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**INDEPENDENT SCRUTINY AND ASSURANCE OF DEVOLVED
TAX FORECASTS FOR WALES**

FINAL REPORT

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** Numbers in the tables may not equal to the total due to rounding.*

EXECUTIVE SUMMARY

This report sets out the methodologies and assumptions relating to the Welsh Government's forecasts for devolved taxes that underpin the Welsh Government Final Budget 2019/20, together with Bangor Business School's conclusion on their suitability for use in the budgeting process.

The Welsh Government, under the terms of the fiscal framework, committed to putting in place arrangements for the independent scrutiny of its devolved tax revenue forecasts. Following a competitive procurement exercise, Bangor Business School, Bangor University was appointed to undertake this work. The aims of this work are:

- The provision of independent scrutiny and assurance of Welsh Government's forecasts for Welsh taxes (Land Transaction Tax, Landfill Disposals Tax, Non-Domestic Rates and Welsh Rates of Income Tax) for inclusion in the 2019-20 Budget and potentially future years; and,
- Advice on improving methodologies for future years' forecasts.

The overall aim of the report is to show how each of the forecasts have been calculated to provide greater transparency on how devolved tax forecasts have been incorporated into the Final Budget 2019/20 and to explain the independent scrutiny and assurance of the process.

By its very nature, forecasting tax revenues is subject to margins of error. Assumptions are built into forecasts based on the best available information at the time. However these assumptions are often proven too optimistic or pessimistic as new economic events continuously unfold. Such uncertainty is particularly high in the current economic climate. For example, Britain's departure from the EU, coupled with the lack of clarity on the future relationship between the UK and EU, inevitably increases the economic uncertainty faced in Wales and, in turn, the future path of tax revenues. The backdrop of these uncertainties needs to be born in mind when interpreting the devolved tax revenue forecasts.

Section 2 presents and discusses the economic scenario which underpins the tax revenue forecasts. The UK has an important role in determining the path of the Welsh economy, and therefore the work of the Office for Budget Responsibility (OBR) in providing independent forecasts for the UK economy is of relevance in constructing the profile and composition of economic activity in Wales. These OBR forecasts and assumptions are part of a broader macro-economic picture and set of assumptions. In the absence of alternative information, such as detailed Wales-specific information, it is considered appropriate to make use of these OBR determinants.

Sections 3 and 4 set out revenue forecasts for the two devolved taxes – Landfill Disposals Tax and Land Transaction Tax – for the period up to 2022/23. The methodology for the Landfill Disposals Tax is based on forecasting the amount and type of waste sent to Welsh landfill sites and applying the appropriate tax rate to derive the tax revenue. The Land Transaction Tax forecast for residential main rates, additional properties, non-residential main rates, and non-residential leasehold is based on a bottom-up methodology which utilises all available information to create a base-year price distribution. This is adjusted to reflect changes in economic conditions and any behavioural effects, and tax revenues are derived from forecasted distributions of future years.

Section 5 sets out the revenue forecast for Non Domestic Rates, a tax which has been financially devolved to the Welsh Government since April 2015. The forecasting of Non Domestic Rates revenues is not derived from a specific model, but from aggregate data from the administrative exercise undertaken to determine the distributable amount for local authorities. A number of reliefs and other adjustments need to be taken into account before the final forecast amount available to distribute back to local authorities can be derived.

Section 6 sets out revenue forecasts for Welsh Rates of Income Tax for the period up to 2022/23. The forecast is based on a bottom-up methodology which utilises all available information and allows a transparent approach to forecasting. The methodology creates a base-year revenue distribution which is adjusted to reflect changes in labour market conditions, and tax revenues are derived from future distributions.

For each of these revenue forecasts Bangor Business School has worked with the Welsh Treasury to review and test their methodology, making recommendations on how these methods could be improved. This has been an iterative process developed over each phase, building on the work undertaken by Bangor Business School last year. A summary of this development work is provided in the next section and discussed further in each appropriate section. We have also made a number of recommendations for future development.

Based on the economic scenario described in Section 2 and the methodologies discussed in this report, the Welsh Government revenue forecast from Landfill Disposals Tax, Land Transaction Tax, Non Domestic Rates, and Welsh Rates of Income Tax for the Welsh Government's Final Budget 2019/20, is given as:

Welsh Government tax revenue forecasts for 2018/19 to 2022/23 (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Landfill Disposals Tax	47	43	39	37	35
Land Transaction Tax	239	256	270	292	318
Non Domestic Rates	1,050	1,061	1,091	1,113	1,137
Welsh Rates of Income Tax	-	2,059	2,166	2,248	2,335
Total	1,336	3,419	3,566	3,690	3,825

The forecasts for the devolved taxes and their underlying methodology and assumptions have been scrutinised by Bangor Business School. **Based on the information provided by the Welsh Treasury, discussion with academics and practitioners on the theoretical assumptions of the models, including information used, and analytical examination of the tools and models, Bangor Business School concludes that the forecasts are based on robust and appropriate methodologies and assumptions.** Expected variation in the revenue forecast for different economic scenarios and model assumptions support the suitability of the forecasts' inclusion in the budget setting process.

DEVELOPMENT OF METHODOLOGY AND FUTURE RECOMMENDATIONS

Development of methodology

Through the process of working with the Welsh Treasury to scrutinise their forecasting methodologies, Bangor Business School made a number of recommendations that will be incorporated into the model development process.

For example, the lack of historical Welsh revenue data for Landfill Tax is a challenge for constructing a forecast. Initial information has become available from the Welsh Revenue Authority (WRA) and, based on a suggestion from Bangor Business School, the Welsh Treasury were able to incorporate this into the forecast in a prudent way. This allowed the forecast to make reasonable use of recently available information.

On Land Transaction Tax, the Welsh Treasury considered the previous year performance of the Welsh property market to ensure that the starting position for the forecast was the most appropriate. Independent back testing of the methodology and testing of the stability of the price distributions of transactions underpinning the forecast was also carried out.

With respect to Non Domestic Rates there has been, in line with Bangor Business School's recommendation, continuing work to improve access to information on appeals, an important element within the forecasting tool.

The Welsh Rates of Income Tax represent a new devolved revenue stream for this budget. The Welsh Treasury was asked to look at alternative sources for forecast determinants and to consider the best approach for capturing the dynamics of the Welsh labour market (a key driver of income tax revenues).

Future recommendations

The following is a list of new (N) recommendations arising from this year's scrutiny work. These are issues advised to be explored and implemented as part of subsequent forecasting work.

No.	Model	Recommendation
N1	General	Further consideration should be given to undertaking further work to provide Welsh specific data to help to inform the forecasting exercise. Consideration should be given to the possibility of developing a systematic approach for measuring and understanding the Welsh economy.
N2	LDT	The Welsh Treasury and WRA to continue collaborating to incorporate relevant information into the forecasting process where possible.
N3	LDT	The Welsh Treasury to establish a monitoring process to assess the performance and continued suitability of the model for forecasting revenues. This to include a method of back-testing the model based on information from the WRA when sufficient data becomes available.
N4	LTT	The Welsh Treasury to establish a monitoring process to assess the performance and continued suitability of the model for forecasting revenues. This to include a method of back-testing the models based on information from the WRA when sufficient data becomes available.
N5	NDR	The Welsh Treasury to continue to work with the Valuation Office Agency (VOA) to discuss approaches to improve the timely availability of information on appeals.
N6	WRIT	The Welsh Treasury to incorporate new data on WRIT as it becomes available and take account of any new information on the behavioural impacts of income tax.

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SECTION 1 – INTRODUCTION

This report sets out the work undertaken in the independent scrutiny and assurance of the Welsh Government's forecasts of devolved taxes. In April 2015, financial responsibility for non-domestic rates (NDR) was devolved to the Welsh Ministers and Land Transaction Tax (LTT) and Landfill Disposals Tax (LDT) replaced UK Stamp Duty Land Tax (SDLT) and UK Landfill Tax (LfT) in April 2018. This is due to be followed by the partial devolution of income tax from April 2019. Most aspects of income tax will remain the responsibility of the UK Government and the tax will be administered and collected by HMRC. Work is underway between the Welsh Government and HMRC to implement Welsh Rates of Income Tax. This work will inform the development of tax revenue forecast models with those forecasts being incorporated into future Welsh Government budgets. Therefore the Welsh Government budget is dependent on Welsh taxes, and forecasts of tax revenue are becoming a more significant component of the budget setting process in Wales.

The Welsh Government has undertaken a forecasting process in order to forecast revenues from these devolved taxes. All forecasts are presented on a financial year basis.

These forecasts have been developed by using economic models and accounting tools, drawing on different data sources for inclusion in the models. These models and forecasting tools have been designed with the objective of forecasting tax revenues, and to act as an analytical tool to help analyse the revenue implications of future changes in the taxes.

Contract objectives

The main objectives of this independent review are:

- The provision of independent scrutiny and assurance of Welsh Government's forecasts for Welsh taxes (Land Transaction Tax, Landfill Disposals Tax, Non-Domestic Rates and Welsh Rates of Income Tax) for inclusion in the 2019/20 Budget and potentially future years; and,
- Advice on improving methodologies for future years' forecasts.

Methodology

As part of this scrutiny Bangor Business School worked with the Welsh Treasury, firstly to gain an understanding of the forecasting process and then to review their economic models and accounting tools, and the different sources of input data used. The quality of the input data was appraised and alternative data was considered; data not currently being used in the forecasting process, but which

merits consideration. Sensitivity analysis to help highlight some of the areas where the impact on revenues could be most significant was done. This also assisted in recognising the uncertainty involved in economic forecasting and provide an insight into possible alternative tax revenue paths.

In recognising the uncertainty involved in economic forecasting Bangor Business School made use of sensitivity analysis to help to highlight some of the areas where the impact on revenues could be most significant.

Process

The forecast scrutiny work for the Welsh Government's Budget 2019 by Bangor Business School commenced at the end of March 2018, when the Welsh Treasury made their forecasting information and supporting documents available for review. Further information was provided on an on-going basis as it became available. The models and the forecasts were updated and continuously reviewed during the process. There were four distinct phases to the contract specification for this work and the output from each phase is described below. This report covers phase 4.

Phase	Summary description
Phase 1	Initial work to gain an understanding of the approach being adopted for the production of devolved tax forecasts, including a context setting meeting; Appraisal work to assess these methodologies; Production of an interim report setting out the assessment of the methodologies, including highlighting areas for improvement or modification; End of Phase meeting to discuss the report and any other issues.
Phase 2	Undertake on-going appraisal work as the Welsh Government works on Budget allocations and interim developed tax forecast; Appraise this process and consider revised forecasts; Production of updated interim report; End of Phase meeting to discuss the report and any other issues.
Phase 3	Continue to consider the on-going Welsh Government work prior to the publication of the Draft Budget and be responsive to any revisions in forecasts; Production of a report drawing on the processes and outcomes of the previous phases; End of phase meeting to discuss the report and any other issues.
Phase 4	Assess forecasts published by the OBR at the Autumn Budget 2018 and any other

Phase	Summary description
	relevant information; An exercise to consider whether any changes are required to the forecast figures proposed by the Welsh Government; Work to conclude an agreed statement to be published with the Final Budget, including any changes between the Draft Budget Forecast and the Final Budget Forecast that are required due to changes in data inputs; Production of guidance for improving methodologies for forecasts in future years; End of contract meeting to discuss the suggestions for the future and to finalise the agreed statement.

Bangor Business School worked alongside the Welsh Treasury, reviewing new material and the revised forecasts, and considering different potential approaches and scenarios. During this iterative process recommendations were made by Bangor Business School and incorporated into the forecasting process by the Welsh Treasury. This work is summarised in the Executive Summary and in the discussion of the methodology in each section. There are a number of further recommendations for the future development of the forecast methodology and these are set out after the Executive Summary.

Knowledge exchange

Forecasting tax revenues is a relatively new function for the Welsh Government. As part of the review work Bangor Business School had regular communications with representatives from the OBR and the Scottish Fiscal Commission (SFC), discussing their approaches to forecasting tax revenues. The OBR produces forecasts for the UK as a whole and the SFC reports on devolved taxes in Scotland and discussions provided insights into the practice of forecasting tax revenues.

Summary information on knowledge exchange and communications can be found in Appendix 1. These communications provided a useful opportunity to discuss the approaches of different institutions with respect to forecasting tax revenues and insights from these were integrated into the scrutiny of devolved tax forecasts for Wales.

SECTION 2 – FORECASTING UNCERTAINTY AND THE WELSH ECONOMY

Introduction

The purpose of this section is to put into context the economic environment underpinning the independent scrutiny of the Welsh Government's forecast of Welsh tax revenues. This section also sets out some of the challenges of forecasting tax revenues.

The Wales Act 2014 gave new powers to the National Assembly relating to taxation and borrowing: powers to introduce Welsh taxes to replace UK stamp duty land tax and UK landfill tax, partial devolution of income tax, powers to introduce other devolved taxes on a case by case basis and borrowing powers. Financial responsibility for Non-domestic rates was devolved from April 2015, with Land Transaction tax and Landfill Disposals tax commencing from April 2018. This is the second annual report that details Bangor Business School's independent scrutiny of the devolved tax revenue forecasts. From April 2019 income tax will be partially devolved, with rates set by the Welsh Government, and this second report also considers this tax.

The tax revenue forecast is an essential component of the Government budget, and for short and medium-term fiscal policy. However, research on appropriate techniques for forecasting detailed tax revenues is under-developed. It is recognised that some types of taxes might be more difficult to predict than others; and this can change over time, particularly as the rules and the tax base change.

Given the prevailing uncertainty in preparing medium and long-term forecasts, the OBR now produces a fiscal risk report that identifies possible shocks or pressures to projections¹. According to the OBR, the biggest peacetime fiscal risks over the medium term relate to the economy with the chance of a recession in any five-year period is circa. one-in-two. Recessions associated with financial crises are typically the most costly, especially when their economic effects persist. These long-term costs are generally much more significant, and the chance of a financial crisis in any five-year period is circa. one-in-four. The likelihood of these uncertainties needs to be taken into account when reflecting on the forecasts presented in this report.

¹ See Fiscal Risk Report (July 2017) by the Office for Budget Responsibility for the most recent report available at www.gov.uk/government/publications/fiscal-risks-report-july-2017

Forecasting uncertainty

Uncertainty is inherent in forecasting as the future cannot be known with certainty and any forecast is unlikely to be completely accurate. Forecasts of future tax revenues, or wider economic variables affected by a wide range of factors, are, by their very nature, subject to margins of error. There is considerable uncertainty in attempting to predict the economy, and economic uncertainty is heightened following the continuing uncertainty with respect to Britain's departure from the EU. For example, the OBR offer that uncertainty arising from the Brexit vote could have encouraged firms to expand production by increasing inputs of relatively flexible labour, rather than investment in capital, which is less easily reversed:² demand uncertainty can lead to firms' wariness of engaging in large investment projects. The actual long-term impact of Brexit on the structure and the size of the UK economy will largely depend on the final agreement with the EU; on its future trade, migration and customs relationship with the bloc³.

In reviewing forecasts and considering forecasting errors, identified as differences between the forecast and the outturn, Bangor Business School shares the approach of the OBR's stated view of forecasting errors as being an arithmetic difference and "this does not imply that it would have been possible to avoid them given the information available at the time of the forecast. Differences with outturns may reflect unforeseeable developments after the forecast was made. It does not mean the errors could necessarily have been avoided given the information available at the time."⁴

There is also uncertainty related to new policy measures, and these forecasts relate to new taxes and a new tax administration. Preparing revenue forecasts involves not only predictions about the macroeconomic development, but also predictions about the functioning of the tax law and its enforcement.

Uncertainty about revenues also stems from changes in the tax law: changes or adaptations in the tax law have the potential for behavioural effects, with revenue consequences that are hard to quantify. This suggests that revenue forecasts tend to be more difficult in the presence of tax law changes as there is a risk that some taxpayers may respond by changing their behaviour, and this requires judgement in the forecasting process.

² Forecast Evaluation Report (October 2017) report by the Office for Budget Responsibility available at www.gov.uk/government/publications/forecast-evaluation-report-october-2017

³ Discussion Paper No 3 Brexit and the OBR's Forecasts (October 2018) report by the Office for Budget Responsibility available at https://obr.uk/docs/dlm_uploads/BrexitDiscussionWebVersion.pdf

⁴ Forecast Evaluation (October 2016) report by the Office for Budget Responsibility available at www.gov.uk/government/publications/forecast-evaluation-report-october-2016

The Welsh Revenue Authority (WRA) was established to collect and manage newly devolved taxes and has been fully operational from 1 April 2018. As the WRA is currently part way through its first year of operation this adds additional uncertainty to predictions about the functioning of the tax law in practice. Over a longer period of time the approach, actions and public statements of the WRA will help to inform expectations as to its approach to administration and enforcement, thus lessening this particular uncertainty.

In developing these forecasting models, the Welsh Treasury team has used Welsh specific data where it is available and appropriate to do so and has also relied on data from other sources such as HMRC and the OBR. The WRA will be an important source of Welsh specific data in the future, providing details of revenues collected in a timely manner to help to appraise how well the models coincide with the outturns and so aid future model developments. Therefore, over time it is anticipated that better data will be available to inform the development of tax revenue forecasts in Wales.

A summary of the key data sources is set out in table 2.1, identifying the Welsh specific data sources there are, in addition to data from the WRA.

Table 2.1: Key data sources, for forecasting models, identifying Welsh specific data

Data source	Welsh specific data	Non-Welsh specific data
Landfill Disposals Tax		
Data from landfill site operators	X	
Data on local authority waste management	X	
Information on waste infrastructure developments	X	
Forecast of RPI		X (OBR UK forecast)
Land Transaction Tax		
SDLT transactions in 2016-17	X	
Forecasts of property transaction and price growth		X (OBR UK growth forecasts)
Information on additional property refunds	X	X (Data from England and Scotland)
Estimates of expected changes to prices and transactions if tax rate changes		X (OBR UK estimates)
Nondomestic rates		
Local authority contributions and reliefs	X	
Central list revenues	X	
Rateable values	X	
Forecast of CPI		X (OBR UK forecast)
Income Tax		
HMRC Survey of Personal incomes data	X	
Forecast of wages and employment growth		X (OBR UK forecast)

The Welsh economy

A view of the future of the economy as a whole informs the broader macro-economic picture and the assumptions that are the context for these forecasts. Forecasts of tax receipts are particularly dependent on the profile and composition of economic activity. If there were to be significant changes or differences in the profile or composition of economic activity there would be an impact on the assumptions used in the models for the devolved Welsh taxes covered in this report, and a number of OBR forecast determinants are incorporated into the forecasting models, for example the Multiplier for the NDR forecasts is increased by the OBR's forecast for the Consumer Price Index (CPI).

The UK has an important role in determining the path of the Welsh economy; therefore, the work of the OBR in providing independent analysis of the UK's public finances, and forecasts for the UK economy, is of relevance in constructing the profile and composition of economic activity. These OBR forecasts and assumptions are part of a broader macro-economic picture and set of assumptions. In the absence of alternative information, such as detailed Wales-specific information, it is considered appropriate to make use of these OBR determinants.

A summary of the wide-ranging determinants of the OBR fiscal forecast is set out below in Table 2.2. In addition to setting out the determinants specifically drawn on for these forecasts, these determinants also provide an indication of the future direction of the economy. Determinants directly drawn on to produce the Welsh Government's forecasts are marked by ●. Any changes to these by the OBR, or any updated in-year forecasts, will have an impact on Welsh revenue projections.

Table 2.2: Key determinants of the OBR Fiscal Forecast to 2022/23 (published October 2018)

Period	2018/19	2019/20	2020/210	2021/22	2022/23
GDP and its components					
Real GDP (%)	1.4	1.6	1.4	1.5	1.5
Nominal GDP (%)	3.2	3.4	3.4	3.4	3.5
Nominal GDP (£ billion)	2,126	2,198	2,273	2,350	2,432
Consumer spending (%)	3.6	3.2	3.2	3.4	3.5
Prices and earnings					
GDP deflator (%)	1.8	1.8	1.9	1.9	1.9
● RPI (%)	3.4	3.0	3.1	3.1	3.1
● CPI (%)	2.5	1.9	2.1	2.1	2.1
● Average earnings (%)	2.3	2.6	2.9	3.0	3.2
Key fiscal determinants					
Employment (millions)	32.5	32.8	32.9	33.0	33.1
Property sector					
● Residential property prices (%)	3.1	3.2	3.1	3.3	3.6
● Residential property transactions (000s)	1,187	1,210	1,244	1,278	1,314
● Commercial property prices (%)	3.0	-1.4	-0.7	1.8	1.8
● Commercial property transactions (%)	-4.1	1.0	1.5	1.6	1.6
Interest rates and exchange rates					
Short term interest rate (%)	0.8	1.2	1.4	1.6	1.6
Euro/Sterling exchange rate	1.13	1.11	1.09	1.08	1.07

There are some changes to the OBR forecast of determinants since Bangor Business School's last December report. Table 2.3 shows changes to the key economic determinants of the forecast since the OBR's report in November 2017, which Bangor Business School included in the Update Report of December 2017. The OBR forecast of determinants included in our report of October 2018 is shown in the Appendices, for reference.

Table 2.3: Change in key determinants of the OBR Fiscal Forecast to 2022/23 – change on previous forecast (published March 2018)

Period	2018/19	2019/20	2020/210	2021/22	2022/23
GDP and its components					
Real GDP (%)	0.0	0.3	0.1	0.1	0.0
Nominal GDP (%)	0.2	0.5	0.4	0.3	0.1
Nominal GDP (£ billion)	10.0	21.0	32.0	38.0	43.0
Consumer spending (%) (calendar year)	0.5	0.5	0.1	0.0	0.0
Prices and earnings					
GDP deflator (%)	0.3	0.2	0.3	0.2	0.1
● RPI (%)	0.0	0.1	0.2	0.2	0.1
● CPI (%)	0.3	0.1	0.1	0.1	0.1
● Average earnings (%)	-0.3	0.2	0.3	0.2	0.2
Key fiscal determinants					
Employment (millions)	0.2	0.3	0.4	0.4	0.4
Property sector					
● Residential property prices (%)	-0.3	0.7	0.9	0.9	0.6
● Residential property transactions (000s)	-49	-49	-41	-34	-29
● Commercial property prices (%)	3.6	-3.0	-2.3	0.0	0.0
● Commercial property transactions (%)	-5.5	-0.2	0.1	0.2	0.2
Interest rates and exchange rates					
Short term interest rate (%)	0.0	0.0	-0.1	-0.1	-0.1
Euro/Sterling exchange rate	-0.01	-0.02	-0.02	-0.02	-0.02

The OBR's stated view⁵ is that the economic outlook is one "of a relatively stable but unspectacular trajectory for economic growth"⁶. Real GDP growth has been revised up in the meantime, given a stronger outlook in the global economy, but is weaker in later years. Real GDP has been slightly increased from 2019/20 onwards, due to the fiscal easing announced in the October Budget.

⁵ Economic and Fiscal Outlook Report (March 2018) by the Office for Budget Responsibility available at http://cdn.obr.uk/EFO-MarCh_2018.pdf

⁶ Economic and Fiscal Outlook Report (October 2018) by the Office for Budget Responsibility page 7 available at <https://obr.uk/efo/economic-fiscal-outlook-october-2018/>

There are many uncertainties underpinning the forecasts: the OBR's key assumptions underpinning the forecast are:

- the UK leaves the EU in April 2019, moving in due course to a less open trade regime and a tighter migration regime than would otherwise be the case. It is assumed that there will be a two-year transition period in which the UK's trading relationship with the EU will remain as it is now.
- credit conditions remain highly accommodative, although the expectation is for monetary policy to loosen slightly;
- slight increase in sterling's strength;
- sterling oil prices are higher than assumed in November 2017; and
- UK export market growth is expected to slow after 2018, and by more than world trade growth

The OBR fiscal outlook and fiscal determinants are for the UK as a whole. In different ways the economy of Wales does not track the UK average, but where OBR determinants have been used Bangor Business School have worked with the Welsh Treasury to test their suitability for Wales. There is little in the way of Wales-specific economic forecast data and it is also recognised that there are significant variations and regional differences within Wales. There is a lack of Wales-specific information; a significant difficulty is the lack of information on Welsh trade flows and cross border trade. Given this, it will be important to assess the costs and benefits in any development of Welsh specific determinants for the purposes of forecasting tax revenues.

Update on previous recommendations

Recommendation 1

Forecasting of revenues from these newly devolved taxes is in the early stages. Subsequently, any forecast errors from these forecasts should be scrutinised to appraise how well the models coincide with the outturns. Evaluating forecast accuracy can be a crucial element of forecasting procedures: it is relevant for monitoring purposes and allows for improving forecasts by learning from past errors.

Outturn data for 2018/19 for the devolved taxes will be available after March 2019. Once the data is available the forecasting errors and their causes can be investigated to help to inform future forecasts. In the interim, in-year revenue data from 2018-19 will be considered and assessed against the forecasts to inform the forecasting process.

Recommendation 2

Consideration should be given to the possibility of undertaking further work to provide Welsh specific data to help to inform the forecasting exercise. However, it is acknowledged that this is challenging and time-consuming, and therefore the costs and benefits of any in-depth work on this should also be appraised.

The collection of the devolved taxes will mean further Welsh specific data relating to these taxes will be collected. For LDT this will be especially significant as limited Welsh landfill tax data currently exists, given that the tax is collected without any geographic identifiers. The development of wider Welsh specific data is being explored by the Welsh Government (both the Welsh Treasury and Knowledge and Analytical Services). Links with the Scottish Fiscal Commission, the OBR and other bodies help to ensure that the Welsh Government is kept aware of the data sets used to forecast taxes and any developments by these bodies, to help inform priorities for Welsh specific data.

Bangor Business School view

There is uncertainty around all such economic forecasts and this is acknowledged in this scrutiny work. Welsh specific data is drawn on in developing the forecasts, but where it is not available, the forecasts use a number of OBR determinants that are only available at the UK level. Given the information available and the work undertaken to test their suitability, the use of these OBR determinants is considered appropriate.

Recommendation N1

Further consideration should be given to undertaking further work to provide Welsh specific data to help to inform the forecasting exercise. Consideration should be given to the possibility of developing a systematic approach for measuring and understanding the Welsh economy.

SECTION 3 – LANDFILL DISPOSALS TAX

Introduction

The Landfill Disposals Tax (LDT) was introduced as a fully devolved tax in Wales from 1 April 2018, replacing the UK Landfill Tax (Lft). Like Lft, LDT is an environmental tax aimed at helping to reduce the amount of waste sent to landfill sites in Wales. The tax is payable by the landfill site operators and there are 17 operators registered with WRA at present⁷.

Different tax rates apply for two different type of waste; standard and lower rate. The lower rate applies to waste disposals that are non-hazardous, have a low potential for greenhouse gas emissions, and have low polluting potential in the landfill environment. The standard rate applies to all other taxable waste.

Some 9.5 million tonnes of standard rate waste and 10.6 million tonnes of lower rate waste was sent to UK landfill sites in 2016/17. Despite similar amounts of waste, the difference in the rates shown has a significant effect on the amount of revenue collected from both waste types. The UK revenue from standard waste in 2016/17 was around £800 million and £28 million from lower rate, before adjusting for any tax reliefs and credits.

The Final Budget 2019/20 LDT rates for standard and lower rate waste are consistent with the announced UK Lft rates⁸. The rate in Table 3.1 updates the 2018/19 rate by a forecast for the retail price index. The Welsh Government has also introduced a rate for disposals made at sites other than an authorised landfill site – known as the unauthorised disposals rate.

The rates will be as set out below in Table 3.1.

Table 3.1: LDT rates for standard and lower rate waste for 2018/19 and 2019/20 (£ per tonne)

Period	2018/19	2019/20
Standard rate	88.95	91.35
Lower rate	2.80	2.90
Unauthorised disposals	133.45	137.00

⁷ See <https://beta.gov.wales/welsh-revenue-authority-list-landfill-site-operators>.

⁸ See <https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013>.

LDT revenue forecast

Landfill Tax no longer applies in Wales with LDT having replaced it from 2018/19 onwards. The Welsh Government's forecasts for LDT as contained in the Final Budget 2019/20 are set out below in Table 3.2.⁹

Table 3.2a: LDT Draft Budget forecasts for 2018/19 to 2022/23 (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Landfill Disposals Tax forecast	44	40	36	34	32

Table 3.2b: LDT Final Budget forecasts for 2018/19 to 2022/23 (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Landfill Disposals Tax forecast	47	43	39	37	35

In overall terms LDT revenues are forecast to decrease from £47 million in 2018/19 to £35 million in 2022/23, a decrease of 26 per cent over the period. The fall in the revenue generated by standard rate waste is the main driver of the decrease, which is forecasted to fall from around 464,000 tonnes in 2018/19 to 294,000 tonnes in 2022/23. This decrease in standard rate waste is driven by Welsh Local Authorities' strategies to reduce the amount of waste sent to landfill¹⁰.

Bangor Business School have previously published;

- a) An October Final Report (published in October 2017) that sets out the methodologies and assumptions relating to the Welsh Government's forecasts for devolved taxes which underpinned the Welsh Government Draft Budget 2018/19 with the provisional tax rates, and
- b) An Update Statement to the October Final Report (published in December 2017), that takes into account new macro-economic forecasts and updates done to the methodologies by the

⁹ These forecasts are not on the same basis as those produced by the OBR as they do not make an adjustment for the landfill communities' scheme, as the scheme does not operate as a tax credit in Wales.

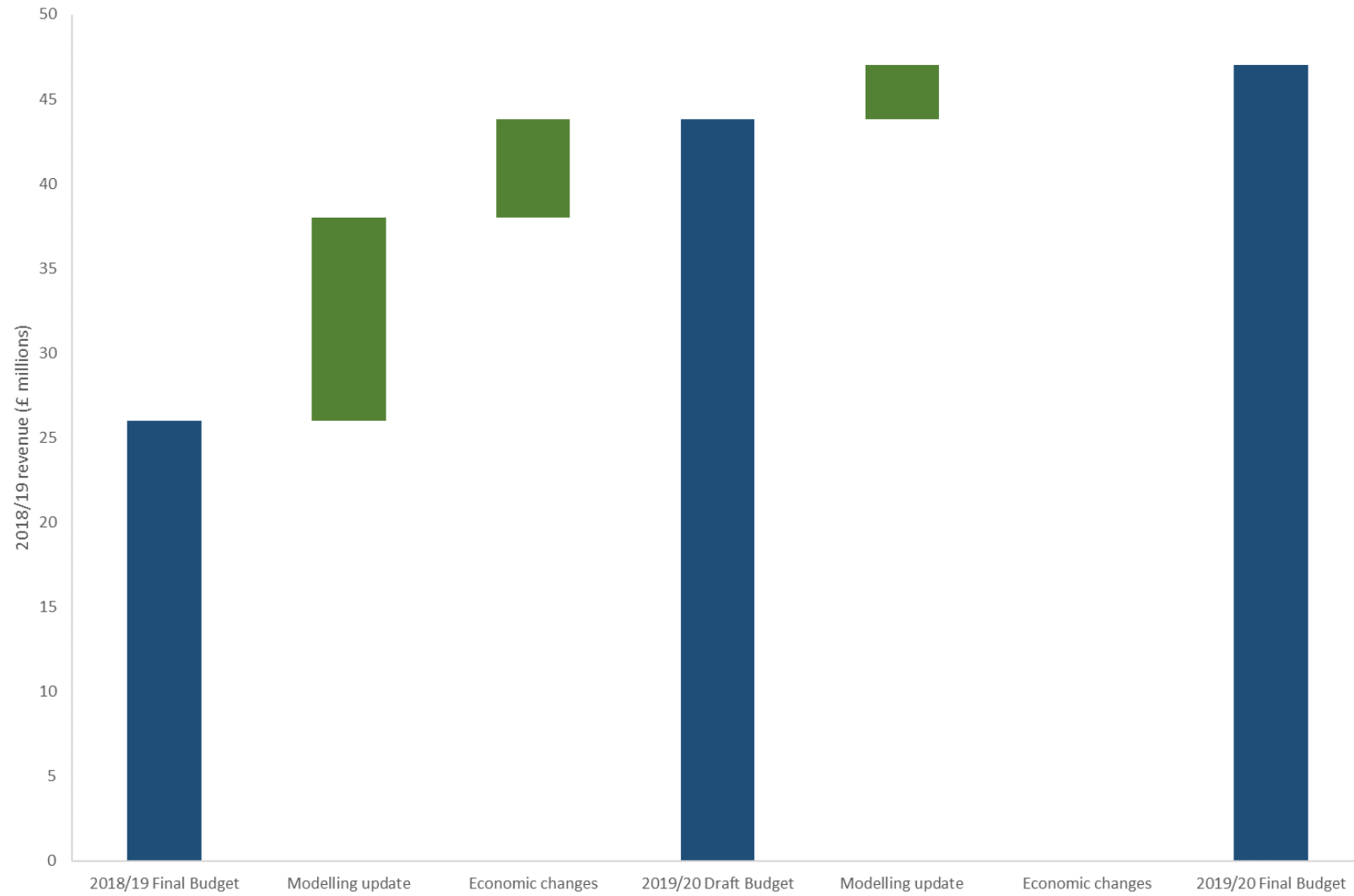
¹⁰ Standard waste from Local Authorities sent to landfill is forecasted to decrease by 43 per cent between 2018/19 and 2022/23, while non-Local Authorities standard waste is forecasted to decrease by only 34 per cent.

Welsh Treasury following the October Final Report,

- c) An October Final Report (published in October 2018) that sets out the methodologies and assumptions relating to the Welsh Government's forecasts for devolved taxes which underpinned the Welsh Government Final Budget 2019/20 with the provisional tax rates.

The above reports have included a forecast for LDT. Figure 3.1 compares the different LDT forecasts from each of the reports.

Figure 3.1 – Evolution of revenue forecasts for 2019/20 only (£ millions)



Update on previous recommendations

Recommendation 3

It is recommended that the forecasts incorporate some of the potential tax revenue from unauthorised disposals and determine how landfill waste volume will respond to an increase or decrease in the number of illegal waste sites.

In progress – The Welsh Government obtained information on HMRC’s method for costing a similar measure, which potentially provides a framework for producing estimates of revenue from unauthorised disposals as a longer term development. However, this will need to be combined with any changes made once the WRA’s compliance approach to unauthorised disposals is agreed

Recommendation 4

Work should be done to link waste from sources other than local authorities to economic determinants, in order to provide estimates of what this will be in the future.

Completed – From autumn 2017 OBR and HMRC stopped using economic activity as a determinant for landfill tax revenues. They concluded that the short-term impact of economic factors on landfilled waste is small in comparison to the shift away from landfill to other waste management sources. Economic activity is more relevant to waste arising rather than the amount of waste that is landfilled. Having investigated this, the Welsh Government have decided not to link waste from other sources to economic determinants. It will continue to review the best method for projecting waste from this sector.

Recommendation 5

It is recommended that in-year data is used to monitor tax revenues and to inform forecasts, once Landfill Disposals Tax becomes operational.

In progress – First quarter’s outturn for April to June published in August 2018 and second quarter in November. This information has been taken into account in the forecast.

Recommendation 6

Close links with local authorities should be further developed and maintained in order to capture and leverage information on future waste management plans which could affect tax revenues.

Completed – The Welsh Government are continuing to use NRW data from local authorities and meet regularly with the Welsh Government waste policy team to ensure it is aware of developments in local authority waste management. Follow up with individual local authorities where necessary.

Methodology

A key challenge to forecasting landfill revenue is that the Welsh historical share of landfill tax receipts is not available. The LDT forecast is produced by using a model based on the estimated standard rate waste and lower rate waste to be sent to Welsh landfill sites in the future. The forecasts are based on the bottom-up methodology to utilise all available information. As there is no information available on historical landfill tax revenues in Wales, information from Natural Resources Wales (NRW) and Welsh local authorities has been drawn on to produce a base year of the waste received by landfill sites in Wales during the 2016/17 period.

All the waste information from NRW is categorised according to European Waste Catalogue (EWC) codes, which are used to determine if the waste is standard or lower rate waste. This method has been developed (and enhanced for this forecast) by the Welsh Treasury as there is no information available on the split in standard and lower rate waste in Wales under LfT; therefore Bangor University suggested carrying out further work to assess the method's suitability. Following this work, the method was considered to be suitable.

Standard rate waste

The model divides standard rate waste into waste coming from Welsh local authorities and waste from other sources. The model assumes that all waste coming from Welsh Local Authorities is standard rate waste. 148,000 tonnes of standard waste is reported to have come from Welsh Local Authorities in 2016/17 with the remaining 425,000 coming from either the Welsh private sector or outside of Wales.

The first quarter of LDT data from WRA suggests a higher proportion of waste is standard rate than assumed in the model. The reasons for this are not yet known. It may be that the WRA compliance regime is affecting the split between standard and lower rate waste. It is also possible that the split of NRW data between standard and lower rate waste using EWC codes is generating some inaccuracy. The overall level of LDT revenues has been increased as a result of the outturn information from WRA.

Welsh Local Authorities also provide information on their waste management strategy and how the amount sent to landfill sites will be reduced (e.g. through the export or incineration of waste) over the forecasted years. The ability of Local Authorities to achieve future targets on landfilling will depend, in part, on the development of new incineration capacity in Wales, which is built into the

model. If no waste management strategy is provided by the Local Authority, it is assumed that their landfilled waste reduces in-line with their trend over the previous three years.

The Welsh Treasury is in contact with National and Local Governments to assess the risk that there is a delay to new incineration capacity coming online. Such risks have been incorporated into the model.

Standard rate waste not from Welsh Local Authorities is assumed to decline by 10% per annum over the forecast period, in line with the UK trend for waste disposed of at landfill.

Lower rate and exempt waste

The amount of lower rate waste has grown by 0.2 percent per annum between 2013/14 and 2016/17. However, the model caps the change at 0.0 percent, which is a reasonable assumption given the long run downward trend in lower rate waste in Wales.

Some landfill sites in Wales do not pay landfill disposals tax as they qualify for exemptions. All waste disposed of at these sites is classed as exempt waste in the model. Some waste which is disposed of at other sites is also likely to be exempt from tax, but it is not possible to identify this waste using the available data sources. As exempt waste can only be made up of lower rate material, the impact of this on the forecast is likely to be small.

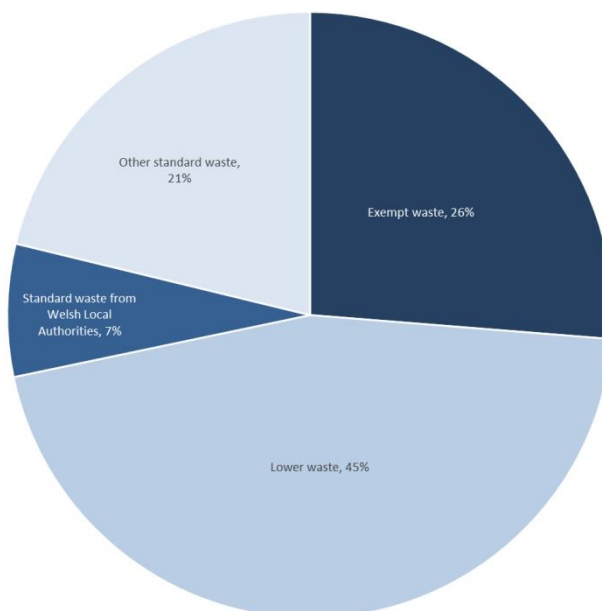


Figure 3.1 – Estimated breakdown of 2016/17 waste sent to Welsh landfill sites

There was a difference between the waste sent to Welsh landfill sites in 2015/16 and 2016/17. Exempt material waste increased from 328,000 tonnes (20%) in 2015/16 to 531,000 tonnes (26%), while standard waste declined from 631,000 tonnes (38%) in 2015/16 to 573,000 tonnes (29%). There was little change in the amount of lower waste and other standard waste sent to Welsh landfill sites.

Figure 3.2 shows forecasted trends for the standard rate waste (Welsh Local Authorities and non-Welsh Local Authorities) and lower rate waste. The fall in total standard waste is driven by a fall in the standard waste coming from Welsh Local Authorities.

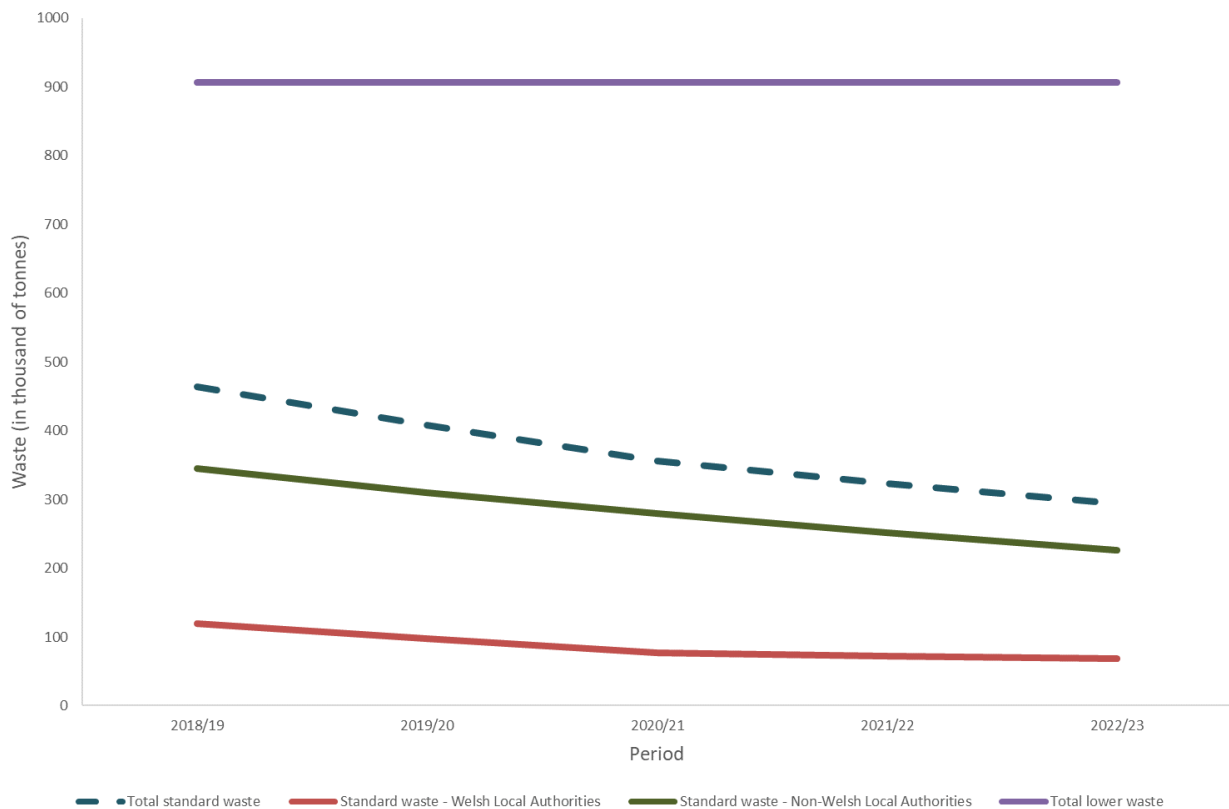


Figure 3.2 - Forecasted estimates for standard rate waste and lower rate waste

Unauthorised disposals

The model has the capacity to include potential revenue from unauthorised disposals but does not currently do so as there is very limited evidence on which to base a forecast. The WRA are currently developing their strategic approach to managing unauthorised disposals. While there is currently

not enough information available to form a judgement on unauthorised disposals this will be reviewed once the WRA strategy has been agreed and the model will be updated accordingly.

Tax revenues

Unlike in the Draft Budget 2018/19, the OBR landfill tax forecast is not used in the LDT forecast. The LDT forecast incorporates outturn adjustments to take account of the first two quarter's revenue data from WRA. The provisional data for 2017/18 from NRW suggests a higher level of landfilling in 2017/18, and is expected to persist into the first half of 2018/19 before returning to previously expected rates by 2019/20.

Tax revenues for 2018/19 and 2019/20 are calculated by applying the tax rates stated in Table 3.1 to the forecasted standard rate waste and lower rate waste amount. The tax rates in Table 3.1 are adjusted for future years based on the RPI forecasted in Table 2.1 to calculate tax revenues in subsequent years.

Table 3.3 – Final forecasted revenues (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Landfill Disposals Tax forecast	47	43	39	37	35
<i>Final Budget 2018/19</i>	26	24	21	20	N/a

Sensitivity Testing

The sensitivity of the LDT model is analysed by assuming no change from 2016/17 waste sent by Welsh Local Authorities to landfill sites and by varying the RPI input. The results of this sensitivity analysis is shown in Tables 3.4.

Table 3.4a – Forecasted revenues (£ millions) if there is no change from 2016/17 waste sent by Welsh Local Authorities to landfill sites

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Forecasted revenues	50	48	46	45	43
<i>Original revenues</i>	47	43	39	37	35

Table 3.4b – 1.5 percentage point increase in UK RPI (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
RPI	4.9%	4.5%	4.6%	4.6%	4.6%
Forecasted revenues	47	43	39	37	36
<i>Original revenues</i>	47	43	39	37	35

Table 3.4c – 1.5 percentage point decrease in UK RPI (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
RPI	1.9%	1.5%	1.6%	1.6%	1.6%
Forecasted revenues	47	43	39	36	34
<i>Original revenues</i>	47	43	39	37	35

In addition, the sensitivity of the forecasts to changes in the assumed annual changes in non-Welsh Local Authority waste was tested (this is currently assumed to be -10% in the model). An increase (or decrease) of 50% in this assumption would have less than +/- 17% impact on the total forecasted revenues raised between 2018/19 and 2022/23.

Back-testing

There is limited opportunity to back-test the LDT model as there is no information on historical tax revenues from landfill tax in Wales.

A major driver of LDT revenue forecast is the amount of waste sent by Welsh Local Authorities to landfill sites as it is assumed to be standard rated. The waste management plans of Welsh Local Authorities however are known by the Welsh Government, which limits the benefit of back-testing of the model.

Bangor Business School view on the forecast

Based on the information provided by the Welsh Treasury, Bangor Business School views the methodology described in Section 3 as an appropriate approach for forecasting Welsh LDT revenues. This decision is based on the discussion with academics and practitioners on the theoretical assumptions of the models, including information used, analytical analysis of the models, and the variation in revenue forecast for different scenarios.

All of the models used by the Welsh Treasury to produce this forecast have been independently reproduced by Bangor Business School as part of the validation process. The final LDT forecast is set out in Table 3.2.

Recommendation N2

The Welsh Treasury to continue working closely with the WRA to incorporate relevant information into the forecasting process where possible.

Recommendation N3

The Welsh Treasury to establish a monitoring process to assess the performance and continued suitability of the model for forecasting revenues. This to include a method of back-testing the models based on information from the WRA when sufficient data becomes available.

SECTION 4 – LAND TRANSACTION TAX

Introduction

The Land Transaction Tax (LTT) was introduced as a fully devolved tax in Wales from 1 April 2018, replacing Stamp Duty Land Tax (SDLT) in Wales. Like SDLT, LTT is a tax applied to residential and commercial land and buildings transactions (including commercial purchases and commercial leases) where a chargeable interest is acquired. Different rates and thresholds apply for the four different segments; residential main rates, additional residential property, non-residential main rates and non-residential lease rents. The LTT rates and thresholds are set out below in Table 4.1.

Table 4.1a: LTT rates and bands for residential transactions

Purchase price/lease premium or transfer value	LTT rate	Additional property rate
Up to £180,000	Zero	3.0%
Above £180,000 to £250,000	3.5%	6.5%
Above £250,000 to £400,000	5.0%	8.0%
Above £400,000 to £750,000	7.5%	10.5%
Above £750,000 to £1,500,000	10.0%	13.0%
Above £1,500,000	12.0%	15.0%

Table 4.1b: LTT rates and bands for non-residential property transactions

Price/value	LTT rate	Net present value of rent	LTT rate
Up to £150,000	Zero	Up to £150,000	Zero
Above £150,000 to £250,000	1.0%	Above £150,000 to £2,000,000	1.0%
Above £250,000 to £1,000,000	5.0%	Above £2,000,000	2.0%
Above £1,000,000	6.0%		

LTT revenue forecast

SDLT no longer applies in Wales with LTT having replaced it from 2018/19 onwards. The LTT revenue forecasts for 2018/19 to 2022/23 by the Welsh Treasury as contained in the Welsh Government's Final Budget 2019/20 are set out below in Table 4.2.

Table 4.2a: Five year Draft Budget LTT forecasts for 2018/19 to 2022/23 (£ millions)

Period		2018/19	2019/20	2020/21	2021/22	2022/23
Residential	Main rates	91	105	115	127	143
	Additional	63	62	60	63	67
	Total	154	167	175	190	209
Non-residential	Total	85	91	94	96	100
Total		240	258	269	287	309

Table 4.2b: Five year Final Budget LTT forecasts for 2018/19 to 2022/23 (£ millions)

Period		2018/19	2019/20	2020/21	2021/22	2022/23
Residential	Main rates	97	112	125	140	159
	Additional	65	65	64	68	72
	Total	162	176	189	208	231
Non-residential	Total	77	80	81	84	87
Total		239	256	270	292	318

In overall terms, LTT revenues are forecast to rise from £239 million in 2018/19 to £318 million in 2022/23, an increase of 33 per cent, based on the economic scenario described in Section 2. The revenue generated by the residential main rates is the principal driver of this increase, which is forecasted to increase from £97 million in 2018/19 to £159 million in 2022/23. Revenues from residential main rates accounts for 40 per cent of total LTT revenue in 2018/19. This is forecast to increase to 52 per cent by 2022/23. The positive residential price growth over the forecasted period

is the main driver of the increase in revenue.

Bangor Business School have previously published;

- a) An October Report (published in October 2017) that sets out the methodologies and assumptions relating to the Welsh Government’s forecasts for devolved taxes which underpinned the Welsh Government Draft Budget 2018/19 with the provisional tax rates, and
- b) An Update Statement to the October Final Report (published in December 2017), that takes into account the final LTT tax rates and new macro-economic forecasts and updates done to the methodologies by the Welsh Treasury following the October Report,
- c) An October Final Report (published in October 2018) that sets out the methodologies and assumptions relating to the Welsh Government’s forecasts for devolved taxes which underpinned the Welsh Government Final Budget 2019/20 with the provisional tax rates.

Both of the above reports have included a forecast for LTT. Figure 4.1 compares the different LTT forecasts from each of the reports.

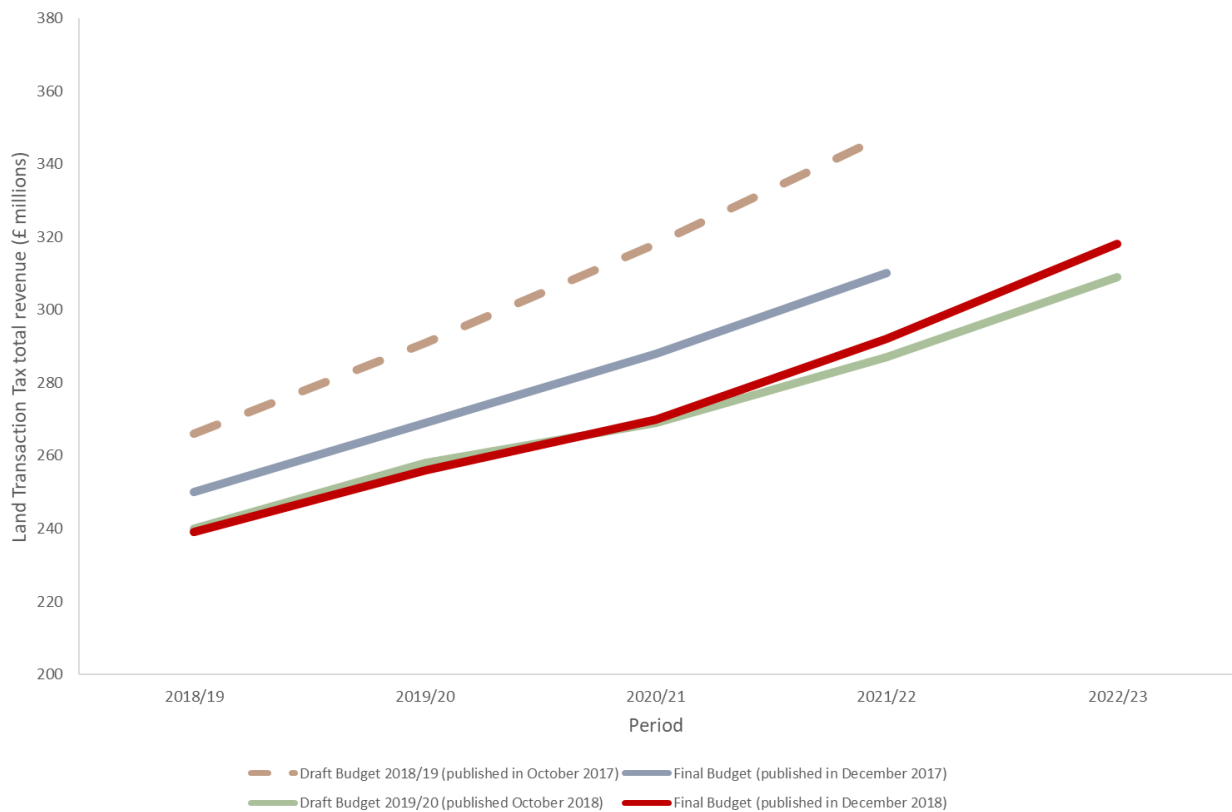


Figure 4.1 – LTT revenue forecasts

The forecast for the Final Budget 2019/20 follows a similar future path to that included in the Draft Budget 2019/20.

The changes in the forecasts reflect both changes to the economic environment and updates to the forecasting models. Noticeable updates to the methodology include;

- Updated base year SDLT Wales transaction data to 2017.
- Following extensive discussion, the models continue to attach the forecast to estimates for the 2017/18 outturn.
- There is a change in the treatment of refunds from accruals to cash (in the additional residential property model). This is to ensure consistency with relevant peers and best practice.

Changes to the forecasted economic environment are described in Section 2. Table 4.3 outlines the progress made with recommendations given by Bangor Business School in the October Final Report. These changes to the forecasting methodology are done to improve the accuracy of the forecasting process.

The evolution of the tax revenue forecasted from land transaction tax models can be seen in Figure 4.2. The above points are included in the 'Modelling update' category.

Figure 4.2a - Evolution of total tax revenue forecasted from residential main rates model

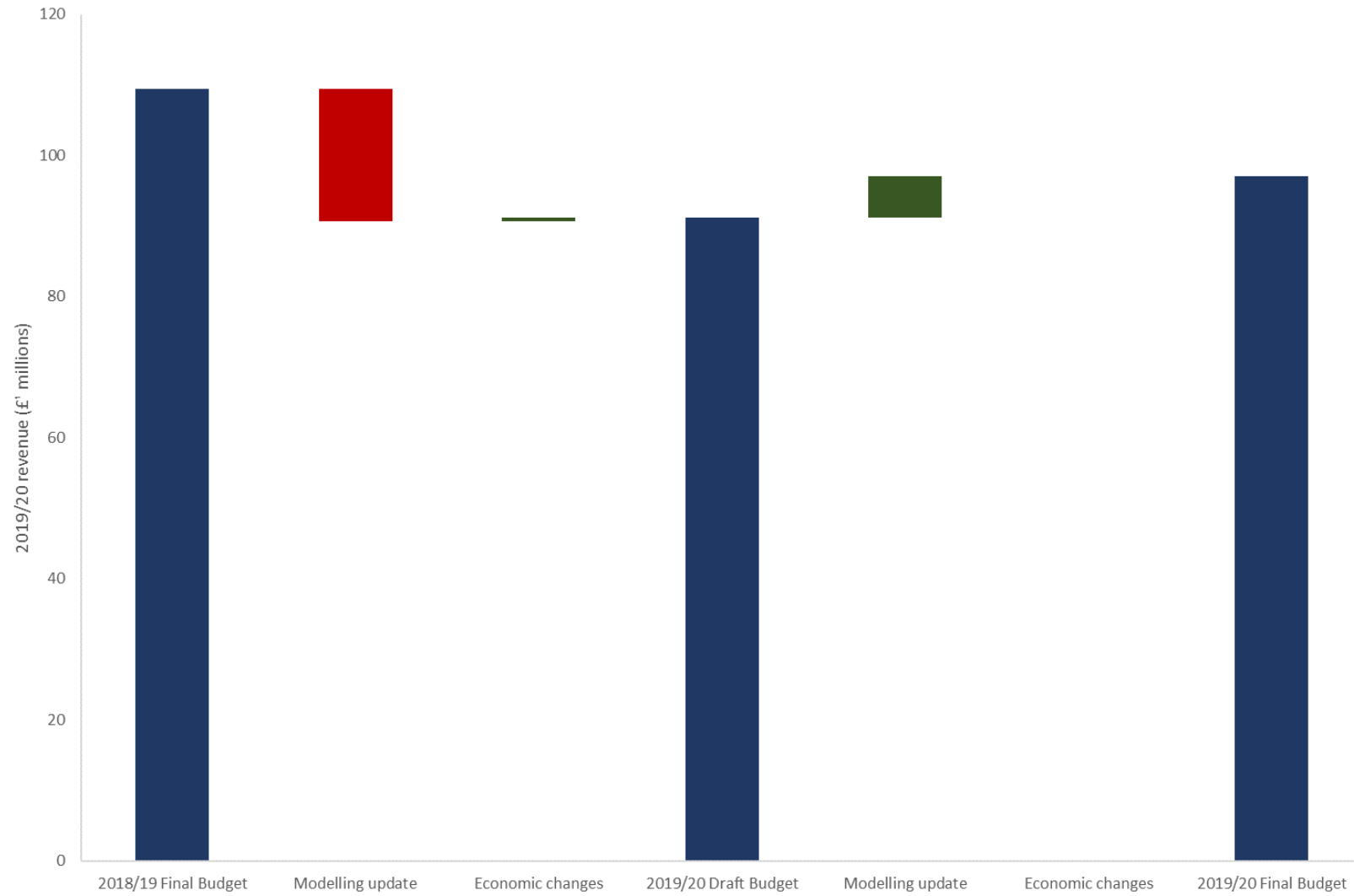


Figure 4.2b - Evolution of total tax revenue forecasted from additional residential property model

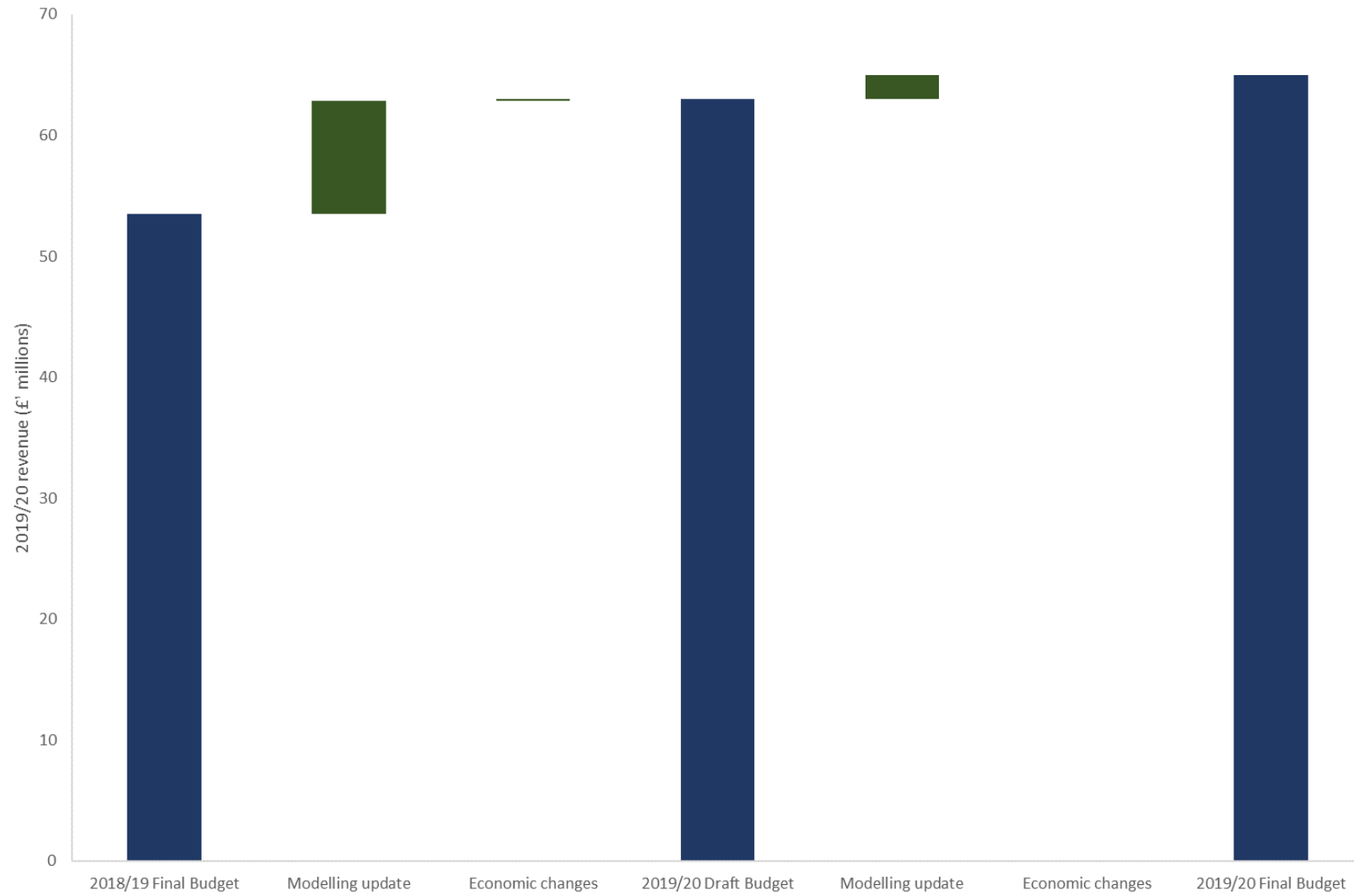
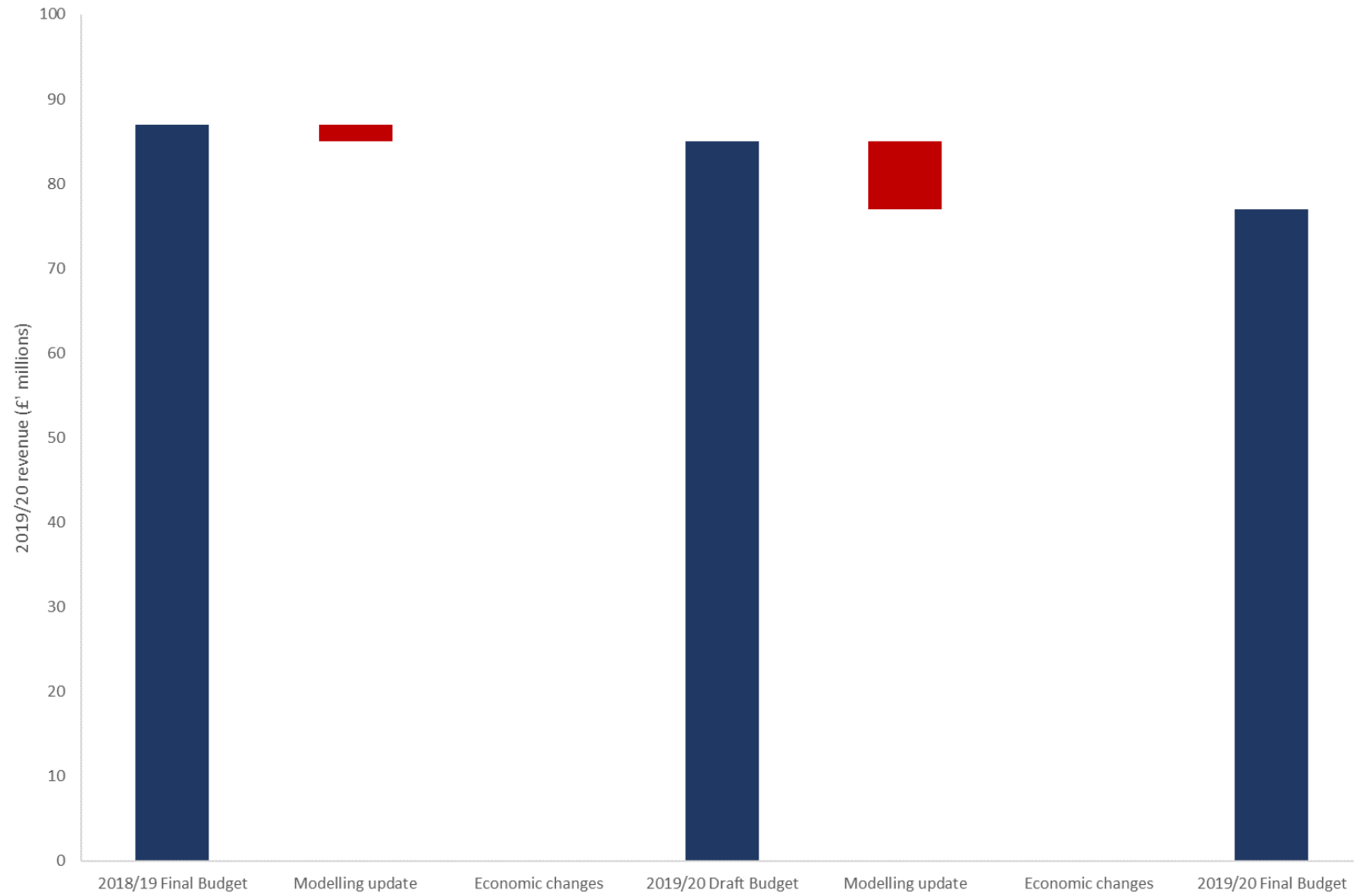


Figure 4.2c - Evolution of total tax revenue forecasted from non-residential



Update on previous recommendations

Recommendation 7

The model used to forecast additional residential property revenue will require further refinement once more relevant information is available on transactions subject to this rate and on those which are refunded.

Completed – An improved model was implemented for the 2018/19 final Budget based on detailed outturn data on additional residential properties in Wales which was made available by HMRC after the draft Budget forecast. The modelling approach is consistent with the main rates of residential LTT.

Recommendation 8

It is recommended that Welsh specific elasticities should be calculated when suitable data becomes available.

In progress – The elasticities for residential LTT were updated for the final Budget, in line with the updated UK elasticities used by the Office for Budget Responsibility. These latest elasticities are primarily based on UK data, which include transactions in Wales. The change in tax rates in Wales between SDLT and LTT provides an opportunity to analyse the effects of tax rate changes in Wales and potentially estimate Welsh specific elasticities. This will be explored following the availability of suitable LTT data.

Methodology

The Welsh Government's LTT forecast is produced by using four separate models; main residential model, additional residential property rates model, non-residential main rates model, and a non-residential leasehold rent model.

Main rates residential model

The main residential model uses a bottom-up methodology to forecast the revenues generated from this segment of LTT. A bottom-up methodology is used to utilise all available information and ensure that the price distribution is captured by the model.

Information from HMRC's Datalab (administrative datasets) is used to produce a distribution from frequency price bins of the residential main rates transactions in Wales during the 2017 period. This distribution contains information on the number of taxable (excludes relieved and exempt) transactions, the total taxable value and the total amount of tax paid during the period. The data contains over 54,000 property transactions in Wales during 2017 with an average value of £169 thousands¹¹.

The price bins are selected to extract the maximum information from the price distributions while still maintaining its shape. This price distribution is analysed in terms of 5 thousand and 10 thousand bins. While the price bins become wider as the price increases this does not significantly affect the performance of the model¹².

The price distribution is used to produce a base year from which future revenues will be derived. Figures 4.3 shows the shape of the distribution in terms of number of transactions per bin and total property values per bin.

¹¹ Calculations based on HMRC administrative datasets, which may differ from the 2016/17 HMRC SDLT Statistics.

¹² The price bins change size towards the top-end of the distribution.

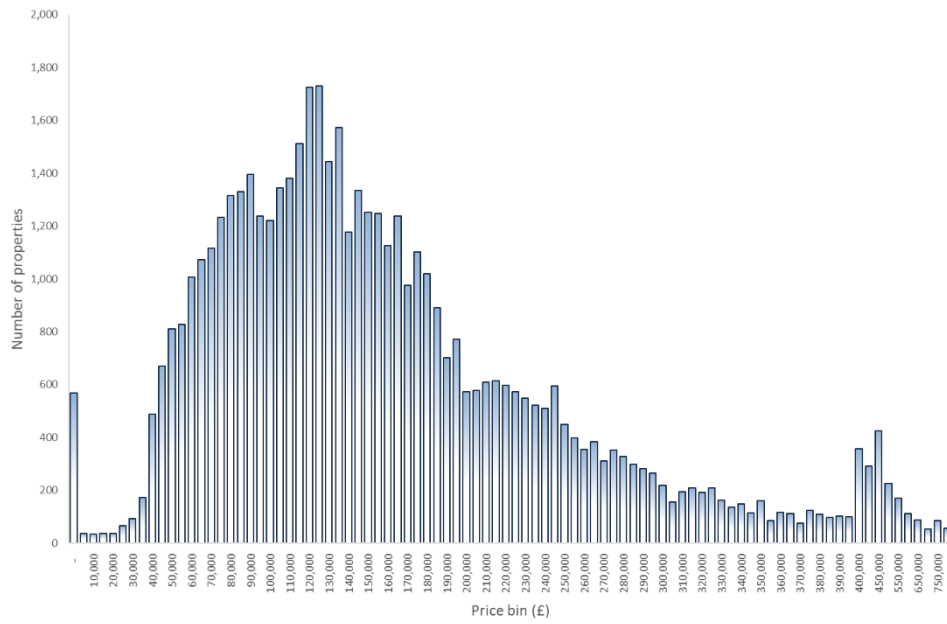


Figure 4.3a – Base year distribution (number of transactions per bin)

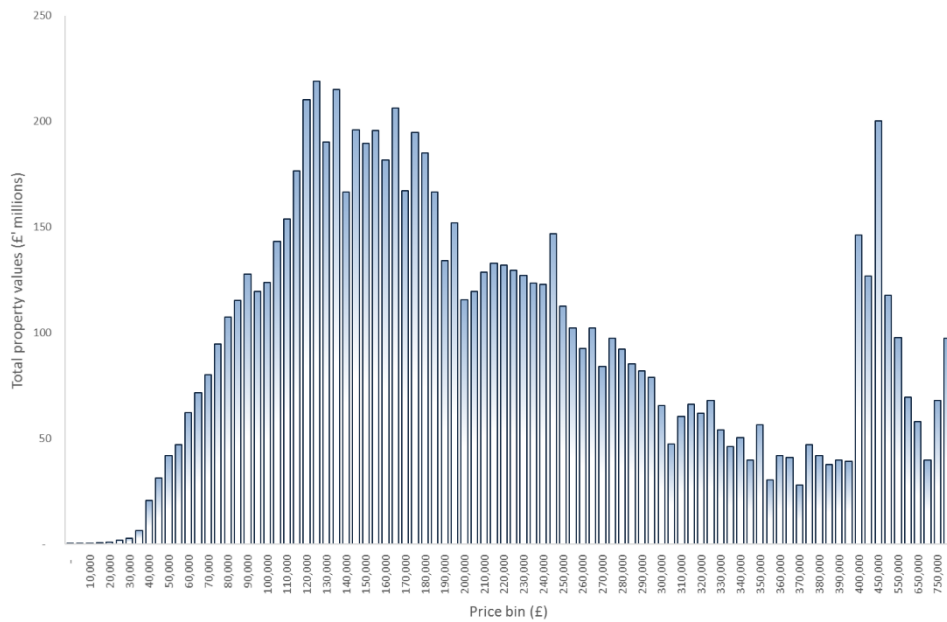


Figure 4.3b – Base year distribution (total property values per bin)

The distributions in Figure 4.3a and Figure 4.3b are adjusted to take account of forecasted residential property price growth and forecasted residential property transaction growth. The number of transactions per bin (Figure 4.3a) is adjusted to take account of future growth in transactions. Total property values per bin (Figure 4.3b) is adjusted to take account of future growth in transactions and growth in residential property prices.

The OBR's residential transactions and price growth forecast for the UK as a whole are used as inputs into the main residential model. Wales' residential transactions follow a similar trend to those in the UK. Correlation analysis is used to show the strength of this relationship using information from the Office for National Statistics (ONS)¹³. The correlation between UK and Wales' residential transactions growth is 0.98, which implies a strong relationship between both series¹⁴. The UK residential property market is likely to be heavily influenced by London's property market, which is likely to be influenced by global trends and not national economic fundamentals. Despite this, the correlation between UK and Wales' residential price growth is 0.98, which implies a strong relationship between both series¹⁵.

Bangor Business School requested the Welsh Treasury to consider economic determinants from alternative sources for this model. Given the strong positive relationship between the different series and the economic rationale, the OBR forecasts are considered suitable inputs into the main residential model. The OBR's forecasts are given in Table 4.4.

Table 4.4 – OBR UK residential transaction and price growth forecasts 2018/19 to 2022/23

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-1.7%	2.0%	2.8%	2.6%	2.8%
Price growth	3.1%	3.2%	3.1%	3.2%	3.6%

The 2017/18 residential transaction and price growth used in the model is estimated outturn data. Tax revenues are calculated by applying the tax rates stated in Table 4.1a to the forecasted transaction and value distributions. The model has the functionality to incorporate the impact of

¹³ Correlation is a measure of relationship strength between two series and can take any value between +1 and -1. A correlation of +1 indicates a perfect positive relationship between the two series while a correlation of -1 indicates a perfect negative relationship.

¹⁴ This correlation is calculated using annual house transaction growth on a quarterly basis in the UK and Wales between Q2 2006 and Q2 2017.

¹⁵ This correlation is calculated using annual house price growth on a quarterly basis in the UK and Wales between Q1 2006 and Q2 2017.

behavioural change through transaction elasticity, price elasticity, and forestalling activity. These three capture changes in behaviour due to changes in tax rates and bands.

The model has the functionality to incorporate the impact of behavioural change through transaction and price elasticities, and forestalling, which are applied at a granule level (i.e. bin level).

An adjustment is made to the revenue forecasts which is applied to all future years. The adjustment takes account of the difference between Wales' SDLT revenue for estimates of 2017/18 outturn and the calculated amount based on the methodology used for the LTT model for 2017/18. A judgment is made on any differences between the forecast and the outturn estimate for 2017/18 on how much of this adjustment should apply to future years.

The forecast benefits from taking into account in-year outturn data available from the Welsh Revenue Authority (WRA). This ensures the forecast is based on all suitable available information.

The sensitivity of the main residential model is analysed by varying the economic inputs (Table 4.4) of the model. These sensitivity analyses give an indication how revenue will vary if the economic scenario changes. The results of these sensitivity analyses are shown in Table 4.6.

Table 4.6a – 2.5 percentage point increase in UK residential transaction and price growth forecasts

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	0.8%	4.5%	5.3%	5.1%	5.3%
Price growth	5.6%	5.7%	5.6%	5.7%	6.1%
Forecasted revenues	106	134	164	200	246
<i>Original forecast</i>	<i>97</i>	<i>112</i>	<i>125</i>	<i>140</i>	<i>159</i>

Table 4.6b – 2.5 percentage point decrease in UK residential transaction and price growth forecasts

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-4.2%	-0.5%	0.3%	0.1%	0.3%
Price growth	0.6%	0.7%	0.6%	0.7%	1.1%
Forecasted revenues	88	93	94	96	100
<i>Original forecast</i>	<i>97</i>	<i>112</i>	<i>125</i>	<i>140</i>	<i>159</i>

Sensitivity analysis has also been performed for changes in the behavioural effects. Changes in the behavioural effects had little impact on the revenue forecast.

Additional residential property model

The additional residential property model uses a bottom-up methodology to forecast the revenues generated from this segment of LTT. A bottom-up methodology is used to utilise all available information and ensure that the price distribution is captured by the model.

Information from HMRC's Datalab (administrative datasets) is used to produce a distribution from frequency price bins of the additional residential property rates sold in Wales during the 2017 period. This distribution contains information on the number of taxable (excludes relieved and exempt) transactions, the total taxable value and the total amount of tax paid during the period. The data contains over 14,000 property transactions in Wales during 2017 with an average value of £154 thousands.¹⁶

The price bins are selected to extract the maximum information from the price distribution while still maintaining its shape. The price distribution is analysed in terms of 5 thousand and 10 thousand bins. While the price bins become wider as the price increases this does not significantly affect the performance of the model¹⁷.

The price distribution is used to produce a base year from which future revenues will be derived. Figure 4.4 shows the shape of the distribution in terms of number of transactions per bin and total property values per bin.

¹⁶ Calculations based on HMRC administrative datasets, which may differ from the 2016/17 HMRC SDLT Statistics.

¹⁷ The price bins change size towards the top-end of the distribution.

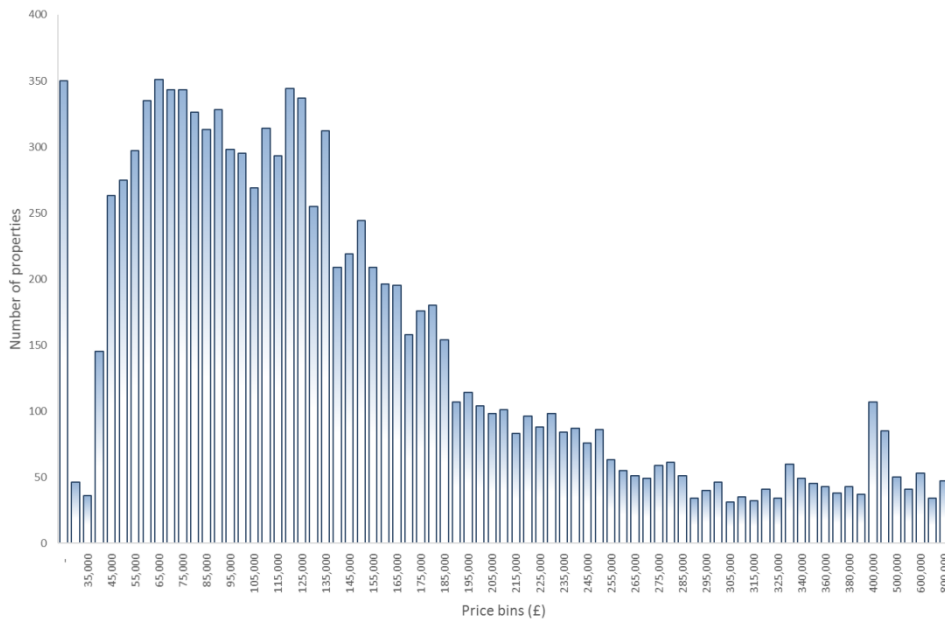


Figure 4.4a – Base year distribution (number of transactions per bin)

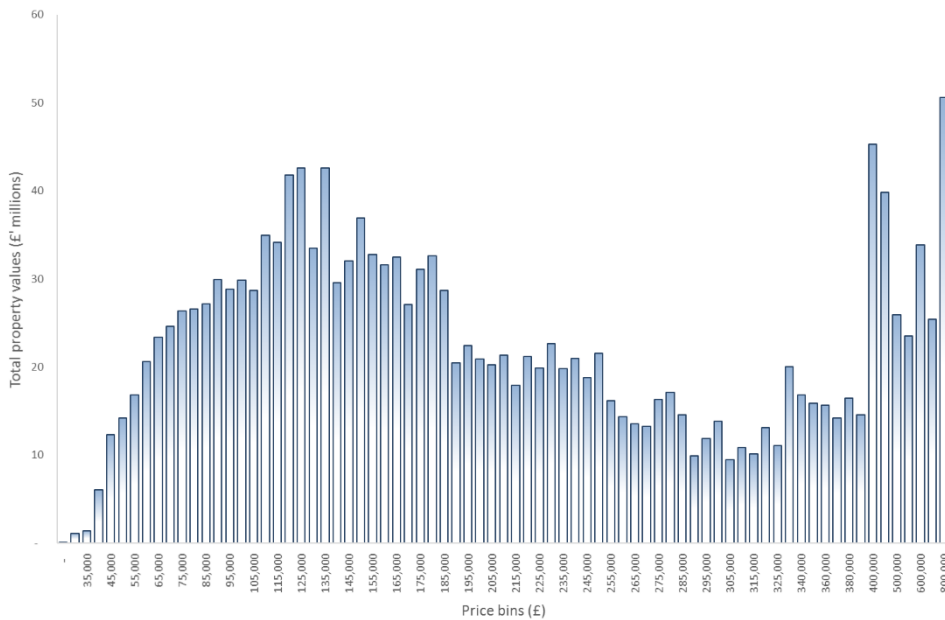


Figure 4.4b – Base year distribution (total property values per bin)

The distributions in Figure 4.4a and Figure 4.4b are adjusted to take account of forecasted additional residential property price growth and forecasted residential property transaction growth. The number of transactions per bin (Figure 4.4a) is adjusted to take account of future growth in transactions. Total property values per bin (Figure 4.4b) is adjusted to take account of future growth in transactions and growth in residential property prices.

The OBR's residential transactions and price growth forecast for the UK as a whole are used as inputs into the additional residential property model. Wales' residential transactions follow a similar trend to those in the UK, which implies a strong relationship between both series.

Bangor Business School requested the Welsh Treasury to consider economic determinants from alternative sources for this model. Given the strong positive relationship between the different series and the economic rationale, the OBR forecasts are considered suitable inputs into the additional residential property model. The OBR's forecasts are given in Table 4.7.

Table 4.7 – OBR UK residential transaction and price growth forecasts 2018/19 to 2022/23

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-1.7%	2.0%	2.8%	2.6%	2.8%
Price growth	3.1%	3.2%	3.1%	3.2%	3.6%

Tax revenues are calculated by applying the tax rates stated in Table 4.1a to the forecasted transaction and value distributions. The model has the functionality to incorporate the impact of behavioural change through transaction elasticity, price elasticity, and forestalling activity. These three capture changes in behaviour due to changes in tax rates and bands.

An adjustment is made to the revenue forecast which is applied to all future years. A level adjustment is made to take account of the difference to estimated Wales' SDLT outturn revenue for 2017/18.

The final part of the model takes into account assumptions regarding the refund rate (8 per cent of revenues in year 1, 6 per cent in year 2 and 3) applied to all forecasted years.

The sensitivity of the additional residential property model is analysed by varying the economic inputs (Table 4.7) of the model. These sensitivity analyses give an indication how revenue will vary if the economic scenario changes. The results of these sensitivity analyses are shown in Table 4.9.

Table 4.9a – 2.5 percentage point increase in UK residential transaction and price growth forecasts

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	0.8%	4.5%	5.3%	5.1%	5.3%
Price growth	5.6%	5.7%	5.6%	5.7%	6.1%
Forecasted revenues	69	71	75	82	92
<i>Original forecast</i>	65	65	64	68	72

Table 4.9b – 2.5 percentage point decrease in UK residential transaction and price growth forecasts

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-4.2%	-0.5%	0.3%	0.1%	0.3%
Price growth	0.6%	0.7%	0.6%	0.7%	1.1%
Forecasted revenues	62	59	55	56	56
<i>Original forecast</i>	65	65	64	68	72

Sensitivity analysis has also been performed for changes in the behavioural effects. Changes in the behavioural effects had little impact on the revenue forecast.

Non-residential main rates model

The non-residential main rates model uses a bottom-up methodology to forecast the revenues generated from this segment of LTT. A bottom-up methodology is used to ensure that the price distribution is captured by the model.

Information from HMRC's Datalab (administrative datasets) is used to produce frequency price bins of the price distribution based on the non-residential properties relevant for the main non-residential rates sold in Wales during the 2017 period. This distribution contains information on over 4,300 transactions (excluding exempt and relieved), the total taxable value and the total amount of tax paid during the period, with an average value of over £514 thousand¹⁸.

The price bins are selected to extract the maximum information from the price distributions while still maintaining its shape. This price distribution is analysed in terms of 25 thousand, 50 thousand,

¹⁸ Calculations based on HMRC administrative datasets, which may differ from the 2016/17 HMRC SDLT Statistics.

and 100 thousand, with larger ones to capture the very top end of the distribution. While the price bins become wider as the price increases this does not significantly affect the shape of the distribution. The price distribution is used to produce a base year from which future revenues will be derived. Figures 4.5 shows the shape of the distribution in terms of number of transactions, total property values per bin, and the amount of tax revenue¹⁹.

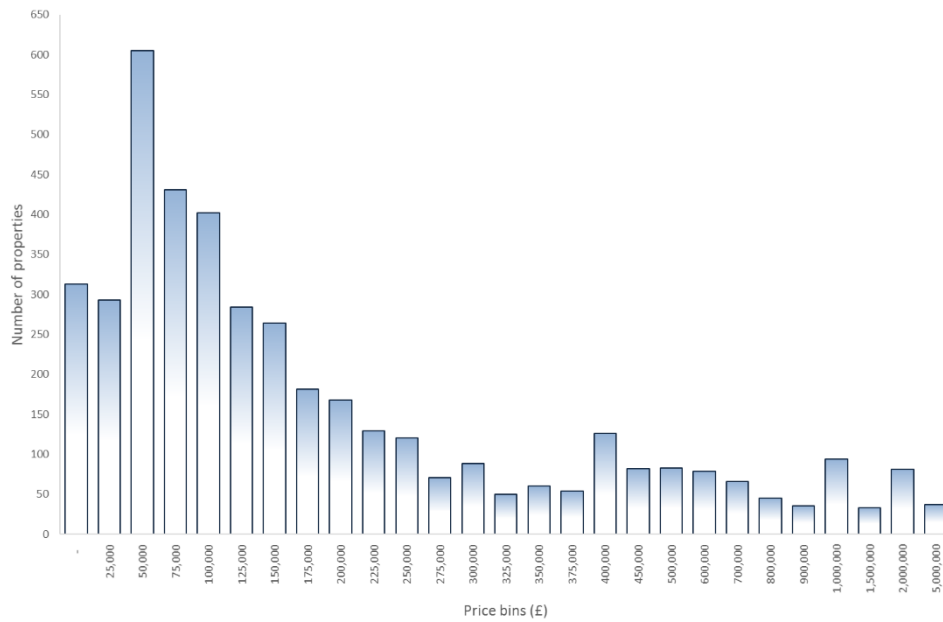


Figure 4.5a – Base year distribution (number of transactions per bin)

¹⁹ The price bins change size towards the top-end of the distribution.

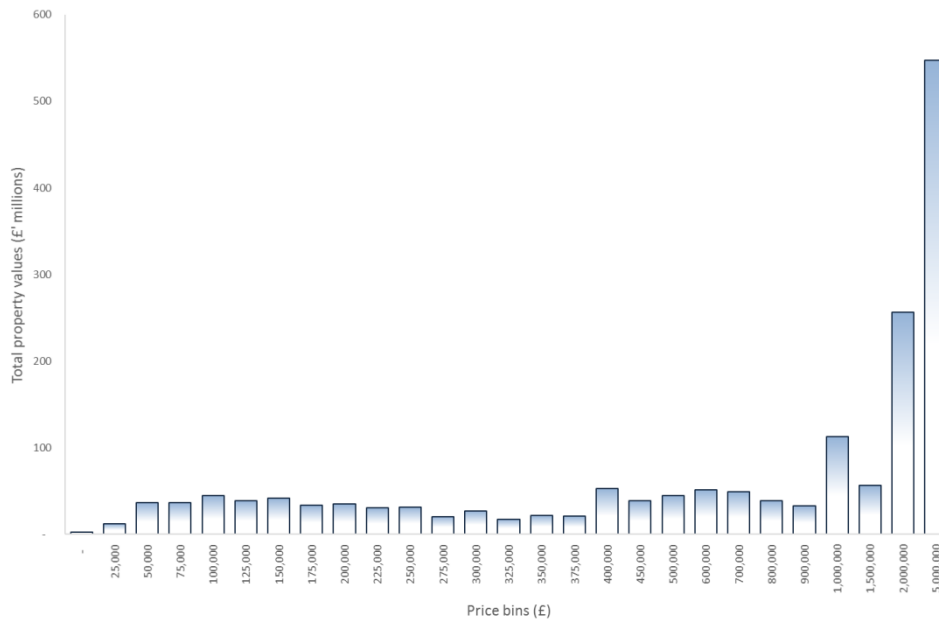


Figure 4.5b – Base year distribution (total property values per bin)

The distributions in Figure 4.5a and Figure 4.5b are adjusted to take account of forecasted non-residential property price growth and forecasted non-residential property transaction growth. The number of transactions per bin (Figure 4.5a) is adjusted to take account of future growth in transactions. Total property values per bin (Figure 4.5b) is adjusted to take account of future growth in transactions and growth in non-residential property prices.

The OBR’s non-residential main rates transactions and price growth forecast for the UK as a whole are used as inputs into the non-residential main rates model. The 2017/18 transaction and price growth are adjusted to be based on estimated Wales SDLT outturn data. Wales’ non-residential main rates transactions follow a similar trend to those in the UK. The correlation between UK and Wales’ commercial transaction growth is 0.94, which implies a very strong relationship between both series²⁰. No non-residential price time series is available for Wales and therefore no correlation measure can be calculated. Further economic determinants from alternative sources were considered, as suggested by Bangor Business School. However, there are limited sources for these, at least at a Wales level. In the absence of a macroeconomic model for Wales and given the economic rationale, the OBR forecasts are suitable inputs into the non-residential main rates model. The OBR’s forecasts are given in Table 4.10.

²⁰ This correlation is calculated using annual commercial transaction growth on a quarterly basis in the UK and Wales between Q1 2006 and Q2 2017.

Table 4.10 – OBR UK non-residential transaction and price growth forecasts 2018/19 to 2022/23

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-4.1%	1.0%	1.5%	1.6%	1.6%
Price growth	3.0%	-1.4%	-0.7%	1.8%	1.8%

Tax revenues are calculated by applying the tax rates stated in Table 4.1b to the forecasted transaction and value distributions. The model has the functionality to incorporate the impact of behavioural change through transaction elasticity and price elasticity measures. These capture changes in behaviour due to changes in tax rates and bands.

An adjustment is made to the revenue forecast which is applied to all future years, like with the residential forecast. A level adjustment is made to take account of the difference between estimated Wales' SDLT outturn revenue for 2017/18.

The sensitivity of the non-residential main rates and lease rent models are analysed together as they use the same determinants and the relative size of the lease rent revenue is small.

Non-residential leasehold rent model

The non-residential leasehold rent model uses a bottom-up methodology to forecast the revenues generated from this segment of LTT. A bottom-up methodology is used to ensure that the price distribution is captured by the model.

Information from HMRC's Datalab (administrative datasets) is used to produce frequency price bins of the price distribution based on the non-residential leasehold properties traded in Wales during 2017. This distribution contains information on nearly 1,800 taxable transactions (excludes exempt and relieved), the total taxable value and the total amount of tax paid during the period. The average value of leases in the model was a net present value of around £447 thousand²¹.

The price bins are selected to extract the maximum information from the price distributions while still maintaining its shape. Appropriate bin widths are selected to analyse this price distribution²².

²¹ Calculations based on HMRC administrative datasets, which may differ from published HMRC SDLT Statistics.

²² The price bins change size towards the top-end of the distribution.

The price distribution is used to produce a base year from which future revenues will be derived. Figures 4.6 shows the shape of the distribution in terms of number of transactions, total property values per bin, and the amount of tax revenue.

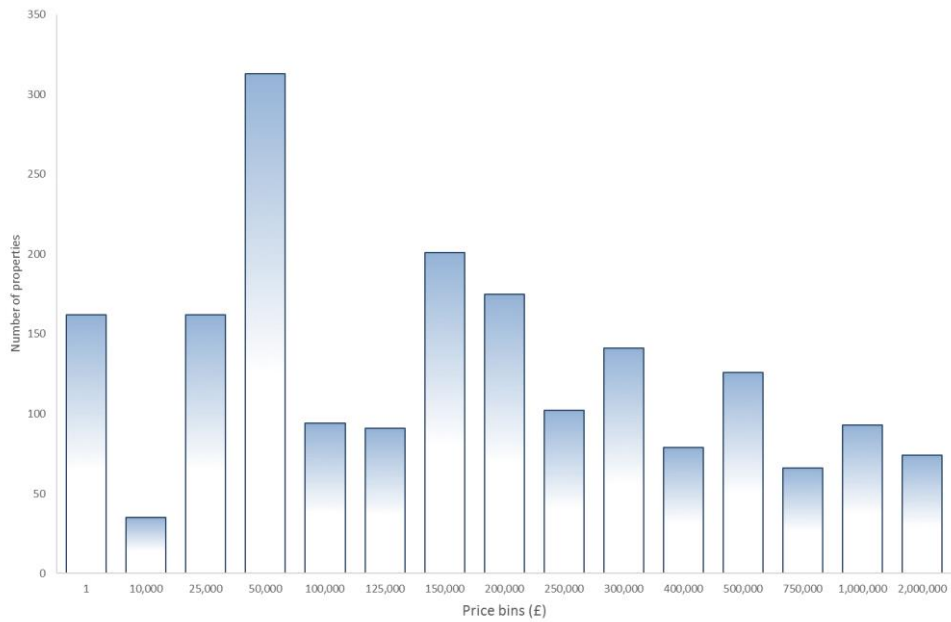


Figure 4.6a – Base year distribution (number of transactions per bin)

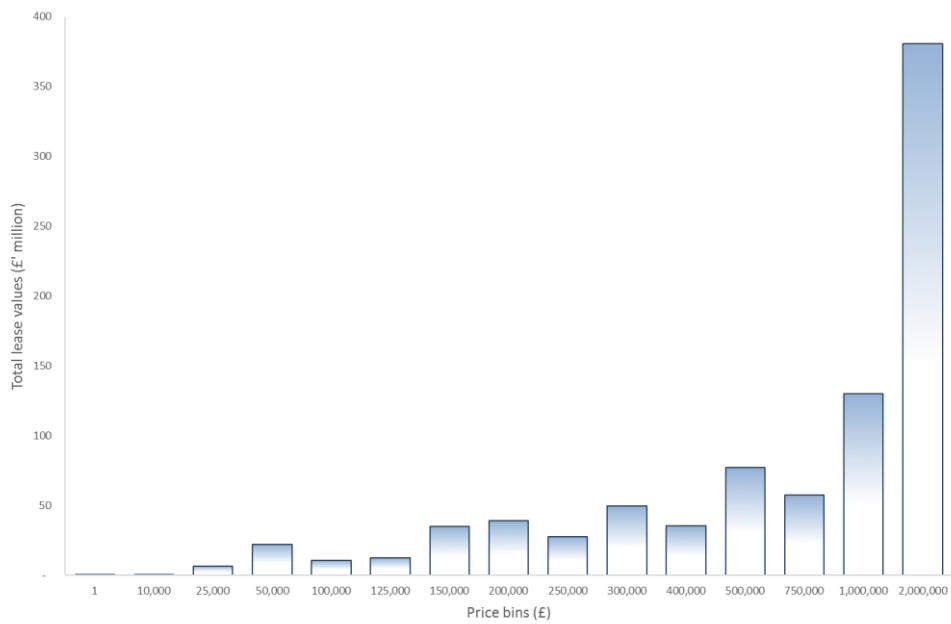


Figure 4.6b – Base year distribution (total lease values per bin)

The distributions in Figure 4.6a and Figure 4.6b are adjusted to take account of forecasted price and transactions growth, which are the main drivers of changes in leases. The net present value of leases per bin is adjusted by the OBR's forecast of commercial price growth. The number of transactions per bin (Figure 4.6a) is adjusted by the OBR's forecast of commercial transaction growth. Total lease net present value per bin (Figure 4.6b) is adjusted to take account of increased transaction activity and price growth.

The OBR forecasts are suitable inputs into the non-residential main rates model.

Tax revenues are calculated by applying the tax rates stated in Table 4.1b to the forecasted transaction and value distributions. The model has the functionality to incorporate the impact of behavioural change through transaction elasticity and price elasticity measures. No forestalling effects are applied to these forecasts as the revenues are relatively low and the forestalling estimate for non-residential main rates is more of a judgement at this stage.

The sensitivity of the non-residential main rates and lease rent models are analysed together as they use the same determinants and the relative size of the lease rent revenue is small. The sensitivity is undertaken by varying the economic inputs (Table 4.10). These sensitivity analyses give an indication how revenue will vary if the economic scenario changes or behaviour is different to that anticipated. The results of these sensitivity analyses are shown in Table 4.14.

Table 4.14a – 2.5 percentage point increase in UK non-residential transaction and price growth forecasts

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-1.6%	3.5%	4.0%	4.1%	4.1%
Price growth	5.5%	1.1%	1.8%	4.3%	4.3%
Forecasted revenues	81	88	93	101	110
<i>Original forecast</i>	77	80	81	84	87

Table 4.14b – 2.5 percentage point decrease in UK non-residential transaction and price growth forecasts

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Transaction growth	-6.6%	-1.5%	-1.0%	-0.9%	-0.9%
Price growth	0.5%	-3.9%	-3.2%	-0.7%	-0.7%
Forecasted revenues	74	73	70	69	68
<i>Original forecast</i>	77	80	81	84	87

Sensitivity analysis has also been performed for changes in the behavioural effects. Changes in the behavioural effects had little impact on the revenue forecast.

Back-testing

Staff from Bangor Business School have previously performed independent back testing of the Welsh Government's LTT models to test their suitability, stability and give assurance about forecasts for devolved taxes.

A key driver of the forecast for all four models is the base-year distributions for the number of transactions per bin and the total property values per bin. These distributions are adjusted to take account of future growth in transactions and prices and tax revenues are calculated from these adjusted distributions. It is therefore important that the base-year distributions are stable and reflect the property market at that time.

The stability and suitability of the distributions for main residential, additional residential property, non-residential main rates, non-residential leasehold rent were tested..

As such, there is no significant change in the distributions and the models are appropriate for forecasting LTT revenues.

Bangor Business School view on the forecast

Considerable progress has been made on developing the LTT forecasting models following the October 2017 Final Report, that included recommendation by Bangor Business School, that should help to improve the revenue forecast.

Based on the information provided by the Welsh Government Treasury Team, Bangor Business School views the methodology described in Section 4 as an appropriate approach for forecasting LTT revenues. This decision is based on the discussion with academics and practitioners on the theoretical assumptions of the models (including factor selection), analytical analysis of the models, and the expected variation in revenue forecast for different scenarios.

All of the models used by the Welsh Treasury to produce this forecast have been independently reproduced by Bangor Business School as part of the validation process. The final LTT forecast is set out in Table 4.3.

Recommendation N4

The Welsh Treasury to establish a monitoring process to assess the performance and continued suitability of the model for forecasting revenues. This to include a method of back-testing the models based on information from the WRA when sufficient data becomes available.

This work contains statistical data from HMRC which is Crown Copyright. The research datasets used may not exactly reproduce HMRC aggregates. The use of HMRC statistical data in this work does not imply endorsement of HMRC in relation to the interpretation or analysis of the information.

SECTION 5 - NON DOMESTIC RATES

Introduction

In an important step in fiscal devolution, in April 2015, financial responsibility for NDR was devolved to Welsh Ministers. The forecasting of NDR revenues is undertaken by the Local Government Strategic Finance Division and the Welsh Treasury. This section sets out some background to the operation of NDR, the forecasting of NDR revenue, and Bangor Business School's assessment of this approach.

NDR is a way of taxing business and other non-domestic properties, with the tax revenue raised being pooled and then distributed to local authorities (principal councils and Police and Crime Commissioners) based on a needs formula. As with all tax revenues, it can be difficult to predict policy decisions, particularly in the longer term. In the case of NDR, this has been the focus of much attention recently, ranging from for example the Barclay Review of NDR in Scotland²³, to the Grimsey Review into "the High Street" which highlighted NDR as an area for potential reform²⁴; and the Welsh Government had a consultation exercise from April 2018 – June 2018 concerned with tackling avoidance of NDR in Wales,²⁵ with the responses published in October 2018²⁶.

The tax is based on the rateable value of non-domestic property in Wales. The rateable value is multiplied by the multiplier to calculate the rates for the property. The VOA assesses the rateable value of properties (which are publicly available) and administers any appeals on these in conjunction with the Valuation Tribunal for Wales (VTW). The Welsh Government sets the multiplier every year. From 2018/19, this is set according to the consumer price index (CPI), for September in the preceding financial year (in the years before 2018/19 it was set according to the RPI).

Non-domestic properties in Wales are normally revalued every 5 years. The latest revaluation came into effect on 1 April 2017, based on rental values at 1 April 2015. The next revaluation is being brought forward to 2021. A rise or fall in rateable value at a revaluation does not lead to a corresponding rise or fall in overall NDR revenue: the multiplier must be adjusted to ensure that the overall yield remains the same. Therefore, as revaluations are required to be overall revenue

²³ www.gov.scot/Resource/0052/00523643.pdf

²⁴ <http://www.vanishinghighstreet.com/wp-content/uploads/2018/07/GrimseyReview2.pdf>

²⁵ <https://beta.gov.wales/sites/default/files/consultations/2018-04/180403-tackling-non-domestic-rates.pdf>

²⁶ <https://beta.gov.wales/sites/default/files/consultations/2018-10/181015-non-domestic-rates-summary-en.pdf>

neutral, for an individual property a fall in its rateable value may not translate into a fall in the NDR for that property. In non-revaluation years, the multiplier is provisionally set in September of each year, and from 2018 this is with reference to the CPI. Therefore, in most years, tax bills increase or decrease in line with this measure of inflation. However, NDR revenues can potentially rise or fall more quickly due to a changing tax base: the value of properties added to the tax base exceeding the value of properties removed from the tax base (such changes in the tax base are linked to the economy and referred to as buoyancy).

A number of reliefs and other adjustments need to be taken into account before the final amount available to distribute to local authorities can be derived. There are a number of reliefs (both mandatory and discretionary) in respect of NDR. These include Small Business Rates Relief, charitable relief, relief on empty properties and hardship relief. The profile of these reliefs is not constant.

The outcome of appeals can have a significant impact on the final amount of NDR revenue available to distribute to local authorities. In Wales, there has been a relatively high proportion of challenges received in relation to the number of hereditaments on the list, around 40% for the 2010 list over the lifetime of the list. However, of these challenges, only around a third have resulted in changes to the list, meaning approximately two-thirds of challenges result in no change to a hereditament's rateable value. However, there is scope for a single successful appeal by a taxpayer to have a significant impact, for example a successful appeal by BT has led to a reduction in yield for the years up to 2019/20 of £8m (0.8% of the forecast distributable amount for 2019/20). Appeals are processed by the VOA and VTW and successful appeals may be backdated over a number of years (until the beginning of the relevant list). There is a lack of timely information on appeals being processed, so forecasting in respect of appeals is difficult, a challenge that has also been highlighted by the Scottish Government²⁷.

²⁷ See publication by the Scottish Government at <https://beta.gov.scot/publications/foi-17-02453/>

NDR revenue forecast

The forecasts for NDR revenues available for distribution are set out below in Table 5.1.

Table: 5.1 Forecast for NDR revenues – distributable amount 2019/20 to 2022/23 (£ millions)

Period	2018/19	2019/20	2020/21	2021/22	2022/23
Distributable amount	1,050	1,061	1,091	1,113	1,137

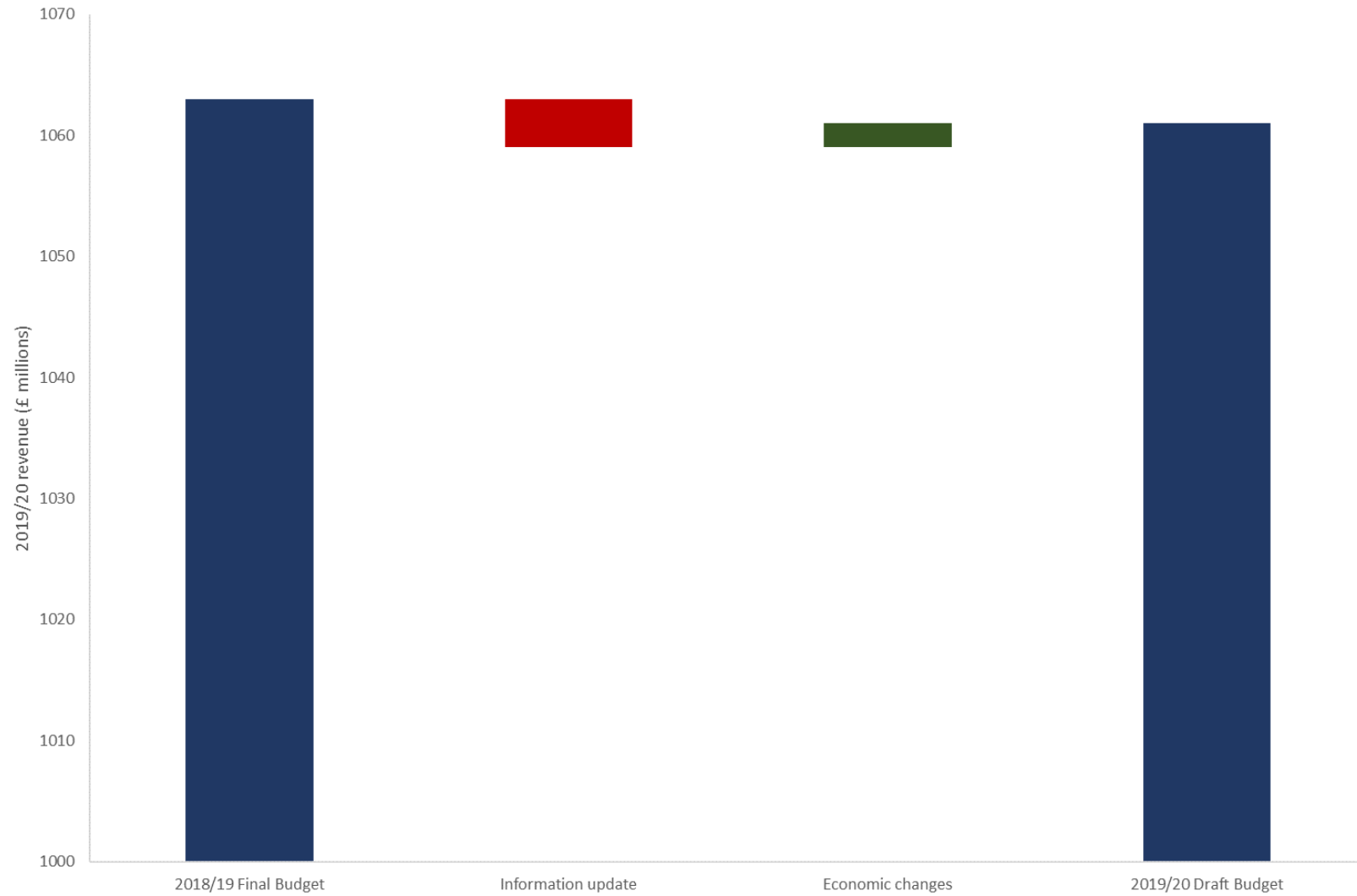
The figure for 2019/20 is derived from the forecasting procedure discussed in this chapter, and forecast figures for later years are derived by increasing forecast receipts, less any prior year adjustments, in line with the OBR forecast for CPI.

Bangor Business School have previously published;

- a) An October Final Report (published in October 2017) that sets out the methodologies and assumptions relating to the Welsh Government's forecasts for devolved taxes which underpinned the Welsh Government Draft Budget 2018/19,
- b) An Update Statement to the October Final Report (published in December 2017), that takes into account new macro-economic forecasts, the change in Small Business Rates Relief and subsequent updated revenue forecasts by the Welsh Government Treasury Team following the October Final Report, and
- c) An October Final Report (published in October 2018) that sets out the methodologies and assumptions relating to the Welsh Government's forecast for devolved taxes which underpinned the Welsh Government Draft Budget 2019/20.

Figure 5.1 compares the NDR forecast for 2019/20 in the report published in December 2017, with the forecast scrutinised in this report. The small change in the forecast distributable amount for 2019/20 is due to the availability of new information on revenue outturns in 2017/18 and local authority projections for 2018/19, and new economic information (revised CPI quarterly figures).

Figure 5.1 - Evolution of total tax revenue forecasted from non domestic rates model



Update on previous recommendation

Recommendation 9

Work should be undertaken to investigate and to incorporate a probability element of successful appeals into forecast calculations.

Work is underway to liaise with the VOA to determine what appeals information could be made available. Discussions have also taken place with the Scottish Government on the appeals information that have available to inform their forecasting process.

Forecasting approach

The forecast of NDR revenues is not derived from a specific NDR economic model, but from aggregate data from the administrative exercise undertaken to determine the distributable amount for local authorities. This approach is similar to that adopted by the Scottish Fiscal Commission, drawing on available data from the Scottish Assessors and Local Authority NDRI returns²⁸. Each year, the Welsh Government must determine the amount of Annually Managed Expenditure (AME) which will be available for distribution to local authorities in the following year. As part of this there are two ways of collecting NDR tax; approximately 90% of the net yield is collected by local authorities (local list), with the remainder being collected centrally by the Welsh Government (central list) from large organisations, typically utilities, that span a number of local authorities. The yield is pooled and distributed by the Welsh Government.

Local List

Prior to knowing how much will be collected, local authorities are requested, at the beginning of the financial year, to report how much NDR revenue they expect to collect to contribute to the pool. A best estimate is given in February by each local authority, along with other estimates, for example, for reliefs, and calculations of costs of collections, in line with the Notes for Guidance issued by the Welsh Government. At this stage, no detailed information is provided on the expected effect of appeals, as local authorities would not have information on this as the VOA administers this.

²⁸ www.fiscalcommission.scot/publications/occasional-papers/current-approach-to-forecasting-september-2017/

While best estimates are given in February by the local authorities, the Welsh Government needs to confirm by the previous December how much money it will be distributing for the following year. As such, there is a disparity between when information becomes available and when tax revenues need to be distributed among local authorities. The forecast of NDR revenues results from this process, rather than being derived from a separate economic forecast carried out with the sole purpose of determining NDR revenue. Those preparing the AME forecast do not hold detailed taxpayer level data and so the forecast of NDR revenue is derived from the reported aggregates. This process has operated in a similar way for many years, including the years prior to the devolution of financial responsibility for NDR in 2015 and there are some difficulties due to the timing of the receipt of information. The in-year schedule for when information becomes available is as follows:

February – NDR1 completed by local authorities, in accordance with the Notes for Guidance and returned to Welsh Government. The NDR1 is a forecast for the coming financial year based on the information on the local rating lists and this information is used to manage the NDR pool and calculate the amounts to be distributed to local authorities.

April / May – NDR3 made available by local authorities which report the unaudited actual amount of their contributions to the NDR pool for the previous year, and includes impact of appeals.

November – Audited NDR3, showing actual income collected, completed by local authorities.

Therefore, 14 months elapse between the submission of an NDR1 (forecast) and NDR3 (actual) to the Welsh Government. (NDR2 forms, completed by local authorities, are used to notify any significant deviance expected from their initial forecasts). As such, a correction is always made to balance the over/under amount of funds distributed to local authorities. The difference between the NDR3 outturn and the NDR1 forecast forms the basis of a balancing payment or prior year adjustment for each local authority.

The distributable amount for 2019-20 is based upon the information made available in 2018 and a number of assumptions about factors which might affect the amount to be collected. Estimates for the following reliefs are included in the NDR1: reliefs for charities, community amateur sports clubs, Small Business Rates Relief scheme, partly occupied and empties. If a property is occupied by a registered charity or community amateur sports club, relief between 80% and 100% is granted. Relief for partly occupied properties is available where part of a property is temporarily empty due to the need to vacate or occupy a property over a period of time. Empty business properties are exempt from paying Non Domestic Rates for at least 3 months after the property becomes vacant. A

new scheme for Small Business Rates Relief has been in place from April 2018. This scheme allows an increase in the relief available to businesses in the childcare sector, and a restriction (to two properties) in the relief available to taxpayers who have multiple properties in any single local authority. 2019/20 is the last year that transitional relief is available for those whose eligibility for SBRR was impacted by the revaluation in 2017.

Central List

This is a set list of ratepayers, with infrastructure spanning local authority boundaries. The figure for the distributable amount net yield for the central list is updated by CPI each year, unless the VOA provides specific information, such as in a year of revaluation. In recent years previous forecasts of the central list have not given rise to significant forecasting errors. The recent BT appeal has served to highlight the potential impact of large appeals.

Components of the forecasting tool

The gross yield is the total rateable value, adjusted for buoyancy, less reliefs, losses in collection, costs of collection and “in year reductions”, which are predominantly appeals (and any revised information subsequently provided). There is scope for uncertainty, and so forecasting error, in respect of each of these adjustments.

In this forecasting process an estimate of buoyancy is used to take changes in the tax-base into account and applied to the local list. (The properties on the central list are not considered likely to expand). This is derived from the rateable value at the start of the year as a percentage of the average rateable value. (VOA provides the start year and end year rateable value). In recent years this has remained static in this forecasting exercise, with a buoyancy factor of 1.0 employed. With regard to the tax-base of the central list, the possibility of increasing this in line with a measure of economic growth was previously considered. However, the central list businesses are not ones that would typically track economic growth; furthermore work by the Scottish Government has found no clear links between buoyancy and economic variables such as GDP²⁹. Therefore, the use of CPI is considered appropriate for forecasting NDR revenues and the OBR forecast CPI is used for this. Local authorities forecast their best estimate of lost yield due to reliefs expected to be given in the year, and are considered to be best placed to forecast this. Their initial returns do not include appeals, as local authorities have little information on this: these are unpredictable and are processed by the

²⁹ Scottish Fiscal Commission (2017) Forecast Evaluation Report September 2017 p 31

VOA, so information is not available until the time that appeals are resolved. Furthermore, predicting the outcome of appeals is difficult and commercially sensitive.

For losses in collection, the initial NDR1 forecast from local authorities provides for a 1% allowance, with the figure for losses in collection included on the NDR3. In recent years, the initial provision of 1% has proved to be slightly higher than the outturn losses.

The figure for NDR revenues forecast by this accounting tool are after deducting notional costs of collection and prior year adjustments. The costs of collection are calculated, without specific reference to the costs directly incurred in collecting NDR revenue, but in accordance with a prescribed allowance, (£39.50 per hereditament and the aggregate rateable value for the authority's rating list multiplied by 0.00087). Each local authority withholds this amount, contributing NDR revenues, net of these notional costs of collection, to the pool.

Analysis of the forecast and sensitivity analysis

A review of the forecasts of NDR revenue compared with actual revenues indicates that this is an approach which has not produced significant forecast errors in NDR revenue in recent years.

Change in the profile of revenues from local authorities

As in the previous year, the local list, showing the returns from the 22 local authorities was reviewed and analysed: this included consideration of the potential impact on total NDR revenue of a fall in NDR revenue from a particular geographical region or local authority. Of the NDR revenue from the local list, it remains the case that the most significant is in respect of Cardiff. In 2016/17, consistent with the previous year, a 10% rise or fall in NDR revenue from Cardiff (£19m) would have led to a 2% change in total local authority NDR revenue.

Change in the number of properties with a high rateable value

As identified in last year's report there is only a very small number of non-domestic properties with a high rateable value (just under 200 hereditaments with a rateable value over £1m). Should there be a drop in the number of these high rateable value properties (for example due to closure or business relocation), or the liability of these properties (for example on appeal) the loss of revenue from them will have a consequent impact on total NDR revenues.

Bangor Business School view of the forecast

Based on the information provided by the Welsh Government's Local Government Finance Team and the Welsh Treasury, Bangor Business School views the methodology described in this chapter as an appropriate approach for forecasting Welsh NDR revenues.

The forecast of NDR revenues is not derived from a specific NDR economic model, which could be reproduced, but from aggregate data from the administrative exercise undertaken to determine the distributable amount for local authorities. This approach was discussed with academics and practitioners. This data was reviewed, including a review of how it is collated, and the steps in the forecasting process, including the Notes of Guidance. This is an established process that has operated for many years by knowledgeable and experienced staff, and, in recent years, the divergence of actual figures from the forecast has been small, suggesting this is a well-understood procedure undertaken by those experienced in making judgments in this area. The final NDR forecast is set out in Table 5.1.

Recommendation N5

The Welsh Treasury to continue to work with the VOA to discuss approaches to improve the timely availability of information on appeals.

SECTION 6 – WELSH RATES OF INCOME TAX

Introduction

The Welsh Rates of Income Tax (WRIT) will be introduced as a partially devolved tax in Wales from April 2019. The Welsh Government will be able to vary the rates of income tax payable by Welsh taxpayers on non-savings non-dividend income, however the UK Government will continue to be responsible for a large proportion of income tax.

From April 2019, the UK Government will reduce each of the three rates of income tax (basic, higher, and additional rates) paid by Welsh taxpayers by 10p. The Welsh Government will then decide the three Welsh rates, which will be added to the reduced UK rates. The overall rate of income tax paid by Welsh taxpayers will be determined by the combination of the reduced UK rates plus the new Welsh rates. For example, if the Welsh Government decides that each of the Welsh rates be 10p, this will mean that the overall rates of income tax paid by Welsh taxpayers will continue to be the same as those paid by English and Northern Irish taxpayers.

In 2015/16, it is estimated that non-savings non-dividend income tax in Wales raised a total of £4,365 million under the current UK system. This total is an aggregation of approximately £3,220 million from basic rate payment, £995 million from higher rate, and £150 million from additional rate. It is estimated that WRIT would account for £1,890 million (or 43 per cent of the total income tax revenue in Wales in 2015/16).

The Final Budget 2019/20 proposes WRIT rates are set so that Welsh taxpayers continue to pay the same rate as those paid by English and Northern Irish taxpayers. The WRIT rates and thresholds are set out below in Table 7.1. The personal allowances and thresholds in Table 7.1 relate to 2019-20 as announced by the UK Government at the Autumn Budget 2018.

Table 7.1a: Income tax rates, 2019/20

Tax rates	UK	Wales	Total	Wales / Total
Basic	10%	10%	20%	0.50
Higher	30%	10%	40%	0.25
Additional	35%	10%	45%	0.22

Table 7.1b: Threshold and tapers, 2019/20

Threshold and tapers	Value
Personal allowance	£12,500
Basic rate limit	£37,500
Additional rate threshold	£150,000
PA taper threshold	£100,000
PA taper rate	50%

OBR WRIT revenue forecast

The OBR estimates/forecasts for the total revenue from WRIT between 2015/16 and 2022/23 are set out in Table 7.2 (which are adjusted for Gift Aid payments).

Table 7.2: OBR (October 2018) total Welsh income tax revenue 2015/16 to 2022/23 (£ millions)

Period	Revenue
2015/16	1,893
2016/17	1,935
2017/18	1,983
2018/19	2,062
2019/20	2,059
2020/21	2,163
2021/22	2,232
2022/23	2,315

In overall terms, WRIT revenues are forecasted to rise from £2,062 million in 2018/19 to £2,315 million in 2022/23, an increase of 12 per cent.

Welsh Government WRIT revenue forecast

The Welsh Government's WRIT revenue forecasts from 2019/20 to 2022/23 are set out in Table 7.3. The 2019/20 forecasts is set to be the same as the OBR's forecast given transitional arrangements apply to the block-grant adjustment for income tax in that period. As such, there will be a neutral budgetary effect from the introduction of WRIT in 2019/20 (with future year's forecasts beginning from the OBR 2019/20 starting point).

Table 7.3: WRIT revenue 2019/20 to 2022/23 (£ millions)

Period	WRIT revenue	Basic rate	Higher rate	Additional rate
2019/20	2,059	1,778	237	44
2020/21	2,166	1,873	246	47
2021/22	2,248	1,940	256	51
2022/23	2,335	2,012	268	55

In overall terms, WRIT revenues are forecast to rise from £2,059 million in 2019/20 to £2,335 million in 2022/23, an increase of 13 per cent. The basic rate accounts for most of the total WRIT revenue; 86 per cent throughout the whole period. While revenue from basic rate is anticipated to grow 13 per cent between 2019/20 to 2022/23, revenue from higher rate and additional rate are forecasted to grow 13 per cent and 26 per cent respectively.

Methodology

The Welsh Treasury WRIT model uses a bottom-up methodology to forecast the revenues generated from income taxes in Wales. A bottom-up methodology is used to utilise all available information and ensure changes in demographics are captured as accurately as possible and allow the separation of the tax revenues into its different components.

Information from HMRC's Survey of Personal Incomes is used to produce a distribution of taxpayers per income bin in Wales during the 2015/16 period (i.e. the latest available data). The data reflects an estimated 1,314 thousand non-savings non-dividend taxpayers in Wales during 2015/16 with an average income of £25,180. Figure 7.1 illustrates the information available in 2015/16.

Figure 7.1a – Number of Welsh taxpayers, 2015/16

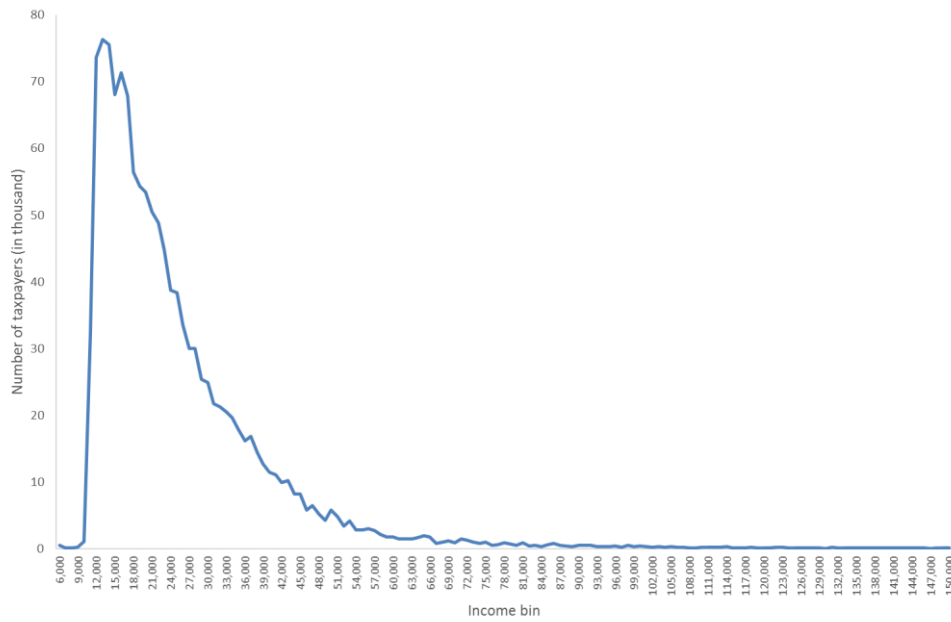


Figure 7.1b – Total tax/WRIT revenue, 2015/16

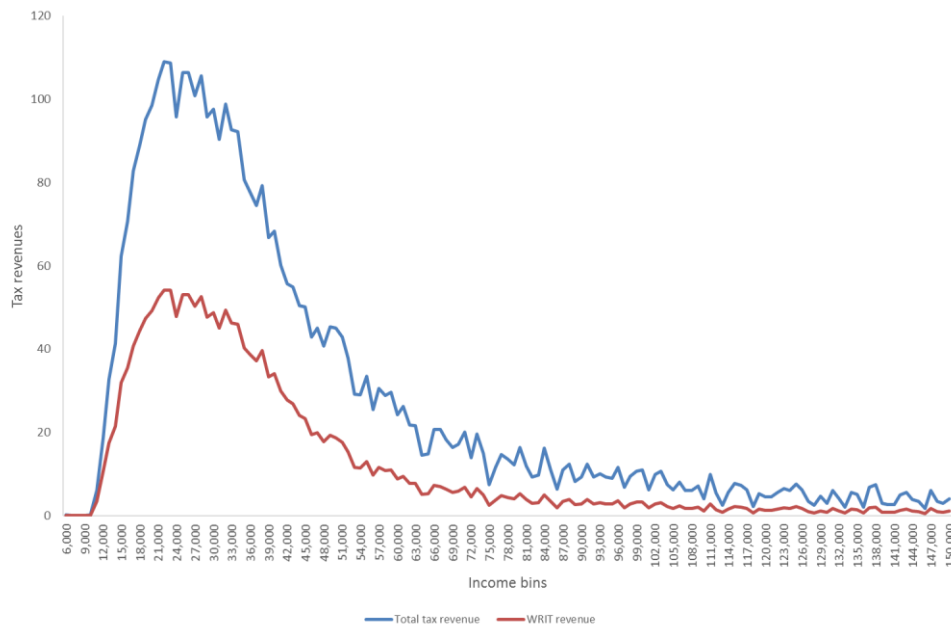
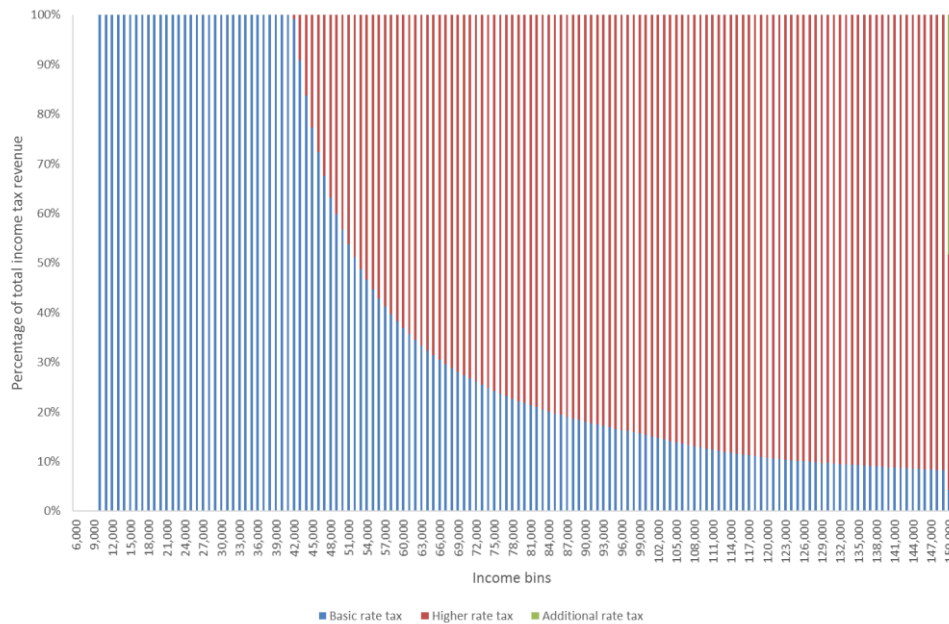


Figure 7.1c – Total tax revenue components, 2015/16



The income bins increase by £1,000 up to £150,000 with a final bin of >£150,000 to capture all remaining taxpayers. This bin size gives a clear distribution of taxpayers in 2015/16, from which future WRIT revenues can be forecasted.

The distribution in Figure 7.1a is adjusted to take account of forecasted growth in Welsh taxpayers. This growth is implied from the OBR’s forecast for wages and salaries adjusted to take account of growth in the Welsh (16+) population. The implied growth in Welsh taxpayers is given in Table 7.4.

Table 7.4: Forecasted taxpayers growth in Wales, 2019/20 to 2022/23

Period	2019/20	2020/21	2021/22	2022/23
Employment growth	0.43%	0.14%	0.02%	-0.10%

The employment growth forecasted in Table 7.4 are extrapolated from the OBR’s forecast for wages and salaries, adjusted to take account of growth in Welsh (16+) population therefore the forecast might not align with employment (count) growth in Wales. This difference is appropriate given the model is only concerned with the growth in taxpayers/wages and salaries.

The income bins in Figure 7.1a are also adjusted to take account of the growth in average incomes. This is based on the OBR’s average earnings forecast for the UK as a whole as given in Table 7.5.

Table 7.5: OBR forecasted average earnings growth in the UK, 2018/19 to 2022/23

Period	2019/20	2020/21	2021/22	2022/23
Average earnings growth	2.6%	2.9%	3.0%	3.2%

Total Welsh tax revenues are calculated by applying the tax rates stated in Table 7.1 to the forecasted taxpayers distribution and associated income bins. WRIT is derived from the total Welsh tax revenue forecast based on the proportions in Table 7.1 (last column). Basic, higher, and additional rates are also derived from the total Welsh tax revenue forecast based on the appropriate thresholds. This is done by increasing those rates in Table 7.1 by using the Consumer Price Index forecast in Section 2.

The model has the functionality to incorporate the impact of behavioural change through elasticities. These capture changes in labour earnings (through changes in income) and also potential migration responses to varying tax rates within the UK. The elasticities take into account differences between tax rates and incorporates National Insurance (employer and employee) contributions into the calculations. However, there is no requirement to do so in this tax forecast, as there are no changes in the tax rates.

While there are no Welsh specific elasticities available, HMRC and others have published estimates of the impact of tax rate changes on incomes for the UK. However, there are no research-based estimates available of intra-UK migration responses to income tax variations given that such variations have only recently existed.

The sensitivity of the WRIT model is analysed by varying the economic inputs (Table 7.4 and Table 7.5) of the model. These sensitivity analyses give an indication how revenue will vary if the economic scenario changes. The results of these sensitivity analyses are shown in Table 7.6.

Table 7.6a: 1.5 percentage point increase in average incomes and taxpayers growth

Period	2019/20	2020/21	2021/22	2022/23
Growth in average incomes	4.1%	4.4%	4.5%	4.7%
Growth in taxpayers	1.9%	1.6%	1.5%	1.4%
Forecasted revenues	2,150	2,353	2,543	2,748
<i>Original forecast</i>	<i>2,059</i>	<i>2,166</i>	<i>2,248</i>	<i>2,335</i>

Table 7.6b: 1.5 percentage point decrease in average incomes and taxpayers growth

Period	2019/20	2020/21	2021/22	2022/23
Growth in average incomes	1.1%	1.4%	1.5%	1.7%
Growth in taxpayers	-1.1%	-1.4%	-1.5%	-1.6%
Forecasted revenues	1,976	1,993	1,983	1,974
<i>Original forecast</i>	<i>2,059</i>	<i>2,166</i>	<i>2,248</i>	<i>2,335</i>

Bangor Business School view on the forecast

Based on the information provided by the Welsh Treasury, Bangor Business School views the methodology described in Section 7 as an appropriate approach for modelling WRIT policy changes. This decision is based on the discussion with academics and practitioners on the theoretical assumptions of the models (including factor selection), analytical analysis of the models, and the variation in revenue forecast for different scenarios.

All of the models used by the Welsh Treasury to produce this forecast have been independently reproduced by Bangor Business School as part of the validation process. The final WRIT forecast is set out in Table 7.3.

Recommendation N6

The Welsh Treasury to incorporate new data on WRIT as it becomes available and take account of any new information on the behavioural impacts of income tax.

SECTION 7 – CONCLUSION

This report presents the assumptions and methodologies underlying the Welsh Government's forecasts for the devolved taxes, and Bangor Business School's work and conclusion on their suitability for inclusion in the budget setting process in Wales.

The Wales Act 2014 gave new powers to the National Assembly for Wales relating to taxation and borrowing: powers to introduce Welsh taxes to replace UK stamp duty land tax and UK landfill tax, partial devolution of income tax, powers to introduce other devolved taxes on a case by case basis and borrowing powers. Non domestic rates have been devolved in April 2015.

The work completed in this report involved a review of the projections and approach for determining the projections in respect of these four taxes; LDT, LTT, NDR, WRIT. Different methodologies are used to forecast the revenue collected by each tax. The differences in methodologies reflect available information and the economic activity relating to the tax.

Based on the information provided by the Welsh Treasury, discussions with academics and practitioners on the theoretical assumptions of the models (including factor selection) and analytical analysis of the models, Bangor Business School conclude that forecasts are based on robust and appropriate methodologies and assumptions.

The absence of large variation in the revenue forecast for different economic scenarios and model assumptions support the suitability of the forecasts inclusion in the budget setting process. In addition, all models used by the Welsh Treasury to produce this forecast have been independently reproduced by Bangor Business School as part of a validation process.

The Welsh Treasury has taken actions to address the advice and recommendations from Bangor Business School on ways to improve the methodologies made during the process.

APPENDIX 1 – SUMMARY OF KEY COMMUNICATIONS

Date	Meeting
21 March 2018	Meeting between Welsh Treasury and Bangor Business School
2 May 2018	Meeting between Welsh Treasury and Bangor Business School
5 July 2018	Conference call between Prof Max Munday (Cardiff University) and Bangor Business School
25 July 2018	Visit by Bangor Business School to the Scottish Fiscal Commission
20 August 2018	Meeting between Welsh Treasury, the OBR and Bangor Business School
5 September 2018	Meeting between Welsh Treasury and Bangor Business School
4 and 5 October 2018	Attend the 2018 Interparliamentary Finance Network
17 October 2018	Bangor Business School presents evidence to the National Assembly Finance Committee
27 November 2018	Meeting between Welsh Treasury and Bangor Business School

Subsequent phone calls and ad-hoc communications are not detailed.

APPENDIX 2 – RECORD OF PREVIOUS FORECAST OF FISCAL DETERMINANTS

Key determinants of the OBR Fiscal Forecast to 2022/23 (published March 2018)

Period	2018/19	2019/20	2020/210	2021/22	2022/23
GDP and its components					
Real GDP (%)	1.5	1.2	1.3	1.4	1.5
Nominal GDP (%)	3.0	2.9	3.0	3.2	3.3
Nominal GDP (£ billion)	2,116	2,177	2,241	2,312	2,389
Consumer spending (%)	3.0	2.8	3.1	3.4	3.5
Prices and earnings					
GDP deflator (%)	1.5	1.6	1.7	1.7	1.8
● RPI (%)	3.4	3.0	2.9	2.9	3.0
● CPI (%)	2.2	1.8	2.0	2.0	2.0
Average earnings (%)	2.7	2.4	2.6	2.8	3.0
Key fiscal determinants					
Employment (millions)	32.3	32.4	32.5	32.6	32.7
Property sector					
● Residential property prices (%)	3.3	2.5	2.2	2.5	3.0
● Residential property transactions (000s)	1,236	1,260	1,285	1,312	1,344
● Commercial property prices (%)	-0.7	1.6	1.7	1.7	1.8
● Commercial property transactions (%)	1.5	1.2	1.3	1.4	1.5
Interest rates and exchange rates					
Short term interest rate (%)	0.9	1.3	1.5	1.7	1.7
Euro/Sterling exchange rate	1.14	1.12	1.11	1.10	1.10