

## Road From Serfdom modelling framework

This paper explains the structure and underlying rationale of the spreadsheet **RoadFromSerfdom**. There are explanatory notes at appropriate points throughout the worksheets to explain each step. This paper provides a comprehensive overview and commentary. Where appropriate reference is made to the OBR *Economic and Fiscal Outlook March 2014* (cited as “Budget EFO”).

The purpose of the Model is to demonstrate the viability of a policy with three elements:

- Exemption from corporation tax for small companies (as defined).
- Reform of the taxation of company dividends – dividend income will be taxed as part of general income; those paid from small companies will be “unfranked” (i.e. not carry an associated tax credit); and dividends from other companies will be “franked” (i.e. carry a tax credit, which will be increased so that shareholders pay no more tax than they do at present).
- Exemption from CGT on the sale of shares in companies which qualified as small companies at the time of acquisition.

The policy is considered to be viable if, within a five year parliament, it produces a Public Sector Net Borrowing which is smaller (or a budget surplus which is larger), and it produces a debt/GDP ratio which is lower, than the forecast by the OBR for the same period on the basis of the current tax system.

There are two versions of the Model:

- “Static Effect”: in which all of the corporation tax change takes place in 2015/16
- “Alternative Gradual”: in which the corporation tax rate for small companies is reduced gradually: 16% in 2015/16; 12% in 2016/17; 8% in 2017/18; 4% in 2018/19; 0% in 2019/20

Each version comprises the same essential spreadsheets and uses the same source data. The Economy and Revenue sheets include an “Exemption Factor” which regulates the headline rate of corporation tax: in Static Effect this is always set at 100%; in Alternative Gradual it increases each year in steps from 20% to 100%. The nature of the dividend/CGT changes are such that phasing is not practical. They will be implemented in full in 2015/16 in both versions.

The Model runs for four years, i.e. until 2018/19. The OBR projections will not permit us to carry the model further with significant reliability. The Alternative Gradual version is used solely to provide comparator results for GDP growth and debt/GDP ratio.

The convention adopted in this note and the Model is that unless stated otherwise a “Year” is a Tax Year comprising calendar quarters Q2, Q3, Q4 and Q1 in that order. Tax Year Y therefore consists of calendar year Y Q2, calendar year Y Q3, calendar year Y Q4 and calendar year Y+1 Q1.

Colour-coding is used throughout the spreadsheet for identification purposes:

- Yellow highlighting indicates a sheet which contains key factors which apply to all Models
- Red/pink highlighting indicates Static Effect pages
- Green highlighting indicates Alternative Gradual pages

- Figures in bold purple are estimates generated by the Model itself for a key variable which the OBR do not include in their forecasts but which is needed for the Model to work

## Outputs

The worksheet **OUTPUT Main** summarises the main results for the Model and compares them to the OBR Base Case:

- Headline GDP;
- annual growth rate by calendar year;
- annual growth year by tax year;
- total Current Receipts by tax year;
- new jobs created by tax year;
- Public Sector Net Borrowing by tax year;
- Public Sector Net Debt by tax year;
- Public Sector Net Debt as a proportion of GDP by tax year

The worksheet **Adjustments** is used to put the Model's results on a comparable basis with the OBR headline forecasts.

### GDP values

As discussed in the **Economy** worksheets, the Model uses the GDP (Current Prices) measure. The Headline OBR forecast for the growth rate is based on the GDP (Chain-linked Volume) measure. In order to place them on a broadly equivalent basis it is necessary to adjust the Model values for GDP.

This is undertaken using a Scaling Factor:

$$\text{Scaling Factor for Year Y} = \frac{\text{OBR forecast for GDP (Current Prices) for Year Y}}{\text{OBR forecast for GDP (Chain-linked Volume) for Year Y}}$$

An internal check is made to confirm that the Scaling Factor applied to the OBR's own GDP (Current Prices) results produces the same forecasts for growth as the OBR's headline summary. That justifies the use of the adjustment to create proxy results for GDP (Chain-linked volume) values as it indicates that there would be no material distortion involved. If for Year Y an OBR figure for GDP (Current Prices) is x% of their equivalent figure for GDP (Chain-linked Volume) then this relationship would be replicated for the Model's values.

The Scaling Factor is applied to the Model values for GDP (Current Prices) to convert them into equivalent GDP (Chain-linked Volume) values. These are used to produce the GDP figures and the annual growth rates (calendar year and tax year) on the **OUTPUT Main** worksheet. There are different Scaling Factors, depending on whether the comparison is on a calendar year or a tax year basis.

### Debt/GDP ratio

The OBR forecast for Debt/GDP ratio uses GDP "centred on March" i.e. the sum of the individual GDP results for Q4, Q1, Q2 and Q3 either side of the end of the tax year. The OBR use the GDP (Current Prices) measure for these purposes.

The Model results for Public Sector Net Debt are taken direct from the **Spending&Debt** worksheets. The individual Qtr values for GDP are taken from the **Economy** worksheets, apart from the final year where the Q2 and Q3 values fall outside the forecast period of the Model. They are therefore

estimated by using the annual growth rate to 2019 Q1 to project forward the GDP values for 2018 Q2 and 2018 Q3.

The other **OUTPUT** worksheets provide tax year summaries of the **Economy, Revenue and Spending&Debt** worksheets.

## Economy worksheets

The worksheets rely upon the basic identity:

$$\text{GDP (Income)} = \text{GDP (Expenditure)}$$

Increments are made to the base case OBR forecasts for the major components of each side of the equation by reallocating portions of the corporate Tax Saving. This results in a new estimate for GDP.

The Model uses GDP at market value on the Current Prices measure. The sole reason for this selection is that it is the only measure for which the OBR provide forecasts for both Income and Expenditure component items. (The Budget 2014 EFO provides forecasts using the chain-linked volume measure only for the Expenditure items, and these are used to derive the Scaling Factor on the **Adjustments** worksheet.) It is preferable to use consistent and objective base data rather than to attempt to generate half of the base forecasts.

### Income items

#### Total Compensation of Employees

This represents the gross cost of employees, including PAYE, Employees' NIC, Employers' NIC and other employer social contributions, such as pension costs.

The OBR forecast is increased by a proportion of the Tax Saving. On this worksheet the increment is regarded simply as an aggregate sum of money and no distinction is made between additional wages for existing workers or the hiring of new employees (although the implicit assumption is that it represents new hires since no adjustment is made to OBR forecast wage levels).

Previous increments are uprated in line with the OBR forecast of wage costs, in order to avoid over-estimating the rise in Private Company Surplus generated by the New GDP. It is reasonable to assume that once an increase in compensation has been paid, employing companies would have to fund continued wage rises on those amounts. To that extent the increments represent permanent increases in GDP.

No adjustment is made to reflect the fact that New Private Company Surplus as a whole is higher than the OBR forecast and that therefore Large Companies could also have capacity to expand their workforce or pay higher wages. To that extent the Model may underscore the gains delivered by the policy.

#### Gross Operating Surplus of Private Corporations

This represents the gross turnover of private corporations including corporation tax but excluding employment costs. It is used as a proxy for profit.

For the first calculation in 2015 Q2, the OBR forecast is used. Thereafter, Private Company Surplus is calculated as the balancing item for New GDP on the Income side. Once the OBR forecast for the other Income items and the Model-calculated increments to them have been deducted from New GDP the residue must, by definition, be equal to Private Company Surplus.

To derive the Tax Saving it is necessary to identify the share of total Private Company Surplus generated by each category of company. The Tax Saving is calculated as the relevant effective rate of corporation tax x the small company share of the surplus.

The Model is only concerned with what happens to the Tax Saving received by small companies. It is assumed that the use of the original after-tax earnings generated by private companies is represented in the OBR base forecasts.

Key Factor A: what is the distribution of Private Company Surplus?

The value generated by private companies also has to be increased by value transferring out of Mixed Income on the conversion of unincorporated businesses to company status. The Tax Saving on this slice of value is calculated by reference to the effective tax rate which it would have suffered in that year under Self Assessment income tax.

Key Factor B: how much value converts to company status?

There is a limit on the maximum amount of value which can convert to company status (because some sole traders/partnerships would be too large to qualify as small companies). This is linked to the underlying value of what Mixed Income would have been if no conversions had taken place.

The aggregate Tax Saving on these two slices is then reallocated to other GDP components.

Key Factor C: how is the Tax Saving reallocated?

This provides three new amounts:

- New dividends paid to small company owner-managers after 1 Qtr
- New employee Compensation paid after 2 Qtrs
- New Investment paid after 3 Qtrs

Because the increments are paid in later Qtrs than the Tax Saving arises there is no circular calculation when deriving the New GDP.

Dividends are not directly represented in the GDP calculation (they constitute a use rather than a resource). However, after-tax, they will give rise to an increase in Private Consumption. So does the increased employee Compensation.

Key Factor D: how much extra Private Consumption will there be?

The extra Private Consumption is incurred 1 Qtr after the new dividends/Compensation is earned. It is calculated from the after-tax value of the dividends/Compensation. Dividends are reduced by the effective rate of Self Assessment income tax (because under the policy, small company dividends would be taxed as general income without a tax credit). Compensation is reduced by the effective rates of PAYE, Employees' NIC and Employers' NIC.

Other Income

In the OBR forecasts this is a combined item comprising:

Operating Surplus of Households

It is assumed that this is unaltered from the OBR forecast.

Operating Surplus of General Government

It is assumed that this is unaltered from the OBR forecast.

### *Operating Surplus of Public Corporations*

It is assumed that this is unaltered from the OBR forecast.

### *Mixed Income*

This represents the gross income of self-employed traders including Self Assessment income tax. This item will be reduced by conversions to company status. "Underlying Mixed Income" represents the original OBR forecast. From this is subtracted accumulated conversions (uprated by the growth in Underlying Mixed Income) to arrive at the figure for New Mixed Income.

For convenience the Model uses the term "Residuary Income" to refer to the difference between OBR forecast Other Income and the projected Underlying Mixed Income estimate.

### *Taxes on Products and Production less Subsidies*

The OBR forecast is increased by the extra VAT element of extra Private Consumption as it arises.

There is also an accumulation of previous VAT receipts relating to accumulated Private Consumption. This is calculated using the relevant VAT tax rate. Because the accumulated Private Consumption is uprated separately this automatically uprates previous VAT by the appropriate amount. Permanent increases in consumption therefore generate permanent increases in Taxes on Products, but transient ones (from the payment of dividends to owner-managers) do not.

### *Statistical Discrepancy (Income)*

It is assumed that this is unaltered from the OBR forecast. In practice the OBR forecast a more or less constant value for this item.

### *Expenditure items*

#### *Total Domestic Demand*

This represents the sum of a number of separate items:

#### *Private Consumption*

Purchases of goods and services including VAT. The OBR forecast for each Qtr is increased by a proportion of the Tax Saving plus previous accumulated increments brought forward.

Consumption increments caused by the payment of new dividends to owner-managers are not accumulated. Dividends are treated as one-off windfalls that do not lead to a permanent increase.

Consumption increments caused by the payment of extra employee Compensation are accumulated because a permanent increase in wages will lead to a permanent increase in consumption spending. The accumulated increments are therefore uprated in line with OBR forecasts for wage levels because the underlying source of the consumption is increasing at that rate.

#### *Government Consumption*

This is not the same as total Government spending and it represents items which would not be affected by the policy. It is therefore assumed that the OBR forecast is unaltered.

#### *General Government Fixed Investment*

It is assumed that this is unaltered from the OBR forecast.

#### *Private Investment*

Fixed Capital formation. The OBR forecast for each Qtr is increased by a proportion of the Tax Saving.

There is no accumulation of previous increments because they do not represent permanent

increases in GDP. Once resources have been spent on building a new factory, say, the money is not continually re-spent in later quarters. (Once built, the factory represents a balance sheet item outside GDP.)

Under the policy investors will be making material savings in CGT on the sale of shares in small companies. The Model does not include any increment in Private Consumption or Private Investment relating to the application of this saving. This is because it is not possible to provide robust estimates for how that saving would be apportioned. In practice, of course, windfall gains of this nature would lead to some windfall increments in Private Consumption and reinvestment. To that extent, the Model underscores the gains that would be achieved by the policy.

No adjustment is made to reflect the fact that New Private Company Surplus as a whole is higher than the OBR forecast and that therefore Large Companies could also have capacity to expand their investment. To that extent the Model may underscore the gains delivered by the policy.

#### *Net Acquisition of Valuables*

Holdings of non-financial goods not used for consumption. It is assumed that this is unaltered from the OBR forecast. In practice the OBR forecast is fairly stable.

#### *Change in Inventories*

Goods and services not yet consumed. It is assumed that this is unaltered from the OBR forecast. In practice the OBR forecast is fairly stable.

#### *Exports*

We are in no position to second-guess the OBR forecast. Equally, it is unrealistic to assume that there would be no affect upon exports.

Therefore it is assumed that for any given Qtr Exports stand in a fixed relationship with GDP. It is reasonable to assume that in any given condition of world trade a more productive economy would have a proportionately larger capacity to generate earnings from exports. So, for any Qtr, the OBR forecast for Exports is expressed as a percentage of the OBR forecast for GDP. This percentage is called the Export Factor. In principle there could be a different Export Factor for each Qtr, but the OBR forecasts are relatively constant (which provides additional support for the approach taken in the Model).

The value for New Exports is derived retrospectively as a balancing item through the formula:

$$\text{New Exports} = \text{Export Factor} \times \text{New GDP}$$

This ensures that as the policy causes GDP to rise (or fall), Exports make the same contribution as the OBR forecast.

#### *Imports*

We are in no position to second-guess the OBR forecast. Equally, it is unrealistic to assume that there would be no affect upon imports.

Therefore it is assumed that for any given Qtr Imports stand in a fixed relationship with Total Domestic Demand. It is reasonable to assume that as domestic demand rises it would draw in a proportionately greater amount of imports. So, for any Qtr, the OBR forecast for Imports is expressed as a percentage of the OBR forecast for Total Domestic Demand. This percentage is called the Import Factor. In principle there could be a different Import Factor for each Qtr, but the OBR forecasts are relatively constant (which provides additional support for the approach taken in the

Model).

New Imports are taken as the Import Factor multiplied by the New Total Domestic Demand. In this way the Model ensures that Imports rise (or fall) rateably as the policy causes Total Domestic Demand to rise (or fall) in the proportion which the OBR forecast.

This approach is preferable to trying to apportion the increased consumption between domestic supplied goods and Imports. In practice consumers would spend money in transactions with UK intermediaries who would arrange the import of the goods separately.

#### Statistical Discrepancy (Expenditure)

It is assumed that this is unaltered from the OBR forecast. In practice the OBR forecast a more or less constant value for this item.

#### New GDP

$$\text{GDP} = \text{Total Domestic Demand} + \text{Exports} - \text{Imports} + \text{Statistical Discrepancy}$$

Given the assumption that

$$\text{Exports} = \text{Export Factor} \times \text{GDP}$$

It follows by definition that:

$$\text{New GDP} = \frac{\text{New Total Domestic Demand} - \text{Imports} + \text{Statistical Discrepancy}}{(1 - \text{Export Factor})}$$

This allows the New GDP to be derived from the OBR forecasts and the calculated increments without having to first derive the New Exports figure.

## Revenue worksheets

OBR produce forecasts for 44 revenue lines.

#### Income Tax (a) PAYE

The Model derives this directly from the Economy worksheet. Total Compensation of Employees is aggregated for each tax year and the revenue derived by multiplying the effective rate of PAYE.

This is a reasonable approach because PAYE is collected by deduction at source when the corresponding wages are paid.

#### Income Tax (b) Self Assessment

The Model assumes that this is collected from:

- The remaining balance of Mixed Income (as calculated on the Economy worksheet)
- The payment of new dividends (as calculated on the Economy worksheet)
- The item “Non-Labour Income” as forecast by the OBR and which represents Operating surplus of households + net property income (e.g. dividends, rent) + imputed social contributions — employee social contributions — social benefits (use) + net miscellaneous transfers.

“Non-Labour Income” is used to represent all unearned and non-trading household income which would be taxed under Self Assessment. It is not a perfect proxy but it is the closest item for which the OBR provide forecasts. Since sole traders and partnerships are not the only source of Self

Assessment income tax, the main function of “Non-Labour Income” in the Model is to ensure that a credible effective rate can be derived which does not overstate the tax burden borne by Mixed Income.

Items are matched up with tax years and the receipt is calculated in accordance with the Self Assessment system. This requires a taxpayer to make two payments on account and a final balancing payment. The timing and quantification of these payments for Tax Year Y are:

- First Payment on Account: in January during Tax Year Y, amount = 50% of the liability for Tax Year Y-1
- Second Payment on Account: in October during Tax Year Y+1, amount = 50% of the liability for Tax Year Y-1
- Balancing Payment: in January during Tax Year Y+1, amount = outstanding balance, which equals the difference between the liability for Tax Year Y-1 and the liability for Tax Year Y (and it can be a negative figure, indicating that a repayment of tax is due)

Once the effective Self Assessment rates for each Tax Year have been derived, it is possible to calculate the amount and timing of each payment and aggregate them for each year. Given the transfer of value out of Mixed Income and into Private Company Operating Surplus, the Model generates net repayments for the final balancing payment. This is what would occur in practice for a sole trader who incorporated his business: at first he would be liable for payments on account which related to the income tax liability on his previous gross unincorporated profits, and in later years he would be liable on the (lower) gross dividends extracted from the new company.

A final item is added into Self Assessment to represent the abolition of the EIS and VCT schemes. These allow taxpayers to claim income tax relief for investments in certain tax-favoured vehicles. Therefore there is a revenue cost associated with them. It is a reasonable assumption that the OBR forecasts give total income tax receipts net of such relief. Since the relief would be abolished under the policy the associated cost has to be added back. It is included in the Self Assessment figure because under the current tax system taxpayers claim the relief through their Self Assessment return.

The added-back item is derived from Factor E.

No adjustment is made to reflect the fact that New Private Company Surplus as a whole is higher than the OBR forecast and that therefore Large Companies could also have capacity to expand the level of dividends which they pay (and hence any higher tax receipts on those dividends collected under Self Assessment). To that extent the Model may underscore the gains delivered by the policy.

### Income Tax (c) Tax on savings income

It is assumed that this item is unaffected by the policy.

Given that the Model is paying additional compensation to employees, and scoring less than 100% of the after-tax values as additional private consumption, in practice personal household savings would increase. Not all of this extra saving would be in tax exempt vehicles such as ISAs and hence this item would collect more revenue. The assumption made therefore undercounts the total receipts which the policy would generate (although not by any great amount).

For National Accounts purposes, savings income falls within Non-Labour Income, which the Model treats under Self Assessment. There is no element of double-counting in this approach. Even if it were possible to derive a robust estimate of savings income as a separate item, subtracting this

amount from the OBR forecast for Non-Labour Income in the Model would merely raise the effective rate of Self Assessment income tax, so that the same receipts were generated from a proportionately smaller tax base. There would not be a double-receipt of the same taxes.

#### Income Tax (d) Company income tax

This represents tax charges on the UK branches of foreign corporations. Such entities would be outside the scope of the tax exemption. It is assumed that this item is unaffected by the policy. That represents a conservative approach, because it assumes that non-UK companies receive no benefit from a general rise in GDP.

#### Income Tax (e) Non-Self Assessment repayments

It is assumed that this item is unaffected by the policy.

#### Income tax (f) Other

This represents previously unpaid tax recovered through settlement agreements with taxpayers. It is assumed that this item is unaffected by the policy.

#### National Insurance Contributions (a) Employee liability

The Model derives this amount directly from the Economy worksheet. Total Compensation of Employees is aggregated for each tax year and the revenue derived by multiplying the effective rate of NIC (Employee).

This is a reasonable approach because NIC (Employee) is collected by deduction at source when the corresponding wages are paid.

#### National Insurance Contributions (b) Employer liability

The Model derives this amount directly from the Economy worksheet. Total Compensation of Employees is aggregated for each tax year and the revenue derived by multiplying the effective rate of NIC (Employer).

This is a reasonable approach because NIC (Employer) is collected from the employer when the corresponding wages are paid.

#### Tax Credits (negative income tax)

This represents part of the social security tax credits system. They are included in current receipts for historical reasons, because the benefit is paid and administered by HMRC rather than DWP. When Gordon Brown implemented tax credits in 1999 it was decided to classify certain payments (in simple terms, those to low-earners where the payment exceeded the amount of income tax that would otherwise be due) as “negative tax” instead of government spending. There may have been presentational accounting advantages from this approach. ONS is reversing this approach and from 2015 the National Accounts will recategorise the payments as public spending, although for the moment OBR forecasts follow the current accounting treatment. In any event the tax credits in question will be replaced by the eventual implementation of Universal Credit.

It is assumed that this item is unaffected by the policy. In reality, the increase in employment compensation envisaged by the policy would affect low-earners in receipt of these benefits. To that extent the Model underscores the gains to be made from the policy.

#### Value Added Tax (VAT)

The Model derives this amount directly from the Economy worksheet.

On the whole (there are certain exemptions) VAT is paid quarterly by businesses. For these purposes “quarter” does not refer to the formal calendar year but the accounting year of the business concerned, so that a business whose accounting year commences in January would account for VAT at different times than one whose year commenced in February. The net VAT is paid over to HMRC one month after the end of each quarter.

Therefore, across the economy as a whole, the VAT tax base for each year does not quite align with the Private Consumption expended during that year. The VAT base for Tax Year Y actually covers  $\frac{1}{3}$  of the Private Consumption for Tax Year Y-1 Q1, all of the Private Consumption of Tax Year Y Q2, Q3 and Q4 and  $\frac{2}{3}$  of the Private Consumption for Tax Year Y Q1. The effective rate for the year is applied to this adjusted tax base.

### Corporation Tax (a) Onshore

The Model derives this amount directly from the Economy worksheet.

For each Qtr the Gross Operating Surplus of Private Corporations is apportioned into the various categories of company. Onshore corporation tax is paid by Large Non-Oil Companies and Small Companies to the extent that they are not exempt (i.e. small companies during the transitional introduction of the policy in 2015/16, or in the Alternative Gradual version where the headline rate is greater than 0%).

Large companies pay corporation tax quarterly, three months in arrears, at the rate in force for a financial year (which actually runs from 1 April, rather than 5 April). For these purposes “large” means any company whose annual profits exceed £1.5 million. The tax base for Year Y for Large companies is therefore Year Y-1 Q1, and Year Y Q2, Q3 and Q4. The relevant effective rate is applied to the Large Non-Oil Company Surplus for those quarters and scored as receipts for the Year in which they are paid.

Small companies pay corporation tax annually, nine months after the end of their accounting year. For these purposes “small” means any company which is not “large”. The tax base for Year Y therefore covers a wide span of time, depending upon when the accounting year of the company commences. Therefore the Model distinguishes between the surplus generated in any Qtr by small Q2 companies, small Q3 companies etc. and matches them up to the Tax Year in which the corporation tax would have been paid over.

The Model assumes that once the policy is implemented any company which is ineligible for exemption accounts for tax as a Large Company. In reality there might well be a very small number of medium-sized businesses which would fall outside exemption and remain eligible for annual accounting of corporation tax. Making this assumption would not affect the aggregate amount of corporation tax collected, but it would slightly accelerate the timing of some receipts. It is assumed that this is not material.

To the extent that the Model generates a share of Private Company Surplus for Large Non-Oil Companies which is larger than the OBR forecast, the Model scores higher onshore corporation tax receipts.

### Corporation Tax (b) Offshore

The Model derives this directly from the Economy worksheet.

For each Qtr the Gross Operating Surplus of Private Corporations is apportioned into the various categories of company. Offshore corporation tax is paid by Oil Companies. They account for tax

quarterly, three months in arrears.

The tax base for Year Y for Oil companies is therefore Year Y-1 Q1, and Year Y Q2, Q3 and Q4. The relevant effective rate is applied to the Oil Company Surplus for those quarters and scored as receipts for the Year in which they are paid.

To the extent that the Model generates a share of Private Company Surplus for Oil Companies which is larger than the OBR forecast, the Model scores higher offshore corporation tax receipts.

### Corporation Tax Credits

This relates solely to small companies. There are actually two types of tax credits:

- One form allows small companies to pay corporation tax at a reduced rate. For convenience the Model describes these as “positive credits”. The OBR subsume this item within their overall forecast for Onshore Corporation Tax receipts.
- The other form allows small companies to reclaim tax from HMRC. For convenience the Model describes these as “negative credits”. These sums are covered by the OBR “Corporation Tax credits” item.

Since the item relates only to small companies, the facility will be abolished under the policy. The Model assumes that the tax credits due for 2015/16 arise in relation to accounting periods prior to the implementation of the policy. For Years 2016/17 and afterwards the OBR item is scaled back in line with the Exemption Factor for headline corporation tax rates in the preceding Tax Year (because that is when the credit would have been earned).

Thus, in the Static version of the Model the OBR forecast is reduced to zero from 2016/17, and in the Alternative Gradual version the amount recognised is equal to 80%, then 60%, 40% etc. of the OBR forecast figure.

### Petroleum Revenue Tax

The Model derives this directly from the Economy worksheet.

For each Qtr the Gross Operating Surplus of Private Corporations is apportioned into the various categories of company. Petroleum Revenue Tax is paid by Oil Companies. They account for tax quarterly, three months in arrears.

The tax base for Year Y for Oil companies is therefore Year Y-1 Q1, and Year Y Q2, Q3 and Q4. The relevant effective rate is applied to the Oil Company Surplus for those quarters and scored as receipts for the Year in which they are paid.

To the extent that the Model generates a share of Private Company Surplus for Oil Companies which is larger than the OBR forecast, the Model scores higher PRT receipts.

### Fuel duties

It is assumed that this item is sensitive to GDP. Supporting evidence: Budget EFO Table 4.4 (page 102) which states that fuel duties will be a constant percentage (1.5%) of GDP for 2015/16, 2016/17, 2017/18 and 2018/19. Although para 4.35 (page 103) indicates that the OBR expect the share of GDP represented by fuel duties to fall over time as a result of increased vehicle efficiency and a freezing of the tax rates, para 4.62 (page 114) confirms that receipts will continue to grow. We regard it as uncontroversial that a higher-than-forecast GDP would lead to higher-than-forecast receipts.

The OBR forecast for each Year is scaled by the ratio of New GDP to forecast GDP. Thus, to the extent that increased vehicle efficiency has a material impact on future revenue and has been incorporated into the OBR forecast, that effect is proportionately reproduced.

### Business rates

It is assumed that this item is unaffected by the policy.

Table 4.4 of the Budget EFO (page 102) indicates that business rates would comprise a constant percentage (1.6%) of GDP. Budget EFO para 4.65 (page 115) indicates that the OBR regard the principal driver of revenue as changes in the RPI index. Since the Model assumes that RPI inflation would be unaffected by the policy, no adjustments are made to the forecast receipts.

### Council tax

It is assumed that this item is unaffected by the policy.

Budget EFO para 4.121 (page 136) indicates that the OBR assume council tax will rise after 2015/16 in line with CPI inflation. Since the Model assumes that the OBR forecasts for inflation are unaffected, we are content to carry over the OBR forecast for council tax receipts.

### VAT refunds

It is assumed that this item is unaffected by the policy.

This item records the refund to public bodies (principally central and local government) of the VAT charged on the goods and services they have purchased. This is meant to remove a disincentive to the contracting-out of functions, instead of performing them in-house on a VAT-free basis. The amount of the item is therefore not driven by Private Consumption, but by public spending.

The Model generally assumes that public spending remains unaffected (apart from Job Seekers Allowance, and debt interest, neither of which are VATable).

### Capital Gains Tax (CGT)

The Model derives this directly on the basis of its own assumptions. The OBR themselves assume that CGT revenue is linked to equity prices and that this is in turn linked to GDP (Budget EFO para 4.19, page 95).

#### Key Factor E: what happens to capital gains?

It is assumed that there is a notional pool of chargeable gains for each Year, and that the growth in the value of this pool is sensitive to GDP. The proportion of the pool attributable to exempt disposals of shares in small companies is subtracted and the balance is charged at the effective rate of CGT for that Year.

CGT is paid via the balancing payment under Self Assessment. Therefore receipts in Year Y relate to disposals which occurred in Year Y-1.

### Inheritance tax

It is assumed that this item is sensitive to GDP. Supporting evidence: Budget EFO para 4.19, page 95 (inheritance tax receipts are linked to equity prices, which are in turn linked to GDP). The OBR also link inheritance tax receipts to house price levels and the effect of fiscal drag caused by the failure to increase the nil rate band (Budget EFO para 4.60, page 113).

The OBR forecast for each Year is scaled by the ratio of New GDP to forecast GDP. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced.

## Stamp Duty Land Tax

It is assumed that this item is sensitive to GDP.

SDLT is levied on the sale of houses and thus receipts are driven by a combination of house prices and the number of transactions (Budget EFO box 4.2, page 113). The main driver is almost certainly movements in the house price index, which the Model assumes is unaffected by the policy. However, it is well established that rising GDP has a positive impact on the property market. We regard it as uncontroversial that a higher-than-forecast GDP would lead to higher-than-forecast receipts.

The OBR forecast for each Year is scaled by the ratio of New GDP to forecast GDP. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced.

## Stamp taxes on shares

It is assumed that this item is sensitive to GDP. Supporting evidence: Budget EFO para 4.19, page 95 (equity prices drive stamp duty receipts and are in turn assumed by the OBR to be driven by GDP); Budget EFO para 4.58, page 112 (higher equity prices have caused the OBR to increase their forecast of stamp duty receipts).

The OBR forecast for each Year is scaled by the ratio of New GDP to forecast GDP. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced.

Arguably, the correct measure for changes in stampable transactions would be the growth in the Chargeable Gains Pool which the Model derives for the purpose of forecasting CGT receipts. That measure has a highly elastic reaction to changes in GDP and would produce an even larger increase in stamp duty receipts. However, since that measure is not an OBR forecast, we prefer to make the more conservative adjustment discussed above.

## Tobacco duties

It is assumed that this item is unaffected by the policy.

In reality a general rise in employee compensation would probably lead to a higher level of tobacco purchases, but it is unlikely that there would be a direct relationship. We prefer to make the more conservative assumption that the OBR forecast would not be affected.

## Spirits duties

It is assumed that this item is sensitive to Private Consumption.

The immediate driver of alcohol receipts is the headline rate, combined with longer-term trends in spending patterns (see Budget EFO para 4.63, page 114). However, the Model assumes that there are no other changes in any tax rates over the forecast period. We regard it as an uncontroversial assumption that a higher overall level of Private Consumption would lead to a proportionately larger volume of alcohol purchases and hence duty receipts.

The OBR forecast for each Year is scaled by the ratio of New Private Consumption to forecast Private Consumption. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced.

## Wine duties

It is assumed that this item is sensitive to Private Consumption.

The immediate driver of alcohol receipts is the headline rate, combined with longer-term trends in

spending patterns (see Budget EFO para 4.63, page 114). However, the Model assumes that there are no other changes in any tax rates over the forecast period. We regard it as an uncontroversial assumption that a higher overall level of Private Consumption would lead to a proportionately larger volume of alcohol purchases and hence duty receipts.

The OBR forecast for each Year is scaled by the ratio of New Private Consumption to forecast Private Consumption. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced.

### Beer and cider duties

It is assumed that this item is sensitive to Private Consumption.

The immediate driver of alcohol receipts is the headline rate, combined with longer-term trends in spending patterns (see Budget EFO para 4.63, page 114). However, the Model assumes that there are no other changes in any tax rates over the forecast period. We regard it as an uncontroversial assumption that a higher overall level of Private Consumption would lead to a proportionately larger volume of alcohol purchases and hence duty receipts.

The OBR forecast for each Year is scaled by the ratio of New Private Consumption to forecast Private Consumption for the Tax Year. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced in the new forecast.

### Air passenger duty

It is assumed that this item is unaffected by the policy.

In reality a higher level of GDP and/or Private Consumption would probably lead to a higher number of passenger journeys. However the OBR forecast has been slightly reduced (see Budget EFO para 4.69, page 115). We prefer to make the more conservative assumption that there would be no change. Arguably, to that extent the Model underscores the gains that would be derived from the policy.

### Insurance premium tax

It is assumed that this item is unaffected by the policy.

In reality a higher level of GDP and/or Private Consumption would probably have some effect on receipts. We prefer to make the more conservative assumption that there would be no change. Arguably, to that extent the Model underscores the gains that would be derived from the policy.

### Climate change levy

It is assumed that this item is unaffected by the policy.

### Other HMRC taxes (a) Customs duties

It is assumed that this item is sensitive to Imports. Supporting evidence: HMRC website explaining the circumstances in which taxpayers for liable for duty on bringing certain goods into the UK.

The OBR forecast for each Year is scaled by the ratio of New Imports to forecast Imports for the Tax Year. Thus, whatever factors led the OBR to produce their forecast would be proportionately reproduced in the new forecast.

### Other HMRC taxes (b) Betting and gaming taxes

It is assumed that this item is unaffected by the policy.

In reality a higher level of GDP and/or Private Consumption and/or employee Compensation would probably have some effect on receipts. We prefer to make the more conservative assumption that there would be no change. Arguably, to that extent the Model underscores the gains that would be derived from the policy.

#### Other HMRC taxes (c) Landfill tax

It is assumed that this item is unaffected by the policy.

#### Other HMRC taxes (d) Aggregates Levy

It is assumed that this item is unaffected by the policy.

#### Vehicle excise duties

It is assumed that this item is unaffected by the policy.

In reality a higher level of GDP and/or Private Consumption would probably have some effect on receipts. Total revenue is determined over the long term by the average tax rate between low-polluting and high-polluting vehicles (Budget EFO para 4.70, page 116). We prefer to make the more conservative assumption that there would be no change. Arguably, to that extent the Model underscores the gains that would be derived from the policy.

#### Bank levy

It is assumed that this item is unaffected by the policy.

This tax is levied on certain types of bank liability. The OBR acknowledge that it is difficult to forecast because of the high volatility of the tax base (Autumn Statement EFO para 4.67, page 113). We are content to carry over the OBR forecast unadjusted.

#### Licence fee receipts

It is assumed that this item is unaffected by the policy.

This tax raises funds for the BBC and it is therefore driven by the BBC budget and other factors external to the Model. In line with the assumption that there is no alteration in other government spending, it can be assumed that the OBR forecast would be carried over without adjustment.

#### Environmental levies

It is assumed that this item is unaffected by the policy.

This represents levies to support environmental policies such as the Renewables Obligation, the Warmer Homes Discount, Feed-in Tariffs and the Carbon Reduction Commitment. To the extent that there was any increase in receipts there would be an equal and off-setting increase in spending, mainly through DECC. There is thus no point in adjusting this item anyway.

#### EU ETS auction receipts

It is assumed that this item is unaffected by the policy.

Receipts under this item are driven by the EU carbon price. It is reasonable to assume that the policy would have no effect on that factor. Increased UK GDP might conceivably lead to some upward pressure on permits and hence receipts, but a robust estimate of the effect would be outside the scope of the Model. Arguably, to that slight extent the Model underscores the gains that would be derived from the policy.

## Other taxes

It is assumed that this item is unaffected by the policy.

This item represents a miscellany of revenue streams: (1) Northern Ireland Domestic Rates; (2) Northern Ireland Business Rates; (3) payments of taxes on products to the EU (offset against the “Own-Resources” contribution, so it actually make no positive contribution to public finances); (4) Consumer Credit Act fees; (5) Financial Services Compensation Scheme Levy; (6) other levy funded body receipts; (7) Camelot payments to the National Lottery Distribution Fund; (8) the OFGEM tax on Non-Fossil Fuels Purchasing Agency energy income; (9) Betting Levy; (10) Rail Franchise Premia; (11) the Community Infrastructure Levy; (12) a provision for Tax Litigation Losses; (11) Passport Fees; (12) Lorry road user levy; (13) Other small taxes; and (14) the National Accounts Tax Credits Adjustment,

less Customs Duties.

Possibly some of these subsidiary items might well be affected by a general rise in GDP but the sums involved would not be material.

## Own-resources Contribution to EU

It is assumed that this item would not be affected by the policy.

The “Own Resources” contribution by the UK to the EU Budget is determined by a complex series of mechanisms involving (a) imports duties; (b) VAT revenues, up to a certain proportion of the tax base; (c) Gross National Income; (d) the UK rebate. It is outside the scope of the Model to predict how the policy might cause this net calculated amount to alter.

## Interest and dividends

It is assumed that this item would not be affected by the policy.

This item represents the income derived from the stock of financial assets held by the government, other than through the Bank of England Asset Purchase Facility. The OBR assume that this is driven by their forecasts for interest rates (Budget EFO para 4.76, page 116). Since it is assumed that the policy has no effect upon interest rates, the Model makes no adjustment to this item.

## Gross Operating Surplus

It is assumed that this item would not be affected by the policy.

This item represents the sum of the depreciation of the assets held by General Government plus the operating surplus of public corporations. Depreciation would not be affected by the policy. Conceivably public corporations might generate a higher operating surplus as part of a rise in GDP which generated above-forecast operating surplus for Private Corporations. However, that element is included in the OBR forecasts as part of “Other Income” and the Economy worksheets have been constructed on the necessary assumption that Other Income follows the OBR forecasts. Therefore it would be inconsistent for the Model to score any additional receipts under Government Gross Operating Surplus on the Revenue worksheets.

## Other receipts

It is assumed that this item would not be affected by the policy.

This item represents a miscellany of revenue streams: (1) Central Government rent receipts; (2) local authority rent receipts; (3) Public Corporation rent receipts; and (4) Central Government current transfers from households less (5) local authority rates payments and (6) Public Corporation tax

payments. None of these elements would be altered by the policy.

### APF Receipts

It is assumed that this item would not be affected by the policy.

This item represents interest received by the Bank of England Asset Purchase Facility on the gilts and other instruments acquired through the quantitative easing programme. Neither the capital stock nor the income would be altered by the policy.

## Spending & Debt worksheets

### Total Managed Expenditure (TME)

#### Job Seekers Allowance (JSA)

The adjustment of DWP spending on unemployed claimants is the only point at which increments of employee Compensation are converted into an equivalent number of workers.

For each Qtr the OBR forecasts for private sector and public sector employment are totalled to provide a figure for the total number of employees. This is divided into the OBR forecast for Total Compensation to arrive at a figure for the notional cost of an average worker.

(The OBR do not provide quarterly forecasts, only annual ones – although in the case of private sector employment these come in the form of both calendar and tax year-end projections. It is assumed that the numbers employed in both sectors transition smoothly between each given forecast.)

The surplus of New Total Compensation in the Model over the OBR forecast is converted into a notional number of new hires, after adjusting for any increase in costs due to a rise in wage levels for workers already employed. It is assumed that new workers are hired at the OBR average cost for that Qtr, and that the policy causes no change in wage levels.

The OBR forecast a gradual reduction in the number of public sector employees and a gradual rise in the private sector over the forecast period. A check is then made as to whether for any Qtr the OBR are predicting a surplus of released public sector workers over the number of new private sector employees. If so, the Model assumes that people within this surplus are hired in preference to any unemployed claimants of JSA.

The balance of new hires is then assumed to reduce the number of JSA claimants.

It is clearly unrealistic to assume that the opening number of claimants represents a fixed pool which reduces over the whole forecast period as the OBR and/or the Model indicate an increase in employment. That would overlook changes in the labour market caused by people reaching retirement age and by new school leavers. Equally, it would be misleading to treat the forecast claimant count for each Qtr as a freestanding cohort unaffected by previous new hires.

Instead the Model treats the claimant count at the start of each Tax Year as a fixed pool. As the Model forecasts a given number of new hires, this reduces the claimant count. At the end of the year the Model scores an expenditure saving based on the new number of quarterly claims during the year as a whole compared to the forecast number. So, for example if the figures were:

Forecast DWP cost of JSA for a Year:	£4 billion
OBR forecast claimants for each Qtr:	1.0 million; 1.0 million; 1.0 million; 1.0 million

OBR forecast annual total claims:	4.0 million
Model forecast for claimants:	0.9 million; 0.8 million; 0.7 million; 0.6 million
Model forecast annual total claims:	3.0 million
Model forecast saving:	$\frac{1}{4} \times \text{£4 billion} = \text{£1 billion}$

This is scored as a negative addition to OBR forecast for total government expenditure.

With the start of each new Tax Year it is assumed that a new and separate pool of claimants comes into play and the process recommences. In other words, the OBR forecast claimant count for Year Y Q2 is independent of the Model forecast claimant count for Year Y-1 Q1.

The Model forecasts a much larger number of new jobs being created each year than the OBR. This may be explained by:

- No government has ever carried out a policy change as dramatic as the one envisaged in this exercise (which would take 90% of all companies out of corporation tax).
- To an extent, the assumption that wage levels remain as the OBR forecast artificially inflates the number of new jobs created. In practice it is likely that there would be a faster rise in wage levels and this would scale back the number of new hires proportionately. It is outside the scope of the Model to accommodate such an effect.

Equally, however, the Model assumes that no large employer hires any additional workforce above the numbers forecast by the OBR, even though they would be earning higher profits.

(It would be possible to assume a fixed minimum number of unemployment claimants, say, corresponding to the deemed NAIRU level. As the Model created a theoretical number of new jobs that would force the claimant count below this level an adjustment could instead be carried out to increase wage levels for all workers by the amount of "excess compensation". However, that would imply that wage levels could be increased indefinitely above the OBR forecasts without having any adverse impact on the OBR base case forecast for employment levels – which is clearly nonsense.)

On balance it is preferable to make the arbitrary assumption that wage levels remain unaltered, and allow the Model to rely exclusively upon OBR figures, than to import an equally arbitrary assumption about redundancies caused by higher wage costs and depart from the OBR framework.)

JSA is the only DWP benefit for which an expenditure saving is scored in the Model. In reality the increase in employee compensation which it forecasts would have ongoing consequences for other income-related benefits. To that extent, the Model underscores the gains which would be realised from the policy (and this provides a counterbalance to any potential over-scoring of the saving from a reduction in the unemployed claimant count).

### Debt interest

When the Treasury issues gilts the coupon is typically paid twice yearly at six month intervals. It therefore follows that any new gilts issued during a year would have only half of their annual interest cost paid during the first year of issue. On the other hand, gilts already in existence at the start of that year would have a full year's coupon paid.

This is used to derive a crude effective interest rate for Government debt for each Year:

$$\text{Effective interest rate} = \frac{\text{OBR forecast debt interest cost for Year Y}}{\text{OBR forecast National Debt for Year Y-1} + \frac{1}{2} \times \text{OBR forecast Deficit for Year Y}}$$

Debt interest costs will be higher (or lower) than the OBR forecast to the extent that the excess of

the adjusted TME over the adjusted tax receipts is greater (or lesser) than the OBR forecast Deficit.

The Model adjustment to debt interest cost must be equal to the effective rate x ½ the amount by which the Model Deficit overshoots (or undershoots) the OBR forecast Deficit, i.e.:

Additional cost = effective rate x ½ x (Forecast TME + JSA adjustment – New Current Receipts – Forecast Deficit)

#### Other expenditure

There is no change to any OBR forecast expenditure item.

#### Public Sector Net Borrowing

The New TME will be equal to OBR forecast TME + adjustment for JSA + adjustment for debt interest.

The New Deficit will be equal to New TME less New Current Receipts from the Revenue worksheet.

#### Public Sector Net Debt

It is assumed that New National Debt for Year Y = OBR forecast for Year Y + the overshoot (undershoot) in the Deficit.

In other words any overshoot in the Deficit leads directly to increased Debt, and any undershoot or surplus leads to a lower Debt issue or repayment.

## Appendix A: main assumptions underlying the Model

- There is no change in Government spending, except in regard to Job Seekers Allowance and debt interest, as a result of the policy.
- The OBR forecasts for wage levels, inflation and interest rates are unaffected by the policy.
- The OBR forecasts for the Operating Surplus of Households, the Operating Surplus of General Government, the Operating Surplus of Public Corporations, General Government Fixed Investment, Net Acquisition of Valuables, Change in Inventories, and the two Statistical Discrepancies are unaffected by the policy.
- For any Qtr, under the policy Exports stand in the same relationship to GDP as the OBR forecast for that Qtr.
- For any Qtr, under the policy Imports stand in the same relationship to Total Domestic Demand as the OBR forecast for that Qtr.
- No company eligible as a “small company” under the policy currently pays corporation tax on the quarterly instalment basis, and no company which would be ineligible currently pays corporation tax on the annual basis. This position does not change once the policy is implemented.
- Corporate turnover and company accounting year-end date are independent of each other.
- Small financial services trading companies (as opposed to non-trading investment companies) are not a material proportion of all businesses.
- Business owners pay themselves higher rewards exclusively through dividends.
- New employment is represented by hiring an “average worker” on average wages.
- Once increments in employee Compensation have been scored, employers continue to fund increases on those amounts in line with the OBR forecast for wage rises.
- The policy does not affect what private companies do with the amount equivalent to their after-tax earnings under the current tax regime i.e. the policy is only concerned with what happens to the Tax Saving.
- The difference between the headline rate of corporation tax on small companies and the headline basic rate of income tax, together with the size of the small company sector, determines the value of business which converts from self-employed to company status.
- The National Accounts items Mixed Income and Non-Labour Income constitute the tax base for Self Assessment income tax.
- The effective rates of Self Assessment income tax for 2010/11 and 2011/12 stand in the same ratio as the effective rates of PAYE for those years.
- The OBR forecasts for income tax receipts are net of relief attributable to the EIS (Enterprise Investment Scheme) and VCTs (Venture Capital Trust) schemes.
- The policy would not affect (either positively or negatively) the OBR forecast receipts for tax on savings income; company income tax; Non-Self Assessment repayments; other income tax; tax credits (negative income tax); business rates; council tax; VAT refunds; tobacco

duties; air passenger duty; insurance premium tax; climate change levy; betting and gaming taxes; landfill tax; aggregates levy; vehicle excise duties; bank levy; licence fee receipts; environmental levies; receipts from the EU ETS scheme; Other Taxes; the EU own-resources contribution; interest and dividends receivable by central government; the Government Operating Surplus; other receipts; and Asset Purchase Facility receipts.

- The following tax receipts are sensitive to changes in GDP: fuel duties; inheritance tax; stamp duty land tax; stamp duty on shares.
- The following tax receipts are sensitive to changes in Private Consumption: spirits duties; wine duties; beer and cider duties.
- The following tax receipts are sensitive to changes in Imports: customs duties.
- Capital gains tax (CGT) receipts may be forecast by assuming the existence of a notional pool of chargeable gains whose value is sensitive to changes in GDP.
- The OBR forecast claimant count for each year represents a separate pool of unemployed individuals.
- Any overshoot or undershoot in the OBR forecast for Public Sector Net Borrowing results in a direct and equal increase or decrease in Public Sector Net Debt.
- Interest on Public Sector Net Debt is paid twice-yearly.

## Appendix B: key factors determining the output of the Model

### Factor A: what proportion of companies qualify as small?

The policy operates to exempt small companies with effect from the start of their first accounting year on or after 1 April 2015.

The definition of “small” which applies for the purposes of the policy is taken from the Companies Act 2006 section 382, two out of three of:

1. Turnover of not more than £6.5 million
2. Gross assets of not more than £3.26 million
3. Not more than 50 employees

Oil companies and insurance companies would be excluded because they already have their own taxation regimes. Non-trading investment companies are also excluded.

(Strictly, there is a slight discrepancy. The Companies Act definition automatically excludes all financial services and insurance businesses, but not oil businesses. The policy definition would potentially include a small number of companies trading in the financial services sector. However it is a reasonable assumption that the number of small oil companies and small financial services trading companies is not material.)

It is therefore necessary to distribute Gross Operating Surplus for all Private Companies between the oil sector, small companies and large non-oil companies as these will all receive different tax treatments in the Model.

ONS data can be used to assess the proportion of Surplus attributable to the financial and oil sectors (Source: [DATA ONS1.1](#) and [DATA ONS1.2](#)). Within the non-financial sector the proportion of turnover represented by the oil sector is fairly stable over the period 2004-2013. That allows a robust ten-year average to be used. In regard to the financial sector, the position is confused by the relative explosion in financial services during the boom and its relative collapse following the crash. In that case a longer average from 1997-2013 gives a more reliable estimate.

The Companies Act definition is used to describe eligibility for audit exemption. Companies House produces annual statistics on the number of companies which qualify. It is possible to derive a hard estimate of the total number of exempt businesses, again assuming that small financial services trading companies are not material (Source: [DATA CH1](#)). From the Companies House data a four-year average of the proportion of all companies which qualify as small can be derived.

The Companies House data does not provide an estimate of the aggregate turnover of small companies. It will be possible to derive an estimate from the annual BIS statistics (Source: [DATA BIS1](#), [DATA BIS2](#) and [DATA BIS 3](#)). This data already excludes insurance and financial services businesses. BIS measure “small” by reference to workforce size only, as a business employing 49 or fewer employees. Nevertheless it is possible to derive a three year average of the proportion of company turnover generated by such companies.

The BIS estimate of the proportion of companies which are small allows the turnover estimate to be cross-checked against the Companies House estimate. The BIS data gives a larger proportion (97% compared to 91%). Since the Companies House data is based on a closer definition of “small company” to the one which is used in the policy, the Companies House estimate is considered more reliable. The turnover estimate derived from BIS data therefore has to be reduced proportionately by a “shrinking factor” (approximately  $^{91}/_{97}$ ).

Combining these results it is possible to apportion Gross Operating Surplus for all private companies between Oil Companies, Large Non-Oil Companies and Small Companies.

The policy applies to companies from their first accounting year on or after 1 April 2015. Therefore, at the start of the forecast period in 2015 Q2 some companies will be part-way through an accounting year on which they will still have to pay corporation tax. Only those companies whose accounting year commences in 2015 Q2 will be exempt from tax at the very start of the policy.

Therefore the proportion of Surplus attributed to small companies has to be further allocated according to the accounting year-end of the business. This is particularly relevant for the Alternative Gradual version where in any one Qtr different small companies will be paying tax at different times and thus at different rates.

Companies House provides data on the accounting year-end of all companies ([Source: DATA CH2](#)). It is assumed that turnover and year-end date are independent of each other, i.e. that there is no bias for large companies to favour a particular accounting date over another. This allows the small company sector to be further sub-divided. The Model uses the term “Small Q2 company” to mean a small company whose accounting year starts in Q2 of the calendar, with equivalent terms being used for the other Qtrs.

That allows the initial proportions of Oil Companies, Large Non-Oil Companies, Small Q2 Companies, Small Q3 Companies, Small Q4 Companies and Small Q1 Companies to be derived for the start of the forecast period in 2015 Q2.

However the position is complicated by businesses which convert to company status in order to take advantage of the policy. In any Qtr, a business which becomes a new company will have an accounting year which commences in that Qtr. Thus, at the end of each Qtr the relative proportions of each category of company have to be recalculated so that the total Private Company Surplus derived by the Model can be allocated correctly in the next Qtr.

#### [Factor B: how many businesses convert to company status?](#)

It would be unrealistic to ignore the dynamic impact of unincorporated businesses turning themselves into companies. To the extent that they do so there would be an additional tax loss to the Exchequer, because they would otherwise have been liable for income tax through Self Assessment.

However, it would also be unrealistic to assume that all sole traders will incorporate. Some of them may already be too large to qualify for exemption under the policy. Others might conclude that there is insufficient benefit from conversion (because if the owners intend to extract all of their profit by way of dividend there would only be a minor saving in the form of NIC and this may not be worth the extra administration and compliance). There must be a maximum limit on the amount of potential conversions.

BIS also provide data on unincorporated businesses ([Source: DATA BIS1, DATA BIS2 and DATA BIS 3](#)). This gives a three-year average for the proportion of such businesses which are “small” by reference to workforce size, and the proportion of total turnover which they generate. Under **Factor A** it was deduced that BIS data slightly overstates the number of businesses eligible under the policy. The same shrinking factor is applied to arrive at a maximum limit on the proportion which could convert.

Gordon Brown experimented with a 10% corporation tax band in 2000-2001 and a 0% band in 2002-2005. Only a business with a profit up to £50,000 would have derived any benefit. Nevertheless, at the time HM Treasury expressed dismay at the extent to which businesses were converting into

companies purely from “tax avoidance” motives and eventually the Brown Policy was discontinued. That previous experience provides guidance for modelling potential conversions under this policy.

Unincorporated businesses are recorded in National Accounts statistics as “Mixed Income”. Had businesses converted they would have become recorded in the Gross Operating Surplus of Non-Financial Companies. Comparing ONS data for these two items over the period 1997-2013 ([Source: DATA ONS2](#)) indicates no obvious correlation between them over the time of the Brown Policy.

However HM Treasury data on the cost of the Brown Policy ([Source: DATA HMT1](#)) does indicate that the cost generally exceeded expectation. In theory it is possible that the Brown Policy cost more than expected because company profits as a whole were higher than expected (i.e. the same proportion of a larger cake was taxed at a lower rate, increasing the absolute cost of the lower rate). However this explanation can be discounted, because HM Treasury consistently over-estimated total corporation tax revenues during this period (i.e. the cake was not larger). It is reasonable to conclude that there was a material increase in the number of smaller companies within the corporation tax net as a result of the Brown Policy. That provides a basis for estimating conversion levels for this Model.

It is a necessarily impressionistic judgment, but the increase in the smaller company share of corporation tax would appear to track the difference between the headline basic rate of income tax and the smallest corporate tax rate (i.e. a widening of the differential between income tax and corporation tax encourages more businesses to convert to company status). That would accord with a reasonable expectation.

Comparing the increase in smaller companies with the difference between the two tax rates for every tax year from 1998/99 to 2005/6 (i.e. a period which preceded and covered the Brown Policy) allows a crude average to be derived such that for every 1% difference between the headline rates of the two taxes, there would be an x% increase in the value falling within the smaller companies tax regime.

This method cannot be regarded as robust or justified in theoretical terms. Nevertheless its use within the Model can be defended:

- It is reasonable to expect that the greater the difference between the income tax rate on Mixed Income and the corporation tax rate on company profit, then the greater the incentive to convert a business into a company (even if any precise numerical relationship could not be justified).
- This approach predicts a snowballing of conversions – the larger the existing size of the small company sector, the larger the value which will convert out of Mixed Income (until the maximum limit is reached). Again, it is reasonable to expect a trend effect that as more people do something, the more others decide to copy them.
- This relationship predicts a massive level of conversion out of Mixed Income, and consequently a probably significant dynamic loss of income tax revenue. Since the objective of the Model is to test the viability of the policy, and the relationship makes the policy less viable, use of the derived relationship is a reasonable modelling assumption.

“Underlying Mixed Income”, the value as forecast by the OBR, is used to calculate the limit on conversions to company status. The figure which the Model reports for New Mixed Income is the difference between Underlying Mixed Income and uprated accumulated conversions.

## Factor C: how is the corporate Tax Saving shared?

The amount which small companies would have paid in corporation tax, but now have as disposable resources, could be distributed between four channels:

- (a) Re-investment in the business: paying more Investment
- (b) Hiring extra workforce: paying more employee Compensation
- (c) Increased remuneration for the business owners: paying dividends
- (d) Increased cash balances

The OBR forecasts are based on a model of how companies will react over the forecast period and use their after-tax surplus on employee compensation, investment, paying dividends or holding cash.

It would be possible to derive theoretical formulae by which the Model could describe how small companies used their Tax Saving, but they might not be compatible with the implicit relationships on which the OBR rely. The Model seeks to mimic what the OBR might have forecast had the policy been in force. Thus the Model ought to rely on OBR or ONS data for its projections.

The better approach therefore is to analyse corporate behaviour since 2009 Q1 to derive the marginal propensity of companies to expend cash on dividends, employee compensation and investment.

- This would provide projections based on hard data about how companies have actually behaved, rather than importing external assumptions that could imply radical differences between companies' use of their original after-tax earnings and the new Tax Saving.
- In particular, matching up changes in Private Company Surplus, employee Compensation, Private Investment etc. – especially by identifying corresponding troughs in each item – will allow a judgment to be made about the likely time lag between a company receiving the Tax Saving and expending part of it.
- The reference period would cover a time when the UK economy was not regarded as performing terribly well. That would guard against giving the Model an implicitly over-optimistic stance towards the recovery.
- Since 2010 HM Treasury has been following a policy of reducing headline corporation tax rates. The reference period therefore captures how companies have reacted in an environment of tax cuts.

When a company is exempted from corporation tax (or becomes liable at a lower rate) tax payments are no longer leaving the business and it has greater disposable resources. That is the same as an increase in its Surplus. The Model therefore seeks to estimate the marginal changes in investment, employee compensation and dividends which have occurred following the observed marginal change in Surplus over the reference period. It is assumed that any balance would represent cash reserves.

### Extra investment

Comparing OBR data for Private Investment and Private Company Surplus ([Source: DATA OBR1.1](#)) indicates that on average a trough in Surplus is followed by a trough in Private Investment slightly more than 2 Qtrs later. It would be prudent to assume therefore that there is a 3 Qtrs delay between receipt of the Tax Saving and the payment of extra Private Investment.

The minimum level of Company Surplus occurred in 2010 Q2. The corresponding trough in Private Investment occurred in 2011 Q1. Comparing the changes in both items over the subsequent reference period allows an estimate of the increase in Private Investment that results from a £1 increase in Company Surplus.

#### Extra employee compensation

Private Company Surplus represents the turnover of all private companies less their employee compensation costs. To provide the fairest measure of the marginal change in employee compensation it is therefore necessary to compare it against changes in the total turnover (Surplus + Compensation). The base figure for compensation should also be uprated in line with the rise in wage levels in order to reverse out any rise which represents wage increases to existing employees rather than a genuine expansion in workforce.

Since the Total Compensation figures in the OBR/ONS data represent all employees, it has to be apportioned between public sector and private sector elements on the basis of ONS figures for the numbers employed in each (Source: DATA ONS3). This adjustment takes into account the reclassification of a large number of FE College staff as “private sector” in June 2012.

Comparing OBR data for private sector Compensation and private company combined turnover indicates that employee compensation is very responsive to changes in Surplus. On average a trough in Surplus is followed by a trough in Compensation only slightly more than 1 Qtr later. It would be prudent to assume therefore that there is a 2 Qtrs delay between receipt of the Tax Saving and the payment of extra employee Compensation.

The minimum level of turnover occurred in 2009 Q2. The corresponding reference point for private sector Compensation would be 2009 Q4. Comparing the changes, adjusting for any increase in wage levels over the subsequent reference period, allows an estimate of the increase in employee Compensation that results from a £1 increase in Company Surplus.

#### Extra dividends

It is assumed that owner-managers take their reward solely in the form of dividends. This is a reasonable assumption because it would be far more tax-efficient for them to do so rather than, say, pay themselves additional salary.

The OBR forecasts do not identify company dividends as a separate item. However the National Accounts prepared by the ONS do report Non-Financial Company dividends. That would represent the closest match to the small companies who would be receiving the Tax Saving.

Strictly, the ONS statistic would cover payments by both listed and unlisted companies. Listed companies are known to pay dividends more frequently and at a higher level than unlisted ones, and it is far more likely that the companies receiving a Tax Saving would be unlisted (because they would be smaller).

However, the Tax Saving represents a windfall gain for owner-managers over and above the dividends they would have paid normally under the current tax regime. It is reasonable to assume that owner-managers would take the opportunity of this windfall to reward themselves with a level of dividends comparable to those received by the shareholders of listed companies. This effect is likely to be stronger for the self-employed who convert their business to company status, as they might be more used to treating a larger slice of business profits as personal reward. Since dividends will not have the same direct effect on GDP as employee Compensation or Private Investment, it

would be a prudent modelling approach to allocate a comparatively high proportion of the Tax Saving to dividends, so as not to over-estimate the benefits of the policy.

Comparing OBR data for Private Company Surplus with ONS data for Non-Financial Company Dividends ([Source: DATA ONS1.1](#)) indicates that on average a trough in Surplus is followed by a trough in dividends slightly less than 1 Qtr later. In many cases the troughs coincide, suggesting an immediate cutting of dividends in response to poorer performance. It would be prudent to assume therefore that there is a 1 Qtr delay between receipt of the Tax Saving and the payment of extra dividends.

ONS data indicates that Non-Financial Company dividends follow a relatively stable proportion of Private Company Surplus. The average over the period 2009-2013 can therefore be used to derive an estimate of the increase in dividends that results from a £1 increase in Company Surplus.

### Combining the three estimates

Added together the three estimates suggest that an extra £1 of Surplus in Qtr Q would lead to:

Extra Dividends	£0.316	In Qtr Q+1
Extra Compensation	£0.568	In Qtr Q+2
Extra Investment	£0.935	In Qtr Q+3
Total	<u>£1.820</u>	

This could be defended theoretically as a situation in which a £1 Tax Saving encouraged the business to spend an additional 82p out of accumulated reserves, or from additional borrowing. However, to sustain that argument it would be necessary to reconstruct small company balance sheets in order to check that such funds were available. It is simpler, and a more prudent approach, to scale back each component proportionately to arrive at a total of £1, i.e:

Extra Dividends	£0.174	In Qtr Q+1
Extra Compensation	£0.312	In Qtr Q+2
Extra Investment	£0.514	In Qtr Q+3
Total	<u>£1.000</u>	

The objection might be made that this does not leave any amount for cash reserves. In practice, however, the business would be holding higher cash reserves. A Tax Saving of £1 received in Qtr Q would not be fully expended until Qtr Q+3. Over that period, the cash held by the business would have increased by the unexpended amount of the first Tax Saving, and would be further topped-up by the Tax Savings for the Qtrs Q+1, Q+2 and Q+3. To the extent that any business opted to hold a fixed proportion of its turnover in cash, it would be doing so out of its after-tax earnings under the current tax regime. That would be incorporated in the original OBR forecasts, and the Model is not concerned with those amounts.

It might be argued that some provision should be made for a labour-substitution effect i.e. that a business which undertook capital expenditure on plant and equipment would need fewer staff and would therefore make redundancies, or hire new staff at a slower rate. If the Model were attempting to devise an idealised and theoretical prediction of how businesses react there might be some force in this criticism. However the apportionments derived above are taken from the real marginal changes in the private company sector over a four year period – and then scaling them back. It is reasonable to assume that any labour-substitution effect has been priced into the allocation proportions and that they represent net changes.

The potential responses, the order of preference and their timing is defensible. It is reasonable to assume that owner-managers would respond to a Tax Saving windfall by firstly rewarding themselves, then by hiring additional staff (whose cost could be curtailed by making them redundant in the event of a downturn), and only lastly undertaking irretrievable capital expenditure (when the business has received four Qtrs of windfall gain).

#### Factor D: how much extra consumption spending would there be?

The “marginal approach” followed for Factor C is also the appropriate method for estimating how much of the extra dividends and the extra employee Compensation flows through to higher Private Consumption.

Comparing Household Disposable Income ([Source: DATA OBR1.6](#)) to Private Consumption ([Source: DATA OBR1.1](#)) indicates that both rose steadily over the period 2009-2013, with only Consumption demonstrating a single fall (from 2009 Q1 to 2009 Q2). However on average a fall in the rate of growth of Household Disposable Income is followed by a fall in the rate of growth of Private Consumption slightly less than 1 Qtr later. It would be prudent to assume therefore that there is a 1 Qtr delay between receipt of additional disposable income by households and an increase in Private Consumption.

A “marginal approach” for the changes in both Household Disposable Income and Private Consumption over the reference period 2009-2013 estimates there would be a 98.8p increase in Private Consumption from a £1 increase in household income.

Alternatively, over the same period, the average level of Private Consumption is 96.4p for every £1 of Household Disposable Income.

The Model is deliberately constructed on a conservative basis. Choosing the lower, averaged estimate will undercount the amount of extra consumer spending, and thus the impact on GDP and tax receipts. This estimate is applied to the after-tax value of new income (i.e. dividends less Self Assessment income tax and Compensation less PAYE, Employees’ NIC and Employers’ NIC) in order to derive the new Consumption spending.

Two criticisms could be made of the way in which the Model forecasts changes in consumption.

Firstly, it might be objected that the Model aggregates consumption by owner-managers of companies and their employees, and that in reality these groups would have different spending habits.

That is a reasonable objection. The Model is forced to follow the approach it does because of limitations in the source data. OBR/ONS figures aggregate all UK households and do not distinguish between categories of earner.

Secondly, it might be objected that the Model still over-estimates the amount of extra consumer spending that would be made by households.

The OBR assume that the saving ratio will fall from 4% in 2014 to around 3% in 2018 (Budget EFO para 3.95, page 67). The Model implies a marginal saving ratio of 3.6%, which is in the midpoint of this range. It is therefore consistent with the OBR forecasts.

#### Factor E: capital gains

The OBR assume that the level of CGT revenue is driven by the stock market, and thus their projections for its movements will affect their projections of CGT receipts: “Equity prices are a

significant determinant of capital gains tax, inheritance tax and stamp duty receipts. Equity prices are assumed to rise from their current level in line with our forecast for nominal GDP. The current level is determined by the average closing price of the FTSE All-Share Index over the ten working days to 27 February 2014.” (Budget EFO, para 4.19, page 95). In other words, OBR assume that GDP growth drives CGT receipts.

The Model assumes that there is in each year a notional pool of chargeable gains from which CGT is collected (in the following Tax Year) and that the value of this pool is sensitive to changes in GDP. Therefore it is necessary to (a) estimate the starting value of the pool; (b) decide how the pool value alters over time; and (c) estimate the impact on CGT revenues of the exemption of small company shares. Deriving this key variable from 2009-2013 data and projecting it forward across 2015-2018 is unavoidable, because although it does introduce a risk of unreliability the dynamic loss of CGT revenue could have a material impact on the viability of the policy. The Model must therefore reflect this impact in some form.

#### Initial value of the chargeable pool

Under the policy three main reliefs against CGT will be abolished: Entrepreneurs’ Relief (which allows certain gains to be taxed at 10% instead of headline rates of 18%/28%); EIS (Enterprise Investment Scheme, which permits income tax relief and CGT exemption on investment in certain small trading companies); and VCTs (Venture Capital Trusts, which permits income tax relief and CGT exemption on investment in listed vehicles which in turn invest in certain small trading companies).

HMRC produce data about the cost of EIS and VCTs ([Source: DATA HMRC1](#)) and also about the level of new investments in both schemes ([Source: DATA HMRC3](#) and [DATA HMRC4](#)) from which the income tax element of the schemes’ cost can be assessed. The remaining CGT cost allows an estimate of the chargeable gains attributable to EIS and VCTs which would otherwise have been subject to CGT.

HMRC produce data about the cost of Entrepreneurs’ Relief ([Source: DATA HMRC1](#)) and also about the level of gains eligible for the relief ([Source: DATA HMRC5](#)). These can be combined to derive an estimate of the chargeable gains which would otherwise have been subject to CGT in full.

Combining these results with HMRC data on the actual chargeable gains within CGT for each year ([Source: DATA HMRC2](#)) permits an estimate of the gross value of the notional pool of chargeable gains to be made.

#### The growth of the chargeable pool

The previous steps have produced estimated gross pool values for Tax Years 2008/9, 2009/10, 2010/11 and 2012/13 (CGT data is always later in arriving because the liability for Year Y is not paid until January in Year Y+1, so the most recent figures refer back to earlier times than is the case with other tax data).

An annual compound growth rate for the pool from 2008/9 to 2012/13 can be derived and compared to the equivalent annual growth rate for GDP. For consistency the measure chosen for this comparison is the same as is used in the Economy worksheets, GDP at market value on the Current Prices basis. No adjustment for the effects of inflation in the value of this GDP measure is made because CGT for individuals is charged on nominal gains without adjusting for the effect of inflation on asset values.

The annual growth rate for the notional chargeable pool over this extended period is approximately x3.5 that of GDP. It is therefore assumed that this can be used to generate values for the notional

chargeable pool for each of the subsequent years covered by the forecast period.

### The effect of the policy

The exemption of small company shares from CGT represents a considerable potential tax loss. The size of that loss will be determined by the proportion of all capital gains in any year which are derived from shares in companies which qualified as small at the time of acquisition.

HMRC provide data on the annual gains made from different asset classes ([Source: DATA HMRC6.1, DATA HMRC6.2 and DATA HMRC6.3](#)), one of which is “unlisted shares” and from which a three-year average can be derived.

The shares exempted under the policy would fall within this category. (Potentially, an investment could be made in a small company which grew in value and eventually achieved a stock market listing, but it is reasonable to assume that within the forecast period such businesses will not represent a material quantity.) However not all unlisted companies will be “small”, so the three-year average should be adjusted downwards. A shrinking factor was used under **Factor A** in these circumstances, and it is applied here for the same reasons.

Thus the Model projects forward an annual value for the notional chargeable pool. It is assumed that in each year a fixed proportion, determined by this adjusted percentage for unlisted companies, is exempt from CGT and that represents the dynamic cost of the policy. The balance of the pool is charged at the effective rate of CGT to derive the forecast CGT receipts.

### Adding back income tax relief

EIS and VCTs offer investors income tax relief, with a cost to the Exchequer. It is reasonable to assume that the OBR have incorporated such a cost into their forecasts for income tax receipts.

Under the policy this tax relief will be abolished. From the HMRC data it is possible to equate the cost reported cost from 2009/10 to 2011/12 to an average proportion of the notional chargeable pool. This proportion can then be used to generate an additional income tax receipt (scored within Self Assessment) for each future Tax Year.

### Tax Rates

The Model derives the effective tax rates for the principal revenue streams by matching up the OBR forecast receipts against the OBR forecast for the GDP component or other item which would suffer the tax in question. The calculation takes account of the timing of the payment of tax, and thus differences between the time when the tax is scored as a receipt and the time when the underlying taxed value is generated.

Since most of the GDP components are scored inclusive of tax (e.g. Compensation is inclusive of PAYE and NIC) the Model generates “inclusive rates” (e.g. an item priced at £100 + VAT at the full rate of 20% would cost £120, but the inclusive rate of VAT on £120 of consumer spending would be  $\frac{20}{120}$  or 16.7%).

Where there is insufficient data to derive the rate of a tax for a particular year, it is assumed that the rate is equal to the latest derived value.

### Corporate taxes

Item suffering tax: Gross Operating Surplus of Private Companies.

Taxes suffered: Onshore corporation tax; offshore corporation tax; Petroleum Revenue Tax.

Timing of the tax: large companies (those with annual profits in excess of £1.5 million) pay quarterly,

with the payment being made in the next quarter; small companies pay annually, nine months after the end of their accounting year. Small companies are also eligible for a form of tax credit, either “positive” (which permits them to pay at a reduced rate on part of their profits) or “negative” (which enables them to reclaim a tax repayment).

Thus, the aggregate Private Company Surplus scored by the OBR for any Qtr would be taxed at different times and at different rates depending upon (a) the business sector of the company; (b) the size of the profits it generates; (c) its accounting year-end.

Under **Factor A** the initial proportions of Oil Companies, Large Non-Oil Companies and four categories of Small Company distinguished by accounting year-end are derived for 2015 Q2. On the assumption that these proportions remain constant, and that all “non-small” companies pay corporate taxes quarterly, it is possible to take the OBR forecast for Private Company Surplus for each Qtr, divide it into a share for each category of company and then match it up with the forecast receipts.

These are reasonable assumptions because the proportion of medium-sized companies, and their share of overall Surplus, which would be eligible for annual payment of corporation tax is unlikely to be material. ONS data ([Source: DATA ONS1.1](#)) indicates that the Oil share of total Surplus is reasonably stable over ten years, and BIS data ([Source: DATA BIS1, DATA BIS2 and DATA BIS3](#)) suggests that the proportion of turnover generated by “small” companies, on a slightly different definition, is stable over three years.

**Factor B** assumes that the conversion of businesses to company status is driven by the difference between the headline rates of small company corporation tax and basic rate income tax. For the OBR base case forecast both taxes would be set at 20%. Therefore it is reasonable to ignore the possibility of conversions and assume, in deriving the effective rates of corporation tax, that the initial proportions of the different categories of companies do not change.

The National Accounts measure Gross Operating Surplus of Private Corporations does not equate exactly to “profit”. It actually represents turnover less employment costs. However, it will correspond fairly closely to the aggregate profits of all companies.

The effective rates for Oil Companies (combined) and Large Non-Oil Companies are roughly equivalent at the start of the forecast period, but those for Oil fall over time. This accords with the OBR expectation of reduced future receipts due to a combination of increased tax-deductible capital expenditure (Budget EFO para 4.52, page 111) and lower expected oil prices (Budget EFO para 4.55, page 112). As would be expected, the effective rate for Small Companies is much lower. The initially higher rate at the start of the forecast period reflects the reduction in the headline rate carried out by the Coalition (the length of time it takes for such changes to take full effect).

### [Employment taxes](#)

Item suffering tax: Total Compensation of Employees

Taxes suffered: PAYE; Employees’ NIC; Employers’ NIC

Timing of the tax: PAYE and employment NIC are collected monthly through the payroll. There is therefore a direct match between the amounts of Compensation scored for the four Qtrs of a Tax Year and the receipts. (Strictly, since the tax year commences on 6 April, there is a few days’ discrepancy but that is not material.)

NIC rates are more or less constant over the forecast period, which indicates that the Model is

following an approach similar to the OBR. The Employees' NIC rate jumps in 2016/17 because of the ending of "contracting-out", a pensions planning process which allowed employees to enjoy a lower NIC rate. The PAYE rate rises gradually over the period because of fiscal drag effects. See Budget EFO para 4.42, page 108, in both cases.

### VAT and consumption

Item suffering tax: Private Consumption

Taxes suffered: VAT (with separate adjustments on the Revenue worksheets for other excise duties)

Timing of the tax: VAT is generally collected quarterly on output tax less input tax over that quarter. There is a slight timing discrepancy in that VAT in respect of the last month of Tax Year Y would be collected in the first Qtr of Tax Year Y+1. This is taken into account in deriving the effective rates.

The effective rate in each year is much lower than the headline value of 20%. That is a reflection of the fact that not all consumption is VATable at the full 20%. Some items are exempt (e.g. insurance and finance), some items are zero-rated (e.g. children's shoes), some items are charged at a reduced rate of 5% (e.g. domestic fuel and power) and traders with an annual turnover below £79,000 do not have to levy VAT. The fall of the effective rate over the forecast period is consistent with the OBR expectation that the proportion of consumer spending which attracts the full standard rate will fall over time (Budget EFO para 4.47, page 109).

### Self Assessment

Item suffering tax: Non-Labour Income + Mixed Income

Taxes suffered: income tax on dividends and self-employment

This is the most difficult of the effective rates to derive, due to problems surrounding (a) identification of the appropriate tax base; and (b) matching receipts to the tax base.

### Issues involving the tax base

Self Assessment covers all income apart from employment (which is taxed under PAYE) and some forms of deposit saving (which is taxed by deduction at source and which the Model assumes is not affected by the policy). There is no single item in the OBR forecast which corresponds to this tax base. The closest proxy would be to combine Non-Labour Income and Mixed Income.

Non-Labour Income ([Source: DATA OBR1.6](#)) covers (1) operating surplus of households + (2) net property income (e.g. dividends, rent) + (3) imputed social contributions — (4) employee social contributions (pensions and NIC) — (5) social benefits (use) + (6) net miscellaneous transfers. Clearly, elements within this item will be subject to income tax, and equally clearly others will not. The unavoidable modelling assumption has to be made that these other items constitute a fixed amount of ballast which merely lowers the effective rate and does not distort the projected revenue.

This modelling stance can be justified by reference to the constituent elements of Household Disposable Income. In the National Accounts this represents three components:

- Labour Income, which in turn equals Total Compensation of Employees + Mixed Income – employer social contributions
- Non-Labour Income
- Net Benefits and Taxes

Total Compensation is taxed under PAYE. If Mixed Income and Non-Labour Income are not both

taxed together under Self Assessment then it is not clear where they would be taxed.

#### *Matching receipts and liabilities*

Self assessment is paid in three tranches. For example, with 2013/14:

- First Payment on Account: 31 January 2014 (payment equal to 50% of the 2012/13 tax liability)
- Second Payment on Account: 31 October 2014 (payment equal to 50% of the 2012/13 tax liability)
- Balancing Payment: 31 January 2015 net payment/reclaim of the final amount for 2013/14.

(Exceptions: annual tax liability is less than £1,000 or more than 80% of liability is collected by deduction at source e.g. PAYE.)

It follows therefore that the total Self Assessment receipts in any Tax Year relate to different periods, none of which is actually the Tax Year in question.

Receipts for Tax Year Y represent the sum of:

- 50% of the liability for Tax Year Y-2
- 50% of the liability for Tax Year Y-1
- the difference between the liability for Tax Year Y-2 and Tax Year Y-1

This resolves to the formula:

$$\begin{aligned}\text{Receipts for Year Y} &= 1\frac{1}{2} \times \text{Liability for Year Y-1} - \frac{1}{2} \times \text{Liability for Year Y-2} \\ &= 1\frac{1}{2} \times \text{Tax Base Y-1} \times \text{Rate Y-1} - \frac{1}{2} \times \text{Tax Base Y-2} \times \text{Rate Y-2}\end{aligned}$$

The receipts for each year are known, since they are taken from the OBR forecasts, and the tax base can be assumed to be the sum of Mixed Income and Non-Labour Income (both forecast by OBR). However it is still not possible to derive any of the effective tax rates unless the first rate in the chain is known.

The dilemma is resolved by making the arbitrary modelling assumption that the Self Assessment rate for 2011/12 stands in the same relation to the Self Assessment rate for 2010/11 as the equivalent PAYE rates for those years. These rates apply to years sufficiently in advance of the forecast period that any adverse consequences of importing an incorrect rate should be smoothed out by the passage of time (although they cannot be entirely eliminated).

#### *Capital gains*

Item suffering tax: the notional pool of chargeable gains (which the Model generates itself)

Tax suffered: CGT

Timing of the tax: CGT is paid via the balancing payment under Self Assessment. Therefore tax on capital gains in Tax Year Y would not be paid until January in Tax Year Y+1. The notional pool is derived under **Factor E** and carried forward at a rate driven by the OBR forecast for GDP. Pool values are then matched up with forecast receipts to derive effective rates.

The headline rates for CGT are 18% and 28%, depending upon whether the taxpayer suffers income tax at the higher rate. All of the effective rates fall between the headline rates, suggesting that gains are being realised by a mixture of higher-rate and basic-rate taxpayers. That is consistent with what would be expected.