

Report

by

Scottish Fiscal Commission

9th October 2014

www.scottishfiscalcommission.org

Report of the Scottish Fiscal Commission

October 9th 2014

Overview

Under powers in the Scotland Act 2012, the Scottish Government will begin to receive tax revenues from two newly devolved taxes to fund a proportion of public spending in Scotland starting in 2015/16. The Land and Buildings Transaction Tax and the Scottish Landfill Tax will differ in some respects from the equivalent taxes today.

The Scottish Fiscal Commission was created in June 2014 by the Scottish Parliament. It was established with a simple remit, to review Government forecasts of receipts from these devolved taxes, and to scrutinise the economic determinants underpinning forecasted receipts from non-domestic rates. The Commission is not charged with doing its own economic forecasts or original analysis.

In providing ‘impartial and expert public scrutiny’ of the Scottish Government’s tax forecasts, its aim is to give both the Scottish Parliament and the public assurance about the reasonableness and integrity of the forecasts.

The Commission anticipates being put on a statutory basis in the future but has meanwhile set out to operate to the extent possible according to best public sector practices.

The nominations of Commissioners by the Cabinet Secretary for Finance, Employment and Sustainable Growth were scrutinised by the Finance Committee, debated in and ultimately approved by the Scottish Parliament. Three Commissioners were appointed on staggered, non-renewable contracts in July and began formal meetings in early August.

The Commission operates independently of the Scottish Government. It does not draw on Scottish Government officials for its own work or analysis, but can commission research independently as needed. The Commission is also in the process of establishing access to new data sources, and alternative forecasts where they are available for comparison. To help ensure its independence from Government, the Commission will be hosted by Glasgow University.

An initial budget of £20,000 was set aside for expenses. To date, these have related to travel or incidentals and have not yet been claimed against the budget. The University of Glasgow will generously provide in-kind support including an office, administrative assistance, access to its library and archives, and it will host the Commission’s website.

Work Programme

The Commissioners have held a series of internal meetings and regularly met and corresponded with Scottish Government economists and forecasters¹. Their first step was to understand the models being used by the officials to predict potential tax revenues. They then moved to examine the Government's quality of data and information, as well as the working assumptions being applied.

The Commission's approach can best be described as one of enquiry and challenge, followed by response, followed by further enquiry and suggested improvements. It examined many issues, ranging from formal mathematical modelling, to the role of judgement in methods of forecasting, to the composition of landfill waste.

Meetings were also held with several agencies with whom a long-term relationship will be important, for example with SEPA and soon with the Registers of Scotland, all of which have a role in the provision of data. In addition, the Commission had more extensive contact with the OBR, whose UK forecasts are sometimes used as an element feeding into the Scottish Government's forecasts.

Contact was also made with HMRC, the OECD team which enables an international network of fiscal commissions, with the UK network of parliamentary budget offices, with Fiscal Commissions in Sweden and Ireland, as well as with the Scottish Parliament's Financial Scrutiny Unit.

Where meetings have already taken place, the Commission has found everyone contacted willing to share expertise, views, and their assumptions and analysis when asked.

Assessment of the Forecasts

Overall, the Scottish Fiscal Commission is able to endorse as reasonable the forecasts made by the Scottish Government in respect of the items defined in our remit. We expect these forecasts to be refined over time with experience and practice. However, the Commission also intends to discuss with Scottish Government forecasters possible ways to enhance the forecasting methods employed in future forecasting rounds, especially as improved data become available.

In the Commission's view, the biggest contribution to improving the accuracy and reliability of these forecasts will be to improve the availability of data relevant to the Scottish economy in general, and these three revenue streams in particular, whether newly collected data, data held by the Scottish government and its various agencies, or data held by the UK government and not yet available to outside agencies.

We recommend, especially if revenue-raising powers expand, that Parliament and the Government take early steps to enhance accessibility to and quality of historic data.

Over time, as well, the Commission would expect the forecasts to reflect economic drivers such as external financial conditions, and behavioural responses, for instance in reaction to changes in tax rates.

¹ See Appendix for outline of the Commission's activities

Conclusion

This is a 'first' for all of us, for the Scottish Government to forecast what revenues it might take from the new taxes, for the Scottish Fiscal Commission to become familiar with the Government's models and make a judgement on its forecasts, for both sides to assess the quality of data which is available and to determine what needs to improve or be enhanced in the coming years.

The Commission is grateful for the co-operation of the Scottish Government officials; it would welcome feedback from any reader to this report. What follows is an assessment of their forecasting methods as applied to both of the devolved taxes and of the economic determinants of income from non-domestic rates. The Commission found these forecasts, within the constraints of the available data, to be reasonable.

Assessment of Forecasting Methods

The forecasting methods applied to each devolved tax and the income from non-domestic rates are considered in turn, each followed by recommendations.

1) Land and Buildings Transactions Tax (LBTT)

The residential model

The forecasting of the tax revenue from LBTT is divided into *residential* and *non-residential* components. The former begins by using historical data on property transactions to describe the probability that any observed property transaction will occur at a particular price. The forecaster then uses a simple statistical model to forecast average house prices. This average is then used to adjust the parameters of the distribution for the period of the forecast in question.

Finally a linear extrapolation from the current level of transactions to an assumed long-run trend or average is used to forecast the volume of transactions. This forecasted volume of transactions can be combined with the forecasted (repositioned) distribution of property transactions in different price categories to generate forecasts for the volume of transactions in each price category. The relevant tax schedule can then be applied to calculate forecast tax revenues per price category and in total.

However, given that the reliable application of standard statistical forecasting techniques depends on having a significant quantity of relevant historical data, the Commission would recommend that the Scottish Government prioritises obtaining such data from existing sources. This is likely to be a more effective way of quickly improving the quality of data available to forecasters than waiting to accumulate meaningful quantities of data from new data sources over time.

That suggestion notwithstanding, this approach is reasonable at this stage in the economic cycle², although the simplicity of the extrapolations of both price and transaction volumes makes it difficult to undertake formal assessment of the uncertainty inherent in the forecast, or to undertake any sensitivity analysis beyond mechanically varying either the level of prices or volume of transactions to give a range but not likelihood of forecast errors.

Recommendations

a) The fit of the price distribution reveals that: i) 4% of revenue is lost at the tax band thresholds under the existing tax system – this should largely be removed under the new tax; ii) there is an underprediction of the volume of high end property transactions. But since such transactions currently only account for 1-2% of revenues raised, this second element is likely to be small relative to possible specification and data errors elsewhere in the model; and iii) the relatively high tax rates applicable to the upper band of the new LBTT may also induce an additional behavioural response which has not been factored into the forecast³. The current forecasting methodology does not account for these revenue losses. The forecast

² The simple linear extrapolation of transactions between their current and long-run average value is, however, likely to misforecast this variable as we enter a recession or the expansionary phase of the economic cycle.

³ The Commissioners will review the evidence presented to the Finance Committee on this issue.

revenues therefore may be expected to overestimate the actual outcomes to some extent. That said, it may be worth investigating another type of distribution with a similar shape for the distribution of prices across price bands to see if a better fit can be obtained.

b) The forecasts of average house prices and the volume of transactions are both areas where, ideally, the forecasts would be based on a reliable statistical model which took account of the economic determinants of these variables. These determinants would include, for example, the evolution of the economic cycle, the level of household indebtedness, the level of interest rates, the regulation of mortgages or other, similar, factors. However, successfully developing such models is notoriously difficult and they are unlikely to be successful in this instance given the available data.

Accordingly, in the short to medium term, as more data become available, we would like to see development, and exploration, of a range of simple statistical models of the path of the house price and transactions data, either individually or jointly. A simple statistical model is currently employed in forecasting average house prices, but extending this to the forecast of residential housing transactions is likely to be particularly important as this variable is volatile and the current approach is unlikely to be robust at all stages of the business cycle.

Little can be done about these issues in the short term. But, in the longer term, there are a number of ways in which the forecasting techniques could be adapted to take account of insufficient or imperfect data on the Scottish economy.

One possibility is to use Bayesian econometric techniques for forecasting in data-poor environments by combining different models to produce a forecast – for example, using the limited Scottish data to update a forecast based on UK data. This would essentially be a formalisation of some of the subjective adjustments currently being made in the forecasting process. Of course, the success of such an approach ultimately depends on the extent to which the information which is being fed in is representative of the missing data.

Another possibility is to take a base model, together with a series of ready reckoner adjustments based on past outliers and knowledge of the market, to get projections back on track. This approach is perhaps best suited for taking into account the effects of external factors for which no explicit Scottish data exist.

The non-residential model

Scottish Government forecasters revealed that the non-residential element of the forecast is hampered today by data availability. It therefore largely relies on the Office for Budget Responsibility (OBR) forecasts for commercial property prices and transactions for the UK as a whole, albeit with a smoothing adjustment in the way OBR's growth rates are projected forward.⁴ In the absence of directly relevant data, this approach is reasonable. However, since it is not possible to assess the applicability of this approach to Scotland for lack of Scottish data, this part of the forecast is liable to significant uncertainty which is not possible to quantify. Further work is therefore needed to assess the extent to which relying on pro-rated OBR forecasts from UK-wide data is an acceptable strategy.

⁴ Preliminary HMRC data suggest that the tax revenues under the Stamp Duty Land Tax regime have been significantly higher than forecast for the non-residential sector. The most likely reason for this is that a greater volume of transactions has taken place at the upper end of the distribution of property prices than was implicitly assumed in the forecast. As these data are preliminary, the Scottish Government has chosen not to update its forecast. However, to the extent that such a pattern is maintained, the current forecast is likely to be more conservative than previously thought.

Recommendations

Because there is currently a lack of data to forecast this component of the Scottish economy directly, the primary recommendation is to develop new data sources as a high priority. Ideally, the forecasters should have a substantial time series of Scottish data carved out from existing sources. However, as this is currently a challenge, creating a new Scotland-specific data set may be the only reliable strategy. That is neither a short-term nor cheap undertaking.

The Scottish Government takes comfort from the fact that, in recent years, the changes in transactions appear to be similar in both Scotland and the UK. However, this does not always translate into the same similarity in observed changes in tax revenues, possibly because the transactions are taking place at different points in the price distribution. This suggests that further work on developing a model for Scottish non-residential revenues is therefore required.

The Commission believes that a new model, with some explanation of the economic drivers of the revenue variations, and better data, are needed in the longer term.

2) *Scottish Landfill Tax (SLfT)*

The Scottish Landfill Tax forecasts start from the assumption that the Scottish Government will achieve its targets for the reduction in landfill waste by 2025, in a linear extrapolation from the current level of waste being sent to landfill to the target value of 5% of total waste to landfill. At present there are insufficient data to speculate as to whether there will be slippage in the future, in part because landfill operators report on a UK-wide basis. This problem may resolve when Revenue Scotland starts to collect the tax instead of HMRC.

Thus, the current methodology is the most optimistic of forecasts for reducing landfill waste, and the most conservative in terms of forecasting tax revenues. However, it is not out of line with declines in the volume of waste sent to landfill in recent years. The Commission will continue to monitor landfill volumes to assess whether this projected path is a reasonable one and whether or not this downward trajectory will be sustained.

Data limitations then require assumptions to be made about the composition of waste being sent to landfill – namely that the ‘mixed waste’ reported by SEPA is all taxed at standard rates, and that the proportion of ‘active waste’, also taxed at the standard rate, relative to total waste is constant over time. This has to be done because detailed SEPA data are categorised differently from the definitions used in the application of the Scottish Landfill Tax. It should also be noted that SEPA data are reported with a two year lag, giving an asymmetry between the information on which the forecasts are based, compared to information on which the taxes are assessed.

Finally, a lack of Scotland-specific data means that the discrepancy between landfill waste reported by the environmental agencies and HMRC at the UK level (16% lower using HMRC data for 2011/12) have been applied to the Scottish Government’s forecasts for taxable waste volumes.

Recommendations

a) The fact that different types of waste need to be separated out implies that the different tax rates on each are thought to make a difference. In that case, the behavioural responses to changing tax rates need to be investigated. We should be able to learn from that and improve the forecasts.

b) That said, the Scottish Government's forecasts reflect data collected from site visits while the OBR forecasts are based on HMRC's revenue data. We will monitor in the future to see which is the more accurate and robust approach.

c) As data emerge, we need to assess whether or not the assumed downward trajectory of landfill volumes is on a reasonable path to achieving the 2025 target.

Overall, given the current data availability, this approach to forecasting revenues from the SLfT is not unreasonable, although the Commission would hope to see a close monitoring of the validity of the assumptions underpinning the forecast as Scotland-specific data on landfill waste and tax receipts become available.

3) Non-Domestic Rates Income

The change in income from non-domestic rates depends upon three factors – the change in the rateable value of properties (excluding revaluation appeals) or 'buoyancy', the change in the poundage – a tax rate applied to the rateable value adjusted in line with inflation to maintain the revenue's real value, less the value of any reliefs granted. These three components are forecasted separately.

i) **Buoyancy**: the rateable value component of the model, calculated as the forecasted increase in the tax base not including any annual changes in the value per square foot of floor space (i.e. at constant prices).

The forecast of buoyancy begins from a base year (last known values) and applies forecast changes for three years using a data average growth rate of 1.25% derived from data for 2006-14. Unfortunately, this is an insufficient time-span of data to undertake any formal statistical modelling or an assessment of its reliability. Second, only the first of the forecast years is used for the budget while figures for the other two years only indicate what may happen in subsequent budgets.

The underlying average growth in buoyancy is then adjusted upwards or downwards based on an assessment of a number of macroeconomic and microeconomic leading indicators, some of which are noted below. For the current forecast, the Scottish Government forecasters believe that such indicators are generally positive and have adopted a forecast buoyancy growth rate of 1.55%. It is not known if this increase in trend will be a one-off or permanent increase, but the implication of the model is that it should be temporary and reflect movements in economic leading indicators.

This increase in the forecast growth rate seems to be on the optimistic side, implying an increase in buoyancy as large as anything observed in the available data, rather than an historical average. Note that this change in trend growth would make little difference to the change in buoyancy for a particular year, but a larger difference to the level of buoyancy over time from which the revenue forecasts for that particular year are calculated, in other words, the impact of buoyancy is cumulative. At this point there are no other allowances for the economic factors that provide incentives to change the floor space in use, although there

is work underway to identify what those factors might be and how they have affected the buoyancy figures.

ii) **Poundage:** (% per £ of rateable value) is essentially a decision made by Government, and therefore acts like a tax rate set by Government. One issue is that, while it will be known in advance, it could nevertheless change.

In recent years, poundage has been set to rise with inflation. The inflation forecasts are taken from the OBR's forecasts for September RPI inflation, with a cap of 2% imposed for the 2014-15 adjustment. If a similar cap were to be applied in the future, then given the OBR's forecasts that RPI inflation will lie significantly above this threshold in the forecast horizon, the Scottish Government calculates that there would be a reduction in the forecast income in the order of £2.6m for every 0.1% of inflation cap. No cap has been factored into the forecasts, although it is anticipated that Barnett consequentials will be triggered should a cap be applied as happened in 2014-15.

iii) **Reliefs:** these are subject to a legal process and lie beyond the forecaster's reach. It would be best to follow current practice and take the data from local Councils, including data from backdated reliefs. It is also possible that reliefs may become an instrument of policy in the future (eg granting relief to SMEs). If that happens, or if it becomes an item for discussion, then the proposed reliefs can be entered directly like any other policy variable.

Recommendations

a) At present, the forecasters project the trend in buoyancy for the next three years in order to make their NDR revenue forecasts. This could be improved by projecting the trend adjusted by economic and local factors, such as forecasted changes in GDP, investment trends, data on planning applications, specific projects that are known to be coming on stream, business confidence indicators, among others. To do that requires econometric studies of what economic factors matter, how much they matter and, most important, how the lags between the changes in those factors and buoyancy play out. The Commission understands that the forecasters have begun a programme of research to address those questions.

b) Similarly, it would be important to allow for financial influences on NDRI revenues – most probably in delaying or accelerating the finishing time of different projects and hence the timing of changes in NDRI revenues. Anecdotal evidence from the work done so far suggests that the timing and lags between changes in the determining variables and revenue levels are the most important items for improving the buoyancy projections. The Commission would like to see this part of the forecasting process extended and/or made more systematic.

c) The Commission recognises that, with limited data sets, a more comprehensive econometric exercise in extending the methodology is unlikely to provide reliable results. Nevertheless, some understanding of the economic influences would be helpful for formally justifying adjustments to the buoyancy trend. They otherwise appear arbitrary and open to question. In that context, the increase in trend buoyancy appears to be largely a subjective assessment of projected movements in buoyancy.

d) The Commission recommends that work continues on improving understanding of the economic determinants underlying the NDRI forecasts as a matter of priority. And revaluation is an important factor to consider. Net NDRI revenues are five to six times larger than the LBTT and SLfT taxes combined. It would therefore pay to make them as reliable as possible, as quickly as possible.

4) Improving the Forecasting Process

Since it has not been necessary to collect data to forecast these taxes in the past, it is inevitable that data have been limited in this first round of forecasts. Plans are therefore in train to gather Scottish data in the future, for instance waste data by SEPA and revenues by Revenue Scotland. However, since a robust forecast should ideally draw on time series data of at least 30 years in length, it would also be useful to carve out existing data from existing sources such as HMRC.

Such an approach could also usefully be complemented by employing statistical techniques designed to facilitate forecasting in data poor environments. However, there are also a number of other cases where there are no Scotland-specific data available at all. In those cases it would be important to examine possible forecast errors implied by, and the value of, using pro-rated UK data in their place.

Thus, the forecasting of almost all elements of the devolved taxes and non-domestic rates income is hampered by data availability in this, their first year. Assumptions which appear to be reasonable have therefore had to be made to build a forecast from available data, but a formal statistical analysis of the results cannot yet be undertaken. As a consequence, the forecasts will have unquantifiable uncertainties attached to them.

The Commission intends to engage with the Scottish Government forecasters to monitor the validity of the assumptions that have been and will be made as new Scottish data become available, and to improve forecasting methods in light of that information.



Lady Susan Rice CBE FRSE
Commission Chairman



Professor Andrew Hughes Hallett FRSE
Commissioner



Professor Campbell Leith FRSE
Commissioner

Appendix

Scottish Fiscal Commission Activities

<p>Week May 12th</p> <ul style="list-style-type: none"> - Initial conversations with John Swinney about SFC
<p>Week May 19th</p> <ul style="list-style-type: none"> - Conversation with SG for background to the scrutiny process - Applications submitted to Finance Committee
<p>Week May 26th</p> <ul style="list-style-type: none"> - Finance Committee: CL and SR scrutinised
<p>Week June 9th</p> <ul style="list-style-type: none"> - Finance Committee: AHH scrutinised - Mr Swinney's evidence to Finance Committee on nominations to SFC
<p>Week June 16th</p> <ul style="list-style-type: none"> - Finance Committee report published about appointments to the SFC - Meeting of SFC (as nominees)
<p>Week June 23rd</p> <ul style="list-style-type: none"> - Parliamentary debate and confirmation of the SFC appointments - SFC Commissioners announced - Conversation with SG on way ahead - Correspondence with SEPA regarding meeting - Correspondence regarding work arrangements
<p>Week June 30th</p> <ul style="list-style-type: none"> - Correspondence with Robert Chote of the OBR regarding a first meeting - Correspondence with Glasgow University regarding hosting the SFC - Second meeting of the SFC with Scottish Government representative
<p>Week July 7th</p> <ul style="list-style-type: none"> - Correspondence with SG regarding arrangements and contracts - Correspondence with Glasgow University about arrangements
<p>Week July 14th</p> <ul style="list-style-type: none"> - Review Terms and Conditions of appointment
<p>July 21st/28th</p> <ul style="list-style-type: none"> - Holidays - Review of OBR Reports and OECD guidance
<p>Week August 4th</p> <ul style="list-style-type: none"> - Meeting with Robert Chote, chairman of the OBR - Correspondence with SG on Terms of Engagement - Update of work over the summer
<p>Week August 11th</p> <ul style="list-style-type: none"> - Initial papers on economic models received from SG - First meeting with Scottish Government economists and forecasters and follow-up correspondence - Comment in Parliament about female representation on the SFC - First meeting at Glasgow University and follow-up on arrangements for an office and support - Correspondence with SG on SFC engagement plans with agencies such as the OECD, SEPA, and specific contacts - Review note of Scottish Tax Consultation forum (May '14)

<p>Week August 18th</p> <ul style="list-style-type: none"> - Invitation from Finance Committee to speak to them on 29/10 - Ongoing correspondence with Glasgow University on arrangements - New papers received from Scottish Government in response to SFC queries - Correspondence with SEPA regarding a meeting - Correspondence with the OECD to introduce SFC - Correspondence with the Scottish Parliament's Business Scrutiny Unit to introduce SFC - Correspondence with Scottish Government Chief Economist about external sources of models of the Scottish economy
<p>Week August 25th</p> <ul style="list-style-type: none"> - Meeting with Simon Wakefield of the Parliamentary Budget Scrutiny Unit - Further correspondence with Budget Scrutiny unit - Correspondence with Scottish Government, receipt of NDRI papers and responses to other questions - Correspondence with Registers of Scotland to introduce SFC - Correspondence with Lisa von Trapp of the OECD to introduce SFC
<p>Week September 1st</p> <ul style="list-style-type: none"> - Ongoing analysis and challenge back to SG - Further discussions on research assistant and PA to provide support in Glasgow University - Correspondence with Registrars of Scotland to introduce SFC - Ongoing consideration of all information to hand and receipt of models of Scottish economy - Further correspondence with OECD
<p>Week September 8th</p> <ul style="list-style-type: none"> - Meeting at SEPA
<p>Week September 15th</p> <ul style="list-style-type: none"> - Meeting of SFC - Preparation for and meeting with Scottish Government officials - Extensive discussion and early drafting of Report by the SFC - Correspondence with SEPA requesting information - Meeting with Peter Aitchison and press team, and others, at Glasgow University about website, communications, office arrangements
<p>Week September 22nd</p> <ul style="list-style-type: none"> - Meeting of SFC in Glasgow - Correspondence with HMRC to introduce SFC - Further progress within Glasgow University - Ongoing exchange with Scottish Government - Meeting with SG officials - Meeting with Irish Fiscal Commission for background discussion - Receipt of report from Swedish Fiscal Commission again for review and comparison
<p>Week September 29th</p> <ul style="list-style-type: none"> - Several meetings of the SFC - Meeting with the Cabinet Secretary for Finance, Employment and Sustainable Growth to present draft Report and discuss logistics for release of the final version - Receipt of a draft Framework for the SFC to consider regarding its working arrangements and responsibilities - Regular correspondence with SG to clarify information

- Correspondence with the OBR requesting information
- Letter to HMRC to introduce SFC and requesting information
- Letter to Revenue Scotland to request meeting
- Correspondence with UK network of budget scrutiny offices about joining their next meeting
- Extensive work on Report
- Draft Report sent to SG for fact check

Week October 6th

- Continued fine-tuning of Report and further fact checks
- Report finalised
- Press Release finalised and arrangements made to publish the Report on the SFC website, hosted by Glasgow University, issuing press release a couple of days beforehand.

HMRC	Her Majesty's Revenue & Customs
NDRI	Non-Domestic Rates Income
OBR	Office of Budget Responsibility
OECD	Organisation of Economic Cooperation and Development
SEPA	Scottish Environmental Protection Agency
SFC	Scottish Fiscal Commission
SG	Scottish Government