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ARITHMETIC AND INDEPENDENCE

GERS and the Scottish Constitutional Debate

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Arithmetic and Independence: GERS and the Scottish Constitutional Debate

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Summary

This paper examines the fiscal position of a putatively independent Scotland under the plans of the Scottish National Party in the light of the most recent data on taxation and public spending in Scotland within the UK, which confirms how Scottish public spending, like spending in other parts of the UK, is supported by substantial fiscal transfers from wealthier parts of the country. It challenges the SNP's conclusion that Scotland could achieve a sustainable fiscal position without immediate substantial spending reductions and instead projects how the SNP's latest plans would result in a newly independent country amassing unsustainably high levels of debt, as it sought to borrow to make up for lost income from the UK. This, together with the assumptions that independence would have no negative effects on Scotland's trade with the rest of the UK, result in the presentation (as the 2014 referendum) of a seriously over-optimistic prospectus for public services under independence.

Introduction

The publication of Government Expenditure and Revenues in Scotland (GERS)[1] is an annual ritual which goes back to the 1990s. GERS was introduced by the then UK government with a view to showing that Scotland benefited fiscally from its position inside the United Kingdom, at a time when North Sea oil revenues figure prominently in Scottish public debate. Publication is now the responsibility of the devolved Scottish government. The data on public spending and tax income in Scotland provide a wealth of material for comparison of trends and priorities and spending and in tax-raising. Attention often focuses, however, on the relative fiscal position in Scotland compared to the UK as a whole. This year, as in all recent years, GERS shows a large fiscal deficit of around 7.5% of GDP, contrasting with that a much smaller deficit for the UK as a whole of 1.5%.

This is the second of two working papers which attempt to shed some light on what this means by looking at the GERS data in two different contexts. The first paper compared

[1] Scottish Government, 2019, at www.gov.scot/publications/government-expenditure-revenue-scotland-gers

Scotland with the rest of the UK's nations and regions. GERS is often interrogated for what it says about the strength or weakness of the Scottish economy, whether Scotland is "subsidised" by England, and so on, but seldom looked at in the context of the fiscal arrangements for whole UK. In part this is because detailed tax as well as spending data has until relatively recently been available only for Scotland, and not for Wales, Northern Ireland or the regions of England. The Office for National Statistics now however regularly publishes data equivalent to GERS for the all the UK's nations and regions. This provides striking evidence of the fiscal flows between different parts of the United Kingdom.

This paper is primarily concerned with the implications of the GERS numbers for a potentially independent Scotland, but it is helpful to summarise the key points about the UK fiscal union and its significance for Scotland (the figures below are for the year 2017-18, the most recent one in which UK wide data is available):

- The United Kingdom is a fiscal union which makes very substantial fiscal transfers from one region of the country to another. The three richest parts of the country (London, the South East and the East of England) which between them account for something approaching half of UK GDP, contribute very substantial resources to all of the other nations and regions. London, for example, funds fiscal transfers equal to approximately 10% of its GDP.
- These fiscal transfers are very economically important for many of the other regions. For example, 20% of the GDP of Northern Ireland is represented by fiscal transfers the rest of the UK. The proportion for Wales is very similar, and for the North East of England it is 15% of GDP.
- Overall, England as a whole transfers approximately 2% of its GDP to Northern Ireland, Wales and Scotland. Scotland is not the largest recipient of fiscal transfers in absolute terms, nor in terms of population or proportion of GDP. But it nevertheless receives total fiscal transfers of 6.5-7% of GDP.
- Fiscal transfers can be conceived of as making up for a shortfall in tax income compared to the national average in a part of the country, and as supporting expenditure higher than the national average. The first of these is commonly referred to as "resource equalisation". It is very striking that the vast majority of fiscal transfers inside the United Kingdom are driven by resource equalisation: that is to say, public spending in the different parts of the UK does not depend on how much tax is raised there. Benefit levels, old-age pension payments and public services provision are not lower in areas which cannot fund them from taxation raised locally. This is an inheritance of the UK's highly centralised public expenditure and taxation systems. It is also very largely true for Scotland and Wales, despite tax devolution, because the complex formulae for taking account of devolved tax income means that the devolved nations bear only the risk of future relative changes in tax yield.
- Scotland, like other nations and regions, receives some fiscal transfers to make up for the fact that is tax yield is lower than the national average. But the striking difference is that most of the fiscal transfer which Scotland receives is driven not by low tax yield but by unusually high public spending by UK standards. This high level of spending is concentrated in devolved services, and is caused by the application of the Barnett

formula[2]. Hence, considering the fiscal position of an independent Scotland, the critical fiscal issue is that Scotland's inherited levels of public spending are substantially out of line with its tax income.

GERS and what it tells us

GERS is produced by Scottish government statisticians, to national statistical standards. The national statistical standards guarantee that the series is free from political interference and spin from any side. It records public expenditure for the benefit of Scotland, the majority of which is spent directly in Scotland on pensions, welfare payments and public services such as health and education, all of which are relatively easy to pin down geographically. A smaller proportion of UK government expenditure, such as on defence or debt interest, is held to benefit the whole UK equally, and is simply allocated on a *per capita* basis. The geographic source of tax and other revenues is also identified and allocated, though that inevitably involves more approximations. For example, the figures for income tax raised in Scotland previously in GERS have been estimated from survey data. Given the almost complete devolution of income tax, actual figures, albeit some years in arrears[3],are now available and give a more accurate (and rather different) picture of income tax revenue in Scotland. After nearly 3 decades of development, the GERS figures are widely regarded as the best available estimates of Scotland's present fiscal position inside the UK, and acknowledged to be the starting point for any discussions of taxation and spending in an independent country.

GERS produces a figure for Scotland's overall fiscal balance, including an estimated geographical share of North Sea oil revenue. For 2018-19 it shows that Scotland had an overall deficit of £12.6bn, slightly lower the previous year at 7.5% of GDP, much higher than the UK deficit of 1.1%; Scotland's onshore deficit was £14 billion about 8.5% of its onshore GDP.

Revenue, spending and fiscal balance, Scotland

	£bn
Revenue	*62.7*
Of which North Sea	*1.4*
Spending	*75.4*
Deficit	*12.6*
As % of GDP	*7.5%*

[2] For a detailed analysis, see Gallagher 2017 *Public spending in Scotland: Relativities and Priorities* at www.nuffield.ox.ac.uk/media/1940/publicpolicywp-public_spending_scotland.pdf

[3] For the complexities of estimating future income tax revenues see the work of the Scottish Fiscal Commission at http://www.fiscalcommission.scot/media/1499/scotlands-economic-and-fiscal-forecasts-may-2019.pdf

What about North Sea oil?

North Sea oil revenues have for many years featured prominently in debates about Scotland's fiscal position. In the 1980s they were very significant overall for the UK, reducing the government's deficit by several percentage points of GDP in some years. Had Scotland been independent at that time, and enjoyed the oil revenues, it would have run a substantial surplus for several years. But these revenues are both finite and volatile, and are now very much smaller than in the past. In 2016-17 Scotland's geographical share of oil revenues was effectively zero, and in recent years have been running at something over l£1 billion annually. One reason is that the costs of decommissioning North Sea platforms can be offset against petroleum revenue duty, so this element of the offshore revenue stream has for some years been negative, offset by offshore corporation tax on the profits made. The Office of Budget Responsibility expects this to continue[4]. In this analysis of Scotland's position inside the UK, a geographical share of oil revenues has been allocated to Scottish income, but it is no longer a game changer for Scotland's fiscal picture, as it amounts to only around 2% of revenue.

The arithmetic of independence

There are renewed demands for another referendum on Scottish independence from the SNP-led Scottish government in the wake of the Brexit vote, and the prospect of a no deal Brexit in particular. Proponents of independence, obviously, need to address what might happen to public expenditure and taxation. Two different approaches have at different times been proposed by the SNP. In 2014, the Scottish government's independence prospectus relied on oil revenues to balance the books, but this approach is no longer being followed. If there is another referendum, the SNP's most recent attempt to grapple with the significant fiscal challenges of independence, the so-called "Sustainable Growth Commission" report, may be the basis of the tax and spend proposition made to the Scottish people. So most of the remainder of this paper looks more closely at what GERS implies for the fiscal model recommended by that report.

Self-evidently, GERS assesses Scotland's fiscal position within the United Kingdom, and it is often said that it is therefore not a picture of the fiscal situation which would face an independent state. This is true, but potentially misleading. What the GERS data show is both the fiscal capacity of an independent Scotland and its inherited expectations and obligations in relation to public services. These could change under independence, but the inherited tax base and rates, levels of public service and public employment would inevitably be the starting position for a new country. This was the basis on which the Scottish government's independence White Paper "*Scotland's Future*[5]" addressed fiscal questions, and GERS also provided the data which underlay the SNP's more recent fiscal prospectus, the so-called

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4 Office of Budget Responsibility 2019 Economic and Fiscal Outlook March 2019 at https://obr.uk/efo/economic-fiscal-outlook-march-2019

5 Scottish government, 2013 *Scotland's Future*

"Sustainable Growth Commission"[6] report, although the latter was a party rather than government document. It is instructive first to compare these two quite different approaches.

The 2013 White Paper

Scotland's Future, written in 2013 as the prospectus for the 2014 independence referendum, was very light on issues of tax and spending. Of its 650 pages, 8 were devoted to government income and expenditure, with one table of figures. They considered Scotland's fiscal position only in one year, 2016-17, the proposed first year of independence. The White Paper contained no long-term fiscal projections but claimed that in 2016-17, under the present constitutional arrangements, Scotland would have a less negative fiscal balance than the UK as a whole, and better even than G7 average. The clear implication was that an independent Scotland would start off from a stronger fiscal position than the UK. This assertion rested however on only that one year's projected figures, and especially a projection of oil revenue which was far too optimistic. By 2013, oil revenues were in decline, but the White Paper nevertheless projected that they would increase, to between £6.8 and £7.9 billion in 2016-7. In the event, they were as close to 0 as makes no difference. No projections of revenue and spending can be expected to be precisely accurate. The White Paper's £56.9 billion projection of onshore revenue was quite accurate (under by £0.6bn), though expenditure was underestimated by £2-4m. But the overall picture was rendered substantially misleading by the over-optimism in relation to oil: it was asserted that Scotland could expect to run a deficit of between 2.5 and 3.2% of GDP, compared to a larger UK deficit, projected at 3.4%. In the event, Scotland's deficit that year was actually over 8% of GDP, compared to 2.4% for the UK.

It is fair to look at this in context. From 2006 until about 2012, oil revenues meant that Scotland's fiscal balance was almost exactly the same, as a proportion of GDP, as the UK's as a whole. In other words, for the period from 2007, in which SNP ministers had been in office, North Sea oil revenue had not just made up for the shortfall in onshore taxes compared to the UK average but also paid for the extra public spending in Scotland. By 2013, this was changing rapidly, but the Scottish government chose to assume this downturn would reverse, that indeed Scotland's fiscal position would become more favourable; and implicitly the White Paper was saying this could be expected to continue indefinitely. At the least this was wishful thinking, but deliberate over-optimism – as we see in the politics of Brexit today – is a conscious political tactic.

Basing an independent Scotland's fiscal future on optimism about oil revenues was not in 2013, and is evidently not now, a sustainable argument. This was accepted by the SNP in commissioning and then publishing the report of the "Sustainable Growth Commission", to which we now turn.

The fiscal approach of the Sustainable Growth Commission

The report of the Sustainable Growth Commission, set up by Nicola Sturgeon and chaired by former MSP Andrew Wilson, tries to be optimistic too. It carries the subtitle "*Scotland – the case for optimism*". The Commission's very wide remit was aimed at the main perceived

[6] Scottish National Party, 2017, at www.sustainablegrowthcommission.scot/report

weaknesses in the independence case in the 2014 referendum – the economy, public finances and the question of currency. It was tasked to produce "measures to boost economic growth and improve Scotland's public finances", to look at potential savings from UK public expenditure programmes, and recommend an appropriate monetary policy for an independent Scotland.

This working paper is focused on the fiscal approach of the report, rather than its approach to economic growth or currency. Some of the economic growth analysis is hard to disagree with, for example that Scotland's population structure means it continues to need immigration in order to grow economically, or the proposition that a reduction in inequality could be economically beneficial. In essence, however, the report merely says that small open economies can prosper, and that *if* Scotland were as successful as a combination of Denmark, Finland and New Zealand*,* then it would be a good deal richer than it is now. If it was, then it would indeed be.

The Report proposes "growth goals" (i.e. targets for the rate of economic growth) in a "national economic strategy"; debate about a "next generation economic model"; a plethora of other goals and targets, on inequality, productivity and housing; an Infrastructure Commission, a Productivity Commission; and a host of other reviews. Concrete policy proposals to be implemented now or in early course are however largely absent. The report has been written in the context of Brexit, but says simply:

> *"Maximising frictionless trade and market access with the rest of the UK and with Europe is of critical importance to the performance of the Scottish economy in the short and long term*."

It does not however suggest how this can be achieved if the UK is outside the European Union, the Customs Union and Single Market, and Scotland is inside them. We will return to the implications of this point, which is obviously important for the economy and hence tax revenues, later.

The Commission also proposes that Scotland should leave the UK currency union, but nevertheless continue to use the Pound Sterling. This approach, known as "sterlingisation", would be followed until a new Scottish currency was launched. SNP party policy is now to move from sterlingisation to a new currency as quickly as possible. The full implications of this approach are beyond the scope of this working paper, but sterlingisation would have significant implications for fiscal policy, which the Commission simply ignored. A country which uses another country's currency has no control over monetary policy, and to ensure that there is enough liquidity (ie cash in the economy) the economy has to run an overall surplus or at least balance. In this respect it is like a business or a household: if more goes out than comes in, the amount of money available will decrease. Figures for Scotland's overall (ie public plus private sectors) balance are not available, but we know that Scotland's public sector runs a very large deficit, and there is nothing to suggest it is offset by an equally large private sector surplus. So it is very likely that Scotland would be driven to running a highly conservative fiscal policy because of its chosen monetary approach. The Commission refer to the Republic of Ireland's post-independence monetary policy as an example (they adopted an approach very like sterlingisation) but fail to record that the new country for many years had to adopt a strict fiscal policy of running a surplus to secure its money supply[7]. As we will see, the Commission propose quite the opposite of strict fiscal discipline.

The fiscal strategy of the Growth Commission

The essence of the Commission's fiscal approach is as follows:

- Oil and any other windfall revenues are placed into a long-term fund (which might once have been very large, but is now likely to be small).
- Public spending should grow less than the rest of the economy grows, and so at a lower rate than in tax revenue grows, so that the deficit gradually reduces from its starting point, without immediate big cuts in spending.
- In the meantime, in the absence of UK fiscal transfers, Scotland should borrow to maintain spending levels. This means immediate high levels of borrowing by the new state.
- But the Commission set some constraints on that borrowing: new debt accumulated by Scotland should not be allowed to exceed 50% of GDP, and Scotland's deficit should be brought down to about 3% of GDP. (We return later to whether this can be achieved under their approach.)

This approach was widely regarded as more mature than the 2013 White Paper, although the emphasis on growth and deficit reduction was condemned by some left-leaning Yes supporters[8], perhaps burnishing the Commission's reputation for fiscal prudence. Certainly, ditching the previous reliance on oil (by the skillful political device of proposing any oil revenue should be placed in an oil fund for future generations) made sense. Such a fund would no longer be large, and the temptation to use it for current spending might become too strong, but the economic and fiscal case for independence would no longer be floated on a declining resource. Similarly, acknowledging that Scotland's level of public expenditure is only supportable by a comparable level of tax income is realistic, albeit that prudence is deferred.

It is also politically understandable (whether or not it is practicable) that the Commission tried to avoid immediate cuts in public spending or tax increases, but instead proposed restricting expenditure growth as a share of the economy until such times as tax revenue caught up to an acceptable level. They recommended public expenditure should grow at 1% less than the economy, and so as tax revenue. Scotland (onshore) starts out from expenditure at over 45% of GDP, and tax revenue at around 37%, so this implies quite a slow pace of deficit reduction. Say in the first year the economy and tax revenues grow by 2%, but expenditure by only 1%, then the deficit as a percentage of GDP reduces by 0.4%, and so on. Over time an approach of this kind can have a noticeable impact on deficit as a percentage of GDP. But it's not quick:

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[7] See Honohan, 2018, at www.centralbank.ie/docs/default-source/publications/economic-letters/vol-2018-no.-3-three-quarter-centuries-of-central-banking-in-ireland-(honohan).pdf?sfvrsn=4

[8] eg Commonweal at commonweal.scot/New%20Common%20Weal/cache/file/D46D4C2A-A84F-5BFD-97FDAEFD748931B5.pdf

the following (purely illustrative) table shows how 2% growth in revenue coupled with a 1% growth might reduce a deficit of over 9% to one of 5% within ten years.

Year	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
GDP	156.5	159.6	162.8	166.1	169.4	172.8	176.2	179.8	183.4	187.0	190.8
Tax	58.6	59.8	61.0	62.2	63.4	64.7	66. 0	67.3	68.7	70.0	71.4
Spend	73.4	74.1	74.9	75.6	76.4	77.1	77.9	78.7	79.5	80.3	81.1
Deficit	14.8	14.4	13.9	13.4	12.9	12.4	11.9	11.4	10.8	10.2	9.6
As %	9.4%	9.0%	8.5%	8.1%	7.6%	7.2%	6.8%	6.5%	5.9%	5.6%	5.0%

The Commission however claimed that their approach would reduce the deficit as a percentage of GDP further than this, to around 3% and, additionally, constrain the associated growth in new debt to less than 50% of GDP. In order produce the projections in their report which sought to demonstrate this, the Commission made a number of additional assumptions, not all of which are stated clearly or explicitly. Not all are valid, and alternative, and perhaps more reasonable assumptions will show quite different outcomes .

Assumptions underlying Growth Commission projections, and possible alternatives

1. Oil revenues are effectively ignored: they are put into a fund for future generations, and not used to meet current liabilities.
2. The projections begin from a forecast deficit for Scotland inside the United Kingdom of 5.9% of GDP (for an illustrative independence year of 2021-22) rather than the most recent actual level. This was based on a projection made some years ago by an independent economist, but it implies that as much of the reduction in deficit is made before as after independence, and it is now clearer that such a reduction is optimistic.
3. Public spending grows more slowly than the economy, by 0.5% real per annum compared with 1.5% for the economy as a whole.
4. Immediate savings are made in defence and other UK programmes, and Scotland pays less than a *per capita* share of inherited UK debt: the total savings assumed are not explicitly set out, but hidden in a “solidarity” payment with the UK along with international aid. It is also assumed that Scotland will gain tax revenues from repatriating some UK functions.
5. The transition to independence is assumed to cost little (several hundred million pounds only) and there are assumed to be no significant continuing extra costs from running a separate state.
6. Since Scotland will not assume direct liability for inherited UK debt but reimburse the UK for a share of it, that debt will not count toward Scotland’s debt/GDP ratio.
7. Inflation is modelled at 2%.
8. Scotland would pay 1% more than the UK does to borrow.
9. (unstated) The transition to independence has no short term negative effect on Scotland’s trade with rest of the UK.
10. (unstated) Leaving the economic union with the UK causes no long-term reduction in Scotland’s trade with the UK and so economic growth in Scotland.

On this basis, the report claims that Scotland's public deficit should reduce to under 3% of GDP within 10 years and its debt will be well under 50% of GDP after 10 years. The remainder of this paper examines whether this is realistic, and offers a range of projections on some (mostly, but not all) less optimistic assumptions. This table lists them.

1. Oil revenues	Agreed	This makes sense for these purposes, although it may be hard to sustain in practice.
2. Starting point	Not agreed. Start from most recent levels of tax, spend and deficit (all onshore, given 1 above)	Given Brexit and experience since the GC report it cannot be assumed Scotland's deficit will narrow. It has done so only slightly in recent years.
3. Spending growth less than GDP growth	Agreed: this is the core of the GC approach	Assume spending grows at 1% less than GDP.
4. Some immediate cuts assumed	Instead we model here: • No immediate cuts • A *per capita* share of UK debt • *But no transitional or additional costs from independence either*	This is partly for clarity. We model below the amount available for *all* public services, including transitional or continuing independence costs, compared to today. No plausible estimates have been made of additional costs have been made. Cuts may then be made to UK-run or devolved services, to meet the fiscal target imposed, or a reduction in UK debt payment might be agreed.
5. Transitional costs	None assumed: see 4 above.	
6. Inherited debt does not score on Debt/GDP ratio	The total effective debt ratio is projected as well as new debt. UK debt is however projected to reduce more quickly than the GC assumed.	Markets can be expected to look through published numbers to total debt servicing liabilities.
7. 2% inflation	Agreed. For clarity, projections are in real terms, with cash amounts devalued by 2% inflation.	This mostly just a projection assumption: but high inflation would erode debt and increase interest rates.
8. Scotland pays higher interest rate	Agreed. Assumptions on top of present UK total debt servicing cost of 3.6% from GERS	1% more as proposed by GC.
9. No transitional impact from leaving UK market	This is implausible. As in the case of Brexit, disruption to trade is inevitable as new border arrangements are created.	A range of assumptions is projected, as no detailed assessment has been made by the SNP or Scottish government.

10. No long term effect from leaving UK market	This too is implausible. Brexit is projected to reduce UK economic growth, and Scotland more integrated in the UK than the UK in the EU.	A range of assumptions is modelled to reflect this, as no estimates have been made.

These projections (just like the Growth Commission's work) do *not* emerge from a detailed economic model. They are simply the results of the various assumptions put in to the arithmetic involved.

Some assumptions merit further explanation. First of all, it is not assumed here that Scotland's deficit will get markedly smaller before independence. It has reduced only slightly for some years now, contrary to what the Commission assumed. As noted above Scotland's onshore deficit (which is what matters for the Commission's calculations) remains at about 8.5% of GDP. Given, as noted above that the difference from the UK deficit is driven primarily by higher spending this can be expected to continue unless there are large extra Scottish spending cuts or tax rises.

Secondly, is implausible to assume that Scottish independence will have no effect on Scotland's trade with the rest of the UK and therefore its economic growth, given Brexit and proposed Scottish EU membership. The Growth Commission simply assumed that Scotland would have frictionless trade with both the UK and the EU. As the ongoing Brexit debate demonstrates, a "cake and eat it" strategy is not viable for the UK with the EU, and would not be viable for Scotland either.

Detailed work has been done to estimate the impact of the UK's leaving the EU. Before leaving the EU, HM Treasury predicted there would be a shock effect from the vote of anything between 3 and 8% of GDP, and long-term reductions of anything from roughly 5 to roughly 10% of GDP after 15 years[9]. More recently, the decision to leave the EU having been taken, the Department for Leaving the European Union modelled the economic effects of the various options for doing so, and assess the effect of either in WTO or a free-trade agreement on UK GDP as a reduction over time of somewhere between 5 and 8%[10]. Scotland is more integrated into the UK economy than the UK is into the EU, so larger downsides might be expected, but no assessment has been made of either the shock or long-term economic effects of exiting the UK's domestic market by the Scottish government or the SNP. It is however implausible to assume that they will be any less, and it may be reasonable to assume that they might be more, then the effect of the UK leaving the EU. Nevertheless in this modelling, only the following options are illustrated:

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[9] HM Treasury, 2016, *the immediate economic effect of the leaving the EU* at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/524967/hm_treasury_analysis_the_immediate_economic_impact_of_leaving_the_eu_web.pdf

[10] DExEU, 2018, *EU Exit: Long Term Economic Analysis at* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/760484/28_November_EU_Exit_-_Long-term_economic_analysis__1_.pdf

Immediate effects:	A one-off 1.25% reduction, optimistic scenario A one-off 2.5% reduction - the base case A one-off 5% reduction – pessimistic scenario
Continuing effects:	0% optimistic (any negative effect offset by independence benefits) 0.5% net annual reduction - the base case 1% net annual reduction - the pessimistic scenario

These are applied to what the Growth Commission calls the trend rate of economic growth of 1.5%, which is roughly what Scotland has achieved over recent decades.

Additionally, however, this modelling assumes that inherited UK debt will run off *more* quickly than the Growth Commission assumed, not only because it will decline in real terms and economic significance, but because the UK's inherited debt instruments will be repaid, and Scotland will have no obligation to service UK debt issued after Scottish independence. Figures to estimate this are not readily available, and a simple assumption has been made that the overall effect of this obligation will decline to about one third of its present level after 10 years. This may be over-optimistic. The cost of servicing this debt is assumed to be in proportion to the present cost of servicing it, at 3.66% as in GERS. The cost of servicing new Scottish debt is assumed to be 1% higher than this.

On these assumptions, the base case after 10 years looks in detail as follows:

Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Tax income (onshore)	61.3	58.2	58.8	59.4	60.0	60.6	61.2	61.8	62.4	63.0	63.7
Spending	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4
Deficit	-14.1	-17.2	-16.6	-16.0	-15.4	-14.8	-14.2	-13.6	-13.0	-12.3	-11.7
New debt (D)	0	-16.8	-33.1	-48.7	-63.8	-78.3	-92.2	105.6	-118.3	-130.4	-141.8
Inherited debt (ID)	-100	-90	-81	-72.9	-65.6	-59.0	-53.1	-47.8	-43.0	-38.7	-34.9
Total debt (D+ID)	-100	-106.8	-114.0	-121.6	-129.5	-137.4	-145.4	-153.4	-161.3	-169.1	-176.7
Servicing of ID	-3.7	-3.3	-3.0	-2.7	-2.4	-2.2	-1.9	-1.7	-1.6	-1.4	-1.3
Servicing D I	0	-0.67	-1.3	-1.9	-2.6	-3.1	-3.7	-4.2	-4.7	-5.2	-5.7
Total Servicing (I)	-3.7	-4.0	-4.3	-4.6	-4.9	-5.3	-5.6	-5.9	-6.3	-6.6	-6.9
Public Service Spend (PSS)	71.7	71.4	71.1	70.8	70.4	70.1	69.8	69.4	69.1	68.8	68.4
PSS indexed	100	99	99	99	98	98	97	97	96	96	95
GDP	160	152	153	155	157	158	160	161	163	165	166
Total debt/GDP	0.62	0.70	0.74	0.78	0.83	0.87	0.91	0.95	0.99	1.03	1.06
Deficit/ GDP	0.08	0.11	0.11	0.10	0.10	0.09	0.09	0.08	0.08	0.07	0.07

Notes

1. Tax income is assumed to grow at the same rate as GDP, after an initial hit of 2.5%, at 1% per annum in real terms (ie a trend growth rate of 1.5%, less 0.5% for the effects of leaving the UK).
2. Spending is assumed to grow at 1% less than GDP, in this base case flat in real terms.
3. Deficit is calculated in real terms here.
4. New debt is cumulative deficit, discounted at 2% *per annum* reflect the benefits of inflation.
5. Inherited debt is a *per capita* share of the outstanding UK debt, net of the proportion owned by the Bank of England.

6. Inherited debt servicing cost is taken from GERS, which takes into account payments received from the Bank of England to the government in respect of the debt which it owns.
7. Inherited debt is assumed (somewhat arbitrarily) to shrink to one third of its present level after 10 years and inherited debt servicing cost to reduce in the same proportion.
8. Spend on services is total public spending less debt servicing costs. It is indexed to year 0 =100.
9. Totals do not add because of rounding

On this scenario, an initial hit of 2.5% to GDP from the disruption of breaking the economic union with the UK, coupled with an annual reduction of 0.5% in economic growth means that it would take about four years for Scotland's economy to recover from the disruption of separation. Throughout the period, Scotland borrows to offset the loss of UK fiscal transfers, and this borrowing swiftly adds up. In summary, for most of the 10 year period Scotland's deficit would be between 7 and 10% of GDP, and never gets below 6%. The ratio of new debt to GDP would then increase over the period to reach 70%, and when account is taken of the (even much reduced) inherited debt, Scotland's debt to GDP ratio almost hits 100%. On this basis there is no real terms reduction in *total* public spending, but because of the continually increasing interest bill, spending on public services would be reduced by about 6% in real terms over the period. In today's money that would be a reduction of over £4 billion, more than Scotland presently spends on defence or on debt interest, or about one third of the cost of the NHS*. It should be emphasised this is a projection, not a forecast, not only because the inputs are uncertain assumptions, but because it seems implausible to assume that a newly independent nation would be able to borrow 75% of its GDP in the first 10 years of its existence. Something else would have to give.*

Why is this projection so much less rosy than that of the Growth Commission numbers? There are two main reasons, both related to optimism. First of all, this projection starts from where Scotland is most recently in terms of its deficit and spending rather than where it might be in future. Much of the optimism in the Growth Commission’s report stems, paradoxically enough, from its assumption that UK austerity plans and UK-driven economic growth will reduce Scotland’s deficit. In the context of Brexit, that now seems unlikely. Secondly, this projection does *not* ignore the potential effects of Brexit on the relationship between cotland and the rest of the UK and hence on Scotland’s economy. This projection does not assume any immediate cost savings from independence, which sounds highly unlikely, partially offset by somewhat more optimistic assumptions about the run-off profile of inherited debt.

Annex A gives similar details for the optimistic and pessimistic assumption sets and their implications, which are summarised in this table.

Scenario	**Key features**	**Deficit**	**Indebtedness**	**Spending on public services**
Base case	Initial shock from separation; No net long-term effect on trend growth	11%, of GDP reducing to 7%	New debt reaches over 80 % of GDP; Total debt burden over 100%	5% real reduction after 10 years

Pessimistic	Larger initial shock of 5%; 1.0% reduction in trend growth from separation	11% of GDP reducing to 7%	New debt reaches 89% of GDP; total debt burden 111%	12% real reduction after 10 years
Optimistic	Small initial shock only; independence boosts growth rate to offset loss of UK trade	10% of GDP, reducing to 6%	New debt reaches 75% of GDP; total debt burden 95%	1% real growth after 10 years

It is very striking how the whole range of assumptions (and even other more optimistic ones) tell broadly the same story about the deficit and indebtedness of an independent Scotland under SNP plans. This follows from the Growth Commission's strategy, which avoids significant public expenditure reductions upfront but at the cost of very significant borrowing in the early years of independence to offset the loss of fiscal transfers from the UK, and effectively channels any upside or downside from growth into public spending on services, rather than debt reduction or increase. As a result debt builds up quickly and so does the cost of servicing it, which cannot be spent on public services. The most significant problem with Commission's approach follows from its unwillingness to confront the public spending issue early. Instead the pain is spread over a decade or more, during which unmanageable levels of borrowing and debt are accumulated, leading to an inevitable fiscal adjustment when the country is already heavily indebted. *Under any of these scenarios the Commission's plans are not sustainable, as they breach the Commission's own fiscal rules, likely EU requirements and expectations of lenders.*

Could anything be done to make the Commission's approach more sustainable? The first option is to start the analysis from a happier place, as they themselves did: hope that independence will be delayed until Scotland's fiscal position has improved. Given that the main driver of the fiscal transfers which Scotland currently enjoys from the rest of the UK is higher public spending, that implies not simply greater economic growth in Scotland under the present constitutional arrangements, but a substantial degree of extra austerity, presumably to be imposed by the UK government. Making this assumption can only be described as deliberate over-optimism.

Alternatively, an immediate reduction in public spending after independence could have the same effect. Broadly speaking, a reduction in public expenditure similar in size to the UK fiscal transfer forgone or to around the level of spending in the rest of the UK. That could put an independent Scotland on the path to a deficit of under 3% of GDP and new indebtedness of less than 40% of GDP after 10 years. The size of the initial cuts would depend on any negative economic effects from separation and set up costs of a new state. Arguably however it might be better to make this spending adjustment early than be obliged to do so after a prolonged period of increasing indebtedness and the associated interest burden.

Oils revenue could be spent rather than saved, but even over a ten oyur period it adds uo to about £15bn, and does not make a significant impact. Some spending cuts might (as the

Commission appeared to hope) be made in programmes presently administered by the UK government. But the scope for this is relatively small. The Commission themselves suggest savings of only about £0.5 billion in defence, while allocating inherited debt on the basis of GDP rather than population might save the Scottish Exchequer about £0.2 billion per annum initially. But this still implies that permanent savings of many billions per annum in public services, welfare benefits and pensions are unavoidable.

Conclusion

Scotland's fiscal position, set out in GERS, presents a major challenge for the independence movement. Today, within the UK, Scotland is part of a fiscal union which regularly shares large proportions of its GDP to equalise tax resources and support at least common standards of welfare and public services. Scotland is unusual in that fiscal sharing system in that it receives large fiscal transfers not just to make up for what is now lower than average tax take but much higher than average spending, mainly due to the Barnett formula. Losing fiscal transfers of around 7% of GDP would be an immediate impact of independence.

The SNP and Scottish government's first response to this challenge, in 2013, was to hope oil revenues would grow to fill the gap. This was surely deliberate over-optimism, and came seriously unstuck when those revenues fell to zero in what was to have been the first year of independence.

Their more recent approach, the Growth Commission, regards any oil revenues as a windfall to be set aside (which makes sense) and proposes instead to borrow heavily to make up for the immediate loss of UK fiscal transfers, and restrict the growth of public spending for a decade or more in the hope of reaching a sustainable fiscal position in time. This too suffers seriously from over-optimism. It pays no heed to the fiscal implications of the Commission's own currency plan. It assumes that Scotland's deficit will reduce markedly before independence. It also assumes that while Brexit is economically damaging to Scotland because of the barriers to trade with the EU it will create, independence will create no such barriers to trade with the UK (even though Scotland is inside the EU trading system). This is having your cake and eating it, which does not work for the UK and the EU and will not work for Scotland and the UK either.

Any more realistic look at the Commission's approach, starting from Scotland's actual fiscal position, swiftly shows that the newly independent country would quickly amass unsustainable levels of debt, and the cost of servicing it would require large cuts in public services. This is hardly surprising: today's relatively high spending is supported by large UK fiscal transfers, and to avoid cutting it large borrowing would be needed. That swiftly adds up to very large debt, which cannot be afforded. All this strategy would achieve is to delay the inevitable big cuts in spending until Scotland is heavily indebted and so has to make even more cuts. The price of over-optimism would be a very heavy one.

Annex A: Detail of Alternative Scenarios

Pessimistic Scenario

Separation from the UK causes a big (5%) one-off reduction in Scottish GDP, and restricts future Scottish economic growth by 1% *per annum* below the trend growth rate. This is very broadly comparable to the pessimistic scenarios painted by the UK government for the UK's leaving the EU.

Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Tax income (T)	61.3	56.	57.0	57.3	57.6	57.8	58.1	58.4	58.7	59..0	59.3
Spending (S)	75.4	75.	74.6	74.3	73.9	73.5	73.2	72.8	72.4	72.0	71.7
Deficit	-14.1	-18.3	-17.7	-17.0	-16.3	-15.7	-15.0	-14.4	-13.7	-13.1	-12.4
New Debt	0	-17.9	-35.2	-51.9	-67.9	-83.3	-98.0	-112.1	-125.6	-138.4	-150.5
Inherited debt	-100	-90	-81	-72.9	-65.6	-59.0	-53.1	-47.8	-43.0	-38.7	-34.9
Total debt (D+ID)	-100	-107.9	-116.3	-124.8	-133.6	-142.4	-151.2	-160.0	-168.6	-177.1	-185.4
Servicing ID (IDi)	-3.7	-3.3	-3.0	-2.7	-2.4	-2.2	-1.9	-1.7	-1.6	-1.4	-1.3
Servicing D (Di)	0	-0.9	-1.8	-2.6	-3.4	-4.2	-4.9	-5.6	-6.3	-6.9	-7.5
Total Servicing (i=Di+IDi)	-3.7	-4.2	-4.7	-5.3	-5.8	-6.3	-6.8	-7.4	-7.8	-8.3	-8.8
PSS spending (S+i)	71.7	70.8	69.9	69.0	68.1	67.2	66.3	65.4	64.6	63.7	62.9
PSS indexed	1	99	97	96	95	94	92	91	90	88	88
GDP	160	148	148	149	150.2	151	152	152	153	154	155
Total debt/GDP	0.62	0.72	0.78	0.83	0.89	0.94	0.99	1.05	1.10	1.15	1.20
New Debt/GDP	0	0.12	0.24	0.35	0.45	0.55	0.64	0.73	0.82	0.90	0.97
Deficit/ GDP	0.09	0.12	0.13	0.11	0.11	0.10	0.10	0.09	0.09	0.08	0.08

Notes: as for table in paper

In this scenario, with a big shock from independence and a drag on growth from trade barriers with the UK, the Scottish economy finds it very difficult to recover from the disruptive effects of leaving the UK and the fiscal position swiftly gets out of control. Within five years the new country has borrowed an additional 50% of its GDP, and despite that spending on public services has reduced by 8%. By the end of 10 years, if this scenario could be sustained, the total debt burden borne by Scottish taxpayers and GDP would be 120% of GDP, and spending on public services reduced by 12% in real terms. In today's money that would be a reduction of over £8 billion, approximately two thirds the cost of the Scottish NHS. Most of that is going to pay debt interest This scenario is clearly neither sustainable where lenders are concerned, nor acceptable to the public. It illustrates however just how sensitive the fiscal model proposed by the Growth Commission is to assumptions about the effect of independence on Scotland's economy some form of border between Scotland and England with consequent effects on Scottish trade: under Growth Commission approach this risk is borne by public services.

Optimistic scenario

In this scenario, the transition to leaving the UK is little more than a hiccough, with a one-off reduction of only 1.25% of GDP, which is swiftly recouped by additional growth resulting from independence, which more than offsets any losses from losing the UK relationship. Growth improves remains at its trend rate of 1.5% real *per annum* because benefits from independnce offset losses from UK trade.

Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Tax income (T)	61.3	59.8	60.7	61.5	62.5	63.4	64.4	65.3	66.3	67.3	68.4
Spending (S)	75.4	75.8	76.1	76.5	76.9	77.3	77.7	78.1	78.5	78.9	79.2
Deficit	-14.1	-16.0	-15.5	-15.0	-14.4	-13.9	-13.3	-12.7	-12.1	-11.5	-10.9
New Debt	0	-15.7	-30.9	-45.5	-59.7	-73.2	-86.3	-98.8	-110.7	-122.0	-132.7
Inherited debt (ID)	-100	-90	-81	-72.9	-65.6	-59.0	-53.1	-47.8	-43.0	-38.7	-34.9
Total debt (D+ID)	-100	-105.7	-111.9	-118.4	-125.3	-132.3	-139.4	-146.6	-153.7	-160.7	-167.5
Servicing ID (IDi)	-3.7	-3.3	-3.0	-2.7	-2.4	-2.2	-1.9	-1.7	-1.6	-1.4	-1.3
Servicing D (Di)	0	-0.6	-1.2	-1.8	-2.4	-2.9	-3.4	-3.9	-4.4	-4.9	-5.3
Total Servicing (i=Di+IDi)	-3.67	-3.9	-4.2	-4.5	-4.8	-5.1	-5.4	-5.7	-6.0	-6.3	-6.6
PSS (S+i)	71.7	71.8	71.9	72.0	72.1	72.2	72.3	72.4	72.5	72.6	72.7
PSS indexed (S+i)	1	100	100	101	101	101	101	101	101	101	101
GDP	160	156	158	161	163	166	168	171	173	175.7	178
Total debt/GDP	0.625	0.68	0.70	0.74	0.77	0.80	0.83	0.86	0.89	0.91	0.94
Total new debt/GDP	0	0.10	0.19	0.28	0.36	0.44	0.51	0.58	0.64	0.69	0.74
Deficit/ GDP	0.08	0.10	0.10	0.09	0.09	0.08	0.08	0.07	0.07	0.06	0.06

On these assumptions, the Scottish economy bounces back very quickly from any disruption caused by independence and grows quickly thereafter. So then does tax revenue, and accordingly the money available for public spending is not as constrained as in the base case or the pessimistic scenario. Scotland's deficit would then decline over the first decade of independence, but would still be at 6% of GDP by the end of that period. During the first decade of independence, Scotland would still accumulate an unsustainably large deficit (74% of GDP on new debt, and over 90% indebtedness in total) and public expenditure on services would increase by only 1% over 10 years because of the increased expenditure on debt servicing. This is all because of heavy borrowing in the early years to make up for the loss of UK fiscal transfers.

It is very striking that each of these models make different assumptions about the economic effects of independence, but each leaves an independent Scotland after 10 years with an unsustainably high level of indebtedness and deficit. This does not depend on the growth assumption. The key to understanding why is to look at the early years, when according to the Growth Commission approach Scotland would continue to spend at present levels and sustain this by borrowing large sums (7 to 10% of GDP each year) until growth finally catches up. This is a feature not of these projections, but of the Growth Commission approach, which avoids significant initial public expenditure cuts but at the price of levels of debt which are unlikely to be sustainable.