tend to have a disproportionate number of highly productive sectors in Scotland. (Chart 50)

**Chart 51: Retail sales in Scotland and UK, quarterly real terms change since 2016**



Source: Scottish Government

**Latest economic data for Scotland**

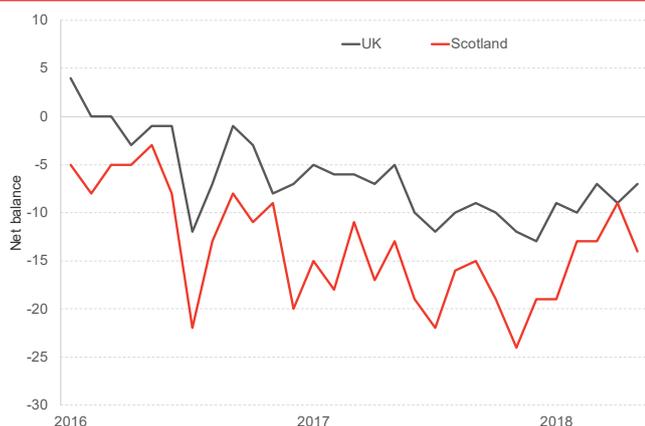
Recent data on Scotland’s economy offers some signs for cautious optimism.

Whilst significant risks remain, most indicators are pointing to a better outlook for 2018 compared to 2017.

The agreement for a transition period to 2020 for the UK’s exit from the EU has helped provide some, albeit short-term, clarity for businesses.

Retail sales for Q1 2018 were positive in Scotland, with growth of 0.5% over the quarter. This was despite the ‘beast from the east’, with growth outperforming Great Britain for only the third time in two years. (Chart 51)

**Chart 52: Consumer confidence, Scotland and UK**



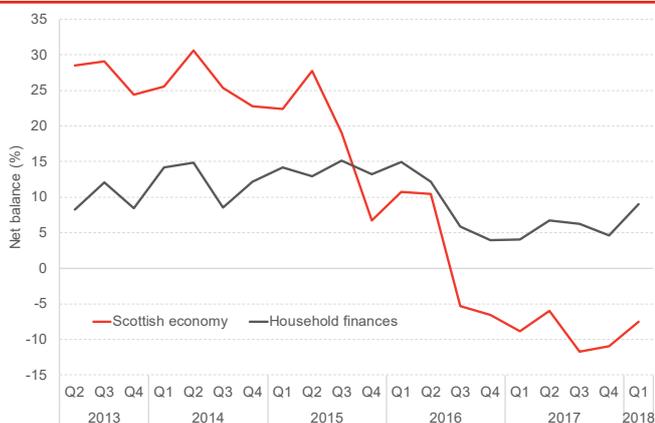
Source: GfK

Consumer confidence levels, whilst remaining weak by historical standards, have also picked up in recent times. The GfK index of consumer confidence recorded its best performance in April since the end of 2016 (although it slipped back a little in May). (Chart 52)

The Scottish Government’s own indicator of consumer sentiment has also improved slightly. (Chart 53)

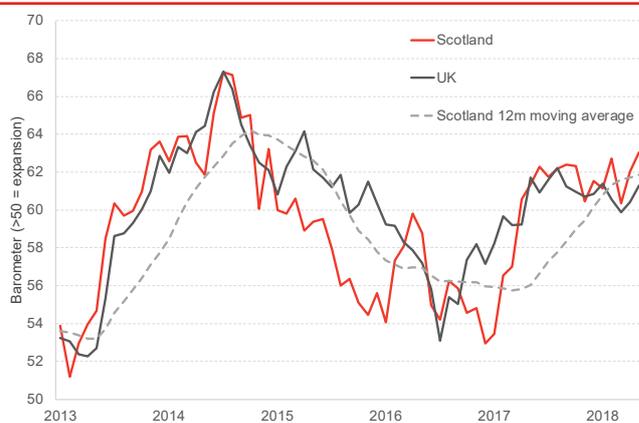
Indicators of labour market demand continue to post relatively healthy returns. The Bank of Scotland Jobs Barometer was 63 in May, and continues to be above its long-term moving average. (Chart 54)

**Chart 53: Scottish Consumer Sentiment Indicator: expectations for economy and household finances**



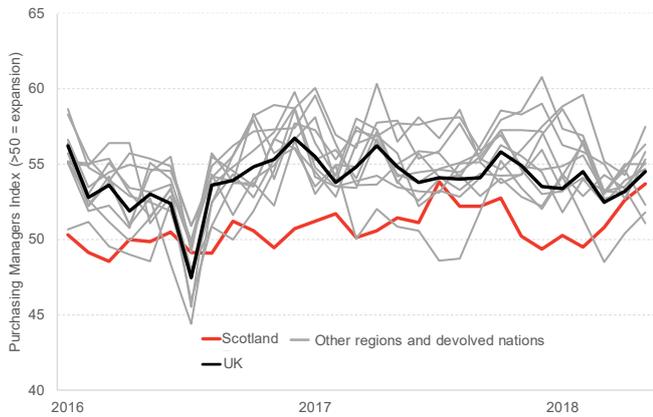
Source: Scottish Government

**Chart 54: Scottish Jobs market survey showing ongoing resilience**



Source: Bank of Scotland

**Chart 55: Royal Bank of Scotland PMI for Scotland – up-tick in activity**



Source: Royal Bank of Scotland / IHS Markit

Indicators of business sentiment – again, whilst not showing strong growth – have also been slightly more positive in recent times.

For example, after a lull at the start of the year, the PMI for Scotland hit a ten month high in May. (Chart 55).

The latest FAI-RBS Scottish Business Monitor did dip during the first quarter of 2018, but expectations for the next 3 to 6 months are more positive. (Chart 56)

Within sectors, our latest survey with the Scottish Chambers of Commerce suggests positive sentiment across the board, with the exception of tourism (which admittedly is coming off the back of a very strong 2017). (Chart 57)

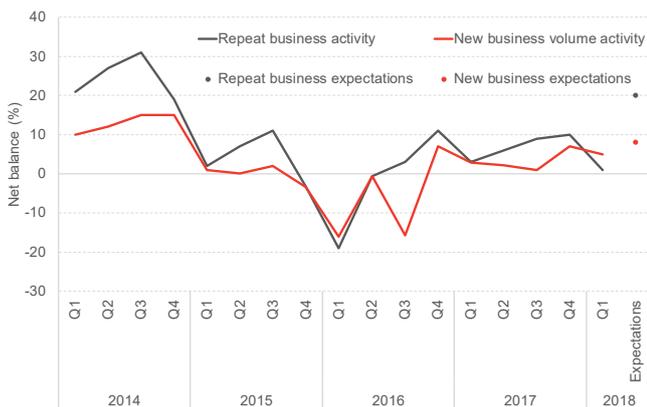
The same survey reports a pick-up in investment levels across most sectors.

Perhaps the most significant turnaround in sentiment has been in oil and gas. (Chart 58)

Boosted by oil prices returning to between \$75 and \$80 and significant cost-cutting in the sector and associated supply chain, confidence has returned to its highest level since spring 2013.

Our latest survey found that 41% of businesses are working at or above optimum levels, 75% are forecasting a rise in profits this year and around 70% see a further rise in business optimism this coming year.

**Chart 56: FAI/RBS Scottish Business Monitor shows optimism improving**



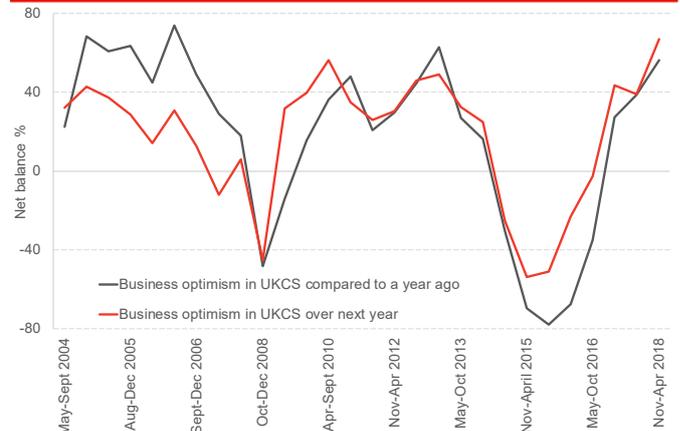
Source: FAI & RBS

**Chart 57: Scottish Chambers of Commerce Quarterly Index for early 2018 suggests a rise in confidence**



Source: FAI & Scottish Chambers of Commerce

**Chart 58: FAI/AGCC optimism in oil and gas on the rise**



Source: FAI & Aberdeen and Grampian Chambers of Commerce

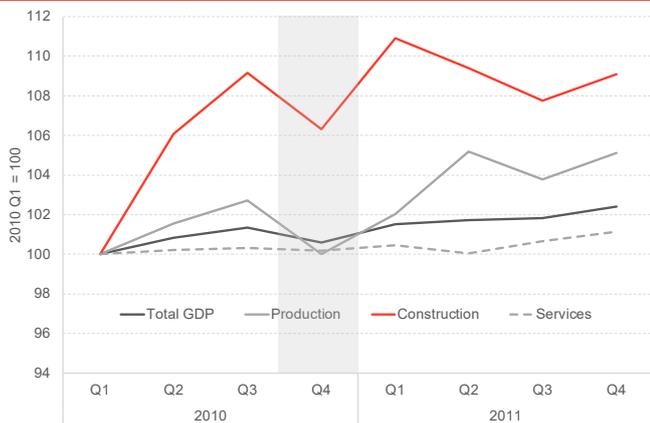
# Our forecasts

**Table 4:** Nowcasts for Q1 2018 and Q2 2018 for Scotland's GDP

|                   | Q1    | Q2    |
|-------------------|-------|-------|
| Quarterly Growth  | 0.29% | 0.29% |
| Annualised Growth | 1.18% | 1.16% |

Source: Fraser of Allander Institute

**Chart 59:** Impact of bad weather on Q4 2010 Scottish GDP statistics



Source: Fraser of Allander Institute

**Table 5:** Latest growth forecasts for the UK economy

|                     | 2018 | 2019 | 2020 |
|---------------------|------|------|------|
| Bank of England     | 1.4  | 1.7  | 1.7  |
| OBR                 | 1.5  | 1.3  | 1.3  |
| NIESR               | 1.4  | 1.7  | 1.8  |
| European Commission | 1.5  | 1.2  | n/a  |
| IMF                 | 1.6  | 1.5  | 1.5  |
| Oxford Economics    | 1.5  | 1.7  | 1.9  |
| ITEM Club           | 1.4  | 1.7  | n/a  |
| CBI                 | 1.5  | 1.3  | n/a  |

Source: HM Treasury

Before turning to our forecasts, it is helpful to review what our latest 'nowcasts' are saying about the outlook for the Scottish economy.

These use the latest official and unofficial data (e.g. business and employment surveys) to provide a statistical prediction of current growth.

Our latest figures, including data up to early June 2018, predict growth of around 0.3% in Q1 and Q2 2018 and 1.2% for the year. This points to growth below trend, but ahead of 2017. (Table 4)

One word of caution. Our nowcasts are based upon trends from a variety of data points at an economy wide and/or sectoral level. Individual factors – e.g. the impact of bad weather on a retailer or the collapse of a construction firm – will not be immediately picked up.

In each individual quarter, the actual GDP series will therefore differ for a variety of reasons.

It is highly likely that the GDP data for Q1 will be weak because of the bad weather in March (the so-called 'beast from the east').

However, we expect such disruption to be temporary. It therefore has not had a material impact on our forecasts for the year as a whole.

The last time we had such poor weather was back in winter 2010. As Chart 59 highlights, the weather did have an impact on Scottish GDP in Q4 2010, but the blip was temporary.

It will be important therefore, not to read too much into any weak GDP figure next week. A complete picture will be possible only once the first 6 months of data are available this autumn.

For comparison, the latest forecasts for the UK as a whole are highlighted in Table 5.

Overall, most organisations are predicting that growth will remain below trend for the foreseeable future. The OBR are amongst the most pessimistic, forecasting growth of just 1.3% in 2019 and 2020.

**Table 6:** FAI forecast Scottish GDP growth (%) 2018 to 2020

|              | 2018        | 2019        | 2020        |
|--------------|-------------|-------------|-------------|
| <b>GDP</b>   | <b>1.2%</b> | <b>1.3%</b> | <b>1.3%</b> |
| Production   | 1.4%        | 1.5%        | 1.5%        |
| Construction | 0.8%        | 0.9%        | 0.9%        |
| Services     | 1.2%        | 1.3%        | 1.2%        |

Source: Fraser of Allander Institute

**Chart 60:** Growth to remain below trend through forecast

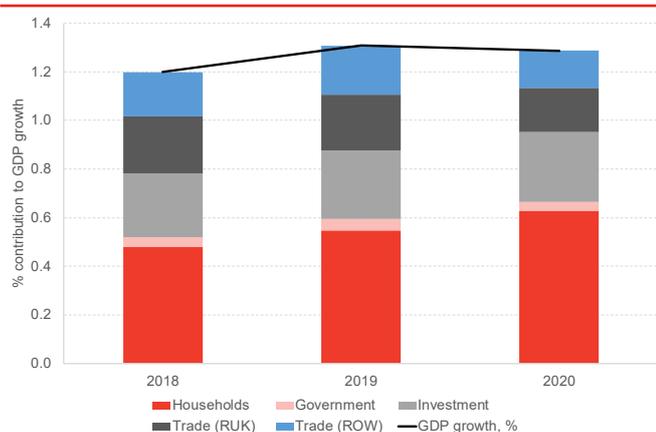


Source: Fraser of Allander Institute

\* Actual data to Q4 2017, central forecast with forecast uncertainty for 2018 – 2020.

Uncertainty bands sourced from accuracy of past forecasts at different forecast horizons.

**Chart 61:** Contribution to FAI forecast 2018 to 2020



Source: Fraser of Allander Institute

Turning to our forecasts, as in the past we report a central forecast but calculate uncertainty bands to set out a likely range within which we predict Scottish growth will lie.

Our forecasts are little changed on March.

The assessment is still the same – we believe that the economy will remain below trend, but that growth will pick-up this year. (Table 6)

**Our forecast is for growth of 1.2% in 2018.**

We share the SFC’s view that the Scottish economy faces long-term challenges – e.g. an ageing population and weak productivity. But in the short-term, we think that there is the potential for demand to pick-up as the economy makes up recent lost ground.

At a sectoral level, services should continue to make the greatest overall contribution to growth. Tourist facing businesses – such as hotels – whilst off to a slower start in 2018 should continue to do well. (Chart 60)

Weak earnings growth will mean that household spending – and the industries that they support (e.g. in retail) – will remain fragile.

Production sectors – particularly manufacturing – should continue to benefit from the weak pound and the pick-up in activity in the North Sea. Scotland’s food & drink industry continues to perform strongly and shows no sign of easing off.

**In looking forward, we have lowered our central forecast for growth in 2019 and 2020 to 1.3% in both years. (Chart 61)**

This reflects a slightly weaker outlook for the UK as a whole. We expect the growth gap between Scotland and the UK to remain over the next couple of years, but to continue to narrow.

There are significant risks to such forecasts however. We clearly do not live in ‘normal’ times, with Brexit uncertainty having a cooling impact on investor sentiment. The possibility of tit-for-tat tariffs with the US is also another significant risk. As a result, the potential for a major change in confidence impacting on the outlook cannot be ruled out.

However, should greater clarity be provided over the UK’s future relationship with the EU post-Brexit, we should see some pick-up in activity.

**Table 7:** FAI Labour Market forecasts to 2020

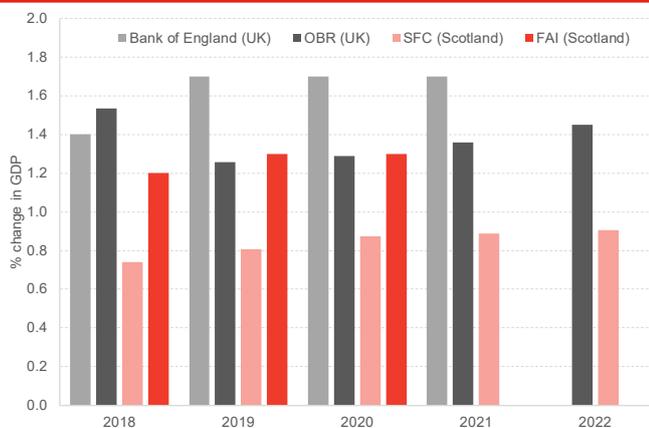
|                                 | 2018             | 2019             | 2020             |
|---------------------------------|------------------|------------------|------------------|
| <b>Employee jobs</b>            | <b>2,493,150</b> | <b>2,516,750</b> | <b>2,540,350</b> |
| % employee job growth over year | +0.9%            | +0.9%            | +0.9%            |
| ILO unemployment                | 115,150          | 118,000          | 124,800          |
| Rate (%) <sup>1</sup>           | 4.3              | 4.4              | 4.5              |

*Source: Fraser of Allander Institute*

Absolute numbers are rounded to the nearest 50.

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

**Chart 62:** Scotland and UK GDP growth forecasts, 2018 – 2022



*Source: Fraser of Allander Institute*

We expect unemployment to rise slightly toward a level consistent with more medium-term trends of around 5%. So any reported rise in unemployment in the coming months should pose little concern. (Table 7)

On balance, our forecasts put us slightly behind those made by the Bank of England for the UK as a whole, but broadly in line with the OBR.

We remain more positive than the Scottish Fiscal Commission. (Chart 62)

# Policy context

## The medium-term fiscal outlook for the Scottish Government

The Scottish Government’s 2018/19 Budget is the 2nd of 5 budgets to be set this parliamentary term.

It contained allocations for 2018/19 only (the last time a Scottish Budget provided anything beyond single year allocations was 2014/15).

However, the government’s new Five Year Financial Strategy, published last month, provides a steer on how the pattern and distribution of Scottish resource spending (day-to-day public services) is likely to evolve over the next few years.

The Strategy contains forecasts of the Scottish budget for five years, based on forecasts for devolved tax revenues and the outlook for the block

grant. It also sets out broad spending commitments.

### Government spending priorities

The most obvious spending change during this parliament results from the devolution of ten social security benefits. The first of these, an enhanced Carer’s Allowance, will come on stream in summer 2018.

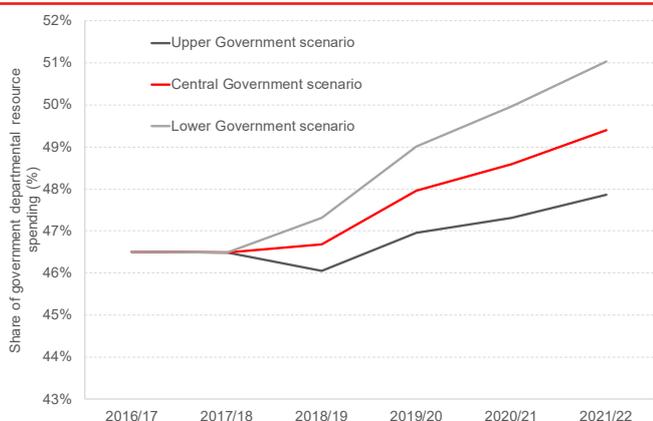
At face value the resource budget will be over £3bn higher, at £30.5bn, than it was in 2016/17. However, if we strip out the resources being transferred to pay for these new benefits and consider the Scottish budget on a like-for-like basis, the resource budget – based on the Scottish

Government's latest scenarios – is expected to be around half a percent lower in real terms by the end of this parliament compared to the end of the preceding parliament.

How will the government prioritise its declining resource budget? The Five Year Strategy identifies six key commitments 'that support the Government's social contract and require significant investment'. These are:

- Health: to increase NHS resource spending by £2bn over the parliament.
- Police: to protect the resource budget of the Scottish Police Authority in real terms over the parliament.
- Early learning and childcare: to increase resource funding to local authorities to £567m annually by the end of the parliament to support 1,140 hours per year of childcare.
- Attainment: to allocate £750m to the Attainment Scotland Fund over the parliamentary term.
- Higher Education: to continue to allocate £1bn each year to the sector.
- Social Security: to deliver a more generous Carer's Allowance Supplement from 2018 and a new Best Start Grant (replacing Sure Start Maternity Grant) from 2019. These policies imply costs of £35m in 2018/19, rising to £56m in 2019/20 and more thereafter.

**Chart 63:** Resource spending on health as a share of departmental resource budget, 2016/17 to 2021/22



Source: Fraser of Allander Institute

## Implications for non-priority spending

But if the government's overall resource budget is falling in real terms, what is the impact on the government's 'other' areas of spend (those that are not mentioned as a specific priority)?

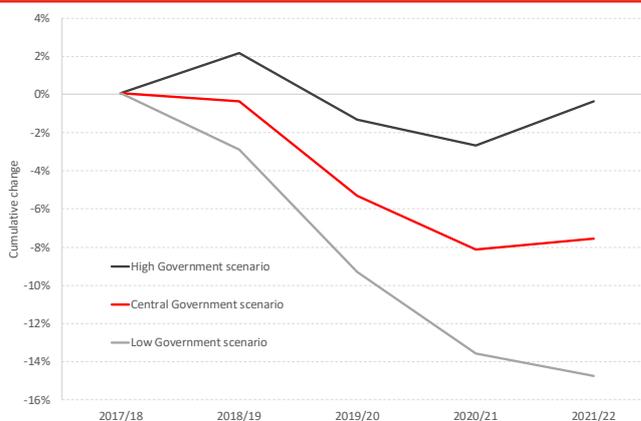
The Five Year Strategy identifies a 'central scenario' – based on the latest forecasts for the block grant and Scottish tax revenues – as well as an 'upper range' and a 'lower range' scenario around that. The upper and lower range scenarios are developed by considering historic variation in tax revenues that have been transferred to Scotland.

Under the government's 'central scenario', **the resource budget available for these other areas will fall by around 10% in real terms between 2016/17 and 2021/22.**

The areas included in this catch-all 'other' category include local government (including schools outwith the ring-fenced Attainment Fund), enterprise, the environment, tourism and culture.

However, the outlook for local government is unlikely to be as bleak as this. The analysis up until this point does not include Non-Domestic Rate Income (NDRI). **Including forecasts for NDRI, the resources available for 'other' spending areas will fall by around 8% over the course of the parliament in real terms, under the central scenario.** (Chart 64)

**Chart 64:** Cumulative real terms change in spend on 'other' policy areas



Source: Fraser of Allander Institute

Of course, within these aggregates lie other commitments. Some of these are legally binding – for example £1bn of repayments per year to fund historical PFI and NPD capital programmes. Others are policy related – for example, the government has pledged to introduce some form of ‘Income Supplement’ for low income families. And there will be ongoing costs from the implementation of the new fiscal powers, particularly in establishing the Social Security Agency.

## Uncertainty and alternative scenarios

As noted in the Five Year Strategy, there is significant uncertainty around the Scottish budget outlook. The Five Year Strategy considers upside and downside risks around the central scenario, and the implications for spending on ‘other areas’ if these upside or downside risks materialise.

If there was additional departmental spending for Whitehall, and if devolved revenues perform better than forecast, then the Scottish Government’s more positive budget outlook could be realised. Under this scenario, spending on ‘other’ areas would fall by slightly less than 3% over the period 2016/17 – 2021/22.

On the other hand, there are also downside risks. Under the government’s ‘lower scenario’, spending on ‘other’ areas of the budget will fall by 17%, even if buoyant NDR income is taken into account.

Arguably, the downside risks in the Strategy are less likely to be realised than the upside risks. This is partly because it has been clear for some time that the UK Government likely to announce additional NHS spending at the UK level, which will generate consequential for Scotland. But it is also partly because the central scenario is based on the latest forecasts for tax revenues and the block grant adjustment, which envisage an unprecedented divergence in relative wage growth (and hence tax revenue performance) between Scotland and rUK over the next two years.

Indeed, in the end the UK Government announce substantial additional funding for the NHS in England on 18 June. It will be up to the Scottish Government to determine how it might distribute any consequential across its portfolio responsibilities. In its Five Year Strategy however, it indicates that it will pass on any consequential arising specifically from health spending in England to the Scottish health budget. This would suggest that ‘other’ areas

of the Scottish budget will face no less of a squeeze as a result of the consequential arising from the increase in UK Government health spending.

Another question is whether or not the government is or might consider making further changes to tax policy over the remainder of the parliament – something that Cabinet Secretary for Finance Derek MacKay refused to rule out when giving evidence to the parliament’s Finance and Constitution Committee.

Of course, if the expected increase in health spending by the UK Government is funded at least in part by an increase in rUK income tax – which would not apply in Scotland – this would pose some interesting tax setting dilemmas for the Scottish Government in its December budget.

## Conclusions: Scotland’s fiscal outlook

The publication of ‘Scotland’s Fiscal Outlook: the Scottish Government’s five year financial strategy’ establishes the government’s policy priorities over the remainder of this parliament (and beyond), and the financial implications of those commitments.

The Five Year Strategy is not a budget document however, and it says little about the plans for portfolios or policies that are not explicitly mentioned in the strategy itself.

Over the course of this parliament, spending on ‘other’ areas could fall slightly or much more substantially, depending on how the government’s budget evolves. Either way, the clear conclusion is that the funding settlement is likely to be tight.

The Five Year Strategy says little about how the government’s plans might change if (and when) the financial outlook evolves. If the budget outlook improves will ‘other’ policy priorities be allocated additional resources, or might existing priorities be allocated more?

The publication of the Government’s Five Year Strategy means we are a little clearer about the fiscal priorities of the government, but there remains significant uncertainty around the budget outlook. The three remaining Scottish budgets of this parliament will be keenly watched.

# Economic Perspectives

## Could a reduction in alcohol consumption be good news for the UK economy?

Kevin Connolly, Katerina Lisenkova and Peter G. McGregor, Fraser of Allander Institute.

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*\*The research underlying this article was funded by the Institute of Alcohol Studies. However, the responsibility for the analysis and opinions expressed in this paper are the sole responsibility of the authors. We would like to acknowledge Aveek Bhattacharya's helpful comments in the development of this paper.*

### 1. Introduction

The UK has one of the highest alcohol consumption rates per capita in the world being ranked 25th according to the latest global World Health Organisation report on alcohol (WHO, 2014). While there are several well documented detrimental effects of alcohol consumption on health, crime and productivity (e.g. Holmes et al, 2016), the sector also contributes positively to the economy through its production and sales activities.

Health concerns have prompted governments' efforts in the UK and elsewhere (including in Scotland) to seek to reduce harmful alcohol consumption, whether through attempts to shift public taste away from such consumption or through the imposition of higher taxes on alcohol. While most would accept that such policies would be likely to have beneficial health effects, there is concern that it would have detrimental effects on the UK economy. For example, previous "impact studies" have produced estimates of the substantial levels of output and employment supported by the UK alcohol industry (Oxford Economics, 2016; Berkhout et al, 2013).

In this study we explore the likely macroeconomic consequences of policy-induced reductions in alcohol consumption using the same basic methodology as impact studies.<sup>1</sup> Conventional industry impact studies are generally not used to address the issue of the economic effects of a shift in tastes away from alcohol or the impact of higher alcohol taxation. In general, in both these cases the reduction in the consumption of alcohol is typically only one aspect of the total impact: this is the "gross" impact of the reduction in expenditure on alcohol and this tends to be the focus of industry impact studies. However, a shift in taste away from alcohol would normally imply a shift in favour of the consumption of other goods and services, and it is the "net" impact of this switch in consumer spending that matters to calculate the overall impact on the economy. Similarly, a rise in alcohol taxation would indeed be expected to reduce consumption on alcohol, but would augment tax revenues and hence increase government current expenditure.<sup>2</sup> Again, the overall impact on the aggregate economy reflects the "net" effect of the reduction in consumption of alcohol and increase in public spending.

Of course, we know that the "gross" macroeconomic impact of a reduction in consumption of alcohol must be negative: the reduction in demand will reduce economic activity.<sup>3</sup> From a policy perspective that focusses only on the gross impacts, the adverse economic consequences of a reduction in consumption would have to be traded off against any beneficial health or wider social effects. However, since the net effect is generally the outcome of conflicting pressures, even the direction of the net macroeconomic

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<sup>1</sup> We develop an alcohol-disaggregated input-output table and model of the UK. For a brief account of this see Fraser of Allander (2018).

<sup>2</sup> In principle, tax revenues could fall in response to a rise in taxes on alcohol, but the evidence suggests the reverse. Of course, if they were to fall, the net effect would in this case would be even more adverse than the gross effect.

<sup>3</sup> This certainly has to be true within an input-output context.

outcome is unknown a priori and, in principle at least, a policy aimed at shifting tastes or changing taxes to reduce alcohol consumption could yield a “double dividend” of improved health outcomes and a positive (net) economic impact. This paper explores, quantitatively as well as qualitatively, the issue of whether there appears to be a trade-off between health benefits and economic activity of a reduction in alcohol consumption or whether there is the potential for a “double dividend” in the UK.

The paper is organised as follows. Section 2 provides some background to the study. Section 3 considers the macroeconomic impacts, net as well as gross, of a switch in taste away from alcohol consumption. Section 4 explores the (gross and net) macroeconomic impact of a rise in taxation on alcohol. Section 5 provides a brief conclusion.

## 2. UK alcohol policy

As in many countries, the legal age for purchases of alcohol in the UK is 18, whereas the legal age for consumption depends on a variety of factors, including location and type of alcohol.<sup>4</sup> While there are no other legal limits on the purchase or consumption of alcohol, the UK government recommends that both men and woman should not consume more than 14 units per week . (Department of Health, 2016).

In the past, the UK Government has set out policies with the objective of reducing the rate of harmful alcohol consumption. The UK Alcohol Strategy (UK Government, 2012) is the most significant recent UK alcohol policy and its objective is to reduce excessive alcohol consumption through a series of actions.

One problem identified by the UK Government is the availability of cheap alcohol. To combat this the UK Alcohol Strategy outlines actions aimed at reducing consumption including: introduction of a minimum juice content rule in cider, increase of the duty on high strength beer (>7.5%) together with a reduction in duty on lower strength beer (<2.9%). The UK strategy also mentions the possibility of banning multi-buy sales discounts (e.g. ‘buy one get one free’) as well as the introduction of a minimum unit price for alcohol but neither policy has been implemented at the UK level. However, the Scottish Government did act; it implemented a ban on multi buy sales in 2012 and – after a lengthy legal challenge by the whisky industry – it finally introduced a minimum unit price for alcohol (of 50p) in May 2018. These measures (Scottish Government, 2017) were taken to combat the greater health impacts in Scotland, given that its alcohol consumption is c. 18% higher than in England and Wales<sup>5</sup>.

Along with multi-buy deals, the UK Government identified alcohol advertising as a potential factor limiting reduction in consumption, especially among the young (18-24). A ban on advertising was mooted, but not adopted as the government noted that there were already strict advertng controls in place to prevent advertisers from targeting and appealing to young people (UK Government, 2012).

The UK Government has also set out other alcohol-focused policies. Launched in 2011, the Public Responsibility Deal is an agreement between the government, industry, public bodies, NGOs and academics to promote public health goals. It includes 11 pledges related to alcohol ranging from alcohol labelling to support for the Drinkaware charity (IAS, 2015). Given the voluntary nature of the agreement there is, however, the possibility of a conflict of interest for the alcohol industry with regard to the pursuit of public health objectives.

The UK government sets alcohol duty levels which affect the cost of alcohol and hence the level of consumption. To induce a reduction in consumption, between 2008 and 2012, an alcohol duty escalator (ADE) was put in place, which increased alcohol duty 2% above the rate of inflation on an annual basis. However, in 2014 the ADE was scrapped (2013 for beer) and in 2015 and 2016 duty rates were frozen (IAS, 2017a). Duty rates in 2017 rose in line with inflation but were again frozen for 2018. Overall however, there

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<sup>4</sup> A unit of alcohol is defined in the UK as 10ml (or 8g) of pure alcohol (NHS, 2018).

<sup>5</sup> The key elements of the Scottish Government’s alcohol policy are: no multi-buy promotions (implemented in 2012) and the introduction of a minimum unit price as introduced on 1st May 2018, after a lengthy legal challenge by the Scotch Whisky Association (SWA) on behalf of the whisky industry.

has been a significant drop in the real terms value of alcohol duty since 2012.

### 3. The macroeconomic impact of a reduction in alcohol consumption

In Section 2 we noted the emphasis on the reduction of harmful alcohol consumption in the UK Government's alcohol strategy. However, while this strategy identified the steps to be undertaken to achieve this objective, it did not specify any clear target for the reduction in alcohol consumption. However, the World Health Organisation (WHO) recommends an overall 10% reduction in alcohol consumption to reduce negative health effects (WHO, 2018). Using this WHO recommendation, in this paper we explore the macroeconomic impact of a 10% reduction in UK alcohol consumption.

To explore these impacts we use an Input-Output (IO) model calibrated using a purpose-built 2010 UK alcohol-disaggregated IO table. Within the alcohol industry we identify two key components, production and consumption. In this paper the focus is on consumption changes and within the alcohol disaggregated IO table there are three consumption sectors: hotels, other on-trade (including pubs/bars/ restaurants/ nightclubs etc.) and retail (off-trade).

#### 3.1 The "gross" impact of a 10% reduction in alcohol consumption

We assume that all three alcohol consumption sectors (hotels, other "on-trade" and retail) experience a 10% reduction in the value of alcohol sales with the price of alcohol fixed. We investigate the economy-wide impacts of such fall in alcohol consumption, which could, for example, reflect the impact of a successful government campaign to shift consumer taste away from alcohol.

In this scenario it is important to note that the income saved as a consequence of the reduction in alcohol spending is not reallocated to other consumption. Scenario 1 isolates the effects of only reducing alcohol consumption. This is broadly the approach used by sectoral "impact studies" that seek to identify the overall impact of a particular sector.

As expected, a 10% reduction in sales by value in all three alcohol sales sectors (hotels, other on-trade and retail) – with no assumed reallocation of spending – has a negative effect on GVA (the value of final goods and services produced in the economy, i.e. accounting for intermediate consumption, taxes etc.)<sup>6</sup> and employment. Overall there is a reduction in GVA of £2.60 billion. This is broadly consistent with the Oxford Economics' (2009) report, which stated that the alcohol industry in 2008, supported £28.6 billion of UK GDP. For employment, a 10% reduction sees the loss of 63,344 full time equivalent jobs (FTEs) – with nearly 55% of these directly within the alcohol sales sectors (34,779), plus 1,200 in manufacturing of alcohol (5.3% of base year). IAS (2017b) notes that in 2014, the UK alcohol sales industry supported 740,000 UK jobs<sup>7</sup>, with only between 30-56% (depending on the sector) being full-time jobs. Our results look to be of the appropriate order of magnitude given a 10% reduction in alcohol consumption<sup>8</sup>.

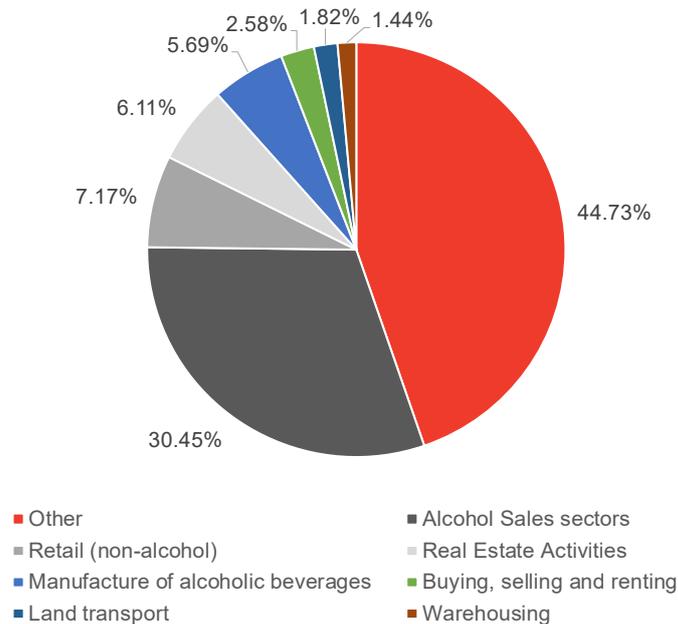
Obviously the reduction in GVA is not evenly distributed across the economy. Its distribution depends on sectors' scale and the inter-sectoral links with alcohol sales sectors. Chart 1 illustrates the sectoral distribution of the overall GVA change. The largest GVA reduction is in the alcohol sales sectors. The other significant GVA changes are the sectors which are inherently linked to the sales of alcohol but are not directly impacted.

<sup>6</sup> GVA is a more important measure for the economy and is closely related to GDP.

<sup>7</sup> There were also 30,000 jobs in alcohol production.

<sup>8</sup> Due to a large percentage of part-time workers in the alcohol sales industry the FTE results would be much lower than the 740,000. Using a scaling factor of 0.5 the FTE becomes 370,000, which with a 10% reduction is in the same magnitude of the model results.

**Chart 1:** Sectoral composition of GVA decline in alcohol consumption



Source: Fraser of Allander Institute

### 3.2 The “net” impact of a 10% reduction in alcohol consumption in favour of other goods and services

If consumers reduce their spending on alcohol it is likely they would switch their spending to other goods and services, rather than saving it (as assumed in the previous section). Not surprisingly, the net effects depend to a degree on what goods and services are consumed instead of alcohol. We consider a number of possibilities, but begin by assuming that the reallocation simply follows the overall pattern of household expenditure in the IO table.

Using the income saved from reduced consumption expenditure on alcohol to spend on other goods and services clearly reduces the scale of the negative impact on the economy. Indeed, ex ante, even the direction of change in aggregate economic activity is strictly ambiguous: depending on the structure of the alcohol-related industries relative to all other industries, it is perfectly possible that the switch in consumption away from alcohol could actually increase aggregate economic activity.

A 10% reduction and reallocation of spending (in line with the IO table) generates a small positive GVA impact of £23 million. Also, FTE employment falls by 21,680, much less than the 63,344 “gross” impact figure noted above in Section 3.1. These results imply that while there are fewer jobs, they are better paid jobs with higher levels of value-added per employee.

**Chart 2:** GVA and employment changes for alcohol sectors



Source: Fraser of Allander Institute

Chart 2 summarises the employment and GVA effects in the alcohol sectors (the three sales sectors plus alcohol manufacturing). All four are negatively affected in terms of both employment and GVA due to the reduction of sales. The greatest part of the employment and GVA reduction occurs in the other-on trade sector. That is because this sector has by far the largest sales value and is more labour intensive as compared to the other sales sectors – and many jobs within this sub-sector are low paid.

#### 4. The impact of a 10% increase in alcohol duty with and without recycling of additional government revenues

The UK alcohol strategy (UK Government, 2012) identified the low price of alcohol as problematic, since the lower price drives an increase in consumption (refer Meng et al (2013), which can, as already noted, lead to various adverse health effects. The simplest method to reduce consumption is to increase the price – either through a tax or minimum unit pricing (MUP). While there is evidence that MUP could lead to a reduction in ‘health inequality’ (Holmes et al, 2014), there has been substantial industry objections to MUP policies<sup>9</sup>. In time MUP may become a UK-wide policy, however the most likely option is an increase in alcohol tax duty. That is the focus of this scenario.

There is no ‘one size fits all’ alcohol tax in the UK. Instead the tax levied is dependent on the type of alcohol. In this scenario we assume a broad 10% increase in the tax duty on all types of alcohol across the three consumption sectors. An important point that needs to be accounted for is the consumption response to a change in price for each type of alcohol. For this the own-price elasticities from Meng et al (2013) listed in Table 1 are used. Most elasticities are between 0 and -1, indicating that as the price rises demand falls, but less than in proportion to the fall in price so that the total expenditure on alcohol increases. Accordingly, with most of the elasticities less than unity, demand falls less than in proportion to the rise in price, so that Government revenues actually increase in response to a tax rise.

<sup>9</sup> One of the key opponents to this minimum unit pricing has been the Scottish whisky industry. <https://www.theguardian.com/society/2017/jul/24/scotch-whisky-industry-attacks-minimum-price-plans-as-blunt-instrument>; <http://www.bbc.co.uk/news/uk-scotland-38390535>

**Table 1:** Own price elasticities by alcohol type

|                    | On-trade | Off-trade |
|--------------------|----------|-----------|
| Beer               | -0.79    | -0.98     |
| Cider              | -0.59    | -1.27     |
| Wine               | -0.87    | -0.38     |
| Spirits            | -0.89    | -0.08     |
| RTDs <sup>10</sup> | -0.19    | -0.59     |

*Source: Meng et al (2013)*

An increase in alcohol duty, without the recycling of additional government revenues, generates a reduction in alcohol consumption: the focus is exclusively on this “gross” impact. Since alcohol duty only makes up part of the total price of alcohol, this 10% increase in tax results in a much lower increase in consumer prices. With a 10% increase in duty, the reduction in alcohol sales amounts to 1.1%. With this increase in tax there is an overall negative effect on the economy with a reduction of £294 million GVA and 7,324 FTE jobs.

The increase in tax also impacts government revenues, with an overall net positive impact of £788.7 million. A 10% increase in tax results in an increase in government revenue through increased alcohol duty of £835.4 million. However, the associated reduction in consumption generates a net reduction in VAT revenue of £46.7 million (assuming standard VAT rate and accounting for change in VAT on alcohol duty).

We next explore the impact of recycling the £788.7 million net increase in tax revenues by increasing public spending in line with the pattern of government expenditure within the original UK IO table. In this case there is a positive impact on employment of 17,041 FTE jobs and GVA of £847 million<sup>11</sup>. A large fraction (77.3%) of the overall employment changes is attributable to just four sectors. Of the overall 17,041 increase in FTEs: 3772 are attributed to public administration and defence; 3128 to education; 4153 to health and 2127 to residential care and social work.

## 5. Conclusions

While there is little controversy that policies directed towards reducing alcohol consumption – either through changing public taste or higher alcohol duties - would improve health outcomes, there is such less known on the impact of such policies on the economy, with some arguing it might impact negatively on value-add and jobs currently supported by the UK alcohol industry. While any reduction in alcohol consumption would, in itself, have an adverse impact on the economy this is only part of the overall effect of either a shift in tastes or higher alcohol duties. In the former case, a shift in taste away from alcohol will typically operate in favour of the consumption of other goods and services, and the overall impact on the economy depends on the net impact of this switch in spending. Similarly, while a rise in alcohol duties will reduce consumption of alcohol, any rise in tax revenues will allow an increase in public spending and the net impact on the economy depends on the outcome of these countervailing forces.

Not surprisingly, we find that a reduction in consumption of alcohol alone, without considering the likely reallocation of consumption spending in the case of a shift in tastes or the recycling of the increase tax revenues in the case of an increase in duties, has significant negative effects on the UK economy. This broadly captures the approach of conventional alcohol industry “impact studies”. In this “gross impact” view, there would appear to be a trade-off between the health benefits of the policy aimed at reducing alcohol consumption and an adverse impact on the economy. However, if one takes a “net impact”

<sup>10</sup> Ready to Drink packaged drinks (i.e. ‘alcopops’ etc.)

<sup>11</sup> We explored the sensitivity of results to alternative assumptions about the use of income freed up by not spending on alcohol: while the quantitative results varied, the qualitative results were unaffected. See FAI (2018).

perspective, where proper account is taken of the reallocation of expenditures and/or the recycling of revenues to increase public spending, outcomes change significantly. For the switch in consumption away from alcohol and towards other goods and services we find that for employment the trade-off is considerably relaxed, and is not present at all for value-added effects (although the quantitative results vary with the assumed use of the income freed up by the reduction in alcohol consumption). For an increase in alcohol duties we find evidence of a net positive effect on both value-added and employment, implying a “double dividend” of a simultaneous improvement in health and a stimulus to the UK economy.

It should be noted that this finding of a “double dividend” for rises in alcohol duties may not apply to other countries / regions or in other time periods. Since the overall impact of a policy-induced reduction in the consumption of alcohol is the net outcome of two countervailing forces: the reduction in consumption itself and either the reallocated consumption or recycled revenues. Even the direction of the net effect cannot be determined a priori: it is an empirical issue that has to be resolved by appeal to evidence drawn from the target country / region.

A number of extensions to this research would yield important additional insights from a policy perspective. First, the analysis could be extended to include explicit modelling of changes in the consumption of alcohol, including responsiveness to relative prices. Second, it would be beneficial to relax the rather restrictive assumption, embedded in the input-output approach, of an entirely passive supply side, to reflect the presence of supply-side constraints on the UK economy. A computable general equilibrium (CGE) framework would accommodate these developments, and allow a more rigorous exploration of the impact of changes in taste and/or taxes. Third, such a framework would also facilitate systematic investigation of the adverse supply-side impacts of alcohol consumption arising from, for example, increased absenteeism, presenteeism and mortality. Fourth, it would be instructive to introduce a regional dimension to the analysis, to identify the regional distribution of impacts, which may prove to be uneven. Finally, disaggregation of households by income level would allow an assessment of distributional impacts.

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# Performance of high growth firms in Scotland

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## Abstract

High growth firms contribute disproportionately to economic growth. This paper summarises new data for Scotland, and compares performance to other UK regions in high growth performance. The analysis considers the proportion of the business base that achieves high growth, characteristics of high growth firms in terms of size and productivity, and the pattern of high growth across local authority areas. The analysis shows that high growth firms in Scotland contribute less to economic and productivity growth than those in other parts of the UK.

## 1. Introduction

A range of research and analysis shows that high growth firms (HGFs) contribute disproportionately to economic growth. For example, in the UK over the 2010-13 period, HGFs accounted for about 1% of all job creating firms but 18% of the jobs created by job creating firms<sup>12</sup>. HGFs are also more likely to be exporters, to innovate and to have higher levels of productivity than lower growth firms<sup>13</sup>. This suggests that HGFs are more likely to create higher quality, higher paying jobs.

The number of HGFs is an indicator in Scotland's National Performance Framework<sup>14</sup>, and developing a better understanding of HGFs in Scotland will contribute to our evidence base on their contribution to economic and productivity performance.

This paper considers the latest data on high growth firms in Scotland, and uses the OECD definition: *all enterprises with 10 or more employees and annual average growth (employment or turnover) of more than 20% per annum over three years (equal to 72.8% growth)*<sup>15</sup>.

The analysis is based on a HGF dataset published by the Office for National Statistics (ONS)<sup>16</sup>, which provides data on the number of HGFs by UK Government Region and local authority areas from 2013 to 2016<sup>17</sup>, providing four years of trend data. Data is provided on high growth in terms of employment growth (Employment HGFs), turnover growth (Turnover HGFs) and employment & turnover growth combined (Employment & Turnover HGFs)<sup>18</sup>.

## 2. High growth firms in Scotland

Table 1 shows the number of HGFs in Scotland over the period 2013 to 2016 and the number experiencing growth in employment, in turnover and in employment and turnover. Firms in Scotland (and in all other UK regions) were far more likely to achieve high growth through increases in turnover than in employment, with few firms reaching high growth via increases in both employment *and* turnover.

In 2016, there were 910 Employment HGFs, employing just over 106,000 people. Employment in Scotland's 1,945 Turnover HGFs was 132,000, with just under 51,000 working in Employment & Turnover HGFs.

Over the four-year period, the general trend has seen an increase in the number of HGFs in Scotland, and Scotland's share of all UK HGFs has stayed relatively stable (Table 2).

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<sup>12</sup> [Moving on from the 'Vital 6%](#), ERC, 2014

<sup>13</sup> See for example [High Growth Firms and Productivity - Evidence from the United Kingdom](#) (Nesta 2013)

<sup>14</sup> [Scotland's national Performance Framework](#)

<sup>15</sup> [Eurostat – OECD Manual on Business Demography Statistics](#)

<sup>16</sup> [High Growth Enterprises 2013-2016](#), ONS 2017

<sup>17</sup> For example, 2016 data refers to enterprises that have grown by at least 20% over the preceding three years i.e. 2013-2016

<sup>18</sup> ONS note that turnover data should be used with caution as they are derived mainly from administrative sources which they are unable to validate.

**Table 1:** Number and characteristics of HGFs in Scotland, 2013 - 2016

|                            | 2013  | 2014  | 2015  | 2016  |
|----------------------------|-------|-------|-------|-------|
| Turnover HGFs              | 1,285 | 1,385 | 1,865 | 1,945 |
| Employment HGFs            | 800   | 980   | 830   | 910   |
| Employment & Turnover HGFs | 340   | 415   | 405   | 435   |

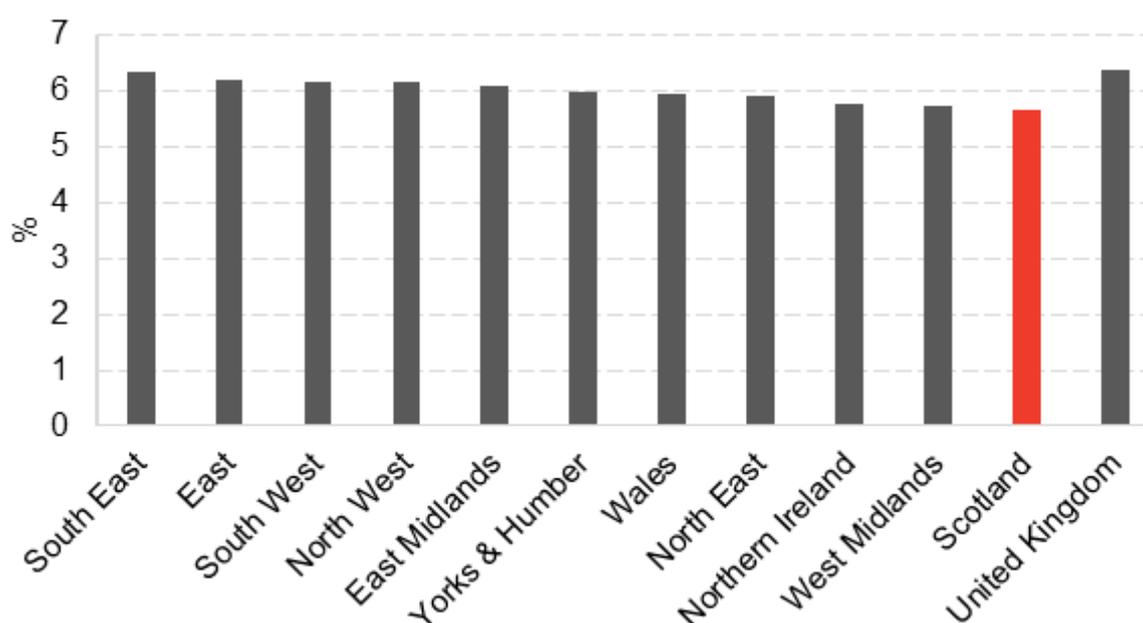
*Source: ONS***Table 2:** HGFs in Scotland as a percentage of UK by characteristic, 2013 -2016

|                            | 2013 (%) | 2014 (%) | 2015 (%) | 2016 (%) |
|----------------------------|----------|----------|----------|----------|
| Employment HGFs            | 6.4      | 6.9      | 6.8      | 6.7      |
| Turnover HGFs              | 6.4      | 7.1      | 7.3      | 6.7      |
| Employment & turnover HGFs | 6.0      | 6.6      | 6.5      | 5.9      |

*Source: ONS*

The HGF rate is defined as the proportion of all 10+ employee firms that achieve high growth<sup>19</sup>, and it can be used to compare Scotland's HGF performance with other parts of the UK.

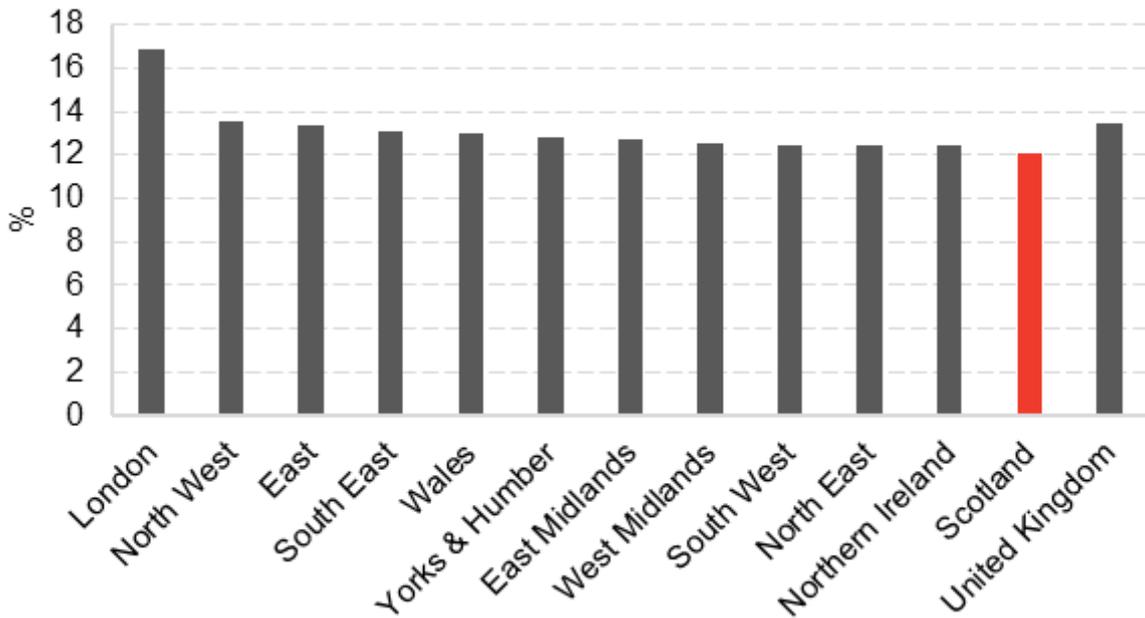
In terms of employment growth, Scotland's HGF Employment rate it was 5.7% in 2016, the weakest performance of all UK regions (Chart 1). Scotland has been in the bottom quartile each year since 2013. To match the Employment HGF rate of the UK average (6.4%), Scotland would need an additional 113 HGFs, and a further 87 to reach the Employment HGF rate of the top quartile of UK regions (6.2%)<sup>20</sup>.

**Chart 1:** Employment High Growth Firm rate (%) by UK Region, 2016*Source: ONS*

<sup>19</sup> The count of surviving enterprises with 10+ employees represents the starting point for the calculation of high growth units. Counts represent those units who were present in xx-3 with 10 or more employees and who survived to year xx. High Growth enterprises are then calculated from this population by measuring the change in employees between xx-3 and year xx. [ONS](#) (2017)

<sup>20</sup> Scottish Enterprise calculations for HGF gap estimates.

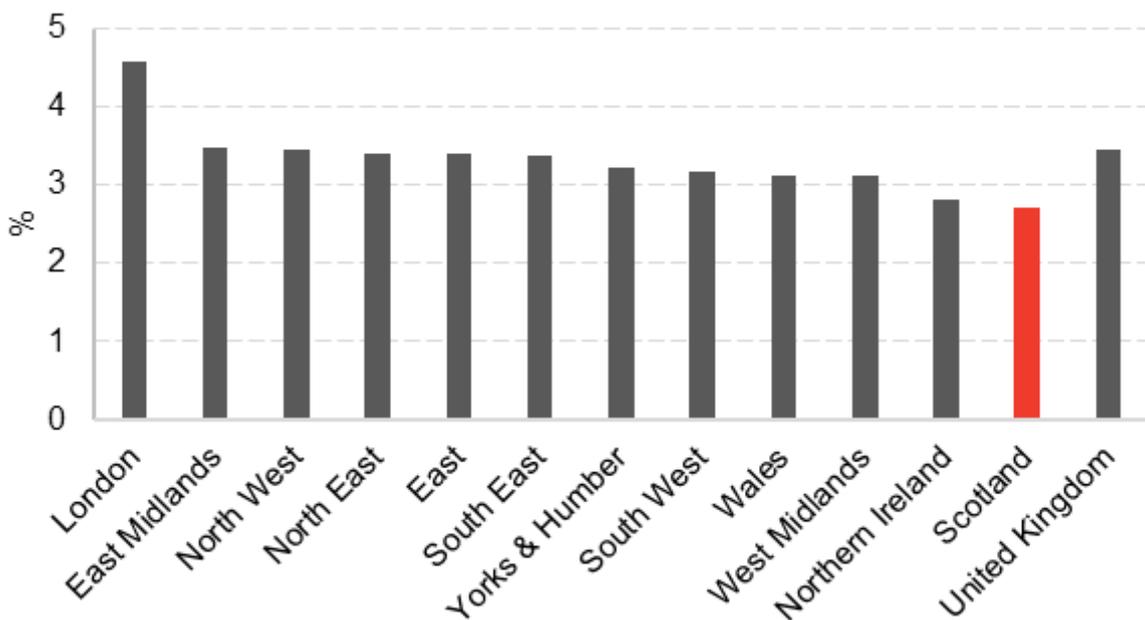
**Chart 2:** Turnover High Growth Firm Rate (%) by UK region, 2016



Source: ONS

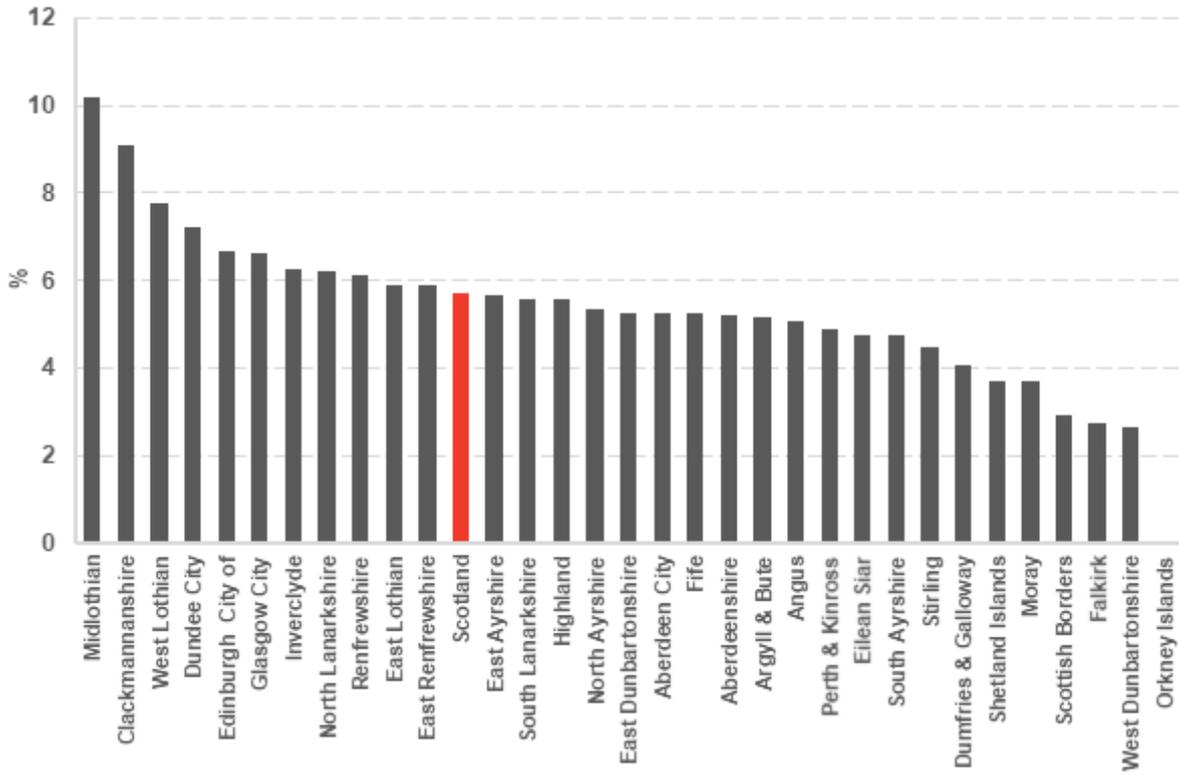
In terms of turnover growth, Scotland’s HGF turnover growth rate was 12.1% in 2016, again placing it last of all UK regions (Chart 2). Scotland was also in the bottom quartile in 2013, ranked in 11th place, although performance improved relative to other regions in 2014 (ranked in 6th place) and 2015 (ranked in 5th place). It is not clear from the data alone why Scotland’s relative performance has changed significantly over the period. To close the gap with the UK average rate, Scotland would need an additional 225 Turnover HGFs, and a further 200 to reach the rate of the top quartile of UK regions.

**Chart 3:** Employment & Turnover High Growth Firm Rate (%), 2016



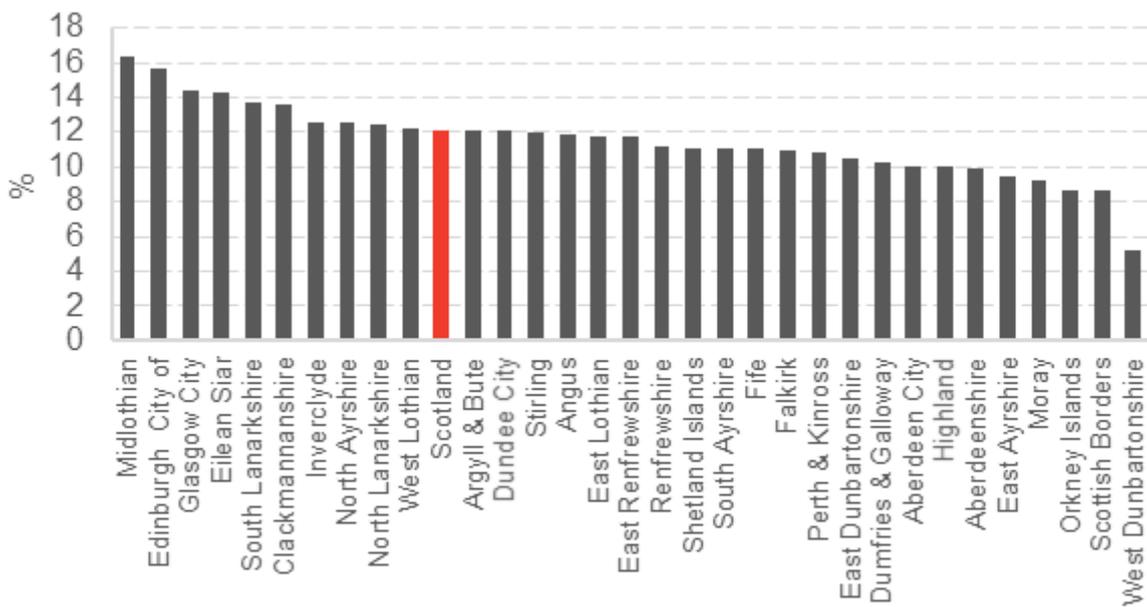
Source: ONS

**Chart 4:** Scottish Local Authority Employment HGF rate, 2016 (%)



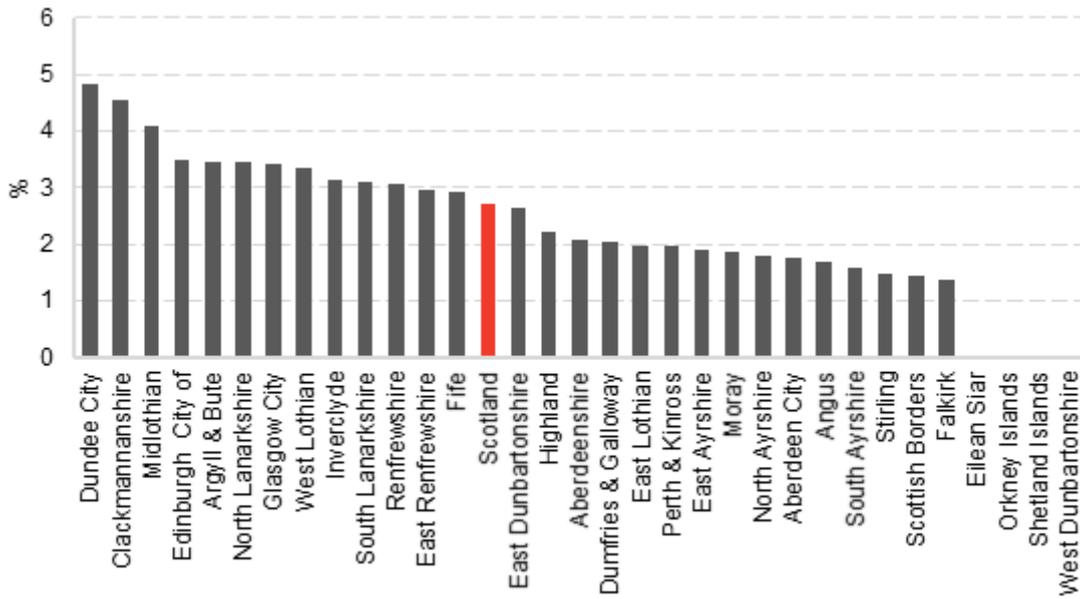
Source: ONS

**Chart 5:** Scottish Local Authority Turnover HGF rate, 2016 (%)



Source: ONS

**Chart 6:** Scottish Local Authority Employment & Turnover HGF Rate (%), 2016



Source: ONS

In terms of employment *and* turnover growth, Scotland’s HGF rate was 2.7% in 2016, ranking it (again) as the weakest of all UK regions (Chart 3) and Scotland was in the bottom quartile of UK regions in 2013, 2014 and 2015. To match the UK average rate, Scotland would need an additional 120 Employment & Turnover HGFs, and a further 121 to match the rate of the top quartile of UK regions.

HGFs of at least one definition can be found in each local authority area in Scotland. The largest number were in the cities of Glasgow, Edinburgh and Aberdeen (Appendix 1). Considering HGF rates (Charts 4 to 6), Midlothian had the highest Employment HGF and Turnover HGF rate in 2016, and West Dunbartonshire had the lowest. Overall, rural local authority areas tended to have lower HGF rates.

### 3. Characteristics of HGFS

#### Average HGF Size

High growth firms tend to be larger than the general population of firms with 10+ employees<sup>21</sup>. The pattern of firm size and by HGF type is broadly the same across each of the UK regions: the largest firms are Employment HGFs and Employment & Turnover HGFs. All three types of HGF are on average larger than HGF employment and HGF employment and turnover firms.

Scotland’s HGFs are smaller in terms of employment than the UK average, and smaller than most other UK regions (Charts 7 to 9)

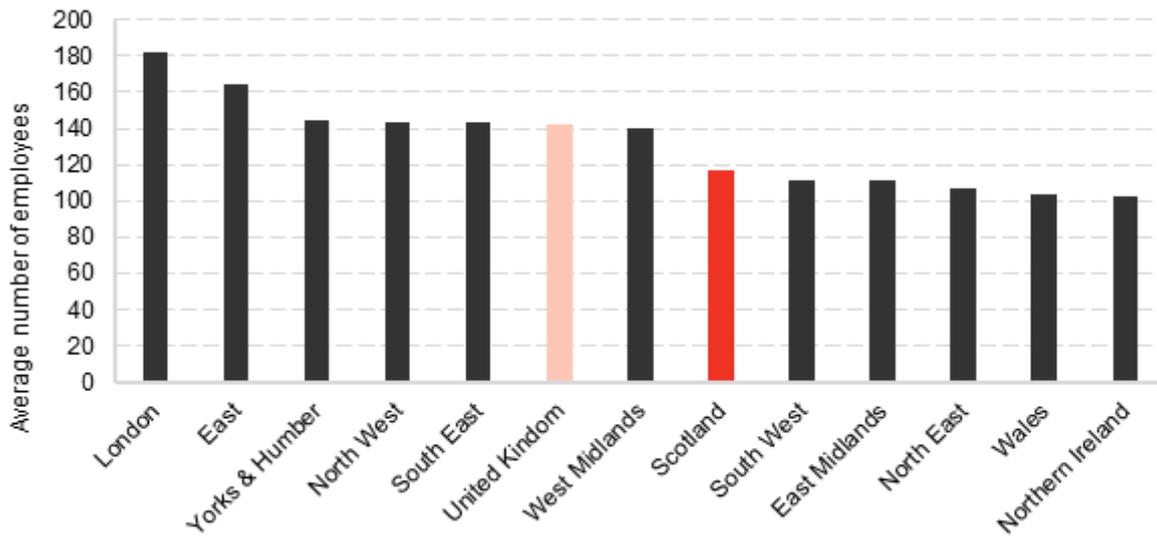
<sup>21</sup> [Business Population Estimates](#) (UK Government) have data on total employment and turnover by firm size band.

**Table 3:** Average HGF firm size (number employed) Scotland and UK, 2016

|                           | Number of Employees |     |
|---------------------------|---------------------|-----|
|                           | Scotland            | UK  |
| Employment HGF            | 117                 | 143 |
| Employment & Turnover HGF | 116                 | 140 |
| Turnover HGF              | 68                  | 92  |
| All 10+ emp               | 65                  | 72  |

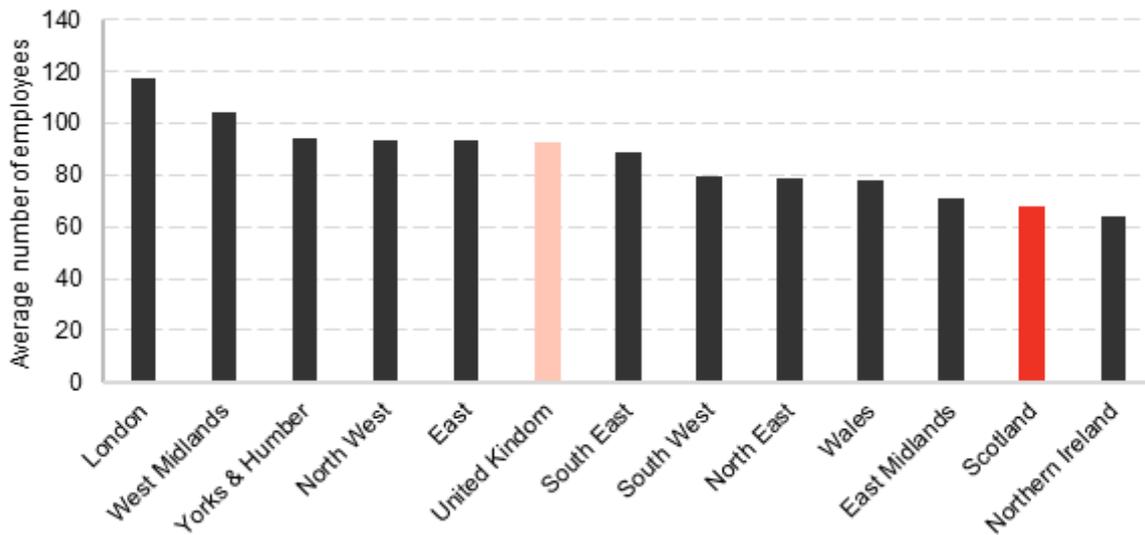
Source: ONS

**Chart 7:** Average number of employees per Employment HGF by UK region, 2016



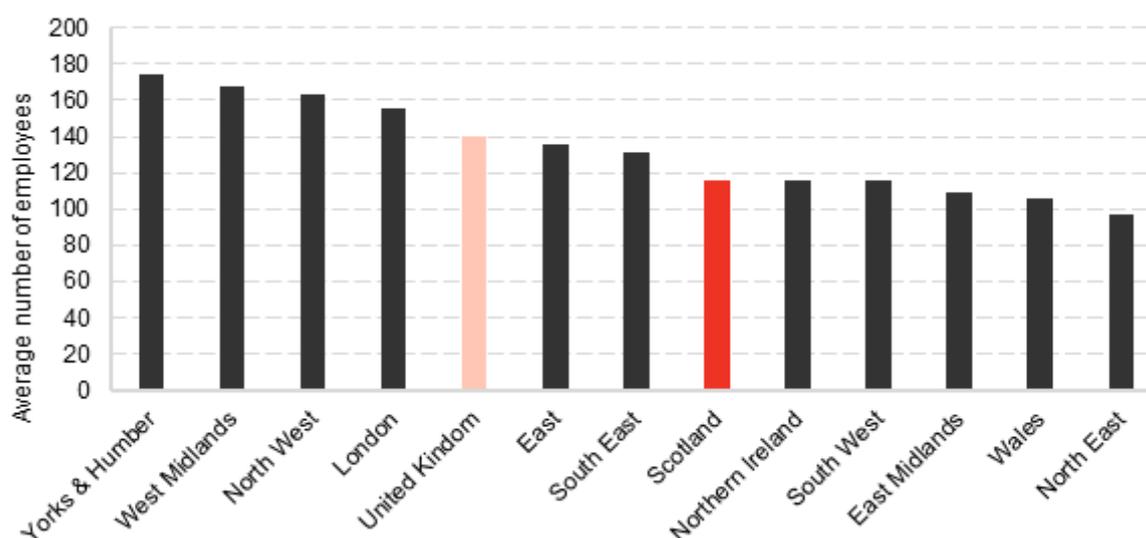
Source: ONS

**Chart 8:** Average number of employees per high Turnover HGF by UK region, 2016



Source: ONS

**Chart 9:** Average number of employees per Employment & Turnover HGF by UK region, 2016



Source: ONS

### HGF Productivity

**Table 4:** Index of Productivity of HGFs by UK region, 2016 (United Kingdom = 100)

| UK Region        | Index of Productivity, UK=100 |                |                             |
|------------------|-------------------------------|----------------|-----------------------------|
|                  | Turnover HGF                  | Employment HGF | Employment and Turnover HGF |
| United Kingdom   | 100                           | 100            | 100                         |
| London           | 236                           | 133            | 137                         |
| South East       | 77                            | 138            | 159                         |
| East             | 56                            | 59             | 58                          |
| Scotland         | 54                            | 81             | 77                          |
| West Midlands    | 54                            | 104            | 109                         |
| North East       | 53                            | 57             | 59                          |
| South West       | 51                            | 80             | 61                          |
| North West       | 49                            | 78             | 70                          |
| Northern Ireland | 48                            | 93             | 100                         |
| Wales            | 41                            | 98             | 103                         |
| East Midlands    | 40                            | 68             | 78                          |
| Yorks & Humber   | 38                            | 66             | 56                          |

Source: ONS

Productivity is measured as turnover per employee. Although the turnover figures should be used with caution, the data suggest Scotland performed relatively strongly for productivity for Turnover HGFs (4th out of 12 UK regions). For Employment HGF and Employment & Turnover HGFs, Scotland was ranked 6th and 7th respectively. London and the South East of England had highest HGF productivity levels for all types of HGF (Table 4).

Generally, in most of the UK regions, Turnover HGFs have on average the highest labour productivity levels, and Employment HGFs the lowest. Turnover HGFs also have average higher productivity levels than all 10+ employee firms in each UK region (Table 5).

**Table 5:** Index of average HGF productivity levels relative to all 10+ employees firms (UK = 100) by UK region, 2016

| UK Region        | Index of Productivity, All 10+ employee firms = 100 |                |                           |                        |
|------------------|---|----------------|---------------------------|------------------------|
|                  | Turnover growth                                     | Employment HGF | Employment & Turnover HGF | All 10+ employee firms |
| East             | 125   | 56             | 63                        | 100                    |
| East Midlands    | 104   | 73             | 97                        | 100                    |
| London           | 296   | 71             | 84                        | 100                    |
| North East       | 143   | 65             | 78                        | 100                    |
| North West       | 110   | 73             | 75                        | 100                    |
| Northern Ireland | 122   | 100            | 123                       | 100                    |
| Scotland         | 121   | 76             | 84                        | 100                    |
| South East       | 114   | 87             | 114                       | 100                    |
| South West       | 131   | 86             | 76                        | 100                    |
| Wales            | 106   | 107            | 130                       | 100                    |
| West Midlands    | 105   | 86             | 103                       | 100                    |
| Yorks & Humber   | 100   | 72             | 71                        | 100                    |
| United Kingdom   | 185   | 78             | 90                        | 100                    |

Source: ONS

### Sector of HGFs

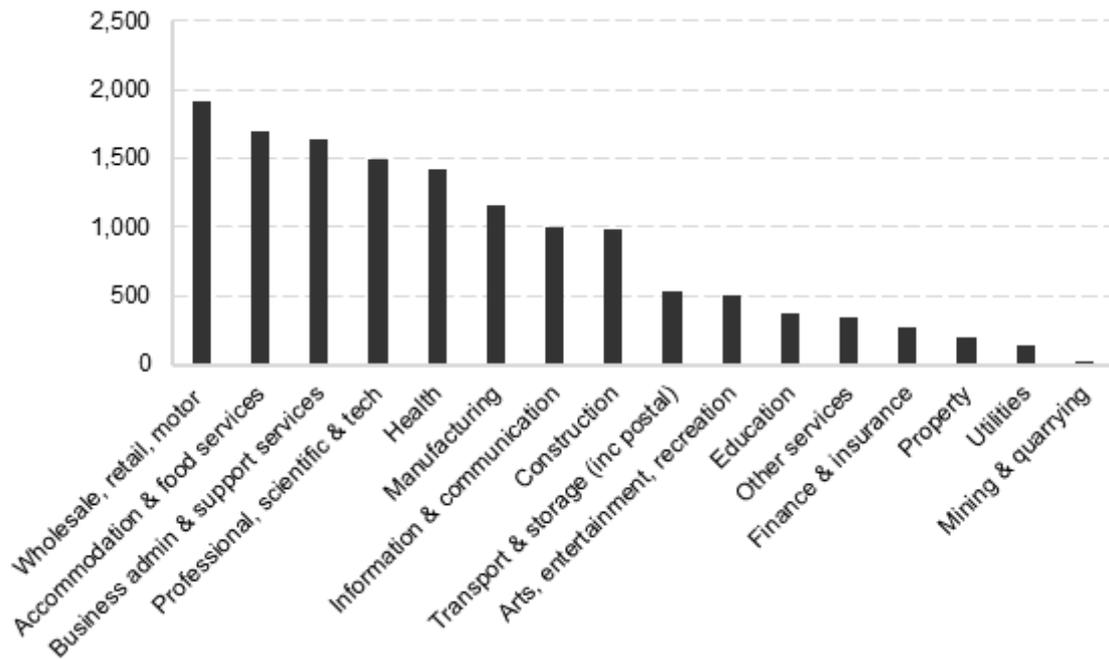
Sector data on HGFs is only available for the UK as a whole, and only for Employment HGFs<sup>22</sup>. It is thought likely that Scotland's HGF sectoral mix will be broadly similar to the UK's. The largest three sectors for Employment HGFs in 2016 in the UK were wholesale/retail, accommodation & food services and business administration & support services, which together accounted for almost 40% of all HGFs (Chart 10).

This sectoral profile may in part explain why Employment HGFs have on average lower productivity, as jobs in the three largest sectors are generally lower paid, in particular wholesale/retail and accommodation & food services where average wages/salaries are 67% and 42% respectively of the overall average for the private sector economy<sup>23</sup>.

<sup>22</sup> Count of 'high growth' enterprises for the period 2010 to 2016 by district, counties, unitary authorities and standard industrial classification, ONS (2017)

<sup>23</sup> [Scottish Annual Business Statistics](#), 2015 figures

**Chart 10:** Number of Employment HGFs in the UK by sector, 2016



Source: ONS

## 4. Conclusions

Key findings from this analysis of HGF data are that:

- Scotland's HGF rate lags most and in some cases all UK regions, and this has been the case for most years over 2013-16;
- Scotland's HGFs tend to be smaller than those in most other UK regions, and have lower levels of productivity.

This suggests that HGFs in Scotland play a far less significant role in boosting economic and productivity growth than those in other UK regions. To illustrate the impacts of this 'performance gap', were Scotland's Turnover HGF rate to match the UK average with average employment in each HGF being the same as the UK's, this would result in 20,700 more people employed in high productivity firms<sup>24</sup> in Scotland.

From the ONS data alone it is not possible to explain why Scotland's HGF rates lags all other UK regions. Other data and research does, however, show that Scotland performs less well than many other UK regions on key drivers of business growth. For example, Scotland's businesses tend to be less innovative than those in other UK regions<sup>25</sup>, are less likely to invest in R&D<sup>26</sup> and are less likely to be exporters<sup>27</sup>. Also, Scotland has a lower business density than nearly all other UK regions, and this may reduce competitive pressures and business growth dynamism<sup>28</sup>.

Further research that could help our understanding of HGF dynamics would be an analysis of performance by sector across the UK regions, and whether there is a sectoral dimension to Scotland's lower HGF rates

<sup>24</sup> Scottish Enterprise calculation

<sup>25</sup> [UK Innovation Survey](#), UK Government (2018)

<sup>26</sup> Scottish Government [BERD Tables](#)

<sup>27</sup> [Annual Business Survey Exporters and Importers](#), ONS (2017) and [DIT national survey of registered businesses' exporting behaviours, attitudes and needs 2017](#), DIT (2018)

<sup>28</sup> [Business Population Estimates for the UK And Regions](#), ONS (2016)

(for example, the recent downturn in the oil and gas sector as a result of low oil prices is very likely to have affected the growth of a large number of oil and gas companies and suppliers – as the ONS data shows). Also, a more in-depth analysis of HGF rates in Scotland’s cities and how this compares to cities in other UK regions may highlight whether there is any geographical dimension to Scotland’s relatively weak HGF performance.

*June 2018*

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## Appendix 1

Number of HGFs by Scottish local authority area, 2016<sup>29</sup>

|                     | Employment HGFs | Turnover HGFs | Employment & Turnover HGFs |
|---------------------|-----------------|---------------|----------------------------|
| Glasgow City        | 145             | 315           | 20                         |
| Edinburgh City      | 115             | 270           | 20                         |
| Aberdeen City       | 60              | 115           | 5                          |
| Aberdeenshire       | 50              | 95            | 10                         |
| Highland            | 50              | 90            | 5                          |
| Fife                | 45              | 95            | 10                         |
| North Lanarkshire   | 45              | 90            | 20                         |
| South Lanarkshire   | 45              | 110           | 5                          |
| West Lothian        | 35              | 55            | 5                          |
| Dundee City         | 30              | 50            | 5                          |
| Renfrewshire        | 30              | 55            | 5                          |
| Midlothian          | 25              | 40            | 60                         |
| Perth & Kinross     | 25              | 55            | 0                          |
| Dumfries & Galloway | 20              | 50            | 5                          |
| Angus               | 15              | 35            | 25                         |
| Argyll & Bute       | 15              | 35            | 75                         |
| East Ayrshire       | 15              | 25            | 20                         |
| East Lothian        | 15              | 30            | 5                          |
| North Ayrshire      | 15              | 35            | 10                         |
| South Ayrshire      | 15              | 35            | 5                          |
| Stirling            | 15              | 40            | 5                          |
| Clackmannanshire    | 10              | 15            | 25                         |
| East Dunbartonshire | 10              | 20            | 0                          |
| East Renfrewshire   | 10              | 20            | 10                         |
| Falkirk             | 10              | 40            | 15                         |
| Inverclyde          | 10              | 20            | 5                          |
| Moray               | 10              | 25            | 0                          |
| Scottish Borders    | 10              | 30            | 5                          |
| Eilean Siar         | 5               | 15            | 25                         |
| Shetland Islands    | 5               | 15            | 5                          |
| West Dunbartonshire | 5               | 10            | 0                          |
| Orkney Islands      | 0               | 10            | 15                         |
| Scotland            | 910             | 1,945         | 435                        |

<sup>29</sup> Data rounded by the ONS to the nearest 5 for reasons of confidentiality

# The output gap: what is it, how can it be estimated and are estimates fit for policy makers' purposes?

Julia Darby and Stuart McIntyre, University of Strathclyde

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## Introduction

The Scottish Fiscal Commission (SFC), as part of its statutory remit to produce forecasts of the Scottish economy and revenues from devolved taxes, provide assessments of Scotland's 'output gap', which in turn are derived from estimating 'potential output'. The evolution of potential output and the output gap play key roles in any assessment of the current position of the Scottish economy, and in turn the outlook for future economic growth and tax revenues. This article looks at these concepts in more detail.

In what follows we explain the concept of the output gap, its relevance to policy, how output gaps in a given economy can be estimated and why the estimates are always uncertain. We then discuss current views on the evolution of the UK's output gap and the SFC's estimates of Scotland's output gap and end by discussing whether estimates of the output gap currently tell policymakers what they really need to know.

## What is the output gap<sup>30</sup>?

In general, economists are not only interested in whether output is going up or down, but also in whether it is above or below its potential. The output gap provides an assessment, at a given point in time, of the difference between an economy's estimated productive potential (typically referred to as 'potential output') and the actual level of output. Potential output is the maximum amount of goods and services an economy can produce when it operating efficiently, that is, at full capacity. A zero output gap implies that actual output is equal to potential output.

A healthy economy in which actual and potential output are growing together, such that the output gap remains at zero would be the aim. However, the output gap at any point in time could be positive or negative, and it is important to emphasise that neither a positive nor a negative gap is desirable. In the next section we sketch out why this is the case, looking in turn at monetary and fiscal policy in the context of positive and negative output gaps.

## Positive and negative output gaps and their relevance to monetary policy

A positive output gap occurs when actual output is greater than potential output. This generally happens when demand is very high and the economy is said to be "overheating". To meet demand, businesses, factories and workers operate beyond their most efficient capacity. This is feasible in the short term, but results in higher costs, which continually drive up prices and wages, generating rising inflation. If demand remains high, the only way this can be sustained without accelerating inflation is if potential output increases, i.e. the economy expands its production capacity; this is most likely to be achieved via investment in physical and human capital, which takes time to deliver. In the short term, a forecast of an emerging positive output gap is likely to result in tighter monetary policy, through a higher interest rate which is intended to "cool" the "overheating" economy by inducing a decline in interest sensitive components of demand, including business investment and household consumption.

A negative output gap occurs when actual output is below the level of output the economy could produce at full capacity. An emerging negative gap implies that there is spare capacity, or slack, in the economy due to deficient demand. During a recession, as output drops below potential, unemployment tends to rise and price and wage growth fall, resulting in falling inflation. On recognising that falling demand is leading to

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<sup>30</sup> There is a long established literature in economics on the theory and estimation of output gaps. While we will touch on this a little in this short article, we refer readers who are interested in a more in-depth discussion of these issues to some excellent review articles (for example Murray (2014)).

the emergence of a negative output gap and is likely to result in falling inflation, the Bank of England will generally adopt expansionary monetary policy in the form of a lower interest rate and/or unconventional methods such as quantitative easing, to boost demand, narrow the output gap and prevent inflation from falling below the 2% target.

Central banks typically define potential output as the level of output consistent with the absence of any pressure on prices to rise or fall. The aim for any inflation-targeting central bank is to achieve a zero output gap alongside low and stable inflation, ideally alongside sustainable and buoyant output growth.

### **The relevance of the output gap to fiscal policy**

From a fiscal policy perspective, assessments of the output gap are important in determining the extent to which developments in public finances are cyclical or structural. This distinction is crucial both when forecasting how fiscal balances are likely to evolve and when making judgements as to whether or not public finances are sustainable. Put simply, a budget deficit at a given point in time needs to be viewed alongside information on whether the economy is working at, above or below capacity.

To explain why the distinction between cyclical and structural developments is important, consider what happens as an economy enters a recession: the cyclically sensitive components of public expenditure such as job seekers allowance, housing benefits and so on, will automatically increase given existing rules on entitlement and levels of support; while tax receipts automatically fall, reflecting the impact of declining sales, earnings and employment at existing tax rates and tax thresholds. These cyclically sensitive components of spending and revenue are collectively known as “automatic stabilisers”.

As a negative output gap emerges, automatic stabilisers act to dampen the economy’s decline, but another result will be an emerging cyclical budget deficit. Importantly, automatic stabilisers also operate in reverse as the economy recovers and if the economy “overheats”. So, in and of itself, a deficit that emerges as a result of the operation of automatic stabilisers can be viewed as temporary, and can reasonably be financed by borrowing in the short term since it will automatically be replaced by cyclical surpluses that can be used to pay down that borrowing in the medium run, provided that the underlying structure of the economy has not changed.

The alternative of enforcing a balanced budget rule at every point in the cycle would be inappropriate. To illustrate this, imagine what would happen if, despite entering into a recession, policymakers had to balance expenditure and revenue in every period. Weakening activity would still result in declining revenues and increases in some elements of expenditure through the operation of automatic stabilisers. In order to balance the budget, the government would then have to raise existing tax rates, introduce new taxes and/or cut discretionary expenditure, in order to offset the effect of automatic stabilisers. In the Scottish case there is of course the issue that fiscal policy is in part controlled by the UK government, so assessing the overall fiscal stance requires more than an assessment of the cyclical/structural elements of the Scottish budget. Since this is not the primary focus here, we avoid a full discussion of this point.

The problem with balancing the budget during a recession is that the required policies would then exacerbate the downturn: reducing households’ disposable income, firms’ post-tax profits and public sector jobs and having further knock on effects to reduce demand, resulting in a rising debt to GDP ratio, despite avoiding any change in borrowing. The increase in the debt to GDP ratio would not reflect increases in debt but rather the adverse impact on GDP. Likewise when an upturn in activity results in a cyclical improvement in government revenues and a decline in welfare spending, balancing the budget would require lower tax rates and/or higher discretionary spending, both of which would add to demand, exacerbating the “overheating” of the economy and adding to inflationary pressure during the upturn.

In a downturn, fiscal policymakers who are able to do so may choose to add to the operation of automatic stabilisers with discretionary stimulus. They can potentially do this via cuts in tax rates, bringing forward public sector investment, making decisions to boost infrastructure spending, and so on. Adding discretionary stimulus in this way is likely to be particularly beneficial when a recession is expected to be

severe and/or long lasting, and all the more so once monetary policymakers have already reduced interest rates as far as they can go. At such times there is now ample evidence that fiscal expansion can have beneficial impacts, unchecked by the kind of ‘crowding out’ of private sector investment and consumption that might occur at other times, given that both are depressed.

However, any such discretionary stimulus will not automatically be corrected as the economy recovers. Left unchecked, this is the kind of policy that could result in deficit bias; that is a tendency to run deficits in bad times and in good times, which can result in a continuously rising, and ultimately unsustainable debt to GDP ratio. Financial markets, well aware of the implications of such trends, demand higher bond yields and hence accelerate a damaging vicious circle. To avoid this, prudent fiscal policy makers will make clear that once a recovery is underway, and while monetary policymakers turn their focus to how quickly inflation pressure will pick up, they will be monitoring how long it takes for tax receipts to recover and benefit spending to fall, and make decisions on when it is appropriate to replace discretionary stimulus with austerity measures. Note that timing is crucial here and the questions rightly focused upon by both monetary and fiscal policymakers are different. In particular it is possible that inflation pressure could potentially pick up well before the public finances fully recover following a sustained recession.

From this discussion it should be clear why, when forecasting developments in fiscal balances and making policy decisions, fiscal policymakers should not simply look at the most recent data in isolation and their objective should not be to balance their budget in each year. A particular value of a budget deficit today, or more importantly, given that the tax base rises with GDP, the budget deficit as a % of GDP today, has to be considered alongside forecast changes in both the output gap and the components of the deficit over coming years.

As noted above, the SFC have a remit to produce forecasts for the economy and devolved tax revenues in Scotland, so must make assessments about the evolving economic cycle. SFC forecasts therefore incorporate judgement about the size of the recent and current output gap and on how long it will take for any gap to close. Linked to this is a judgement about the extent to which the evolving deficit is cyclical or structural, and a view on how government revenues and expenditure will correct as the output gap evolves.

The SFC should, in our view, do much more to explain this in the commentary that accompanies its published forecasts. While admitting that judgements are being made, there is an absence of any discussion of sensitivity to alternative assumptions.

Judgement is also important when it comes to selecting a method to derive estimates of the output gap itself. In the next section we will discuss the different methods for producing estimates of the output gap and discuss their shortcomings.

## **Estimating output gaps**

Unlike actual output, the output gap and potential output are unfortunately not observable directly, they can only be estimated.

Various approaches to estimation are commonly used in practice, all of which assume that output can be divided into a trend and cyclical component. In broad terms approaches can be divided into three categories: i) univariate estimates that make use of statistical filters; ii) multivariate methods of which production function based estimates are the most common; and iii) survey based measures. Any estimate of potential output and the output gap will have its shortcomings, and this in part explains why a range of alternatives are often presented. Where these methods provide differing views it is important to consider what inference can be taken from this additional information and how this too can inform policymakers.

Taking each approach in turn, at their most simple, the univariate methods employ statistical filters to smooth actual output and generate a measure of trend output. The Hodrick-Prescott filter is one technique that is frequently used in practice, but there are many others. Estimating trends in time series data is particularly problematic near the end of the sample. Unfortunately this means that estimates of potential

output and the output gap are most uncertain for the period of the greatest interest to policymakers, i.e. for the recent past and in near term projections. For Scotland, the fact that the relevant data are available over a relatively short time period and the most recent data appears with a longer lag than does comparable UK data, present additional challenges. However one advantage of filtering univariate data is that no assumptions need to be made about the structure of the economy.

Multivariate techniques incorporate useful information on a number of other variables alongside output, and rely on using relationships based on economic theory. An example of a multivariate technique is the production function approach. This approach is applied widely, by the OECD, the OBR and others. Measures of the available labour force and the available capital stock are combined to calculate potential output under the assumption that all inputs into production are fully utilised. In principle the use of economic theory in guiding the estimation is attractive, but the production function method still requires assumptions to be made about population trends, trends in labour force participation, in accumulation of the capital stock, and in total factor productivity (the efficiency with which inputs are combined). Views about these trends, as well as about the underlying structure of the economy, can differ across researchers, therefore any given results can be controversial and consensus is unlikely.

Lastly, survey based measures of the output gap are typically derived from responses to questions that ask firms if they are working at or above/below normal levels of capacity utilisation. To the extent that the questions focus on utilisation of current capacity they are in danger of missing out on capturing intentions to increase capacity, or indeed the lack of such intentions. There is not an obvious single method for translating survey answers into a quantitative measure of the output gap, and of course survey measures are imperfect because they have limited coverage, achieve only partial response rates, and firms' responses may reflect different interpretations of the same questions.

Given limitations in all the methods, and the fact that all the methods involve a degree of judgment, it makes sense for forecasters and policymakers to also consider a range of economic indicators to infer the extent of excess demand or supply, for example tracking inflows and outflows into employment and unemployment, labour shortages, average hours worked, hourly earnings alongside surveys of investment intentions.

### **Uncertainty in output gap estimates**

Perhaps the greatest problem with all the estimation approaches outlined above is the fact that all measures of the output gap are subject to considerable uncertainty.

In broad terms, output gap uncertainty can be attributed to three main sources: end point uncertainty; data uncertainty; and model uncertainty. End point uncertainty affects the univariate and multivariate approaches outlined above: inference on the today's cyclical position has to be estimated based on trends projected into the unknown future and is highly sensitive to assumptions made. This is less of a problem with survey based measures. Data uncertainty reflects the fact that information available at the time of estimating the gap will generally be the latest available release (or vintage) of data, not the final vintage. Subsequent data releases tend to include revisions which improve accuracy, reflecting new information, and revisions can be attributed either to potential output or the output gap. The final source of output gap uncertainty relates to uncertainty about the underlying relationships in the economy. The fact is that extreme events such as the global financial crisis, the subsequent deep recession, and even the policy responses to the crisis, can potentially cause the structure of the economy to change. Certainly growth rates of output achieved in the recent past are remarkably low by historical standards, and wage growth has not so far picked up in the way that has been associated with past recoveries. It is possible that some of this reflects structural change.

### **Current views on the UK economy's output gap**

Following the financial crisis and great recession, estimates of the UK's output gap were consistently negative. Nonetheless, there is a general consensus that the UK's output gap has narrowed in recent times.

Since May 2017, forecasts in successive Bank of England Inflation Reports have pointed to spare capacity being fully absorbed before the end of the forecast period. As a result, the focus of the Bank of England's Monetary Policy Committee (MPC) has been on when interest rates should rise, see, for example Saunders (2017, 2018).

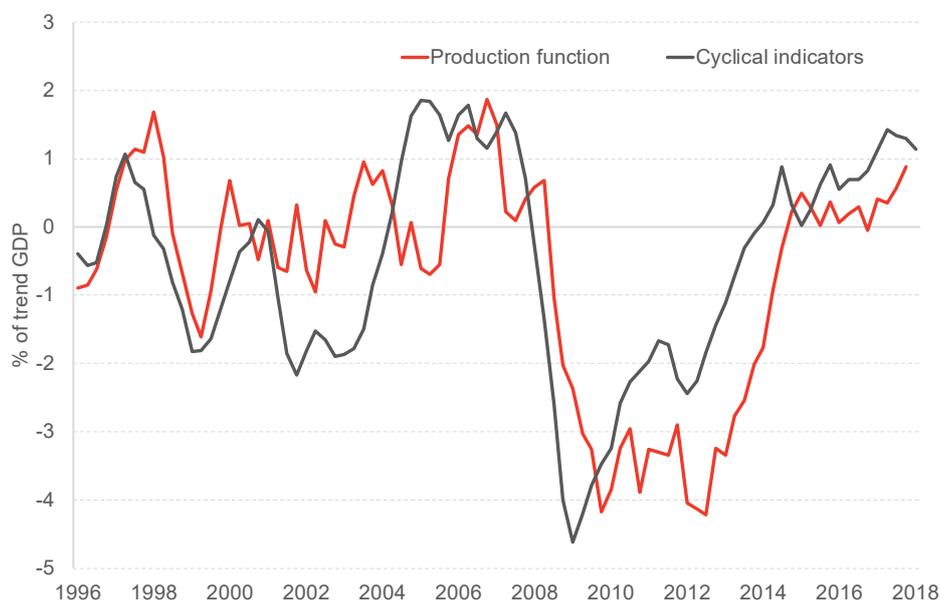
Likewise, recent forecasts from Office of Budget Responsibility (OBR) present a central scenario with a small positive output gap at the end of 2017 which then fluctuates at or slightly below this level through their forecast horizon. The OBR also consider a range of alternative scenarios for both potential output, and the output gap.

### The current view on the Scottish economy's output gap

Estimates of the output gap for Scotland's economy are now provided by the Scottish Fiscal Commission (SFC), and are intended to inform the Scottish Government's use of enhanced powers and responsibilities over fiscal policy.

The SFC has so far published two rounds of forecasts, in December 2017 and May 2018. They admittedly have a harder job than some, given the challenge of the available data, meaning they face greater difficulty in estimating both pre- and post-crisis trends. Nonetheless it is surprising that they only provide two estimates of the output gap: a central one, generated using a production function approach, and another that uses a range of Scottish specific and UK wide surveys (in an unspecified way). These are shown in Figure 1 below. The SFC comment that both estimates currently indicate a similarly sized positive output gap in 2017-18. However, they make no mention of the very different paths of the two measures during the recovery from recession, and have not presented any sensitivity analysis or alternative scenarios for the recent evolution of potential output.

**Chart 1:** Scottish Fiscal Commission estimates of Scotland's output gap



Source: Scottish Fiscal Commission, May 2018

### Do output gap estimates tell policy makers what they need to know?

Indicators of output gaps suggest there is little spare capacity left in the UK and Scottish economies. However, growth in actual output has now been weak now for a prolonged period and is not currently forecast to pick up substantively. This implies that both output and potential output are growing very slowly

by historical standards. These circumstances are very different to observing a narrowing output gap at a time of buoyant output growth.

The deep and protracted recession experienced since 2008 certainly had the potential to have caused a sizeable drop in potential output. This could be the case if large numbers of unemployed workers have exited the labour force and become inactive; if firms close and are not replaced; and if previously successful firms have ceased to operate due to stricter lending by banks that lost money during the recession. Fiscal austerity enacted before a strong recovery was underway could also have exacerbated long-term damage to potential output. However, we know that employment has been relatively strong with rising labour force participation, though this has been achieved alongside remarkably weak growth in productivity and wages.

But do we really believe that the economy is in immediate danger of “overheating”? Will firms respond to continued weak demand by raising prices? Public finances certainly haven’t yet fully recovered, and the OBR has now consistently overestimated income tax revenues for some time. So, output gap estimates alone do not seem to be sufficient to tell policy makers what they need to know.

### **Policymakers should be concerned about a likely innovations gap**

Given weak growth, it seems likely that many companies have not been investing in the most productive equipment and the best production techniques in the recent past. This will apply less to leading companies at the frontier, but could be having a major impact on the evolution of potential output if it applies to large numbers of companies whose combined performance has a far greater influence on aggregate figures. What this means is that there is likely to be a difference between actual output and the level of output that could be achieved if companies had started using the best technology available to them. Wren Lewis (2017, 2018) has referred to the gap between actual output and the output that could be achieved using the best available technology as the “innovations gap”.

Wren Lewis argues that when the innovations gap is high, as is likely now, the output gap is no longer a good indicator of how far and fast the economy can expand without generating inflation.

In a normal recovery from recession, when demand is growing rapidly, companies are happy to incur the fixed costs associated with investing in the best technology since they need to expand capacity – there is unlikely to be a persistent innovation gap in these circumstances. In contrast, in a weak and drawn-out recovery, most firms observe only very modest demand growth which is likely to be insufficient to generate significant new investment, particularly when they factor in continuing uncertainty around Brexit. The latest ONS international comparisons of show that the UK has had relatively weak investment as a proportion of GDP for a sustained period now (ONS 2018).

The UK and Scottish economies have now grown at rates well below previous trends for a significant period. Many companies may well know that their current production methods are outdated, too labour intensive and inefficient. If demand were to increase significantly, would they raise prices or rather undertake profitable investment in new equipment to meet more buoyant demand? If the latter, the potential for the return of wage growth justified by higher productivity, without therefore generating inflation, but boosting tax revenues, becomes more tenable.

Without significant investment, the innovations gap is likely to widen and persist, inhibiting growth of potential output and sustaining slow growth in actual output. Investment is essential to work toward closing the innovations gap.

### **Consequences of a large innovations gap**

From the discussion above, it is easy to argue that the greatest scope for sustained recovery comes from action that can boost potential output. From a monetary policy perspective, raising interest rates certainly won’t, in and of itself, make investment to close this gap more attractive. From a fiscal perspective, higher government investment could be necessary to shift the economy out of a low growth equilibrium, and

resolution of Brexit related uncertainty may be crucial to bringing back the desire of many businesses to invest. And if indeed there is a significant innovations gap in the UK and Scottish economies at present, this has the potential to undermine the current assessments of the OBR and SFC on the pre-eminence of policies to ensure fiscal sustainability while assuming slow growth will continue, indeed this could become a self-fulfilling prophecy.

In conclusion, policymakers, Wren Lewis argues, need to “stop treating the sustainable level of output as something which is independent of what they do.” They need to do more that recognises their role in policies that can boost potential output and the likes of the OBR and SFC could help by making it clear just how sensitive their forecasts are to alternative scenarios for potential output, including any innovations gap.

In a time of sustained weak growth, the output gap is perhaps simply no longer a sufficient guide for policy makers and policymaking.

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