

A photograph of a dense urban cityscape, likely Edinburgh, showing a mix of modern glass-fronted buildings and older stone structures under a cloudy sky.

**Report on
Draft Budget 2016-17**
December 2015



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1. Introduction

Origins and remit of the Commission

- 1.1 Under powers in the Scotland Act 2012, two taxes were devolved to Scotland with effect from 1st April 2015. The Scottish Government (SG) began to receive revenues from the Land and Buildings Transaction Tax (LBTT) and the Scottish Landfill Tax (SLfT) in 2015/16 to fund a proportion of public spending in Scotland.
- 1.2 The Scottish Fiscal Commission was created as a non-statutory body in June 2014 by the Scottish Parliament. It was established with the initial remit to review Government forecasts of receipts from these devolved taxes and also to scrutinise the economic determinants underpinning forecasted receipts from non-domestic rates.
- 1.3 It operates independently, providing 'impartial and expert' 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.
- 1.4 Three Commissioners, whose appointments were recommended by the Deputy First Minister and approved by the Scottish Parliament, were appointed in July 2014 on staggered, non-renewable contracts. Short biographies for Prof Andrew Hughes Hallett, Prof Campbell Leith and Lady Susan Rice are attached at Appendix A.
- 1.5 The Commission operates independently of the Scottish Government. It does not draw on Scottish Government officials to carry out its own work or analysis, but may interrogate the Scottish Government forecasters and also carry out independently commissioned research as needed.
- 1.6 Work began early in 2015 to move the Commission onto a statutory footing. It has meanwhile operated to the extent possible according to public sector practices.

- 1.7 The University of Glasgow has generously continued to provide in-kind support including an office, administrative assistance, access to its library and archives, and hosting of the Commission's website.

Engagement on a broad range of fronts

- 1.8 Over the past year, the Commission has deepened and expanded relationships and ways of working with a range of stakeholders. For example, we developed closer ties with the OECD, linking into its network of Independent Fiscal Institutions (IFIs). This has provided an opportunity to learn from other bodies doing similar roles, as well as to present to OECD IFI colleagues at their annual conference. We have also forged closer ties with, among others, Revenue Scotland, the Office for Budget Responsibility (OBR) and other IFIs operating in the UK nations.
- 1.9 More recently, we have started to anticipate being put onto a statutory footing. While that change will not come into effect until 1st April 2017, the Commission will need to put in place an Accountable Officer, the capacity to work with the project board which will oversee the transition in the coming months, and a suitable approach to governance.
- 1.10 Meanwhile, the Commission agreed with the Scottish Government a Framework Document to delineate its obligations before and until it goes into statute. In addition, the Commission agreed with the Deputy First Minister a budget for the current fiscal year. The Financial Memorandum which accompanies the Draft Bill sets out an estimate of the budget the Commission will require to deliver its remit once it's operating on a statutory basis. This also covers additional budget required for the transition.
- 1.11 During the year, the Commission responded to requests from the Deputy First Minister for a view on the impact of forestalling on LBTT, and the Finance Committee for comment on outturn numbers for the devolved taxes, as well as comment on the draft Bill which will put the Commission on a statutory footing.

- 1.12 As the Commission has gained experience, and in anticipation of its being put onto a statutory footing, it has actively engaged in a number of discussions and consultations on this change. The Commission commented on the early draft of the Bill and made individual comments, as well, on proposed changes to the Fiscal Framework.
- 1.13 We gave evidence at three meetings of the Finance Committee during the year, where we could also consider the range of views held by Committee members.
- 1.14 Commissioners met with colleagues from the Scottish Parliament Information Centre (SPICe) to learn more about the work they do. Members also informally discussed the shape of fiscal institutions with colleagues from Government across the UK nations, and with others, especially Ontario, which is one of only a few sub-national fiscal bodies.
- 1.15 The Finance Committee, through SPICe, engaged a notable subject matter expert formerly with the IMF, Ian Lienert, to prepare a report on the Scottish Fiscal Commission in the context of international fiscal institutions. The Commission took part in a lengthy interview with Ian Lienert as part of his research and welcomed his report.
- 1.16 An overview of the work of the Commission is shown in Appendix B.

Preparing this Report

- 1.17 Since its last Report, the Commission has built capability in a number of ways. It expanded its economics capacity by recruiting two part-time research assistants in June who are providing support to our analytic work and can also undertake detailed research on specific topics. Their activity has supported deeper examination of the methodologies and assumptions used by the Government forecasters.

- 1.18 In response to a request from the Finance Committee, the Commission developed a view on the part-year outturns from the newly devolved taxes which is discussed later in this Report. The underlying point is that a proper judgement about outturn revenues against actual forecast can only be made once a full year's receipts are in hand. The Commission anticipates doing such an analysis each year.
- 1.19 Early in the calendar year, we had several meetings with the Scottish Government forecasters to discuss guidance given for the previous year's Draft Budget and how the forecasting work might proceed in the current year. Officials from the Fiscal Responsibility Division met with Commissioners to explain the legislative process in relation to the upcoming Bill. And the Commission also discussed with the Fiscal Responsibility Division updated information on the new taxes anticipated in future years.
- 1.20 In the challenge meetings with Scottish Government forecasters, the approach taken by the Commission has been to explore in depth the methodologies and processes undertaken by the forecasters. A simple rule of thumb for the Commission has been to ask itself – is there evidence to support the approach adopted? Available Minutes of these challenge meetings starting in August 2015 are attached as Appendix C.
- 1.21 Where the Commission felt that there would be benefit from approaching a tax from different or additional perspectives from those taken, such challenges were put on the table. For example, in the analysis of residential LBTT, the Commission proposed that the forecasters might benefit from a review of the work of Best and Kleven (2015), which examined the impact of property taxes on the timing, volume and price of housing transactions. In each case, the forecasters choose themselves whether or not to pursue these alternative approaches.
- 1.22 The Commission periodically requested and received analytic work, with explanations, underpinning the Government's forecasts and received the final models for review shortly before the Draft Budget was due to be laid before Parliament. The Commission drafted this assessment of the reasonableness of these forecasts, sending sections and then a near-final copy to the Scottish Government, purely for a fact-check. The Report was then finalised and prepared

for publication in time to be released as the Minister announced Draft Budget 2016-17. At that time, copies were made available in Parliament and the Report was posted on the Commission's website, www.fiscal.scot.

What the next year holds

- 1.23 In '16-'17, the Commission will plan and prepare for its transition to statutory status, making sure it has the support structures, working practices and governance systems in place to operate effectively as a Non-Ministerial Department (NMD). Subject to the outcome of the legislative process, the Commission will formally begin operating as an NMD on 1st April 2017.
- 1.24 Reflecting on its experience to date and on what it hears from stakeholders, the Commission will also continue to refine its approach to scrutinising the Scottish Government's forecasts of receipts from devolved taxes and will develop that into a Protocol, which will be published on the Commission's website once it's finalised.
- 1.25 The Commission discussed aspects of the way it works with the Finance Committee, alongside its written submission on the final version of the Draft Bill. Documentation can be found on the Commission's website, www.fiscal.scot.
- 1.26 All this work is helping shape our thinking about how to operate as a Non-Ministerial Department which is fully independent of Government. The Commission will continue to evolve over the coming months in light of this transition, and we have started thinking about future staffing, accommodation and IT requirements, and communication plans.
- 1.27 The Commission anticipates producing annual assessments of the outturns of the devolved taxes after each full year of revenues are available for analysis. Over time, we also expect to develop and publish technical papers on various aspects of the devolved taxes.
- 1.28 Finally, the Commission will stay abreast of developments in relation to the new Fiscal Framework for Scotland, as those changes will have a direct impact on the Commission's future size, remit and way of working.

2. Executive summary

- 2.1 What follows is the Commission's assessment of the reasonableness of the Scottish Government's forecasts on the currently devolved taxes.
- 2.2 Forestalling in relation to Land and Buildings Transaction Tax (LBTT) is a particular challenge, especially in the first year of the newly devolved tax. The effects of forestalling, to the extent they can be, will best be assessed after twelve months of outturn data are analysed. But, while tax receipts are confirmed numbers, the extent to which they are influenced by temporary forestalling effects, more permanent behavioural responses or other factors is extremely difficult to disentangle.
- 2.3 A new supplement on additional homes was added to the Land and Buildings Transaction Tax this year, a slab tax applying to 'additional' property transactions. We emphasise the uncertainties behind our assessment of reasonableness in terms of data available for the second homes and buy-to-let market and the challenge of estimating the size of the tax base.
- 2.4 In sum, the Commission believes the forecasts of devolved tax revenues and the economic determinants of NDRI for the 2016-17 Draft Budget are reasonable. Forecasts, of course, are never 'right'. But they should be as close as possible to what will happen and, for that reason, we have challenged the forecasters to enhance aspects of their models. This is especially important as the Government moves to a five year horizon for its forecasts.
- 2.5 In the following sections, the forecasting methods applied to each devolved tax and the income from non-domestic rates are considered in turn, each followed by an assessment of forecasts vs outturns and, subsequently, recommendations are made.

3. Land and Buildings Transaction Tax (LBTT)

The Residential Model

- 3.1 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 within the estimated price distribution. 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.
- 3.2 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.

Developments in Forecasting Methodology Since Draft Budget '15-'16

- 3.3 There have been no significant changes in residential LBTT forecasting methods since the draft budget of 2015-16. However, there have been ongoing interactions between the SG forecasters and the Commission as the SG sought to implement the recommendations of our first report.

3.4 The relevant extract from our initial report is given below:

“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.”

3.5 What drove the Commission’s initial concerns is that the current forecasting methods essentially amount to an extrapolation of historical data for house prices and transactions towards a long-run average. While such techniques are reasonable for short-term forecasting in normal times they contain some deficiencies. Firstly, if the housing market was drifting away from its long-term average either by entering a period of boom or bust the current forecasting approach would not capture such developments, under or over predicting revenues in the respective cases.

3.6 Secondly, even if the modelling could be enhanced to use a more data-driven approach to forecasting short-term dynamics, such approaches are also known generally to fail to capture turning points in the market – for example where a housing market boom turns to bust.¹ While forecasting when a bubble bursts is often seen as the holy grail of forecasting, some kind of ongoing assessment of the sustainability of developments in the housing market would be a useful way of

¹ W. D. Larson (2011), “Evaluating Alternative Methods of Forecasting House Prices: A Post-Crisis Reassessment”, GWU Research Program on Forecasting Working Paper Series, 2010-004, updated Feb 2011.

monitoring possible corrections to the market and the impact that would have on forecast revenues.

- 3.7 Thirdly, the current approach contains no behavioural responses to changes in tax regime. While the evidence on the magnitude of the effects of variation in property transaction tax rates is very limited and uncertain² further analysis of such effects seem warranted if we are to adequately forecast the response to the adoption of the current tax regime as well as any further changes should these emerge.

Forestalling

- 3.8 Since the time of the initial forecast, there have been changes in the application of Stamp Duty Land Tax (SDLT) in the rest of the UK, alongside a policy response from the Scottish Government. Originally, the Scottish Government proposed to replace the slab structure of Stamp Duty with a new Land and Buildings Transaction Tax which had a series of tax rates and thresholds which were forecast to raise revenue of £295m in 2015/16, a similar amount as was expected under Stamp Duty.
- 3.9 In the Autumn Statement of 3rd December 2014, the UK government announced a restructuring of the SDLT to move towards a marginal tax structure more like that of LBTT. At the same time, the revenues forecast to be produced by the new SDLT were reduced. The Scottish Government responded on January 21, 2015 by altering the tax rates and thresholds that would apply to the LBTT when it was first implemented in April 2015. This resulted in a reduction in forecast tax revenues to £235m.
- 3.10 On top of this change in tax rates and thresholds, LBTT revenues may be expected to be affected by 'forestalling' effects as households bring transactions forwards or backwards in time to minimise their tax bill given the anticipated changes in the tax payable under the new and old tax systems.

² A notable exception is M. C. Best and H. J. Kleven (2015), "Housing Market Responses to Transaction Taxes: Evidence from Notches and Stimulus in the UK", mimeograph London School of Economics which examined the response to the Stamp Duty holiday introduced in the UK in September 2008.

3.11 The Scottish Government estimated the loss of revenues under LBTT in 2015-16 due to households bringing forward transactions prior to the change in tax to be in the range of £12m - £37m, with the expectation that they would lie towards the bottom of this range. This estimate comes from examining the response observed in Scottish data to the stamp duty holiday analysed by Best and Kleven (2015). SG forecasters have stressed that the natural experiment offered by the stamp duty holiday of 2008 took place at the depths of the financial crisis and may not offer a reliable guide to the behavioural response to the current change in tax regime. The Commission acknowledges this concern.

3.12 Having now observed part of the year's outturn data for residential LBTT, we are in a position to begin to evaluate to what extent the estimated forestalling has materialised. Table 1 gives a monthly breakdown of the tax revenues that would be expected to be received in the absence of any forestalling effects, given the original annual forecast of £235m revenues from residential LBTT. These are then contrasted with the actual revenues received and in the final column the shortfall is cumulated.

Table 1: Residential LBTT - Monthly Forecast vs Outturn

Month	Expected Tax Revenues (%)	Expected Tax Revenues (£m)	Actual Liabilities (Accruals) (£m)	Difference (£m)	Cumulative Difference (£m)
Apr	7.5	17.6	7	10.6	10.6
May	8.1	19.1	11.4	7.7	18.3
Jun	9.3	21.9	18.5	3.4	21.7
Jul	10.3	24.1	19.4	4.7	26.4
Aug	9.2	21.5	21.4	0.1	26.6
Sep	9.6	22.5	18.7	3.8	30.3
Oct	9.1	21.3	20.0	1.3	31.6
Nov	8.4	19.8			
Dec	9.8	23.0			
Jan	5.5	12.9			
Feb	6.1	14.3			
Mar	7.2	17.0			
Total	100.0	235.0			

- 3.13 The first column of Table 1 gives the percentage of the annual revenues that would be expected to be received in that month in the absence of any forestalling. This is not uniform across each month as there is a seasonal pattern in both prices and transactions in the residential housing market. Using Scottish Government estimates of that seasonality, we see the two peaks in housing market activity, in July and immediately before Christmas, which are well known in the industry. Contrasting the monthly allocation of the forecast with the outturn data for residential LBTT in the third column of figures gives us a monthly breakdown in the shortfall in revenues over the period from April to October 2015, which cumulates to around £31.6m.
- 3.14 The downward trend in this shortfall from April to August did suggest that forestalling effects may have come to an end. However, the re-emergence of a sizeable shortfall in September casts doubt on that assessment, although the revenue shortfall subsequently fell again in October. This suggests that either (1) the forestalling effects are larger and possibly more prolonged than anticipated, (2) the underlying forecast is over-predicting revenues received for the year to date, or (3) the process of seasonal adjustment used to allocate an annual forecast across individual months is no longer accurately capturing the monthly variability in revenues this year. Forestalling has not only altered the size, but also the timing of the revenue payments. But whether this is a long-term change remains to be seen.

Revenue shifting under forestalling

- 3.15 Another means of considering the impact of forestalling is to examine changes in behaviour after the announcement of LBTT tax schedules, but prior to their implementation. Information presented to the Finance Committee of the Scottish Parliament gave anecdotal evidence that there had been a significant increase in activity in those segments of the market that have subsequently become relatively subdued from April 2015 onwards.

- 3.16 In evidence submitted to the Finance Committee of the Scottish Parliament the National Association of Estate Agents report that, outside Edinburgh, the number of properties sold for £750,000 or more in March 2015 was 113 while inside Edinburgh the figure was 115.³ To put this in context, the total number of transactions of properties in excess of £750k implicit in the SG forecast for the whole of the fiscal year 2015-16 (without accounting for any forestalling effect) is 131.⁴ Subsequently the same sources report that only “3 were sold in April and 9 in May. June showed an increase to 19 but this fell back to 3 in July. In Edinburgh the figures were none in April, 5 in May, 7 in June and 3 in July”.
- 3.17 Based on evidence given to the Finance Committee by Homes for Scotland and the National Association of Estate agents on the observed rise of prices and transactions in 2015 Q1, Professor Hughes Hallett estimates that these transfer effects could be as high as £40m in 2015 Q1, leaving around £200m of the Government’s implicit revised £245m residential LBTT forecast to arise in tax year 2015-16. Significantly, these estimates are exactly consistent with the forecasts given in the second last row of Table 2 and last row of Table 5 below.
- 3.18 Therefore, there appears to have been a substantial increase in residential property transactions at the high end of the market prior to April, which has subsequently declined following the introduction of the new tax. Obviously the incentives to behave in this way increase with the price of the individual house and are not constant across a given tax band. This will have moved part of the forecast tax revenues for 2015-16 into the previous tax year. In addition, the increased and then reduced activity in that section of the market may have had some impact on house prices which would exacerbate the effects described.

³ “Annex B – Inquiry into the Land Building and Transaction Tax. Summary of the Evidence Submitted”, Papers prepared for the Finance Committee Meeting, 25th of November 2015.

⁴ Outturn data for 2015-16 provided to the SFC by Revenue Scotland suggests that this benchmark may understate the likely number of transactions observed at the top end of the market. Nevertheless, it remains the case that there was a striking increase in transactions of properties in excess of £750k prior to April and a dramatic fall in the months immediately after the introduction of the new tax.

Outturns vs Forecast for 2015-16

3.19 Where Table 1 sought to examine the monthly pattern in the shortfall in residential LBTT liabilities relative to forecast as a means of assessing the extent of any forestalling effects, Table 2 aims to assess the quality of the underlying forecast.

Table 2 Comparison of Residential LBTT forecasts for 2015-16 with Outturns (in £m)

SG, Forecast Jan 2015	235	235	235
Forestalling	12 (SG min.)	20 ⁵ (OBR)	37(SG max.)
Outturn Data to Date (Apr-Oct)	116.4	116.4	116.4
Outturn Data to Date Adjusted for Forestalling	128.4	136.4	153.4
Estimated Outturn Data Annualised.	203.9	216.6	243.6
Estimated Forecast Error	31.1	18.4	-8.6

3.20 Initial estimates of the revenues from residential LBTT at the time of the Draft Budget for 2015-16 suggested revenues under the new tax would be £295m. Following the changes to the tax rates and thresholds in January 2015, this forecast fell to £235m with an additional possible fall in revenue estimated to be in the region of £12m-£37m due to forestalling effects arising from the changes to UK Stamp Duty.

3.21 Initial outturn data from Revenue Scotland indicate that liabilities of £116.4m have been generated over for the period between April and October 2015. In order to make these data comparable to the initial forecast, we need to make assumptions about the extent to which they have been affected by forestalling. We therefore add back the upper and lower bound of the Scottish Government's forecasts of forestalling, as well as the OBR's forestalling estimate of £20m to get a range of estimates of the revenues that would have been generated in the absence of forestalling.⁶

⁵ The OBR has subsequently revised its forestalling estimate to £30m – Devolved Taxes Forecast, November 2015.

⁶ This implicitly assumes that the effects of forestalling have ended by October 2015.

- 3.22 We then scale these estimates by a measure of the seasonality in the housing market which suggests that typically 62.98% of revenues would be expected to have been raised over this part of the year. This gives rise to an annualised measure of the outturn data (after adjusting for a range of potential forestalling effects) of £203.9m-£243.9m, which can be compared with the pre-forestalling forecast of £235m, giving an implied estimated forecast error of between £31.1m and -£8.6m.
- 3.23 Taken together, the two tables suggest that there has been a sizeable forestalling effect as a result of the change in LBTT tax regime, thresholds and rates. What remains unclear is to what extent this is a temporary phenomenon or whether the tax rates applied to certain sections of the market will reduce activity in the longer-term. The Commission shall continue to monitor this closely.
- 3.24 Returning to the current forecast for the 2016-17 Draft Budget, the forecast method does not account for any behavioural responses to the tax rates set under LBTT and the outturn data for 2015-16 does not feed into the forecast either. As a result, the SG produces a revised forecast for residential LBTT revenues in 2015-16 as a by-product of forecasting subsequent years. This implies the pre-forestalling forecast for 2015-16 has risen from £235m to £245m.
- 3.25 Following the same approach as Table 1 above, we can compute how much of this revised forecast we would expect to have received by October 2015 in the absence of any forestalling and contrast that with the outturn data of £116.4m to give a cumulated forecast error of £37.9m. To the extent that any element of this shortfall is due to a longer-term reduction in activity in certain sections of the housing market rather than a purely temporary forestalling effect, the forecast will tend to over-predict future revenues.

Fiscal Drag

- 3.26 The forecast revenues rise substantially over the forecast horizon, rising from £245m in 2015-16 to £545m by 2020-21. Scottish Government calculations show that £188m of this increase is due to fiscal drag. This is the phenomenon whereby

rising house prices will move transactions involving a given representative house up through the LBTT tax bands over time, assuming that these bands are not adjusted in line with house price inflation (one of the assumptions that underpins the forecast). Moreover, the most significant element of fiscal drag involves transactions being pushed into the £325k to £750k residential LBTT tax band accounting for fiscal drag of £129m by 2020-21. To the extent that (1) tax bands are increased over time and/or (2) there is a behavioural response to the tax rates applied at the upper end of the market, particularly within the £325k-£750k band, then the forecast revenue increase due to the effects of fiscal drag is less likely to be realised.

A Changing Distribution of House Purchases

- 3.27 The forecasting approach of the Scottish Government relies on shifting the historical distribution of housing market transactions as a whole in line with the growth in house prices. However, implicit in this approach is the assumption that both the median and average house price grow at the same rate, thereby effectively fixing the shape (spread) of the price distribution underpinning the residential LBTT forecast.
- 3.28 Historical evidence suggests that average and median house prices do not always move proportionately, implying that the shape of the distribution may also change over time in a way in which the forecast does not take account.
- 3.29 Over the period Q1 2003-4 to Q2 2015-16, Registers of Scotland data⁷ suggest that the ratio of median to average house prices has fluctuated between 78% and 86%. Of particular interest is the fact that the 2014-15 Q4 figures see a rise in average over median prices due to the forestalling effects described above, which are then reversed in 2015-16 Q1. However, there does not appear to be any obvious trend suggesting an ongoing widening or narrowing of the difference between the median and average price. Nevertheless, the year-to-date forecasts and outcomes may still be affected by these changes in the price distribution, and this may have a significant impact on the fiscal drag estimated in the previous section.

⁷ Registers of Scotland, Quarterly Statistics Time Series Q1 2003-04 to Q2 2015-16, released 27th of October 2015.

- 3.30 In light of the observed fluctuations in the distribution of housing transactions, going forward, it would be useful to undertake a systematic exploration of the significance of changes in the shape of the price distribution for the forecast.

The Definition of the Headline Forecast

- 3.31 As an aside, the Commission also notes an unfortunate inconsistency in the way the Scottish Government and OBR report their residential LBTT forecast in the presence of forestalling effects. The former exclude such effects in the headline forecast, and the latter include them. While it is a matter of taste which approach should be followed (provided each forecaster also presents an estimate for forestalling), for transparency and clarity, we recommend presenting the forecast which includes forestalling in the headline number in order to attribute uncertainty correctly and minimise confusion.

Recommendations

- 3.32 The simple univariate forecasting of house prices and transactions employed by Scottish Government forecasters will tend to produce reasonable short-term forecasts when there is no major change in the economic environment. However, such approaches are known to miss major turning points such as housing market booms or busts which typically require a multi-variate modelling approach either to anticipate or recognise quickly changes in housing market conditions. The Commission continues to encourage Scottish Government forecasters to explore what such methods can offer in terms of improving the forecast of the housing market.
- 3.33 It would also be useful for the SG to undertake a systematic exploration of the significance of changes in the shape of the price distribution for the forecast.

- 3.34 Aside from wishing to widen the range of economic determinants incorporated into the modelling of the housing market that underpins the LBTT forecast, the Commission increasingly believes that the behavioural response to tax changes merits further analysis. The initial indications are that the revenues generated by LBTT are less than forecast, possibly because of the behavioural response to the announced tax changes – the ‘forestalling’ effects discussed above. However, the fact that we can still not safely conclude that these effects have worked their way out of the system seven months after the tax change suggests that there may be longer-term behavioural responses to the new tax which the current forecasting approach does not allow for.
- 3.35 More generally, there may be an ongoing behavioural response that could mean the forecast is too optimistic. This could be exacerbated as we go through the forecast horizon by the fiscal drag which is pushing transactions to higher tax bands, again without any behavioural response.

The Non-Residential Model

- 3.36 Scottish Government forecasters argue that the non-residential element of the forecast is hampered by a lack of suitable Scotland-specific data. 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 base of Scottish non-residential LBTT revenues to which the OBR’s projected growth rates are applied. The smoothing is designed to overcome the fact that a small number of particularly large transactions can have significant effects on tax revenues in Scotland at particular points in time. It ensures the initial base for the extrapolation averages observed tax receipts over the last three years in order that the forecasts shall not be too dependent on the peculiarities of the transactions in any one year.

- 3.37 Relative to the forecasting approach in the draft budget 2015-16, there have been the following innovations to the forecasting of non-residential LBTT. The SG has introduced indexation to commercial property prices prior to smoothing the initial tax base to which the OBR's growth projects are applied. This ensures that the tax revenues for the three years prior to the forecast horizon are made comparable by scaling each year's revenues by observed commercial property price inflation. Failing to do so could have introduced a downward forecasting bias to the projection.
- 3.38 In our previous report, our main concern was that the use of UK wide forecasts for commercial property price and transaction growth may be inappropriate. However, no data was thought to be available to assess this. Commission researchers have since discovered a new source of commercial property transaction data for Scotland from HM Revenue and Customs (HMRC) which was initially published in October 2015. This allows us to assess the validity of the assumption that Scottish and UK commercial property transactions move together.
- 3.39 We regressed the natural logarithm of Scottish commercial property transactions against the UK equivalent in order to obtain a measure of the elasticity of Scottish transactions with respect to UK transactions i.e. if UK non-residential property transactions rise by 1%, how much would we expect Scottish transactions to increase by? Using annual⁸ data from 2005 to 2015 we find that, using levels data, the elasticity has a point estimate of 0.94 with a standard error of 0.12 (or in growth terms an elasticity of 1.08 with a standard error of 0.16) and that UK transactions can explain 89% or 87% of the variation in Scottish transactions when looking at levels or growth based regression, respectively.
- 3.40 Since neither estimate is statistically significantly different from unity, this provides some comfort that the use of projections of UK transactions data is not inappropriate in forecasting Scottish non-residential LBTT revenues. However, the existence of this data set may also facilitate direct modelling of this variable for Scotland in the future.

⁸ Running similar regressions using quarterly or monthly data gives very similar results.

- 3.41 Another limitation of the current forecasting approach is that it does not analyse the distribution of transactions across prices in a manner analogous to the forecasting of residential LBTT. This has the effect of failing to incorporate any of the effects of fiscal drag which are an important element of the residential LBTT forecasts. Specifically, as property prices rise without any matching rise in LBTT tax bands, more transactions will be pushed into higher tax bands thereby, other things being equal, generating more tax revenues. However, given the relatively flat tax schedule for non-residential LBTT, these effects would be expected to be far smaller than in the case of residential LBTT.

Outturn Data vs Forecast

- 3.42 Non-residential LBTT revenues were forecast to be £146m in the Draft Budget of 2015-16. Outturn data from Revenue Scotland for the period April-October 2015 imply realised revenues of £101.6m. Simply scaling up the seven months outturn data to obtain an annual estimate of £174.2m implies an estimated forecast error of -£28.2m. Obviously this estimate is highly dependent on the extent of any seasonal pattern in the outturn data which we have not controlled for.
- 3.43 Since undertaking these calculations on behalf of the Finance Committee in November 2015, we have become aware of the data series for non-residential property transactions which enables us to begin to assess the extent of any seasonal pattern in that data.⁹
- 3.44 Averaging the proportion of transactions occurring in each month over the last five years suggests that between April and October 2015 we would expect that 58.5% of annual transactions would have taken place, implying that the annualised outturn number is £173.7m. As this is very similar to the above estimates which ignore seasonality, it would appear that accounting for seasonality in non-residential property transactions does not materially affect the assessment of the forecast error. Obviously, this conclusion would change if there were significant seasonal movements in commercial property prices or the distribution of transactions across property values.

⁹ HMRC, UK Property Transactions Statistics, Released 24th November 2015.

3.45 Using the seasonality implied by the transactions data, we can also infer the expected tax revenues from non-residential LBTT by month. This is given in Table 3. Here we can see there were negligible forecast errors in the first few months of the fiscal year, while the tax take appears to have risen ahead of expectations in the summer months before narrowing again in October. The Commission shall continue to monitor outturn data as they are issued by Revenue Scotland.

Table 3: Non-Residential LBTT - Monthly Forecast vs Outturn

Month	Expected Tax Revenues (%)	Expected Tax Revenues (£m)	Actual Liabilities (£m)	Difference (£m)	Cumulative Difference (£m)
Apr	7.9	11.5	10.9	0.6	0.6
May	8.6	12.6	12.6	-0.0	0.6
Jun	8.3	12.1	13.9	-1.7	-1.1
Jul	8.4	12.3	18.1	-5.8	-7.0
Aug	8.1	11.9	15.5	-3.6	-10.6
Sep	8.4	12.2	15.8	-3.6	-14.1
Oct	8.7	12.8	14.8	-2.0	-16.2
Nov	8.9	13.0			
Dec	8.3	12.2			
Jan	7.0	10.2			
Feb	7.4	10.8			
Mar	9.8	14.4			
Total	100.0	146.0			

3.46 As with residential LBTT forecasts, the above outturn data are not used in the forecasts generated for the 2016-17 Draft Budget. Therefore, there is a revised forecast for 2015-16 of £210m, up from £146m in the 2015-16 Draft Budget. Relative to the annualised outturn numbers of £173.7m, this moves us from an expected forecast error for 2015-16 of -£27.7m to +£36.3m under the revised forecast

- 3.47 This upward revision in the forecast is largely due to buoyant SDLT receipts in 2014/15, although around £22m of the revision was due to indexing the non-residential tax revenues prior to extrapolation. This is a sensible development. However, there may also be a case for using some of the information contained in the part-year outturn data to enhance the quality of the base from which non-residential LBTT revenues are projected forwards, particularly since outturn data for the majority of the year have been released prior to this particular forecast being made. We recommend these issues are reviewed.

Recommendations

- 3.48 In our previous report we stated: *“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”*. We would reiterate that recommendation in the current report.
- 3.49 OBR forecasts for non-residential LBTT rely on HMRC estimates of the distribution of transactions across property values in much the same way as the Scottish Government’s forecasting of residential LBTT. Given the thinness of the market at the upper end it is difficult for the Scottish Government forecasters to get access to such data at the same level of disaggregation without compromising tax payer confidentiality. Nevertheless, we would recommend that the Scottish Government attempt to enhance the use of micro-data to underpin the forecast as a possible means of both identifying the extent of any fiscal drag and as a first pass at attempting to analyse behavioural responses to variations in tax rates.
- 3.50 Given that indexation to recent outcomes of SDLT is considered necessary to set the initial conditions for this forecasting model, there is a case for using the information contained in the part-year outturn data on non-residential LBTT revenues to improve the base from which non-residential LBTT revenues are projected forwards, particularly when outturn data for the majority of the year are released before the forecast is made.

4. Scottish Landfill Tax (SLfT)

- 4.1 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 ending up in landfill. Due to data limitations the previous forecast had to rely on a series of assumptions to translate available landfill data into tax revenue forecasts. The validity of these assumptions will be revealed as outturn data from the SLfT becomes available.
- 4.2 In this respect, a key issue in the forecast was the discrepancy between landfill volumes at the UK level and the tax revenues they generate. In 2012-13, HMRC data on landfill tax revenues suggested that revenues were 13% below what one would expect from landfill volumes reported by the environmental agencies. After seasonal adjustment, the first two quarters tonnage data underpinning SLfT receipts in 2015-16 do not suggest that such a discrepancy is a feature of the Scottish data. This initial tentative conclusion will be kept under review as additional data become available.
- 4.3 Another assumption was the relationship between the waste categories used by Scottish Environment Protection Agency (SEPA) and those employed in the application of the SLfT. Again, the initial pieces of data suggest that this mapping was not unreasonable.
- 4.4 Accordingly, these initial data points have also been used as a base from which to extrapolate the SLfT forecasts. It is therefore important to monitor each additional release of SLfT data to ensure the current forecast is not being extrapolated from a point which is off due to unusual seasonal variation. Nevertheless, it is expected that the assessment of the forecast is likely to become more robust as fewer assumptions are needed to move from available data to the forecast itself.

- 4.5 The remaining elements of uncertainty in the forecast are the assumption about the share of different waste categories in total landfill and the extrapolated path for total landfill waste. The former were based on historical averages, and are subject to some variability (although no obvious systematic change) which the Commission continues to monitor. However, they have now been adjusted to ensure that the waste volumes going to landfill in 2015-16 are consistent with the half-year outturn data from Revenue Scotland (see below). The latter is driven by assuming a linear achievement of 2025 landfill targets.
- 4.6 The Commission has obviously been concerned that a target does not automatically imply a forecast and has therefore sought reassurance that this projection is a reasonable one. To do so, we have sought a quantitative evaluation of the impact of various environmental policies to assess whether or not these are capable of delivering the implied reduction in landfill volumes. The Commission is broadly satisfied that there are potential policies which could feasibly deliver the target which underpins the forecast.
- 4.7 We also asked the Scottish Government forecasters to provide us with the implied path of landfill volumes obtained from applying a simple statistical trend to historical data. This analysis suggests that recent trends in reducing landfill volumes may imply more rapid progress towards the targets than assumed in the forecast. Nevertheless, it remains the case that recent data include the effects of the Great Recession which may have reduced the generation of landfill waste, particularly since the largest part of the landfill volume reductions between 2008-11 was in the construction sector. The Commission will continue to monitor progress towards achieving the landfill volume targets.

Outcomes vs Forecast

- 4.8 The first quarter's outturn data for Q1 and Q2 SLfT yields a tax liability of £74.6m which, after applying the Scottish Government's estimated seasonal factors implies an annualised amount of £142m. This is above the original forecast of £117m. There are two major components to the discrepancy. Firstly, the mixed waste landfill volumes forecast (the component that generates almost all the SLfT revenues) based on extrapolating 2011 SEPA data were less than would have

been forecast using the 2013 release of SEPA data under the Scottish Government's method – amounting to an under-prediction of £5m. Secondly, the undershooting of UK revenues from Landfill Tax relative to what would be predicted from environmental agency data was originally applied to the 2015-16 forecast. However, as this difference between tax revenues and landfill volume data does not appear to apply to Scotland, the forecast is raised by around £20m.

- 4.9 Unlike the other forecasts where the part-year outturn data do not directly affect the forecast, in the case of SLfT the outturn data are being used to refine the forecast in various ways. Firstly, in supporting the removal of the adjustment whereby revenues were reduced to 87% of the level that would be implied by the extrapolation of SEPA tonnage data to reflect the possible under-collection of tax revenues apparent in UK data. Secondly, in adjusting the shares of standard and lower rated waste relative to total waste to ensure 2015-16 tonnage figures for standard and lower rated waste match outturns from Revenue Scotland. This effectively means that the tonnage figures reported by Revenue Scotland are the base from which the new forecast extrapolates towards the long-run target.
- 4.10 The estimate of seasonality applied in assessing the part-year outturn data is crucial. The Commission has therefore explored the nature of seasonality in landfill returns at the UK level (historical data do not exist for Scotland). In doing so, we must distinguish between seasonality in cash received ("cash basis") and tonnages on which tax is payable ("accruals") since the latter may and often are settled with a lag.
- 4.11 It should also be noted that HMRC report data for cash receipts in the quarter, while Revenue Scotland report the cash received to date arising from liabilities incurred in the quarter. Based on the Revenue Scotland data release of the 27th of November 2015, the 2015-16 Q1 data implied that the tax liability and cash received to date coincided at £37.5m, while for the Q2 data the tax liability is £37.1m, with total payments received to date of £36.3m. It would therefore be inappropriate to adjust these data using the seasonal factors implied by the pattern observed in HMRC quarterly cash receipts data.

4.12 Table 4 summarises the estimated seasonal factors across various spans of historical data, where there is a noticeable difference between the seasonality in lower rated and standard rated tonnage going to landfill. We can see that the seasonality of 0.53 applied by the Scottish Government forecasters to both Standard and Lower Rate Tonnages overstates the latter. However, on balance the effect is marginal since lower rated waste accounts for less than 2% of tax revenues raised. The maximum difference between the Scottish Government's forecast and what would be forecast using the seasonality suggested by the average UK data from 1997-2014 would be 1.4%.

Table 4: Estimated Tonnage Outturns with alternative seasonal factors for Q1+Q2

	"Standard Rate" Seasonal factor	"Lower Rate" Seasonal factor
Scottish Government Est.	0.530	
Q1+Q2-2014	0.531	0.475
5-year Average	0.530	0.482
10-year Average	0.526	0.474
1997-2014 Average	0.523	0.487
	Standard Rate Tonnage	Lower Rate Tonnage
Q1+Q2 Outturn Data from Revenue Scotland	950,100	532,300
Estimated Annualised Tonnage Outturns using different seasonality estimates (millions).		
Q1+Q2-2014	1.789	1.121
5 Year Average	1.792	1.110
10 Year Average	1.806	1.123
1997-2014 Average	1.816	1.093
Note 1: Seasonality patterns were calculated using HMRC Landfill Bulletin data July 2015.		

- 4.13 An obvious concern with a forecast implicitly driven by a long-term target is that if there was ever any slippage in achieving the target such that landfill waste was higher than projected, then the forecasting methodology would imply a more aggressive reduction in landfill waste in the future. It is therefore imperative that the forecast remains on track, and any substantial upward drift in landfill waste volumes may trigger a need to re-evaluate the appropriateness of the forecast method. However, with the limited outturn data that currently exist, it still appears that the forecast is broadly in line with the levels of waste that would be expected given a simple trend extrapolation of recent data. The Commission shall continue to monitor this closely.

Recommendations

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

5. Non-Domestic Rate Income

- 5.1 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.
- 5.2 The Commission’s current non-statutory remit in respect of Non-Domestic Rate Income (NDRI) requires it to assess “the economic determinants underpinning Scottish Government forecasts of Non-Domestic Rate Income”. This has been further refined in the Fiscal Commission Bill currently being considered by the Scottish Parliament to:
- “(a) the change predicted to the rateable value of the lands and heritages on the valuation rolls, and
- (b) the rate of inflation used for the purposes of the forecast of the non-domestic rate to be prescribed under section 7B of the Local Government (Scotland) Act 1975.”
- 5.3 Buoyancy is 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 Scottish Government’s inflation forecast simply adopts the September Retail Prices Index (RPI) forecast of the OBR, which the Commission confirms is reasonable. However, how well the inflation adjustments interact with buoyancy to produce reasonable revenue forecasts requires a separate study. Work by the Commission to date on such a study shows steady improvement with forecast errors down to 0.35-0.5%, or £7m-£12m, in the recent past.
- 5.4 In the forecasting of buoyancy for the 2015-16 Draft Budget, Scottish Government forecasters used a range of macroeconomic data to justify raising the buoyancy forecast above its historical average. The Commission discouraged this approach as no link between the macroeconomic variables and buoyancy had been formally demonstrated to justify the magnitude of the adjustment.

- 5.5 At the same time, the forecasters also explored the relationship between buoyancy and the completion of major projects identified within the planning system. This was seen as a means of obtaining forward-looking data on buoyancy. Unfortunately, while this approach initially looked promising as a means of enhancing the accuracy of the buoyancy forecast, difficulties in judging the timing of project completions led to the approach lacking the robustness required to forecast reliably. The Commission encourages the Scottish Government to continue to explore this data source as a potential means of obtaining forward-looking information on likely developments in buoyancy.
- 5.6 As a first step towards enhancing the forecasting of buoyancy, the Commission encouraged the Scottish Government forecasters to gather more historical data on buoyancy. As a result the Scottish Government developed two historical series, one a direct measure of buoyancy, the other inferred from NDRI receipts.
- 5.7 From a simple visual examination of these buoyancy data series, there would appear to be a cyclical pattern with a peak level of buoyancy occurring around the beginning of each revaluation cycle which then declines until the next revaluation cycle. Initial attempts by the SG forecasters to assess this cyclical pattern statistically suggested that no statistically significant cyclical pattern was present.
- 5.8 However, analysis by the Commission which suggested that a simple downward trend which repeated itself each revaluation cycle could explain up to 65% of the variability of the buoyancy data prompted the SG to reconsider this issue. Obviously, the fact that the buoyancy data were constructed in a way which should have eliminated the impact of revaluation appeals, means that such appeals on their own cannot explain the cyclical pattern.

- 5.9 The SG discussed possible mechanisms for the observed cyclical in the buoyancy data with the Scottish Assessors Association. These discussions revealed that there are interactions between Revaluation appeals and Running Roll appeals¹⁰ which could account for the pattern in Buoyancy data. The latter are in fact typically resolved only after the former have been resolved and we are, therefore, more likely to see successful Running Roll appeals influencing the buoyancy data in the final part of the revaluation cycle.
- 5.10 In our final challenge meeting with SG forecasters the Commission raised two concerns with this analysis. Firstly, while the Commission acknowledged the possibility that Running Roll appeals could interact with Revaluation appeals in a way which could potentially explain the cyclical in the buoyancy data, the Commission would have liked to have seen evidence that the magnitude of such effects was consistent with the observed cycle. Secondly, the Commission was concerned that, particularly at the start and end of the revaluation cycle, the estimation of the magnitude of the cyclical effect relied on too few observations to be robust.
- 5.11 In response to this, the Scottish Government forecasters collected data from two sources – properties with a rateable value in excess of £100k which had both Revaluation and Running Roll appeals lodged in 2010-11 or 2011-12 in the Lothian area and a second sample of high value properties (rateable value >£1.5m) throughout Scotland. Analysis of these two data sources suggested the magnitude of the variation of Rateable Value lost to Running Roll appeals over the revaluation cycle was broadly consistent with the amplitude of the observed cyclical pattern.

¹⁰ Revaluation appeals can be lodged within one year of a roll-wide revaluation and are excluded from the calculation of buoyancy, while Running Roll appeals can be lodged at any time and do affect the buoyancy calculation.

- 5.12 The second issue relates to the lack of data with which to compute the cyclical pattern prior to forecasting. The cyclical adjustment essentially contrasts the average level of buoyancy with the level that is observed in each of the years of the revaluation cycle, finding the buoyancy is unusually high in years 1 and 2 of the cycle and correspondingly low in years 3, 4 and 5. The problem is that for years 1 and 5 there is only one and two observations being used to compute this cyclical factor, respectively.
- 5.13 The Commission attempted to see if any further evidence could be generated for the adjustments depending on relatively few observations – specifically in period 5 of the revaluation cycle. We regressed the original buoyancy series on the one constructed from NDR revenues to obtain fitted values for the missing observations for years 1999-00 and 2004-05 of 1.6% and 1.2%.¹¹ This gave us a revised estimate of the deviation of period 5 buoyancy from the average of -0.1% rather than -0.3%. The tailing off of the cyclical effects on buoyancy by year 5 of the revaluation cycle may be more plausible given the mechanism outlined above. However, it remains the case that, particularly for year 1, the data underpinning the cyclical adjustment is very limited.

Outcomes vs Forecast

- 5.14 A strict interpretation of our remit prevents us from commenting directly on the budgetary implications of the magnitude of the forecast errors in NDRI receipts, which arise for a range of factors of which the buoyancy and inflation forecasts are just two. Nevertheless, we remain interested in assessing what part the various elements of the forecast play in the generation of the overall forecast error in NDRI receipts since this is a means of assessing the underlying quality of the forecasts. The Commission is working to assess this and plans to discuss these issues with SG officials early in the new year.

¹¹ The Commission feels this approach is preferable to simply using the second series to directly fill missing observations in the first as the fitted value approach effectively uses information as to how well the two series move together to map between the two series.

Recommendations

- 5.15
- a) Continued analysis of the planning system to see if it can generate robust forward-looking predictors of buoyancy.
 - b) Further exploration of the nature of the mechanism identified to see if any further light can be shed on the expected magnitude and pattern of the cyclical pattern in buoyancy data.
 - c) Once the cyclical adjustment has been finessed the work of trying to relate the buoyancy data to wider economic conditions can recommence.

6. Comparisons with Third Party Forecasts

Table 5: Summary - OBR vs SG Forecasts for 2015-16

	Residential LBTT	Non-residential LBTT	SLfT
OBR-July-2015	264	275	94
OBR-NOV-2015	178	220	140
SG-JAN-2015	198-223*	146	117
SG-Dec-2015 ¹²	208-233*	210	142
Estimated Outturn Data	192-207**	174	142
<p>* Since the SG's forecast is pre-forestalling and the OBR's post, we deduct the SG's range of estimates of forestalling of £12m-£37m to obtain a post-forestalling forecast of LBTT revenues for comparison.</p> <p>** We use the range of annualised outturn data from Table 2 and add back the associated forestalling estimate.</p>			

6.1 The evolution of both OBR and SG forecasts for 2015-16 highlight the difficulties in forecasting. In the case of the OBR the major revisions to the forecast largely reflect the incorporation of part-year outturn data into the forecast. This is also true for the Scottish Government in the case of the updated SLfT forecast for 2015-16. For Scottish Government LBTT forecasts the updated forecasts for 2015-16, which do not utilise any of the outturn data, but do include updated price and transaction forecasts move the forecast slightly away from the estimated outturn data.

¹² It should be noted that the revised forecast for tax yields in 2015-16 are a by-product of forecasting yields in 2016-17, and do not constitute an official revision in the Scottish Government's forecast of tax yields in 2015-16.

6.2 Turning to the estimates for 2016-17 we can see a convergence in OBR and SG SLfT forecasts which reflects the weight given to the recent outturn data in both cases. The others remain further apart but not unreasonably so given the alternative methods employed to generate the respective forecasts.

Table 6: Summary - OBR vs SG Forecasts for 2016-17

	Residential LBTT	Non-residential LBTT	SLfT
OBR-July-2015	324	291	88
OBR-NOV-2015	253	243	131
SG-JAN-2015	-	-	-
SG- Dec-2015	295	220	133

7. Land and Buildings Transaction Tax, New for 2016-17

- 7.1 The proposed 3% slab tax is envisaged to be applied to additional residential property transactions in excess of £40,000. The Scottish Government's forecast of the revenues expected from such a tax is computed as follows. Firstly, there is an estimate of the current number of transactions which would come under the remit of the new tax. By combining data on buy-to-let mortgages, the proportion of house purchases typically mortgage financed, census data on second home ownership and typical turnover rates in the residential market a range of estimates for the number of potential transactions is between 8500 and 12500.
- 7.2 Secondly, Council for Mortgage Lending data for the size of buy-to-let mortgages suggest that these are typically 10% lower than other mortgages, suggesting that the price of the buy-to-let property is also lower. These two elements are then combined in the SG's LBTT model to get the 'static' estimate of the revenues generated of between £45m-£75m.
- 7.3 It is important to note that the slab nature of this tax may create a spike in transactions recorded just below the £40000 threshold and the static forecast does not account for this. Despite the fact that the £40k threshold is significantly below average house prices there are still a number of residential property transactions taking place near the threshold, although the extent to which these are buy-to-let or second home purchases is unclear. Moreover, the distribution of transactions over prices used for residential LBTT may be different for the buy-to-let/second home market, particularly with respect to the higher-end properties which generate the most revenues, and for mid-range properties where the additional home purchases are likely to be larger in volume. At present, Government forecasts assume first and additional homes have the same distributions.
- 7.4 These first-round estimates do not include any behavioural response to the new tax. However, unlike the rest of the residential LBTT forecast, SG forecasters have sought to undertake some assessment of the likely behavioural response to the new tax. Firstly, the SG argues that current yields enjoyed by buy-to-let landlords for the UK as a whole are around 6-7%. Recent data for Scotland suggests that after accounting for capital gains and void periods between tenants

(but before considering financing costs, maintenance etc.) the annual yield to October 2015 on Scottish buy-to-let property is 5%.¹³ Therefore, the transaction tax will effectively wipe out the return in the first year of a buy-to-let investment.

- 7.5 A second knock-on effect will arise if the tax reduces additional home purchases. This will affect the price distribution for the first homes. At present, this is not in the forecasting model.
- 7.6 Whether or not this is significant then depends on how long buy-to-let landlords typically hold a property prior to re-sale. We are not aware of any data on this. Moreover the restriction of the tax deductibility of buy-to-let mortgage payments to the basic rate of tax from April 2017 announced in the UK Summer Budget 2015 may also dampen this section of the market relative to recent experience and further reduce the tax take from this measure.
- 7.7 Secondly, the SG forecasters apply the highest of the elasticities the OBR use to infer the behavioural response to changes in the average SDLT rate, to this tax change. This reduces the forecast to £37m-£57m.
- 7.8 Thirdly, the SG includes knock-on effects for LBTT revenues from the existing tax schedule if the number of transactions is reduced. Using OBR estimates that the tax change would reduce overall transactions by 3% this reduces the revenue forecast by another £7m. Although this effect is relatively modest, Ngai and Tenreyro (2013)¹⁴ argue that relatively modest fundamental seasonal factors can be blown up into much larger seasonal effects as they lead to more or less market thinness over the course of the year. Therefore, there is the possibility that this modest thinning of the buy-to-let/second home market could have larger effects on the rest of the residential property market.

¹³ Your Move, "Scottish Buy-to-Let Index", Wednesday 25th November 2015.

¹⁴ L. R. Ngai and S. Tenreyro (2013), "Hot and Cold Seasons in the Housing Market", mimeograph, London School of Economics.

- 7.9 Finally, there is an assessment of the forestalling effects which could arise as a result of announcing an April 2016 tax change in December 2015. This will bring forward some transactions into the 2015-16 tax year, before reducing the number of taxable transactions 2016-17. Using the same elasticities employed in the SG's computation of residential LBTT forestalling in 2015-16 this implies tax revenues should rise by £5m-£7m in 2015-16 before falling by £8m-£14m in 2016-17. This leads to a final revenue estimate for 2016-17 of between £17m-£29m.
- 7.10 The various elasticities employed in these adjustments come from analyses of Stamp Duty tax changes including the Stamp Duty holiday of 2008. As noted by the Scottish Government forecasters the applicability of these estimates to quite a distinct section of the property market is uncertain. Similarly, the data used to estimate the size of the tax base is equally uncertain.¹⁵ As a result these forecasts should be treated with a great deal of caution. Nevertheless, bearing these caveats in mind, we are prepared to endorse these forecasts as reasonable although we would stress the very significant uncertainties inherent in assessing the impact of such a tax change given the lack of data describing the behaviour of the Scottish buy-to-let and second-home markets.

¹⁵ The precise definition of the tax base, at the time of writing, has also not been finalised.

8. Improving the Forecasting Process

- 8.1 At the end of this first year of application of the new devolved taxes, we will see outturn data which can be contrasted with forecasts. Our ability to do so is limited at present since we only have partial year data which necessitates an assessment of any likely seasonality in tax revenues to enable us to contrast that incomplete outcome data with an annual forecast. Nevertheless, the process of contrasting forecasts with outcomes has commenced and should lead to improvements in the forecasting process going forwards.
- 8.2 Progress overall in developing the forecasting methodologies has been slower than the Commission had hoped. In the Commission's challenge meetings with the Scottish Government forecasters, we continued to urge them to explore possible enhancements to their forecasting methods in light of the Commission's recommendations in its initial report. We understand, however, that data limitations may place a constraint on the forecasters' ability to apply more sophisticated methods. Nevertheless, in some instances the Commission is yet to be convinced that all possible avenues have been fully explored.
- 8.3 In particular, we are increasingly concerned about the residential LBTT forecasts which still assume no behavioural responses. Similarly, we urge the forecasters to analyse what micro-data are available for non-residential LBTT as a way to interrogate any effects of fiscal drag. Finally and to the extent possible, a good deal of work needs to be done on the new slab tax, particularly in relation to behavioural differences in this part of the market compared to other residential transactions, in order to understand better the size of the tax base and the property movements in this sector.

8.4 The Commission is grateful for the co-operation of the Scottish Government officials; it would welcome feedback from any reader to this report. On the whole, the Commission found these forecasts, within the constraints of the available data, to be reasonable.

A handwritten signature in blue ink, reading "Susan Rice".

Lady Susan Rice CBE FRSE
Commission Chairman

A handwritten signature in blue ink, reading "Andrew Hughes Hallett".

Professor Andrew Hughes Hallett FRSE
Commissioner

A handwritten signature in blue ink, reading "Campbell Leith".

Professor Campbell Leith FRSE
Commissioner

Appendix A

Biographies



Lady Susan Rice, Chair

Susan Rice CBE, a Chartered Banker, is inter alia Chairman of Scottish Water, non-executive director of J Sainsbury, the Banking Standards Board, and a lay member of Court of Edinburgh University. Previously, she was Chairman and Chief Executive of Lloyds TSB Scotland plc, the first woman to head a UK clearing bank, and Managing Director of Lloyds Banking Group. Before that, she was senior Vice President at NatWest Bancorp in New York and, earlier, a dean at Yale and Colgate Universities in America and a published medical researcher.

She has been senior independent director and chaired the Remuneration Committee of FTSE 30 Scottish and Southern Energy, and a member of Court and chair of the Audit and Risk Committee of the Bank of England. She is also a founding director of Big Society Capital and chairs the Chartered Banker Professional Standards Board. Susan Rice has degrees from Wellesley and Aberdeen University. She is a Regent of the Royal College of Surgeons Edinburgh and a Fellow of the RSA, the Chartered Banker Institute and of the Royal Society of Edinburgh.



Professor Andrew Hughes Hallett

Professor Andrew Hughes Hallett has been jointly Professor of Economics and Public Policy at George Mason University, USA since 2006 and Professor of Economics at St Andrews University since 2007, with short term appointments at Princeton and Harvard Universities, and at the University of Rome.

He is ranked in the top 3/4% of economists world-wide (REPEC rankings unfiltered). He has acted as a consultant to the World Bank, the IMF, the Asian Development Bank, Federal Reserve Board, the UN, OECD, the European Commission, and various governments and central banks around the world. He has served as an expert witness on various occasions, both in the UK and abroad. In this context, he was responsible for the EU Commission's evaluation of exchange rate conversion factors at the creation of the Euro, also the EU Council of Ministers adoption of a system of debt targets. He has been advising the European Central Bank on different fiscal sustainability regimes for use after the crisis since 2009, and the World Bank in the same area (2011-13). He was a member of the Scottish Council of Economic Advisers 2007-15, and has been a Commissioner of the Scottish Fiscal Commission since 2014, and advisor for economic and monetary affairs to the European Parliament since 2015.



Professor Campbell Leith

Professor Campbell Leith has been Professor of Macroeconomics at the University of Glasgow since 2005. He previously held positions at the Universities of Strathclyde and Exeter. He specialises in the theoretical and empirical analyses of monetary and fiscal policy and their interactions. His proposal for the creation of a Fiscal Council was cited as providing the rationale for the establishment of the Office for Budget Responsibility. He has presented his work at several central banks including the Bank of England and the European Central Bank, and between 2004 and 2008 was commissioned by HM Treasury to undertake research on fiscal stabilisation in the EMU.

Appendix B

Overview of the work of the Commission

<p>Week December 7th</p> <ul style="list-style-type: none">• SFC submitted first draft Report on the Draft Budget 2016-17 to Scottish Government for fact-checking• SFC meeting with the Deputy First Minister to present their recommendations
<p>Week November 23rd</p> <ul style="list-style-type: none">• SFC internal preparation meeting• SFC gave evidence at a Finance Committee meeting
<p>Week November 16th</p> <ul style="list-style-type: none">• Submitted written evidence to Finance Committee on the Scottish Fiscal Commission Bill and on Land and Buildings Transaction Tax forecasts and outturn data• SFC Weekly Meeting Re: Finance Committee requests and Draft Budget Report preparations• SFC Chair Meeting With SG• SFC Forecasting meeting with SG• SFC internal preparation meeting
<p>Week November 9th</p> <ul style="list-style-type: none">• SFC weekly meeting re: Finance Committee requests and Draft Budget Report preparations

Week November 2nd

- SFC participation in HMT conference calls re: Scottish rate of income tax ready reckoner
- SFC participation in OBR challenge meeting conference call
- SFC weekly meeting re: Finance Committee requests and Draft Budget Report preparations

Week October 19th

- SFC internal meeting re: Finance Committee requests

Week October 12th

- Publication of Finance Committee Call for Evidence on Scottish Fiscal Commission Bill

Week October 5th

- Publication of Framework Agreement and Operating Budget for 2014-15
- SFC attendance at two-day meeting of the UK and Irish IFIs in Westminster (AHH)

Week September 28th

- Scottish Fiscal Commission Bill published by the Scottish Parliament (28/09)
- SFC internal meeting

Week September 21st

- SFC Forecasting meeting with SG

Week September 14th

- SFC pre-meeting in advance of Forecasting meeting

Week September 7th

- Correspondence from Finance Committee re: SFC request for relevant reports
- Response to Finance Committee correspondence on request for analysis to support scrutiny of the 2016-17 Draft Scottish Budget, 9 September 2015
- SFC internal meeting re: analysis work requested by Finance Committee
- SFC Chair quarterly bilateral meeting with DG Finance

Week August 31st

- Response to Finance Committee request for analysis to support scrutiny of the 2016-17 Draft Scottish Budget
- Finance Committee correspondence on request for analysis to support scrutiny of the 2016-17 Draft Scottish Budget

Week August 24th

- SFC internal meeting re: prep for FC and Scrutiny meetings
- SFC gave evidence at a Finance Committee meeting
- SFC meeting with Parliamentary Scrutiny Unit
- SFC Forecasting meeting with SG
- SFC Governance meeting
- Letter from Finance Committee re: request for analysis to support scrutiny of the 2016-17 Draft Scottish Budget

Week August 17th

- SFC internal meeting re: Financial Memorandum
- SFC meeting with SG re: Framework document and Financial Memorandum

Week July 13th

- Letter to Finance Committee re: requesting copies of relevant reports
- SFC internal planning meeting

Week July 6th

- SFC response to the Scottish Government's consultation on the Scottish Fiscal Commission

Week June 29th

- SFC meeting with forecasters to discuss approach to LBTT and NDR forecasting
- Article about the SFC was published in the Smithy (the University of Glasgow's internal staff newsletter)
- Publication by Finance Committee of Report on the Scottish Fiscal Framework

Week June 22nd

- SFC meeting to discuss the Draft Bill and the proposed work plan for the coming year
- Ongoing correspondence and conversations about the response to the Scottish Government's Consultation on the Draft Bill, on remuneration for Commissioners and on finalising the summer work plans
- Joined OBR challenge session on devolved income tax forecast (AHH)

Week June 15th

- Joined OBR challenge session on Devolved Taxes revenues (AHH)

Week June 8th

- SFC meeting to discuss Landfill Tax Forecasting and Computation on Draft Bill to put the SFC on a Statutory basis
- Finance Committee meeting to take evidence on the Fiscal Framework covering some aspects of the SFC

Week June 1st

- SFC meeting to finalise response to Draft Framework
- AHH met with SG officials to discuss latest revisions to NDRI forecasting methods
- Appointment of Interim Secretariat and workplan development
- Engagement with OECD re: their information-gathering on IFIs
- Correspondence with SG Finance Team re: upcoming meeting

Week May 25th

- Teleconference meeting of SFC to discuss Draft Framework, further work done on response
- CL meeting with Scottish Government officials to discuss various forecasting issues

Week May 18th

- Correspondence with SG Finance Team on workplan timetable
- Engagement with OBR on prior and future contact
- Workplan proposal from SFC Secondee

Week May 11th

- CL and AHH conducted Interviews for Research Assistant posts of which 2 RAs were appointed

Week May 4th

- SFC meeting with SG Finance Team to discuss budgets and other plans, and follow-up correspondence

Week April 20th

- SFC meeting to discuss Draft Bill

Week April 13th

- SR and AHH attended OECD meeting for IFIs
- CL and AHH make independent submissions in response to consultations and devolved tax powers
- SFC correspondence in relation to questions from Finance Committee on Scotland's Fiscal Framework

Week April 6th

- Receipt of correspondence between Finance Committee and the Deputy First Minister in relation to the non-statutory Framework Document

Week March 30th

- Receipt of letter from Finance Committee re: information they would welcome in relation to the Draft Budget '16-'17
- SFC meeting to discuss Finance Committee scrutiny
- Meeting with Finance Committee to give evidence
- SR meeting with Chairman and Head Clerk of Finance Committee and Chairman of OBR
- SR Meeting with DG Finance to discuss SFC
- SFC correspondence in relation to questions from Finance Committee on Scotland's Fiscal Framework
- Correspondence with SG Finance Team re: resources for SFC

HMRC	Her Majesty's Revenue and Customs
HMT	Her Majesty's Treasury
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

Appendix C

Available Minutes of challenge meetings with Scottish Government forecasters

BRIEFING WITH THE SCOTTISH GOVERNMENT FORECASTERS

20 NOVEMBER 2015

Present

Scottish Fiscal Commission (SFC) Participants:

Lady Susan Rice, Chair

Professor Andrew Hughes Hallett, Commissioner

Professor Campbell Leith, Commissioner

Petros Varthalitis, Research Assistant

Mattia Ricci, Research Assistant

Scottish Government (SG)

The following divisions were represented:

- Communities Analysis Division
- Fiscal Responsibility Division
- Local Government and Analytical Services Division
- Office of the Chief Economic Adviser
- Rural and Environmental Science and Analytical Services Division

The meeting constituted the last official forecast challenge session before the release of the 2015/2016 Budget draft. It primarily focused on the latest developments in the forecast methodologies for Buoyancy in Non-domestic Rates, the Land and Buildings Transaction Tax (LBTT) and the Scottish Landfill Tax (SLfT).

The SG forecasters presented a series of papers prior to the challenge session which were the basis for discussion at the meeting:

- Paper 1: Forecasting Buoyancy for Non-Domestic Rates for Draft Budget 2016/17.
- Paper 2: Land and Buildings Transaction Tax (LBTT). Provisional Forecasts 2016-2020.

- Paper 3: Scottish Landfill Tax (SLfT) Revenue Forecasting methodology.

Additionally, two documents on the buoyancy data cyclical pattern and on the results produced by different cyclical adjustments were tabled at the meeting.

Discussion Surrounding Paper 1:

Paper 1 covers the methodological developments on buoyancy forecasting in response to SFC comments from the September 23rd and earlier meetings. In particular, it presents the results of the SG investigation into the possible causes behind the observed cyclical pattern on buoyancy data and the SG's attempts to adjust the buoyancy forecast to account for the cyclical pattern in the series.

The SG discussed possible mechanisms for the observed cyclical pattern in the buoyancy data with the Scottish Assessors Association. This discussion suggested that there may be an interaction between Revaluation appeals and Running Roll appeals which may account for the pattern in Buoyancy data. The latter are in fact typically resolved only after the former have been resolved and we are, therefore, more likely to see Running Roll appeals influencing the buoyancy data in the final part of the revaluation cycle.

The Commission found this to be a plausible hypothesis in explaining the cyclical pattern in the data but felt that, without a rigorous quantitative assessment, it is difficult to draw firm conclusions about its ability to account for the scale of the observed cyclical pattern. However, this explanation does imply a cycle of 4-5 years which fits the pattern of weakly significant cycles implied by the SG results reported in the August 27 meeting. Hence it is a matter worth closer investigation, although the numerical impact on the forecasts may be small.

At the meeting the techniques used to cyclically adjust the buoyancy data were also discussed and the Commission was concerned that some of the adjustments relied on very few observations such that the implied pattern may not be well identified given the data limitations.

Actions Arising:

- SG to provide further evidence supporting the explanation of the cyclical pattern observed in the data and to discuss the magnitude of this effect.

Actions Arising:

- SG to provide evidence supporting their explanation of the saw-tooth pattern and to discuss the magnitude of this effect.

Discussion Surrounding Papers 2:

Paper 2 details SG's provisional forecasts of LBTT revenues for 2016-2020 addressing the comments made by the Commission in previous challenge meetings. LBTT involves tax revenues collected on Residential land and building and Non-residential land and building transactions.

As far as Residential LBTT is concerned, following comments made by the Commission in the August 27th challenge meeting, SG presented a revised forecast of transactions where its transaction volume series is smoothed in order to allow for a less abrupt convergence to the long run growth rate towards the end of the forecast horizon.

The meeting also discussed the desirability or otherwise of replacing the ARIMA modelling of house prices with a straight-line extrapolation of current house price growth to its long-run average. Although statistical assessment of sample forecasting performance provided by the SG earlier in the year could not find a significant improvement in forecasting ability with the ARIMA modelling versus the simple linear extrapolation, the Commission felt that having some data driving the short-run evolution of house prices may be a preferable approach.

The Commission also observed that the forecast of its relative price distribution assumes the same growth rate for average and median price. Beyond the current forecasting round it may be helpful to explore the robustness of this assumption and, if average and median house price growth rates differ systematically, then this may inform a forecast of the evolution of the distribution of housing market transactions which underpins the residential LBTT forecast and which in its turn would go part way to explaining the presence of fiscal drag in the forecasts. The meeting then moved to a general discussion of to what extent fiscal drag was responsible for the rise in forecast tax revenues from residential LBTT.

In terms of non-residential LBTT revenues, the Commission raised three issues. First, it suggested that the rolling average employed by the SG might ignore the presence of underlying trends (particularly in prices), and therefore potentially bias the forecasts downward. Second, it encouraged the SG to analyse the likely extent of fiscal drag which is not currently accounted for in the forecast method. Third, it underlined that historical data released by HMRC on non-commercial property transactions could be useful in two respects – assessing the relationship between the forecast and part-year outturn data, and in assessing the reliability of using OBR projections of UK-wide commercial property transactions to infer growth in the equivalent Scottish variable.

Actions Arising:

- The SG to investigate the extent of fiscal drag on Residential and Non-Residential LBTT revenues.
- The SG to re-examine the smoothing of the base for the non-residential LBTT projection.
- The SG to use the HMRC data on commercial property transactions in Scotland to assess the reliability of using UK-wide projections in the forecast of Scottish commercial property transactions.

Discussion Surrounding Paper 3:

Paper 3 sets out the forecasting methodology for Scottish Landfill Tax (SLfT) and it has been updated since the previous challenge session in order to address issues discussed in previous meetings.

In particular, the current version provides the details relating to the production of UK actual and seasonally adjusted quarterly landfill revenue shares (used for scaling the 2015/16 1st quarter outturn for Scotland to its annual equivalent under two of the revenue estimates made for 2015/16; the central estimate is scaled using long-run UK shares of annual volume). There was discussion of the importance of seasonality, given that the 2015/16 outturn data is being used as a base for the forecast, and how it may differ across revenue and tonnage measures. This drew attention to the difference between forecasts by accruals and cash basis forecasts, and the meeting noted that the latter would be appropriate for assessing the revenues entering the budget.

Finally, the Commission wished to discuss the flexibility of the various policy measures in place to achieve the SG's waste targets. In other words, to what extent could the existing set of policy measures be enhanced if, for example, the waste going to landfill happened to drift off target?

Actions Arising:

- SG to provide an explanation of the quarterly analysis which is driving the base for the forecast, including fully explaining the differences in results for tax revenues and tonnage (mindful of the accruals basis for forecasting and reporting).
- SG to provide full technical note outlining the steps undertaken to produce the decomposition analysis in Table 1.
- SG to ensure that the paper provides robust evidence of seasonality effects.

SG to provide updated annex setting out what policy / practical interventions are or could be put in place to ensure that SG waste targets are met.

BRIEFING WITH THE SCOTTISH GOVERNMENT FORECASTERS

23 SEPTEMBER 2015

Present

Scottish Fiscal Commission (SFC) Participants:

Lady Susan Rice, Chair

Professor Andrew Hughes Hallett, Commissioner

Professor Campbell Leith, Commissioner

Petros Varthalitis, Research Assistant

Mattia Ricci, Research Assistant

Scottish Government (SG)

The following divisions were represented:

- Communities Analysis Division
- Fiscal Responsibility Division
- Local Government and Analytical Services Division
- Office of the Chief Economic Adviser
- Rural and Environmental Science Analytical Services Division

1. The meeting followed up on the discussions of the meetings between the SFC and SG on the 9th of June and 27th of August, 2015 and primarily focused on further development of the forecast methodologies for the forecasting of revenues from the Scottish Landfill Tax (SLfT) and Non-Domestic rates (NDRI) buoyancy growth. There was also an update from SG officials on possible SFC involvement in the forecasting of Scottish Rate of Income Tax revenues. A progress update on residential Land and Buildings and Transaction Tax (LBTT) was tabled at the meeting, but was not discussed in depth.

2. The SG forecasters presented a series of papers in advance of the meeting which were the basis for discussion at the meeting:

- Paper 1: Scottish Landfill Tax (SLfT) revenue forecasting methodology.
- Paper 2: Forecasting Buoyancy for Non-Domestic Rates for Draft Budget 2016/17.

- Paper 3: Addendum paper to forecasting buoyancy for Non-Domestic Rates for Draft Budget 2016/17- Analysis of Planning Data and Growth in NDR Tax Base.
- Paper 4: Addendum paper to forecasting buoyancy for Non-Domestic rates for Draft Budget 2016/17-Analysis of cyclical pattern in historic data.
- Paper 5: Progress update on LBTT Forecasts 2016-2020 (Tabled at the meeting).
- Paper 6: Forecasting Scottish rate of income tax revenues.

Discussion Surrounding Paper 1:

3. Paper 1 presents the assumptions and modelling approach SG intends to use to forecast SLfT revenues for 2016-21. It also contains a number of additional pieces of analysis in response to queries raised by the SFC at the meeting on the 9th of June 2015.
4. The general methodology remains unchanged, although the first quarter of actual returns data from SLfT is now available. SG forecasters examined the seasonal pattern in UK landfill revenue shares in order to infer what the annualised revenue would be expected to be given the data from Q1. The forecast now extrapolates from this annualised data point. This new data suggests that the discrepancy between Environmental Agency and HMRC data on landfill previously observed at the UK level may not apply in Scotland, thereby beginning to resolve an area of uncertainty affecting the previous forecast.
5. As the main drivers of SG forecast are long-run policy targets, at the meeting of the 9th of June 2015 the SFC invited the SG to provide more evidence on the quantitative importance of planned and implemented waste policies, as well as comparing the target-based forecasts with a simple trend-based extrapolation of recent landfill volumes. In this respect the SG reported that there are various measures including incineration, anaerobic digestion and exportation of 'refuse derived fuel' which should offer sufficient alternative waste treatment capacity to deal with any diversion from landfill. At the same time, a straight trend extrapolation of recent landfill volumes would imply that the target-based forecasts were more than met over the forecast horizon.

6. As the re-basing of the forecast from SEPA data from 2013 to the actual outturn data for the first quarter of the fiscal year 2015-16 requires a seasonal adjustment of the quarterly data, the SFC were particularly interested in the estimation of the seasonality in UK landfill volumes and their application to Scotland.
7. Actions Arising:
 - SG to provide the raw data and a note detailing the underlying model producing the actual and seasonally adjusted quarterly landfill revenue shares for the UK (see Table 1, pp: 7).
 - SG to provide data on Scotland's share of UK total landfill revenues in order to facilitate the comparison of SG and OBR forecasts.
 - SG to attempt an explanation of the differences between the SG and OBR forecasts for SLfT revenues.

Discussion Surrounding Papers 2-4:

8. Paper 2 provides a discussion on the SG's approach to forecasting the "buoyancy" of Non-domestic Rates Income (NDRI), in light of discussion with the SFC in meetings on the 30th of June 30th and 27th of August 2015, as well as the SFC's report on the 2014-15 budget. The SG's benchmark approach is to adopt a long-term average buoyancy growth rate, derived from historical data, when forecasting buoyancy. The various papers relating to NDRI buoyancy discussed at the meeting involve various pieces of modelling work seeking to explain the variation in buoyancy over time, and thereby improve the quality of the buoyancy forecast.
9. Paper 2 also contains the latest version of the SG's attempts to quantify the impact of additional economic factors on buoyancy growth. SG's analysis suggests that, given data limitations, there was little or no evidence that any additional factors could robustly be used to enhance the forecasting of buoyancy.
10. Paper 3 updates the SG's ongoing work to use micro-data on "major projects" making their way through the planning system to help predict movements in buoyancy. Unfortunately, while this approach had initially looked promising as a means of enhancing the NDRI buoyancy forecast, recent work using real time planning data

suggests that the relationship between that data and subsequent observed buoyancy was not sufficiently stable to support a reliable forecast.

11. Paper 4 uses various statistical techniques to formally assess the presence of a systematic 'saw-tooth' pattern which can be visually seen in the buoyancy data. Given the relatively small data sample, the techniques were largely unable to quantify the extent to which such a pattern was present.
12. In response to these various papers, the SFC undertook some simple statistical analysis of the 'saw-tooth' pattern which may possibly be a feature of the buoyancy data. This provided some evidence that a cyclical pattern could exist in the data and should be controlled for. The SG and the SFC then discussed the possibility that controlling for this pattern may reveal relationships between buoyancy and potential economic determinants of buoyancy which have not yet to date become apparent.
13. Actions Arising:
 - SG to review their analysis on the 'saw-tooth' pattern in the data in light of the evidence provided by SFC.
 - SG to examine why such a pattern might occur over the revaluation cycle, assessing whether it is an artefact of the data that needs to be controlled for or a meaningful economic phenomenon.
 - SG to refine their econometric work assessing the role of a reduced selection of other economic variables for movements in buoyancy by controlling for any systematic pattern present and ensuring consistency in terms of stationarity of variables and their measurement (for example, by ensuring all variables are real).
 - On a longer-term horizon SG to further investigate the role of major projects going through the planning system in forecasting buoyancy, possibly involving other colleagues with extensive knowledge of the planning system data.

Discussion Surrounding Paper 5:

14. Paper 5 providing a progress update on LBTT forecasting was tabled at the meeting and the SFC, therefore, had not had a chance to reach a view on its contents prior to the meeting.

15. Paper 5 updates the forecast of LBTT in light of the discussions on the August 27th meeting between the SG and SFC. Following the meeting of the 27th of August the SFC provided the SG with various academic papers which develop and evaluate forecasts of the housing market, as a possible way to address technical issues and enhance the modeling work presented at that meeting. The SG indicated that it couldn't utilise these techniques within the current Budget cycle as significant time and resource would be required for SG economists to familiarise themselves with the techniques and provide output of a sufficiently robust standard. However, SG recognised the need to investigate these techniques over the longer term, with a view to determining whether they would enhance future forecasts.
16. Actions Arising:
- SFC to assess the forecasts on their merits including the justification the SG forecasters provide for the methodology followed
 - SG to provide five-year forecasts for non-residential LBTT following publication of UK Stamp Tax Statistics 2014-15 by HMRC (due for publication on 30 September 2015).
 - The SG to provide additional evidence about forestalling and seasonality adjustments to house prices made by SG to refine the seasonal allocation of their annual forecast. This action is still pending since the meeting of the 27th of August.

Discussion Surrounding Paper 6:

17. Paper 6 describes the forecasting arrangements for the Scottish Rate of Income Tax (SRIT) which will commence in April 2016 and will require Scottish Ministers setting the corresponding tax rate.
18. The Command paper 'Strengthening Scotland's future' states that the SRIT forecasts in the Draft Budget 2016-17 will be provided by the OBR. The precise role the SFC will have in this process is part of ongoing discussions.
19. Actions arising:
- SFC is invited to formally consider and propose the nature of its role in scrutinising SRIT forecasts underpinning the 2016-17 Draft Budget.
 - SG to keep the SFC informed of any developments in their forecasting work relating to SRIT.

BRIEFING WITH THE SCOTTISH GOVERNMENT FORECASTERS

27 AUGUST 2015

Present

Scottish Fiscal Commission (SFC) Participants:

Lady Susan Rice, Chair

Professor Andrew Hughes Hallett, Commissioner

Professor Campbell Leith, Commissioner

Petros Varthalitis, Research Assistant

Mattia Ricci, Research Assistant

Scottish Government (SG) Participants:

The following divisions were represented:

- Communities Analytical Services Division
- Fiscal Responsibility Division
- Local Government and Analytical Services Division
- Office of the Chief Economic Adviser

This scrutiny meeting between the SFC and SG forecasters focused on the methods used to forecast Residential Land and Buildings Transaction Tax (LBTT) revenue and Non-Domestic Rates Income (NDRI) buoyancy.

The SG forecasters presented a series of papers which were the basis for discussion at the meeting:

- Paper 2: Residential LBTT Forecasts 2016-20 (provisional).
- Paper 3: LBTT Forestalling
- Paper 4: Forecasting Buoyancy for Non-Domestic Rates for Draft Budget 2016/17
- August 2015: Addendum paper covering actions from the June 2015 meeting
- Paper 5: Forecasting Buoyancy for Non-Domestic Rates for Draft Budget 2016/17: Scottish Fiscal Commission, 27 August 2015.

Discussion Surrounding Paper 2:

Paper 2 provided an update of the SG forecast for Residential LBTT using the pre-existing methodology, but extending the forecast to five years. The SFC noted the sharp reversion to the long-run value of transactions in 2020/21 and suggested some smoothing of the transition

from the return to the average turnover rate in 2019-20 to the long-run trend may be appropriate. The SG forecasters indicated this was feasible

This paper also included an Annex detailing econometric work the SG had undertaken to develop alternative models for forecasting house prices and transactions volumes as these underpin the LBTT revenue forecasts. This work is as a result of suggestions made by the SFC at a scrutiny meeting on 30 June 2015. The SFC was generally disappointed by the progress made in this work, raising again a number of technical issues. The SG forecasters commented that it favoured simpler rather than econometrically more complex models, but that, since they did not have direct experience of the techniques suggested, these could be explored over the longer term. These issues were discussed.

Actions Arising:

- SG to investigate smoothing the transition from average turnover rates to long-run trend in producing the forecast.
- SFC to provide a selection of papers generating and evaluating forecasts of the housing market using a mixture of univariate and multivariate techniques.
- The SG forecasters will explore these papers as a means of resolving the technical issues with their previous attempts to apply alternative forecasting methods to the Scottish housing market.

Discussion Surrounding Paper 3:

Paper 3 provided an update on how the outcome data between April and July 2015 for LBTT revenues compared with those forecast as a means of assessing the magnitude of the forestalling effects created by the various reforms to Stamp Duty Land Tax in the UK. (This paper also includes, as an Annex, the paper “Alternative econometric techniques for forecasting Scottish house prices and transaction volumes” which details the SG’s response to the SFC’s requests to strengthen the evidence underpinning the estimate the likely size of forestalling effects).

In order to assess the extent to which transactions had been temporally shifted the SG forecasters needed to allocate their annual forecast on a monthly basis. To do so they used estimates of the average seasonality in housing transactions. The SFC welcomed this work, and suggested that the analysis of seasonality could also be usefully applied to house prices as well as transactions to further refine the estimate of the magnitude of the forestalling effects. There was also some discussion on what the analysis of forestalling implied about the importance of behavioural effects from changes in LBTT rates more generally.

Actions Arising:

- The SFC to provide a paper on seasonality in UK prices as a guide to measuring seasonality in Scottish house prices.
- The SG to make similar seasonality adjustments to house prices to refine the seasonal allocation of their annual forecast across the early months of the forecast as a means of assessing the magnitude of any forestalling effects.

Discussion Surrounding Paper 4:

The issues arising from the meeting of 30 June 2015

in respect of the buoyancy forecast were twofold. Firstly, visual inspection of historical buoyancy data suggested that there may be a systematic 'saw-tooth' pattern in buoyancy data spiking in revaluation years and then declining until the next revaluation date. The SFC asked that this be investigated further. Secondly, there were missing observations in the historical buoyancy data and the SFC suggested that these gaps may be filled by inferring buoyancy from NDRI income data.

In paper 4, the SG argued that there was unlikely to be any meaningful systemic pattern in the data, although this had not been formally tested. While in relation to the missing data, the SG had produced estimates of buoyancy derived from NDRI income data which showed a statistically significant correlation with the existing (actual) buoyancy data, and potentially provided an additional two data points in the time series

Actions Arising:

- SG to formally test whether (1) revaluation years are associated with unusually high buoyancy and (2) there is a systemic 'saw-tooth' pattern in the data between revaluation periods.
- SG to provide time series data for the new buoyancy estimates derived from income data, alongside the corresponding actual buoyancy data.

Discussion Surrounding Paper 5:

A large part of paper 5 is concerned with the use of local authority data on large scale projects likely to come on stream in the forecast period and thereby affect the level of buoyancy. The SFC welcomed this use of additional data to enhance the forecasting of buoyancy. However, it transpired that there may be technical issues related to ensuring the data used to calibrate the link between historical major projects data and buoyancy outcomes is comparable to the data available at the time the forecast of future buoyancy is made. The SFC applauded the SG for identifying and taking steps to resolve this issue.

Actions Arising:

- SG to further explore the application of local authority major project data to the forecasting of NDRI buoyancy.

Scottish Fiscal Commission

4 Lilybank Gardens
Glasgow G12 8RZ

T: 0141 330 5611
E: info@fiscal.scot

www.fiscal.scot

