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Economic Perspectives

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

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Abstract

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

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

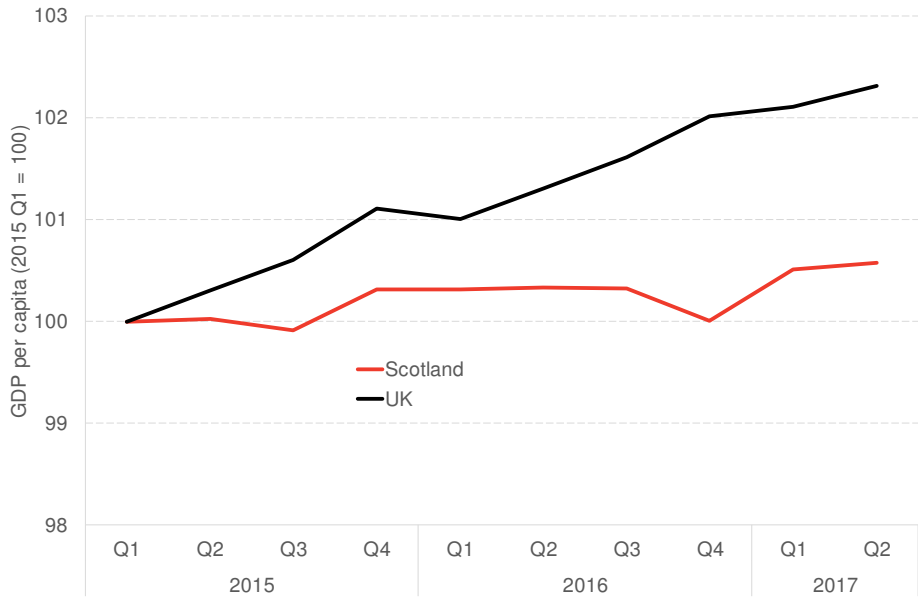
1. Introduction

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The role of tax policy

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

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

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

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

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

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

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

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

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

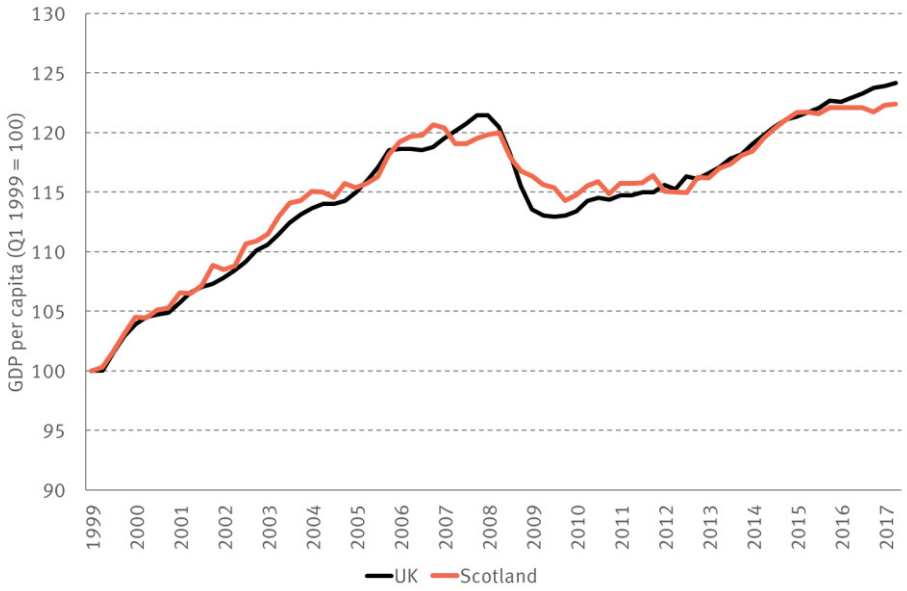
Empirically, how have Scottish GDP per capita and Scottish tax revenues trended over time relative to UK revenues and GDP?

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

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

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

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



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

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

1999-2007

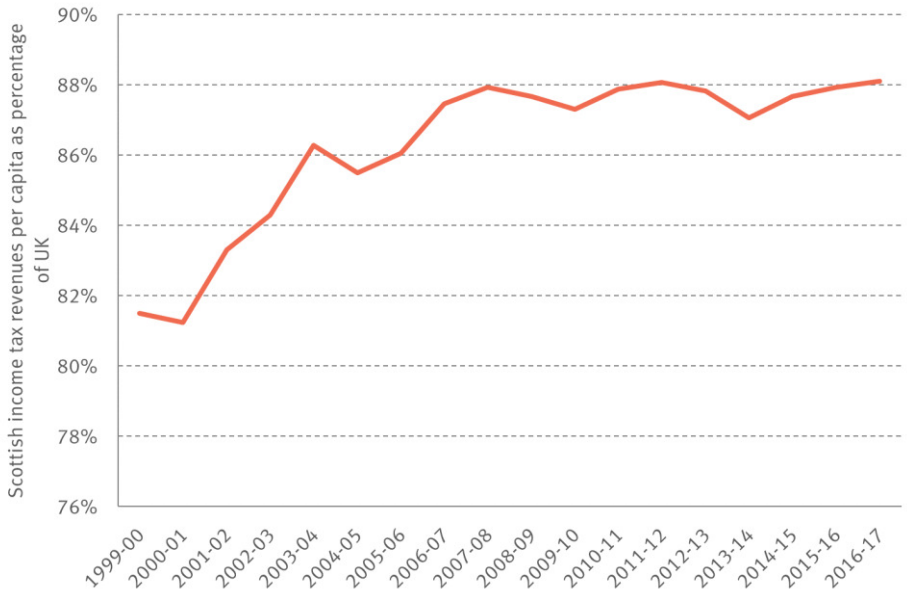
Scottish income tax revenues per capita converged towards that of the UK between 2000 and 2007, but have since remained around 12% lower than in the UK (Chart 3).

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

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

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

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



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

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

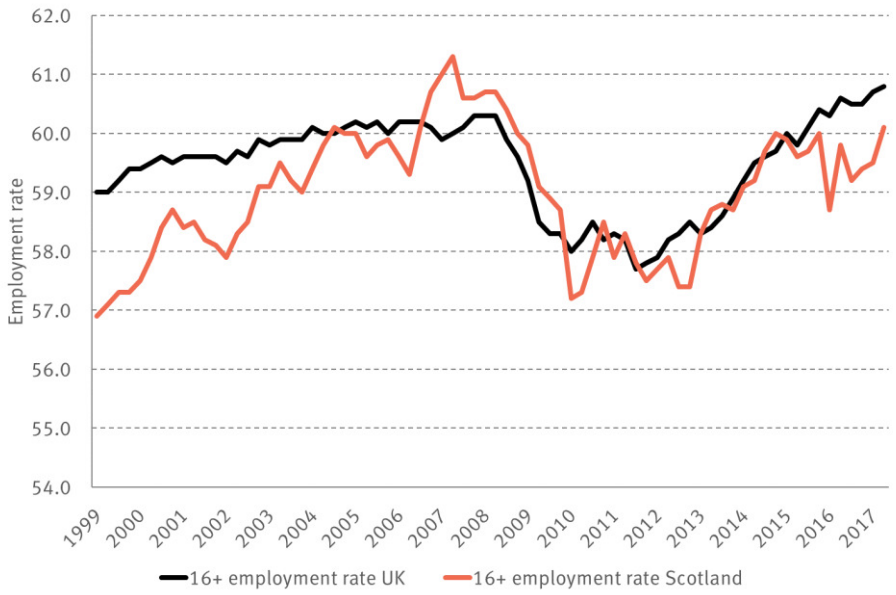
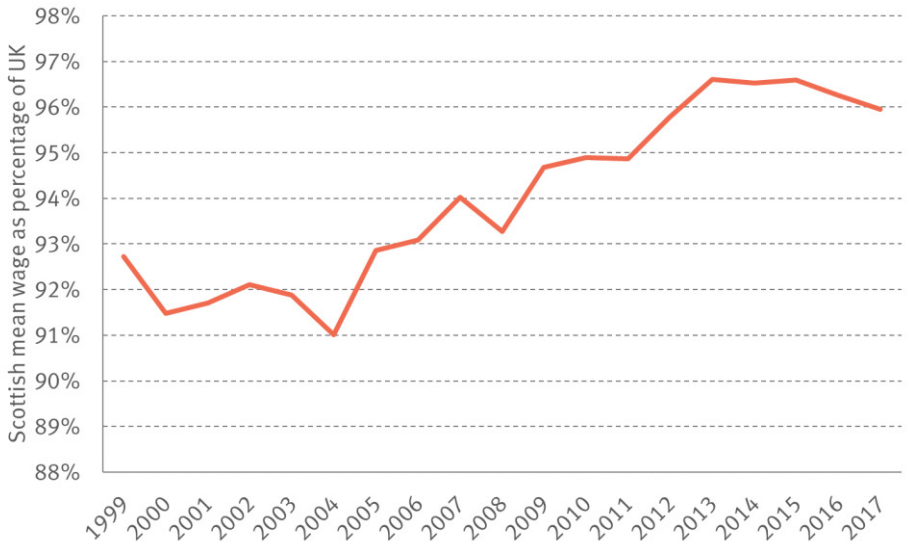


Chart 5: Scotland average weekly wage as a percentage of UK, all workers



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

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

2007 – 2015

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

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

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

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

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

2015 – present

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

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

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

Summary

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

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

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

4. Conclusions

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

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

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

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

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

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

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

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

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

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

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