Forecasting the Public Finances in the Treasury

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Abstract

This article describes the methods used by the Treasury and other government departments for making forecasts of the public finances. A highly detailed approach is required because of the Treasury's budgetary role, but the aggregated results are subjected to careful 'top-down' checks. Forecasts have a necessary role in fiscal policy. But they are subject to large margins of error, and should be presented and used with caution.

JEL classification: E6, H1, H6.

I. INTRODUCTION

Forecasting the public finances has a much longer history than economic forecasting. Estimates, in some form, of government spending and receipts for the year ahead have been published in the 'Red Book of the Exchequer' since the nineteenth century. Before the late 1960s, attention focused on the traditional accounts of central government, with their somewhat confusing distinctions between 'Above the Line' and 'Below the Line' items; but over the past 30 years, prominence has been given to the borrowing requirement of the whole public sector — including local authorities and the nationalised industries — on a 'national income' basis.

Following the transfer of the Economic Section from the Cabinet Office to the Treasury in the early 1950s, the Treasury also took on responsibility for economic forecasting, with separate but linked exercises for world economic prospects, UK

national income forecasts, balance of payments forecasts, financial forecasts and medium-term assessments. These various exercises were gradually unified, and a single econometric model was eventually adopted for both short-term forecasts and medium-term projections of the economy and public finances.

Publication of short-term forecasts started on a regular basis in the 1968 'Red Book'. Since 1975, the Industry Act has required the Treasury to publish two forecasts a year. Short-term forecasts, covering both the economy and the public finances, have continued to be published at Budget time; the second of the year's Industry Act forecasts appeared in the *Economic Progress Report* (1976–81), the *Autumn Statement* (1982–93), the *Summer Economic Forecast* (1994–96) and last November's *Pre-Budget Report*.[1]

Industry Act forecasts typically look two years ahead. Since 1980, the 'Red Book' has also included medium-term projections of the public finances. These are rather different in character from the short-term forecasts: they are much less detailed and are based on stylised economic assumptions which abstract from the course of the business cycle.

Section II briefly explains the organisation of forecasting in the Treasury and the part played by other government departments, particularly Inland Revenue and Customs and Excise. The paper goes on to discuss, in Section III, the role of short-term forecasts and medium-term projections in policy. Then Section IV describes the methods used. It emphasises the importance for short-term forecasting of monitoring the latest information on government borrowing, tax revenues and spending. The various models used are briefly described, including the Treasury's macroeconomic model, which provides the framework for bringing all the economic and public finances forecasts together in a consistent way, and the detailed models used by the revenue departments to forecast individual taxes. The role of judgement is discussed, as is the use of simpler, very aggregative models to provide a check on the forecasts built up from detailed tax and spending components. Section V describes how the forecasts are monitored, to help assess whether they are on track. Finally, Section VI discusses the 'forecastability' of the PSBR and examines the accuracy of the Treasury forecasts and the information they contain.

II. ORGANISATION OF FORECASTS

Around 10 economists and statisticians in the Treasury's Public Sector Finances Team (PSF) contribute to the forecasts of the public finances. They work on forecasts for less than half of the year, and are also responsible for compiling the data on the central government borrowing requirement (CGBR), and for monitoring and analysing the latest public finances statistics and briefing Ministers on them. They also undertake the wide range of tasks carried out by

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[1] All the published forecasts up to 1993 are collected together in HM Treasury (1993).

most other Treasury officials (dealing with Parliamentary Questions and ministerial correspondence, representing the UK in discussions with international organisations, and so on). Another team of similar size (the Economic Prospects Team or EP) is responsible for preparing the forecasts of the economy and for maintaining and developing the Treasury's macroeconomic model.

A number of other government departments contribute to the forecast: in particular, Inland Revenue and Customs and Excise provide detailed, tax-by-tax projections of revenues. Care is taken to ensure consistency between these tax projections and the Treasury's economic forecasts. Tax forecasting procedures are discussed in Section IV. But briefly, the first step is for the Treasury to prepare a preliminary economic forecast using its macroeconomic model and to send the revenue departments projections of the economic variables (for example, consumers' expenditure, profits and wages and salaries) that they require to run their models. The detailed tax projections made by the revenue departments are discussed with Treasury colleagues, and an agreed set of more aggregative tax variables are entered into the Treasury macroeconomic model, which contains some (fairly simple) tax equations. These tax variables then iterate as the economic forecast evolves. Towards the end of the forecast round, a revised set of economic forecasts is sent to the revenue departments, which rework their detailed tax projections.

It is natural to ask why the Treasury goes through these rather complicated procedures to forecast taxes in great detail, when all it needs for fiscal policy purposes is the bottom line — the budget deficit. In some cases, disaggregation helps to increase the precision of the forecasts. For example, corporation tax payments cannot be modelled at all satisfactorily at an aggregate level because they depend so much on the distribution of changes in profits and allowances across companies. Also, detailed knowledge of the latest payments and the impact of legislation or special factors on tax revenues can be incorporated for each tax as needed. More fundamentally, however, the need for detail arises because the Treasury has a budgetary role as well as a macroeconomic policy role. A detailed presentation of the public finances in the 'Red Book' is required to show how the Budget 'adds up': how the individual measures taken have affected the fiscal prospects. In this respect, the Treasury, as a finance ministry, is different from other economic forecasting organisations, which only need to forecast some key fiscal aggregates and can choose the level of disaggregation that best suits this purpose.

III. THE ROLE OF FORECASTS IN FISCAL POLICY

It has long been questioned whether forecasts are reliable enough for fiscal 'fine tuning'. Their main role these days is to help assess whether the public finances are on a sound and sustainable footing, and to provide timely warning when they are moving off course.

The July 1997 Budget laid down two complementary rules: the golden rule, whereby the government will only borrow to invest and not to fund current spending, and the rule that public debt will be held at a stable and prudent level as a percentage of national income. These rules apply over the economic cycle and would not be expected to hold exactly in each and every year.

Tax and expenditure decisions cannot be easily reversed and often have consequences stretching years ahead. So a view of fiscal prospects over the medium term is needed to judge whether the public finances are consistent with the golden rule and a prudent debt ratio. This view informs the decision on whether tax rates or public expenditure totals need to be changed in the Budget. If the current position is judged inconsistent with the government's fiscal objectives, the projections provide a basis against which to monitor progress towards putting the public finances back on a sound, sustainable path.

However, there is no simple or automatic link between forecasts and policy decisions. If the PSBR (public sector borrowing requirement) forecast for the year ahead were revised down by £1 billion, there would be no *necessary* presumption that taxes would be cut or government spending raised by £1 billion. Error margins are large and relatively small changes in the forecast figures for any year are typically of little significance. Consideration is given to major risks to the projections. For example, at the time of the July 1997 Budget, there was considerable uncertainty about the cyclical position of the economy. The main projections assumed that output was close to its trend level. But it was recognised that this assumption could be seriously wrong and, to test the robustness of the conclusion that fiscal policy was on track to meet the government's objectives, cyclically-adjusted measures of the deficit were computed on the alternative, more pessimistic basis that output was already significantly above trend.

The PSBR, while still important, is no longer the key focus of fiscal policy that it was during the 1980s. The golden rule emphasises the distinction between public investment and current expenditure, and attaches importance to the position on current account. The government's second fiscal rule relates to the public debt ratio — which is roughly the stock counterpart of the PSBR. There is also increasing interest in the public sector's overall balance-sheet position, allowing for its physical assets as well as its financial assets and liabilities; this is poorly measured currently in the National Accounts, but the data now being collected by government departments for Resource Accounting and Budgeting should eventually improve the quality of the balance-sheet statistics. The European Union excessive deficits procedure relates to the internationally comparable general government financial deficit (GGFD) which, unlike the PSBR, excludes borrowing by public corporations and is (mainly) on an accruals rather than a payments basis. There are therefore a range of related, flow and stock, concepts that the Treasury needs to forecast on a consistent basis.

IV. FORECASTING METHODS

The Treasury relies mostly on a 'bottom-up' approach, whereby forecasts of government deficits and borrowing are built up from forecasts of each of the individual taxes and non-tax receipts that make up total general government receipts (GGR), and from each of the main components of total general government expenditure (GGE). The paper outlines the forecasting methods for government receipts and spending separately, starting with receipts.

1. Government Receipts

The public sector receipts section of the Treasury's macroeconomic model has 44 behavioural or technical relationships, and 20 exogenous variables. Most of the behavioural tax equations express the tax yield as some function of the tax base *times* the tax rate, where the tax base is proxied as closely as possible by appropriate income or expenditure variables on the model.

As the Treasury model is designed to simulate the effects of changes in policy instruments as well as to forecast, most major tax rates and allowances are identified. Some equations are highly non-linear; for example, the main income tax equation uses the gamma distribution $n(x)=Ax^2\exp(-BX)$, where $n(x)$ is the number of taxpayers with income x, and the parameters A and B are defined in terms of the number of employees and the level of average earnings.

Reflecting the wide range of economic transactions covered by the tax system, and hence the heterogeneity of tax bases, it is considered necessary to have a reasonably disaggregated treatment of tax receipts. For example, income tax is modelled by four behavioural equations, covering PAYE, taxes on self-employment income, net company tax on investment income, and other (net) taxes on personal incomes (including tax on bank and building society interest (TOBBI) and tax relief on mortgage interest payments). Similarly, corporation tax is modelled by equations for advance corporation tax (ACT), onshore mainstream corporation tax (MCT), North Sea corporation tax, and payments of taxes on company gains.

Despite various slimming exercises, which reduced the total number of variables from over 1,000 in the late 1980s to about 350 currently, the Treasury model continues to have well-defined income and expenditure accounts, which provide the tax bases for the direct and indirect taxes, respectively. The model also has behavioural equations for equity and house prices, which provide the tax bases for capital taxes, such as capital gains and inheritance tax, and stamp duty.[2]

Inevitably, however, the complexity of the tax system is such that some of the model equations do not perform particularly well. Corporation tax is especially

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[2]For a recent description of the Treasury model, see Chan, Savage and Whittaker (1995). A full description and listing of all the equations is given in the 'HM Treasury Macroeconomic Model Documentation', updated annually and available from the Treasury.

difficult to model using macroeconomic variables. For example, companies can set off past losses and interest payments against their taxable profits, and allowances and tax losses reduce the aggregate tax yield. The impact of these factors varies through the economic cycle, which in part explains the volatility of corporation tax receipts. For example, the corporation tax yield fell by 30 per cent in the three years to 1993–94, but then recovered by almost 90 per cent in the following three years. In addition, the National Accounts definition of gross trading profits does not correspond with taxable profits. For these and other reasons, there is no clear relationship between the tax yield and National Accounts measures of companies' gross trading profits.

The Treasury relies a great deal on the expertise of Inland Revenue and Customs and Excise, which maintain forecasting models for each of their taxes. The corporation tax and North Sea oil models are by far the most complex. Both are micro-simulation models based on, respectively, the taxpaying history of a sample of about 15,000 non-North-Sea companies (including all of the largest 3,000 firms) and all companies operating in the North Sea. For corporation tax, many very large companies, such as the privatised companies, are modelled separately, using company-specific assumptions about their future prospects. The models are used both for forecasting and for costing the effects of proposed Budget measures (see Eason (1993)).

The income tax regime is probably as complex as the corporation tax one. For example, the self-employed have to follow similar rules to companies when computing their profits, and can also claim capital allowances and set off losses in much the same way, but, like all other income tax payers, their tax bill depends on a complicated regime of rates and personal allowances. The tax due on self-employment profits made by a partnership will hence depend on how these profits are shared between the individual partners, who may have very different marginal tax rates. Fortunately, however, there is much less volatility from year to year in income tax receipts from employment, largely collected under PAYE, and most of Inland Revenue's income tax models are consequently much smaller (although here, too, micro-models are in use, in particular to estimate the impact of the indexation of allowances and tax bands on PAYE receipts).

Each of the excise duties — on alcohol, fuel and tobacco — is modelled as part of a consistent system of equations, with cross-elasticities of demand that allow consumption of beer, for example, to be a function not just of the price of beer but also of the price of close substitutes, such as cider and spirits. Some other taxes are forecast using single behavioural equations which have explanatory variables that are not included in the Treasury's macroeconomic model. For example, Customs' VAT equation includes the number of registered traders as an explanatory variable to allow for past increases in the real registration threshold.[3]

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[3]It has proved very difficult in recent years to model and forecast VAT receipts, partly because of the expansion of tax planning and avoidance and a worsening of traders' compliance. These problems are discussed in HM Treasury (1997a).

All the revenue departments' models are more sophisticated and detailed than would be possible to incorporate within the limitations of a (medium-sized) macroeconomic model of the economy. However, the use of separate models for different taxes inevitably has implications for our forecasting procedures. A typical forecast follows the pattern outlined below.

The Treasury's Economic Prospects Team (EP), which is responsible for the domestic forecasts other than of the public finances, produces a preliminary forecast base using the Treasury model. The tax determinants from that base are given to the revenue departments, which produce consistent forecasts for each of their taxes. This process usually takes about five working days. In the mean time, the economic forecast will have moved on. The revenue departments' tax forecasts are simulated on the original base in order to calculate the implicit residuals on the Treasury model tax equations. Given these residuals, movements in the tax determinants, away from the figures initially sent to the revenue departments, are reflected in the forecasts of tax yield. This procedure will be repeated at least once, at a time when the domestic forecast is close to being finalised, so that the final tax forecasts do not iterate too far away from the numbers forecast by the revenue departments.

During this period, the tax forecasts of the revenue departments will be discussed with counterparts in the Treasury, who perform a 'challenge' role. This is often based on alternative forecasting methods, including the use of 'top-down' analysis. At the end of the discussions, the forecasts for each tax are agreed between the Treasury and the revenue departments, so that they are jointly owned.

The application of 'top-down' checks guards against the risk — with such a highly disaggregated approach — of losing the wood for the trees. To give an example of such checks, Inland Revenue's forecast of total income tax receipts is converted into a forecast of the effective tax rate, using the Treasury's forecasts of wages and salaries as the tax base. The forecast effective tax rate can then be split up into components that reflect the effects of real fiscal drag (the tendency, because of the progressivity of the tax system, for tax receipts to grow faster than GDP as real GDP grows), the impact of all previous Budget measures over the period and an underlying component (the residual). The profile of the underlying effective tax rate can then be assessed for consistency with the forecasts of other tax determinants, such as the level of employment and the growth of average earnings. (For a given level of wages and salaries, the income tax yield will be higher the lower is the level of employment. This reflects the impact of the single and married person's tax allowances on the average tax rate.)

Treasury forecasters also check that the aggregate forecasts of tax revenues appear plausible, viewed against expected movements in the aggregate tax burden (the ratio of total tax accruals to GDP). Expected movements in the tax burden take into account the effects of Budget measures, real fiscal drag and the effects of the economic cycle. Published Treasury research (see HM Treasury (1995))

suggests that the tax burden rises by about ¼ percentage point after two years, for every 1 percentage point increase in real GDP above its trend level.

Budget forecasts need to take account of the impact of Budget tax measures. Estimates of the cost of Budget measures are produced within the revenue departments, often using the same models that are used for forecasting, and are reflected in the forecasts they send the Treasury. Inevitably, however, the Budget tax measures (and their costings) go through a process of evolution and refinement, whereas the revenue departments only send the Treasury their tax forecasts at discrete intervals. The Treasury forecasters of the public finances thus have the responsibility for ensuring that the latest costings are reflected in the forecast as it, too, evolves.

2. Government Expenditure

(a) The Control Total

Since 1993–94, public spending has been planned in terms of an aggregate called the control total. The control total covers roughly 85 per cent of total general government spending but excludes cyclical social security and debt interest, both of which are affected by the economic cycle. Control total cash plans are set for three years ahead in the Public Expenditure Survey. For the purposes of published Treasury forecasts, spending covered by the control total has generally been projected at its planned level. The only exception has been that an unconstrained, best-view forecast has been made for the current year in recent November Budgets. By this stage of the financial year, monitoring of likely claims on the reserve should give a reasonable indication of whether the control total is likely to be overspent or underspent.

Plans are set on a departmental basis, and only an approximate economic breakdown is possible. The breakdown for the current year is provided by the General Expenditure Statistics Team (GES), taking information from departments provided by their monthly monitoring system. In later years, the plans are adjusted for different assumptions for inflation, pay and unemployment and the need fully to allocate the reserve.

(b) Cyclical Social Security

Expenditure on cyclical social security (CSS) is comprised of three components: income support to the non-elderly, job seekers' allowance contributory (formerly known as unemployment benefit) and job seekers' allowance non-contributory (formerly known as income support to the unemployed).

The Department of Social Security (DSS) forecasts CSS expenditure as part of the annual Public Expenditure Survey, using the Treasury's assumptions for unemployment, the retail price index and the Rossi index (which excludes housing). The DSS model is very disaggregated, but essentially forecasts spending

as the product of the expected average caseload in any one year and the average amount of benefit paid.

Caseload is projected by looking at particular client groups (the short-term and long-term disabled, lone parents and others). The disabled group caseload is estimated using inflow and outflow models. It is also linked to a forecast of disability living allowance (DLA), as a proportion of those receiving DLA are automatically entitled to income support. The number of lone parents is forecast using a time-series model. Historical data on average payments are given in a quarterly statistical enquiry based on a sample of claimants from the income support / job seekers' allowance computer system. Again, modelling is done at a disaggregated level, looking at the recent trends in average benefit payments for different client groups.

The forecasts are discussed and agreed by Treasury forecasters, the department and the relevant Treasury spending team. During Budget rounds, these forecasts will then be adjusted for the effects of policy measures, estimates of which are again provided by the DSS. The final DSS numbers are added to estimates of CSS expenditure in Northern Ireland to produce a total for UK cyclical social security expenditure.

The Treasury's macroeconomic model contains a simple econometric equation for cyclical social security expenditure as a function of unemployment, inflation and a time trend (proxying the trend in the non-unemployed caseload and any unidentified policy effects). For internal Treasury forecasts, the residual on the equation is set to generate an underlying trend in caseload consistent with the DSS numbers. The equation is then allowed to iterate with unemployment and inflation, as the forecasts for these diverge from those used for the Survey.

(c) Debt Interest

The forecasts of debt interest rely mainly on technical relationships of the following form:

$$\textit{Interest payments} = \textit{Interest payments in the previous period} \\ + \textit{Rate of interest} \times \textit{New borrowing.}$$

This assumes that payments on existing debt will continue at their present level (as most debt is issued at fixed rates), while new borrowing (including the refinancing of redemptions) will be at projected interest rates.

As well as borrowing and interest rates, levels of debt interest are also affected by the inflation rate and changes in the mix of debt. Issues of index-linked debt result in a greater sensitivity to the inflation rate and to lower cash payments in the short term (as the uplift is accrued and only paid upon redemption).

Most public sector interest payments are made by central government to the private sector and overseas. For forecasting purposes, they are split into four main types of payment: interest on conventional gilt-edged stock; interest and the

inflation uplift on index-linked gilts; interest on National Savings; and interest on Treasury bills.

The forecast of interest paid by the National Loans Fund on existing *conventional gilts* is based on a detailed analysis which identifies the coupon, redemption date and nominal value of every gilt in issue. The forecast of interest on new issues is done at an aggregate level, taking account of the likely path of gross new issues, the coupon on these issues and the time lag before interest starts to be paid. Given the overall borrowing requirement, new issues are projected so as to satisfy the government's funding policy. The coupon is projected in line with the interest rate assumptions in the economic forecast. The timing of interest payments depends on whether the gilts are new issues or further tranches of existing stock. All gilts are normally assumed to be issued at par.

Interest on *index-linked gilts* is handled in a similar way, using a forecast of the retail price index.

For the current financial year, interest on *National Savings* is forecast by the Department of National Savings, using a detailed model which identifies all its products. The Treasury supplies the Department of National Savings with assumptions for interest rates and for the contribution of National Savings to the funding requirement. Forecasts further ahead rely on a simple aggregate equation in the Treasury model.

The forecast of interest on *Treasury bills* is based on assumptions about short-term interest rates and the size of the Treasury bill tender.

3. National Accounts (Accruals) Measures of the Budget Deficit

Most tax and spending components of the PSBR are also components of National Accounts, accruals measures of the deficit — principally the general government financial deficit (GGFD) and the public sector current balance. The GGFD and public sector current balance can be derived from the following identities:

$$GGFD = GGBR + Accruals\ adjustments$$
$$+ General\ government\ financial\ transactions$$

and

$$PSCD = GGFD + PCFD – Public\ sector\ net\ capital\ spending$$

where *GGBR* is the general government borrowing requirement, *PSCD* is the public sector current deficit and *PCFD* is public corporations' financial deficit.

As their name suggests, *accruals adjustments* are applied to cash figures to put them on a National Accounts (accruals) basis. They represent the difference between actual cash receipts and the money owed to the exchequer. Because tax accruals normally exceed cash receipts, the accruals adjustments are normally

negatively signed. Hence, the accruals adjustments typically reduce the GGFD relative to the GGBR.

The main accruals adjustments for taxes are for PAYE, VAT, National Insurance contributions (NICs), business rates and the council tax. Corporation tax, although subject to particularly long collection lags, is not measured on an accruals basis, as, in practice, it is extremely difficult to measure the tax base. (Tax accruals are measured by the hypothetical liability of taxpayers, which is determined in part by estimates of the tax base.) Most accruals are forecast by the revenue departments, along with the cash forecasts.

The only other significant accruals adjustment is for the capital uplift on index-linked gilts. Index-linked gilts attract two separate interest payments — the fixed-rate interest payment made every six months and the uplift payment that offsets the effect of inflation on the real value of the gilt. The latter is made as a lump-sum payment upon redemption of the gilt. In the National Accounts, the capital uplift accrues over the life of the gilt. Because this accrued uplift is scored in general government expenditure (GGE), an offsetting accruals adjustment has to be included on the receipts side in the measurement of the cash-based PSBR. Hence, in moving from the PSBR to accruals measures of the deficit, the accruals adjustment for the capital uplift on index-linked gilts has to be stripped out of general government receipts (GGR). (While this is formally an exogenous variable in the Treasury model, it is reasonably straightforward to derive a behavioural equation for it, with the stock of index-linked gilts and the inflation rate as explanatory variables.)

Financial transactions, which score 'above the line' in the government's cash accounts, are scored 'below the line' — that is, as a financing item — in the National Accounts. The most important of these transactions are asset sales, such as privatisations, and net lending. Projections of central government financial transactions are made in consultation with the relevant policy teams in the Treasury.

V. MONTHLY MONITORING

Once a forecast is completed, the current financial year forecasts of GGR, GGE and public corporations' market and overseas borrowing (PCMOB) are converted into consistent monthly profiles, in order to produce a monthly profile of the PSBR. Monthly out-turns of the PSBR can then be compared against the profile, to help assess whether the forecasts are on track.

As with the forecast itself, the monthly profile of GGR is produced using 'bottom-up' methods. That is, with the help of the revenue departments, monthly profiles are produced for each of the main taxes, for other tax revenues (such as from the council tax and business rates) and for non-tax receipts (such as interest and dividends). The profiles take into account the regular seasonal variations in the tax yield. For example, a very high proportion of the full year's tobacco duty

TABLE 1

**Errors in Budget Projections of the PSBR
as a percentage of GDP[a]**

	Average absolute error[b]	*Average error[c]*
One year ahead	1.1 (1.1)	–0.2 (0.3)
Two years ahead	2.2 (1.4)	0.1 (0.8)
Three years ahead	3.1 (1.6)	0.9 (1.3)
Four years ahead	3.9 (1.7)	1.8 (1.7)

[a]For the period 1985 to 1993. Figures in parentheses are adjusted for the effect of the errors in the GDP forecasts using the estimates reported in HM Treasury (1995).
[b]The average error ignoring signs.
[c]The average error taking signs into account.
Source: *Pre-Budget Report*, 25 November 1997, p. 107.

VI. FORECAST ACCURACY

The PSBR, like the balance of payments, is difficult to forecast because it is the relatively small difference between two very big numbers. Total GGE is over £300 billion and total receipts are just a little less. So if errors of only 1 per cent were made on both expenditure and receipts, but they were differently signed (which is likely to be the case if they reflect errors in forecasting economic activity), then the error on the PSBR would be around £6 billion.

Table 1 shows average errors in Budget projections of the PSBR since 1985. (All forecasts have been adjusted for subsequent Budget tax changes, and all 'fiscal adjustments' that were built into the forecasts have been taken out.)

Over this period, the average absolute error in PSBR forecasts made in November or March for the financial year ahead was around £9 billion (at current levels of GDP). Errors in the late 1980s and early 1990s were exceptionally large, reflecting the economic turbulence of that period.[4] Errors over the past five years of relatively steady economic growth have been substantially smaller (averaging £6–7 billion).

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[4]Forecasting errors and policy mistakes during that period are discussed in HM Treasury (1997b).

Errors tend to grow as the forecast period lengthens, and the average absolute error rises to almost 4 per cent of GDP for projections four years ahead.

Errors have tended to be cyclical. This mainly reflects the failure of economic forecasts fully to capture the cycle in economic activity: there has been a marked tendency to understate growth when it is accelerating (as in the late 1980s) and overstate it when it is decelerating or negative (as in the early 1990s).

If GDP forecasts had been exactly right, we estimate that the average absolute error in projections four years ahead would have been substantially smaller — around 1¾ per cent of GDP. However, this is still large; and, moreover, the projections have suffered from an optimistic bias (the average errors shown in parentheses are positive).

But despite the large average errors, it is important to emphasise that the PSBR forecasts do contain useful information. They substantially outperform simple rules of thumb, such as assuming the PSBR always takes its mean value or is always equal to its value in the previous period.[5]

VII. CONCLUSION

Forecasting the PSBR is extremely difficult. This is partly because the public finances are highly sensitive to the economic cycle and our ability to forecast the path of the economy is very limited. It is also partly because the relationships between receipts (and 'endogenous' public expenditures such as social security benefits) and aggregate economic variables such as consumption, profits and unemployment are often complex and difficult to predict. As a result, error margins are large, and forecasts should be used and presented with caution. The Treasury was the first major UK forecaster routinely to report average errors from past forecasts when presenting new forecasts. It is encouraging that other forecasters are now also presenting error margins.

Policy should aim to be as robust as possible to a range of outcomes; but it is difficult to conceive of a practical fiscal policy that does not rest to some extent on a view of the prospects for the public finances and how these prospects would be changed by adjustments in taxes and spending plans. Forecasts, fallible as they are, do contain significant information about likely future developments and are probably indispensable.

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[5]See the more rigorous analysis on a longer dataset in Melliss (1996).

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