The IFS Green Budget

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Stuart Adam
Melanie Baker
Stephen Bond
Mike Brewer
James Browne
Robert Chote
Carl Emmerson
Ben Etheridge
Christine Frayne
Rustom Irani
Andrew Leicester
David Miles
Laurence Mutkin
Vladimir Pillonca
Graham Secker
Luke Sibieta
Helen Simpson
Stephen Smith
Gemma Tetlow

Copy-edited by Judith Payne

Editors:
Robert Chote
Carl Emmerson
Andrew Leicester
David Miles

The Institute for Fiscal Studies
7 Ridgmount Street
London WC1E 7AE

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The Institute for Fiscal Studies
7 Ridgmount Street
London WC1E 7AE
Tel: +44 (0) 20 7291 4800
Fax: +44 (0) 20 7323 4780
Email: mailbox@ifs.org.uk
Website: www.ifs.org.uk

in collaboration with

Morgan Stanley
25 Cabot Square
London, E14 4QA
Tel: +44 (0) 20 7425 8000
Website: www.morganstanley.com

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Preface

Welcome to the Institute for Fiscal Studies' 2007 Green Budget, in which we discuss some of the issues confronting Gordon Brown in what is expected to be his final Budget as Chancellor of the Exchequer.

We are delighted once again this year to be producing the Green Budget in collaboration with Morgan Stanley. David Miles, Managing Director and Chief UK Economist, has had a long association with IFS as a Research Fellow and as an editor of *Fiscal Studies* between 1999 and 2004. He and his and colleagues have contributed chapters on the economic outlook and debt management.

Since the publication of the last Green Budget, we – along with the rest of the economic policy community in the UK – have been greatly saddened by the death of David Walton, who contributed to IFS Green Budgets for more than a decade while working at Goldman Sachs. David was a much-valued collaborator and a good friend. He is being remembered at Oxford through the David Walton Distinguished Doctoral Scholarship. Applications for the first scholarship close in March and details can be found here: http://www.economics.ox.ac.uk/Graduate/DavidWalton.htm.

We are also grateful for financial support from the Economic and Social Research Council's Centre for the Microeconomic Analysis of Public Policy at IFS. As with all IFS publications, the views are those of the authors of the particular chapters and not of the institute – which has no corporate views – or of the funders of the research.

It is 25 years since the publication of the first Green Budget in 1982. As we embark on our second quarter-century, let me take this opportunity to thank all those who have helped write and edit them – or who have taken the trouble to read them.

Director
Institute for Fiscal Studies

Contents

	List of figures	vii
	List of tables	x
1	**Summary**	**1**
2	**The public finances under Mr Brown**	**7**
2.1	Introduction: Brown's fiscal objectives	7
2.2	Brown's inheritance	9
2.3	The Brown decade	10
2.4	Brown's bequest	15
2.5	Brown's plans and forecasts	18
2.6	Uncertainty and the Treasury's fiscal forecasts	23
2.7	Fiscal monetary coordination	28
2.8	Conclusion	31
3	**The fiscal rules and policy framework**	**32**
3.1	Introduction	32
3.2	The golden rule	33
3.3	The sustainable investment rule	45
3.4	Reforming the rules: a golden opportunity?	53
4	**The economic outlook**	**57**
4.1	Introduction	57
4.2	Recent developments	58
4.3	Productive potential and the economic cycle	59
4.4	The short-term outlook	69
4.5	The medium-term outlook	79
5	**Green Budget public finance forecasts**	**82**
5.1	Introduction	83
5.2	Short-term projections	83
5.3	Medium-term prospects	87
5.4	Alternative macroeconomic assumptions	93
5.5	The fiscal rules and the budget judgement	96
6	**Funding issues and debt management**	**99**
6.1	Introduction	99
6.2	The likely scale of debt issuance	100
6.3	Demand for gilts from the Bank of England	105
6.4	Optimal debt management	106
6.5	The impact of changing debt stock composition	114
6.6	Longevity and new types of debt instruments	117
6.7	Tax deductibility of corporate interest payments	119
6.8	Conclusions	123

7	**Challenges for public spending**	**124**
7.1	Introduction	124
7.2	Trends in UK public spending	125
7.3	Scenarios for the 2007 CSR	140
7.4	Longer-term spending pressures	147
7.5	Conclusion	150
8	**Public services performance**	**152**
8.1	Introduction	152
8.2	Measuring public sector output and productivity	155
8.3	Trends in public sector performance	157
8.4	Conclusion	166
9	**VAT fraud and evasion**	**167**
9.1	Introduction	167
9.2	The vulnerability of VAT to evasion and fraud	168
9.3	Estimates of losses through evasion and fraud	171
9.4	Policy options to tackle VAT evasion and fraud	174
10	**Taxation of multinationals and the ECJ**	**178**
10.1	Introduction	178
10.2	Background	178
10.3	Controlled Foreign Companies rules	180
10.4	Taxation of foreign profits	181
10.5	Corporate tax rates	185
11	**Environmental taxation**	**187**
11.1	Introduction	187
11.2	The economics of environmental taxation	189
11.3	Current environmental taxes	192
11.4	Environmental tax revenues	195
11.5	Possible reforms	203
11.6	Conclusions	215
12	**Supporting couples with children through the tax system**	**216**
12.1	Introduction	216
12.2	What should governments think about when designing taxes and benefits for couples?	217
12.3	The current system and its perceived drawbacks	220
12.4	Three proposals for reform	225
12.5	Conclusions	239
	Appendix A: Forecasting public finances	240
	Appendix B: Headline tax and benefit rates and thresholds	247

Figures

Figure 2.1	Revenues, spending, budget balances and debt	11
Figure 2.2	Revenue raised in 2007–08 by Labour-announced measures	13
Figure 2.3	Deficits, debt and investment: Labour vs. Conservatives	17
Figure 2.4	Fiscal forecasts: Brown 2006 vs. Clarke 1996	20
Figure 2.5	Treasury public sector net borrowing forecasts	24
Figure 2.6	Probabilities for net borrowing outcomes	25
Figure 2.7	Probabilities for current budget balance outcomes	26
Figure 2.8	Probabilities for public sector net debt outcomes	27
Figure 2.9	Treasury current budget balance forecasts	27
Figure 2.10	Intended and unintended fiscal policy changes	30
Figure 3.1	Current budget balance: cyclical and structural	37
Figure 3.2	Treasury current budget balance forecasts	39
Figure 3.3	The output gap and the economic cycle: Treasury estimates	40
Figure 3.4	Current budget balance in the 2006 Pre-Budget Report	42
Figure 3.5	General government debt ratios in OECD countries in 2006	47
Figure 3.6	Treasury public sector net debt forecasts	52
Figure 4.1	Economic growth and inflation since 1957	58
Figure 4.2	Growth in population and the labour force	60
Figure 4.3	Drivers of the recent increase in the labour force	61
Figure 4.4	Labour participation	62
Figure 4.5	Cyclical fluctuations in the economy since 1972	65
Figure 4.6	Treasury estimates of the output gap	67
Figure 4.7	Treasury and statistical filter output gap revisions	68
Figure 4.8	UK goods, services and current account balances	69
Figure 4.9	Corporate profits	70
Figure 4.10	Investment rewards: the return to and cost of capital	71
Figure 4.11	Investment intentions	71
Figure 4.12	Household gross financial liabilities	72
Figure 4.13	Distribution of financial assets and liabilities	73
Figure 4.14	Saving rate	74
Figure 4.15	Debt servicing and interest rates	75
Figure 4.16	Employment growth	75
Figure 4.17	Real consumer spending growth	79
Figure 4.18	Alternative GDP growth scenarios	79
Figure 5.1	PBR and IFS forecasts for revenue growth, 2006–07 to 2011–12	89
Figure 5.2	Treasury forecasts for corporation tax revenues and Morgan Stanley forecasts for UK stock-market growth	90
Figure 5.3	Probabilities of current budget balance outcomes (Green Budget baseline)	91
Figure 5.4	Probabilities of public sector net debt outcomes (Green Budget baseline)	92
Figure 5.5	Current budget balance forecasts	93
Figure 5.6	Cyclically adjusted current budget balance forecasts	95
Figure 5.7	Public sector net debt forecasts	95

Figure 6.1	National debt as a proportion of national income since 1855	102
Figure 6.2	Overseas holdings of gilts	103
Figure 6.3	International real yields on inflation-proof government bonds	103
Figure 6.4	Long-term real interest rates on UK conventional debt	104
Figure 6.5	Conventional gilt sales according to maturity type	108
Figure 6.6	Composition of stock of UK government debt	108
Figure 6.7	Gilt portfolio maturity and duration	109
Figure 6.8	Average spot yield curves on 18 January 2007	110
Figure 6.9	Corporate debt as a proportion of domestic production	115
Figure 6.10	Bonds issued as a proportion of non-financial institutions' debt	115
Figure 6.11	Breakdown of household debt	116
Figure 6.12	Value of fixed-rate mortgages as proportion of all mortgages	116
Figure 6.13	Composition of capital expenditure financing by non-financial companies	120
Figure 6.14	Gearing of non-financial companies	122
Figure 7.1	Public spending since 1948–49	126
Figure 7.2	Total managed expenditure	127
Figure 7.3	Total public spending, OECD countries, 1996 and 2006	131
Figure 7.4	Changing composition of public spending under Labour	132
Figure 7.5	Health spending	133
Figure 7.6	Public and private health spending	136
Figure 7.7	Private health spending as a share of total health spending	136
Figure 7.8	Education spending	137
Figure 7.9	Education spending across the G7 economies, 2003	139
Figure 7.10	Planned public spending in 2007–08	141
Figure 7.11	Potential trade-off between spending on education and health	146
Figure 7.12	Latest HMT long-term spending projections	148
Figure 7.13	Projected age-related spending, EU countries, 2005 and 2050	149
Figure 7.14	Recent long-term projections for public spending	150
Figure 8.1	Measures of health outputs and inputs, 1995=100	157
Figure 8.2	National Accounts measures of education outputs, inputs and productivity, 1995=100	159
Figure 8.3	Experimental measures of education outputs, 1998=100	161
Figure 8.4	GCSE results: proportion of 15-year-olds achieving five GCSEs at grades A*–C, 1989–2006	161
Figure 8.5	Experimental measures of education productivity, 1998=100	162
Figure 8.6	Measures of social security administration outputs, inputs and productivity, 1998=100	163
Figure 10.1	EU corporation tax rates, 1996 and 2006	185
Figure 11.1	Taxes and permit trading under uncertainty	190
Figure 11.2	UK environmental tax receipts, 2005	197
Figure 11.3	UK environmental tax receipts, 1987–2005	199
Figure 11.4	Composition of total environmental tax receipts	200
Figure 11.5	International green tax revenues, 2003	201
Figure 11.6	Distributional impact of a 5% rise in fuel duty, 2004–05	206

Figure 12.1	The budget constraints for a low-wage second earner with a low-earning partner in a couple with children	230
Figure 12.2	The budget constraints for a high-wage second earner with a low-earning partner in a couple with children	231
Figure 12.3	The budget constraints for a low-wage second earner with a medium-earning partner in a couple with children	232
Figure 12.4	The budget constraints for a low-wage first earner in a couple with children	232
Figure 12.5	Distributional analysis across working-age couples with children	233

Tables

Table 2.1	Contributions to changes in government revenue (2007–08 terms)	14
Table 2.2	Key fiscal indicators: 1996–97 versus 2006–07	16
Table 2.3	Current budget balance: cyclical and structural	21
Table 2.4	Revenue changes projected in PBR 2006 (% of national income)	22
Table 2.5	Treasury errors in forecasting public sector net borrowing	24
Table 2.6	Monetary and fiscal policy working in the same direction?	29
Table 3.1	Meeting the golden rule?	43
Table 3.2	Performance against notional five-year rolling target	44
Table 3.3	Estimated value of various future public sector obligations based on official estimates	49
Table 3.4	Meeting the sustainable investment rule?	53
Table 3.5	Cycles and Chancellorships	55
Table 4.1	GDP growth: the contribution of labour inputs	62
Table 4.2	GDP growth: capital deepening and innovation	63
Table 4.3	Dates of UK economic cycles	66
Table 4.4	Household financial balance sheet	73
Table 4.5	Explaining the change in house prices since 1996	78
Table 4.6	Morgan Stanley central case economic projections	80
Table 4.7	Morgan Stanley ‘pessimistic case’ economic projections	81
Table 5.1	Comparison of forecasts for 2005–06	83
Table 5.2	Comparison of forecasts for government borrowing, 2006–07	84
Table 5.3	Comparison of Green Budget and HM Treasury forecasts for government borrowing, 2006–07 and 2007–08	85
Table 5.4	Comparison of forecasts for government borrowing, 2007–08	86
Table 5.5	Medium-term public finance forecasts under Pre-Budget Report 2006 assumptions (£ billion)	87
Table 5.6	Medium-term public finance forecasts under Pre-Budget Report 2006 assumptions (% of national income)	88
Table 5.7	Public finance forecasts under various macroeconomic scenarios	94
Table 5.8	The golden rule under the Green Budget baseline forecast	96
Table 5.9	The sustainable investment rule under the alternative forecasts: percentage chance of net debt exceeding 40% of national income	97
Table 6.1	Public sector net borrowing	100
Table 6.2	Public sector net debt	101
Table 6.3	Gilt issuance: the DMO’s illustrative projections based on PBR forecasts	101
Table 6.4	Outlook for gross gilt issuance	101
Table 6.5	Gilt issuance and gilt yields	102
Table 6.6	Breakdown of gilt issuance by maturity and type	107
Table 6.7	Composition of nominal issuance strategies	111
Table 6.8	Simulation results for nominal issuance strategies	112
Table 6.9	Composition of further issuance strategies	113
Table 6.10	Simulation results for further issuance strategies with shares of inflation-linked bonds (with accrued compensation on principal)	113

Table 7.1	Comparison of Labour's Spending Reviews to date	128
Table 7.2	Trends in total spending	129
Table 7.3	Trends in health spending	134
Table 7.4	Trends in education spending	138
Table 7.5	Education spending per pupil relative to national income, 2003	140
Table 7.6	Early tight settlements for 2007 CSR	141
Table 7.7	Possible 2007 CSR allocation under PBR 2006 spending plans	142
Table 7.8	Possible scenarios for spending on health and education, given child poverty target and growth in 'other' spending	143
Table 7.9	Illustrative trade-offs between health and education spending	145
Table 7.10	Possible scenarios for spending on health and education, given child poverty target and growth in 'other' spending, under assumption of spending constant as a share of national income	146
Table 8.1	Measuring the output of public sector services: recommendations from the Atkinson Review	156
Table 9.1	The evolution of VAT revenue estimates	168
Table 9.2	HMRC's estimates of the 'VAT gap'	172
Table 11.1	Current UK environmental taxes	192
Table 11.2	Change in environmental tax rates required to raise £1 billion, 2007–08	205
Table 12.1	Estimated participation tax rates for women in couples with dependent children	236
Table 12.2	METRs for working adults in couples with dependent children	237
Table 12.3	METRs for non-working adults in couples with dependent children	238
Table A.1	A comparison of last year's IFS Green Budget forecast and the Treasury's December 2005 Pre-Budget Report forecast with the estimated out-turn for 2005–06 from the December 2006 Pre-Budget Report	241
Table A.2	IFS Green Budget and Treasury main errors in forecasting tax receipts, 2005–06	241
Table A.3	Forecasts for government borrowing in 2006–07	244
Table A.4	Medium-term public finances forecasts under different macroeconomic assumptions	246

1. Summary

Chapter 2: The public finances under Mr Brown

- When the Conservatives lost the 1997 election, they were still trying to eliminate the large budget deficit that opened up in the early 1990s. Kenneth Clarke had roughly halved the budget deficit he inherited as Chancellor in 1993 by the time Gordon Brown took over at the Treasury.
- Mr Brown continued to strengthen the fiscal position during Labour's first term by cutting public spending and increasing tax revenues as shares of national income. The fiscal position then weakened in Labour's second term as rapid increases in public spending coincided with an unexpected drop in tax revenues.
- Mr Brown has increased taxes and intends to slow spending growth to improve the fiscal position in Labour's third term. If his Chancellorship ends in 2007, he will leave the public finances stronger than he found them, although most industrial countries have recorded bigger improvements over the same period.
- Trends in public debt and the structural budget balance under Mr Brown do not compare favourably with the first decade under Conservative Chancellors from 1979. But this partly reflects higher investment. The position also worsened for four more years under the Tories; Mr Brown believes he has turned the corner.
- Net tax increases announced by Mr Brown since 1997 will bring in more than £17 billion in 2007–08. Adding Conservative policy changes that Mr Brown maintained, his decision not to adjust tax allowances for above-inflation earnings growth, and economic developments since 1997, there is forecast to be a total rise in tax revenue since 1996–97 equivalent to £40 billion, or £1,300 per family.
- Mr Brown hopes to return the current budget balance to the black and to halt the recent rise in public sector debt over the next five years. His forecasts suggest this will require cuts in public spending worth 0.8% of national income, or £10 billion in today's terms, plus an increase in the tax burden of a similar amount.

Chapter 3: The fiscal rules and policy framework

- Designing fiscal rules requires a trade-off between sophistication on the one hand and simplicity and transparency on the other. The golden rule and sustainable investment rule – like any fiscal rules that could be applied in practice – are not optimal, but they still have value as rules of thumb.
- Many economists outside government no longer see compliance with the fiscal rules as a good guide to the health of the public finances. This presumably reflects concern that the Chancellor 'moved the goalposts' to make the golden rule easier to meet when downward

revisions to his public finance forecasts eroded the margin by which he expected to meet the rules after 2001.

- The Treasury could be argued to have pursued a rolling five-year target to achieve a current budget surplus of 0.7% of national income. This target was missed significantly in 2005–06 and is also set to be missed in coming years.
- The likely arrival of a new Chancellor later this year may be a golden opportunity to tweak the fiscal rules for the better. Sensible changes would include making the golden rule symmetric, forward-looking and less reliant on the ability to identify economic cycles. The Treasury's fiscal forecasting could also be made more transparent or perhaps even delegated to an independent body.

Chapter 4: The economic outlook

- Over the past 10 years, growth and inflation have been relatively stable by the standards of previous decades. But this may be sowing the seeds of future volatility by encouraging consumers and the government to borrow more.
- The Treasury has recently revised up its central estimate of the UK economy's potential growth rate over the next few years from 2½% to 2¾%, but assumes a more 'cautious' rate of 2½% when forecasting the public finances. However, 2½% looks a reasonable central forecast, rather than an obviously cautious one.
- House prices have risen sharply over the past decade, and some falls are rather likely in the next few years. The rise in prices to date has made housing less affordable for younger households and has driven borrowing higher. Disposable income – net of essential spending – looks set to grow only modestly.
- We are more pessimistic than the Treasury about economic growth in the next couple of years. Compared with the Treasury, we expect a smaller contribution from net exports, weaker investment growth next year and weaker consumer spending growth through to 2009.

Chapter 5: Green Budget public finance forecasts

- The current budget deficit is likely to be £1.3 billion bigger this year, and £1.9 billion bigger next year, than forecast in the December 2006 Pre-Budget Report. But we are around £1½ billion more optimistic than the Treasury about the current budget balance by 2011–12, assuming that the economy evolves as the Treasury expects.
- If the Chancellor is correct in his provisional judgement that 2006–07 is the last year of a decade-long economic cycle, the golden rule would be met over this period with £7 billion to spare. Public sector net debt would also remain below the 40% of national income ceiling set out in the sustainable investment rule.
- We believe that the golden rule is more likely than not to be met over the next economic cycle, as long as it lasts five years or more. Despite forecasting slightly higher public

sector debt than the Treasury over the next five years, we also believe that debt is more likely than not to remain below 40% of national income.

- But judging the Chancellor's adherence to the golden rule depends crucially on his method of identifying the economic cycle. Using a statistical filter, rather than the Treasury's judgement, Morgan Stanley identifies a seven-year cycle from 2003–04 to 2009–10. Over this period, the golden rule would be broken by £66 billion.
- In today's terms, we expect the current budget balance to be roughly £21 billion stronger in five years' time than it is now. Of this improvement, £13 billion reflects a rise in the tax burden and £8 billion cuts in public spending after 2007–08. We expect public sector net debt to rise by 1% of national income by 2011–12.
- By announcing £6 billion of new tax increases and pencilling in an £8 billion cut in public spending since the 2005 election, the Chancellor has followed our advice from earlier Green Budgets – although by delaying he may have helped diminish the credibility of the fiscal rules. We see no need for further tax increases at present, as long as he is able to stick to his PBR spending projections.
- If history is any guide, at some point the Treasury's fortunes as a fiscal forecaster will take a turn for the better. But whoever is Chancellor should be wary of spending any unexpected revenue that materialises or giving it away in tax cuts. As in the current cycle, this would risk the need for retrenchment later.

Chapter 6: Funding issues and debt management

- In recent years, the UK government's cost of borrowing has been falling in both nominal and real terms, even though the amount it has borrowed has been rising and has consistently exceeded its own forecasts. In the light of this, we should not expect a big impact on the cost of debt if the government needs to issue a few billion pounds more in gilts than its central forecasts over the next few years.
- Modelling the impact of random factors on different debt issuance strategies provides strong reasons to favour a strategy involving greater issuance of long-dated conventional and long-dated indexed debt.
- Lengthening maturity and duration of public sector debt has not been offset by a shortening of the maturity or duration of private sector debt – in fact, quite the opposite. It is likely that this has affected – though probably not weakened – the transmission mechanism of monetary policy.
- Despite the potentially large cost that the ultimate holders of longevity risk might need to be compensated with, it is not at all clear that this reflects a market failure. There remains a rather weak case for government action in this area.
- Removing the ability of non-financial companies to deduct interest payments from the measure of profits on which they pay corporation tax might allow the rate of corporation tax to be cut from 30% to 20% with no net loss of revenue.

Chapter 7: Challenges for public spending

- The 2007 Comprehensive Spending Review looks set to be a very 'Challenging Spending Review'. The projections set out in the December 2006 Pre-Budget Report would, if implemented, reduce public spending by 0.5% of national income over the three years to be covered by the review – £7 billion in today's terms.
- These projections may prove incompatible with two key government aspirations: to improve public services and reduce poverty in the UK and overseas.
- Meeting the 2010–11 child poverty target would probably cost at least an extra £4½ billion. Finding this within the PBR spending projections would require difficult choices over other areas of spending. Even if spending in areas such as defence and environmental protection were frozen in real terms, the government would still have to allocate the NHS less than the minimum recommended by the 2002 Wanless Review or cut education spending as a share of national income.
- The most plausible scenario may be one where the Chancellor announces tight initial 2007 CSR settlements in the hope of topping them up at a later stage, as he has done with past reviews. Decisions to increase tax credits to meet the child poverty target could also be deferred to later Budgets and Pre-Budget Reports.
- Unless revenues or spending come in more favourably than expected, the Chancellor might have to choose between fresh tax increases or downplaying the child poverty target. Keeping spending constant as a share of national income in the CSR would require an extra £7 billion a year in today's terms by 2010–11.

Chapter 8: Public services performance

- The output of public services is complex, multi-dimensional and difficult to measure.
- Using National Accounts measures, the output of the health and education sectors has been rising but productivity has not. However, these output measures may not be accurately capturing changes in the quality of services. Accounting for quality change typically increases measured output growth.
- Short-term falling productivity may not, however, be a problem. Increased output, even without productivity gains, may be desirable, and productivity improvements may be difficult to achieve in some sectors.
- To get an accurate picture of performance, measures should, as far as possible, incorporate non-targeted outputs in addition to those that are subject to performance targets.

Chapter 9: VAT fraud and evasion

- VAT revenue losses through evasion jumped sharply in 2005–06, reaching £12.4 billion or 14.5% of potential VAT revenues. HM Revenue and Customs estimates that missing trader and carousel frauds account for less than a quarter of these losses, but that they have been growing rapidly despite its best efforts.
- HMRC estimates that the VAT gap increased by £2.7 billion in 2005–06, with missing trader fraud increasing by around £1 billion. If the jump in the VAT gap is genuine, either missing trader fraud is significantly higher than HMRC suggests or there has been an abrupt, significant and unexplained rise in other VAT fraud.
- Carousel frauds exploit opportunities provided by the VAT zero-rating of exports. The vulnerability of the VAT systems of EU member countries has increased as a result of the abolition of internal EU frontiers at the end of 1992.
- The UK government has sought EU agreement to extend reverse charging for certain categories of transaction, and, if agreed, this may help to check the growth in carousel fraud. But the underlying problem is unlikely to be resolved without a fundamental reform to the VAT treatment of international transactions, which would end the zero-rating of exports.

Chapter 10: Taxation of multinationals and the ECJ

- Recent cases at the European Court of Justice have prompted changes to UK Controlled Foreign Companies rules and a broader consultation on the taxation of foreign profits.
- The tax treatment of dividend income from overseas subsidiaries of UK companies is a complex but increasingly important area of the corporation tax system, given the growing importance of multinational firms.
- The announced review is welcome and should be wide-ranging. It should consider the option of replacing the UK's complex credit system with the simpler exemption system used in many other EU countries. Estimating the potential cost of this to the exchequer is extremely difficult and a matter of some debate.
- Corporate tax rates have fallen faster in other EU countries than in the UK over the last decade, and particularly since 1999; this has contributed to growing concerns about the impact of UK corporation tax on business investment and location choices.

Chapter 11: Environmental taxation

- The government has implemented several tax reforms in recent years that have improved environmental incentives, most notably: linking vehicle excise duty and company car tax rates to the emissions ratings of vehicles; imposing an energy tax on businesses; and developing domestic and international emissions trading.

- Despite these reforms, receipts from environmental taxes have fallen as a share of national income since 1999. The measures announced in the Pre-Budget Report will do little to reverse this. However, the UK still takes a higher share of national income from green taxes than the OECD average.
- The decline in green tax revenue as a share of national income is largely due to the government's decision to abandon annual above-inflation increases in fuel duty. Raising green tax revenues substantially through the existing tax system will be difficult without significantly higher rates of fuel duty.
- Longer-term reforms may dramatically alter the structure of green taxes. But increasing green taxes may conflict with government targets for fuel poverty (or poverty in general) or with the desire to promote business competitiveness.

Chapter 12: Supporting couples with children through the tax system

- The tax and tax credit system treats some married or cohabiting couples with children less generously than if the parents live (or claim to live) apart. Some 'couple penalty' or 'couple premium' is inevitable if you want to be proportionately more generous to people on lower incomes and if you assess entitlement to help according to family rather than individual circumstances.
- But critics variously argue that the current system is inefficient in lifting couples with children out of poverty, that it encourages parents to live apart to the detriment of their children and that it gives insufficient support to couples where one partner gives up work to care for young children.
- We assess three recent proposals to alter the tax treatment of couples with children in order to ameliorate one or more of these perceived problems. Reflecting the different objectives that motivate them, these proposals would have different effects on family incomes and financial work incentives.
- Increasing the working tax credit for all couples with children would particularly help low-income one-earner couples, but would discourage them from increasing their income, for example through adding an earner or working longer hours.
- Increasing the working tax credit only for two-earner couples would reverse a recent trend by strengthening the incentive for low- to middle-income couples to have both adults in work, but would also discourage such families from seeking increases in income through other means.
- A transferable personal allowance for families with a child under 6 would benefit the majority of one-earner couples with a young child, regardless of income, but would act to discourage such families from having both adults in work.
- All three proposals would reduce the 'couple penalty' in the tax credit system because they give extra support to couples with children but not to lone-parent families.

2. The public finances under Mr Brown

Robert Chote, Carl Emmerson, Christine Frayne and Gemma Tetlow (IFS)

Summary

- When the Conservatives lost the 1997 election, they were still trying to eliminate the large budget deficit that opened up in the early 1990s. Kenneth Clarke had roughly halved the budget deficit he inherited as Chancellor in 1993 by the time Gordon Brown took over at the Treasury.
- Mr Brown continued to strengthen the fiscal position during Labour's first term by cutting public spending and increasing tax revenues as shares of national income. The fiscal position then weakened in Labour's second term as rapid increases in public spending coincided with an unexpected drop in tax revenues.
- Mr Brown has increased taxes and intends to slow spending growth to improve the fiscal position in Labour's third term. If his Chancellorship ends in 2007, he will leave the public finances stronger than he found them, although most industrial countries have recorded bigger improvements over the same period.
- Trends in public debt and the structural budget balance under Mr Brown do not compare favourably with the first decade under Conservative Chancellors from 1979. But this partly reflects higher investment. The position also worsened for four more years under the Tories; Mr Brown believes he has turned the corner.
- Net tax increases announced by Mr Brown since 1997 will bring in more than £17 billion in 2007–08. Adding Conservative policy changes that Mr Brown maintained, his decision not to adjust tax allowances for above-inflation earnings growth, and economic developments since 1997, there is forecast to be a total rise in tax revenue since 1996–97 equivalent to £40 billion, or £1,300 per family.
- Mr Brown hopes to return the current budget balance to the black and to halt the recent rise in public sector debt over the next five years. His forecasts suggest this will require cuts in public spending worth 0.8% of national income, or £10 billion in today's terms, plus an increase in the tax burden of a similar amount.

2.1 Introduction: Brown's fiscal objectives

The 2007 Budget will be Gordon Brown's eleventh as Chancellor of the Exchequer and is expected to be his last before replacing Tony Blair as Prime Minister. During his decade at the Treasury, Mr Brown has outlined four main objectives for fiscal policy:[1]

[1] Page 7 of HM Treasury, *Analysing UK Fiscal Policy*, November 1999 (http://www.hm-treasury.gov.uk/media/CC5/BA/90.pdf).

- to ensure that tax and public spending decisions do not imply an unsustainable and potentially damaging rise in public sector debt;
- to ensure that future taxpayers are not left to pay for public spending undertaken today from which they cannot be expected to benefit;
- to avoid any bias against investment spending if and when public spending as a whole has to be restrained;
- to allow changes in government borrowing to 'support' monetary policy in helping to stabilise economic activity and keep inflation on target.

Reflecting these objectives, Mr Brown had several complaints to make about his inheritance from the Conservatives:

> In 1997, the Government was faced with a large structural deficit, low net investment, rising public debt and falling public sector net worth. This situation had come about in part as a result of a lack of clear and transparent fiscal objectives, together with fiscal reporting that did not permit full and effective public and parliamentary scrutiny.[2]

With no track record of his own, Mr Brown saw a new fiscal framework as a way to help convince people that he would avoid repeating what he saw as the mistakes of the Conservative era (and of previous Labour Chancellors). The Treasury has described the objective as 'constrained discretion' – in other words, making a credible commitment to long-term goals of sustainability and intergenerational fairness while retaining the ability to respond flexibly to economic developments.

Hence, two important elements of Mr Brown's new fiscal framework were:

- the **Code for Fiscal Stability**, which sets out the broad principles of fiscal policy, as well as requiring the Treasury to be transparent about its goals and record; and
- publicly stated **fiscal rules**, which turn broad principles of 'sound' fiscal policy into specific operational targets against which success or failure can be judged.

The fiscal rules make Mr Brown's four broad objectives for fiscal policy more concrete:

- The **golden rule** requires the public sector to borrow only what it needs to pay for capital investment, and to finance its remaining current spending from tax and other revenues. In other words, the government has to keep the current budget (revenues minus current spending) in balance or in surplus. To help monetary policy manage demand in the economy appropriately, the rule has to be met on average over the economic cycle rather than every year.
- The **sustainable investment rule** requires the Government to keep the public sector's debt (net of its financial assets) at a 'stable and prudent' level. The Treasury defines this as less than 40% of national income (GDP) at the end of each financial year of the current economic cycle, but has not yet announced how 'stable and prudent' is to be defined over subsequent economic cycles.

[2] Pages 133–4 of E. Balls and G. O'Donnell, *Reforming Britain's Economic and Financial Policy*, HM Treasury / Palgrave, 2002.

We will discuss the rules and the fiscal framework in more detail in Chapter 3 and the challenges of the 2007 Comprehensive Spending Review (CSR) in Chapter 7. In this chapter, we look at the state of the public finances when Mr Brown took office in 1997 (Section 2.2) and at how they have evolved over the past 10 years (Section 2.3). We then assess how Mr Brown's bequest to his successor will compare with his inheritance from Kenneth Clarke (Section 2.4). We then turn to Mr Brown's plans for the next five years, describing how he expects the public finances to evolve, comparing his plans with the last presented by Mr Clarke (Section 2.5) and quantifying the uncertainties that lie around all public finance forecasts (Section 2.6). Finally, we turn to assessing whether Mr Brown has met his objective of using fiscal policy to support monetary policy (Section 2.7). Section 2.8 concludes.

2.2 Brown's inheritance

Mr Brown became Chancellor at a time when the Conservatives were still trying to eliminate the large budget deficit that opened up in the early 1990s. Although Chancellor Nigel Lawson had achieved budget surpluses in 1988–89 and 1989–1990 (the first time this had occurred in any year since 1970–71), with hindsight these turned out to be the result of an unsustainable economic boom that had temporarily boosted tax revenues and cut social security bills. The recession of the early 1990s exposed the underlying weakness of the fiscal position, which had been exacerbated by increases in public spending and tax cuts in the run-up to the 1992 election. Adjusting for the level of economic activity, the underlying 'structural' budget balance[3] deteriorated from a surplus of 1.5% of national income in 1981–82 to a deficit of 5.7% by 1992–93. The recession meant that the headline budget deficit was even bigger, with public sector net borrowing hitting 7.8% of national income in 1993–94.

Britain's exit from the European Exchange Rate Mechanism in September 1992 prompted a significant rebalancing of macroeconomic policy. Looser monetary policy – lower interest rates and a weaker exchange rate – was accompanied by a big fiscal tightening. Mr Clarke, who became Chancellor in May 1993, raised taxes and cut public spending as shares of national income, almost halving the structural budget deficit between 1992–93 and 1996–97. This in turn helped stabilise public sector net debt, which reached a high of 43.6% of national income in 1996–97 – well above its trough at the end of the Lawson boom but little different from the level that the Conservatives had recorded in their first year in office (1979–80 when net debt was 43.9% of national income). Mr Clarke forecast in his November 1996 Budget that over the next five years revenues would continue to rise and spending fall as shares of national income. This would get the budget back into surplus by 2000–01 and pull public sector net debt back towards 40%.

This set the scene for Labour's inheritance. In 1996–97, the Conservatives' last year in office, the public sector spent 40.8% of national income, while government revenues totalled 37.3% of national income. This left a gap of 3.5% of national income to be covered by public sector net borrowing, which, if sustained, would have left net debt climbing towards 70% of national income (assuming 5% nominal growth in the economy). A fifth of this borrowing financed

[3] The budget balance that would be recorded if economic activity were at its sustainable 'trend' level, consistent with stable inflation. See Section 3.2.

investment, leaving a current budget deficit of 2.8% of national income. The Treasury estimates that part of this deficit was explained by the automatic impact of weak economic activity on tax revenues and welfare spending, but that there was still an underlying 'structural' current budget deficit of 2.3% of national income. This would have to be reduced if Mr Brown were to comply with his 'golden rule'.

By international standards, Labour inherited a relatively large budget deficit but a debt level in the middle of the industrial country league table. Using internationally comparable figures, in 1996 the UK's structural general government deficit of 3.5% of national income was the sixth highest of the 22 major industrial countries for which we have comparable data for a broad range of fiscal indicators. General government net financial liabilities (the broadest OECD net debt measure) stood at 40.6% of national income, the tenth highest of the same 22 countries.[4]

2.3 The Brown decade

The evolution of the public finances

In its 1997 manifesto, Labour promised to keep to the tight spending plans laid down by Mr Clarke for two years. Mr Brown kept that promise and reduced spending further in his third year in office, thanks partly to unintended departmental underspending. Despite beginning to spend more in the run-up to the 2001 election, public spending ended Labour's first term 3.3% of national income lower than it started (Figure 2.1). Most of the decline was in current spending, but public sector net investment also dropped, from 0.7% of national income to 0.4%. Notwithstanding Mr Brown's complaints about underinvestment by the Conservatives, public sector net investment was lower on average in Labour's first term – at 0.6% of national income – than in any other four-year period since the Second World War.

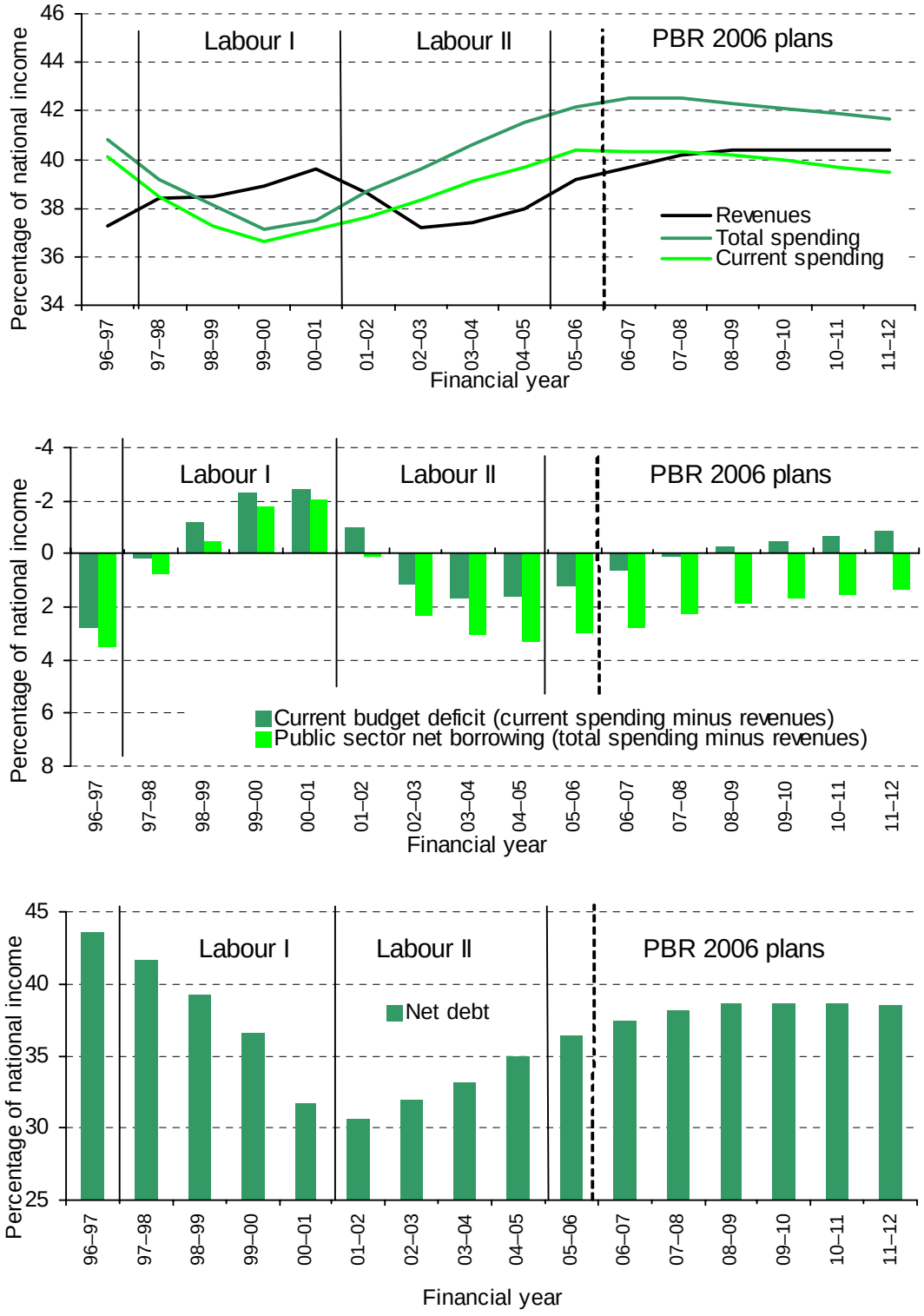
Over the same four years of Labour's first term, government revenues rose by 2.3% of national income, thanks to ongoing increases in fuel and tobacco duties (put in place by the Conservatives and then accelerated and maintained by Mr Brown until the November 1999 Pre-Budget Report), Budget measures such as the abolition of repayable dividend tax credits (reducing the returns received from UK equities by pension funds and charities) and above-average economic growth, combined with the Chancellor's decision not to raise income tax thresholds as quickly as incomes, which meant that a progressively larger proportion of people's incomes was taxed at higher rates, which boosts tax revenues (a phenomenon known as 'fiscal drag').

With revenues rising and spending falling, by the time of the 2001 election the total budget balance and the current budget balance had both moved into surplus. The structural budget surplus reached 1.5% of national income in 1999–2000 and 2000–01, equalling the biggest structural surplus achieved by the Conservatives, in 1981–82, the year after Geoffrey Howe's controversially tight Spring 1981 Budget. Meanwhile, public sector net debt fell from 43.6% of national income in 1996–97 to 31.7% of national income in 2000–01, aided in part by the

[4] See Table 2.2 for more details.

£22.47 billion (2.2% of national income in 2000–01) received from the 20-year auction of 3G mobile phone licences.

Figure 2.1. Revenues, spending, budget balances and debt



Sources: HM Treasury, *Pre-Budget Report 2006*, London, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm); HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls).

Mr Brown had described his determination to reduce borrowing in his early years in office as 'prudence for a purpose'.[5] The purpose became clear after 1999 – and especially as Labour's second term unfolded. Public spending reversed its earlier decline, with health, education, and lower-income pensioners and families with children the main beneficiaries of the Chancellor's largesse (for more details, see Chapter 7). But as spending rose by 4.0% of national income over the course of Labour's second term, tax revenues weakened unexpectedly when the stock market fell in 2000 and 2001, reducing tax payments by financial sector firms and their employees. The tax-raising Budget of April 2002 helped begin to reverse the decline, but government revenues still ended Labour's second term 1.6% of national income lower than they began it (even though the net impact of policy announcements during the second term was to increase taxes significantly).

The combination of higher spending and weaker tax revenues reversed the strengthening in the public finances seen during Labour's first term. The current budget balance moved from a surplus of 2.5% of national income at the end of the first term to a deficit of 1.6% at the end of the second. The swing in the overall budget balance was even larger, reflecting the fact that public sector net investment had at last begun to increase. The return to budget deficits began to push public sector net debt up again, reaching 35.0% of national income in 2004–05.

Years two and three of Labour's third term are set to see public spending grow more slowly as a share of national income than in the previous years of plenty, reflecting the more cautious plans laid down in the 2004 Spending Review for 2006–07 and 2007–08. The Treasury expects the broadest measure of public spending, total managed expenditure (TME), to reach 42.5% of national income this year, up from 41.5% in 2004–05. But, as we shall discuss in the next section, despite the planned slowdown in spending growth, IFS and other independent commentators argued in the run-up to the 2005 election that the government would have to announce further tax increases or cuts in spending plans if it wished to meet its fiscal rules with the degree of comfort it had sought in the past.

Mr Brown rejected any such suggestion, claiming during the campaign that 'People say we won't meet our fiscal rules. Once again, with the public finances strong, we will prove them wrong'.[6] But, with the election out of the way, the Chancellor has announced a succession of net tax increases – in the 2005 Pre-Budget Report, the 2006 Budget and the 2006 Pre-Budget Report – sufficient in total to raise an extra £6 billion in 2007–08. Thanks also to a rebound in corporation tax receipts and a gradual increase in the income tax burden as people drift into higher tax brackets, revenues are expected to rise from 38.0% of national income in 2004–05 to 39.7% this year – an increase equivalent to £22 billion in today's money since the election.

With revenues growing more quickly than spending, the current budget deficit is expected to have narrowed from 1.6% of national income in 2004–05 to 0.6% of national income this year, with net borrowing falling from 3.3% to 2.8% of national income over the same two years. But public sector net debt will still have edged up from 35.0% of national income to 37.5%.

[5] Mr Brown's 1998 Budget Speech: 'I said that this would be a Budget based on prudence for a purpose and that guides us also in our approach to public spending' (http://www.hm-treasury.gov.uk/budget/budget_1998/bud98_speech.cfm).

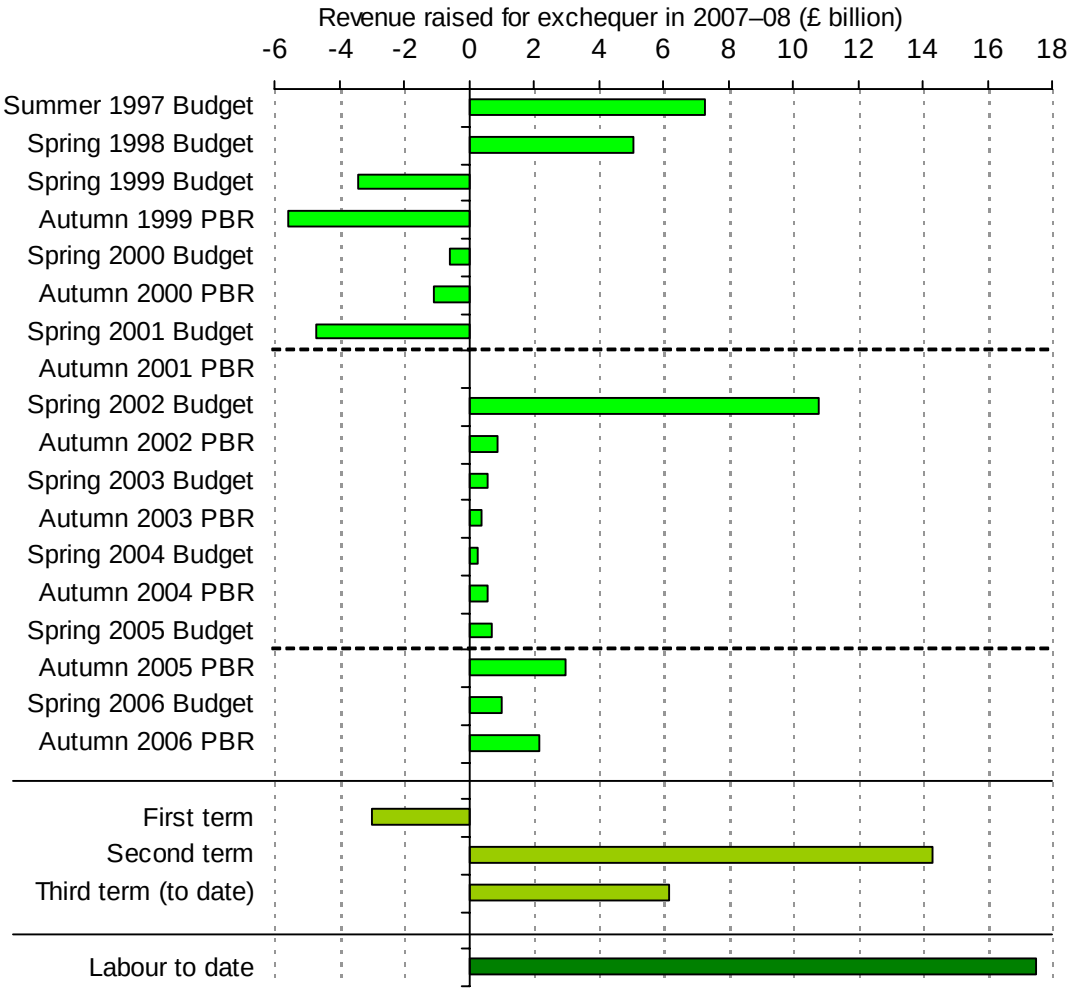
[6] 'Row over £11bn black hole', *Guardian*, 22 April 2005.

Labour's revenue-raising

Looking over Labour's first decade as a whole, government revenues will have risen by 2.4% of national income between 1996–97 and 2006–07, with a further increase expected next year of 0.5% of national income. Where has the money come from?

Figure 2.2 shows the impact of tax measures announced in each of Mr Brown's 18 Budgets and Pre-Budget Reports to date on revenues in 2007–08.

Figure 2.2. Revenue raised in 2007–08 by Labour-announced measures



Notes: 2007–08 terms. Measures defined as taxation using National Accounts definitions. Hence, only a proportion of the cost of the new tax credits is scored as a tax cut. The escalators on tobacco and fuel duty that were announced by the Conservatives and increased by Labour are assumed to have been intended to run to 2001–02. The cost to the exchequer of abolishing these escalators is attributed to the Autumn 1999 Pre-Budget Report. For more details of classifications prior to January 2001, see table 3.1 of A. Dilnot, C. Emmerson and H. Simpson (eds), *The IFS Green Budget: January 2001*, IFS Commentary 83 (http://www.ifs.org.uk/budgets/gb2001/chap3.pdf).
Sources: Announcements from HM Treasury, *Financial Statement and Budget Report*, various years; HM Treasury, *Pre-Budget Report*, various years.

Mr Brown began his Chancellorship with substantial net tax-raising measures in his first two Budgets. But these were more than offset by net tax cuts in the remaining five Budgets and Pre-Budget Reports of Labour's first term (including the abandonment of the fuel and tobacco escalators in the November 1999 Pre-Budget Report). This adds up to a net giveaway next

year from all measures announced in Labour's first term of 0.2% of national income, or £3.0 billion in 2007–08 terms.

The tax measures in Labour's second term were dominated by the increase in National Insurance contributions in the post-election April 2002 Budget, with relatively small net revenue-raisers in the remaining Budgets and Pre-Budget Reports contributing to a net tax increase from all measures announced in the second term worth £14.3 billion next year.

The three Budgets and Pre-Budget Reports since the 2005 election have been relatively significant revenue-raisers, bringing in a further £6.2 billion next year. This means that all the tax measures announced by Mr Brown to date will bring in 1.3% of national income (£17.5 billion) next year, compared with the situation if he had simply increased tax thresholds and allowances by the default amounts used in presenting the public finances (for example, increasing income tax allowances in line with inflation).

But, as Table 2.1 shows, the tax measures announced by Mr Brown account for less than half the increase in revenue of 2.9% of national income (£40 billion, or around £1,300 per family) that, on Treasury figures, we will have seen between 1996–97 and next year.

Table 2.1. Contributions to changes in government revenue (2007–08 terms)

	Policies taking effect 1997–98 to 2006–07		Policies to take effect in 2007–08		Total policies taking effect 1997–98 to 2007–08	
	% of national income	Cash equivalent	% of national income	Cash equivalent	% of national income	Cash equivalent
Announcements						
Conservative	+0.7%	+£10.0bn	none	none	+0.7%	+£10.0bn
Labour 1st term	–0.2%	–£3.0bn	none	none	–0.2%	–£3.0bn
Labour 2nd term	+1.0%	+£14.0bn	+0.0%	+£0.3bn	+1.0%	+£14.3bn
Labour 3rd term	+0.1%	+£1.0bn	+0.4%	+£5.1bn	+0.4%	+£6.2bn
All announcements	+1.6%	+£22.0bn	+0.4%	+£5.4bn	+2.0%	+£27.5bn
Fiscal drag	+2.0%	+£27.6bn	+0.2%	+£2.8bn	+2.2%	+£30.3bn
Economic cycle	+0.2%	+£2.3bn	+0.0%	+£0.6bn	+0.2%	+£2.9bn
Other factors	–1.3%	–£18.2bn	–0.1%	–£1.8bn	–1.5%	–£20.1bn
Total	+2.4%	+£33.6bn	+0.5%	+£6.9bn	+2.9%	+£40.5bn

Notes: As Figure 2.2.
Sources: As Figure 2.2. Fiscal drag estimated using HM Treasury estimate of 0.2% a year from paragraph A24 of HM Treasury, *End of Year Fiscal Report*, December 2003 (http://www.hm-treasury.gov.uk/media/324/70/end_of_year_352%5B1%5D.pdf). Impact of economic cycle estimated using figures in table A.5 of HM Treasury, ibid.

An additional 0.7% of national income (£10 billion) will come from measures that were announced by the Conservatives before 1997, notably the above-inflation increases in fuel and tobacco duty that Mr Brown initially chose to maintain. The conventional assumption that income tax allowances and thresholds rise in line with prices rather than real earnings (and equivalent assumptions for other taxes) brings in 2.2% of national income (£30 billion) – and indeed the Chancellor has chosen not to offset much of this fiscal drag with policy measures (the most important exception being the decision in the 2005 pre-election Budget to announce a big increase in the lowest threshold for stamp duty on property transactions). Labour's

announced measures, the Conservative policies they chose to maintain and acquiescence in fiscal drag will together raise revenue by 4.2% of national income (£58 billion) next year.

Less in the Chancellor's control, another 0.2% of national income (£3 billion) will come from above-trend economic growth. And, offsetting these revenue increases, other economic developments will have cost the Chancellor 1.5% of national income (£20 billion) next year. In particular, these reflect the weak performance of the stock market and the associated fall in the profitability of financial companies, which adversely affected tax payments by firms and individuals in that sector.

2.4 Brown's bequest

The public finances have waxed and waned during Mr Brown's Chancellorship, strengthening during Labour's first term, weakening during its second, and now strengthening again early in its third. Given this pattern, we should be wary of focusing too closely on the fiscal position in any particular year. But it is nonetheless interesting to compare how the key fiscal indicators stood in Mr Clarke's last year as Chancellor (1996–97) with the way the Treasury forecasts that they will stand in what is expected to be Mr Brown's last year (2006–07).

As Table 2.2 shows, Mr Brown will likely leave the public finances stronger than he found them. He expects to spend 1.7% of national income more this year than Mr Clarke did in his final year (£22 billion more in 2006–07 terms), with most of the increase (1.5% of national income or £19 billion) being investment rather than current spending. But Mr Brown has also increased tax and other revenues by an even larger 2.4% of national income (£31 billion), which has paid for the extra spending and also allowed him to cut borrowing by 0.7% of national income (£9 billion). Mr Brown is still having to borrow this year to pay for some of his non-investment spending, but to a much lesser degree than Mr Clarke did: at 0.6% of national income, the current budget deficit is 2.2% of national income (£29 billion) smaller this year than the 2.8% deficit in 1996–97.

Turning to the government's balance sheet, we see that public sector net debt is expected to be 6.1% of national income (£80 billion) lower this year than it was in 1996–97, with the annual cost of debt interest also falling, by 1.6% of national income (£21 billion). Critics have argued that the government understates its true debt position by ignoring public sector pension liabilities and commitments made under the Private Finance Initiative. We discuss this criticism in Section 3.3.

These borrowing comparisons flatter Mr Brown slightly because economic activity was a little weaker in 1996–97 than it is expected to be in 2006–07, which depressed tax revenues and pushed up welfare bills for Mr Clarke. But the stronger economy is estimated to account for only 0.3% of national income (£4 billion) of the improvement in the budget balances between 1996–97 and 2006–07, so the structural position is also stronger now than it was at the end of the Conservative era. Similarly, public sector net debt is lower than it was a decade ago, whether or not the state of the economy is taken into account.

Table 2.2. Key fiscal indicators: 1996–97 versus 2006–07

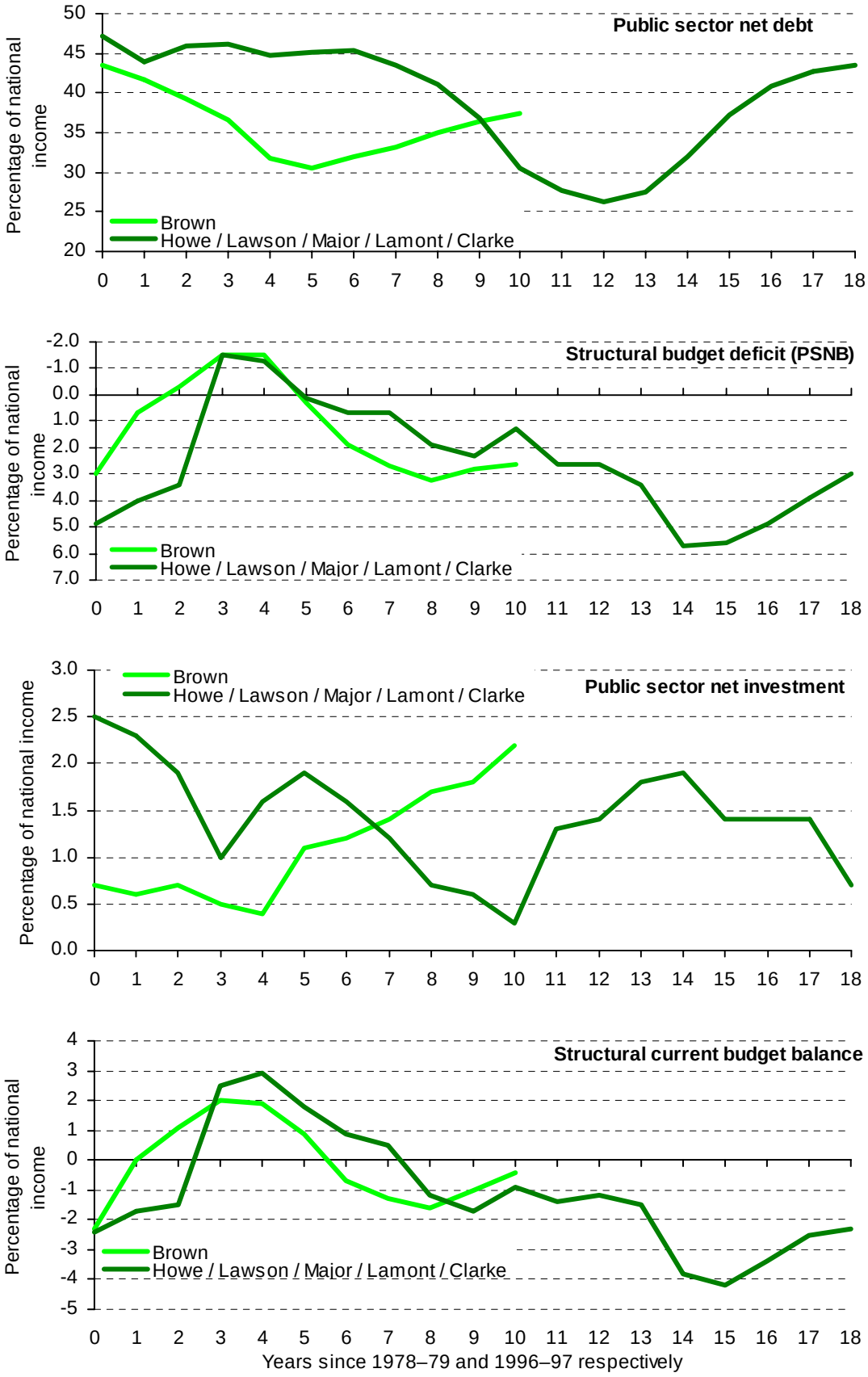
% of national income unless otherwise stated Rankings: among 22 OECD member countries with consistent data for 1996 and 2006 for all measures	**Brown's inheritance** (1996–97)	**Brown's bequest** (2006–07)
Debt		
Public sector net debt	43.6%	37.5%
Place in OECD league table	*10th highest debt*	*11th highest debt*
Borrowing		
Public sector net borrowing: total	3.5%	2.8%
Public sector net borrowing: structural	3.0%	2.6%
Place in OECD league table	*6th highest borrowing*	*5th highest borrowing*
Current budget deficit: total	2.8%	0.6%
Current budget deficit: structural	2.3%	0.4%
Spending		
Total public spending	40.8%	42.5%
Place in OECD league table	*12th highest spending*	*10th highest spending*
Public sector net investment	0.7%	2.2%
Central government debt interest	3.6%	2.1%
Place in OECD league table	*13th highest debt interest*	*9th highest debt interest*
Revenues		
Tax and other revenues	37.3%	39.7%
Place in OECD league table	*15th highest revenues*	*13th highest revenues*

Note: OECD figures relate to general government rather than public sector and include data from all OECD countries other than the Czech Republic, Ireland, South Korea, Poland, Slovakia and Switzerland.
Sources: OECD, *Economic Outlook No. 80*, November 2006 (http://www.oecd.org/document/18/0,2340,en_2649_201185_20347538_1_1_1_1,00.html); HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls); Office for National Statistics.

However, the improvements in debt, borrowing and structural budget balances have occurred at a time when most other industrialised countries have also been strengthening their public finances – indeed, many more so. Out of the 22 OECD countries for which we have comparable data on a wide range of indicators, 15 reduced their debt and 17 improved their structural budget balances by more than the UK between 1996 and 2006.

Figure 2.3 compares the evolution of the public finances during Labour's first decade with the Conservative record after 1979. On the face of it, the comparison is not flattering to Mr Brown. Having inherited a smaller public sector net debt than the Conservatives in 1979, after 10 years Mr Brown now finds himself for the first time with a higher debt burden than the Conservatives had after the same number of years in office. In addition, having inherited a smaller structural budget deficit than the Conservatives, and having reached the same peak structural surplus in his third year in office, Mr Brown has also presided over a bigger deterioration than the Conservatives over the subsequent seven years.

Figure 2.3. Deficits, debt and investment: Labour vs Conservatives



Source: HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls).

But this in part reflects Mr Brown's willingness to borrow more to increase net investment from the low level he inherited. As Figure 2.3 shows, net investment actually fell over his first four years as Chancellor, but it has since increased every year and it is now three times higher than the level he inherited. By comparison, net investment fell sharply during the Conservatives' first decade (although this in part reflected the privatisation of capital-intensive industries). If we exclude borrowing to finance investment, we see that the current budget deficit has been smaller over the last couple of years than it was in the equivalent period under the Conservatives, both parties having inherited similar levels.

Whether the performance of the public finances has been stronger during the first decade under Labour or during the first decade under the Conservatives depends on which indicator one looks at. But under the Conservatives the worst was certainly yet to come, while Mr Brown doubtless hopes that for Labour things can only get better.

The Conservatives overestimated the strength of the fiscal position in the late 1980s by misjudging the amount of spare capacity in the economy – in part thanks to the misfortune of inaccurate National Accounts data. They then compounded their problems with tax cuts and spending increases they could ill-afford in the run-up to the April 1992 election. They finally addressed their fiscal problem with tax increases and spending cuts after 1993. This may have contributed to their poor performance at the ballot box in 1997.

Labour too overestimated the underlying strength of the fiscal position in the early 2000s by assuming a rapid bounce-back in tax revenues from the financial sector, which had been inflated and then deflated by the gyrations of the stock market. Mr Brown delayed the adjustment that IFS and other independent commentators thought necessary until after the 2005 election. Mr Brown would argue that he has been able to do so while still meeting his 'golden rule'; but, as we shall see in Chapter 3, the suspicion that he has only been able to do so by 'moving the goalposts' has undermined the credibility of the fiscal rules.

Although there are parallels between the ways in which the two parties have managed the public finances, it seems reasonable to argue that, over their full 18 years, the Conservatives both had worse luck and made more serious lapses of judgement than Labour has to date. As a result, by 1996–97 Mr Clarke had only been able to climb halfway out of a deep fiscal hole, while in 2006–07 Mr Brown will hope to have climbed halfway out of a much shallower one.

2.5 Brown's plans and forecasts

Mr Brown expects to spend 42.5% of national income this year (40.3% of national income on current spending and 2.2% on public sector net investment). With revenues forecast at 39.7% of national income, this leaves a current budget deficit of 0.6% of national income (£7.9 billion) and public sector net borrowing of 2.8% of national income (£37.5 billion).

How does the Treasury hope that the public finances will evolve over the next five years – and how do its projections compare with Mr Clarke's aspirations at the end of his period as Chancellor, as implied by the forecasts in his November 1996 Budget?

By way of preamble, we should note that, in principle, the Pre-Budget Report is an interim forecast and does not necessarily indicate what the Treasury hopes will happen. For that, we need to wait for any policy measures to be announced in the Budget. But, in practice, Mr

Brown has eroded the distinction between the Budget and Pre-Budget Report, with the latter recently having contained more significant policy changes than the Budget (see Figure 2.2). So it seems reasonable to treat the Pre-Budget Report forecasts as a reasonable proxy for the Treasury's desired path.

According to the Pre-Budget Report, the current budget is predicted to move steadily from the deficit of 0.6% of national income this year to a surplus of 0.8% of national income in 2011–12. Over this period, revenues are expected to rise by 0.7% of national income while current spending is projected to fall by 0.8% of national income (the figures do not add because of rounding). Public sector net investment is expected to be unchanged at 2.2% of national income. Net debt is forecast to rise from 37.5% of national income this year to a peak of 38.7% in 2010–11 before dropping back to 38.5% in 2011–12.

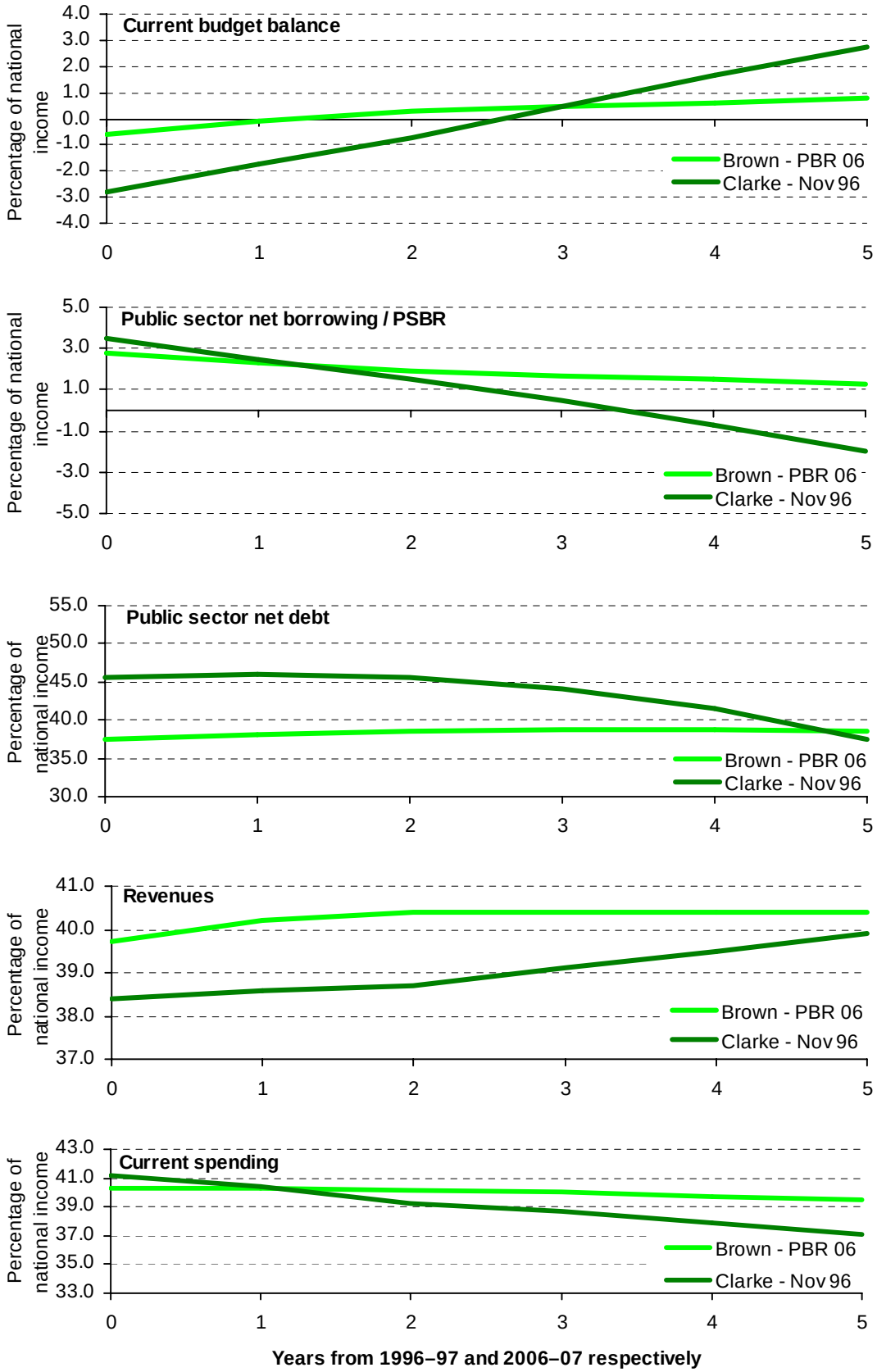
Figure 2.4 shows the Treasury's forecast trajectories over forthcoming years for various public finances aggregates, starting from 1996–97 for Mr Clarke and 2006–07 for Mr Brown. It can be seen that Mr Clarke laid out his plans from a weaker starting point in 1996–97 than Mr Brown is doing in 2006–07. But Mr Clarke was also aiming for a bigger current budget surplus and a slightly smaller debt burden after five years, and therefore pencilled in a bigger policy tightening over the five years than Mr Brown is doing now. Mr Clarke was looking for a bigger cut in spending and a bigger tax increase than Mr Brown is now anticipating (which Mr Clarke sought to achieve, in part, by the introduction of yearly escalators on tobacco and fuel duties at least until 2001–02), although Mr Clarke has admitted that he probably would not have been as tough as his forecasts suggested if the Conservatives had been re-elected.[7] On health spending, for example, nearly every year under the Conservatives saw spending considerably exceed the plans that were made in the preceding Budget or Autumn Statement.[8] It should be borne in mind that Figure 2.4 shows Mr Clarke's forecasts as of 1996 – subsequent revisions to both the fiscal aggregates and national income mean that spending, revenues, debt and the current budget deficit are all now thought to have been smaller as shares of national income in 1996–97 than they appeared at the time.

How does Mr Brown expect the improvement in the public finances over the next five years to come about? In marked contrast to the previous Budget and Pre-Budget Report, and thanks mostly to stronger-than-expected economic growth, the Treasury now believes that economic activity is running only 0.2% below the level consistent with stable inflation (the 'output gap'). So only a small part of the forecast improvement in the current budget balance will come about automatically as the economy enjoys above-trend growth this year and next (see Table 2.3). Most of the expected improvement is structural, both for spending and revenues.

[7] Source: L. Elliot, 'Still papering over the cracks', *Guardian*, 20 March 2001 (http://society.guardian.co.uk/commongood/comment/0,,459713,00.html).

[8] A. Dilnot and P. Johnson (eds), *Election Briefing 1997*, IFS Commentary 60, 1997.

Figure 2.4. Fiscal forecasts: Brown 2006 vs. Clarke 1996



Sources: HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm); HM Treasury, *Financial Statement and Budget Report 1997–98*, November 1996.

Table 2.3. Current budget balance: cyclical and structural

	Economic growth	***Output gap*** *(% potential output)*	**Current budget balance** (% national income)			**Net borrowing** (% national income)
			Cyclical	**Structural**	**Total**	
2006–07	*2¾%*	*–0.2*	–0.2	–0.4	–0.6	2.8
2007–08	*2¾%*	*0*	–0.2	0.1	–0.1	2.3
2008–09	*2½%*	*0*	0	0.3	0.3	1.9
2009–10	*2½%*	*0*	0	0.5	0.5	1.7
2010–11	*2½%*	*0*	0	0.6	0.6	1.5
2011–12	*2½%*	*0*	0	0.8	0.8	1.3

Source: Tables B1 and B3 of HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

Spending

The 2004 Spending Review began a deceleration of public spending growth after the rapid increases seen during Labour's second term. Next year is the last to be covered by the 2004 review and is expected to see current (and total) spending growing by 2.7% in real terms – the lowest real increase since 1999–2000 – and sufficient only to hold it constant as a share of national income. Thereafter, as we explain in more detail in Chapter 7, the Treasury has pencilled in cuts in spending as a share of national income over the three years to be covered by the 2007 Comprehensive Spending Review.

Firm spending totals for the 2007 CSR are expected in the Budget. In the Pre-Budget Report, the Treasury once again pencilled in slower growth in real public spending than in the economy in 2008–09, 2009–10 and 2010–11. Real growth in current spending averaging 2.0% a year is projected to cut spending by 0.6% of national income (£7 billion in today's terms). This would return current spending as a share of national income to its level in 2004–05. In addition, the Treasury also for the first time pencilled in an assumption for current spending growth in 2011–12, the first year beyond the 2007 CSR. This would cut current spending by a further 0.2% of national income, bringing the total cut to 0.8% of national income (£10 billion).

Revenues

Revenues are expected to rise by 0.7% of national income (£10 billion) over the next five years. The increase is expected to come predominantly from taxes on incomes and profits, partially offset by a decline in revenue from taxes on spending and North Sea oil production. Of this increase, 0.1% of national income is cyclical and 0.6% structural. Most of the increase (0.5% of national income) is expected in the coming year alone and will come from income tax, corporation tax and 'other receipts' (mostly profits and rent from public bodies).

As usual, the forecast incorporates an ongoing structural increase in revenues arising from 'fiscal drag'. This reflects the Treasury's conventional forecasting assumption that tax allowances and thresholds rise in line with retail prices. As earnings typically rise more quickly, this implies a continuous rise in the share of national income taken in income tax as more people find larger proportions of their income being taxed at higher rates. (We would see a similar phenomenon on a smaller scale – relative to national income – for taxes such as

capital gains tax and stamp duty on properties, where the tax base tends to grow more quickly than the rise in thresholds assumed for forecasting purposes.)

The Treasury estimates that fiscal drag increases current receipts by 0.2% of national income a year, which implies an increase of at least 0.75% of national income after five years once rounding is taken into account.[9] This accounts for most if not all of the 0.8% of national income increase in revenue from income tax and National Insurance contributions (NICs) over the forecast horizon – and indeed most of the increase in revenues overall.

Table 2.4. Revenue changes projected in PBR 2006 (% of national income)

	2006–07	2011–12	Change
Income tax & NICs	17.6	18.4	+0.8
Corporation tax	3.1	3.4	+0.3
North Sea revenues	0.8	0.7	–0.1
VAT & excise duties	8.8	8.5	–0.3
Other taxes & royalties	7.0	7.2	+0.2
Net taxes & NICs	**37.3**	**38.1**	**+0.8**
Other receipts etc.	2.3	2.3	No change
Current receipts	**39.7**	**40.4**	**+0.7**

Note: Components may not add to totals due to rounding.
Source: Table B14 of HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm)

One impact of fiscal drag is to increase the number of higher-rate income taxpayers. In 2006–07, with a higher-rate threshold of £38,335, HMRC estimates that there will be 3.25 million higher-rate taxpayers.[10] Had the higher-rate threshold been increased in line with average earnings over the last 10 years, the threshold would have been £44,175 and there would have been almost 1 million fewer higher-rate taxpaying individuals.

The assumption that fiscal drag proceeds uninterrupted over the Treasury's forecasting horizon is not a new one – for example, Mr Clarke's November 1996 Budget made the same assumption. But, as the Treasury acknowledges, assuming that the tax burden continues to increase for the foreseeable future would be unrealistic. It therefore assumes in its *Long Term Public Finance Report* that revenues and their composition remain broadly unchanged as shares of national income over the longer term.[11] This implies 'a comprehensive form of "real indexation"',[12] which presumably means tax allowances and thresholds rising in line with growth in the relevant tax base, i.e. often faster than prices.

The Treasury may indeed believe that, over the short to medium term, exploiting fiscal drag – with the increase in marginal (as well as average) income tax rates for many people that this implies – is the most sensible way to raise the extra revenues that it requires to meet the

[9] Paragraph A24 of HM Treasury, *End of Year Fiscal Report*, December 2003 (http://www.hm-treasury.gov.uk/media/324/70/end_of_year_352%5B1%5D.pdf).

[10] Table 2.1 of HMRC Statistics (http://www.hmrc.gov.uk/stats/income_tax/table2-1.xls).

[11] Paragraph 5.20, page 50, of HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, December 2004 (http://www.hm-treasury.gov.uk/media/8F5/85/pbr04long-term_473.pdf).

[12] Footnote 13, page 51, of HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, December 2004 (http://www.hm-treasury.gov.uk/media/8F5/85/pbr04long-term_473.pdf).

golden rule looking forward. But the Treasury, both now and in the past, does not make this case explicitly, and we should be clear that this would be a policy choice and not an economically neutral assumption – indeed, it only arises from the particular way in which the tax system is written in legislation. There are other ways that the public finances could be strengthened.

2.6 Uncertainty and the Treasury's fiscal forecasts

As Mr Brown and previous Chancellors have discovered to their cost, forecasting the public finances is a difficult business. The main problem is that small errors in forecasts for spending or revenues can imply proportionately much bigger errors in forecasts of budget balances – the difference between the two. So when the Treasury predicts that the current budget balance will strengthen by 1.4% of national income over the next five years (and public sector net borrowing by 1.5% of national income over the same period), how confident should we and Mr Brown be that this will actually be the outcome?

The Chancellor has repeatedly argued that his forecasts are cautious. But, unlike the Bank of England in its pursuit of the inflation target, he shies away from explicit discussion of the confidence that can be attached to his forecasts and the implications that has for his decisions. We have argued for some time that the Treasury should emulate the Bank and publish its fiscal forecasts in a way that makes clear the uncertainty that lies around the central estimate. The Treasury has consistently rejected this suggestion, arguing that it is difficult to do and that it is sufficient to publish average forecasting errors alongside its predictions.

Lessons from past experience

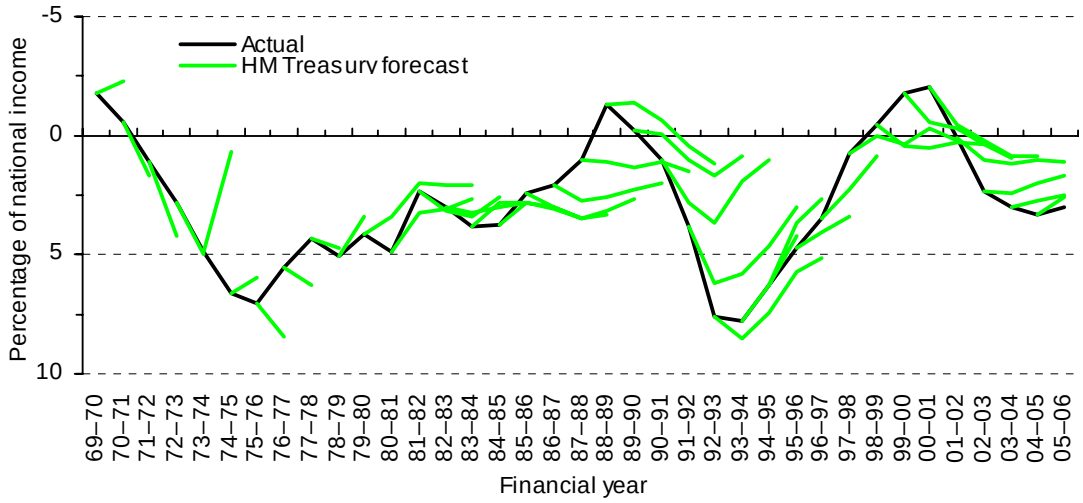
The Treasury's past forecasting errors are a good place to start in assessing the confidence we should have in its current predictions. If we are happy to assume that its forecasting performance in the future will be the same as that in the past, we can calculate the probability that the outcome will differ by a given amount in one direction or the other from the central forecast.

Figure 2.5 shows how Treasury forecasts of changes in public sector net borrowing since the early 1970s have compared with what actually happened. We can see that the errors are relatively large and that they are also serially correlated: in other words, an over-optimistic forecast tends to be followed by another over-optimistic one and a pessimistic forecast by another pessimistic one (as shown by the fact that the forecast lines tend not to cross the actual borrowing line in the graph).

The Treasury's average absolute error in forecasting public sector net borrowing one, two, three and four years ahead for the period from 1977–78 to 2005–06 is shown in Table 2.5. This shows that even one year ahead, the average absolute error is 1% of national income, or £13 billion in today's prices.[13]

[13] IFS forecasts show errors of similar magnitude. See C. Giles and J. Hall, 'Forecasting the PSBR outside government: the IFS perspective', *Fiscal Studies*, 19, 83–100, 1998 (http://www.ifs.org.uk/publications.php?publication_id=2250).

Figure 2.5. Treasury public sector net borrowing forecasts



Source: Authors' calculations, from data contained in HM Treasury, *End of Year Fiscal Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm).

Table 2.5. Treasury errors in forecasting public sector net borrowing

Time period	Average absolute error (% of national income)	Average absolute error (£ billion)
One year ahead	1.0	13
Two years ahead	1.5	20
Three years ahead	2.0	26
Four years ahead	2.5	33

Notes: Figures in £ billion are calculated assuming HM Treasury forecast for national income in 2006–07 of £1,305 billion. Average absolute error is given over the period 1977–78 to 2005–06 for one year ahead, 1981–82 to 2005–06 for two years ahead, 1982–83 to 2005–06 (excluding 1996–97 to 1999–2000) for three years ahead, and 1983–84 to 2005–06 (excluding 1984–85 to 1986–87 and 1997–98 to 2000–01) for four years ahead.
Sources: HM Treasury, *End of Year Fiscal Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm); authors' calculations.

Errors in forecasting public sector net borrowing can arise either from errors in forecasting the strength and composition of economic growth or from errors in predicting tax revenues and spending for any given level and composition of national income. Errors in forecasting economic growth have been relatively unimportant in explaining the Treasury's errors in forecasting the budget balance over a horizon of at least up to four years.[14]

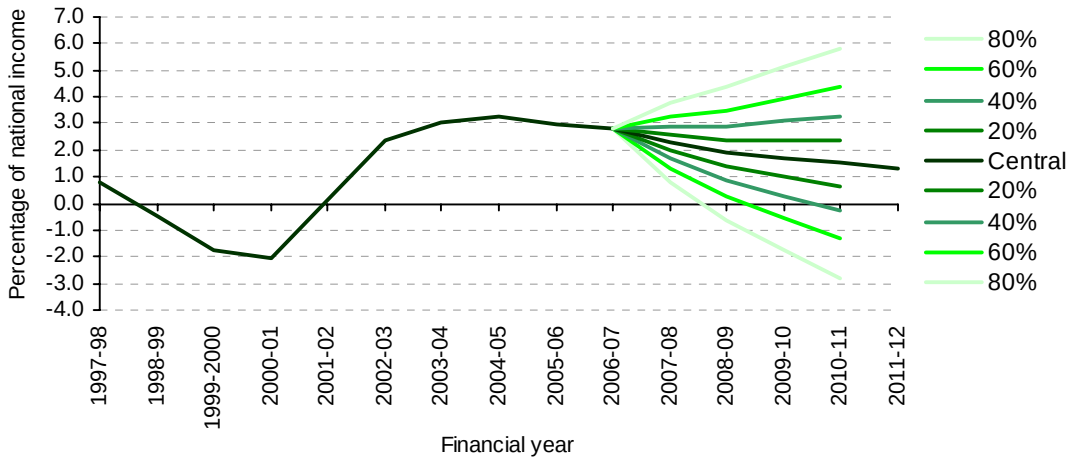
If we assume that the Treasury's latest forecasts will be as accurate as its past ones and that errors are normally distributed, we can put confidence intervals around the projections. Figures 2.6, 2.7 and 2.8 show confidence intervals around the central projections for net borrowing, the current budget balance and net debt respectively over the next four years. By assumption, it is just as likely that things will turn out better than the Treasury expects as that they will turn out worse than expected. Looking at the Treasury's one-year- and two-year-ahead forecasts back to 1970, under previous governments the predictions were slightly more

[14] See table B13 of HM Treasury, *Pre-Budget Report 1998* (http://archive.treasury.gov.uk/pub/html/prebudgetNov98/index.html).

likely to be pessimistic than optimistic, but the average error is very small, at 0.1% of national income. In the period since the current government introduced its fiscal rules, the Treasury claims that its forecasts have been deliberately cautious. This is consistent with the fact that forecasts for public sector net borrowing one year ahead have been on average 0.2% of national income too pessimistic. But forecasts two years ahead are as likely to have been over-optimistic as unduly pessimistic.[15]

The main source of caution in the public finance forecasts is the assumption that the trend growth rate of the economy is a quarter of a percentage point lower than the Treasury's central view. This means that the level of national income assumed for 2011–12 is 1¼% lower than the Treasury's true expectation.[16] If the Treasury's central view of trend growth is correct, this would lead us to expect its borrowing forecasts to become increasingly pessimistic over time relative to the true outcome – reaching an expected difference of around 0.9% of national income by 2011–12. It would be more transparent if the Treasury dealt with the need for caution explicitly when explaining its policy decisions rather than trying to incorporate deliberate bias in its forecasts. As we have yet to see whether the supposedly cautious growth assumption will produce unduly pessimistic forecasts on average over a long period, we assume for the time being in calculating the probability distribution of future outcomes that future Treasury forecasts will be unbiased.

Figure 2.6. Probabilities for net borrowing outcomes



Sources: Central projections are taken from HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm) and assume that the forecast for 2006–07 is correct; methodology for computing fan charts taken from C. Emmerson, C. Frayne and S. Love, 'Updating the UK's Code for Fiscal Stability', IFS Working Paper W04/29, 2004 (http://www.ifs.org.uk/publications.php?publication_id=3163).

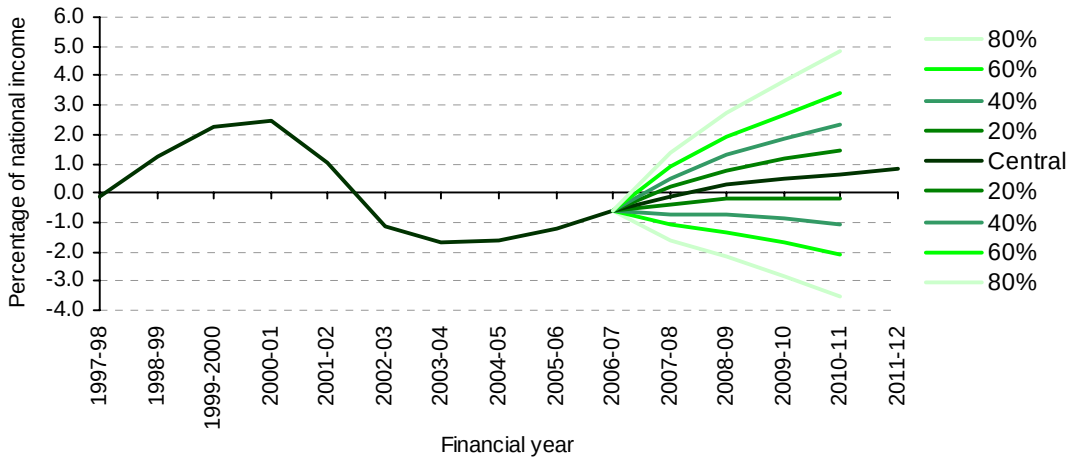
[15] Table 2.2 of HM Treasury, *End of Year Fiscal Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm).

[16] Source: Paragraph B.23, page 221, of HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

Figure 2.6 shows the probabilities of different outcomes for public sector net borrowing, based purely on the Treasury's latest forecasts and its past forecasting performance. We assume that the Treasury's projection for 2006–07 is correct, but that there is uncertainty thereafter. The presentation is analogous to the Bank of England's inflation and growth forecasts in its quarterly *Inflation Report*.[17] The 'central' estimate is the Pre-Budget Report forecast shown in Figure 2.1. Figure 2.6 shows that there is a 20% probability that the outcome will lie within the darkest bands either side of the central forecast, a 40% probability that it will lie between the next darkest bands, and so on. It shows, for example, that in 2010–11, there is around a one-in-three chance on past performance that the deficit will have been eliminated.

Similarly, Figure 2.7 shows the probability distribution around the Treasury's central Pre-Budget Report forecast for the current budget balance. It suggests that there is a slightly greater than 40% chance that the current budget will still be in deficit in four years' time rather than recording the surplus of 0.6% of national income predicted in the Pre-Budget Report. There is a more than 30% chance that there will be no improvement in the current budget balance over the next four years.

Figure 2.7. Probabilities for current budget balance outcomes

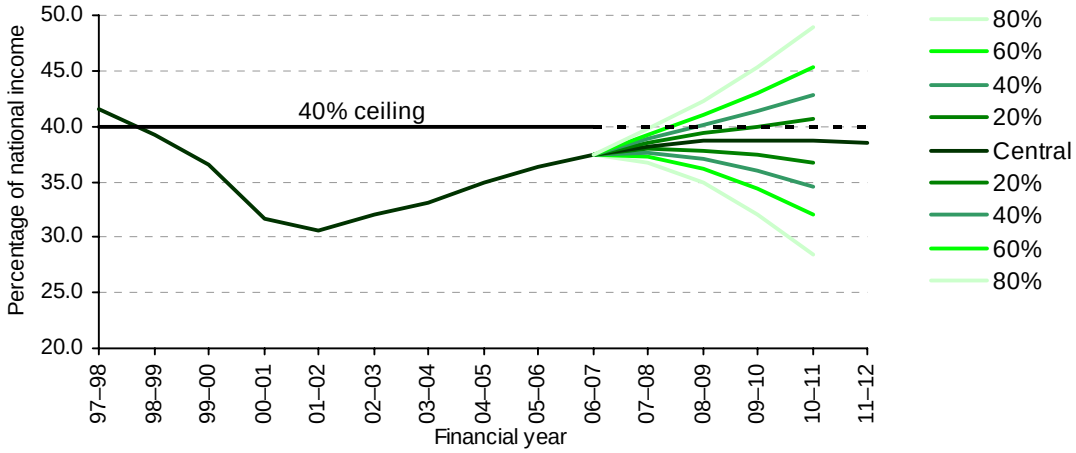


Sources: As Figure 2.6.

Figure 2.8 shows a similar probability distribution around the Treasury's central forecast for public sector net debt. This distribution also takes into account the fact that the direction of forecasting errors tends to be correlated from one year to the next, as shown in Figure 2.5. As we shall discuss in the next chapter, Figure 2.8 suggests that the probability of public sector net debt breaching the 40% of national income ceiling established by the sustainable investment rule rises from a little over 30% in 2008–09 to 40–45% in the following two years, again based purely on the Treasury's past forecasting performance.

[17] http://www.bankofengland.co.uk/publications/inflationreport/index.htm.

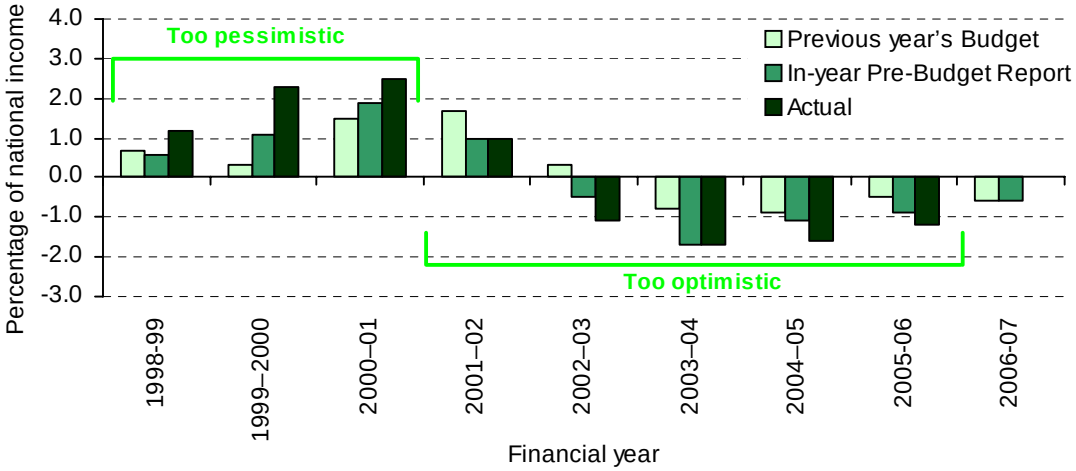
Figure 2.8. Probabilities for public sector net debt outcomes



Note: Assumes that any cumulative variation in public sector net borrowing from that forecast by the Treasury directly adds to public sector net debt. The second-order impact of changes in debt interest is ignored.
Sources: As Figure 2.6.

The estimates of previous Treasury forecasting errors used in this analysis are likely to be underestimates of the true forecasting error. This is because the forecasts for borrowing have not been adjusted for subsequent tax and spending decisions. In practice during periods where (underlying) borrowing was exceeding expectations, Chancellors would have been more likely to engage in a fiscal tightening than a fiscal loosening. For example, the two Budgets of 1993 contained significant tax-raising measures aimed at bringing revenues closer to previous expectations. This suggests that, if anything, the probability bands shown in Figures 2.6, 2.7 and 2.8 should be wider. It would be very useful if the Treasury published information on previous forecasting errors that have been adjusted for subsequent policy announcements.

Figure 2.9. Treasury current budget balance forecasts



Sources: HM Treasury, various Budgets and Pre-Budget Reports.

As mentioned above, forecasting errors tend to be correlated from one year to the next. We can see this for the current government's short-term forecasts of the current budget balance in Figure 2.9. In the Budget of March 1999, the Treasury forecast a current budget surplus in 1999–2000 of 0.3% of national income. The eventual out-turn was 2.3% of national income.

Hence the Treasury's year-ahead Budget forecast for the current budget balance was 2% of national income too pessimistic in 1999–2000. In subsequent years, it was about 1% of national income too pessimistic in 2000–01, ¾% too optimistic in 2001–02, 1½% too optimistic in 2002–03, 1% too optimistic in 2003–04, ¾% too optimistic in 2004–05 and ¾% too optimistic in 2005–06.

Asked to explain the serial over-optimism of the Treasury's public finance forecasts in recent years, Jon Cunliffe, Second Permanent Secretary at the Treasury responsible for macroeconomic policy and international finance, told the Treasury Select Committee in December 2005 that 'There is a tendency for forecast errors to be correlated with the economic cycle, so when you have a positive output gap there is a tendency for forecast errors to be one way and when you have a negative output gap there is a tendency for forecast errors to be the other way'.[18] This is consistent with the switch from undue pessimism to over-optimism in 2001–02. With the Treasury now expecting that the output gap will close in the current financial year, this suggests that the Treasury's forecasting fortunes may turn again soon. However, if there is indeed this predictable relationship between errors in the Treasury's public finance forecasts and its contemporaneous estimates of the output gap, it should be possible to improve the forecasts by taking this into account.

2.7 Fiscal monetary coordination

Mr Brown has said that one of his objectives for fiscal policy is to allow changes in government borrowing to 'support' monetary policy in helping to stabilise economic activity and keep inflation on target. He cites as evidence that this has been achieved that 'net borrowing increased to allow fiscal policy to support monetary policy as the economy moved below trend in 2001'.[19] The implication is that on most occasions, monetary and fiscal policy should tighten together or loosen together, rather than moving in opposite directions. Presumably, this is designed to reduce the swings in real interest rates necessary to keep inflation on target as economic activity fluctuates above and below trend.

Whether this is an appropriate goal for the coordination of monetary and fiscal policy is debatable. The Chancellor sets fiscal policy twice a year in the Budget and Pre-Budget Report, while the Bank of England meets monthly to set nominal interest rates in pursuit of the inflation target over an approximately two-year time horizon. If the Treasury understands how the Bank will react to fiscal policy changes – which is presumably one reason why it has a representative at meetings of the Monetary Policy Committee – it can in effect determine the mix of monetary and fiscal policy at any given time.

If the Treasury tightens fiscal policy, it might reasonably expect the Bank to set a lower interest rate to hit the inflation target than it otherwise would. And there may be occasions when such a 'rebalancing' of monetary and fiscal policy is thought desirable. For example, some commentators have at various times urged tax increases or spending cuts in order to encourage the Bank to keep interest rates lower than they otherwise would be, in the hope that

[18] http://www.publications.parliament.uk/pa/cm200506/cmselect/cmtreasy/uc739-ii/uc73902.htm.

[19] Source: Page 19 of HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

this will push down the exchange rate and boost the competitiveness of the internationally traded (and especially the manufacturing) sector. Mr Brown has shown no appetite for such an approach, perhaps on the reasonable grounds that there is no reliably predictable relationship between the monetary/fiscal mix and the exchange rate. Indeed, tightening fiscal policy could strengthen the exchange rate if it attracts capital inflows by boosting investor confidence in macroeconomic management.

But let us assume that it is desirable for monetary and fiscal policy to move in the same direction most of the time. In part, this will happen automatically if below-trend economic activity encourages lower interest rates and also increases borrowing through the workings of the 'automatic stabilisers' – weaker tax revenues and higher social benefit spending. But the Chancellor can enhance this effect through changes in the structural budget balance.

This would appear to have happened over most of the past 10 years. In its *End of Year Fiscal Report*, the Treasury shows this by comparing the change in real interest rates that occurred in each year with the change in public sector net borrowing (PSNB) and with the change in the cyclically adjusted change in PSNB which strips out the estimated impact of the economic cycle on borrowing. As shown in column 1 of Table 2.6, there have been five years in which real interest rates have been increased (a monetary tightening) and five years in which real interest rates have been reduced (a monetary loosening). As column 3 shows, in four of the five years that monetary policy was tightened, so too was fiscal policy; and in three of the five years in which monetary policy was loosened, so too was fiscal policy. This is true whether or not the automatic stabilisers are taken into account.

Table 2.6. Monetary and fiscal policy working in the same direction?

	Change in demand resulting from:				
	(1) Real interest rate	(2) PSNB	(3) Cyclically adjusted PSNB	(4) Policy measures – short run	(5) Policy measures – medium run
1997–98	tighten	tighten	tighten	tighten	tighten
1998–99	tighten	tighten	tighten	tighten	tighten
1999–2000	loosen	tighten	tighten	loosen	loosen
2000–01	tighten	tighten	tighten	loosen	loosen
2001–02	loosen	loosen	loosen	loosen	loosen
2002–03	loosen	loosen	loosen	loosen	tighten
2003–04	loosen	loosen	loosen	loosen	loosen
2004–05	tighten	loosen	loosen	loosen	loosen
2005–06	loosen	tighten	tighten	loosen	loosen
2006–07	tighten	tighten	tighten	tighten	tighten

Sources: Change in real interest rate and change in cyclically adjusted net borrowing taken from chart 2.2, page 8, of HM Treasury, *End of Year Fiscal Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm). Change from policy announcements taken from Budgets and Pre-Budget Reports from July 1997 to December 2006.

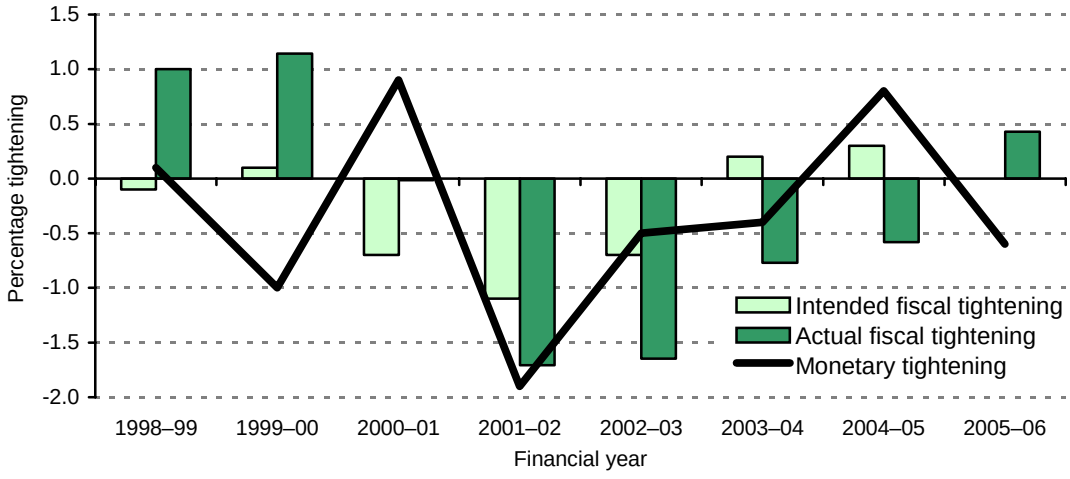
But showing that the change in cyclically adjusted borrowing is negatively correlated with changes in real interest rates (i.e. that rises in borrowing are associated with falls in real interest rates) is not sufficient to demonstrate that fiscal policy has actively supported monetary policy in the way that Mr Brown intends. If, for example, there had been

phenomena other than the economic cycle that have influenced both the state of the public finances and interest rate decisions, then this would be likely to lead to a negative correlation between changes in structural borrowing and changes in real interest rates.

Such a correlation might still remain even if fiscal policy decisions announced over the period in question actually worked in the opposite direction to monetary policy. An example is to imagine an asset price cycle that strongly affects individuals' incomes and therefore both demand in the economy and tax receipts. This could be relevant to the period since April 1997, given the rise and subsequent fall in the stock market and the fortunes of the financial sector. If a Chancellor announced new tax cuts when real interest rates were rising and tax increases when real interest rates were falling, as long as the tax changes were smaller than the overall impact of the asset price cycle on the government's finances, he or she would still be able to point to a period in which borrowing fell when real interest rates were rising and borrowing rose when real interest rates were falling. But it would be difficult to argue that fiscal policy had really 'supported' monetary policy in the way that Mr Brown intends.

We can assess this in part by comparing the change in structural borrowing that the Chancellor intended over the year ahead at the time of each recent Budget with that which actually occurred. Figure 2.10 shows that monetary and fiscal policy did both loosen after 2001 as the Chancellor claims, but that the loosening in fiscal policy was partly unintended at the time – the weakness of the stock market led to unexpected weakness in tax revenues (and hence unexpected looseness in fiscal policy). An alternative explanation for some Treasury forecast errors is that it has underestimated how powerful the automatic stabilisers are.

Figure 2.10. Intended and unintended fiscal policy changes



Notes: Fiscal tightening refers to the change in cyclically adjusted net borrowing. Monetary tightening refers to the change in the real interest rate.
Sources: HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls); successive Budgets; HM Treasury, *End of Year Fiscal Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm).

It is important to remember that the Monetary Policy Committee takes a forward-looking approach to setting monetary policy. As a result, the forecast change in cyclically adjusted public borrowing is likely already to have been considered in current interest rate decisions. Table 2.6 also shows the impact of Budget and Pre-Budget Report decisions on borrowing

both in the current year (column 4) and in the longer term (column 5). This shows that even using this better measure of changes in the fiscal stance, on average, Mr Brown can still claim to have used fiscal policy to support monetary policy. On three of the five occasions when real interest rates were rising, the impact of new measures announced in Budgets and Pre-Budget Reports were to increase borrowing (in both the short and medium terms). In addition, on all five occasions when real interest rates were falling, the impact of measures announced in Budgets and Pre-Budget Reports was to increase borrowing in the current year (although on one of these occasions the medium-term impact was to reduce borrowing).

2.8 Conclusion

Mr Brown began his decade as Chancellor defying the stereotypes conjured up by previous Labour occupants of the post: he cut spending and increased tax revenues sharply, pulling the public finances back into the black. But after 1999 it became clear that he could not deliver the quality of public services and the reduction in child and pensioner poverty that he sought without substantially higher public spending. Unfortunately, as the resulting spree got underway, the downturn in the stock market punched a hole in his tax revenues, and the strengthening of the public finances with which he began was swiftly reversed despite a big tax increase after the 2001 election. Continued weakness in revenues means that the Chancellor has already had to raise taxes repeatedly since the 2005 election as well as pencilling in spending cuts over the next few years, albeit much smaller than those with which he began his Chancellorship.

After 10 years at Number 11, he should leave the public finances in stronger shape than that in which he inherited them – although having presided over a smaller improvement than most industrial countries over the same period. He now faces the prospect of his first general election as Prime Minister with the tax burden rising and public spending falling. The tightening is less draconian than that on which the Conservatives fought the 1997 election, and Mr Brown doubtless hopes that the electorate will smile more favourably upon his efforts now than it did on those of his predecessors then.

3. The fiscal rules and policy framework

Robert Chote, Carl Emmerson, Christine Frayne and Gemma Tetlow (IFS)

Summary

- Designing fiscal rules requires a trade-off between sophistication on the one hand and simplicity and transparency on the other. The golden rule and sustainable investment rule – like any fiscal rules that could be applied in practice – are not optimal, but they still have value as rules of thumb.
- Many economists outside government no longer see compliance with the fiscal rules as a good guide to the health of the public finances. This presumably reflects concern that the Chancellor 'moved the goalposts' to make the golden rule easier to meet when downward revisions to his public finance forecasts eroded the margin by which he expected to meet the rules after 2001.
- The Treasury could be argued to have pursued a rolling five-year target to achieve a current budget surplus of 0.7% of national income. This target was missed significantly in 2005–06 and is also set to be missed in coming years.
- The likely arrival of a new Chancellor later this year may be a golden opportunity to tweak the fiscal rules for the better. Sensible changes would include making the golden rule symmetric, forward-looking and less reliant on the ability to identify economic cycles. The Treasury's fiscal forecasting could also be made more transparent or perhaps even delegated to an independent body.

3.1 Introduction

As we explained in Chapter 2, while in opposition, Gordon Brown attempted to persuade people that as Chancellor he would be a fair and prudent steward of the public finances by converting broad principles of good fiscal policymaking into specific operational rules that he promised to abide by and against which his performance could be judged:

- The **golden rule** requires the public sector to borrow only what it needs to pay for capital investment, and to finance its remaining current spending from tax and other revenues. In other words, the government has to keep the current budget (revenues minus current spending) in balance or in surplus. The rule has to be met on average over the ups and downs of the economic cycle rather than every year.
- The **sustainable investment rule** requires the government to keep the public sector's debt (net of its financial assets) at a 'stable and prudent' level. The Treasury defines this as less than 40% of national income (GDP) at the end of every financial year of the current economic cycle, but has not yet announced how 'stable and prudent' is to be defined over subsequent economic cycles.

The government formally adopted these rules in the 1998 Finance Act. The Act also placed the rules in a statutory framework; this 'Code for Fiscal Stability' requires any government to

spell out how it intends to formulate and implement fiscal policy, and manage the national debt, and to publish twice-yearly forecasts illustrating how the setting of policy at any given time is consistent with its approach.

But the Code leaves the government to decide whether or not to set itself any operating rules and, if it does, to decide whether those rules have been kept to or not. There is no penalty (other than potential reaction of voters and financial market participants) if they are missed.[1] This has contributed to suspicions that the government has applied the rules in such a way as to make them easier to meet while avoiding having to make painful policy adjustments at politically inconvenient times. This in turn has prompted calls for greater independence in judging adherence to the rules so that the Treasury no longer 'marks its own exam paper'.

This chapter describes the fiscal rules, assesses their operation to date and highlights ways in which assessment of adherence to them could be improved further. Section 3.2 examines the golden rule and Section 3.3 the sustainable investment rule. In Section 3.4, we describe a set of reforms that would improve the operation of the rules and might also help restore confidence that they truly reflect the underlying principles on which they were originally built.

3.2 The golden rule

The golden rule is designed to help achieve intergenerational fairness by ensuring that future taxpayers are not left to pay for public spending from which all the benefits have accrued to the current generation. It is also intended to remove a possible bias against investment if and when public spending has to be restrained, since it might be more tempting to cut capital rather than current spending because it normally takes longer for voters to feel the effects of cuts in capital spending in the quality of public services.[2] Requiring the golden rule to be met only on average over the economic cycle, rather than every year, allows it to 'support monetary policy' by ensuring that fiscal policy does not have to be tightened at the same time as monetary policy is being loosened. Section 2.7 discusses this issue in more detail.

In the next two sections, we focus on two questions that arise in relation to the objectives of the golden rule:

- Does allowing the government to borrow only to finance capital investment in fact achieve intergenerational fairness?
- Is it sensible to seek to apply the rule over an economic cycle with specific start and end dates?

We then examine how the golden rule has been applied in practice and whether the Treasury's latest forecasts suggest it will be met over the current economic cycle.

[1] For a detailed discussion, see C. Emmerson, C. Frayne and S. Love, 'Updating the UK's Code for Fiscal Stability', IFS Working Paper W04/29, 2004 (http://www.ifs.org.uk/publications.php?publication_id=3163).

[2] For a discussion, see HM Treasury, *Fiscal Policy: Current and Capital Spending*, London, 1998 (http://www.hm-treasury.gov.uk/media/A97/77/530.pdf).

Intergenerational fairness

For a number of reasons, balancing the current budget as defined for the purposes of the golden rule will not necessarily achieve intergenerational fairness:

- The golden rule is based on the distinction between capital and current spending used in the National Accounts, which is in turn based on international accounting standards as interpreted by the Office for National Statistics. These accounting definitions do not necessarily coincide with spending that does and does not benefit future taxpayers; for example, spending on the enhancement of skills can increase future economic growth but does not score as capital spending. £1 of 'current' spending on the training of teachers or doctors might benefit future taxpayers more than £1 of 'capital' spending on an Olympic venue of doubtful long-term use.

  The Chancellor could distinguish spending that may and may not be covered by borrowing in a more sophisticated way, but there is likely to be a trade-off between the richness of the rule and its transparency. As Treasury officials have argued, 'It is difficult to agree on a robust definition of growth enhancing expenditure once generally accepted accounting standards are departed from'.[3] Observers might well suspect that a bespoke definition could be tweaked and spending reclassified if and when a breach of the rule looked likely. Even with the use of the National Accounts definitions, the current government has sometimes been accused of reclassifying current spending to ease the constraint of the golden rule.[4]

- To judge rigorously whether tax and spending decisions are intergenerationally fair, one would need to consider the overall impact of taxes and spending and take a 'general equilibrium' approach, analysing their knock-on impact throughout the economy and not just the formal incidence of a few policy instruments taken in isolation. One would need to understand who ultimately bears the costs of taxation and receives the benefits of public spending after taking into account the way in which all policies, and their interactions with each other, affect individuals.

- Furthermore, were a particular generation to lose from the introduction and financing of a new policy, this could still enhance intergenerational fairness if that generation would otherwise have been in a privileged position due to the effect of other policies.[5]

- Borrowing only to invest over a cycle does not directly link the time profile of debt repayments with the time profile of the benefits flowing from an investment project that the debt has financed.

  A related issue is the servicing of debts that have arisen from past breaches of the rule (i.e. to finance some of past generations' current spending). It may be fairer to pass on some burden of this to the next generation (in the expectation that it and future

[3] P. Toigo and R. Woods, 'Public investment in the UK', paper presented at the 7th Banca d'Italia Public Finance Workshop, 2005.

[4] 'Brown faces "fiddle" claim after U-turn on the roads', *The Times*, 19 February 2005 (http://www.timesonline.co.uk/article/0,,19809-1490602,00.html).

[5] W. Buiter, 'Notes on "A Code for Fiscal Stability"', *Oxford Economic Papers*, 53(1), 1–19, 2001.

generations will in turn continue to do so ad infinitum) rather than to be the 'transition' generation that selflessly pays for its own and all outstanding past current spending.

- Fairness considerations might lead us to argue that future generations should pay for some of today's current spending, as productivity growth arising from technological progress should make future generations financially better off on average and therefore give them greater ability to pay. In other words, running a current budget deficit would achieve progressive redistribution across the generations.

Even if a balanced current budget could be relied upon to deliver intergenerational fairness, that is not what Labour's variant of the rule requires. Instead, it says the current budget should be in balance *or in surplus*. But the concept of intergenerational fairness underpinning the golden rule suggests that we should be as concerned if today's taxpayers pay too much for current spending as if they pay too little.

For all these reasons, the golden rule is not an optimal mechanism to achieve intergenerational fairness. But it may well still have value as a rough-and-ready rule of thumb that is reasonable to use as a guide in most (but not necessarily all) time periods. In practice, it may not be worth sacrificing the transparency of the rule to get closer to optimality.

Taking account of the economic cycle

Now to our second question regarding Labour's interpretation of the golden rule: does it make sense to aim to achieve it over a specific economic cycle with defined start and end dates?

There is certainly a powerful case for taking some account of the condition of the economy in assessing the appropriate level of the current budget balance (or any other measure of borrowing or debt) at any given time. Government revenues and spending are both influenced directly by fluctuations in income, spending, transactions and employment. Economic activity can be thought of as fluctuating around a rising sustainable level consistent with stable inflation. When the economy is weak and activity is below the sustainable level (i.e. there is a negative output gap), tax revenues will be depressed temporarily and the government is likely to have to spend more on transfer payments for the low-paid and out-of-work. This will tend to push the current budget towards deficit. Conversely, when the economy is above trend output, the budget will tend towards surplus.

Changes in national income affect current spending and taxes collected, with higher national income leading to lower spending and higher receipts. According to Treasury estimates, if national income were to rise by 1% relative to its sustainable level, current spending would be expected to fall by about 0.5% of national income while current receipts rise by about 0.2% of national income over the following two years. The net effect is to increase the current budget surplus by about 0.7% of national income.[6]

[6] As taxes and spending both equal roughly 40% of the economy, if national income were to rise by 1%, both revenues and spending would fall by about 0.4% of national income when compared with the size of the economy (assuming there was no change in their cash value). Treasury estimates suggest that, in addition to this 'denominator' effect, over the following two years we would see spending on transfer payments and debt interest payments drop by 0.1% of national income and revenues rise by 0.6% of national income. Adding the two effects together, after a 1% rise in national income relative to its sustainable level, we would see current spending fall by about 0.5% of national income while current receipts rise by about 0.2% of national income over the following two years. The net effect is to increase the current budget surplus by about 0.7% of national income. (HM Treasury, *End*

The Bank of England is tasked with using interest rates to pursue an inflation target, which implies that once inflation is on target, it will try to keep activity as close as possible to its sustainable level. Over time and on average, monetary policy should therefore tend to erode any cyclical component of the budget surplus or deficit (even if shocks, policy errors and any other factors not associated with the economic cycle mean that it is not eliminated *ex post*). This implies that fiscal policy decisions should focus on the structural budget position. Broadly speaking, it is reasonable to expect cyclical deficits and surpluses to sum to zero over the course of a single symmetric economic cycle. So, if tax and spending decisions also succeed in keeping the structural position in balance on average, the golden rule will be met.

Allowing borrowing to rise and fall through the cycle acts as an 'automatic stabiliser'. If the government tried to keep the current budget balanced in every year of the cycle, it would need continuously to offset cyclical surpluses and deficits with structural deficits and surpluses respectively. This would typically mean raising taxes and/or cutting spending when a negative output gap leads to a cyclical deficit. Conversely, it would mean cutting taxes and/or increasing spending when a positive output gap leads to a cyclical surplus. This would place a greater burden on monetary policy to stabilise the economy. It would also require temporary changes in tax rates that might well be more costly in economic terms than holding tax rates steady and allowing the current budget balance to fluctuate instead. It should be borne in mind that the strength of the automatic stabilisers will depend on the size of the public sector and the progressiveness of the tax and benefit system, so it may not be optimal from a stabilisation perspective. However, there would be nothing to stop the Treasury from making additional discretionary policy changes in either direction, as long as they balanced out on average over the cycle, or from making changes to the tax and benefit system so that the automatic stabilisers are of a different magnitude.

But it is one thing to argue that the government should aim to balance the structural current budget at some appropriate time horizon in the future; it is another to argue that it should explicitly date a particular cycle and aim for a structural balance or surplus on average over that period. The Treasury identifies cycles by estimating from a variety of economic indicators points in time when economic activity was at its sustainable level and the output gap was zero (i.e. when there was neither upward nor downward pressure on inflation). It then assumes that the sustainable level of activity grows at a constant rate between these 'on-trend' points, allowing it to estimate the output gap at any other point. To date, it has chosen to define a cycle as a period of above-trend activity followed by a period of below-trend activity, although it could equally have opted for a below-trend one followed by an above-trend one.

Figure 3.1 shows the Treasury's estimates of the output gap[7] and the periods that it defines as economic cycles. It then shows the current budget balance, divided into its estimated 'structural component' (the level that would have occurred had the output gap been zero throughout) and the estimated remaining 'cyclical' element that reflects deviations in economic activity from its trend. This is based on the Treasury's estimates of the average output gap in each financial year.

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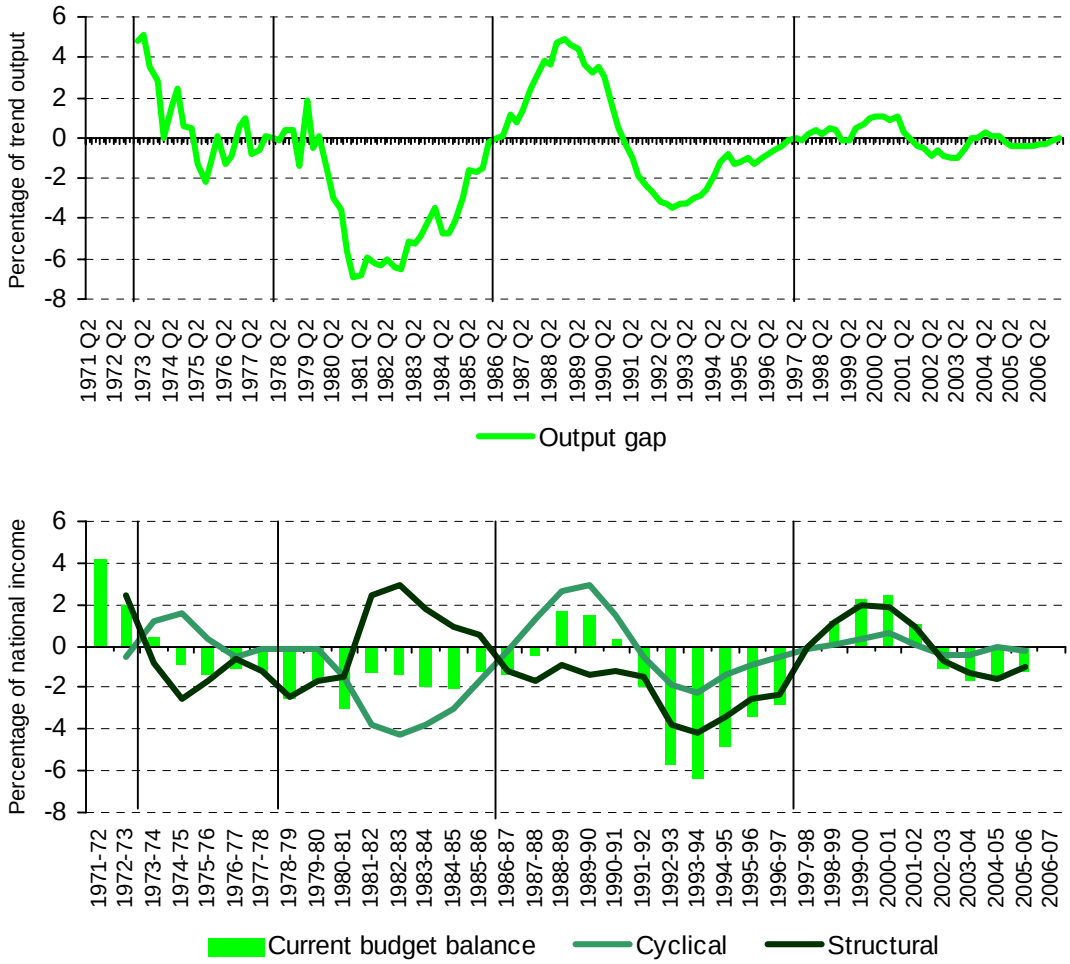
of Year Fiscal Report, December 2003 (http://www.hm-treasury.gov.uk/media/324/70/end_of_year_352%5B1%5D.pdf).)

[7] The output gap shown in Figure 3.1 is measured using 'non-oil gross value added' as the measure of output, in line with Treasury practice.

Figure 3.1. Current budget balance: cyclical and structural



Source: HM Treasury, *Public Sector Finances Databank*, London, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls).

One disadvantage of picking any fixed period over which to judge the rule is that the amount the government can borrow towards the end of the period is determined by what it has borrowed earlier on. Policy becomes backward-looking as the Chancellor is potentially constrained to compensate for the policy and forecasting errors of the past rather than setting what is necessarily the most sensible policy looking forward.

This is significantly different from the approach Labour has taken with monetary policy, where the Chancellor is happy for the Bank of England to set interest rates to try to achieve the inflation target at roughly a two-year time horizon but without requiring it to offset actual deviations from the target in the past or expected deviations from the target in the very near term (i.e. the Bank of England's Monetary Policy Committee (MPC) targets inflation rather than a particular price level – higher-than-target inflation in period 1 would not lead to the MPC trying to achieve lower-than-target inflation in period 2). An analogous approach for fiscal policy would be to set a rolling forward-looking target for the cyclically adjusted current budget balance (or just the total current budget balance if the policy horizon were sufficient to expect the output gap to have returned to zero). We argue below that the present government's approach can actually be interpreted in this way, given its published forecasts.

All this assumes that we can identify 'on-trend' points and the output gap at any given time. But, according to Barry Eichengreen of the University of California (Berkeley), 'The one thing economists know about cyclical adjustments is that we do not know how to do them'.[8]

Using the Treasury's own technique, identifying the start and end points of the cycle is in large part a matter of judgement. But there are also other methods of identifying the cycle – including statistical filters and production function techniques – that can yield very different answers (as shown in Table 4.3 of Chapter 4). Typically, the Treasury technique identifies fewer cycles than the filters do.

Given the lack of consensus over the dating of the cycle from different methods, if the Treasury re-dates the cycle in a way that increases the average current budget surplus for the period over which the golden rule is being judged (as it did in 2005, as we shall see below), it will not be surprising if people suspect that this has been done to make the golden rule easier to meet.

An obvious alternative would be for the Treasury to present forecasts based on output gap estimates produced by an independent body or bodies, such as the soon-to-be-independent Office for National Statistics, perhaps advised by an external panel.

But, more fundamentally, does it make sense to base policy on a clearly defined economic cycle at all? In a stable environment in which monetary policy is well run and credible, we might expect deviations in economic activity from its sustainable level to be relatively small. Economic activity might show high-frequency noise around its trend rather than protracted periods with significantly positive or negative output gaps. This would make cycles increasingly hard to identify and prone to re-dating as the National Accounts are revised.

As Mervyn King, Governor of the Bank of England, has argued:

> I am not even sure if the output gap is terribly well defined. To put precise numbers on it is pushing beyond the bounds of the plausible. The Bank and the Treasury have a very different view of how to think about the cycle. We don't like this sort of fixed dating and we have a different way of thinking about the productive potential of the economy and how it evolves. I am not even sure it makes sense to think about a cycle as if it is a well-defined phenomenon.[9]

An alternative might be for the Treasury to set a target for the current budget in the medium term and constrain itself to present forecasts of revenues and spending based on some average of independent forecasts for growth and other macroeconomic variables. Or it could use the forecasts used by the Bank of England, which would mean that the same projections would be used for both fiscal and monetary policy. One pitfall of this approach is that it could increase the political importance of the Bank of England's projections, which, over time, might risk reducing public confidence in their neutrality.

An even more dramatic option would be for more of the fiscal forecasting process to be delegated to an independent body, following the precedent of the Bank of England's

[8] B. Eichengreen, 'Comment on "The political economy of fiscal adjustments"', *Brookings Papers on Economic Activity*, 1, 255–62, 1998.

[9] M. King, *Inflation Report* press conference, August 2005 (http://www.bankofengland.co.uk/publications/inflationreport/2005.htm).

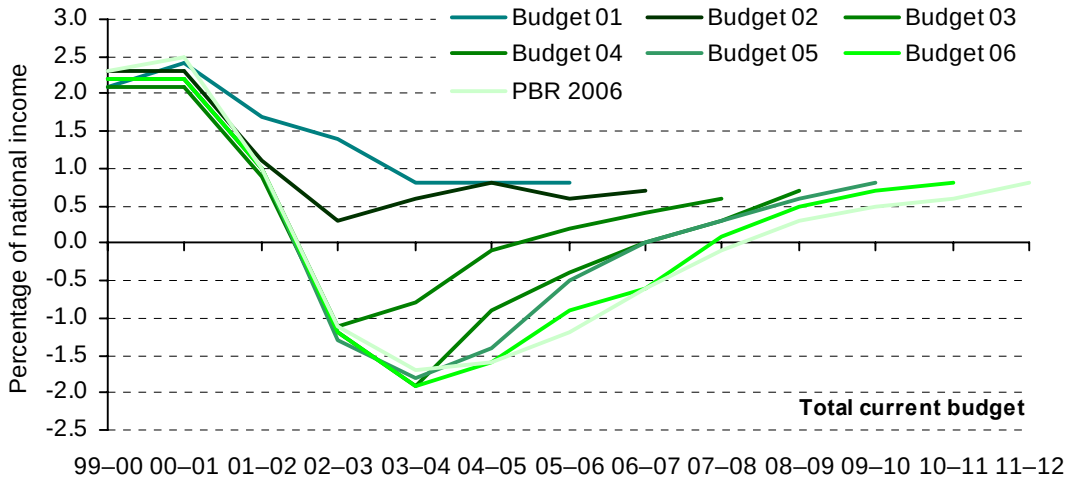
Monetary Policy Committee. For example, an independent body could be asked to provide official tax revenue forecasts, helped by access to information from HM Revenue & Customs. However, the Treasury has traditionally argued that it is impossible to separate responsibility for public finance forecasts or the economic inputs into them from the responsibility for making policy. We discuss this further in Section 3.4.

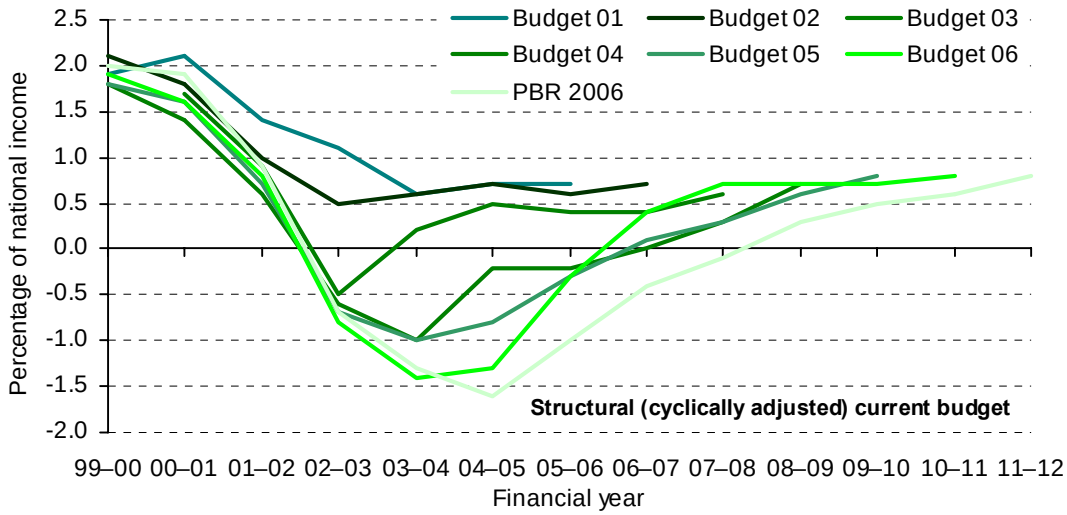
The golden rule in practice

In understanding how Mr Brown has interpreted and applied the golden rule in practice over recent years, it is important to remember that the Treasury's forecasts for the public finances have been consistently over-optimistic since 2001 and have hence been revised down in successive Budgets and Pre-Budget Reports. In particular, there has been a persistent unexpected weakness of tax revenues from the financial sector after the stock market decline between 2000 and 2002. The latest downward revisions, in the 2006 Pre-Budget Report, reflect a weaker outlook for North Sea oil revenues and higher-than-expected inflation.

Figure 3.2 shows the Treasury's forecasts for the current budget balance in each Budget since 2001 and the latest Pre-Budget Report. It shows that in 2001 and 2002, the Treasury expected current budget surpluses over the medium-term forecasting horizon, clearly implying that the golden rule would be met over any economic cycle of plausible duration. But in 2002–03, the current budget moved into deficit and the Treasury's expectations of a swift return to the black were repeatedly frustrated. As the second chart in Figure 3.2 shows, the unexpectedly weak fiscal performance was not explained in any large part by temporary weakness in the economy – Treasury forecasts for the structural current budget balance were revised downwards in similar fashion.

Figure 3.2. Treasury current budget balance forecasts



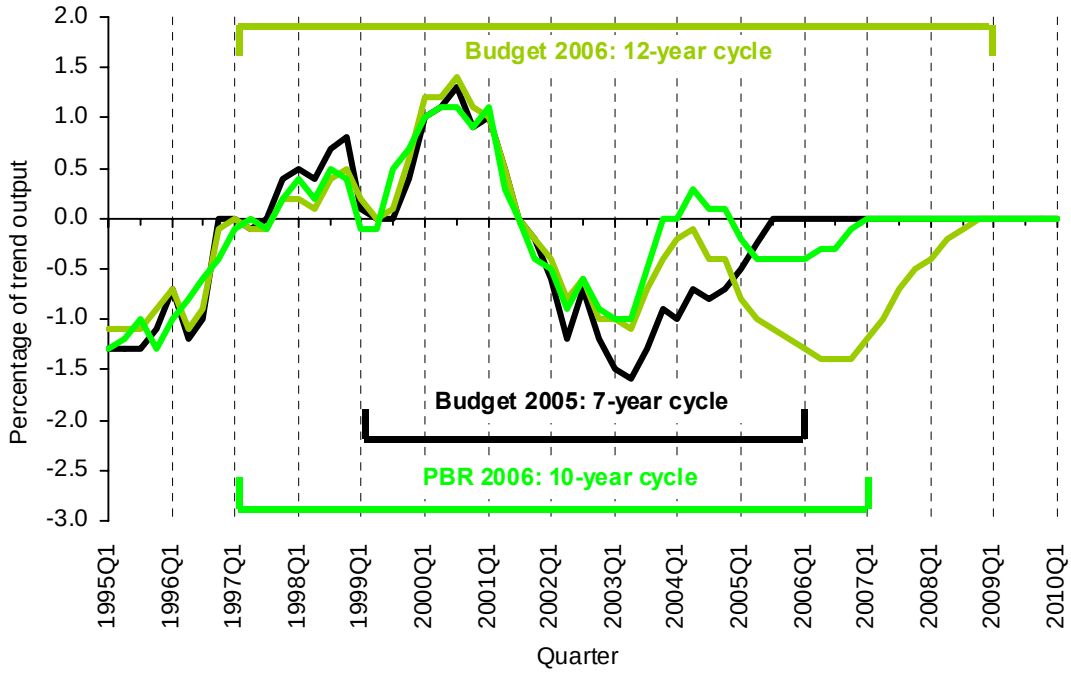


Sources: Successive Budgets and 2006 Pre-Budget Report.

As Mr Brown's hopes of continued surpluses were dashed and deficits began to mount up, the precise dating of the economic cycle became increasingly important in determining whether the golden rule was on course to be met – and, if so, with what degree of comfort.

In Budget 2000, the Treasury had reached the 'provisional conclusion' that the present economic cycle began in financial year 1999–2000, a view it maintained up to and including the pre-election Budget in 2005. In that Budget, the Treasury argued the economy was running about 0.7% below full capacity and that above-trend economic activity would close the output gap 'around the end of 2005'. For the purposes of the golden rule, this meant that there was one financial year still to come (2005–06) in a cycle spanning a total of seven years, as shown in Figure 3.3.

Figure 3.3. The output gap and the economic cycle: Treasury estimates



Note: Actual output less trend output as a percentage of trend output (non-oil basis).
Source: HM Treasury.

The Treasury estimated in Budget 2005 that it would meet the golden rule over this period with around £5 billion to spare,[10] far lower than the margins implied over the same period by previous forecasts. But as 2005–06 got under way, it soon became clear that the current budget deficit was not shrinking as rapidly as planned. In June 2005, the Treasury published figures showing that the deficit in the first two months of the financial year was only about 10% smaller than in the same period of 2004–05. If this persisted, it would come in at around £15 billion rather than the £5.7 billion forecast in Budget 2005. The golden rule would be breached.

Then, a month later, the Treasury published a detailed analysis arguing that the period from mid-1997 to mid-1999 should be regarded as part of the up-phase of the current cycle rather than as a complete mini-cycle in its own right. This would add two additional financial years to the beginning of the cycle and extend it from seven to nine years. The Treasury justified this change largely on the grounds that revisions to National Accounts data showed that economic growth in 1999 had been stronger than hitherto thought. In Budget 2000, the Treasury had identified a 'mini-cycle' in 1997–98 and 1998–99, the down-phase of which was estimated to last for two quarters with an average negative output gap of 0.3% of potential output. But, following the revisions up to 2005, output appeared to have fallen below potential only in 1999Q1 and then by less than 0.1% of potential output. The Treasury concluded: 'There is now no evidence of a clear dip below trend in early 1999. So the below trend phase of the previously identified 1997H1 to mid-1999 "cycle" now looks non-existent'.[11]

At a stroke, adding the two extra years to the beginning of the cycle put the Treasury back on course to meet the golden rule, thanks to the current budget surplus of 1.2% of national income recorded in 1998–99 (which outweighed the 0.1% of national income deficit in the previous year). The fortuitous timing of the Treasury's decision inevitably fuelled speculation that it had been motivated by the desire to make the golden rule easier to meet.

We have argued in the past that if one were to accept the Treasury's methodology and estimates for the output gap, it would be quite plausible to suggest that the cycle began in 1997 rather than 1999.[12] In most recent Budgets and Pre-Budget Reports, casual observation of the output gap chart would suggest that 1997 to 2001 was a single up-phase with a pause in the middle, rather than one-and-a-half cycles. But the case for making this judgement in the summer of 2005 seemed little stronger than at any time in the previous five years.[13] So it is hardly surprising that extending the cycle at precisely the point at which it meant the government would suddenly be on course to meet the rule rather than to break it should undermine the credibility of the policy framework and create suspicion that the Chancellor was simply 'moving the goalposts' to avoid the embarrassment of missing his target.

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[10] Cash value of cumulative current budget surpluses across the cycle, with surpluses in each year measured as shares of national income and then converted to cash terms using 2005–06 money GDP.

[11] HM Treasury, *Evidence on the UK Economic Cycle*, July 2005 (http://www.hm-treasury.gov.uk/media/2E6/A5/economic_cycles190705.pdf).

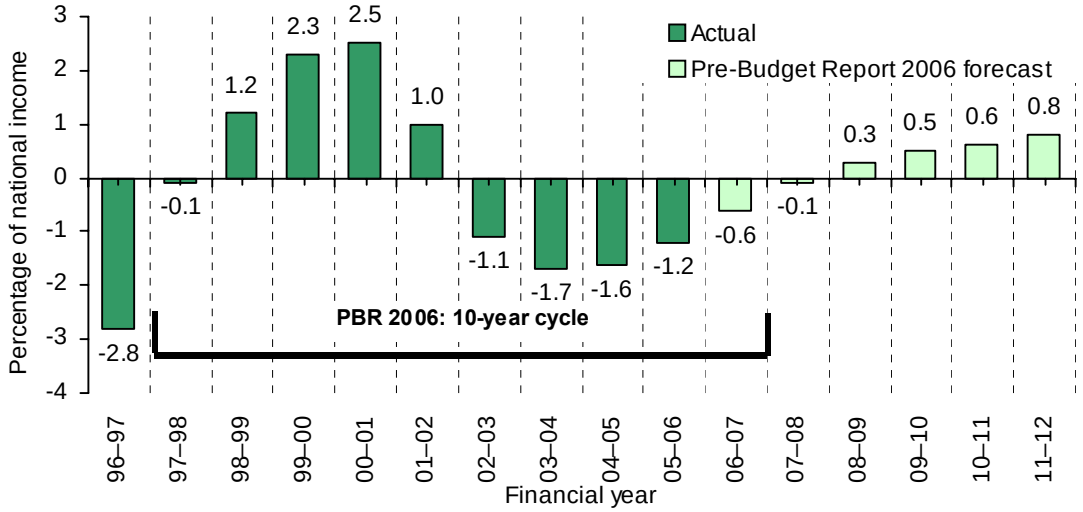
[12] C. Emmerson, 'Bending the rules?', *Public Finance Magazine*, 5 August 2005 (http://www.cipfa.org.uk/publicfinance/features_details.cfm?News_id=24755).

[13] See pages 20–26 of chapter 2 of R. Chote, C. Emmerson, R. Harrison and D. Miles (eds), *The IFS Green Budget: January 2006*, London (http://www.ifs.org.uk/budgets/gb2006/index.php).

The Chancellor also announced in the 2005 Pre-Budget Report that he expected the cycle to end in 2008–09 rather than 2005–06. The Treasury estimated that economic activity was at that time running around 1½% below potential, its weakest cyclical position since 1994. The Treasury expected the output gap to remain at a similar level in 2006–07 and only to close in 2008–09 after two years of above-trend growth. Given the forecasts for the current budget balance over the three additional years, this marginally increased the comfort with which the Treasury expected to meet the rule, but with greater uncertainty around the central forecast because of the longer time horizon.

In last year's Pre-Budget Report, the Treasury yet again changed the dating of the cycle. Revisions to the National Accounts and stronger-than-expected growth prompted the Treasury to revise its estimate of the negative output gap at the end of 2006 to just ¼% of national income from the 1¼% implied by its forecasts in the 2006 Budget. With growth remaining above trend, the Treasury said that the cycle would close in early 2007, implying that the final financial year of the cycle would by 2006–07 rather than 2008–09, cutting it to 10 years.

Figure 3.4. Current budget balance in the 2006 Pre-Budget Report



Source: HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls).

Figure 3.4 shows recent out-turns and Treasury forecasts for the current budget balance from the 2006 Pre-Budget Report. If the Treasury is correct in its forecast that the current budget deficit this year will be £7.9 billion (0.6% of national income), then the rule will be met with £8.4 billion to spare. If trends in spending and revenues over the first nine months of the financial year continue over the remaining three, the current budget deficit would come in at £12.0 billion and the Chancellor would meet the golden rule with £4.3 billion to spare. But we might well expect spending growth to slow and the margin to be larger (see Chapter 5). This suggests that the golden rule is very likely to be met if the cycle dates do not change again.

As Table 3.1 shows, if the Treasury forecasts and latest estimated out-turns are accurate, then the rule would also be met on the cycle as defined in the 2005 Budget, 2005 Pre-Budget Report and 2006 Budget and is expected to be met under the 2006 Pre-Budget Report

Table 3.1. Meeting the golden rule?

	Average surplus over cycle (% of GDP)	**Cumulative surplus** (£ billion, 2006–07 GDP terms)	**Current budget balance in first year of next cycle** (% of GDP)
Budget 2005 cycle: 1999–2000 to 2005–06	+0.0%	+£2.4bn	–1.2%
PBR 2005 & Budget 2006 cycle: 1997–98 to 2008–09	+0.1%	+£10.8bn	+0.3%
PBR 2006 cycle: 1997–98 to 2006–07	+0.1%	+£8.4bn	–0.6%
PBR 2006 cycle end with later start: 1999–2000 to 2006–07	–0.1%	–£5.5bn	–0.6%

Sources: HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls); authors' calculations.

projections. However, assuming that the cycle closes in 2006–07 – as the Treasury now expects – the golden rule would have been missed had the Treasury not added the extra two years at the beginning of the cycle.

What about the prospects for meeting the golden rule in the next economic cycle?

One problem in judging this is that although the Treasury has reached a provisional judgement that the current economic cycle will end in 2006–07, it has not decided, in that event, which year would be the first of the next cycle. Paul Boateng, the then Chief Secretary to the Treasury, said in 2003 that 'Progress against the golden rule is measured by the average surplus on the current budget over the period from the financial year in which the economic cycle starts up to and including the financial year in which it ends'.[14] This would seem to imply that if 2006–07 is treated as the last year of one economic cycle, it should also be treated as the first year of the next. But, in response to questioning by the Treasury Select Committee in December, Mr Brown's officials left open the option of dropping this approach:

> **David Gauke MP:** But whenever it does end, whichever year it is, will that year count for both the old cycle and the new cycle?
>
> ***Jon Cunliffe (HM Treasury):*** That is what we have done in the past.
>
> **David Gauke MP:** Is that what you are going to do in the future?
>
> ***Jon Cunliffe (HM Treasury):*** I do not know what we are going to do in the future.[15]

If the Treasury were to count 2006–07 as the first year of the next cycle, it would begin with a current budget deficit of 0.6% of national income that would need to be offset by a surplus of at least the same size later in the cycle (as shown in Table 3.1). On the Treasury's December 2006 Pre-Budget Report forecast, the golden rule would be more likely to be met than not on this basis as long as the next cycle lasted at least four years. By contrast, if the Treasury counted 2007–08 as the first year of the next cycle, it would start with a deficit of just 0.1% of

[14] *Hansard*, 4 November 2003, column 630w.

[15] http://www.publications.parliament.uk/pa/cm200607/cmselect/cmtreasy/uc115-ii/uc11501.htm.

national income in that year, and the golden rule would be more likely than not to be met after two years.

We noted earlier in this section that one alternative to meeting the golden rule over a specifically dated economic cycle would be to aim for a particular target level for the current budget balance over an appropriate time horizon. As Figure 3.2 illustrates, we could argue that in practice the government has in fact been pursuing just such a target in recent years; it has made tax and spending decisions that it expects will deliver a current budget surplus (total or cyclically adjusted) of around 0.7% of national income after five years.

How has the Treasury performed relative to these notional targets?

Table 3.2 shows that the five-year-ahead target set in Budget 2001 was undershot by 2.0% of national income last year, of which 0.3% reflects the fact that the economy was running below potential. Budget 2002 loosened the target for this year by 0.1% of national income, but the Treasury still expects it to be undershot by 1.5% of national income, of which 0.4% reflects a weak economy. Budget 2003 loosened the target again by 0.1% of national income, and the Treasury now expects to undershoot this by 0.7% of national income. In the next two Budgets, the target was tightened back to the level set in Budget 2001, with the Treasury now expecting to miss these targets by 0.4% of national income in 2008–09 and 0.3% of national income in 2009–10. Budget 2006 set a five-year-ahead target of 0.8% of national income for 2010–11, and the Treasury already expects to be 0.2% of national income adrift from that.

Table 3.2. Performance against notional five-year rolling target

Current budget balance (% of national income)	**2005–06**	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**
Target set 5 years previously						
(total & structural)	*0.8%*	*0.7%*	*0.6%*	*0.7%*	*0.8%*	*0.8%*
Total						
Actual deviation	–2.0%	-	-	-	-	-
Forecast deviation		–1.5%	–0.7%	–0.4%	–0.3%	–0.2%
Structural						
Actual deviation	–1.7%	-	-	-	-	-
Forecast deviation		–1.1%	–0.7%	–0.4%	–0.3%	–0.2%

Source: Projections from various HM Treasury Budgets. Latest out-turns from HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls).

The current budget underperformed the Treasury's notional Budget 2001 target for 2005–06 largely because of the unexpected fall in tax revenue from the financial sector in 2000–01 and 2001–02 failing to rebound as quickly as it hoped and because of decisions to spend more on health, education and tax credits. Since 2002, IFS Green Budgets have been less optimistic than the Treasury about tax revenues. To achieve the sort of improvement in the public finances that the Chancellor was looking for, we said there would be need for tax increases and/or spending cuts worth roughly 0.6% of national income in the 2002 Green Budget, and roughly 1% of national income in the Green Budgets of 2003, 2004 and 2005.

The Chancellor consistently rejected this advice in the run-up to the 2005 election, but then followed it at the first opportunity once polling day was safely out of the way – he announced tax increases and signalled cuts in spending plans worth in total around 1% of national

income in the 2005 Pre-Budget Report. We argued for a further tightening of 0.2% of national income in Green Budget 2006, and tax increases worth roughly this amount have been delivered in the 2006 Budget and Pre-Budget Report. Looking back over this period, if the Chancellor had made some of the tightening that we and other commentators had said would be necessary to fulfil his forecasts during most of Labour's second term, rather than waiting until after the 2005 election, the Treasury would not now be expecting to undershoot its notional rolling target for the current budget balance over the next few years to the extent that it is.

3.3 The sustainable investment rule

The sustainable investment rule states that the public sector's debt (net of its financial assets, which mostly comprise foreign exchange reserves) should be kept at a 'stable and prudent' level. More precisely, 'To meet the target with confidence, at the end of every fiscal year of the current economic cycle, public sector net debt must be below 40% of GDP'.[16]

Why impose a debt ceiling?

Governments take on debt for much the same reason that individuals and firms do – to smooth their spending. Whilst the biggest changes in government debt levels in this country have been driven by the need to finance the two World Wars, in more normal circumstances there are three main reasons why governments might take on debt:

- First, it can be both fair and efficient to smooth the cost to taxpayers of public spending that yields a flow of (typically non-financial) benefits into the future.
- Second, it may make sense to smooth payments for current spending over the ups and downs of the economic cycle to help stabilise activity and alleviate pressure on monetary policy.
- Finally, and less commendably, governments may seek to push the costs of current spending onto future taxpayers for political advantage, because they believe that voters are short-sighted.

But when does debt – taken on for any or all these reasons – become 'unsustainable'? As the Treasury argues, 'There are many possible definitions of sustainability. One definition is that a government should be able to meet its obligations if and when they arise in the future'.[17] As debt increases, the cost of servicing it also increases. In principle, the cost could rise so high that the economy produces too little meet it. But in practice, long before then, sustainability becomes a political judgement: the ability of a government to meet the obligations it undertakes or inherits will depend on the willingness of future taxpayers to provide the revenue or to sacrifice other spending.

[16] HM Treasury, *Analysing UK Fiscal Policy*, 1999 (http://www.hm-treasury.gov.uk/Documents/UK_Economy/Fiscal_Policy/ukecon_fisc_policy99.cfm?).

[17] Page 19 of HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adlongterm.cfm).

As experience in various emerging market countries has shown over the decades, *in extremis* governments may find it more attractive to lift the burden of meeting their financial obligations from taxpayers and concentrate it instead on their domestic and/or international creditors through rescheduling, default or inflation. Conscious of this danger, investors will become more reluctant to lend to a government if its policies look likely to impose a politically unacceptable burden on future taxpayers. By increasing interest rates and reducing economic growth, such investor fears can become self-fulfilling by further increasing the government's obligations and simultaneously shrinking the resources available to meet them. Even in the absence of a significant default risk, interest rates may rise as government debts increase, weakening growth by 'crowding out' private investment. (This market discipline has been relatively weak in recent years, with most industrial countries seeing their borrowing costs fall even as their debts have risen, as discussed in Chapter 4.)

Given these dangers, it may be sensible for a government to make a clear public commitment to limit its obligations to some level that would not (under plausible economic circumstances) impose an unacceptable burden on future taxpayers. As Treasury officials have argued, 'Committing to a clear benchmark level of debt helps to anchor expectations and helps avoid self-fulfilling losses of credibility in fiscal policy'.[18]

The height of the debt ceiling

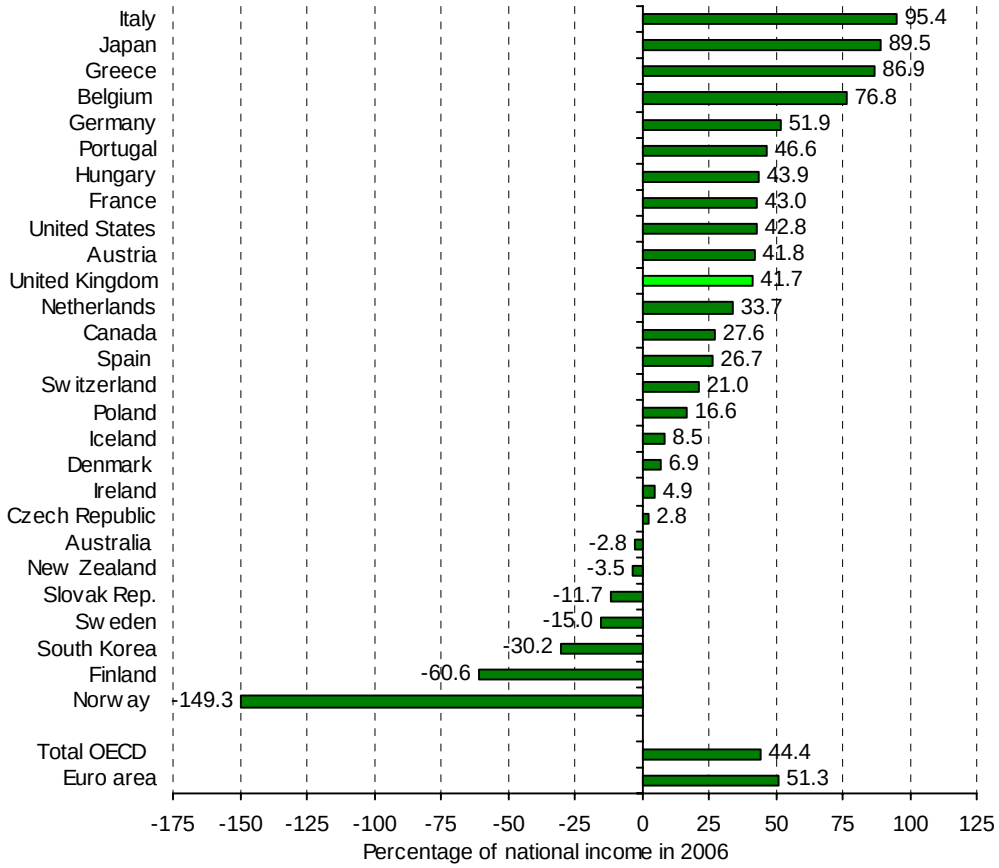
Choosing where to set the debt ceiling is no easy task. For one thing, taxpayers' willingness to meet the obligations implied by past policy decisions may depend on a whole host of factors: the existing tax burden they face, the size of the debt interest bill, the reason the debt was incurred, the identity of the creditors and so on. Attempts have been made to infer an optimal debt ratio from comparisons with the debt/equity ratios prevailing in the private sector and from theoretical and empirical analyses of the relationship between debt levels, interest rates and economic growth rates. None has given a precise or robust result.

It certainly seems implausible to suggest that a debt ratio of up to 40% of national income would be sufficient to trigger a sovereign debt crisis, especially for a developed country such as the UK that has long been able to borrow in its own currency with relative ease. The current government appears to have chosen this ratio in effect as a commitment not to allow debt to rise above the level it inherited. Assuming that the golden rule was met, a debt ceiling of 40% of national income is also sufficiently high to permit a higher level of public sector net investment in the long term than Labour inherited.

The Treasury estimates that public sector net debt will be 37.5% of national income this year, slightly below the 40% ceiling. Figure 3.5, which uses a slightly different definition of debt to aid international comparison, shows that even if public sector debt in the UK did rise by the 2.5% of national income or so necessary to hit the ceiling, it would still be low relative to that of most other G7 countries. But there are other industrial countries with much stronger net debt positions, including Australia, New Zealand and the Scandinavian countries. Some OECD countries have more financial assets than debt – for example, Norway (to smooth the

[18] R. Woods, 'The role of public debt in the UK fiscal rules', paper presented at the 6th Banca d'Italia Public Finance Workshop, 2004.

Figure 3.5. General government debt ratios in OECD countries in 2006



Source: Annex table 33 of OECD, *Economic Outlook No. 80*, November 2006 (http://www.oecd.org/document/18/0,2340,en_2649_201185_20347538_1_1_1_1,00.html).

consumption of its oil revenues) and South Korea (which has built up enormous foreign exchange reserves to limit the rise in its exchange rate).

So why might the UK wish to aim for a debt ratio higher or lower than 40%?

First, the desired debt ratio will depend on the desired level of public sector net investment over the long term. The amount the government can invest while adhering to a particular debt ceiling will depend on: (a) the current level of debt; (b) the degree to which the golden rule is over- or under-achieved (which in turn partly depends on how much the government has to spend servicing its existing debt); and (c) the growth of the cash value of the economy.

If we assume that the golden rule is met exactly, that whole-economy inflation is 2.5% a year and that the economy grows in real terms by 2.5% a year, then the government could sustain public sector net investment of 2% of national income a year while keeping public sector net debt at 40% of national income. If we believe that public sector net investment should be higher than 2% of national income in the long term, this argues for raising the debt ceiling above 40% unless the golden rule is consistently overachieved or unless cash growth in the economy exceeds 5% a year. Conversely, if we wish to invest less than 2% of national income, the debt ceiling could be lowered.

Second, a Chancellor might move the debt ceiling due to a belief that the underlying level of current spending is likely to rise (or fall) from its present level at some point in the future in order to limit economically costly variation in tax rates. This could be done without altering the level of investment by deliberately over- (or under-) achieving the golden rule for a while and temporarily reducing (or increasing) the debt ceiling. For example, some Scandinavian economies are deliberately pursuing low or negative net debt positions now because they believe that the ageing of their populations will require more public spending on the elderly in future decades. By running tight fiscal policies today, and giving themselves greater scope to borrow more in the future, they can limit future increases in tax rates and the associated disincentives to work and saving.

As we discuss in more detail in Section 7.4, the Treasury estimates that, on existing policies, public spending in the UK will, as a result of changing demographics, rise from 40.9% of national income last year to 44.7% in 2055–56 – an increase of 3.8% of national income or £50 billion in today's terms.[19] Individuals are likely to wish to smooth their consumption in the face of an expected rise in tax rates to pay for these increases in spending, but some will be more aware of the necessary adjustments and better placed to make them at low cost than others. On these grounds, it may be thought preferable for the state to help make the adjustment by increasing tax rates now (aiming for a lower debt-to-national-income target) to reduce the increase required in the future (when the debt ratio would be allowed to rise again).

Other liabilities

As well as future debt repayments due to current borrowing, the government has made promises of other future payments in a number of ways. These include payments arising from the Private Finance Initiative and the pensions of public sector workers, plus possible contingent liabilities (notably the debt of Network Rail). The treatment of these future payments is important since, despite not appearing in the headline figures for debt, they could reduce the amount of income that future generations will be able to spend as they choose.

The opposition Conservative Party,[20] among others, has expressed concern at the size of the liabilities that are not counted in public sector net debt, and therefore are not constrained (at least in the short and medium term) by the sustainable investment rule. Arguably more important than the level of these liabilities is whether or not the total indebtedness of the public sector is increasing and the appropriateness of the financing tool used. Financing this spending through means that do not immediately score against public sector net debt would be inappropriate if it is done in order to keep the headline net debt figure low rather than for reasons of economic efficiency.

But how large are these commitments that are not included in public sector net debt (PSND)? Due to intrinsic differences in their nature, comparable figures (based on consistent underlying assumptions) for different components of public sector indebtedness are not

[19] Source: Table 5.1, page 40, of HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adlongterm.cfm).

[20] See, for example, Conservative Party, *Developing a Conservative Macroeconomic Framework*, 2005 (http://www.conservatives.com/pdf/Macroeconomicframework-Dec2005.pdf).

available. Bearing in mind this important caveat, Table 3.3 compares the size of PSND with official estimates of public sector pension liabilities, an estimate of the value of the future flow of payments to PFI providers under contracts already signed, and the latest figure on the debt of Network Rail. Quantitatively speaking, the PFI and Network Rail obligations appear to be relatively small compared with the official measure of PSND, while public sector pension liabilities are particularly significant in size. They are estimated by the government to be larger than net debt itself. Taken all together, these estimates of public sector pension liabilities, future PFI payments and the debt of Network Rail are around £650 billion, which is 40% larger than PSND. This gives an estimate of total liabilities of the public sector standing at around £1,100 billion, just under 90% of national income.

A number of issues arise with each of these components of the indebtedness of the public sector, and we now discuss each in turn.

Table 3.3. Estimated value of various future public sector obligations based on official estimates

	£ billion	% of GDP
Public sector net debt, March 2006	462.7	36.4
Estimated public sector pension liabilities, March 2005	530	≈42
Estimated future PFI payments, signed deals December 2006	100	≈8
Network Rail debt, September 2006	18	≈1
Total	**≈1,100**	**≈87**

Sources: Public sector net debt from table A4 of HM Treasury, *Public Sector Finances Databank*, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls); public sector pension liabilities from answer to parliamentary question by Des Browne, then Chief Secretary to the Treasury, 2 March 2006, *Hansard*, column 388W (http://www.publications.parliament.uk/pa/cm200506/cmhansrd/cm060302/debtext/60302-03.htm#60302-03_spmin0); estimated future PFI payments from table B24 of HM Treasury, *2006 Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm) with payments discounted to 2006–07 by future nominal GDP (assuming growth of 5% p.a. from April 2012 onwards); Network Rail debt from table 9, page 20, of Network Rail Limited, *Interim Financial Statements, six months ended 30 September 2006* (http://www.networkrail.co.uk/browse%20documents/interim%20results/2006-07%20network%20rail%20limited%20interim%20financial%20statements.pdf).

Network Rail (net debt of £18 billion, September 2006)

Borrowing carried out by Network Rail could be considered similar to conventional government borrowing as the government guarantees to repay its debt if the company collapses, though the Office for National Statistics defines it as a private sector company and therefore off the public sector's balance sheet. In order to avoid a collapse, if the company got into serious trouble, it is likely that the government would take greater control and the ONS would reclassify it as part of the public sector for the purposes of the National Accounts, even if Network Rail had not been formally renationalised. This would further reduce the Chancellor's room for manoeuvre in remaining below the current debt ceiling.

The latest Network Rail accounts, at September 2006, report net debt of £18 billion.

Private Finance Initiative (future payments totalling £100 billion, December 2006)

Under PFI arrangements, private firms undertake some capital spending on behalf of the public sector, with the public sector paying private firms a rental price for use of a capital asset, in addition to payments for any current goods and services, that the private sector delivers. While the use of the PFI began in 1987 (with the Queen Elizabeth II Bridge built over the Thames at Dartford/Thurrock), it has been much more widely used since 1998.[21]

In total, PFI deals signed up to December 2006 will finance a total of £55 billion (4.2% of national income in 2006–07) of capital spending. This will only be incorporated in public sector net debt to the extent to which payments have already been made by the public sector to the private sector, or where debt has been undertaken by the private sector under PFI and accountants judge (and the National Audit Office agrees) that the public sector has taken on the risks and rewards of owning the asset concerned (e.g. a hospital), and where the new asset – or a phase of improvement work on an existing asset – is operational.

Therefore, in the short run, a conventionally financed investment project would typically add more to public sector net debt than a project financed via PFI or public private partnerships (PPPs). As long as this remains the case, there may be a suspicion that investment projects are undertaken via PFI (rather than conventionally) to help meet the sustainable investment rule rather than on value-for-money grounds. Had conventional finance been used instead of the PFI then public sector net debt would have been increased by the total amount of capital spending that has taken place under the PFI so far (which will be less than the £55 billion that will eventually be done from all contracts signed to date). Instead, the only amount that has so far been included in public sector net debt is the payments that have so far been made to PFI providers and the finance-lease component (which in September 2006 were estimated by the ONS to total £4.95 billion). Under a no-PFI scenario, public sector net debt – in the absence of compensating changes to taxes or other spending – is likely to have been around, and possibly above, the 40% of national income level. However, the Chancellor might reasonably argue that if he had not intended to use the PFI, he would have set the ceiling higher.

The future indebtedness of the public sector relates not to the capital value of PFI deals, but instead to the value of the payments that have been agreed contractually. In total, under deals signed up to December 2006, the value of future payments under PFI contracts is £100 billion (after discounting future payments by assumed nominal growth in national income of 5% a year). However, one key difference between these payments and the amounts owed to the holders of national debt is that in many cases these payments are in return for the receipt of future delivery of public service provision. Therefore a future government might well be able to negotiate a lower payment from the public purse in return for a reduction in services provided, in particular where these are for current rather than capital goods.

Public sector pensions (estimated liabilities of £530 billion, March 2005)

The future liabilities of unfunded public sector workers' pension schemes are not included in public sector net debt. Estimating the value of these liabilities is extremely difficult as it will

[21] Capital spending financed through the PFI averaged 0.1% of national income a year under deals signed over the 10-year period from 1987 to 1996, but averaged 0.5% a year over deals signed during the 10 years from 1997 to 2006 (with the three London Underground Tube deals being particularly significant in terms of the contracted capital spend (£16.3 billion, 1.2% of national income).

depend on individuals' pension tenure, their final salaries, how their pension benefits are indexed and the longevity of public sector workers. Nonetheless, these liabilities appear to be substantial: the most recent official estimate is that at March 2005, they were worth £530 billion. The estimate of this liability is extremely sensitive to how future payments are discounted. Under these official estimates, calculated by the Government Actuary's Department, future payments are discounted at a rate of 3½% per year after inflation, but in future these will be discounted by a lower rate of 2.8% per year. Reducing the discount rate will increase the estimated liabilities, with a recent study projecting that this change would increase the liability from £530 billion to £639 billion.[22] Given that the state can use future national income to cover its liabilities, it would seem more appropriate to deflate by expected economic growth, which would be around 2½% a year and (since it is below 2.8%) would increase the estimated liabilities further. Other studies propose using the discount rate implied by government bonds, which is currently significantly below 2½% a year and would increase the estimated liability even further.[23]

One key difference between public sector pension liabilities and public sector net debt is that governments are able to reduce the generosity of the future accrual of public sector workers' pension rights, though this could have implications for other components of the remuneration package required to attract and retain public sector workers of the desired quality and motivation.

The treatment of public sector pensions also deserves more thought under the golden rule. On grounds of intergenerational fairness, it seems reasonable that today's taxpayers should pick up the tab for the future pension costs of workers employed to deliver current services today. Leaving aside the liability for longevity and other risks, this would happen automatically if public sector pension schemes were funded rather than pay-as-you-go. But as most are not, it seems reasonable that if the government increases the number of public sector workers (or increases their expected tenures or expected final salaries, both of which would increase the expected value of their final salary pension arrangements), it should run a current budget surplus on average so that the increased cost of pension payments faced by tomorrow's taxpayers is offset by lower debt interest payments.

Of course, in thinking about whether and how to set such a target, we have to remember that we are not starting with a blank sheet of paper – today's taxpayers are already paying the pensions of past public sector workers despite receiving no services from them. On these grounds, it might be thought reasonable to pass a similar burden onto future generations. So while it is true that today's public sector pension commitments are expected to cost 2.0% of national income in 2055–56, past public sector pension commitments were already costing

[22] See table 11, page 72, of N. Record, *Sir Humphrey's Legacy Facing Up to the Cost of Public Sector Pensions*, Institute of Economic Affairs, 2006 (http://www.iea.org.uk/files/upld-release114pdf?.pdf).

[23] Deflating by expected GDP growth was proposed by J. Hawksworth, *Public Service Pension Liabilities and the Fiscal Rules*, PriceWaterhouseCoopers, London, 2006. Alternative estimates for public sector liabilities have made less optimistic (in terms of pension liabilities) assumptions over mortality improvements, salary growth and also the discount rate. For example, estimates produced by Neil Record and Stephen Yeo are that the liabilities stand at £1,025 billion and £960 billion respectively. The largest component of the difference between these estimates and those of the Government Actuary's Department is the chosen discount rate. See N. Record, *Sir Humphrey's Legacy: Facing Up to the Cost of Public Sector Pensions*, Institute of Economic Affairs, 2006 (http://www.iea.org.uk/files/upld-release114pdf?.pdf), and S. Yeo, 'Unfunded public sector pension liabilities now close to £1,000 billion', Watson Wyatt Press Release, 8 March 2006 (http://www.watsonwyatt.com/news/press.asp?ID=15784).

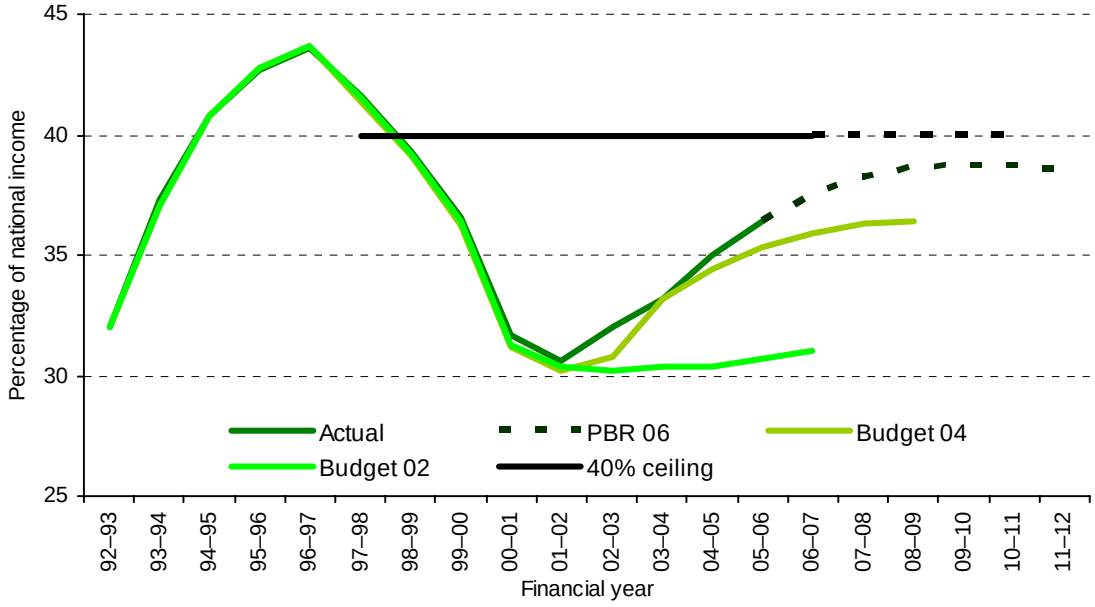
1.5% of national income in 2005–06.[24] It is the increase in the servicing burden over time that implies an additional intergenerational transfer, not the total debt burden.

Returning to the justification for the sustainable investment rule, we should presumably favour targeting a measure of public sector liabilities that reflects the expected impact of policy commitments made today on the revenue needs of governments tomorrow – not least because this is what investors in government debt will ultimately worry about. That suggests that we should not ignore commitments where the precise timing and amount of the revenue required in the future is uncertain, but rather take explicit account of the uncertainties in deciding what obligations are safe to undertake. The completion of the Whole of Government Accounts[25] would be a good opportunity for the incoming Chancellor to think about widening the scope of the existing sustainable investment rule at least to include provisions (including public sector pensions), and possibly the expected cost of contingent liabilities.

The sustainable investment rule in practice

The same errors that have required the Chancellor to increase his forecasts of public sector borrowing repeatedly since 2001 have also required him to increase his forecasts for public sector net debt. As Figure 3.6 shows, the headroom beneath the 40% of national income ceiling over the forecast period has dropped from 9.0% of national income in the Budget 2002 forecasts to less than 1.5% in the December 2006 Pre-Budget Report. But the Treasury has only promised to keep the ratio below 40% in every year of the current cycle, so we do not know yet if the same will apply during the next cycle.

Figure 3.6. Treasury public sector net debt forecasts



Sources: Various Budgets and Pre-Budget Reports.

[24] Source: Table 5.1, page 40, of HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adlongterm.cfm).

[25] For more information, see www.wga.gov.uk.

Table 3.4. Meeting the sustainable investment rule?

Financial year	Central estimate for net debt in PBR 2006	Probability net debt exceeds 40%
2007–08	38.2%	8%
2008–09	38.6%	32%
2009–10	38.7%	41%
2010–11	38.7%	44%

Notes: As Figure 2.8.
Sources: As Figure 2.8.

Applying the probability distribution implied by past Treasury forecasting performance to its central estimate in the Pre-Budget Report (see Section 2.6 of Chapter 2), we can derive the probabilities that net debt would, on unchanged policies, breach 40% in each of the next four years. These are shown in Table 3.4. Unless the Chancellor relaxes the sustainable investment rule in the next cycle, the Treasury's own forecasting abilities give him a less than 60% chance of sticking to it (without further spending cuts or tax increases) based on past performance. This suggests that the sustainable investment rule may now be more binding than the golden rule.

3.4 Reforming the rules: a golden opportunity?

Gordon Brown has transformed the machinery of macroeconomic policymaking in the UK – by giving the Bank of England control of interest rates in pursuit of an inflation target, and by setting himself two high-profile pass/fail tests for fiscal policy in the shape of the golden rule and sustainable investment rule. His monetary reforms are widely regarded as a triumph, while his fiscal reforms are regarded with scepticism at best and cynicism at worst.

Judging from the inflation expectations implicit in gilts prices, the Chancellor's monetary policy framework has convinced financial market participants that interest rates will be driven by the inflation target rather than by short-term political considerations. When it comes to fiscal policy, we do not have an objective measure of the credibility of the rules analogous to financial market inflation expectations. When government borrowing (and the supply of gilts) is expected to increase, we might expect the yield on government debt to increase as well and fulfil a similar function. But, as discussed in Chapter 4, other factors are at play and the relationship between the amounts industrial country governments borrow and the interest rates they pay has not been particularly close in recent years.

Economists outside government have little faith in the rules as a decisive factor determining Mr Brown's tax and spending decisions. In its New Year survey of the views of independent economists, the *Financial Times* concluded earlier this month that 'Almost none use the chancellor's fiscal rules any more as an indication of the health of the public finances'.[26]

This probably reflects the belief that the Chancellor has 'moved the goalposts' as downward revisions to his public finance forecasts eroded the margin by which he expected to meet the

[26] 'Cut spending to reduce borrowing', *Financial Times*, 2 January 2007 (http://www.ft.com/cms/s/683400d2-9a05-11db-8b6d-0000779e2340.html).

rules after 2001. Suspicions were raised initially when he changed the way in which he calculated the cumulative current budget surplus over the cycle in a way that gave a more flattering picture (although the Treasury claimed that the less flattering method was only a 'shorthand' for use in speeches). The most controversial decision was to add two years, during which there had been on average a net current budget surplus, to the beginning of the economic cycle at precisely the point when it became necessary to get the government back on course to meet the golden rule. The Chancellor's decision repeatedly to delay the announcement of a fiscal tightening that most independent observers thought necessary until just after the 2005 election has also suggested that the rules have not depoliticised budget judgements to anything like the degree that the monetary policy framework has depoliticised interest rate decisions. The Treasury's current reluctance to say whether the year in which the current economic cycle ends will also be counted as the first in the next cycle – which would be consistent with past practice, but would mean beginning the next cycle with the current budget in deficit by 0.6% of national income – risks further accusations of goalpost-moving.

On the face of it, this seems like a lot of fuss over nothing. As we saw in Section 3.2, the golden rule is at best a rule of thumb and there is little direct economic significance if it is met or missed by a few billion pounds either way. It can also be argued that the rules have acted as a constraint on tax and spending decisions – as we note in Chapter 2, Mr Brown is likely to leave the Treasury with the public finances in stronger shape than when he arrived there.

But Mr Brown has from the outset staked his credibility on achieving the rules exactly, creating conditions in which meeting them by £1 would be a political triumph and missing them by £1 a disaster. This approach did not look very risky four or five years ago, when the rules were expected to be met with tens of billions of pounds to spare. But the Chancellor has fallen victim to the characteristic serial correlation of the Treasury's fiscal forecasting errors: things turned out better than expected early in the cycle, and Mr Brown used the proceeds to top up his spending plans; but when the forecasts took a turn for the worse, his room for manoeuvre evaporated and time ran out to take countervailing measures. It is between the Chancellor and his conscience whether he instructed the Treasury to add two years to the beginning of the cycle primarily because it appeared necessary to meet the golden rule. But there is a widespread suspicion that he did, and that he has preferred to affront fiscal aficionados by moving the goalposts in a way that will be obscure to the general public, rather than read headlines saying the rule has been broken. This suspicion has eroded credibility.

Whatever the reality, if the Treasury sticks with its current dates for the cycle, Mr Brown will presumably declare the golden rule successfully met over a full cycle when March's public finance data are published on 23 April. This may leave close observers of the fiscal goalposts unimpressed, but the combination of this opportunity to declare 'victory' and the arrival of a new Chancellor later in the year may be a golden opportunity to tweak the fiscal framework for the better. This could legitimately be presented as adhering to the spirit of Mr Brown's original vision, and indeed could be said to apply lessons learned from the widely hailed success of his monetary policy regime.

If so, what should be done?

- First, it seems reasonable to stick with the golden rule and sustainable investment rule as rules of thumb, but they should be presented as such rather than as an exact science. A new Chancellor might ponder a more sophisticated distinction between spending that

does and does not benefit future taxpayers, but the benefits may well not exceed the costs in terms of transparency and predictability from abandoning the familiar National Accounts distinction between current and capital spending. It may be more worthwhile to rethink the treatment of public sector pension liabilities, using the introduction of Whole of Government Accounts to widen the range of obligations to which the sustainable investment rule applies and to require today's taxpayers to finance the difference between the future costs of public sector pension commitments that arise simply because they wish to consume more current spending today and the public sector pensions being paid by today's taxpayers for services delivered to previous generations.

- Second, like the inflation target, the golden rule should be made symmetric, requiring the government to pursue a point target for the current budget balance rather than 'balance or surplus'. Symmetry seems a more appropriate way to pursue intergenerational fairness. And it also avoids the problem of the Chancellor needing to decide – implicitly or explicitly – what safety margin to aim for to give an acceptable probability of falling the right side of the pass/fail line.
- Third, the Treasury should present its forecasts for the fiscal aggregates in such a way that they explicitly quantify the uncertainties around the central estimate – for example, with a 'fan chart' similar to that which the Bank places around its inflation target. The baseline forecast should also be a genuinely 'central' forecast, rather than one based on 'cautious' economic assumptions that inject deliberate bias.
- Fourth, the Treasury should no longer seek to meet the golden rule over a specific dated economic cycle. Instead, it should say that it is aiming for a target level for the total or cyclically adjusted current budget balance over an appropriate time horizon. (The former has the added attraction of avoiding the need to calculate an estimate of the output gap that may be suspected of political manipulation.) It can be argued that the Treasury has in effect been doing this implicitly in recent years, with a rolling target (now being missed) to achieve a current budget surplus of around 0.7% of national income after five years.

Table 3.5. Cycles and Chancellorships

	Mean length (years)	Median length (years)
Chancellors of the 20th century		
Years as Chancellor		
Excluding Mr Brown	2.83	2.38
Including Mr Brown	3.02	2.42
Years as Chancellor plus consecutive period as Prime Minister (where applicable)	3.45	2.54
Economic cycles		
HM Treasury estimate (1972Q4 – 2007Q1)	8.56	9.13
Morgan Stanley (2005) estimate (1957Q2 – 2004Q1)	6.75	7.00

Notes: All figures for lengths of Chancellorships exclude Iain Macleod's Chancellorship as he died after just one month in office. Morgan Stanley estimates of business-cycle lengths since 1957 are based on detrending using an HP filter with lambda = 1,600.

Source: Table 3.5 of R. Chote, C. Emmerson, D. Miles and Z. Oldfield (eds), *The IFS Green Budget: January 2005*, IFS Commentary 97, 2005; authors' calculations.

The use of a fixed, dated cycle means that policy is unnecessarily and unhelpfully backward-looking, with tax and spending decisions today in principle depending on past policy and forecast errors and on changing assessments of the start date of the cycle, rather than on the most appropriate path looking forward. It is also worth bearing in mind that Mr Brown's Chancellorship has been unusually long and that in more normal circumstances it may not be particularly convincing to promise to meet a rule over a period typically lasting seven or more years when most Chancellors spend less than three years in the job and four-year parliaments seem to have become the norm (Table 3.5). Interestingly, before Mr Brown, Dennis Healey is the only Chancellor in the last 50 years to have served for a full cycle.

- Fifth, if possible, an independent body or bodies should be given access to the same information on the evolution of spending and tax revenues that the Treasury receives to make forecasts of fiscal aggregates. The Treasury has long argued that this would be impossible, and there are certainly serious legal issues of taxpayer confidentiality that would need to be addressed. However, it would be helpful for the Treasury or for the Treasury Select Committee to ask former senior officials of the Treasury and HM Revenue & Customs to assess independently whether this would be possible and how it might be achieved. One model would be for an official forecasting body to be responsible to Parliament rather than to ministers. The Treasury might even agree to abide by the net fiscal policy adjustment recommended by this body to achieve the fiscal targets that would appropriately still be set by the government.

  The argument is not that reforms of this sort would necessarily produce more accurate forecasts, but that it would reassure voters and investors that the forecasts were not being massaged to delay politically inconvenient policy adjustments. This would also leave the choice of individual tax and spending decisions – and the political trade-offs they involve – with ministers, where they belong. At the very least, the Treasury could continue to enhance transparency further by publishing a more in-depth explanation of the assumptions that underpin its revenue and spending projections.

4. The economic outlook

David Miles, with Melanie Baker and Vladimir Pillonca (Morgan Stanley)

Summary

- Over the past 10 years, growth and inflation have been relatively stable by the standards of previous decades. But this may be sowing the seeds of future volatility by encouraging consumers and the government to borrow more.
- The Treasury has recently revised up its central estimate of the UK economy's potential growth rate over the next few years from 2½% to 2¾%, but assumes a more 'cautious' rate of 2½% when forecasting the public finances. However, 2½% looks a reasonable central forecast, rather than an obviously cautious one.
- House prices have risen sharply over the past decade, and some falls are rather likely in the next few years. The rise in prices to date has made housing less affordable for younger households and has driven borrowing higher. Disposable income – net of essential spending – looks set to grow only modestly.
- We are more pessimistic than the Treasury about economic growth in the next couple of years. Compared with the Treasury, we expect a smaller contribution from net exports, weaker investment growth next year and weaker consumer spending growth through to 2009.

4.1 Introduction

Whether the government meets its fiscal rules and what tax and spending decisions it makes in the coming years will in part depend on what happens in the wider economy. The evolution of both government spending and tax revenues, and therefore deficits and the stock of outstanding debt, are sensitive to the path for economic activity and its composition.

In this chapter, we assess the outlook for the UK economy and consider the chances that the Treasury's December 2006 Pre-Budget Report assessment of the prospects for economic growth will be accurate. We also analyse in some detail the recent and likely future path of productivity. This is a key determinant of the potential growth rate of the economy and therefore of any assessment of where we lie in the economic cycle.

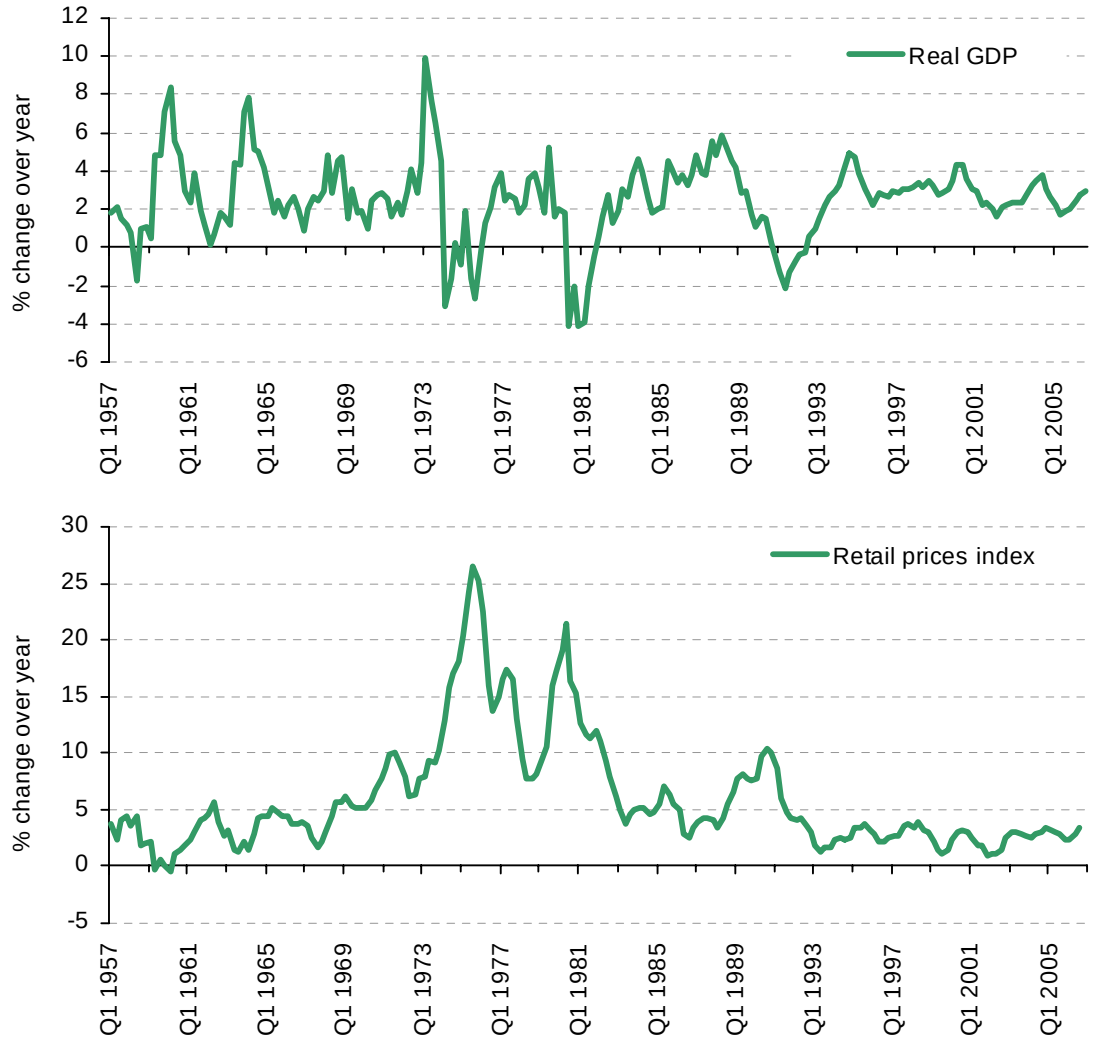
Economic growth has been relatively robust over the past decade. The Treasury expects the economy to pick up, with growth of between 2¾% and 3¼% in 2007 and the output gap closing in early 2007. We see several risks to this benign outlook: high debt levels and a still low saving rate may prevent a significant pick-up in consumer spending growth, while a weaker world economy may slow investment growth and worsen our net exports. Against that backdrop, marginally below-trend growth seems likely to us in 2007. In the medium term, inadequate saving, a volatile housing market, the risks of a slowdown in productivity growth and the unwinding of external imbalances are all threats to hopes of steady growth.

We begin by summarising recent developments in the UK economy (Section 4.2). We then turn to the evolution of productive potential in the economy, contrasting our estimates from structural analysis and statistical filters with those of the Treasury (Section 4.3). We then look at the short-term outlook for the economy (Section 4.4) and present our own medium-term forecasts (Section 4.5).

4.2 Recent developments

2006 looks set to have been a year of solid, rather than spectacular, growth. In 2005, real national income (GDP) grew by 1.9%, the lowest annual growth rate for more than 10 years and significantly below the average rate seen since 1995 of 2.8%. In 2006, GDP growth looks to have been about 2.7%, a touch below the average pace of the past 10 years, but slightly above the longer-run historic trend. Interest rates remain low in nominal and (especially) real terms; the exchange rate has been relatively stable on a trade-weighted basis (though on a more volatile upward path against the dollar); unemployment has edged up (but so has employment); stock prices and house prices have moved up significantly over the past year.

Figure 4.1. Economic growth and inflation since 1957



Source: ONS.

The UK's recent economic performance continues to look remarkably stable by the standards of the past 50 years. Volatility in the pace of overall economic activity and in inflation has been exceptionally low over the past 10 years (Figure 4.1). However, this may have helped sow the seeds for a more volatile period ahead. Less fear of sharp gyrations in the economy may well have contributed to the very rapid rise in household debt and perhaps also the government's willingness to run deficits on a scale not normally associated with periods of extended economic growth. As a result, the UK economy may now be less able to weather an economic shock than a couple of years ago, particularly one that adversely affects the labour market. Crucial to any such assessment are the extent of spare capacity in the economy and the likely rate of growth of productive potential. These are issues we address in the next section.

4.3 Productive potential and the economic cycle

The importance of productive potential

In this section, we consider how the UK's productive potential is likely to evolve. The trend or potential growth rate is the speed at which the economy can grow without inflation rising. It is also the best guess at the growth rate we are likely to experience over a long time horizon, and is a key determinant of the potential growth of tax revenues and therefore of the longer-term sustainability of fiscal policy. Prior to the December 2006 Pre-Budget Report, the Treasury assumed that trend growth would be 2¾% until 2006Q4 and would then fall to 2½% a year until the end of the forecast period. In the Pre-Budget Report, the Treasury revised upwards its assessment of trend growth from 2006Q4 onwards so that it remains at 2¾%. We assess whether this revision is sensible.

Changes in potential output arise from two sources: greater inputs of labour and/or capital; and greater efficiency in the use of those inputs to generate outputs (productivity).

Labour productivity is the simplest and most intuitive way to measure productivity: it is the level of an economy's output divided by the level of employment.[1] One difficulty in analysing the evolution of labour productivity is that it tends to rise when economic growth is strong, as output tends to rise proportionally more than employment. This is why many simple measures of labour productivity tend to be pro-cyclical (or follow the cycle). We are interested in the 'underlying' trends that drive the economy over the medium term, and must therefore abstract from such cyclical forces. To do so, we rely on an approach that aims to extract trends in the economic drivers and inputs that determine the potential output of the economy.

Estimating productive potential: a structural approach

We can split UK GDP *growth* into the (weighted) sum of three components: changes in labour supply; changes in the amount of capital per worker; and technological progress (also known as total factor productivity). To work out the relative contribution of these three

[1] An alternative measure of productivity is the ratio between economic output and the total number of hours worked. This is in principle a better measure of productivity, but it is harder to measure in practice.

components, we use a production function, which relates an economy's output to the available inputs (labour and capital) and the existing technology.

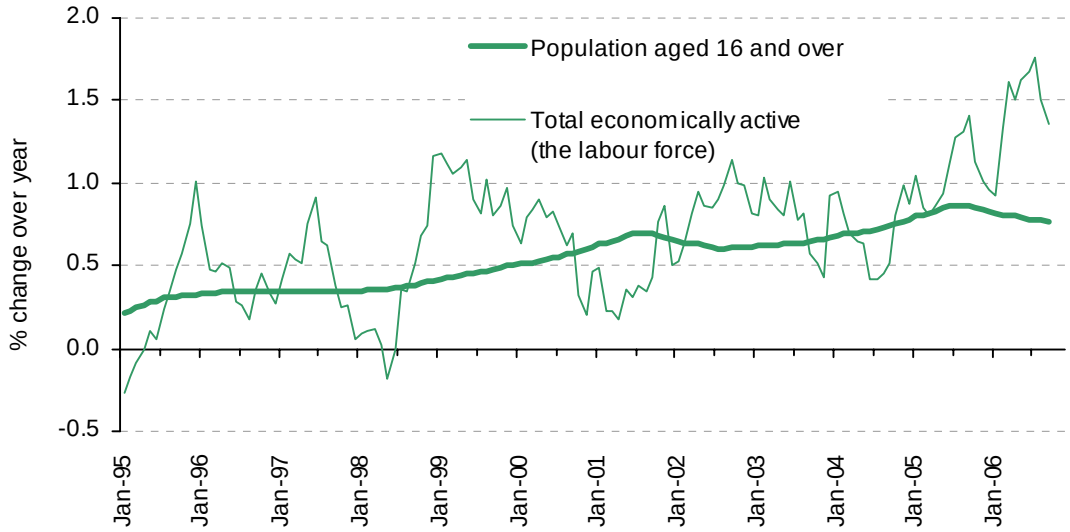
This enables us to assess whether the recent growth of the UK economy reflects special circumstances that are unlikely to be maintained (for instance, unusually strong immigration flows) or whether long-lasting changes might have taken place that should make us revise up estimates of the UK's longer-term economic growth. We will then cross-check this 'bottom-up' structural economic approach with simple statistical approaches that extract the path of trend growth from the evolution of actual GDP.

The labour market: key developments

ONS data show that labour force growth over the past year or two has been particularly strong (Figure 4.2). This reflects three main factors (Figure 4.3):

- Most importantly, an increase in the working-age population. Of the increase in mid-year population between 2004 and 2005, the ONS attributes the main part to net immigration. There were 447,000 applicants to the Worker Registration Scheme (WRS) between 1 May 2004 and 30 June 2006.[2]
- Next most important, people retiring later and remaining economically active for longer.
- Much less importantly, falling inactivity, potentially partly the result of government initiatives to decrease the numbers of benefit claimants on inactivity-related benefits and to get more such claimants back into the labour force. According to the Department for Work and Pensions (DWP), as of May 2006, the numbers on incapacity benefit were down 54,000 on the year and the numbers of lone parents on income support were down 14,000.

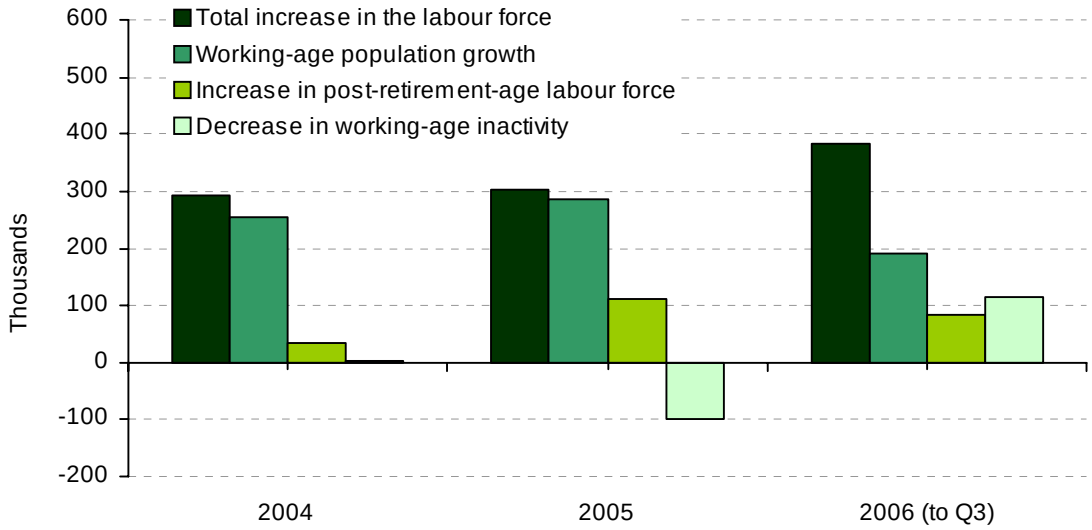
Figure 4.2. Growth in population and the labour force



Sources: ONS; Morgan Stanley Research.

[2] The WRS requires workers from the 'A8' accession countries (nationals of the 10 countries that joined the EU in May 2004 less Malta and Cyprus) to register when wishing to take up employment in the UK. 447,000 is roughly 0.75% of the 2004 mid-year UK population. This scheme does not pick up the self-employed (however, neither does it require workers to de-register when they leave the country).

Figure 4.3. Drivers of the recent increase in the labour force



Sources: ONS; Morgan Stanley Research.

Although our central assumption is that the rate of labour force growth slows as the pace of net immigration slows, the numbers of working-age people moving from inactivity into employment may continue to rise as the government continues to pursue initiatives to move people off inactivity-related benefits. Workforce growth might also increase following new laws against age discrimination in October 2006, as the 'baby-boomer' generation reaches the state pension age, as individuals are allowed to draw an occupational pension while continuing to work for the same employer (from April 2006) and with the continuing trend towards defined-contribution rather than defined-benefit pension schemes. (Surveys suggest that people overestimate their likely income in retirement and thus may wish to work longer to boost them.) The increase in the state pension age for women (to 65 from 60), due to be implemented in April 2010, may also start to have an impact in coming years.

Table 4.1 shows our estimates of the contribution of changes in the population, in the participation rate (the proportion of the working-age population who are employed or unemployed), in the employment rate (the employed as a proportion of the employed plus unemployed) and in average hours worked. The penultimate column on the right of the table shows the total contribution from changing aggregate labour input to GDP growth.

We find that rising labour supply and population growth has added a substantial 0.5 percentage points to GDP growth in the 2001–05 period and almost 0.7 percentage points in 2005 – more than three times its contribution over the period from 1972 to 2005 – only to rise further in the first half of 2006. The question is whether such high contribution rates can be maintained in the future.

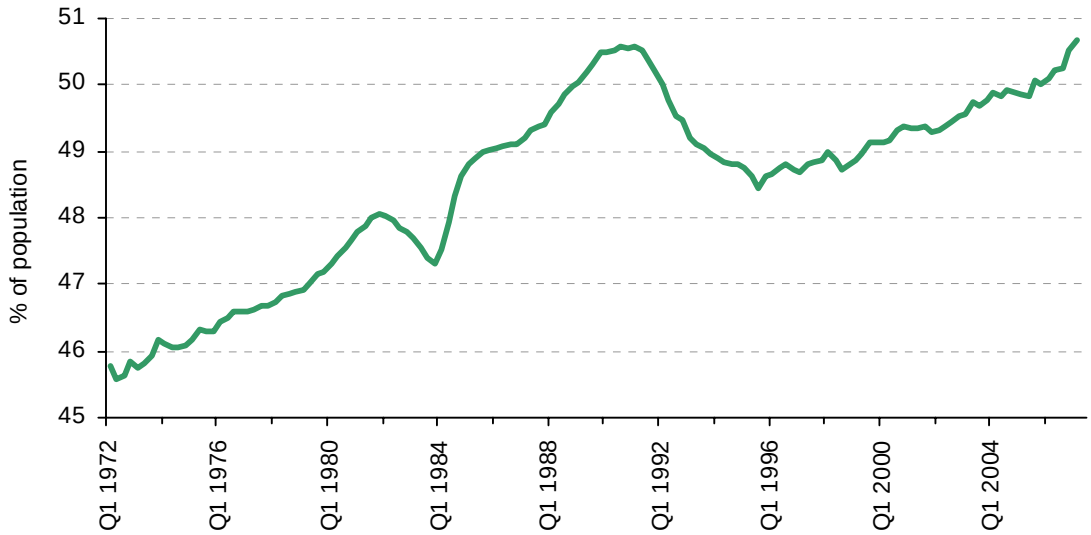
Table 4.1 also shows that, within the labour supply aggregate, the main contributors to GDP growth have been increasing labour participation and population growth, with the latter alone adding almost half a percentage point over the last five years. In contrast, hours worked have continued to decline in recent years, albeit at a reduced pace relative to the historical average trend of –0.2% per year. The contribution of the employment rate became slightly negative in 2005 and early 2006.

Table 4.1. GDP growth: the contribution of labour inputs

Factors: (percentage point contributions)	Labour participation	Employment rate	Hours worked	Population growth	Total contribution: labour variables and population	Actual observed GDP growth
1972–2005	0.2	0.0	–0.2	0.2	0.2	2.3
1972–85	0.3	–0.4	–0.3	0.1	–0.3	1.8
1985–95	0.0	0.2	–0.1	0.3	0.4	2.5
1996–2005	0.2	0.3	–0.2	0.4	0.6	2.8
2001–05	0.3	0.1	–0.3	0.4	0.5	2.4
2001	0.2	0.3	–0.4	0.4	0.5	2.3
2002	0.2	0.2	–0.4	0.4	0.4	2.0
2003	0.3	0.1	–0.3	0.4	0.5	2.6
2004	0.3	0.0	–0.2	0.5	0.6	3.2
2005	0.4	–0.1	–0.1	0.5	0.7	1.8
2006 Q1–Q2	0.4	–0.3	0.0	0.6	0.7	2.4
Forecasts						
2007	0.4	0.1	–0.1	0.5	0.9	
2008	0.4	0.1	–0.1	0.4	0.8	
2009	0.3	0.0	–0.1	0.4	0.6	
2010	0.2	0.0	–0.2	0.3	0.3	
2011	0.2	0.0	–0.2	0.3	0.3	

Note: The trend rate of the underlying components from the production functions is calculated using an HP filter, which aims to decompose output into a permanent ('trend') component and a cyclical factor.
Source: Morgan Stanley Research.

Figure 4.4. Labour participation



Note: We define labour participation as employment plus unemployment (aged 16 years and above) divided by the overall population.
Sources: Morgan Stanley Research; ONS.

What of the future? We assume population growth remains strong, increasing at a pace similar to that recorded in 2004 and 2005, and stays above average until 2011. Only from 2010 do we project a slight decline in population growth, from 0.4% to 0.3%.[3] For labour participation, we assume the recent pace of growth to be maintained until 2008 and to start slowing only very gradually thereafter. Finally, we assume that after contributing negatively since 2005, the contribution of the employment rate turns positive, and gradually returns to zero by 2009, in line with its historical average. This leaves us with the labour market making a positive, but declining, contribution to growth.

Capital inputs and technical progress

We now turn our attention to the contribution of capital deepening and technical progress, or total factor productivity (TFP). Capital deepening simply means changes in the amount of capital per employee, while TFP reflects improvements in the effectiveness with which output is extracted from a given amount of input. As economic growth cannot rely on ever-increasing amounts of capital and labour, it is TFP growth that ultimately matters the most for driving economic growth on a sustained basis. As Table 4.2 shows, we find no evidence that TFP growth has accelerated in recent years.

Table 4.2. GDP growth: capital deepening and innovation

Factors: (percentage point contributions)	Capital deepening	TFP growth	Total contribution from labour variables and population	Overall potential GDP growth from sum of filtered contributions	Actual observed GDP growth
1972–2005	0.5	1.6	0.2	2.3	2.3
1972–85	0.6	1.6	–0.3	1.9	1.8
1985–95	0.3	1.7	0.4	2.4	2.5
1996–2005	0.8	1.4	0.6	2.8	2.8
2001–05	0.6	1.4	0.5	2.6	2.4
2001	0.9	1.4	0.5	2.8	2.3
2002	0.8	1.5	0.4	2.7	2.0
2003	0.6	1.5	0.5	2.6	2.6
2004	0.4	1.5	0.6	2.5	3.2
2005	0.3	1.4	0.7	2.3	1.8
2006 Q1–Q2	0.2	1.3	0.7	2.2	2.4
Forecasts					
2007	0.3	1.4	0.9	2.6	
2008	0.3	1.5	0.8	2.6	
2009	0.3	1.5	0.6	2.4	
2010	0.5	1.6	0.3	2.4	
2011	0.5	1.6	0.3	2.4	

Note: The trend rate of the underlying components from the production functions is calculated using an HP filter, which aims to decompose output into a permanent ('trend') component and a cyclical factor.
Source: Morgan Stanley Research.

[3] While the EU accession in 2004 has boosted immigration into the UK, and therefore population growth, the accession of Bulgaria and Romania this year is unlikely to lead to a significant influx, not just because these two countries account for a much smaller population relative to the 2004 accession, but also because the UK government has decided to curb the employment opportunities for migrants from these newly accessed countries.

Between 1972 and 2005, the average contribution of labour variables to GDP growth has been 0.2 percentage points, compared with 1.6 percentage points for TFP growth. But while the contribution of labour market variables has increased in recent years, the contribution of TFP has been stable, or even slightly below its longer-term average. Even if TFP growth were to pick up towards its historical average of 1.6%, and capital deepening were to pick up from the 0.3% recorded in 2005 to its longer-term average of 0.5% by 2010, our medium-term estimate of UK potential growth would still be only around 2.4%. This suggests that the Treasury's assessment of trend growth of 2¾% is on the optimistic side, and that its 'cautious' estimate of 2½% is central rather than cautious, especially beyond 2008.

Estimating productive potential: statistical filters

While the production function approach of the previous section had to rely on specific economic assumptions,[4] here we focus on methods that distinguish an underlying trend from transient or cyclical perturbations *directly* from the actual data on economic output, without making any specific assumptions about the nature of the production function or about what is happening to the labour force or capital stock.

We use a statistical approach based on the path of output to look at economic fluctuations and the dating of business cycles. These fluctuations or cycles are characterised by periods when output (typically real GDP, but non-oil gross value added on the Treasury's definition) is above trend and times when it is below trend. The economic cycle is made up of two phases: a period when output is above trend followed by a period when output is below trend. When actual output exceeds potential output, the output gap – the percentage difference between actual output and potential output – is said to be positive. At an on-trend point, the output gap is zero.

To avoid relying excessively on any given method, we compute potential output using a few different statistical approaches. Once this is done, we can estimate how far output is above or below its underlying potential level. This in turn enables us to estimate when economic cycles have started and ended.

Among statistical techniques to identify trends, the most popular is the Hodrick–Prescott (HP) filter. More recent evolutions are the Christiano–Fitzgerald (CF) and the Baxter–King (BK) band-pass filters.[5] We use the filters to see whether the results they generate match our findings from the production function approach, which suggested at best a short-lived improvement in potential growth to a fraction above 2½% – short of the Treasury's central estimate of 2¾%, but in line with the 'cautious' figure that the Treasury uses to make its fiscal projections.

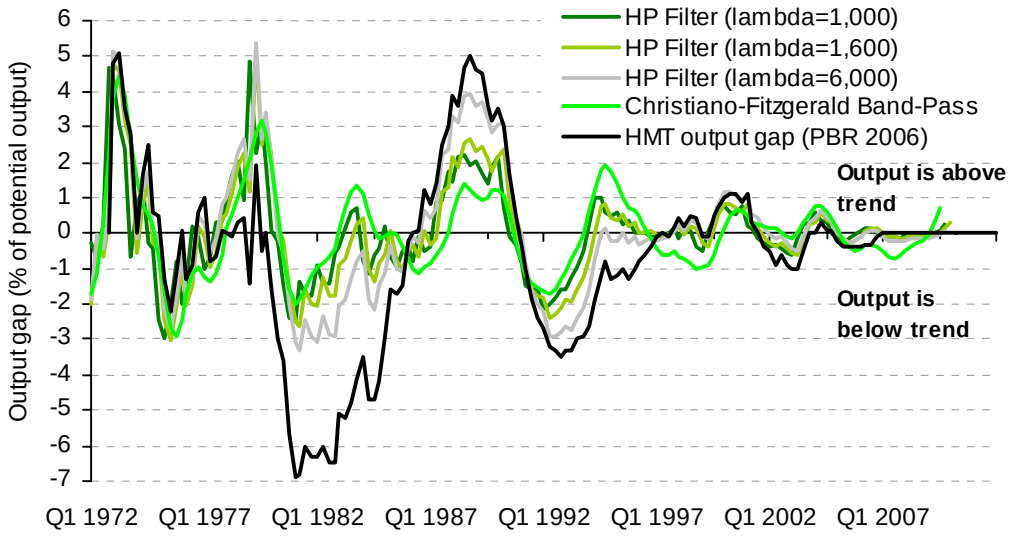
The estimate of the trend that comes from applying the HP filter depends on assumptions about how smooth that trend is. This is a matter of judgement. We show a range of estimates of spare capacity based on different values for the smoothness of the trend. Figure 4.5 shows the paths of potential output corresponding to three different values of lambda (1,000, 1,600

[4] For instance, we assumed a simple Cobb–Douglas specification where technology enters multiplicatively.

[5] See, for example, L.J. Christiano and T.J. Fitzgerald, 'The band pass filter', *International Economic Review*, 44(2), 435–65, 2003.

and 6,000) – the parameter controlling the smoothness of the trend. The CF band-pass, like the HP filter with lambda set to 1,000, penalises any deviation from a smooth (i.e. linear) trend relatively mildly, so that potential output tracks actual output relatively closely. When we set lambda at 1,600 – our benchmark case – the estimate of trend growth in output is slightly straighter, because the algorithm penalises deviations from a linear trend more heavily.

Figure 4.5. Cyclical fluctuations in the economy since 1972



Sources: ONS; HM Treasury; Morgan Stanley Research.

Figure 4.5 shows the amount of spare capacity corresponding to these various measures of the trend, and compares it with the Treasury's own estimate, which tends to show more marked deviations from the trend than most statistical algorithms.

Two key features of the economic cycle are duration and amplitude. The amplitude of the cycle is the vertical distance between the peak (or trough) of the cycle and the level of potential output at the time. Figure 4.5 shows that amplitude peaked in the 1970s, reflecting large economic shocks, notably the sharp rise in oil prices. The severity of these shocks was probably compounded by less effective stabilisation policies, in particular monetary policy failing to bring down inflation swiftly after the shock, making larger interest rate hikes necessary later. This policy response probably increased the persistence of deviations from the trend growth path. The graph shows that output remained below its potential level for a prolonged period of time. Conversely, the switch to inflation targeting and the Bank of England's increased independence may have helped to reduce the volatility of the cycle in the 1990s, perhaps significantly. Figure 4.5 suggests the amplitude of the cycle has fallen from ±2.5% of potential output in 1980–90 to less than ±1% of potential GDP since the mid-1990s. Our estimates suggest that the output gap is currently close to zero.

Smaller deviations from potential output mean that cycles have become much harder to date, as 'on-trend' points are inherently hard to pin down. If the volatility of the UK economic cycle remains as low as it has been over the last decade, we should expect that the Treasury may have to substantially alter its initial dating of cycles.

Table 4.3. Dates of UK economic cycles

HM Treasury	Statistical filters		
	HP 1,600	CF	BK
1972Q4 – 1978Q1 (22Qs)	1972Q4 – 1977Q3 (20Qs)	1972Q3 – 1977Q4 (22Qs)	1972Q3 – 1977Q3 (21Qs)
1978Q1 – 1986Q2 (34Qs)	1977Q4 – 1987Q2 (39Qs)	1978Q1 – 1982Q4 (20Qs)	1977Q4 – 1987Q1 (38Qs)
1986Q2 –1997Q2 (45Qs)	1987Q3 – 1994Q1 (27Qs)	1983Q1 – 1987Q3 (19Qs)	1987Q2 – 1994Q1 (28Qs)
1997Q2 – F2007H1 (41Qs)	1994Q2 – 2003Q3 (38Qs)	1987Q4 – 1993Q4 (25Qs)	1994Q2 – 1999Q2 (21Qs)
	2003Q4 – F2009Q2 (23Qs)	1994Q1 – 1999Q4 (24Qs)	1999Q3 – 2003Q3 (17Qs)
		2000Q1 – F2009Q1 (37Qs)	2003Q4 – n/a

Sources: Morgan Stanley Research; HM Treasury.

The average duration of a full cycle identified by the statistical filters has been around seven years, slightly less than under the Treasury's methodology. But the estimated duration of economic cycles is sensitive to the technique used and to the choice of the smoothness of the underlying trend.

Estimating productive potential: the Treasury's approach

The Treasury estimates what the potential growth rate of the economy has been in the past by identifying points when the economy has been 'on trend', i.e. when the economy was running exactly at its potential or longer-term growth rate. Having identified these points, the Treasury *assumes* that potential output grows at a constant rate between them,[6] although the economy's potential output is likely to vary across the business cycle. A problem with this approach is that these estimated 'on-trend' points are liable to shift, partly because data are revised.

To identify these past 'on-trend' points, the Treasury uses a wide range of indicators, including output, business surveys and labour market variables. While there may be value in dating the economic cycle on the basis of both output and labour market variables rather than just output itself, there are also significant drawbacks – for instance, how are different indications of the degree of spare capacity arising from different indicators reconciled?

Spotting on-trend points invariably requires a high degree of subjectivity. Output will never be *exactly* equal to its potential level for a single indicator, let alone for several indicators at the same time. Instead, there will be multiple instances where a given indicator is very close to its trend level, perhaps for a prolonged period of time. This has particularly been the case over the last decade, as economic growth persistently hovered close to its potential rate, as shown in Figure 4.5. Unless the volatility of the economic cycle shifts upwards, dating the UK cycle will remain a difficult and controversial task. To avoid frequent redating of the economic cycle, it is important to develop approaches that are not excessively sensitive to data revisions.

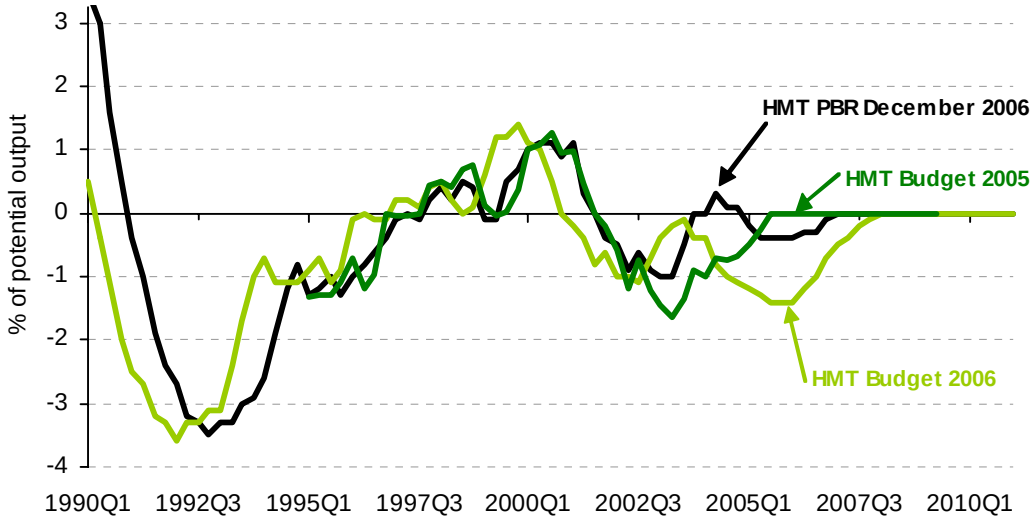
[6] See HM Treasury, *Trend Growth: New Evidence and Prospects*, December 2006 (http://www.hm-treasury.gov.uk/media/53D/CE/pbr06_trendgrowth_345.pdf).

To date cycles in the past, the Treasury utilises on-trend points; to project potential growth forward, it uses a more transparent 'bottom-up' approach. This approach consists of decomposing the evolution of trend growth into contributions from growth in labour productivity (output per hour worked), changes in average hours worked per person, the size of the working-age population and the proportion of the working-age population in employment. The Treasury then judges how growth in these four elements is likely to evolve, to generate a projection for trend growth in potential output.

The assumptions the Treasury makes about trend growth and spare capacity are important in planning the public finances for two reasons. First, they inform its judgement on where we are in the cycle and when the cycle is likely to end, which defines the period over which the golden rule and the sustainable investment rule are assessed (as discussed in Chapter 3). Second, the future rate of trend growth is crucial to the Treasury's assessment of the outlook up to the end of its forecasting horizon in 2011 and beyond. The evolution of the trend is more important than cyclical deviations from it for long-term fiscal projections.

Figure 4.6 shows that the Treasury sharply reduced its estimate of the size of the negative output gap at the end of last year to 0.3% of potential output in the December 2006 Pre-Budget Report from the 1.2% implied by the March 2006 Budget both for the end of 2006 and for 2005–06. The new figure was in line both with our own estimates and with those of international organisations such as the IMF and the OECD.[7]

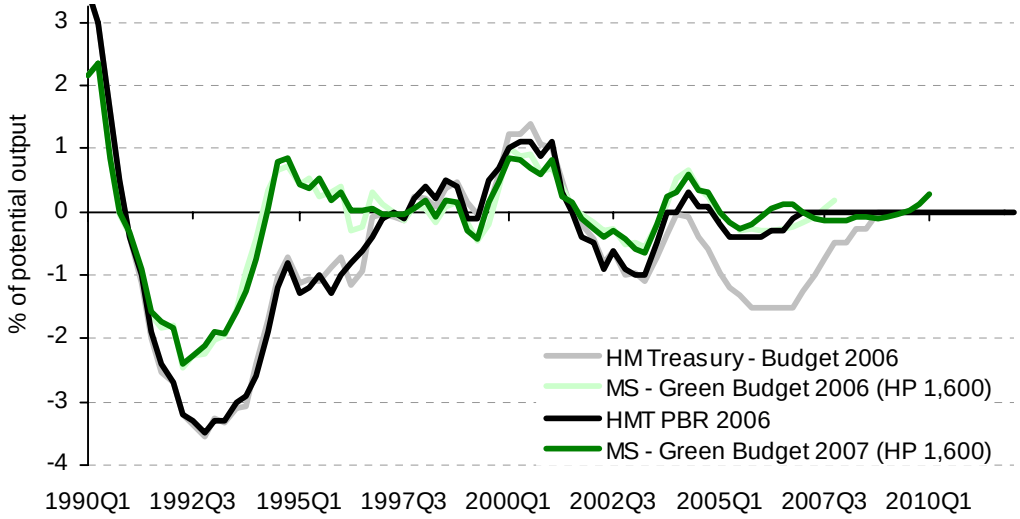
Figure 4.6. Treasury estimates of the output gap



Source: HM Treasury.

[7] See OECD, *Economic Outlook No. 80*, November 2006 (http://www.oecd.org/document/18/0,2340,en_2649_201185_20347538_1_1_1_1,00.html), and IMF Article IV Staff Report, 2006 (http://www.imf.org/external/pubs/ft/scr/2006/cr0686.pdf).

Figure 4.7. Treasury and statistical filter output gap revisions



Sources: Morgan Stanley Research; HM Treasury.

The need for this sharp revision arose from the Treasury's approach to calculating the output gap. Figure 4.7 shows that a simple HP filter based on our GDP forecasts has required much less revision than the Treasury's estimates, despite the fact that output data have been revised, and even though the forecasts on which we compute our HP-based estimates of potential output have been extended by several years in this year's Green Budget.

As shown in Table 4.3, our filter-based estimation of the output gap suggests that, conditional on our own central GDP forecasts, the current cycle started in the second half of 2003 and will not end until 2009. The current cycle would only be slightly shorter than the average past UK cycle. In contrast, the Treasury's assessment is that the current cycle started in 1997 and will last a longer-than-average 10 years, until the first half of 2007.

Conclusion: What is the trend rate of growth now?

Using a production function approach, we concluded that sustained population growth and a small pick-up in the rate of technical progress could push UK potential output growth to 2.6% in 2007 and 2008, before easing back to around 2.4% after 2008. The temporary acceleration this year and next reflects an assumption that population growth remains strong for a few years and then gradually slows, while the employment rate recovers and total factor productivity growth picks up towards its long-term annual average of 1.6% a year. Finally, capital deepening was also assumed to edge back up to its historical average. None of these underlying assumptions is implausible, but we can certainly see some downside risks to this central estimate, especially in the near term.

Turning to the statistical filters, HP filters suggest a potential growth rate of around 2.5% for 2006–10, while the CF band-pass filter suggests a medium-term potential growth rate of just under 2.6%, only marginally above the UK's long-term historical real GDP growth rate of around 2.5%. But, conditional on our GDP forecasts, these filters tend to suggest a gradual deceleration of potential output towards the end of the forecast horizon (2009).

Both techniques suggest that the Treasury's estimate that the growth of productive potential will remain at 2¾% beyond 2007 is slightly optimistic. The 2½% assumption used to forecast the public finances looks central rather than cautious as the Treasury claims.

4.4 The short-term outlook

We are more pessimistic than the Treasury about the economic outlook because of several specific risks. Compared with the Treasury, we expect a smaller contribution to growth from net exports, weaker investment growth (but only next year) and weaker consumer spending growth through to 2009.

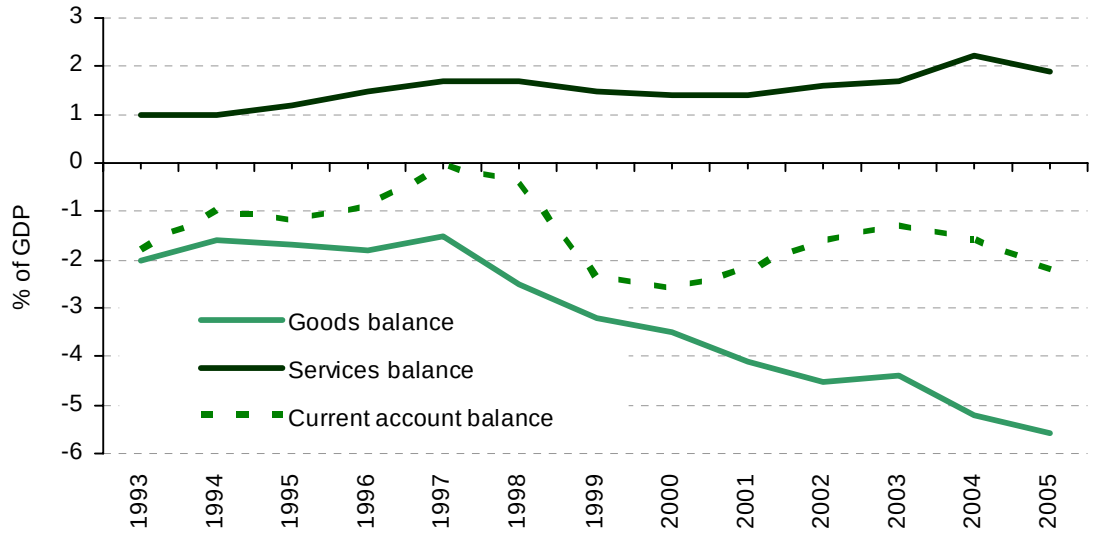
Net exports

The Treasury expects the contribution of net trade to GDP growth to be broadly neutral, with exports growing somewhat faster than imports throughout the forecast period. We are somewhat less optimistic.

Our global economic outlook for 2007 is relatively benign, incorporating a shallow slowdown in global growth. Risks to this profile are probably more on the downside than on the upside, given uncertainties about how the broader US economy will respond to the slowdown in the US housing market and about how growth in the Euro area will be affected by fiscal tightening in Germany and Italy.

Furthermore, structural pressures point to further deterioration in the UK trade and current account balance (Figure 4.8). The elasticity of exports with respect to export partner demand is probably some way below the elasticity of imports with respect to domestic demand.[8]

Figure 4.8. UK goods, services and current account balances



Source: ONS.

[8] See, for example, A. Senhadji and C. Montenegro, C., 'Time series analysis of export demand equations: a cross country analysis', *IMF Staff Papers*, 43(3), 259–73, 1999, and A. Senhadji, 'Time series estimation of structural import demand equations: a cross country analysis', IMF Working Paper WP/97/132, 1997.

Unless demand is much stronger in the UK's export markets than at home, and/or there is a major depreciation of sterling (not our central forecast), it is difficult to see where a significant improvement in the net trade contribution to economic growth would come from. Further deterioration in the trade balance seems likely. So the risks to our central forecast that net exports deduct 0.2 percentage points from UK GDP growth in 2007 are probably on the downside.

Investment

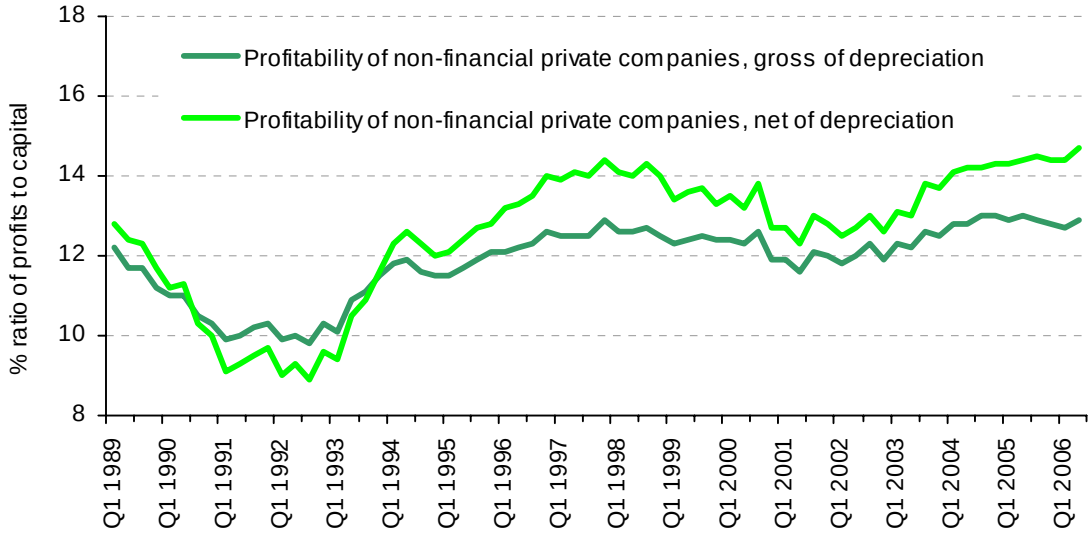
The Treasury describes the outlook for business investment as positive:

> Profitability is expected to remain strong and the cost of capital to remain low by historical standards.… though the Pre-Budget Report business investment forecast for 2006 has been revised up substantially compared with Budget 2006, there are still significant upside risks in 2007 and beyond.[9]

Our short-term investment projection is somewhat weaker than the Treasury's, where we assume that the very strong investment growth seen in 2006 is not sustainable into 2007 and where a slower global growth environment constrains investment plans somewhat. But we also think that risks to our investment outlook are, if anything, slightly on the upside.

The corporate rate of return looks very healthy (Figure 4.9). We measure this as the ratio of profits (arising from UK activities) to capital, where profits are measured after wages and employers' social contributions, but before dividends, interest and tax. Net and gross of depreciation, pre-tax real rates of return on corporate capital, relative to the comparable measure of capital employed, are around the 40-year highs they reached at the end of the 1990s.

Figure 4.9. Corporate profits



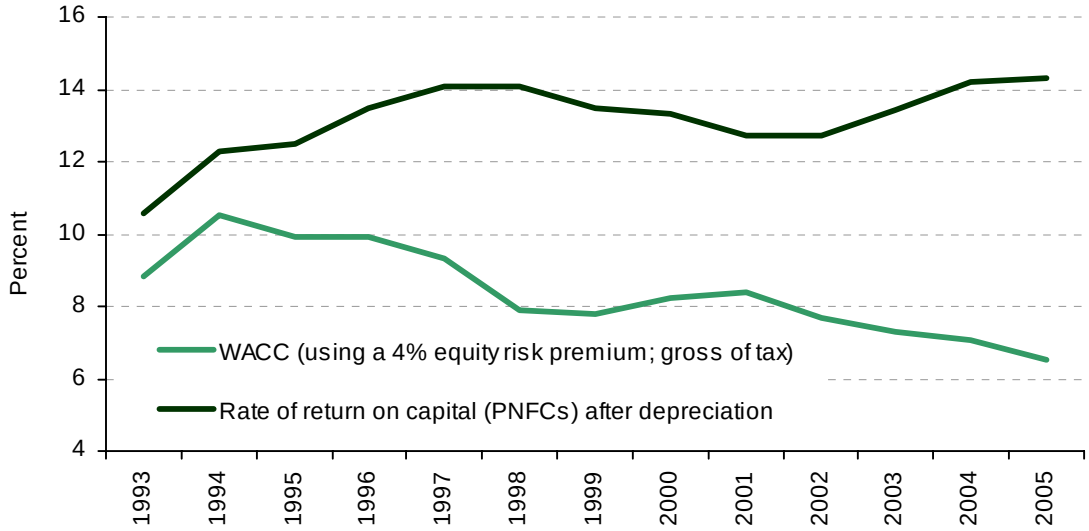
Source: ONS.

[9] Paragraph A.72, page 206, of HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

Rates of return on investment in the UK continue significantly to outpace the cost of funding, suggesting that fundamental incentives to invest in the UK remain strong. The cost of capital (measured using the weighted average cost of capital – the WACC[10]) is low. The gap between the average rate of return on capital and the WACC is now probably greater than at any time in the period since the early 1990s (Figure 4.10).

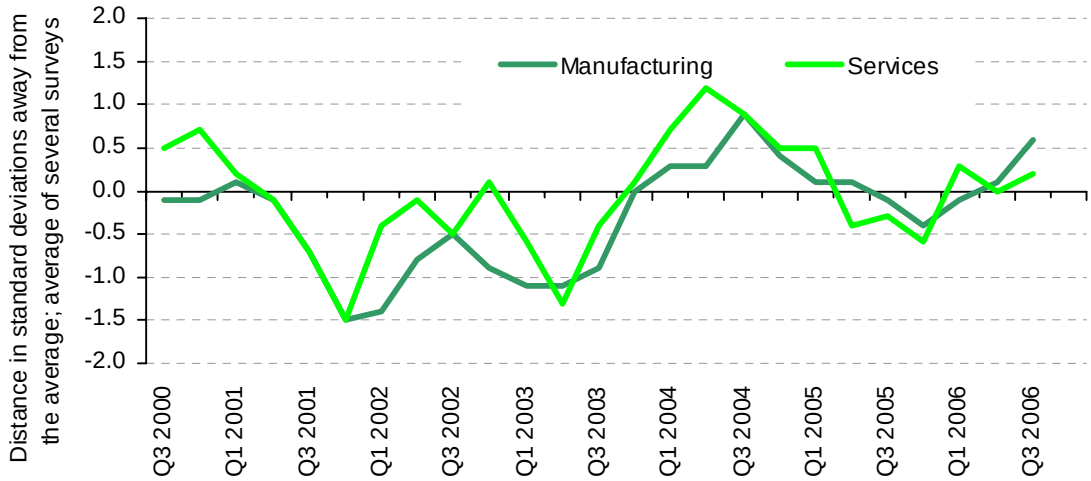
Surveys of investment intentions turned somewhat more upbeat in Q3 2006 (Figure 4.11), also suggesting some upside risk.

Figure 4.10. Investment rewards: the return to and cost of capital



Note: WACC (weighted average cost of capital) is for UK private non-financial corporations (PNFCs).
Sources: ONS; Morgan Stanley Research.

Figure 4.11. Investment intentions



Source: See next page.

[10] The WACC is a weighted average of the real cost of debt and of equity. The real cost of debt is an estimate of the average real interest rate paid on public non-financial corporation (PNFC) debt (using the euro-sterling non-banks corporate index spread plus the 10-year index-linked government bond yield). The cost of equity is estimated by using the yield on an index-linked bond plus a 4% assumed equity risk premium. The weights use an estimate of gearing based on PNFC data from the National Accounts.

Sources for Figure 4.11: Haver; Morgan Stanley Research. Manufacturing survey measures used are: BCC manufacturing survey (plant and machinery investment plans); CBI industrial trends (capital expenditure on plant and machinery over next year versus last year); BoE agents' survey on investment intentions in the manufacturing sector. Services survey measures used are: BCC services survey (plant and machinery investment plans); CBI distributive trades survey (expected capital expenditure over the next year); CBI services sector survey – consumer services (information technology capital expenditure over next 12 months and vehicles, plant and machinery capital expenditure over next 12 months); CBI services sector survey – business services (information technology capital expenditure over next 12 months and vehicles, plant and machinery capital expenditure over next 12 months); BoE agents' survey on investment intentions in the services sector.

Consumer spending

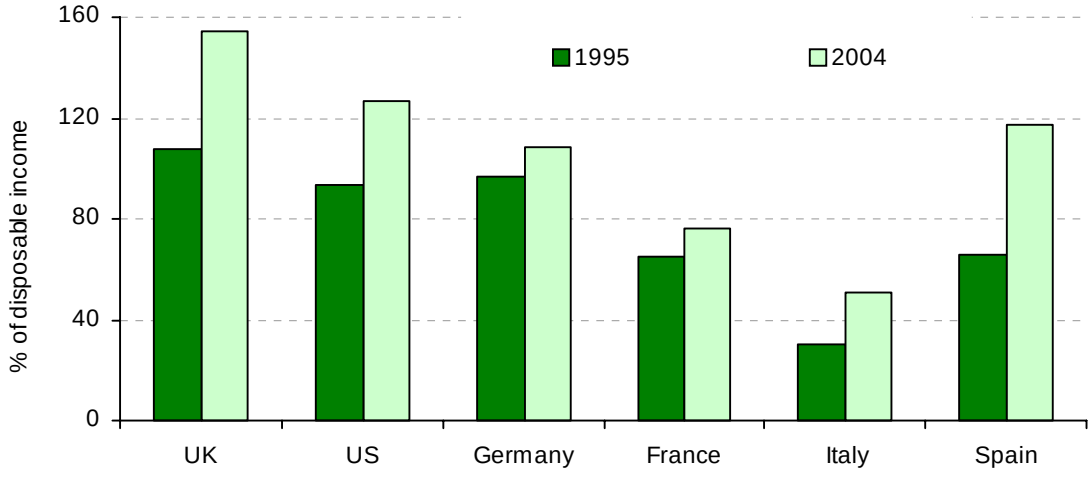
Both we and the Treasury expect the saving ratio to rise further (although the Treasury assumes that this will be largely accounted for by households' net equity in pension funds rather than an increase in more liquid saving). The Treasury suggests that the possibility of a larger increase in the saving ratio represents a downside risk to its consumption forecast.

Our central forecast has a weaker profile for consumption and a higher profile for the saving rate than the Treasury's, but we would agree that the balance of risks to consumer spending is also tilted to the downside. High debt levels, a still low saving rate, relatively high rates of debt service, slower employment growth and the squeeze on consumers' discretionary income that occurred in 2006 suggest to us that 2007 is unlikely to see a strong rebound in consumer spending, and we expect consumer spending growth to remain below average in 2007 (at close to the pace of 2006).

Household indebtedness

UK household financial liabilities were 159% of household disposable income in Q3 2006, up from 111% in Q1 2001. Compared with several other developed economies, this level of debt relative to income looks high, although the sharp rise seen over the past 10 years is not unusual (Figure 4.12). As an offsetting factor, the UK household sector also holds a large amount of financial assets – 446% of household disposable income in Q3 2006, compared with 447% in Q1 2001 (and a very large amount of non-financial assets in the form of

Figure 4.12. Household gross financial liabilities



Sources: Eurostat; Federal Reserve; BEA; Morgan Stanley Research.

Table 4.4. Household financial balance sheet

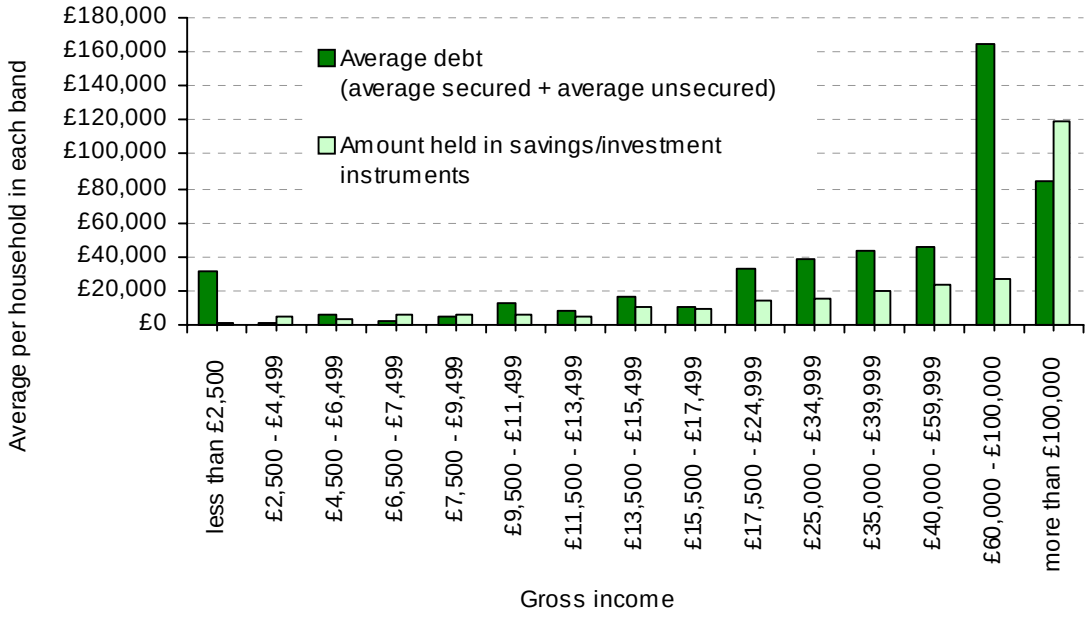
£ billion	Q4 2004	Q4 2005	Q3 2006
Total financial assets	**3,152**	**3,591**	**3,745**
Currency & deposits	855	921	976
Securities other than shares	45	42	48
Share & other equity	506	586	574
Insurance technical reserves	1,641	1,933	2,034
Other accounts payable/receivable	98	102	106
Total financial liabilities	**1,172**	**1,249**	**1,338**
Loans	1,083	1,158	1,246
Short-term loans	183	194	202
Long-term loans	900	964	1,044
of which: secured on dwellings	*876*	*938*	*1,017*
Total net financial assets	**1,980**	**2,342**	**2,407**

Source: ONS.

residential housing). Table 4.4 shows the aggregate UK household sector financial balance sheet – financial assets exceed liabilities for the aggregate household sector.

With households having almost three times as many financial assets as liabilities, there may seem little reason for concern. However, much of the household sector's financial assets are concentrated in the 'insurance technical reserves' category, which is largely the net equity of households in life insurance and pension funds' reserves – both are hard to turn into cash if

Figure 4.13. Distribution of financial assets and liabilities



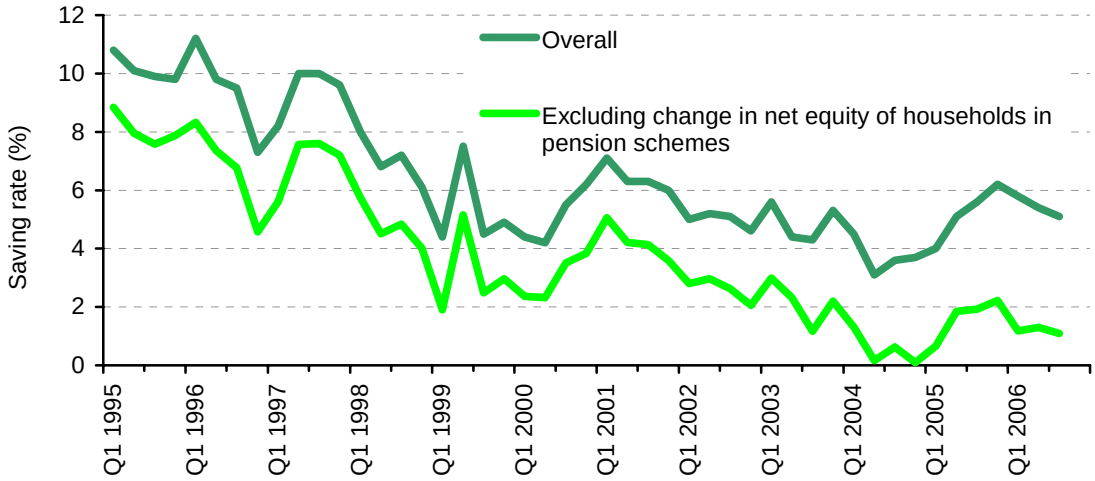
Notes: Uses survey data. Original sample size is 1,923 and sample size for some income bands is small. Ignores responses that refused to give their income / did not know their income or answered not applicable to that question. Secured debt adds together first and second mortgages.
Sources: NMG/Bank of England survey (Spring 2006); Morgan Stanley Research.

required at times of financial difficulty, although households could divert future flows of individual pension saving into liquid assets. Further, there is evidence that financial assets are much more concentrated on a smaller number of households than financial liabilities (Figure 4.13). This suggests that a substantial proportion of households may need to increase the amount of 'financial cushion' they have currently against unexpected life events.

The saving rate

The household saving rate in the UK continues to look on the low side, especially if (unlike the official measure) we exclude net contributions into employee pension schemes to focus on liquid saving (Figure 4.14). We continue to think that consumer spending growth will likely remain rather subdued while households build their liquid savings up to levels where they feel more comfortable.

Figure 4.14. Saving rate

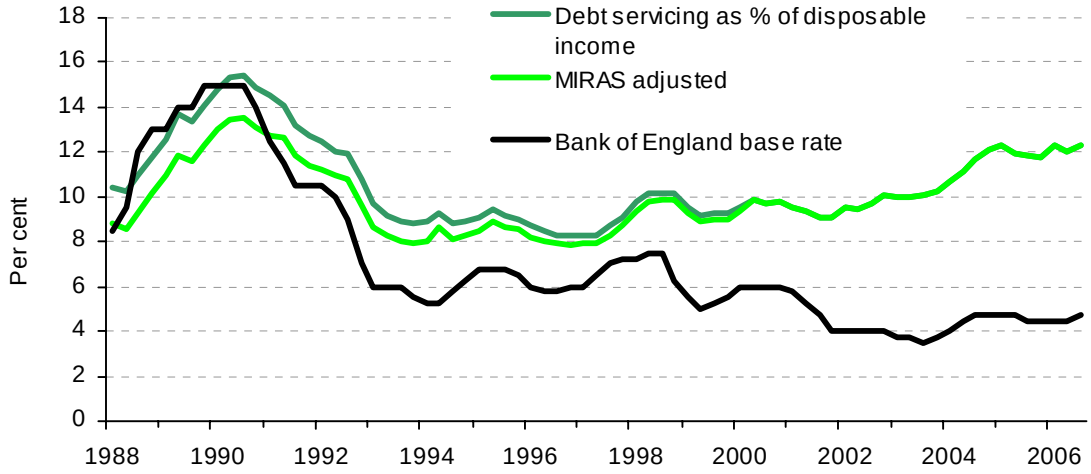


Note: Net equity of households in pension schemes is the balance of contributions to and pensions paid by private funded pension schemes.
Sources: ONS; Morgan Stanley Research.

Debt service ratios

Debt service payments as a percentage of disposable income are now at comparable levels to those of the early 1990s (Figure 4.15), though interest rates were then substantially higher. To some extent, the path of debt service could be a rational reaction by households to a perception of lower economic volatility and permanently lower interest rates. However, that debt service ratios are already so high when interest rates are still low (compared with recent history at least) suggests that many UK households may be vulnerable to economic shocks. Rising levels of insolvency in the UK add weight to this. Many insolvents are now citing expenditure in excess of income rather than, for example, loss of employment as a reason for going insolvent. A rise in unemployment led by job losses (rather than an increasing labour force, as is the case currently) could leave many more households in significant difficulties, although we forecast only a slight increase in the unemployment rate on our central forecast.

Figure 4.15. Debt servicing and interest rates

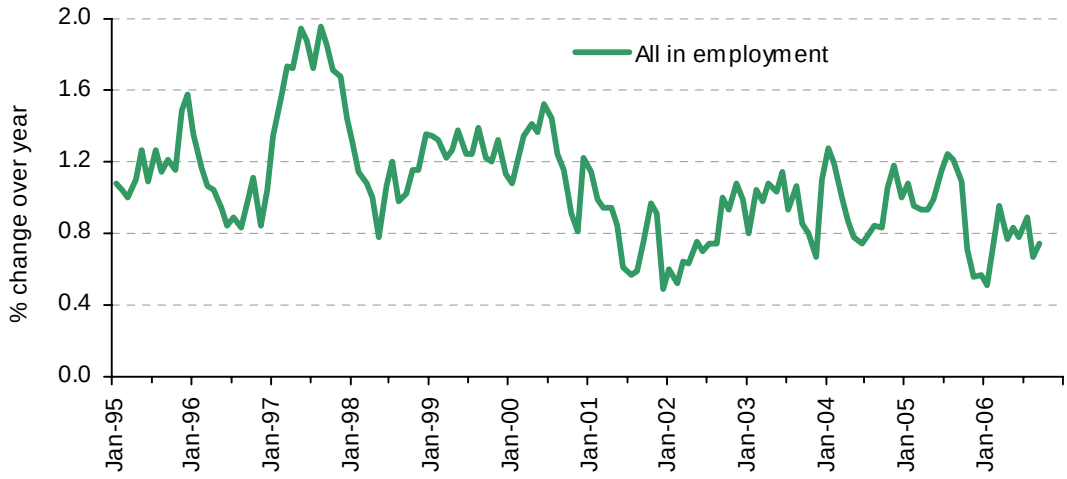


Notes: Debt servicing is interest payments by households and regular payment of mortgage principal. MIRAS is mortgage interest tax relief (phased out during the 1990s).
Sources: ONS; Inland Revenue; Morgan Stanley Research.

Employment growth

The UK unemployment rate has risen substantially, from 4.7% in Q3 2004 to 5.6% in Q3 2006. However, this has been driven by the increase in the labour force, rather than by job losses, with redundancy rates (aside from a short-lived spike in mid-2005) relatively steady and low over that period. Nevertheless, employment growth has slowed somewhat over the past year (Figure 4.16). This looks largely due to public sector employment, which fell by 49,000 over the first three quarters of 2006. We do not anticipate a major pick-up in public sector hiring anytime soon, given the slower rate of spending growth projected by the Treasury from April 2007 to March 2012 (Chapter 7 places these spending plans in historical context and describes the possible implication for spending growth in areas such as health and education).

Figure 4.16. Employment growth



Source: ONS.

Discretionary income

Our analysis suggests that households are now spending a high proportion of their income on 'core non-discretionary items' – which we define as tax, debt repayments, interest payments and energy. This proportion is now at close to its highest level since Q1 1988 (which is as far back as our data go) at 35% (compared with around 32% in the late 1980s). This squeeze on discretionary income makes a period of fast consumer spending growth look less likely.

Inflation

Risks to inflation are key to the overall UK economic outlook, particularly in 2007–08. With a central forecast of GDP growth around trend and inflation remaining above target (but gradually declining over 2007), the most likely scenario is that interest rates are held steady during the rest of 2007. However, we see inflation risks on the upside of both our forecasts and the Bank of England's central projection. This means that the risks for interest rates are skewed more in the direction of further rate rises rather than cuts, particularly in the first half of 2007, when inflationary risks related to wage growth will likely be at their highest.

On our central forecast, we see year-on-year inflation (as measured by the consumer prices index (CPI)) rising into the turn of 2007 before gradually declining back towards 2.0%, the Bank of England's target. We believe GDP growth is likely to run slightly below potential in 2007 and that current upward pressure on inflation from factors such as electricity and gas bills will fall out of the year-on-year comparison.

In December 2006, year-on-year CPI inflation hit 3.0% and RPI inflation moved above 4%, partly year-on-year petrol price increases (to some extent reflecting the rise in fuel duty announced in the Pre-Budget Report), with RPI additionally boosted by the direct effect of the Bank of England's rate rises on the mortgage interest payment component.

However, over 2007 and into 2008, we expect a decline in both RPI and CPI inflation, with the latter very close to the Bank of England's 2.0% target in 2008. This is the result of several specific components whose contribution to year-on-year inflation should become less positive (or more negative) for overall inflation. These include utility bills, clothing and food (the latter two partly as retailers respond to slower consumption growth in 2007). In addition, recent data show that year-on-year consumer goods import price inflation (excluding cars) became negative in October 2006 (after a recent peak of 3.1% in April 2006), possibly reflecting the steady rise in trade-weighted sterling over the past year. Unless we see a sharp unwind in this sterling move in 2007 (which is plausible in our view), it seems likely that this lower import inflation will feed through into CPI inflation.

On balance, however, we see the risks to our central inflation projection as skewed to the upside:

- We think there is little or no spare capacity in the UK economy. Current estimates of spare capacity are subject to greater-than-usual uncertainty because of the uncertain size of migration and uncertainty over the responsiveness of migration to hiring pressures, as the Bank of England has emphasised. Nonetheless, our models indicate that there is slack amounting to less than ¼% of potential GDP. This may leave UK inflation vulnerable to shocks.

- Wage increases may become more inflationary. A number of factors are coinciding at the turn of the year, typically an important time for wage negotiations. First, RPI inflation (more important in wage negotiations than CPI) was at 4.4% in December 2006; second, the national minimum wage rose 5.9% in October 2006; third, discretionary income (the amount of money households have left after paying taxes, interest and energy bills and after debt repayments) has been squeezed, which may persuade some employees to push harder for higher wages; fourth, profit growth has been relatively strong in the UK this year.

Housing market

Our central profiles for UK growth, inflation and the monetary policy outlook face several risks over 2007 and 2008. The risk of significant falls in house prices in the UK is probably the largest source of domestic risk to our outlook in the next few years and also one of the most difficult to factor into our forecasts. Our analysis suggests that significant falls in house prices are rather likely in the next few years. We summarise the main points below.

UK house prices are still rising rapidly on average, having more than doubled in real terms over the past decade. Have we reached a situation where house prices are so high that they cannot be sustained for much longer? Very simple measures of affordability (most obviously the ratio of average house prices to average household incomes) look immensely stretched relative to past levels. But unless we take some account of a much wider range of factors than just incomes, it makes little sense to talk of house prices as being unsustainable.

Explaining UK house price movements

We assume that the demand for housing depends on three factors: average per-capita incomes; the population; and the real 'user cost' of home ownership. The third factor depends on the level of real house prices, interest rates and other costs (e.g. house insurance and taxes), net of anticipated changes in house prices. We assume that the new supply of houses depends, to a limited extent, on the price of housing. We use estimates from the large literature on the UK housing market for the sensitivity of demand and supply to these factors.

The major unknown factor in this procedure is figuring out how people decide where they think house prices will be going. We make an assumption that people attach some weight to what has happened to house price inflation in recent years, but that they also attach some weight to a belief that there is a tendency for prices to move towards some long-run average rate of increase. The backward-looking element is potentially destabilising: if people believe that a period of rapid high price growth means further sharp rises in prices, their demand is actually boosted by fast growth in prices, and this adds to price pressures.

We find that in accounting for the change in prices seen over the past 10 years, we need to ascribe some of the rise to changing expectations – it is hard to account for house price appreciation simply in terms of change in incomes, population, interest rates and the pace of house-building. Indeed, changed expectations play a major role in explaining the rise in house prices. Table 4.5 shows the breakdown of the model's result by component. Using alternative assumptions about housing supply suggests that changing expectations explain between a third and slightly more than half of the rise. Part of that change in expectations may itself be justified in terms of sustainable changes in economic fundamentals. But our reading of the

evidence is that part has been driven by the rapid rise in prices itself and is likely therefore to be a more transient factor.

The fact that one apparently needs to put some considerable weight on changed house price inflation expectations to explain actual house price inflation suggests that the current level of house prices may be rather unstable. When we roll this model forward, assuming that the real interest rate, mortgage spread and 'other costs' elements are stable, and assuming steady 2.5% annual growth in household real disposable income, then the model predicts great volatility in house prices going forward.

Table 4.5. Explaining the change in house prices since 1996

Percentage point contribution to change in real house prices	Model I	Model II
Rise in income per capita	28	44
Increase in number of persons	9	15
Change in real interest rate	14	33
Change in expected capital gains	62	39
Change in housing supply	n/a	–16
Total change explained by model	**113**	**115**

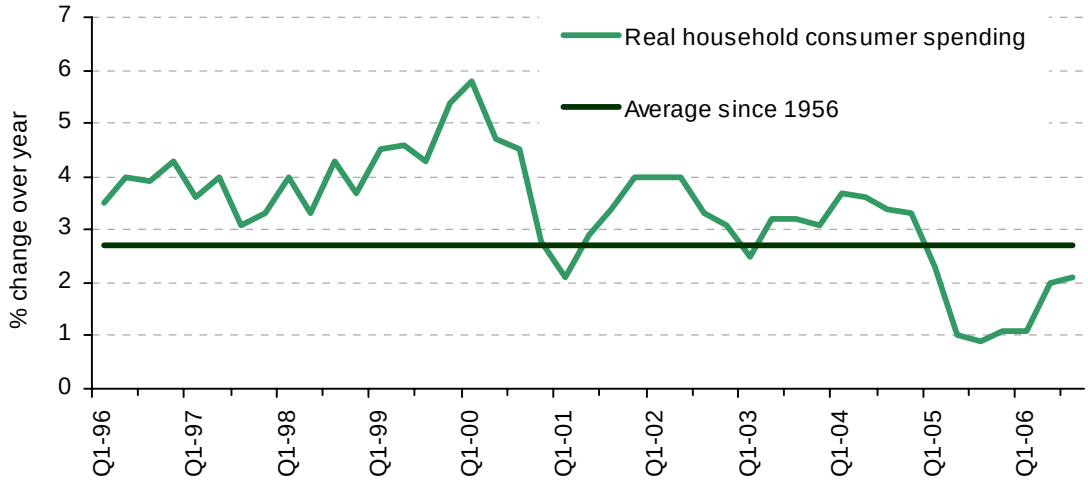
Source: Morgan Stanley Research.

A key question is whether, starting from here, we have to have a period of falling real house prices once those expectations come down, as they will, should real house price inflation move down from the current rate of close to 10% a year in cash terms. We think this is quite likely, but our simulations suggest that we could still get another year or so of rising house prices.

But the model shows why trying to 'call' the housing market over the next year or two is pretty much hopeless. We find that very small changes in assumptions about the forward/backward weight in forming expectations, about income growth or changes in real interest rates have a very large effect on the profile of prices and the timing of a downturn. However, most of the profiles we generated do show some falls in real house prices at some point over the next two years.

Although there is a degree of linkage between the state of the housing market and consumer spending (for example, through changes in housing market activity driving purchases of certain types of household goods and through changes in the available collateral for household borrowing), this linkage is probably variable over time and may not even be especially strong. What has been striking about the past 10 years is that a period when house prices have more than doubled in real terms is one over which the average rate of growth of consumer spending has been relatively close to the long-run average, particularly in the second part of the 10-year period, when most of the house price appreciation occurred (Figure 4.17). Based on what has happened over the past 10 years, one would sensibly conclude that the link between the housing market and the wider economy is actually rather weak. While sharp falls in house prices would probably significantly dent consumer spending growth, we do not agree with the conventional wisdom that house price falls will necessarily result in a consumer recession.

Figure 4.17. Real consumer spending growth



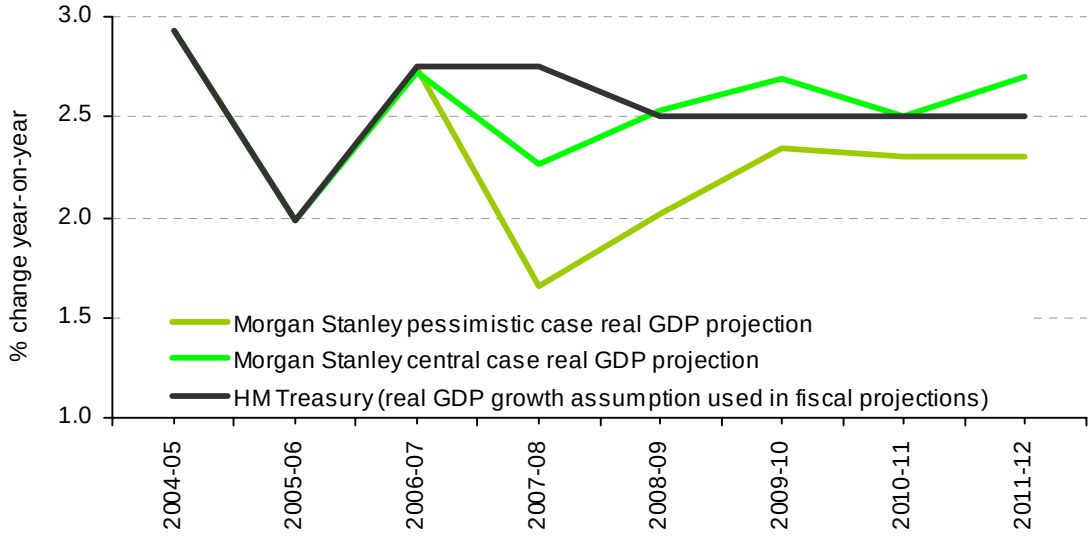
Sources: ONS; Morgan Stanley Research.

Our overall judgement is that risks are likely weighted more to the downside relative to the Treasury's growth forecasts.

4.5 The medium-term outlook

We now present two scenarios for the economy over the medium term – a central case and a more pessimistic case that reflects upside risks to inflation and interest rates and downside risks to consumer spending and net export growth (Figure 4.18). We would see a roughly 45% probability that the outcome will be better than the central case, 45% that it will be somewhere between the central and pessimistic case, and 10% that it will be worse even than the pessimistic case.

Figure 4.18. Alternative GDP growth scenarios



Sources: HM Treasury; Morgan Stanley Research.

Central case

We do not expect to see growth accelerate significantly over the next two to three years. We expect a negative contribution from net trade in 2007, somewhat weaker investment spending after a very strong 2006 and continued subdued consumer spending growth. As the global economy improves, we forecast slightly stronger growth in 2008. We expect growth close to trend in most years.

Table 4.6. Morgan Stanley central case economic projections

	2004–05	2005–06	2006–07E	2007–08E	2008–09E	2009–10E	2010–11E	2011–12E
Real GDP (% annual change)	3	2	2¾	2¼	2½	2¾	2½	2¾
Real consumer spending (% annual change)	3	1	2	2	1¾	2½	2¼	2½
Employment (% annual change)	1	1	¾	¾	¾	1	1	1
CPI inflation (% annual change)	1½	2	2½	2	2	2¼	2	2
Output gap (%)	½	–¼	0	–¼	0	0	0	¼
Saving rate (%)	3½	5¾	5½	5½	6	5¾	5¾	5½
Unemployment rate (%)	4¾	5	5½	5½	5¾	5½	5	4¾
Productivity growth (% annual change)	2¼	1¼	1½	1¾	1¾	2	1¾	1¾

E = Morgan Stanley Research estimates.
Sources: ONS; Morgan Stanley Research.

Consumer spending growth seems likely to recover somewhat in the years ahead. However, we continue to think that a desire to put household finances on a better footing will keep consumer spending growth below its historic average pace for several years to come.

A somewhat stronger contribution from net trade is plausible compared with this central forecast. Sterling probably remains overvalued. Morgan Stanley's currency team see sterling drifting lower in 2007 and 2008. On their forecasts, the sterling exchange rate index (on the Bank of England's 'narrow' trade-weighted measure) would depreciate by around 2% over 2007. This could help (slightly) to boost export growth relative to imports so that the contribution of net trade to overall growth becomes positive.

Investment weakens somewhat on our central forecast, but remains rather strong overall. Aggregate fixed investment growth seems likely to hold up well on continued robust government investment growth and a pick-up in real residential investment partly on the back of the government's drive to increase housing supply (although falls in house prices, should they occur, could offset this factor). There may still be upside risks to our forecast for business investment growth.

This forecast for the UK economy differs from that of the Treasury. In particular, we forecast somewhat weaker GDP growth than the Treasury in fiscal year 2007–08. Beyond that point, the Treasury actually projects similar or slightly weaker output growth than we do for use in its budget projections, as it uses deliberately 'cautious' assumptions in its fiscal projections

(though these are closer to our own central projections rather than a profile that we would recognise as being 'cautious').

'Pessimistic case'

Our 'pessimistic case', which we view as a plausible downside scenario for output growth, envisages (in part) one of the earlier highlighted risks playing out. In our pessimistic scenario, inflation and wage pressures rise in the first half of 2007, prompting two more Bank of England rate rises to 5¾% by mid-2007. This also leads to a deterioration in the labour market. The global backdrop is somewhat worse than in our central case. Against that backdrop, consumer spending slows sharply and investment spending slows. The Bank of England cuts rates at the end of 2007.

Compared with our central case, GDP growth (both actual and trend) is somewhat slower in this scenario as the economy responds to interest rate rises.

We consider the public finance implications of this more pessimistic scenario, and of our central forecast, in Chapter 5, where we compare them with forecasts based on the Treasury's central projection for the economy.

Table 4.7. Morgan Stanley 'pessimistic case' economic projections

	2004–05	2005–06	2006–07E	2007–08E	2008–09E	2009–10E	2010–11E	2011–12E
Real GDP (% annual change)	3	2	2¾	1¾	2	2¼	2¼	2¼
Real consumer spending (% annual change)	3	1	2¼	1	1¼	2	2	2
Employment (% annual change)	1	1	¾	½	½	1	1	1
CPI inflation (% annual change)	1½	2	2½	2½	2¼	2¼	2	2
Output gap (%)	¼	–¼	0	–¾	–1¼	–1¼	–1¼	–1¼
Saving rate (%)	3½	5¾	5½	6	6½	6¼	6½	7
Unemployment rate (%)	4¾	5	5½	5¾	6	5¾	5½	5
Productivity growth (% annual change)	2¼	1¼	1½	1¼	1½	1¾	1¾	1¾

E = Morgan Stanley Research estimates.
Sources: ONS; Morgan Stanley Research.

Conclusion: the medium-term outlook

Despite relatively good overall economic outcomes over the past 10 years, we see several rather worrying signs of economic weakness in the medium to longer term. Productivity performance has deteriorated somewhat and UK households are probably still saving too little. Nearer term, we see particular downside risks relative to the Treasury's forecasts in fiscal year 2007–08.

5. Green Budget public finance forecasts

Robert Chote, Carl Emmerson, Christine Frayne and Gemma Tetlow (IFS)

Summary

- The current budget deficit is likely to be £1.3 billion bigger this year, and £1.9 billion bigger next year, than forecast in the December 2006 Pre-Budget Report. But we are around £1½ billion more optimistic than the Treasury about the current budget balance by 2011–12, assuming that the economy evolves as the Treasury expects.
- If the Chancellor is correct in his provisional judgement that 2006–07 is the last year of a decade-long economic cycle, the golden rule would be met over this period with £7 billion to spare. Public sector net debt would also remain below the 40% of national income ceiling set out in the sustainable investment rule.
- We believe that the golden rule is more likely than not to be met over the next economic cycle, as long as it lasts five years or more. Despite forecasting slightly higher public sector debt than the Treasury over the next five years, we also believe that debt is more likely than not to remain below 40% of national income.
- But judging the Chancellor's adherence to the golden rule depends crucially on his method of identifying the economic cycle. Using a statistical filter, rather than the Treasury's judgement, Morgan Stanley identifies a seven-year cycle from 2003–04 to 2009–10. Over this period, the golden rule would be broken by £66 billion.
- In today's terms, we expect the current budget balance to be roughly £21 billion stronger in five years' time than it is now. Of this improvement, £13 billion reflects a rise in the tax burden and £8 billion cuts in public spending after 2007–08. We expect public sector net debt to rise by 1% of national income by 2011–12.
- By announcing £6 billion of new tax increases and pencilling in an £8 billion cut in public spending since the 2005 election, the Chancellor has followed our advice from earlier Green Budgets – although by delaying he may have helped diminish the credibility of the fiscal rules. We see no need for further tax increases at present, as long as he is able to stick to his PBR spending projections.
- If history is any guide, at some point the Treasury's fortunes as a fiscal forecaster will take a turn for the better. But whoever is Chancellor should be wary of spending any unexpected revenue that materialises or giving it away in tax cuts. As in the current cycle, this would risk the need for retrenchment later.

5.1 Introduction

This chapter presents the IFS public finance forecasts and discusses them in the context of the fiscal rules. Section 5.2 presents the 2007 Green Budget forecasts for 2006–07 and 2007–08, using as a baseline the assumption that the economy evolves as the Treasury predicted in the December 2006 Pre-Budget Report. Section 5.3 looks at the medium-term prospects for the public finances (up to 2011–12), also based on the 2006 PBR macroeconomic assumptions. Section 5.4 compares our baseline forecasts with forecasts based on the alternative macroeconomic assumptions outlined by Morgan Stanley in Chapter 4. Finally, Section 5.5 examines whether the Chancellor will meet his fiscal rules under our forecasts and what this implies for tax and spending decisions in the next and future Budgets.

5.2 Short-term projections

In 2005–06, current spending came in almost £7 billion higher and receipts around £2 billion higher than either the Treasury expected in the December 2005 PBR or we expected in the January 2006 Green Budget, as shown in Table 5.1. This includes a reclassification of the treatment of receipts of the BBC licence fee and the current expenditure that it finances, which added £3 billion to both receipts and current expenditure – without this, spending would have been up £4 billion and revenues down £1 billion.[1] This left the public sector current deficit £4.5 billion bigger than either we or the Treasury expected, although lower-than-forecast public sector net investment meant that public sector net borrowing overshot our forecasts by only £0.5 billion. For more details on the components of the forecasts and out-turns, see Appendix A.

Table 5.1. Comparison of forecasts for 2005–06

£ billion	**HM Treasury PBR forecast, December 2005**	**IFS Green Budget forecast, January 2006**	**Estimate, PBR, December 2006**
Current receipts	483.0	483.1	485.3
Current expenditure[a]	493.6	493.6	500.4
Net investment	26.3	26.3	22.4
Public sector net borrowing	37.0	36.8	37.5
Surplus on current budget	–10.6	–10.5	–15.1

[a] Includes depreciation.

Sources: Out-turn figures for 2005–06 from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm). Forecasts from HM Treasury, *Pre-Budget Report 2005*, Cm. 6701, December 2005 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr05/prebud_pbr05_index.cfm), and table 5.2 of R. Chote, C. Emmerson, R. Harrison and D. Miles (eds), *The IFS Green Budget: January 2006*, IFS Commentary 100 (http://www.ifs.org.uk/budgets/gb2006/index.php).

[1] Source: Paragraph 3.36, page 27, of HM Treasury, *End of Year Fiscal Report*, 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm).

Borrowing in 2006–07

Table 5.2 presents an overview of the Treasury's and the January 2007 Green Budget baseline forecasts for 2006–07. Between the March 2006 Budget and December 2006 PBR, the Treasury increased its spending forecast slightly more than its revenue forecast, pushing its current budget deficit forecast from £7.0 billion at Budget time to £7.9 billion in the PBR. The January 2007 Green Budget forecast is for a slightly bigger deficit of £9.2 billion, with our spending forecast higher than the Treasury's by a slightly larger margin than our revenue forecast is. With the same forecast for public sector net investment as the Treasury, we predict public sector net borrowing £1.3 billion higher than the Treasury expects, at £38.1 billion.

Table 5.2. Comparison of forecasts for government borrowing, 2006–07

£ billion	Budget, Mar. 06	PBR, Dec. 06	Green Budget, Jan. 07	Differences in Green Budget forecast relative to:	
				Budget	PBR
Current receipts	516.4	517.9	518.5	2.1	0.6
Current expenditure[a]	523.5	525.7	527.7	4.2	2.0
Net investment	28.8	28.9	28.9	0.1	0.0
Total managed expenditure	552.3	554.6	556.6	4.3	2.0
Public sector net borrowing	35.8	36.8	38.1	2.3	1.3
Surplus on current budget	–7.0	–7.9	–9.2	–2.2	–1.3

[a] In line with the National Accounts, depreciation has been included as current expenditure.

Sources: Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm), and HM Treasury, *Financial Statement and Budget Report*, HC968, March 2006 (http://www.hm-treasury.gov.uk/budget/budget_06/bud_bud06_index.cfm).

Receipts and spending in 2006–07

The January 2007 Green Budget forecast for receipts in 2006–07 is just £0.6 billion higher than the Treasury's December 2006 forecast. The breakdown of the receipts forecasts into constituent taxes is shown in Table 5.3, which also includes forecasts for 2007–08. Due to strong receipts so far in 2006–07, the Green Budget forecasts that VAT and stamp duty revenues will each come in higher than the PBR forecast (by £0.8 billion and £0.3 billion respectively), while due to weak in-year growth we expect income tax revenues to come in slightly lower (£0.5 billion).

The Green Budget forecasts that current spending (including depreciation) will be £2.0 billion higher than the PBR, which had in turn revised up the previous Budget 2006 forecast by £2.2 billion. To meet the PBR forecast, current spending growth would have to slow in the final three months of this financial year, relative both to the first seven months up to the PBR and (less dramatically) relative to the two months that have elapsed since the PBR. Despite net investment also running above the level consistent with the PBR forecasts, the Green Budget prediction here is in line with the PBR forecasts – the level of net investment has been consistently revised down both during and after the end of the financial year in recent years.

Table 5.3. Comparison of Green Budget and HM Treasury forecasts for government borrowing, 2006–07 and 2007–08

£ billion	**2006–07**		**2007–08**	
	PBR Dec. 2006	*Green Budget Jan. 2007*	*PBR Dec. 2006*	*Green Budget Jan. 2007*
Income tax (net of tax credits)	141.5	141.0	151.4	150.7
National Insurance contributions	88.5	88.5	94.3	93.7
Value added tax (VAT)	76.2	77.0	80.1	81.2
Corporation tax (net of tax credits)	47.4	47.4	53.2	52.6
Petroleum revenue tax	2.3	2.3	1.9	2.0
Fuel duties	23.7	23.7	25.2	25.2
Capital gains tax	4.0	4.0	4.9	4.5
Inheritance tax	3.6	3.6	4.1	3.9
Stamp duties	12.7	13.0	13.8	14.2
Tobacco duties	8.0	8.0	8.0	8.0
Spirits duties	2.3	2.3	2.4	2.4
Wine duties	2.4	2.4	2.5	2.6
Beer and cider duties	3.3	3.3	3.4	3.5
Betting and gaming duties	1.4	1.4	1.4	1.5
Air passenger duty	1.1	1.1	2.0	2.0
Insurance premium tax	2.3	2.3	2.4	2.4
Landfill tax	0.8	0.8	0.9	0.9
Climate change levy	0.7	0.7	0.7	0.7
Aggregates levy	0.3	0.3	0.3	0.3
Customs duties and levies	2.3	2.3	2.3	2.4
Total HM Revenue and Customs	**424.7**	**425.4**	**455.4**	**454.9**
Vehicle excise duties	5.1	5.1	5.5	5.4
Business rates	21.5	21.5	22.3	22.2
Council tax[a]	22.5	22.5	23.8	23.8
Other taxes and royalties[b]	13.3	13.3	14.5	14.0
Net taxes and NI contributions[c]	**487.1**	**487.8**	**521.4**	**520.3**
Accruals adjustments on taxes	3.2	3.2	2.3	2.3
Less Own resources contribution to EU budget	–4.4	–4.4	–4.4	–4.4
Less PC corporation tax payments	–0.2	–0.2	–0.2	–0.2
Tax credits adjustment[d]	0.6	0.6	0.7	0.7
Interest and dividends	5.3	5.3	6.1	6.1
Other receipts[e]	26.2	26.2	27.9	27.9
Current receipts	**517.9**	**518.5**	**553.8**	**552.7**

[a] PBR figures are based on stylised assumptions rather than government forecasts, as council tax increases are determined annually by local authorities, not by the government.

[b] Includes VAT refunds and money paid into the National Lottery Distribution Fund.

[c] Includes VAT and the traditional 'own resources' contributions to the EU budget.

[d] Tax credits that are scored as negative tax in the calculation of 'Net taxes and NI contributions' but expenditure in the National Accounts.

[e] Includes gross operating surplus and rent; net of oil royalties and business rates payments by local authorities.

Sources: PBR forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm); this table is similar to table B13 on page 234. IFS calculations.

Borrowing in 2007–08

The Treasury revised its forecast for the current budget balance in 2007–08 from a surplus of £1 billion in the March 2006 Budget to a deficit of £1.5 billion in the December 2006 PBR. It revised its receipts forecast fractionally higher, thanks to tax increases in the PBR offsetting a weakening of underlying receipts. But this was more than offset by an upward revision to the spending forecast, reflecting the impact of higher-than-expected inflation and lower-than-expected earnings growth on tax credit and benefit spending projections. The January 2007 Green Budget forecasts a current budget deficit of £3.4 billion, some £1.9 billion worse than the Treasury's PBR prediction. Our public sector net borrowing forecast is worse than the PBR's by a similar margin, at £33.2 billion.

Table 5.4. Comparison of forecasts for government borrowing, 2007–08

£ billion	Budget, Mar. 06	PBR, Dec. 06	Green Budget, Jan. 07	Differences in Green Budget forecast relative to:	
				Budget	PBR
Current receipts	553	553.8	552.7	–0.3	–1.1
Current expenditure[a]	551.9	555.2	556.2	4.3	1.0
Net investment	31	29.8	29.8	–1.2	0.0
Total managed expenditure	582.8	585.0	586.0	3.2	1.0
Public sector net borrowing	30	31.3	33.2	3.2	1.9
Surplus on current budget	1	–1.5	–3.4	–4.4	–1.9

[a] In line with the National Accounts, depreciation has been included as current expenditure.

Sources: Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm), and HM Treasury, *Financial Statement and Budget Report*, HC968, March 2006 (http://www.hm-treasury.gov.uk/budget/budget_06/bud_bud06_index.cfm).

Receipts and spending in 2007–08

The December 2006 PBR revised up the March 2006 Budget current receipts forecasts for 2007–08 by around £1 billion. This represents a downward revision of underlying receipts, as the PBR policy decisions (notably higher air passenger duty and anti-avoidance measures) are expected to raise an additional £2 billion. The Green Budget forecasts that current receipts will be £552.7 billion in 2007–08, which is £1.1 billion below the PBR forecast.

Table 5.3 breaks down the receipts forecast tax by tax. The Green Budget forecasts lower income tax, National Insurance contributions, corporation tax, capital gains tax and inheritance tax than the Treasury, but these are in part offset by higher VAT, petroleum revenue tax, stamp duty, alcohol duties, betting and gaming duties, and customs duties and levies receipts. Just as the overall receipts forecast is close to the PBR forecast, there is also little substantial difference on a tax-by-tax basis, with the largest difference being the £1.1 billion additional VAT revenue that the Green Budget forecasts.

The Green Budget forecasts current spending (including depreciation) £1.0 billion higher than the PBR, due to higher social security spending and the assumption that the AME margin (the unallocated reserve) will be set to £1 billion as in previous years.

5.3 Medium-term prospects

Over the medium term, we expect the near-term gap between the Green Budget and PBR current budget balance forecasts to narrow and then reverse (Tables 5.5 and 5.6). The Green Budget forecasts a deficit £1.9 billion bigger than the PBR in 2007–08, but a surplus £1.4 billion bigger than the PBR for 2011–12. Given the uncertainties around both forecasts (judging from past forecasting performance), this is not a significant difference.

Table 5.5. Medium-term public finance forecasts under Pre-Budget Report 2006 assumptions

£ billion	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**
Green Budget forecasts						
Current budget						
Current receipts	518.5	552.7	583.2	615.4	649.8	686.1
Current expenditure[a]	527.7	556.2	583.0	610.1	638.1	670.8
Surplus on current budget	**–9.2**	**–3.4**	**0.2**	**5.4**	**11.7**	**15.4**
Capital budget						
Net investment	28.9	29.8	31.0	33.0	35.0	36.8
Public sector net borrowing	**38.1**	**33.2**	**30.8**	**27.6**	**23.3**	**21.4**
HM Treasury forecasts						
Current budget						
Current receipts	517.9	553.8	586	616	647	681
Current expenditure[a]	525.7	555.2	582	609	637	666
Surplus on current budget	**–7.9**	**–1.5**	**4**	**7**	**10**	**14**
Capital budget						
Net investment	28.9	29.8	31	33	35	36
Public sector net borrowing	**36.8**	**31.3**	**27**	**26**	**24**	**22**

[a] In line with the National Accounts, depreciation has been included as current expenditure.

Sources: Authors' calculations. Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm); this table is similar to table B8 on page 229.

Over the coming five years, we expect the current budget balance to move from a deficit of 0.7% of national income in 2006–07 to a surplus of 0.9% of national income in 2011–12. Of this 1.6% of national income improvement (£21 billion in today's terms), 1.0% of national income (£13 billion) comes from a rising tax burden and 0.6% of national income (£8 billion) from cuts in spending. Over the same period, the PBR has a slightly smaller improvement (from a fractionally stronger starting point to a fractionally weaker end point).

The forthcoming Comprehensive Spending Review (CSR), due later this year, will set out firm plans for departmental spending for the years 2008–09, 2009–10 and 2010–11. We use the cash values for spending in those years as projected in the PBR as an indication of the most likely trajectory of spending over those years. With current spending increasing by just 1.9% per year in real terms (i.e. slower than the rate of growth of the economy – see Table 7.2), this results in forecast current spending falling from 40.4% of national income in 2007–08 to 39.8% in 2010–11. For 2011–12, the Green Budget forecasts that current spending will

remain constant as a share of national income, rather than falling further to 39.6% as the PBR assumes. As a result, current spending in that year would be nearly £4 billion higher in today's terms than in the PBR forecast.

Green Budget forecasts show public sector current receipts closing their gap with the PBR forecast by around 2009–10 and thereafter growing at a faster rate than the Treasury expects. Receipts are forecast to rise from 39.7% of national income in 2006–07 to 40.7% in 2011–12; the biggest increase is set to occur between this year and 2007–08, largely due to policy changes increasing revenues, including increases to North Sea oil taxes introduced in the December 2005 PBR. The next section discusses the composition of receipts in more detail.

Table 5.6. Medium-term public finance forecasts under Pre-Budget Report 2006 assumptions

% of national income	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Green Budget forecasts						
Current budget						
Current receipts	39.7	40.1	40.2	40.4	40.5	40.7
Current expenditure[a]	40.4	40.4	40.2	40.0	39.8	39.8
Surplus on current budget	**–0.7**	**–0.3**	**0.0**	**0.4**	**0.7**	**0.9**
Capital budget						
Net investment	2.2	2.2	2.1	2.2	2.2	2.2
Public sector net borrowing	**2.9**	**2.4**	**2.1**	**1.8**	**1.5**	**1.3**
Public sector net debt	**37.6**	**38.4**	**39.1**	**39.3**	**39.1**	**38.9**
HM Treasury forecasts						
Current budget						
Current receipts	39.7	40.2	40.4	40.4	40.4	40.4
Current expenditure[a]	40.3	40.3	40.2	40.0	39.8	39.6
Surplus on current budget	**–0.6**	**–0.1**	**0.3**	**0.5**	**0.6**	**0.8**
Capital budget						
Net investment	2.2	2.2	2.2	2.2	2.2	2.2
Public sector net borrowing	**2.8**	**2.3**	**1.9**	**1.7**	**1.5**	**1.3**
Public sector net debt	**37.5**	**38.2**	**38.6**	**38.7**	**38.7**	**38.5**

[a] In line with the National Accounts, depreciation has been included as current expenditure.

Sources: Authors' calculations. Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm); this table is similar to table B9 on page 229.

The Green Budget forecasts for net investment are in line with the PBR ones until 2011–12, when we expect net investment to be slightly higher than the Treasury does. Consequently, the profile for public sector net borrowing over the medium term tracks that of the current budget, with borrowing being higher under the Green Budget forecasts until 2009–10, but lower in 2010–11 and 2011–12.

The higher borrowing forecasts from the Green Budget for the years 2006–07 to 2009–10 mean that we have slightly higher forecasts than the Treasury for public sector net debt right through to 2011–12. As discussed in Section 3.3, the sustainable investment rule requires that public sector net debt be kept below 40% for all the years of the current cycle. The Treasury

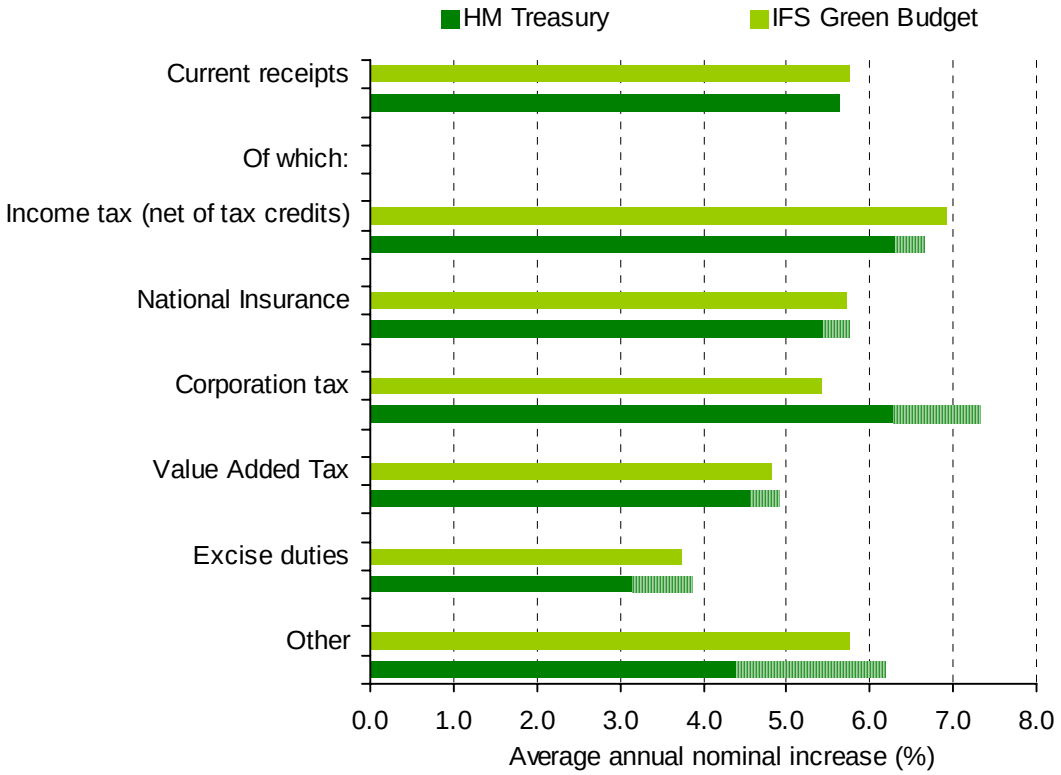
expects the cycle to end in 2006–07 and has not yet announced how it will assess compliance with the rule over the next cycle. Nevertheless, under both the Treasury and the Green Budget scenarios, debt is set to remain under the 40% ceiling throughout the next five years, although the smallest margin of error in any particular year is only 0.7% of national income in 2009–10 under the Green Budget forecasts compared with 1.3% of national income in the PBR.

Breakdown of medium-term revenue projections

Figure 5.1 shows the average annual nominal growth for each major component of tax revenues under the Green Budget projection over the period from 2006–07 to 2011–12. These are compared with the Treasury's December 2006 projections. Comparing the two medium-term projections is hampered by a lack of availability of detailed forecasts from the Treasury, since the PBR only shows limited information on the composition of its medium-term revenue projections and rounds revenues from each of the categories to the nearest 0.1% of national income. As a result, a lower and an upper bound on the Treasury's projection are shown in the graph (the range between these two bounds being shown by the striped region).

Overall, the Green Budget projection is for very slightly higher growth in tax (and non-tax) revenues, from a slightly higher base. Between 2006–07 and 2011–12, the Green Budget forecasts show stronger growth in income tax (net of tax credits). In contrast, the Green Budget forecast is for lower growth in revenues from corporation tax than the PBR, with

Figure 5.1. PBR and IFS forecasts for revenue growth, 2006–07 to 2011–12



Note: Corporation tax includes petroleum revenue tax.
Sources: Authors' calculations; Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm).

Box 5.1. Company earnings and corporation tax revenues

By Graham Secker (Morgan Stanley)

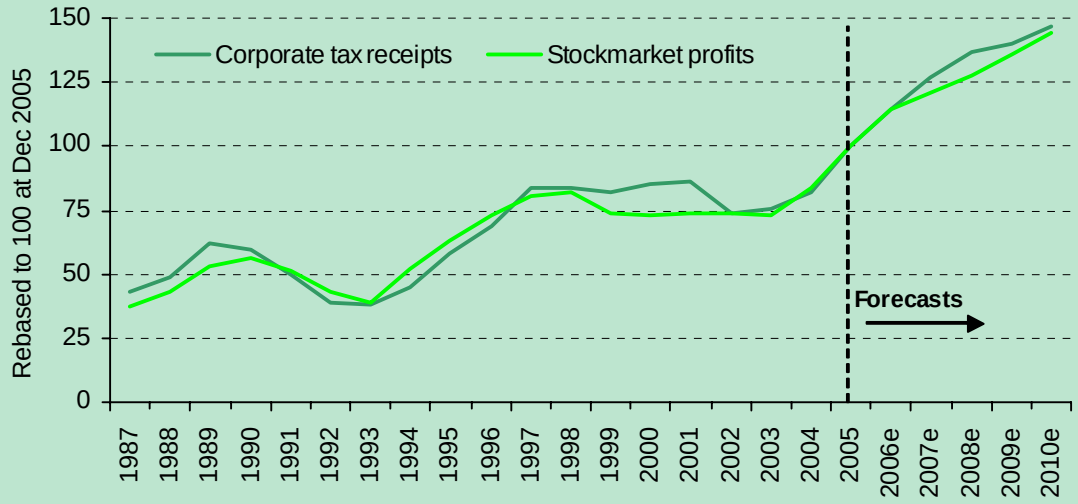
Strong global economic growth and high levels of corporate profitability have produced a very strong environment for corporate earnings over the last few years. This has also fed through into strong growth in corporate tax receipts, although the government consistently overestimated corporation tax receipts during most of its second term. Although growth in corporate profits (and by default tax receipts) is beginning to slow, it should still come in at around 14–15% for 2006, down from over 20% in the previous year.

Going forward, the Treasury's forecast of corporate tax receipt growth is now lower than in previous years, with expectations of 11%, 8% and 3% for the next three years respectively. This compares with our medium-term projection for growth in stock-market profits of 6% per annum, which is the average earnings growth of the UK stock market since 1960.

In the December 2005 PBR, the forecasts were for total corporate tax receipt growth of 30% in 2005–06, 21% in 2006–07 and 11% in 2007–08. In the latest PBR, these forecasts are now 26%, 14% and 11% growth respectively. The overall impact on total forecast corporate tax receipts by 2007–08 is considerable; in effect, the Treasury has revised down its expectation for total corporate tax receipts in 2007–08 by £12.1 billion which includes a shortfall in non-North-Sea corporate tax receipts of £9.1 billion – in both cases, this equates to around a 17% shortfall.

In the last two Green Budgets, we have included a graph showing how much more optimistic the Treasury is about growth in corporate tax receipts than we are in corporate earnings growth. In Figure 5.2, we update this analysis; it is apparent that HMT's view on corporate tax receipts and Morgan Stanley's view on stock-market earnings are now much more aligned with one another than in previous years. This is due both to HMT's downgrades to its growth forecasts for the last couple of years and corporate earnings that have come in stronger than we were expecting.

Figure 5.2. Treasury forecasts for corporation tax revenues and Morgan Stanley forecasts for UK stock-market growth



Note: Stock-market profits from 2005 onwards are based on Morgan Stanley forecasts.
Sources: ONS; MSCI; Morgan Stanley Research.

revenues from this source forecast to reach 3.8% of national income, rather than the 4.1% expected by the PBR. With the economy forecast to be on trend in the years after 2007–08, the Green Budget forecast is for underlying corporation tax (adjusted for policy changes and a forecast decline in North Sea oil yields in the medium term) to stay constant as a share of national income (see Box 5.1). With each of the other categories, the Green Budget projection for revenue growth lies within the possible range of projected revenue growth from the PBR.

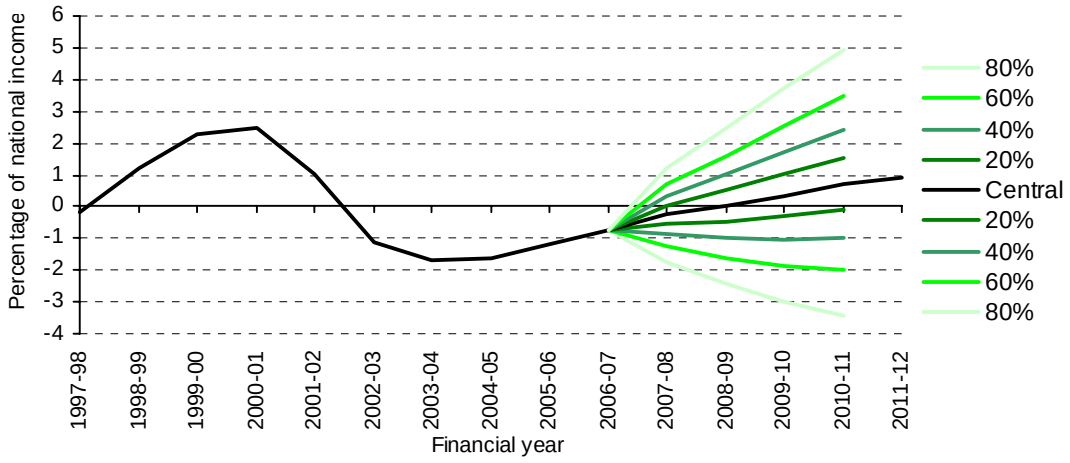
Uncertainties around the baseline Green Budget forecast

Public finance forecasts are by their nature uncertain and it is important to acknowledge that uncertainty when presenting them. The further ahead forecasts are made, the larger the degree of uncertainty. Figures 5.3 and 5.4 present probabilistic fan charts for the Green Budget forecasts for the next four years, with the forecast for 2006–07 taken as given. The fan charts assume that the Green Budget forecasts will be right on average (and so are the best forecasts available) and that they are as accurate as the Treasury's forecasts have been in the past. If the Green Budget forecasts were more inaccurate than the Treasury's, the fan charts would be wider, while if they were more accurate then the fan charts would be narrower.

In each graph, the black line shows the central Green Budget forecast – it is assumed that there is a 50% chance that the outcome will lie above this line and a 50% chance that it will lie below, as the central forecasts are (by definition) assumed to be right on average. The darkest green lines on either side of the central forecasts denote the range of outcomes within which there is a 20% probability that the outcomes will lie. As uncertainty increases with the time horizon, these lines fan out.

The central forecast for 2007–08 is for a current budget deficit of 0.3% of national income and Figure 5.3 indicates that there is a 20% probability that the actual outcome will be a deficit of between 0.5% and 0.0% of national income. In 2010–11, the central forecast is for a

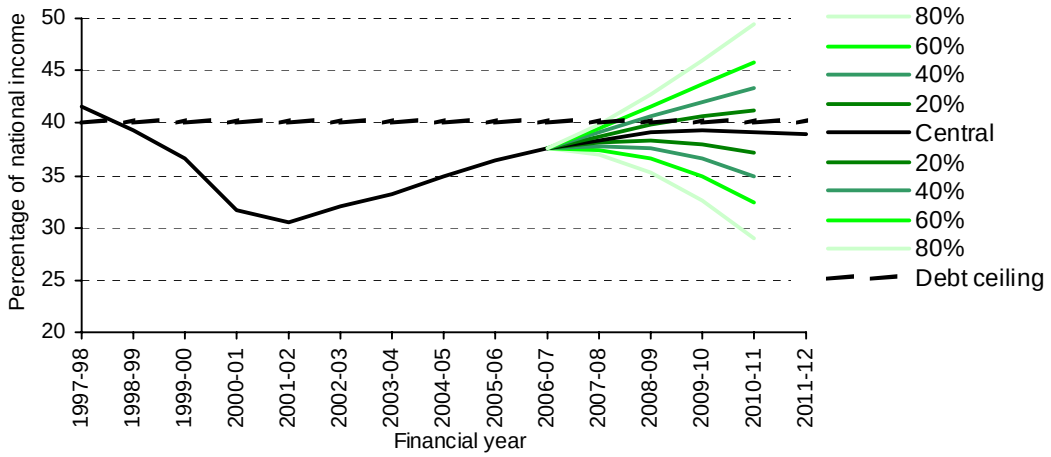
Figure 5.3. Probabilities of current budget balance outcomes (Green Budget baseline)



Notes: Central projections are taken from Table 5.6 and assume that the Green Budget projection for 2006–07 is correct. Methodology for computing fan charts taken from C. Emmerson, C. Frayne and S. Love, 'Updating the UK's Code for Fiscal Stability', IFS Working Paper W04/29, 2004 (http://www.ifs.org.uk/publications.php?publication_id=3163).

surplus of 0.7% of national income – but the greater uncertainties in forecasting four years in advance mean that we can only be 20% certain that the outcome will lie within the much larger range of –0.1% to 1.6% of national income. The 40%, 60% and 80% lines bound the ranges within which there is a 40%, 60% or 80% probability that the outcome will eventually lie. Therefore there is a 10% probability that the outcome will lie above the upper 80% line and a 10% probability that it will lie below the lower one. There is an estimated 41% probability that, on unchanged policies, the current budget would still not be back in surplus in 2010–11.

Figure 5.4. Probabilities of public sector net debt outcomes (Green Budget baseline)



Notes: Central projections are taken from Table 5.6 and assume that the Green Budget projection for 2006–07 is correct and that any cumulative variation in public sector net borrowing from that forecast in the Green Budget projection directly adds to public sector net debt. The second-order impact of changes in debt interest is ignored. Methodology for computing fan charts taken from C. Emmerson, C. Frayne and S. Love, 'Updating the UK's Code for Fiscal Stability', IFS Working Paper W04/29, 2004 (http://www.ifs.org.uk/publications.php?publication_id=3163).

With the economic cycle due to end during 2006–07, Figures 5.3 and 5.4 implicitly assume that the forecasts for this year are met and that, therefore, both fiscal rules are met over the current cycle. Judging whether or not the golden rule is to be met over the next cycle depends on the length of the next cycle, whereas the Treasury assumes for forecasting purposes that this cycle will be the last. Similarly, it is not possible to assess the probability of the sustainable investment rule being missed over the next cycle, as the Treasury has not yet defined how it will be judged (as discussed in Chapter 3). However, it is possible to estimate the probability that net debt will exceed 40% in any given year, whether or not that is the benchmark against which compliance with the sustainable investment rule will be judged. We estimate that the probability of net debt breaching 40% increases from 6% in 2007–08 to 44% in 2010–11.

A key conclusion of this analysis is that the difference between the central projections in the Green Budget and the PBR – for both budget balances and net debt – is much less significant than the uncertainty that lies around either, given past forecast performance.

5.4 Alternative macroeconomic assumptions

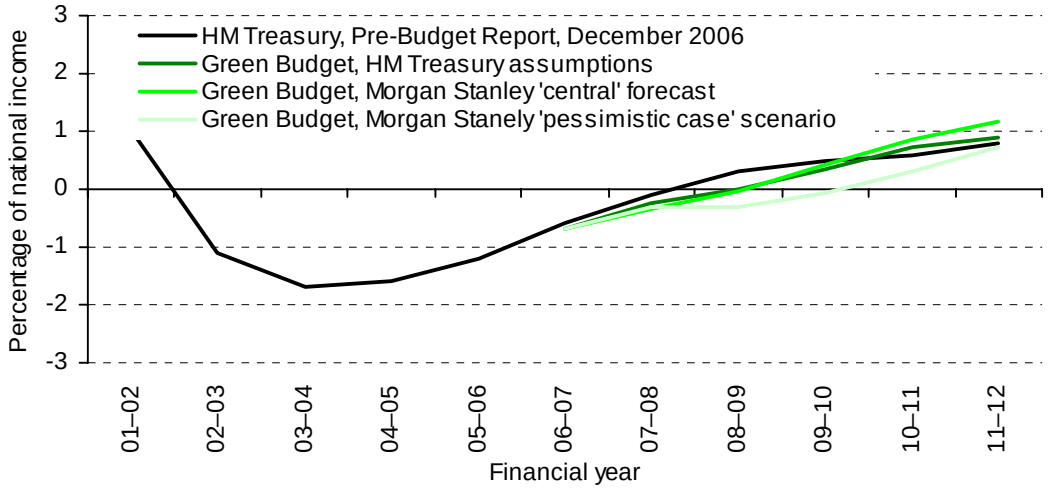
The Green Budget baseline forecasts are, as far as possible, based on the same macroeconomic assumptions that underlie the Treasury's forecasts from the Pre-Budget Report (although we are hindered somewhat by the Treasury's refusal to publish some of the economic assumptions on which its fiscal forecasts are based – for example, growth in average earnings). This section presents alternative forecasts under two different sets of macroeconomic assumptions from Morgan Stanley – the central case and the 'pessimistic case' described in Chapter 4.

Table 5.7 presents the underlying growth in national income and trend level assumptions used by the Treasury and presented by Morgan Stanley. It also shows the four sets of public finance forecasts: the Treasury's PBR forecasts, the baseline Green Budget forecasts using the Treasury's macro scenarios, the Green Budget forecasts under the central Morgan Stanley macro forecasts and the Green Budget forecasts under the 'pessimistic case' Morgan Stanley macro forecasts.

The PBR macro scenario has the output gap (trend GDP minus actual GDP) averaging zero in 2007–08 from –0.2% in 2006–07. From 2008–09 onwards, GDP is set to increase at ¼ percentage point below the trend rate of growth, at 2½% a year. The Morgan Stanley central forecast shows the output gap not closing until 2009–10. Higher growth in the years that follow leads to an increasingly positive output gap. The two macro scenarios have similar levels of nominal growth overall, but with more real growth and less inflation over the full five-year forecasting horizon in the Morgan Stanley scenario. Section 4.5 describes the Morgan Stanley scenarios in more detail.

The public finance forecasts are shown in Figures 5.5, 5.6 and 5.7 for the overall current budget balance, the cyclically adjusted current budget balance and public sector net debt respectively. The Green Budget public finance forecasts using the Morgan Stanley central case show a similar cyclically adjusted and overall surplus on the current budget to the

Figure 5.5. Current budget balance forecasts



Sources: Authors' calculations; Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm).

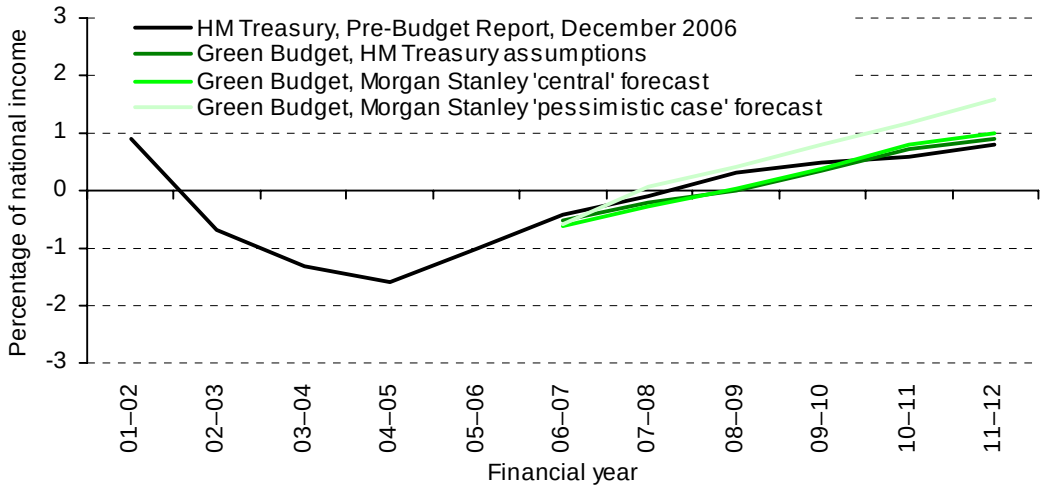
Table 5.7. Public finance forecasts under various macroeconomic scenarios

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Treasury Pre-Budget Report forecasts (PBR macro assumptions)						
GDP growth	2¾	2¾	2½	2½	2½	2½
Output gap (% of potential GDP)	–0.2	0.0	0.0	0.0	0.0	0.0
Public finance forecasts (% of GDP)						
Current budget surplus	–0.6	–0.1	0.3	0.5	0.6	0.8
Cyclically adjusted current budget surplus	–0.4	–0.1	0.3	0.5	0.6	0.8
Net borrowing	2.8	2.3	1.9	1.7	1.5	1.3
Net debt	37.5	38.2	38.6	38.7	38.7	38.5
Green Budget baseline (PBR macro assumptions)						
GDP growth	2¾	2¾	2½	2½	2½	2½
Output gap (% of potential GDP)	–0.2	0.0	0.0	0.0	0.0	0.0
Public finance forecasts (% of GDP)						
Current budget surplus	–0.7	–0.3	0.0	0.4	0.7	0.9
Cyclically adjusted current budget surplus	–0.5	–0.2	0.0	0.4	0.7	0.9
Net borrowing	2.9	2.4	2.1	1.8	1.5	1.3
Net debt	37.6	38.4	39.1	39.3	39.1	38.9
Alternative Green Budget scenario I (Morgan Stanley central case)						
GDP growth	2¾	2¼	2½	2¾	2½	2¾
Output gap (% of potential GDP)	0.1	–0.1	–0.1	0.1	0.1	0.3
Public finance forecasts (% of GDP)						
Current budget surplus	–0.7	–0.3	0.0	0.4	0.9	1.2
Cyclically adjusted current budget surplus	–0.6	–0.3	0.0	0.4	0.8	1.0
Net borrowing	2.9	2.5	2.2	1.8	1.3	1.0
Net debt	37.3	38.8	39.2	39.3	39.1	38.5
Alternative Green Budget scenario II (Morgan Stanley 'pessimistic case')						
GDP growth	2¾	1¾	2	2¼	2¼	2¼
Output gap (% of potential GDP)	0.0	–0.8	–1.2	–1.2	–1.2	–1.2
Public finance forecasts (% of GDP)						
Current budget surplus	–0.7	–0.3	–0.3	–0.1	0.3	0.7
Cyclically adjusted current budget surplus	–0.6	0.1	0.4	0.8	1.2	1.6
Net borrowing	2.9	2.5	2.5	2.3	1.9	1.5
Net debt	37.3	38.9	39.5	40.1	40.3	40.2

Sources: Morgan Stanley; Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm).

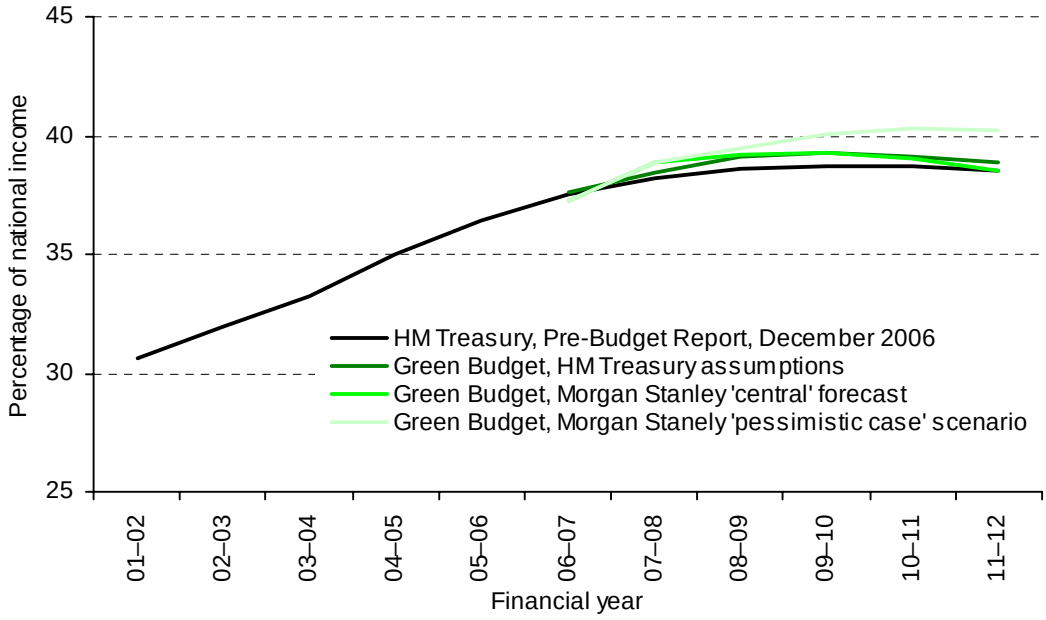
baseline forecasts (though the Morgan Stanley central case forecast implies a slightly higher deficit in 2007–08 and a slightly higher surplus in 2010–11 and 2011–12). Borrowing is slightly higher in 2007–08 and 2008–09 due to relative underperformance of the economy and this is reflected in higher debt levels. Debt reaches 39.3% of national income by 2009–10. Thereafter, higher growth brings down borrowing and 2011–12 sees debt below that in the baseline forecast.

Figure 5.6. Cyclically adjusted current budget balance forecasts



Sources: Authors' calculations; Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm).

Figure 5.7. Public sector net debt forecasts



Sources: Authors' calculations; Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm).

The Morgan Stanley 'pessimistic case' scenario forecasts a higher deficit in 2008–09 than the baseline forecast and, unlike the other forecasts, implies that the current budget will not be back in surplus until 2010–11. This is because this scenario assumes that an output gap of around 1% of national income persists in the medium term. This negative output gap means that the cyclically adjusted current budget surplus is higher under this scenario than under either the baseline scenario or the Morgan Stanley central scenario.

Net debt is higher under the Morgan Stanley 'pessimistic case' scenario than under the baseline scenario as a result of the larger current budget deficits in 2008–09 and 2009–10 and smaller surpluses in 2010–11 and 2011–12. In fact, under the 'pessimistic case' scenario, net debt would exceed the currently defined sustainable investment rule debt ceiling of 40% of national income in 2009–10, 2010–11 and 2011–12. Net debt is forecast under this scenario to peak in 2010–11 at 40.3% of national income.

5.5 The fiscal rules and the budget judgement

As we describe in Chapter 3, the golden rule requires that the current budget be in balance or surplus over the years that constitute an economic cycle. In the December 2006 PBR, the Treasury said that it now expected a 10-year cycle to run from 1997–98 to 2006–07. Over the nine years that have already elapsed, there has been a cumulative surplus of £16.3 billion on the current budget, thanks to the large surpluses in the first half of the cycle. In the absence of any revisions, the golden rule will be met as long as the current budget is in deficit by no more than £16.3 billion in 2006–07. As the Green Budget forecasts a £9.2 billion deficit, we expect the rule to be met with £7.1 billion to spare.

Whether or not the golden rule is met over the next cycle depends, amongst other things, on the length of the cycle. Table 5.8 presents the surplus on the current budget over the current and the next cycle, according to the Green Budget baseline forecasts. If the next cycle starts in 2006–07, and includes that year (see Section 3.2), then it would not be until 2010–11 that the current budget is cumulatively in surplus. So, if the Green Budget baseline forecast is correct,

Table 5.8. The golden rule under the Green Budget baseline forecast

% of national income	**2006–07**	**2007–08**	**2008–09**	**2009–10**	**2010–11**	**2011–12**
Surplus on current budget	–0.7	–0.3	0.0	0.4	0.7	0.9
Cycle 1 (1997–98 to 2006–07)						
Average surplus since 1997–98	0.1	n/a	n/a	n/a	n/a	n/a
Cumulative surplus (£ billion)	7.1	n/a	n/a	n/a	n/a	n/a
Cycle 2 (from 2006–07)						
Average surplus since 2006–07	–0.7	–0.5	–0.3	–0.1	0.0	0.2
Cumulative surplus (£ billion)	–9.2	–12.5	–12.3	–7.7	1.8	13.7
Morgan Stanley estimated cycle (2003–04 to 2009–10)						
IFS baseline forecast						
Average surplus since 2003–04	–1.3	–1.1	–0.9	–0.7	n/a	n/a
Cumulative surplus (£ billion)	–67.6	–70.8	–70.7	–66.1	n/a	n/a

Note: Figures rounded to one decimal place.

the golden rule would be met over the next economic cycle as long as it lasts at least five years. On the Treasury's methodology, no cycle since the early 1970s has lasted less than six years, which suggests that the golden rule is more likely than not to be met over the next cycle.

Using a statistical filter[2] to date economic cycles, Morgan Stanley judge that a cycle began at the end of 2003 and will close in the financial year 2009–10. Over this cycle, we estimate that the Treasury would breach the golden rule by around £66 billion, because deficits recorded from 2003–04 to 2006–07 would not be outweighed by surpluses in subsequent years. On the Treasury's own forecasts, the cumulative deficit on the current budget over these years would be £57 billion. These large misses underline the fact that reasonable differences of opinion over the dating of the cycle can have very significant consequences for the perceived health of the public finances. It strengthens the case, as we argued in Chapter 3, for an interpretation of the golden rule that does not require precise estimates of the output gap and the dating of the cycle. If the Treasury were suddenly to agree with the dating of the cycle provided by this statistical filter, it would be inappropriate to tighten fiscal policy sufficiently to meet it over an estimated cycle running from the end of 2003 to 2009–10.

Using the Treasury's method for estimating the output gap, the sustainable investment rule looks like it could be more constraining over the next few years than the golden rule. As we explained in more detail in Chapter 3, the sustainable investment rule constrains the Chancellor to keep public sector net debt at a 'stable and prudent' level. Over the current cycle, this has been defined as keeping debt below 40% of national income at the end of each year of the cycle, though the Chancellor has not yet stated how this rule will be judged over the next cycle.

Table 5.9 shows the probability that net debt exceeds 40% of national income in each of the next four years under the alternative forecasts. These figures assume for each scenario that the forecast is right on average and is as accurate as the Treasury's forecasts have been in the past. Under all four scenarios, there is at least a 40% chance that net debt will exceed 40% of national income in 2009–10. Under Morgan Stanley's 'pessimistic case' scenario, there is a 50:50 chance that this will happen. This suggests that, whilst the sustainable investment rule has not appeared to constrain the Chancellor as much as the golden rule over the current economic cycle, it will become more constraining as we move into the next cycle.

Table 5.9. The sustainable investment rule under the alternative forecasts: percentage chance of net debt exceeding 40% of national income

% chance	HMT Pre-Budget Report forecast	Green Budget baseline	Morgan Stanley central	Morgan Stanley pessimistic
2007–08	6.2	9.0	16.1	16.7
2008–09	31.5	37.7	39.2	43.0
2009–10	40.1	44.4	44.8	50.5
2010–11	43.5	45.7	45.3	51.6

Source: As Figure 5.3 and Table 5.7.

[2] Hodrick–Prescott filter with lambda=1,600 (see Table 4.3).

So what do recent out-turns and our forecasts imply for the Budget judgement this year?

As we discuss in Chapter 3, through most of Labour's second term we argued in successive Green Budgets that the Chancellor would need to announce spending cuts and/or tax increases worth around 1% of national income (£13 billion in today's terms) to bring about the improvement in the public finances he was looking for (i.e. to achieve a current budget surplus of around 0.7% of national income in five years) and to meet the golden rule with the desired cushion over an economic cycle then estimated to run from 1999–2000 to 2005–06.

The Chancellor rejected this advice right into the 2005 election campaign, but within a couple of months of Labour's victory it was clear that he was on course to breach the rule. Mr Brown promptly added two good years for the public finances to the beginning of the economic cycle, putting him back on course to meet it. In the 2005 Pre-Budget Report, he pencilled in an £8 billion spending cut over the entire period to be covered by the 2007 Comprehensive Spending Review and announced a £3 billion tax increase. In the 2006 Budget and Pre-Budget Report, he continued to pencil in the projected spending cut (and in fact extended the period during which public spending is pencilled in to grow less quickly than expected growth in the economy by one more year to 2011–12) and announced another £3 billion of tax increases.

Delaying the necessary adjustment and re-dating the cycle at a particularly opportune moment has both economic and political significance. It has helped undermine the credibility of the fiscal rules as a meaningful discipline on the Chancellor's decision-making. It has also meant that Mr Brown will now be presiding over a rising tax burden and cuts in public spending at precisely the point at which he hopes to take over from Tony Blair as Prime Minister and then seek his own mandate.

Looking ahead, the Treasury's forecasts for tax revenues are much more realistic than they were prior to the 2005 Pre-Budget Report. Indeed, there is little difference between our forecasts for the current budget balance and the Treasury's over the next few years. We therefore see no need for further significant tax increases at this stage, assuming that the Chancellor confirms that the Comprehensive Spending Review will implement the spending cuts projected in the Treasury's last three forecasts. This would be sufficient to give the Chancellor a better-than-evens chance of meeting his fiscal rules over this cycle and the next (although, as we argue in Chapter 3, there is a compelling case for reforming them). To cut taxes or increase the spending plans (without a corresponding tax increase) would require a longer economic cycle to meet the golden rule, increase the chances of breaching the debt ceiling and threaten further damage to the credibility of the fiscal framework.

As we discuss in Chapter 7, a key challenge for Mr Brown will be to achieve his goals for health, education and poverty reduction within a constrained spending envelope. He may well allocate the available money to health and education (still implying slower growth for them than in recent years) and hope that revenues come in more buoyantly than expected in future years, providing money to spend on anti-poverty measures. This is not implausible – the Treasury's revenue forecasts have been over-optimistic for six years now, and history suggests that at some point it will be due for a run of better luck. But whoever is Chancellor then needs to be wary of repeating the history of recent years: spending the proceeds of good fortune early in the economic cycle only to find themselves having to retrench later on.

6. Funding issues and debt management

David Miles, with Laurence Mutkin and Rustom Irani (Morgan Stanley)

Summary

- In recent years, the UK government's cost of borrowing has been falling in both nominal and real terms, even though the amount it has borrowed has been rising and has consistently exceeded its own forecasts. In the light of this, we should not expect a big impact on the cost of debt if the government needs to issue a few billion pounds more in gilts than its central forecasts over the next few years.
- Modelling the impact of random factors on different debt issuance strategies provides strong reasons to favour a strategy involving greater issuance of long-dated conventional and long-dated indexed debt.
- Lengthening maturity and duration of public sector debt has not been offset by a shortening of the maturity or duration of private sector debt – in fact, quite the opposite. It is likely that this has affected – though probably not weakened – the transmission mechanism of monetary policy.
- Despite the potentially large cost that the ultimate holders of longevity risk might need to be compensated with, it is not at all clear that this reflects a market failure. There remains a rather weak case for government action in this area.
- Removing the ability of non-financial companies to deduct interest payments from the measure of profits on which they pay corporation tax might allow the rate of corporation tax to be cut from 30% to 20% with no net loss of revenue.

6.1 Introduction

This chapter begins by assessing the likely scale of gilt sales over the next few years and the likely demand from the Bank of England (Sections 6.2 and 6.3) and then considers how the Debt Management Office (DMO) might optimally choose what types of bond to issue (Section 6.4). We consider whether a significant change in the composition of bonds issued – including the possibility of issuing new types of instrument – might be sensible. The choice between shorter-dated and longer-dated debt, and between conventional debt and price-indexed debt, has an impact upon the way in which monetary policy affects the economy, and we consider the links between the evolution of the nature of public and private debt and the conduct of monetary policy (Section 6.5). We review the arguments for and against the DMO issuing longevity-indexed debt (Section 6.6). The stock of corporate debt is itself likely to reflect the tax treatment of debt and equity, and we consider how a change to the tax treatment of debt relative to equity might alter the balance sheets of the private sector (Section 6.7). Section 6.8 concludes.

6.2 The likely scale of debt issuance

Gross gilt issuance depends upon the central government net cash requirement (closely linked to public sector net borrowing) and the scale of redemptions. Based on the Treasury's December 2006 Pre-Budget Report (PBR) projections for borrowing and on the assumption that other factors (e.g. changes in the stock of Treasury bills) are neutral, gross and net gilt issuance would decline fairly significantly over the next few years as both public sector net borrowing and redemptions of outstanding government debt fall. On the PBR 2006 projections, gross gilt issuance rises again in 2010 as redemptions pick up, but net gilt issues level off at around £10 billion a year below recent levels.

Table 6.1 shows central estimates of the scale of public sector net borrowing under four scenarios:

- the DMO projections based on the Treasury's 2006 PBR forecast;
- the 'base case', which shows IFS's forecasts for borrowing if the economy evolves as the Treasury predicted in the 2006 PBR;
- IFS's forecast if the economy evolves according to the Morgan Stanley 'central case' (see Section 4.5);
- IFS's forecast if the economy evolves according to Morgan Stanley's 'pessimistic case' (see Section 4.5).

Table 6.1. Public sector net borrowing

£ billion	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
PBR	36.9	36.8	31.3	27.0	26.0	24.0	22.0
IFS base case	36.9	38.1	33.2	30.8	27.6	23.3	21.4
MS central case	36.9	37.9	34.3	30.9	26.4	21.1	16.7
MS pessimistic case	36.9	37.9	34.3	35.6	33.8	29.7	24.4

Sources: IFS; Morgan Stanley Research; HM Treasury.

Table 6.2 shows how the stock of debt relative to national income (GDP) might evolve in each case. Table 6.3 shows the DMO's illustrative projection of gilt issuance based on the Treasury's 2006 PBR forecasts. Table 6.4 compares these with the outlook for gilt issuance on the other three borrowing scenarios. Our three alternative scenarios show public sector net borrowing somewhat higher than the Treasury expects over the next three years, but then falling back towards (and ultimately dropping slightly below) the PBR projections. Assuming no offsetting changes elsewhere, the IFS base case and the Morgan Stanley central case imply gilt issuance between £2 and £4 billion a year higher than the DMO projections for most of the next three years. On the Morgan Stanley 'pessimistic case' scenario, borrowing is higher still and consistently remains above the PBR projections. If the alternative scenarios turned out to be accurate projections for the UK economy, and for the subsequent path of the public finances, the government might well change policy so that borrowing does not increase as much. This is more likely in the medium term than the short term. In particular, the £29.7 billion figure for public sector net borrowing for 2010–11 under the 'pessimistic'

Table 6.2. Public sector net debt

% of GDP	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
PBR	36.4	37.5	38.2	38.6	38.7	38.7	38.5
IFS base case	36.4	37.6	38.4	39.1	39.3	39.1	38.9
MS central case	36.4	37.3	38.8	39.2	39.3	39.1	38.5
MS pessimistic case	36.4	37.3	38.9	39.5	40.1	40.3	40.2

Sources: IFS; Morgan Stanley Research; HM Treasury.

Table 6.3. Gilt issuance: the DMO's illustrative projections based on Pre-Budget Report forecasts

£ billion	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Central government net cash requirement	41.2	35	31	33	29	32
Redemptions	29.9	29	17	16	30	27
Financing requirement	71.1	64	48	49	59	59
Other sources of financing	–8.6*	–2	–2	–2	–2	–2
Illustrative gross gilt sales	*62.5*	*62*	*46*	*47*	*57*	*57*

Notes: 2006–07 financing requirement and estimate of gross gilt sales are from the PBR. * includes proceeds from restructuring balance sheet of British Nuclear Fuels (BNFL) and sales of national savings net of the reduction in the stock of Treasury bills. Other projections assume national savings and investments run at £2 billion a year and that other factors (for example, changes in the public sector net cash position and changes in the stock of Treasury bills) have zero net impact.
Sources: Debt Management Office; Morgan Stanley Research.

Table 6.4. Outlook for gross gilt issuance

£ billion	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
DMO/PBR illustrative gilt sales	62.5	62.0	46.0	47.0	57.0	57.0
IFS base case	63.8	63.9	49.8	48.6	56.3	56.4
Morgan Stanley central case	63.5	65.0	49.9	47.4	54.1	51.7
Morgan Stanley pessimistic case	63.6	65.0	54.6	54.8	62.7	59.4

Note: The alternative projections in Table 6.4 to the DMO/PBR illustrations are not really forecasts of what gilt sales would be since they are based on an assumption of unchanged spending plans and tax rates.
Sources: IFS; Morgan Stanley Research; HM Treasury.

scenario for the economy is not a very likely outcome since the Chancellor would very likely have cut spending and/or increased taxes if things turned out that badly.

Over the past few years, it has been striking how the UK government's cost of borrowing (illustrated in Table 6.5) has been falling – in both nominal and real terms – even though the amount it has borrowed has been rising and has consistently exceeded its own forecasts. In

Table 6.5. Gilt issuance and gilt yields

	Gross (Net) issuance (£bn)	15-year nominal yield	15-year real yield
2001–02	14 (–5)	4.86%	2.37%
2002–03	26 (9)	4.71%	2.21%
2003–04	50 (29)	4.70%	2.04%
2004–05	50 (35)	4.57%	1.78%
2005–06	52 (38)	4.24%	1.44%
2006–07	63 (32)	4.41%	1.37%

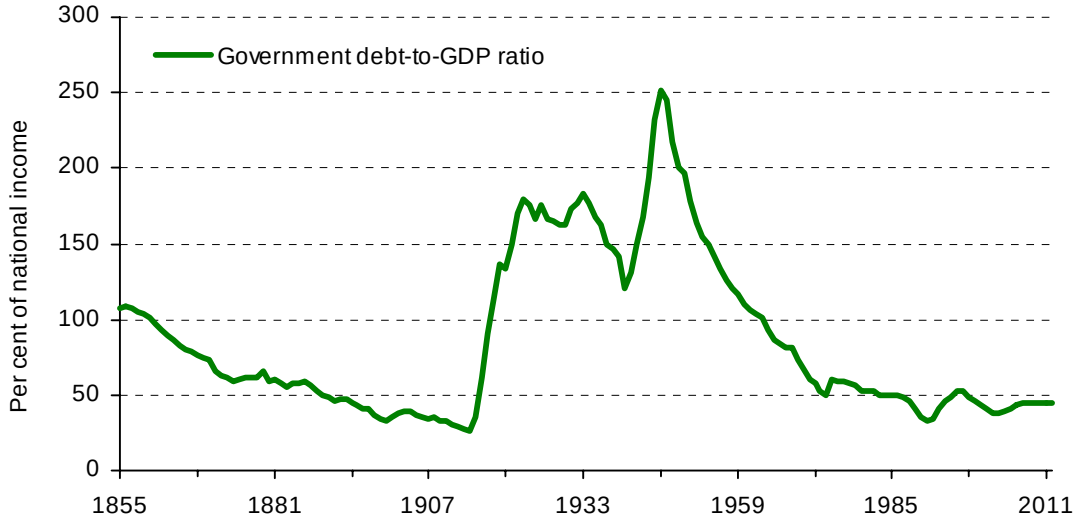
Notes: 15-year real and nominal yields are funding year averages of Bank of England estimated spot yields. 2006–07 estimates are calculated using spot yields up until 5 January 2007.
Sources: Bank of England; Debt Management Office.

the light of this, we should not expect a big impact on the cost of debt if the government needs to issue a few billion pounds more in gilts than its central forecasts in the next few years.

As discussed in Chapter 5, however, the Treasury expects the stock of debt to rise sufficiently over the next five years that a few years of borrowing £2–3 billion more than expected would probably be sufficient to take the net-debt-to-national-income ratio very close to the 40% limit – though it is only in the pessimistic scenario that we forecast net debt actually to exceed the 40% limit. Net debt being marginally above or below 40% of national income is in itself clearly not very significant from an economic point of view. So its impact upon gilt yields would be small, *unless* people came to see a breaching of the 40% limit as a signal that very substantially higher debt and deficits were now more likely in the future.

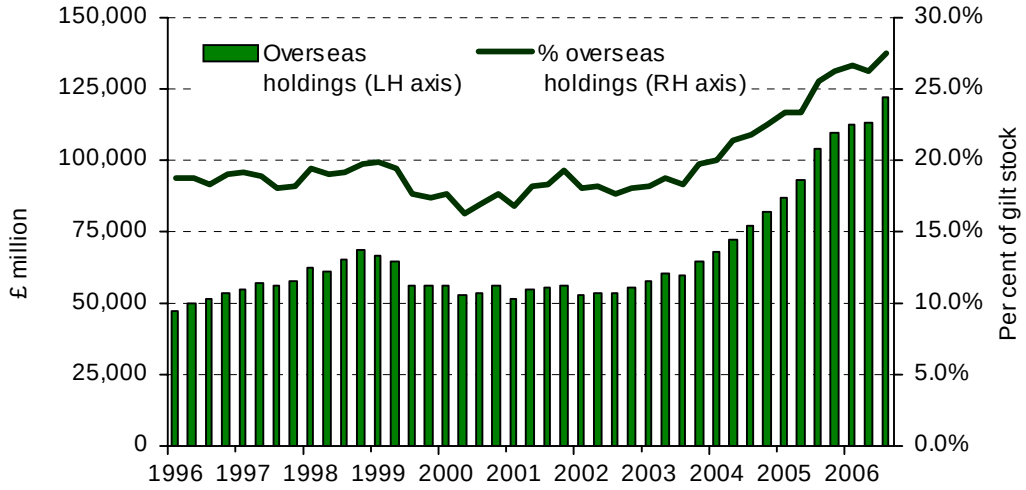
Even then it is a stretch to see that generating a significant sell-off in the market for government debt. UK government debt, given the size of the economy, is low relative to most other G7 economies and also to the UK's past history. Figure 6.1 shows an estimate of

Figure 6.1. National debt as a proportion of national income since 1855



Notes: Pre-1974 series is gross nominal liabilities of the National Loans Fund (formerly known as the national debt). 1974 onwards it is the general government gross debt.
Sources: HM Treasury, Office for National Statistics.

Figure 6.2. Overseas holdings of gilts



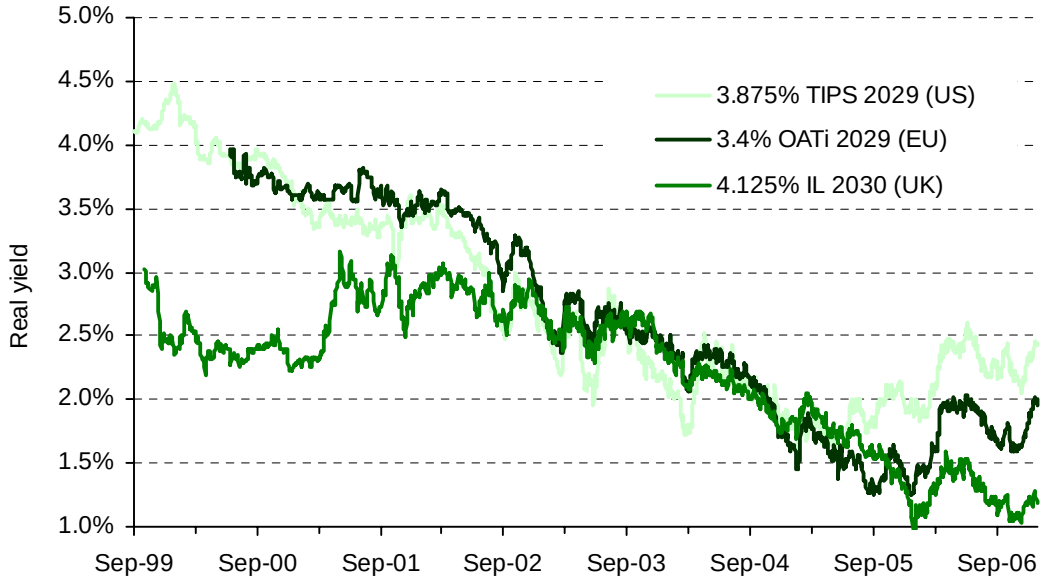
Source: Debt Management Office.

government debt relative to national income since the middle of the nineteenth century. Although rising, by the standards of the last 150 years debt is still not that far above the low point of 26% of national income reached on the eve of the First World War.

Furthermore, the cost of UK government borrowing is probably less influenced now by the scale of borrowing than it has been in the past. This reflects the increasing internationalisation of the bond market, evidence of which we can see in the increasing proportion of UK gilts that are now held overseas, as shown in Figure 6.2.

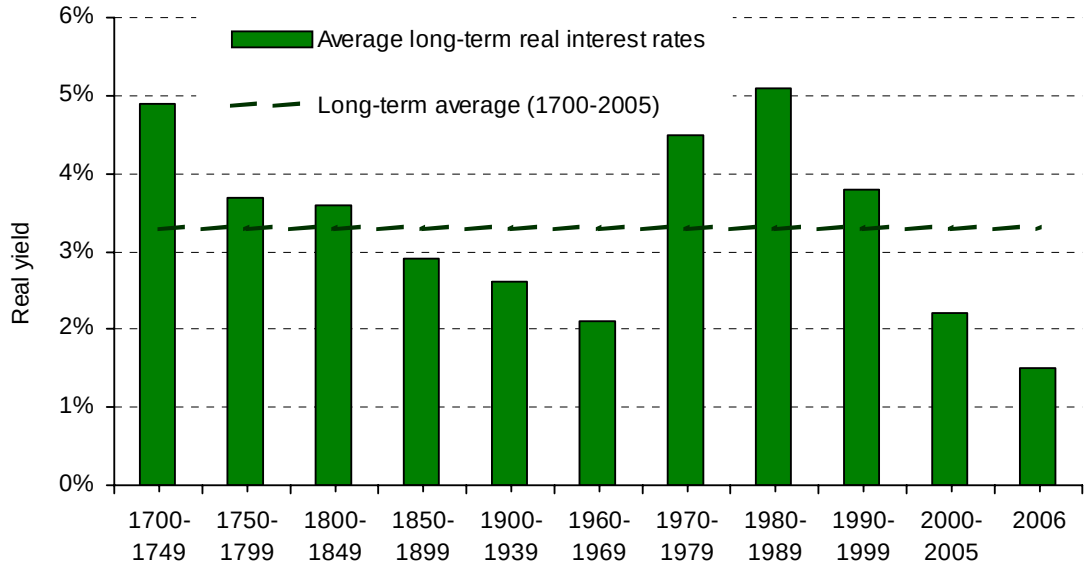
Another manifestation of this globalisation is the increasing tendency for the real cost of government debt for different developed countries to move together. Figure 6.3 shows that the fall in the real cost of government debt over the past six years has been similar in the US, the

Figure 6.3. International real yields on inflation-proof government bonds



Source: Bloomberg.

Figure 6.4. Long-term real interest rates on UK conventional debt



Notes: Nominal 2.5% consol rate less long-term inflation expectations. 1940–59 is omitted from the graph because rationing during this period made price data unreliable, leading to a negative real long-term interest rate.
Source: Morgan Stanley Research. Estimates of real yields are based on the nominal yield on consols net of a measure of expected inflation over the coming 10 years. For a detailed description of the method used to construct the real yields, see D. Miles, M. Baker and V. Pillonca, 'Where should long-term interest rates be today? A 300 year view', Morgan Stanley Research, March 2005.

Euro area and the UK. The synchronisation of movements in bond yields across the developed economies in the past few years has been exceptionally high.

Such has been the decline in the real cost of debt issued by the UK government that it is now able to issue debt at a real cost that is likely to be close to the lowest levels seen at any time in the past few hundred years (Figure 6.4).

The decline in real yields on sterling denominated debt issued by the UK government has in fact been somewhat more marked than for other countries. The yield curve on UK government bonds – the relation between the cost of debt and the maturity of that debt – is also more inverted in the UK than in other countries: in other words, relative to short-term interest rates, UK long-term interest rates are lower compared with other countries.

To an extent, this is likely to be a reflection of the importance of funded defined-benefit (DB) pension liabilities in the UK and gradual moves by UK pension funds to better match the interest rate (yield) sensitivity of their assets to that of their liabilities. This has plausibly generated a strong demand for long-dated gilts and an anticipation that it will continue. The scale of the mismatch between the interest rate sensitivity of assets held by DB pension funds and their (debt-like) liabilities remains very large. This means that the DMO is not likely to find it hard to sell a few billion more in gilts each year than it might now forecast – just as it has found little difficulty doing so over the past five years or so.

Any impact on gilt yields from an increase in supply arising from higher-than-expected government borrowing is likely to be small relative to the impact of the increase in demand likely to arise from the Bank of England's decision to start buying gilts outright to hold as assets against the issuance of bank notes.

6.3 Demand for gilts from the Bank of England

The Bank of England announced last year (jointly with the DMO)[1] that it would be an outright buyer of some £12 billion of gilts over the next three years, starting some time after September 2007. This is a consequence of reforms to the way the Bank operates in the money market. The Bank will use outright purchases of gilts (and foreign government bonds swapped into sterling) to provide longer-term finance to the banking system, partially replacing the liquidity currently provided via reverse repo operations (in which the Bank buys gilts from a bank with an agreement to sell them back to it later).

The bonds purchased outright by the Bank will be part of the portfolio of assets with which the Issue Department backs its banknotes. There are currently about £37 billion of banknotes in circulation, backed by £24 billion in reserve repo agreements and an advance of approximately £13 billion to the National Loans Fund. The Bank believes that, given the low volatility of the banknote issue, holding longer-term assets against a proportion of the banknotes in circulation would be a more structured approach to its asset/liability management.

Whilst this change will be significant for the gilts market as a whole, it will be neutral from the perspective of the Treasury, since the change in the composition of the Issue Department's balance sheet does not affect the size of the advance to the National Loans Fund or the value of gilts outstanding.

By switching to outright purchases from repos, the Bank will become an incremental buyer of gilts in the public market. The Bank intends to hold gilt tenders across the maturity spectrum from (initially) 3 to 20 years. The Bank intends to spread its buying to minimise the impact on gilt market liquidity. Each month (except December), the Bank will buy £400 million of gilts at tender. Relative to the size of the Treasury's expected new issuance in 2007–08, this amounts to some 7% of expected supply. But in relation to subsequent years (thanks to the fall in redemptions), Bank outright purchases are likely to amount to some 9–10% of new supply. In total over the coming three years, the Bank of England will buy about 4% of the stock of outstanding conventional gilts. This consistent buying has the potential to increase gilt prices and lower yields – and may to some extent have already done so – helping reduce the Treasury's financing cost at the margin.

The strategy of buying and holding gilts largely replaces the current practice of rolling forward repurchase agreements (that is, effectively making a series of collateralised loans). The difference between the Bank accepting gilts as collateral for reverse repos and buying outright (across the maturity spectrum, especially at the long end) is that the latter withdraws duration exposure (reducing the stock of debt whose value is sensitive to shifts in yields on longer-dated debt) from other market participants whereas the former leaves the duration exposure of the underlying collateral with the Bank's counterparties. Thus the prospective change in the Bank's open market operations will result in a withdrawal of duration from other market participants (that is, a fall in the stock of debt held in the private sector whose values are sensitive to shifts in the level of yields on longer-dated gilts).

[1] http://www.dmo.gov.uk/documentview.aspx?docName=/gilts/press/sa150506.pdf.

Is this something that should influence the DMO's issuance policy? Given the strength of demand for duration from pension funds evident in the very low level of long-term interest rates relative to short-term interest rates, the DMO may consider that the gradual withdrawal of duration that will happen as the Bank accumulates gilts to be undesirable. However, the withdrawal of duration available to other market participants caused by the Bank's outright purchases will be relatively small. Because the Bank will be purchasing gilts across the maturity spectrum from 3 to 20 years, we calculate that the effect over the first three years will be to reduce total duration available to other market participants by about 2¾%. This is the equivalent of removing about £4.75 billion of new 30-year bonds – just over two typically-sized 30-year auctions.

The DMO could therefore, if it decided to, create duration to substitute for what the Bank is going to remove by adding two or three more long auctions to its calendar over the next three years. To do so, it would have to increase the size of its gilt issuance and allow the size of the (short-dated) T-bill market to fall by about £4.75 billion over three years.

In principle, a reduction in the value of outstanding T-bills should not present an obstacle to increasing gilt issuance at the expense of bill issuance, at least as far as the Bank's repo operations are concerned, given the range of collateral available to the Bank's counterparties. (There are no data available on the composition of the collateral currently accepted in the Bank's repo operations.)

Alternatively, the DMO could adjust the composition of its issuance over the next three years, providing more long-dated bonds rather than short-dated bonds, and thereby reinstate the duration being absorbed by the Bank's outright purchases. This would not be a departure for the DMO, which has responded to pension fund demand in recent years by issuing a growing proportion of long-dated gilts.

If the DMO does decide to create duration to substitute for what will be removed by the Bank's purchases, it will have little difficulty in doing so – as long as strong demand for long-dated gilts persists. Whether that is the right strategy is part of the more general question of the optimal structure of government debt. We turn to this issue in the next section.

6.4 Optimal debt management

Debt management involves choosing the types of bonds to issue – longer or short dated, denominated in sterling or other currencies, with fixed nominal values or values that depend upon unknown future events (e.g. the level of consumer prices). The Debt Management Office (DMO) describes the operation of debt management thus:

> The UK Government borrows funds to finance the excess of cash payments over receipts, to pay interest on outstanding debt and to refinance maturing debt. The Government issues debt instruments in order to raise the cash it wishes to borrow. Currently, government debt instruments are issued with maturities ranging from one month (for T-bills) to 50 years (for gilts), and with interest payments (on gilts) that are

either fixed in nominal terms (conventional gilts) or linked to inflation (index-linked gilts).[2]

Here we consider how the stock of debt should be managed – what sort of bonds should be issued? We start with an overview of what the funding strategy has been to date and how the composition of the outstanding debt has evolved. We then look at what recent DMO modelling of different debt issuance strategies suggests about the best way to fund deficits.

The recent history of debt issuance and the structure of debt

In recent years, the government has issued about 25% of its new gilts in index-linked (inflation-proof) form whilst around 75% has been conventional (fixed, nominal value) debt. Most index-linked debt is relatively long term, with maturities of new indexed gilts generally being 20 years or more; since 2005, some indexed gilts have original maturities as long as 50 years. There has been a recent increase in the proportion of conventional debt that has long maturity – that is, an original maturity at issue of 15 years or more (Table 6.6).

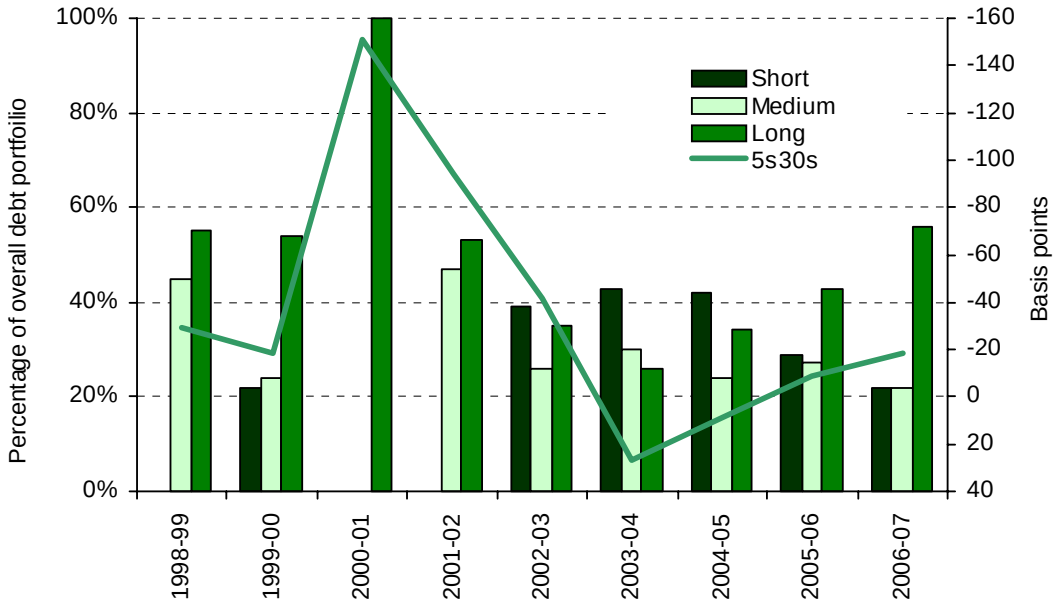
Table 6.6. Breakdown of gilt issuance by maturity and type

%	Conventional					Other		
	0–3 years	3–7 years	7–15 years	15+ years	**Total**	Floating	Undated	Index-linked
1990–91	17.7	22.4	33.1	8.0	**81.1**	0.0	2.6	16.2
1991–92	17.7	25.0	28.3	10.7	**81.6**	0.0	2.4	16.0
1992–93	13.1	25.5	27.6	14.7	**80.9**	0.0	2.0	17.1
1993–94	11.2	24.8	30.4	15.0	**81.4**	0.0	1.5	17.1
1994–95	14.9	19.8	29.3	15.3	**79.4**	2.2	1.4	17.0
1995–96	16.2	20.1	27.4	15.1	**78.9**	2.2	1.2	17.8
1996–97	16.0	21.0	25.2	15.9	**78.1**	3.0	1.1	17.8
1997–98	15.3	20.0	25.4	15.5	**76.2**	2.9	1.1	19.8
1998–99	16.2	21.6	24.0	14.7	**76.5**	1.0	1.1	21.4
1999–00	17.1	22.0	19.5	16.5	**75.1**	1.0	1.1	22.7
2000–01	16.9	22.0	16.1	17.4	**72.5**	1.1	1.1	25.3
2001–02	17.9	18.8	17.0	19.5	**73.2**	0.0	1.2	25.6
2002–03	16.2	19.4	17.7	19.0	**72.2**	0.0	1.1	26.7
2003–04	15.9	18.4	18.6	21.0	**73.9**	0.0	1.0	25.1
2004–05	20.3	16.9	14.1	23.0	**74.3**	0.0	0.8	24.8
2005–06	19.0	13.8	15.4	25.2	**73.5**	0.0	0.7	25.8
2006–07	15.7	13.1	18.2	23.7	**70.7**	0.0	0.6	28.7

Notes: Floating-rate gilts have coupons set in line with short-term interest rates. The redemption of undated gilts is at the discretion of the government.
Source: Debt Management Office.

[2] DMO, *Annual Review 2005–06*, August 2006 (http://www.dmo.gov.uk/index.aspx?page=publications/Annual_Reviews).

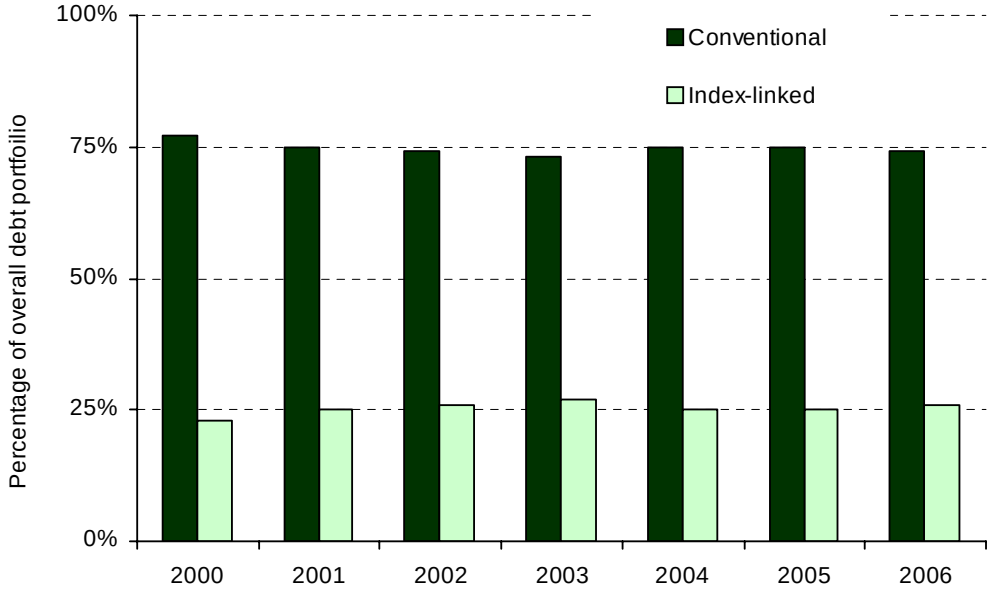
Figure 6.5. Conventional gilt sales according to maturity type



Note: 5s30s (right axis) is defined as the spread on a typical 5- and 30-year government bond.
Source: Debt Management Office.

The strategy of issuing about one-quarter of debt in price-indexed form has been fairly consistent for several years. As a result, the proportion of the outstanding stock of debt that is price indexed (or real) has been fairly steady and also settled down at around 25% (Figure 6.6).

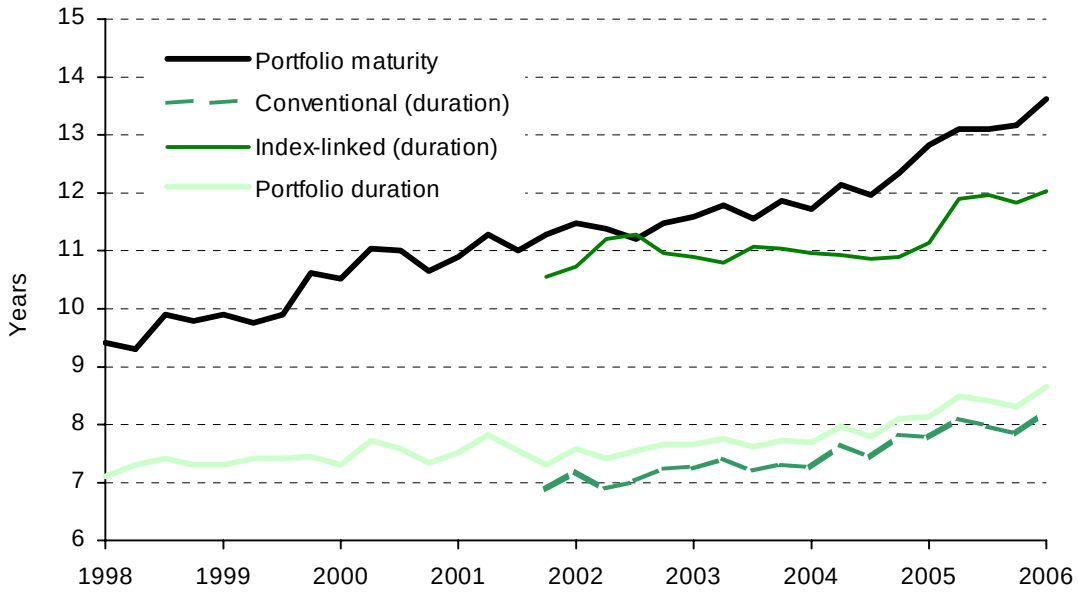
Figure 6.6. Composition of stock of UK government debt



Note: Measures based on nominal (uplifted) par amounts outstanding at end March.
Source: Debt Management Office.

But within the stock of both real and nominal debt, the average maturities of new issues have lengthened. Figure 6.7 shows that the average maturity of the outstanding stock of government debt has increased from about 9½ years a decade ago to about 13½ years today. A more relevant measure of the length of government debt is its duration, which takes account of the fact that interest (coupon) payments on gilts are generally paid every six months so that the maturity of the debt (the date until the final payment is made) overstates the period for which money is effectively lent.[3] Duration has also increased substantially over the past decade – from around 7 years to about 8½ years. The strategy of lengthening the maturity and duration of debt has occurred over a period when long yields have consistently been below shorter yields. The data shown in Figure 6.5 suggest there may have been a link between the degree of inversion of the yield curve and the amount of long issuance.

Figure 6.7. Gilt portfolio maturity and duration

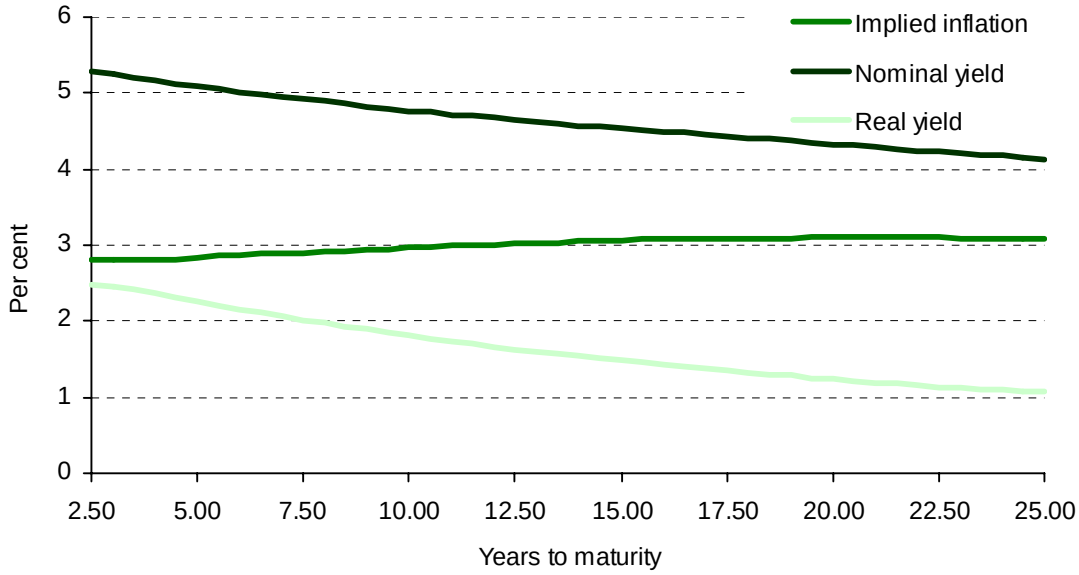


Source: Debt Management Office.

This strategy of lengthening the maturity and duration of debt has seemed intuitively sensible, given the level of yields on longer-dated debt relative to the yields on shorter-dated debt. Figure 6.8 shows what those yields looked like in early 2007. It reveals a pattern that has been typical in the UK for several years: yields on longer-dated bonds are substantially lower than yields on shorter-dated bonds, and to an extent which is unlikely to reflect a belief that short-term interest rates are likely to fall steadily over many years – indeed, the expectation in the market in early 2007 was that the Bank of England was likely to further increase short-term interest rates. The inversion of the yield curve is common to both conventional and real debt, and in both cases it has existed for some years.

[3] Duration also measures the sensitivity of the price of a bond to a change in its yield.

Figure 6.8. Average spot yield curves on 18 January 2007



Source: Bank of England.

Modelling the cost of government debt

Several questions are prompted by this pattern of yields and by the gilt issuance strategy that the DMO has followed. Is the intuitively sensible policy of issuing more long-dated debt in an environment of inverted yield curves actually optimal once we account for risk? Has it gone far enough? Given the exceptionally low level of yields on real debt, is the strategy of only issuing about 25% of bonds in indexed form actually too conservative?

To answer these questions, we need to model what drives yields over time and how those factors affect the balance between tax revenue and spending. Many of the factors that influence bond yields and the levels of government spending and tax revenues are volatile and uncertain, so any model that can tell us something about the mix of bonds that will optimally balance cost and risk considerations has to take account of random (or stochastic) factors. Recently, the DMO has developed a stochastic model to address the issues.

The model takes account (in a stylised way) of important common drivers of yields, output, inflation and government deficits. In the model, there are a set of random factors that affect inflation, output and the fiscal position and also affect prices of bonds of different maturities. The model can be used to simulate what the cost to the government of servicing the national debt would be under different gilt issuance strategies (which in each case are consistently followed over a long horizon). By averaging the cost of servicing government debt over many different paths for the realisations of shocks (that is, taking the ratio of debt interest to national income along many possible future histories), we can get an estimate of the average cost implications of different strategies. But risk may also matter, so the volatility of the cost of servicing debt is also relevant. The remit given to the DMO by government reflects the importance to government of both the average cost and the volatility of the cost of its debt. The remit is that the DMO should seek to '… minimise over the long term, the costs of

meeting the Government's financing needs, taking into account risk, whilst ensuring that debt management policy is consistent with the aims of monetary policy'.[4]

The DMO states that:

> The debt management policy objective is achieved by:
>
> - pursuing an issuance policy that is open, transparent and predictable;
> - issuing benchmark gilts that achieve a benchmark premium;
> - adjusting the maturity and nature of the Government's debt portfolio, primarily by means of the maturity and composition of debt issuance and potentially by other market operations including switch auctions, conversion offers and buy-backs;
> - developing a liquid and efficient gilt market; and
> - offering cost-effective savings instruments to the retail sector through National Savings & Investments (NS&I).[5]

The stylised model developed by the DMO does not take account of some of these wider aims of debt management (for example, developing and preserving liquidity of gilts), but it nonetheless gets to the heart of the most important elements of an issuance policy by focusing on the average cost and risk implications of different strategies.

Table 6.7 summarises four strategies for gilt issuance which differ in the proportions of conventional debt issued (index-linked issuance is set to zero here) according to maturity. Table 6.8 shows the results of using the stochastic model developed by the DMO to generate paths for the cost of servicing the stock of debt under each of these strategies. It is assumed here that the yield curve slopes gently downwards, so that it is typically inverted (though to an extent that is probably less than seen in the UK in recent years).

Table 6.7. Composition of nominal issuance strategies

	1-year nominal bond	5-year nominal bond	10-year nominal bond	30-year nominal bond
Strategy 1	17.5%	17.5%	30.0%	35.0%
Strategy 2		35.0%	30.0%	35.0%
Strategy 3			50.0%	50.0%
Strategy 4				100.0%

Source: Debt Management Office.

Table 6.8 shows that if we assume that on average there is a slightly inverted yield curve, not surprisingly a strategy of just issuing long-dated conventional bonds (strategy 4) wins on average cost grounds. Much less obviously, however, the results suggest that such a strategy is also better on risk grounds, as the standard error and the 95th percentile are both very slightly lower than in the other three strategies considered. So a strategy of issuing only long-

[4] DMO, *Annual Review 2005–06*, August 2006 (http://www.dmo.gov.uk/index.aspx?page=publications/Annual_Reviews).

[5] DMO, ibid.

Table 6.8. Simulation results for nominal issuance strategies

	Strategy 1	Strategy 2	Strategy 3	Strategy 4
Debt cost/GDP at t=500				
Mean	1.41	1.43	1.41	1.39
Standard deviation	0.20	0.20	0.20	0.19
95th percentile	1.75	1.76	1.74	1.72
Debt cost/GDP over the interval t=400 to t=500				
Mean mean	1.42	1.43	1.41	1.39
Mean standard deviation	0.20	0.20	0.20	0.19
Mean 95th percentile	1.73	1.77	1.74	1.71

Note: Figures are quarterly, annualised and expressed in percentage points.
Source: Debt Management Office.

dated bonds generates a lower average cost of funding but that does not come at the cost of greater volatility.

If we were to assume a typically flat or upward-sloping yield curve, this dominance of the strategy of issuing only long bonds on both cost and risk grounds would no longer hold. But conditional on a typically inverted yield curve, the result is clearly in favour of having a very high proportion of conventional debt being long dated. Taken at face value, Table 6.8 would suggest it is optimal to issue *only* very long-dated gilts. Indeed, the assumptions made in the DMO stochastic modelling that generate the results in Table 6.8 actually imply a typical degree of inversion of the yield curve that is somewhat lower than we have seen over the past 10 years,[6] such that these results may understate the cost and risk advantages of long-dated conventional debt over shorter-maturity debt.

Introducing indexed real debt

It is not straightforward to show the impact of issuing indexed debt in the DMO stochastic framework. This is because we need to allocate the cost of the inflation uplift on the outstanding principal over time – which can either be done at the maturity of the bond or smoothly over the life of the gilt (on an accrued basis). For comparison with earlier tables, and given the criterion used in DMO modelling, we believe it makes sense to do this on an accrued basis, the justification being that the government could effectively generate cash-flow servicing costs that match the accruals path by buying back a part of the outstanding stock of indexed gilts as inflation varies.

Tables 6.9 and 6.10 show the results of introducing long-dated indexed gilts when we measure the cost of servicing debt on an accruals basis. The DMO results show that on cost grounds a strategy of just using long-dated index-linked gilts (strategy 8) is best. On risk grounds a strategy of only issuing long-dated conventional debt remains best (strategy 4). Once again, this set of results is based on the assumption of a continuation of a mildly inverted yield curve.

[6] Table 11 of DMO, *Annual Review 2005–06*, August 2006 (http://www.dmo.gov.uk/index.aspx?page=publications/Annual_Reviews).

Table 6.9. Composition of further issuance strategies

	1-year nominal bond	5-year nominal bond	10-year nominal bond	30-year indexed bond
Strategy 5	17.5%	17.5%	30.0%	35.0%
Strategy 6		35.0%	30.0%	35.0%
Strategy 7			50.0%	50.0%
Strategy 8				100.0%

Source: Debt Management Office.

Table 6.10. Simulation results for further issuance strategies with shares of inflation-linked bonds (with accrued compensation on principal)

	Strategy 5	Strategy 6	Strategy 7	Strategy 8
Debt cost/GDP at t=500				
Mean	1.42	1.42	1.41	1.38
Standard deviation	0.21	0.21	0.21	0.27
95th percentile	1.80	1.77	1.79	1.83
Debt cost/GDP over the interval t=400 to t=500				
Mean mean	1.41	1.42	1.41	1.39
Mean standard deviation	0.21	0.21	0.22	0.28
Mean 95th percentile	1.78	1.77	1.78	1.85

Note: Figures are quarterly, annualised and expressed in percentage points.
Source: Debt Management Office.

In interpreting these results, it obviously matters how much the government cares about risk relative to average cost. It is clear why a government should care about the average cost of debt. It is less clear why it should really care about risk as measured by the standard deviation of the ratio of the debt servicing cost to GDP, or by the cost in unusually bad cases. There would be a cost to having tax rates move sharply from one year to the next; but the volatility of debt servicing costs need not be costly, so long as shocks to those costs are not permanent and the government has the scope to let deficits rise and fall in response to temporary fluctuations in them. Because of this, we believe there is a case for attaching far more weight to the results on the average cost of different debt management strategies than to the results on the volatility of those costs. The DMO puts a rather different emphasis on its results:

> … consideration of the Government's risk preferences is also important when determining the issuance programme. Other things being equal, the Government would like to have a prudent debt portfolio structure such that in the event of adverse shocks to the government finances, the debt portfolio should not exacerbate further the strains on the Government's resources, but should help to mitigate some of those strains. In other words, the Government's debt portfolio should be structured so as to possess adequate fiscal-smoothing properties. The implication of taking into account the Government's risk preferences, as well as the other factors previously discussed, when determining its debt strategy is that the Government naturally has a proclivity to choose issuance strategies and a debt portfolio structure which are diversified both in terms of their maturity structure for nominal gilts and their composition in terms of the proportion of the various debt instruments, which in the present environment means the split between nominal and inflation-linked gilts. Such a well-diversified

> issuance and portfolio structure provide a prudent risk mitigation approach to debt management as, to the extent that different debt instruments have different risk and cost characteristics, they therefore help to insure the Government in the face of a variety of shocks to its finances. Hence, the preferred issuance strategies suggested by the simulation illustrations will need to be modified in practice.[7]

But even if one attaches weight to the risk profile of debt servicing costs, the DMO modelling provides strong reasons to favour a strategy involving greater issuance of long conventional and long indexed debt. If one believes that the inversion of yield curves is likely to be a persistent feature, there is not much reason to issue short-dated conventional debt. A sensible strategy might be overwhelmingly to issue long-dated conventional and indexed debt until the yield curve inversion ends.

There are, however, potentially important factors not reflected in the DMO stochastic model – it attaches no weight to the value of preserving liquidity (and thus avoiding volatility) across the yield curve and that might make issuing more short-dated bonds sensible (though it is not obvious that it would do so). But such factors really need to be quantified and modelled consistently. In the absence of that, increasingly moving duration and maturity higher is sensible, as is increasing the share of index-linked debt.

If that strategy is followed, it would of course affect the duration of the stock of overall debt in the UK – though it could be offset by the changing nature of household and corporate debt. In fact, the duration of such private debt has probably been going up along with that of government debt. We document and discuss the implications of this in the next section.

6.5 The impact of changing debt stock composition

The duration and maturity of the stock of government debt has been lengthening. We argued in the previous section that it makes sense for this process to continue. If it does, it will further insulate the cost of debt servicing from temporary movements in short-term interest rates. If this were to happen within the private sector as well, it would affect the impact monetary policy has on the economy. In this section, we examine whether there has been a change in the fixity of debt issued by companies and households and then consider the implications of shifts in the overall duration of debt issued by UK households, companies and the government.

Figure 6.9 shows how the stock of debt issued by UK non-financial companies has evolved since 1990. We also break this down into corporate loans and corporate bonds (which are overwhelmingly fixed rate). Total corporate debt and the stock of corporate bonds have both risen relative to national income.

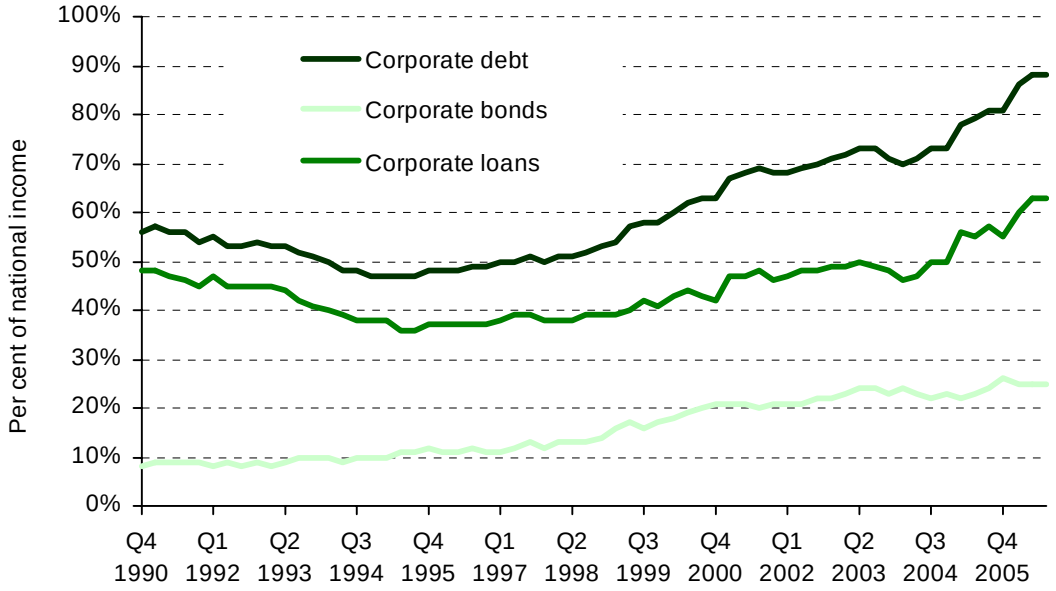
Since the early 1990s, the stock of fixed-rate corporate debt has likely risen relative to the stock of variable-rate debt – Figure 6.10 shows that in recent years the stock of corporate bonds makes up a larger share of overall company debt (and loans make up a lower share) than was the case at the start of the 1990s. That share may now be falling, but it is nonetheless

[7] DMO, *Annual Review 2005–06*, August 2006 (http://www.dmo.gov.uk/index.aspx?page=publications/Annual_Reviews).

plausible that the duration of corporate debt is now longer than it was at a time when companies relied more on bank loans and less on issuing debt securities.

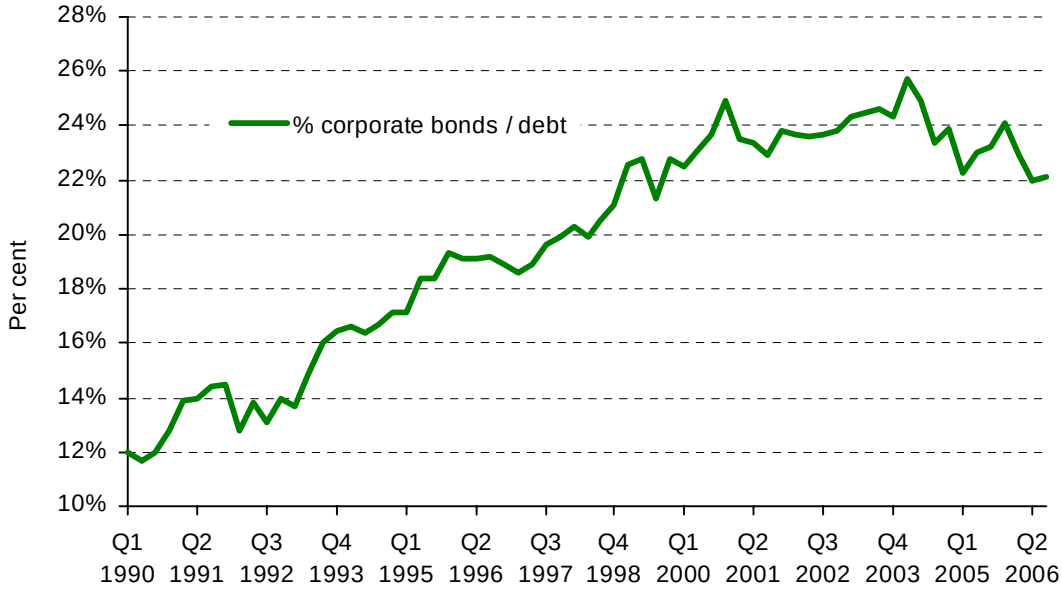
There has also been some tendency for household debt to become more fixed, along with a very sharp rise in overall household debt relative to national income. Figure 6.11 shows that household debt – by far the largest part of which is mortgage debt – has risen much faster than national income since 2000.

Figure 6.9. Corporate debt as a proportion of domestic production



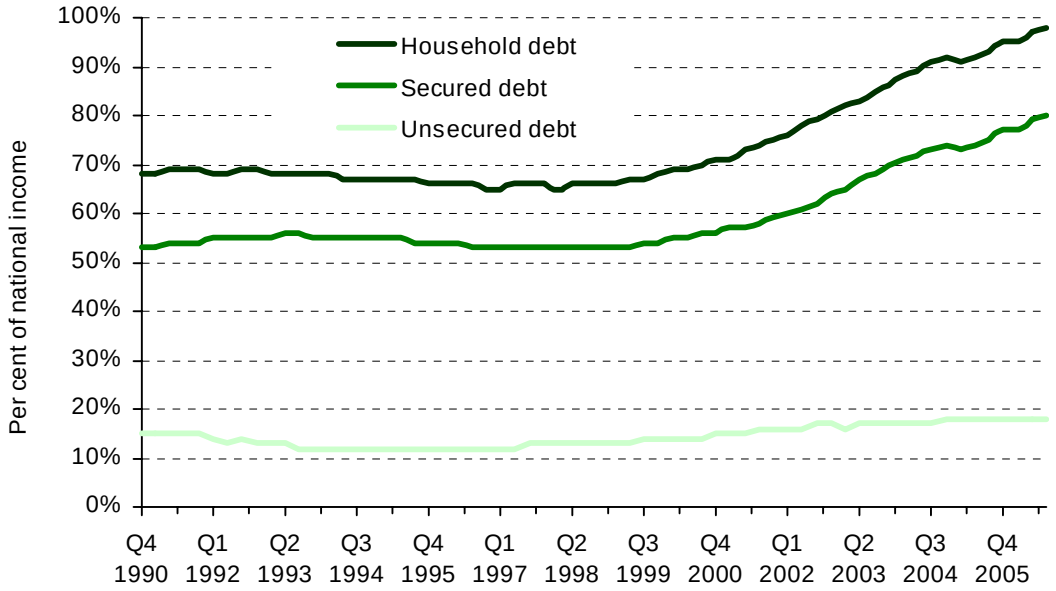
Source: Office for National Statistics.

Figure 6.10. Bonds issued as a proportion of non-financial institutions' debt



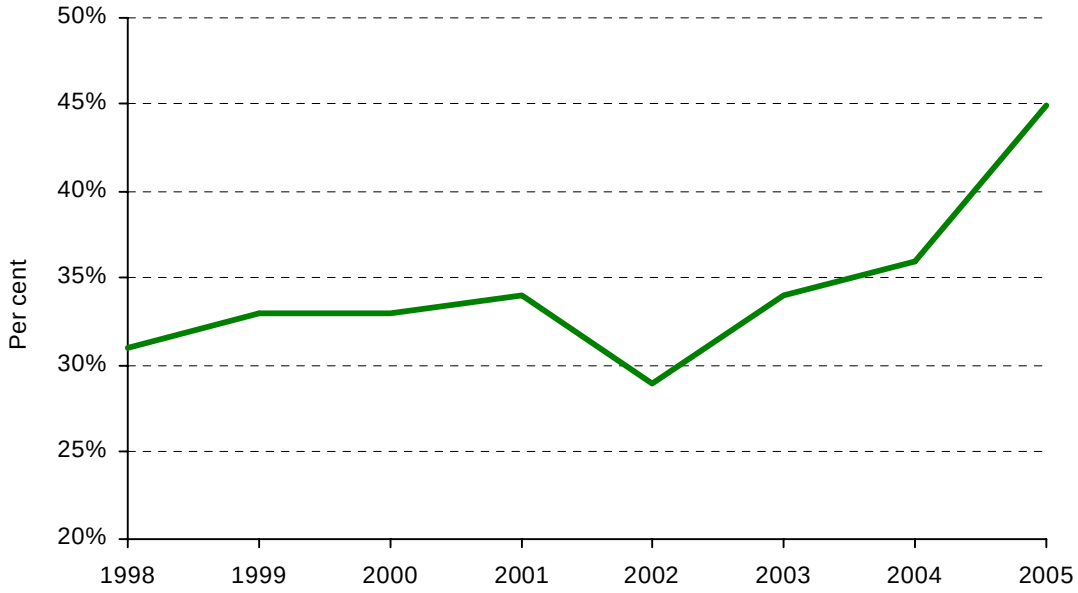
Source: Office for National Statistics.

Figure 6.11. Breakdown of household debt



Source: Office for National Statistics.

Figure 6.12. Value of fixed-rate mortgages as proportion of all mortgages



Note: Includes the stock of both capped and fixed-rate mortgages.
Source: CACI Mortgage Market Database.

Within mortgage debt, there has been an increase in fixed-rate debt. Figure 6.12 shows that in the late 1990s, about one-third of mortgage debt was at fixed rates; by the middle of 2006, that proportion was around 45%. Little of this debt is at rates of interest fixed for more than five years; nonetheless, the duration is likely to have risen.

In the light of these trends, it is clear that the lengthening maturity and duration of public sector debt has not been offset by a shortening of the duration of private sector debt – in fact, quite the opposite. This has probably affected – although not necessarily weakened – the

transmission mechanism of monetary policy. Since the degree of fixity of the interest rates on debt issued by UK households, companies and government has risen on average, it is likely that monetary policy works proportionately more nowadays through the impact that changes in shorter-term interest rates have on longer-term interest rates.

But it is not clear that there has been an absolute reduction in the effectiveness of monetary policy. In part this is because the sensitivity of longer-term interest rates to shorter-term rates – or more generally to monetary policy actions (including words, i.e. Bank of England statements, reports and speeches) – is significant. But even if we ignore this channel, it is still the case that the absolute amount of variable-rate debt, relative to national income, has almost certainly risen. Figure 6.9 shows that corporate loans have risen significantly relative to national income, albeit at a slower pace since 1990 than the stock of corporate bonds. Figure 6.11 shows that the overall stock of household debt has risen so much relative to national income that it is likely that the variable part of it has also been increasing relative to the size of the economy.

We conclude that the rising maturity and duration of debt – increasing fixity of interest rates – has probably not reduced the effectiveness of monetary policy. It is plausible that this lengthening of maturity and duration will continue, driven in part by strong demand for long-dated debt to match pension liabilities that are debt-like and which have a duration that itself is lengthened by rising life expectancy. On the supply side, rising life expectancy – which should bring with it longer working lives – also makes longer-maturity debt desirable for households who are able to service the debt out of their earnings for longer.

6.6 Longevity and new types of debt instruments

One reason that the duration of debt can be expected to rise is that increasing life expectancy is likely to lengthen working lives and so lengthen the horizons over which those with debt can repay. Increasing life expectancy is also likely to lengthen the periods over which those with obligations to pay pensions have to make payments, and because of that it raises the duration of the debt assets they want to hold against those obligations.

But the scale of the increase in life expectancy is highly uncertain. UK companies face significant longevity risk because of the size of their defined-benefit pension obligations. An explicit market in hedging longevity risk through the trading of financial instruments whose values are linked to movements in longevity has been very slow to develop. Partly as a result, there have been calls for the government to help such a market develop by issuing 'longevity bonds' with values linked to life expectancy.[8]

We have argued in the past that there is no compelling case for the government to issue such debt – largely because it already has massive exposure to unexpectedly fast rises in life expectancy from its commitments to pay state and public sector pensions and from its role in heath and social care.[9] The DMO – having consulted on the issue in 2005 – has made it clear

[8] See, for example, the article by David Cule, principal at Punter Southall, 'How to deal with ever-improving mortality', *Financial Times*, 8 January 2007.

[9] See chapter 6 of R. Chote, C. Emmerson, R. Harrison and D. Miles (eds), *The IFS Green Budget: January 2006*, IFS Commentary 100 (http://www.ifs.org.uk/budgets/gb2006/index.php).

that it has no plans to do so.[10] But have developments over the last year meant that those assessments should be revised?

During 2006, the government has adopted the recommendation of the Pensions Commission to increase the age at which state pensions are normally received from 65 to 66 between 2024 and 2026, from 66 to 67 between 2034 and 2036 and from 67 to 68 between 2044 and 2046.[11] To the extent that such changes become linked to movements in life expectancy, the exposure of the public sector to changes in life expectancy is reduced and so its scope to issue longevity bonds might seem to have risen. But the very long time lag between announcements of changes to the state pension age and actual implementation means that the scale of exposure to changes in life expectancy – which can be very large in relatively short periods – remains huge.

One recent development rather weakens the case for government issuing longevity bonds. There has been a substantial increase in the number of life assurance companies willing to take on longevity risk by buying pension obligations from other companies. There is still a question as to whether the scale of the longevity risk held by non-financial companies is so large that the entrance of new players in the market to buy corporate pension obligations can make much difference. Even if much of the risk does come to sit with life insurance companies, the question remains as to whether that is the most efficient place for it to reside.

The scale of the exposure to shifts in life expectancy held in the corporate sector can be measured in various ways. The most obvious is to look at the value of defined-benefit (DB) pension liabilities – a number recently estimated to be around £700 billion.[12] The Purple Book, a joint publication of the Pensions Regulator and the Pension Protection Fund, contained an estimate that each year added to longevity assumptions adds between 3% and 4% to pension scheme liabilities, raising aggregate deficits by an amount likely to be £20 billion or more.

Given that realised longevity arises gradually over time (as opposed to assumptions about future longevity, which can change sharply in a short period), how much should DB schemes be prepared to pay to hedge against their long-term longevity risk? The regulatory capital required to be put against longevity risk held by financial firms should be some guide as to the cost of longevity exposure. Under life insurance regulations (PS04-16), there is no so-called Pillar I capital requirement related to longevity risk. Any longevity capital charge would arise only under so-called Pillar II, which is the internal capital assessment (ICA) and is not public information. We estimate, however, that for annuity companies, capital held against longevity risks might amount to about 6–7% of annuity reserves. According to FSA returns, annuity reserves among the major market participants amount to more than £160 billion. This would put the longevity capital charge in the region of £10–11 billion.

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[10] DMO, *Issuance of Ultra-Long Gilt Instruments: Consultation Document*, December 2004 (http://www.dmo.gov.uk/documentview.aspx?docname=publications/giltsmarket/consultationpapers/cons021204.pdf&page=Gilts/Consultation); DMO, *Issuance of Ultra-Long Gilt Instruments: Response to Consultation*, April 2005 (http://www.dmo.gov.uk/documentview.aspx?docname=publications/giltsmarket/consultationpapers/cons160305.pdf&page=Gilts/Consultation).

[11] Department for Work and Pensions, *Security in Retirement: Towards a New Pensions System*, May 2006 (http://www.dwp.gov.uk/pensionsreform/whitepaper.asp).

[12] *The Purple Book: DB Pensions Universe Risk Profile*, December 2006 (http://www.thepensionsregulator.gov.uk/pdf/PurpleBook.pdf).

The liabilities of DB pension schemes – which are in many ways analogous to the annuity exposures of life insurance companies – are around £700–800 billion (on an FRS17 basis). If we applied a capital charge of 6–7% against that, it would mean that extra capital held to handle the risk would amount to £45–55 billion. If the real cost of equity capital is about 7% (a plausible figure and one close to the typical earnings yield on large UK companies), the annual cost of that capital would amount to around £3–4 billion. But the value of pension liabilities might well be some 30% or more higher based on a buyout measure (that is, the amount a life insurance company might need to take on the liabilities), in which case the annual capital charge might be nearer £4–£5 billion.

This is a rough-and-ready calculation and there is great uncertainty about what the true cost to those who hold longevity risk is. But it is clearly not a small amount. The issue is whether it could be reduced and risk handled more effectively if government played a role in helping that risk be more effectively hedged. Risk that sits with life insurance companies and with large quoted companies is actually fairly well spread because they are widely owned by a diverse group of end investors. So despite the potentially large cost that the ultimate holders of longevity risk might need to be compensated with, it is not at all clear that this constitutes a market failure. There remains a rather weak case for government action in this area.

6.7 Tax deductibility of corporate interest payments

Fiscal and debt management policy can change the structure of assets and liabilities in the private sector through varying the type and quantity of government debt issued – we have considered various aspects of this in earlier sections. Another way in which government policy affects the structure of private sector balance sheets is through differential treatment of different financing instruments by the tax system. One change that has at various times been advocated is removing the tax advantage to corporate debt financing that comes from allowing interest payments to be deducted from gross operating surpluses before corporation tax is levied.[13] Companies in the UK, and indeed in nearly all developed economies, can deduct debt interest payments from gross operating surpluses in calculating taxable incomes. But it is not at all clear what the rationale for that is.

Companies are not able to deduct dividend payments on equities from their profits in calculating taxable income and there is no clear case for favouring debt financing over equity financing.[14] While capital gains on equities are, for many shareholders (at least individual shareholders), rather favourably treated relative to the taxation of interest received – and are in that sense an offset to the advantage that corporate debt financing otherwise enjoys – it is the expected flow of dividends received that ultimately generates the value of equities. Since the changes in the tax system introduced in the March 1998 Budget, which saw the end of the imputation system and an effective increase in the rate of tax on dividends, the tax advantage

[13] One reason for considering this is that the ability of the UK government to levy extra taxes on income re-patriated to the UK from overseas subsidiaries is threatened by rulings by the European Court of Justice. The issues involved, and the link between this and interest tax deductibility, are explored in Chapter 10.

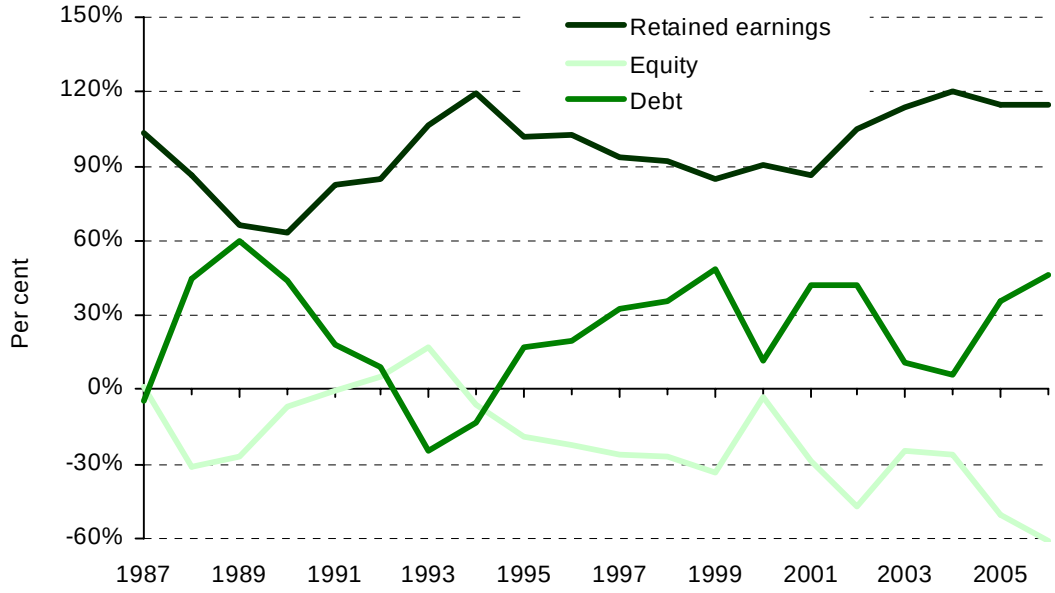
[14] For a thorough and recent review of the case for withdrawing tax deductibility of corporate interest payments, see M. Devereux, S. Mokkas, J. Pennock and P. Wharrad, *Interest Rate Deductibility for UK Corporation Tax*, 2006 (http://www.sbs.ox.ac.uk/Tax/publications/reports/reports.htm).

to companies distributing operating incomes in the form of interest on debt – rather than dividends on equity – has become even clearer. This change was made, paradoxically, at the same time as the last vestiges of tax privileges for household borrowing (the tax deductibility of some part of mortgage interest payments against income tax) were removed.[15]

Removing interest tax deductibility in itself would generate substantially more tax revenue. Such a policy could hardly be applied to financial institutions – most clearly in the case of banks for which debt liabilities are largely offset by debt assets. So it is likely that if a policy of levelling the tax playing field between debt and equity were to be applied, financial institutions would either need to be exempted or else the rules structured so as to reflect their unusual position.

A revenue-neutral way of implementing a change would be to offset the removal of interest deductibility for non-financial companies with a cut in the corporate tax rate. In 2006–07, non-financial corporations in the UK will have paid around £64 billion in interest. They will pay corporation tax of around £40 billion. The corporate tax rate (for all but small companies) is 30%. If we apply that 30% rate to all taxable corporate income (ignoring lower rates for companies earning small levels of profit), we would get an estimate of the flow of taxable profit of about £133 billion. If we add interest paid (about £64 billion) to that, we would get taxable profits of just under £200 billon. This means that the tax rate on this larger flow of taxable income could come down from 30% to around 20% and still generate tax receipts of £40 billion. (It should be noted that some tax experts argue that it is very hard to estimate accurately the revenue implications of removing interest deductibility. See Chapter 10.)

Figure 6.13. Composition of capital expenditure financing by non-financial companies



Source: Office for National Statistics.

[15] Several reductions in the mortgage relief rate culminated with the phasing out of MIRAS (or Mortgage Interest Relief at Source) programme in April 2000.

What might be the implications of a cut to 20% in the rate of corporate tax and a removal of deductibility of interest payments (all applied to non-financial companies)? To get some idea of them, it is helpful to look at the existing way in which companies finance their operations. Figure 6.13 shows the proportion of capital investment that has been financed from retained earnings (operating surplus after interest paid, tax and dividends), from issuing new equity and from issuing debt. The proportion of corporate spending financed from equity issues and from debt can be, and very frequently has been, negative as share repurchases can exceed new share issues, and repayment of existing debt can exceed new loans raised from banks and from new issues of corporate bonds. Companies find it harder to pay dividends in excess of post-tax equity profits, so retained earnings (or gross corporate saving) are rarely negative.

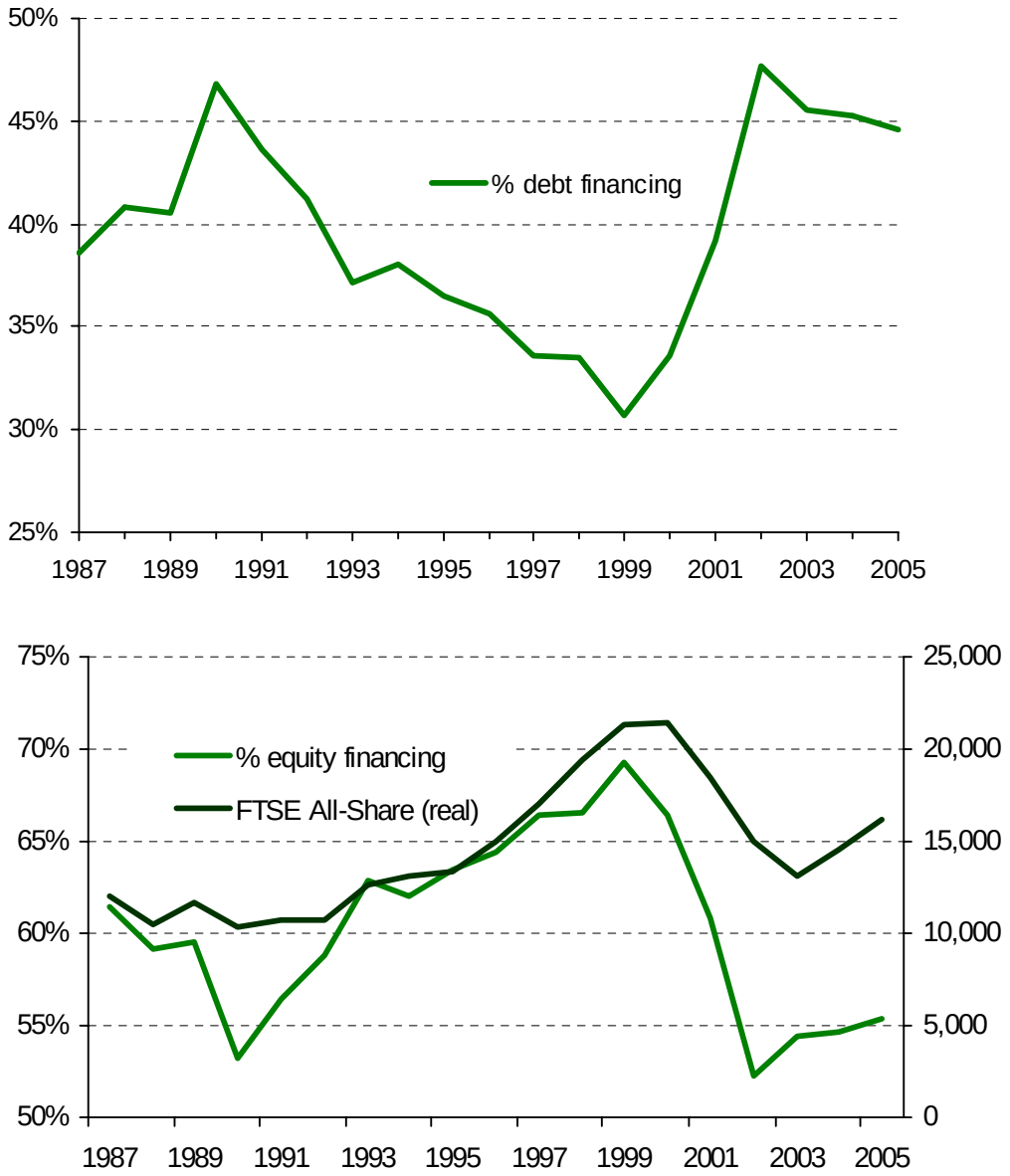
Figure 6.13 reveals that over the past 20 years, *on average*, new issues of equities and debt have hardly contributed to the aggregate financing of corporate investment. Share buybacks have more than offset new share issues. Debt issues have exceeded debt repayments in most recent years, though the share of corporate spending financed out of debt has only averaged around 20–30%. Retained earnings – a form of equity financing – have consistently financed by far the largest part of corporate spending. That might make it seem that any adverse consequences upon corporate spending from removing a tax advantage to debt might be small.

But looking at the *flows* of *net* debt (which is appropriate in looking at the overall contribution to financing investment) does not tell one much about the importance of the *stock* of corporate debt in the economy. That is better measured by gross corporate gearing – the ratio of gross debt to the sum of gross debt plus equity. Figure 6.14 shows that this ratio has fluctuated a good deal over the past 20 years, driven to a significant extent by movements in the value of equities. Aggregate gearing for UK non-financial companies is now just under 45%.

It is not easy to know how much smaller the existing stock of corporate debt might become if the tax advantage of corporate debt were removed. The growth of household debt since the final removal of tax deductibility of mortgage payments has been huge – but households have no opportunity to raise finances through equity and the effect of tax deductibility had already dwindled to a small level before it was finally removed in 2000. One interesting feature of Figure 6.14 is that the aggregate debt-to-equity ratio has fluctuated around a level of 40% over a relatively long period, during which time the relative tax advantage of debt over equity issues and retained profits has fluctuated greatly. The sharp movements in gearing have been driven more by changes in equity prices than by conscious decisions to retire equity and issue lots more debt. The lower panel of Figure 6.14 shows how close is the link between the equity share of total balance sheets (1 – debt gearing) and stock prices. So, whatever the impact of tax advantages on financing techniques, it is not likely to be the overwhelmingly powerful factor.

It is likely, however, that reliance on bank lending and upon debt issuance would be lower without interest tax deductibility – potentially so much so that corporates would embark on a strategy of buying back bonds and repaying loans on a substantial scale. Would that be a problem? Might it further reduce the cost of government debt?

Figure 6.14. Gearing of non-financial companies



Note: Debt (Equity) gearing is defined as the ratio of debt (equity) to the sum of debt and the market value of equity.
Sources: Office for National Statistics; Morgan Stanley Research.

We offer the following thoughts:

- We noted above the common trends in the real yields on bonds issued by governments (in different currencies) across the world and the increasing internationalisation of holdings of gilts. That suggests that the knock-on impact of any change in the supply of corporate debt from UK companies on the cost of government debt might be limited.
- There would be winners and losers: companies that have had small amounts of debt will find the benefit from lower corporation tax more than offsets the cost of losing tax deductibility; firms that have had unusually high gearing would be net losers.
- At a time when companies are looking to better match their portfolios of assets held within DB pension plans against liabilities whose values are calculated by reference to the

yield on an AA sterling corporate bond, a move that plausibly reduces the stock of such debt is hardly helpful.

The second and third points make this potential reform of the system of corporation tax problematic. So while we expect the issue to generate continuing debate, it is unlikely to be implemented by any government for some time.

6.8 Conclusions

The UK government is able to borrow at exceptionally low interest rates. Nominal and real interest rates on longer-dated government bonds are low relative to the rates that are demanded by investors buying long-maturity debt issued by the US government or long-dated, euro denominated bonds issued by European governments. This position has existed for some years. Whether it will persist is hard to judge, though the structure of bond prices implies that investors believe that it will. The government should continue its strategy of lengthening the maturity and duration of its debt. Taking advantage of low yields on longer-dated bonds does not harm investors; it merely provides more of the type of bonds that market prices suggest are most highly valued.

7. Challenges for public spending

Carl Emmerson, Christine Frayne and Gemma Tetlow (IFS)

Summary

- The 2007 Comprehensive Spending Review looks set to be a very 'Challenging Spending Review'. The projections set out in the December 2006 Pre-Budget Report would, if implemented, reduce public spending by 0.5% of national income over the three years to be covered by the review – £7 billion in today's terms.
- These projections may prove incompatible with two key government aspirations: to improve public services and reduce poverty in the UK and overseas.
- Meeting the 2010–11 child poverty target would probably cost at least an extra £4½ billion. Finding this within the PBR spending projections would require difficult choices over other areas of spending. Even if spending in areas such as defence and environmental protection were frozen in real terms, the government would still have to allocate the NHS less than the minimum recommended by the 2002 Wanless Review or cut education spending as a share of national income.
- The most plausible scenario may be one where the Chancellor announces tight initial 2007 CSR settlements in the hope of topping them up at a later stage, as he has done with past reviews. Decisions to increase tax credits to meet the child poverty target could also be deferred to later Budgets and Pre-Budget Reports.
- Unless revenues or spending come in more favourably than expected, the Chancellor might have to choose between fresh tax increases or downplaying the child poverty target. Keeping spending constant as a share of national income in the CSR would require an extra £7 billion a year in today's terms by 2010–11.

7.1 Introduction

This year's Comprehensive Spending Review (CSR) will set out departmental spending plans for the three financial years beginning in April 2008. They will indicate the spending priorities on which Gordon Brown intends to fight the next general election if he succeeds Tony Blair as Prime Minister.

The 2007 CSR could well be dubbed a 'Challenging Spending Review'. As we discussed in Chapter 2, under current revenue forecasts the Treasury's fiscal projections require public spending to fall as a share of national income in order to meet its borrowing projections and therefore be able to expect to comply with both its fiscal rules with the degree of comfort that Mr Brown deems appropriate. This is in contrast to each of the four spending reviews under Labour to date, which have all planned (and, at least to date, delivered) increases in public spending as a share of national income. As we describe in this chapter, reducing public spending as a share of national income would require difficult choices in the 2007 CSR, and

might prove incompatible with the government's aspirations to improve the quality of public services and reduce poverty both in the UK and overseas.

Section 7.2 compares the growth in overall spending implied by the plans set out in the December 2006 Pre-Budget Report with what has happened since Labour came to power in May 1997 and with what has happened over the longer term. We then describe recent trends in spending on health and education, and contrast these to the trends seen over the longer term. Section 7.3 presents the trade-off that the government is likely to face between spending on health, education, transfer payments and other areas of public spending if the projections for overall spending set out in the December 2006 Pre-Budget Report are adhered to. We also describe how the trade-off would change were the Chancellor instead to preserve public spending as a share of national income at its projected 2007–08 level. Section 7.4 compares the latest Treasury estimates of the impact of changing demographics on longer-term public spending pressures with both previous UK estimates and those for other EU countries. Section 7.5 concludes.

7.2 Trends in UK public spending

Total spending since 1948–49

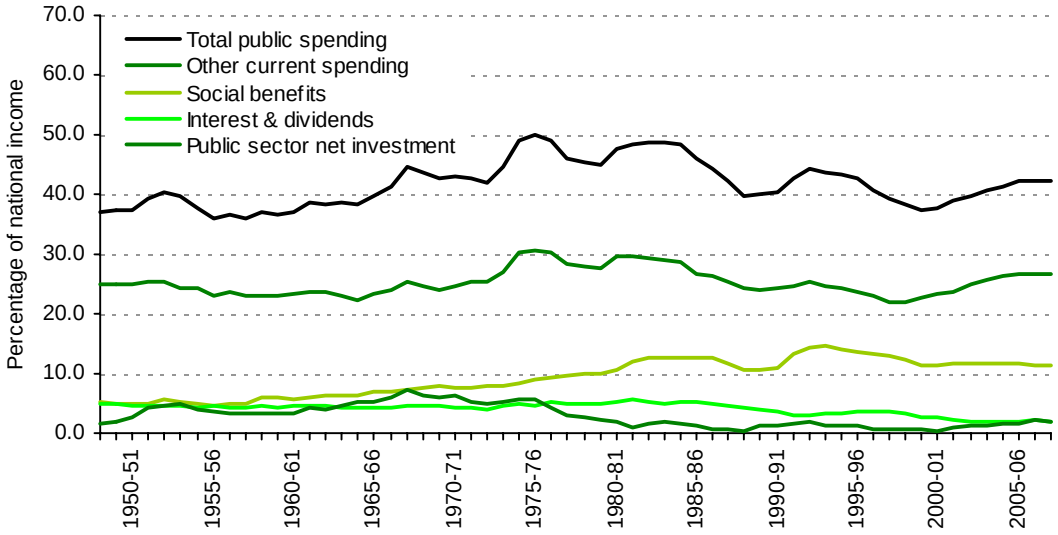
The Treasury predicts that total managed expenditure (TME), the broadest measure of government expenditure, will be £554.6 billion in 2006–07. This equates to 42.5% of national income or just over £9,150 for every person in the UK.

Figure 7.1 shows how public spending as a share of national income has varied since 1948–49. Total spending climbed from 37.1% of national income in 1948–49 to a peak of 50.1% in 1975–76. Particularly large growth occurred in spending on health, education and contributory benefits such as the basic state pension. Conversely, defence spending fell sharply from 9.7% of national income at the end of the Korean War in 1953 to 4.9% of national income in 1975.[1] Between 1975–76 and 1998–99, public spending fell as a share of national income, due initially to cuts in public sector net investment[2] and then to cuts in current spending on public services (including education). Public spending fell particularly sharply during the late 1980s and late 1990s as a strong economy reduced expenditure on social benefits and debt interest payments. Conversely, the early 1990s saw public expenditure increase as weak economic performance pushed up these expenditures. Figure 7.1 shows that public spending has risen again as a share of national income since April 1999. We now describe trends in spending under the current Labour government in more detail.

[1] For more details, see section 3 of T. Clark and A. Dilnot, *Long-Term Trends in British Taxation and Spending*, IFS Briefing Note 25, 2002 (http://www.ifs.org.uk/bns/bn25.pdf).

[2] For more information about public sector investment, see T. Clark, M. Elsby and S. Love, 'Trends in British public investment', *Fiscal Studies*, 23, 305–42, 2002 (http://www.ifs.org.uk/publications.php?publication_id=2127).

Figure 7.1. Public spending since 1948–49



Notes: Projections are from the December 2006 Pre-Budget Report. Current expenditure includes depreciation.
Sources: Measures of public spending are ONS series ANLO, ANLT, ANLY, ANNW and ANNZ from table 2.3C of *Financial Statistics Freestanding Time Series Data*. GDP is ONS series BKTL from table A2 of *United Kingdom Economic Accounts* (http://www.statistics.gov.uk/statbase/tsdtimezone.asp). HM Treasury, *Pre-Budget Report 2006*, London, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

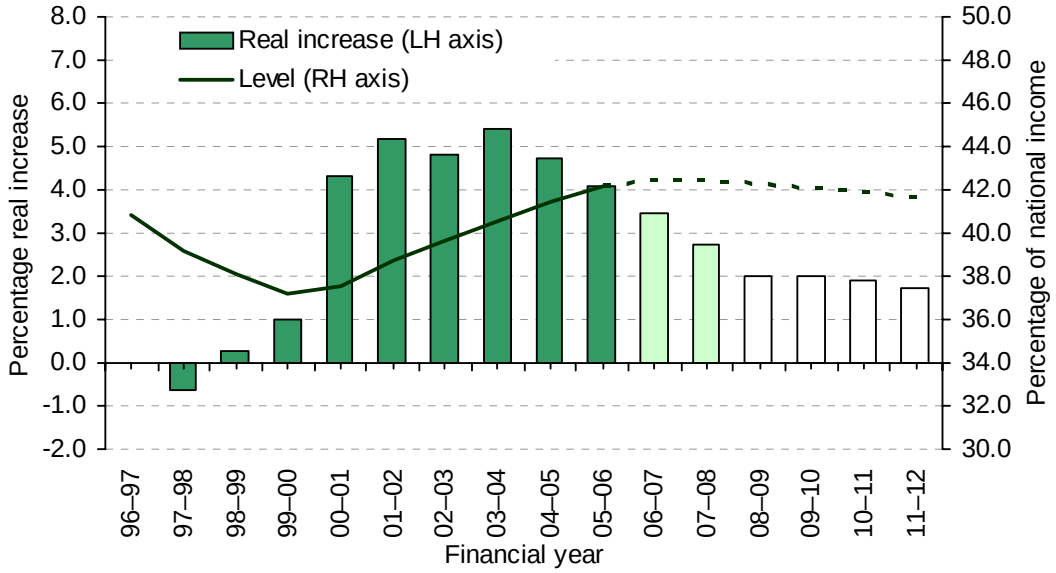
Growth in public spending under Labour

In 1996–97 – the last full financial year before Labour came to power – total public spending stood at 40.8% of national income. As the solid line in Figure 7.2 shows, this fell to 37.1% of national income in 1999–2000. This decline reflected a combination of strong economic performance and low growth in spending on public services. In July 1998, the government presented the results for the first Comprehensive Spending Review, which set out departmental spending plans for 1999–2000, 2000–01 and 2001–02. Despite 1999–2000 being the first year under the 1998 CSR plans, expenditure fell rather than rose as a share of national income due to some government departments spending less than their allocations. Public spending has since increased, reaching 42.2% of national income in 2005–06, which is due to increases in spending on public services (in particular, education and health) and large increases in the generosity of targeted support aimed at lower-income families with children and lower-income pensioners. The subsequent Spending Reviews of July 2000, 2002 and 2004 revised previous plans and set out departmental spending plans until 2007–08.

The bars in Figure 7.2 (and the left-hand axis) show the annual real[3] increase in spending. Relatively large real increases in spending were seen in each year from 2000–01 to 2005–06. Lower growth in public spending projected for 2006–07 and 2007–08 (the last two years covered by the 2004 Spending Review) means that public spending as a share of national

[3] Throughout this chapter, we refer to changes in 'real' spending, by which we mean spending calculated by deflating spending with growth in the GDP deflator. While this might not be the appropriate deflator for the increase in the cost of goods and services purchased by public spending, it could be considered the most appropriate deflator when considering the cost to the taxpayer.

Figure 7.2. Total managed expenditure



Sources: Total managed expenditure from table B1 of HM Treasury, *Public Sector Finances Databank*, London, December 2006 (http://www.hm-treasury.gov.uk/media/A5B/FD/pfd_dec06.xls) and table B8 of HM Treasury, *Pre-Budget Report*, London, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm). GDP and GDP deflators up-to-date as of 21 December 2006 from HM Treasury website (http://www.hm-treasury.gov.uk/economic_data_and_tools/gdp_deflators/data_gdp_fig.cfm).

income is expected to grow to 42.5% of national income in 2006–07 and remain at this peak in 2007–08.

Public spending in the years 2008–09, 2009–10 and 2010–11 is to be set in this year's CSR. However, the December 2006 Pre-Budget Report contains provisional plans that imply a further slowing in the growth of public spending: Mr Brown has pencilled in real increases of just 2.0% a year on average for the years 2008–09 to 2010–11. While these are provisional plans, any upward deviation from them would reduce the ability of the Chancellor to meet his fiscal rules with the comfort he is looking for without a commensurate increase in tax revenues. If the spending plans were implemented, these would be the lowest increases in public spending since 1999–2000. As shown by the dotted line, they would involve public spending declining to 41.9% of national income in 2010–11. This 0.5% of national income cut in public spending is equivalent to £7 billion in 2006–07 terms.

The projected level of spending in 2010–11 would be higher than that inherited by Labour when they came to power (40.8% of national income), but lower than the average seen during either John Major's premiership (42.9% of national income) or Margaret Thatcher's (44.9% of national income). The Treasury has also pencilled in a further decline in public spending as a share of national income in 2011–12. If delivered, it would bring public spending down to 41.7% of national income (with the 0.8% of national income reduction in public spending between 2007–08 and 2011–12 equal to £10 billion in 2006–07 terms). It would also be consistent with David Cameron's aspiration to share 'the fruits of economic growth between lower taxes and strengthened public services' since public spending would be growing in real terms but declining as a share of national income. However, while Mr Brown's public

Table 7.1. Comparison of Labour's Spending Reviews to date

Average annual growth in real public spending over:	Original spending plans	Adjusted for subsequent inflation	Eventual out-turn / Latest forecast
Inherited Conservative spending plans			
April 1997 to March 1999	+1.0[a]	+0.3[a]	–0.2
Comprehensive Spending Review, July 1998			
April 1999 to March 2002	+2.7	+3.3	+3.5
Spending Review, July 2000			
April 2001 to March 2004	+3.2	+2.9	+5.1
Spending Review, July 2002			
April 2003 to March 2006	+4.3	+4.3	+4.7
Spending Review, July 2004			
April 2005 to March 2008	+3.2	+3.4	+3.4
Comprehensive Spending Review, 2007			
April 2008 to March 2011	+2.0?		

[a] Original plans, and plans adjusted for inflation, from April 1997 to March 1999 refer to GGE(X) rather than TME.
Sources: Eventual inflation and latest spending estimates as Figure 7.2. Figures for each spending review from HM Treasury, *Financial Statement and Budget Report November 1996*, TSO, London, 1996; HM Treasury, *1998 Comprehensive Spending Review*, Cm. 4011, London, July 1998; HM Treasury, *2000 Spending Review*, Cm. 4807, London, July 2000; HM Treasury, *2002 Spending Review*, Cm. 5570, London, July 2002; HM Treasury, *2004 Spending Review*, Cm. 6237, London, July 2004. All documents available from http://www.hm-treasury.gov.uk/spending_review/spend_csr07/spend_csr07_index.cfm or http://archive.treasury.gov.uk/siteindex.html.

spending plans from 2007–08 onwards would, if adhered to, comply with Mr Cameron's proposed third fiscal rule, the Chancellor has rejected such a rule on the basis that it could restrict his options for public spending.[4]

Were the 2007 CSR actually to stick with real total public spending growth of 2.0% a year on average, this would also be less generous than the plans announced in any of Labour's previous four Spending Reviews. Table 7.1 compares the relative generosity of each of these reviews. The first column shows the average real spending growth over the three years of the review implied by the Treasury's original cash plans. The second column shows the real growth that would have resulted if these cash plans had been kept to, bearing in mind that in three of the four periods inflation differed from the rates assumed by the Treasury when the plans were drawn up. Inflation in 1999–2000 and 2000–01 was lower than had been expected at the time of the July 1998 Comprehensive Spending Review, giving scope for a bigger real increase from given cash plans. Conversely, inflation in 2002–03 and 2003–04 was higher than expected at the time of the July 2000 Spending Review, reducing the real generosity of the cash plans. The third column shows the actual average growth in real spending over each of the spending review periods. These figures are essentially the same as those presented in

[4] See, for example, his March 2006 Budget speech: 'I have also received representations that we should adopt a third fiscal rule, that over the economic cycle and regardless of the needs of the economy, infrastructure and services – public spending and investment must, as a matter of principle, always rise slower than growth. Having analysed this proposal against our published plans I have found it would require in the coming year public spending £17 billion lower and £16 billion lower the year after, closing off the possibility of additional investment. I have rejected these representations'. Source: http://www.hm-treasury.gov.uk/budget/budget_06/bud_bud06_speech.cfm.

Figure 7.2 – but note that the spending review periods overlap and therefore some years are double-counted. It is clear that if Mr Brown's assumption of 2.0% a year real growth in public spending for the 2007 CSR is retained, then this will be a lower rate of increase than that planned, delivered or set to be delivered over any of the four previous Labour spending reviews.

Average growth in real TME is shown over different periods of interest (prior to and including Labour's term in office) in Table 7.2. Between Labour coming to power in May 1997 and the end of the current spending review period (March 2008), total public spending is forecast to grow by an average of 3.2% a year in real terms. This is higher than the growth of 1.5% a year over the 18-year period of Conservative Governments from 1979 to 1997 and the growth of 2.5% a year over the longer-term period prior to new Labour taking office. Also highlighted in Table 7.2 is the contrast between the growth in public spending seen during Labour's first two years in office and the period covered by Labour's spending reviews to March 2008 (when spending has grown in real terms).

Table 7.2. Trends in total spending

Period	Current	Capital	Total	*GDP growth*
Labour				
2007 CSR: April 2008 to March 2011	+1.9?	+2.7	+2.0?	*+2.4*
Plans to date: April 1997 to March 2008	+2.9	+13.9	+3.2	*+2.8*
First two years: April 1997 to March 1999	–0.3	+6.7	–0.2	*+3.2*
Spending reviews: April 1999 to March 2008	+3.6	+15.6	+4.0	*+2.7*
Conservatives				
April 1979 to March 1997	+1.7	–4.9	+1.5	*+2.1*
Long-term trend (pre new Labour)				
April 1964 to March 1997	+2.9	–3.4	+2.5	+2.3

Notes: Figures are for average annual growth. Capital spending refers to public sector net investment. Current spending includes depreciation.
Sources: As Figures 7.1 and 7.2.

Table 7.2 also shows the breakdown between growth in current and capital spending. On average over the period from April 1997 to March 2008, Labour is set to increase capital spending by 13.9% a year, though from a very low base, and current spending by 2.9% a year.

The capital spending plans for the 2007 CSR were announced by Mr Brown in his December 2006 Pre-Budget Report statement.[5] These imply capital spending continuing to grow as a share of national income (2.7% a year compared with expected growth in the economy of 2.4% a year), albeit at a much slower rate than over the period from April 1999 to March 2008. While overall spending plans have not yet been set for the 2007 CSR, the plans contained in the December 2006 Pre-Budget Report, when combined with the capital spending figures that have now been announced, imply that current spending would grow by

[5] While the December 2006 Pre-Budget Report documentation does not seem to state that the investment figures have been confirmed, Mr Brown's speech to parliament said 'And I can announce the spending review for the years to 2011 will be based on planned capital investment rising from £39 billion last year to £60 billion in 2011–12. Let me give details of the investment we will make over the five years ahead: next year £48 billion, rising in 2008 to £51, then £54, £57 and £60 billion'. Source: http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_speech.cfm.

1.9% a year on average in real terms over the three-year period from April 2008 to March 2011. This compares with growth of 2.9% a year over the period from April 1997 to March 2008, which is also the average growth in current expenditure seen over the longer term prior to Labour coming to power.

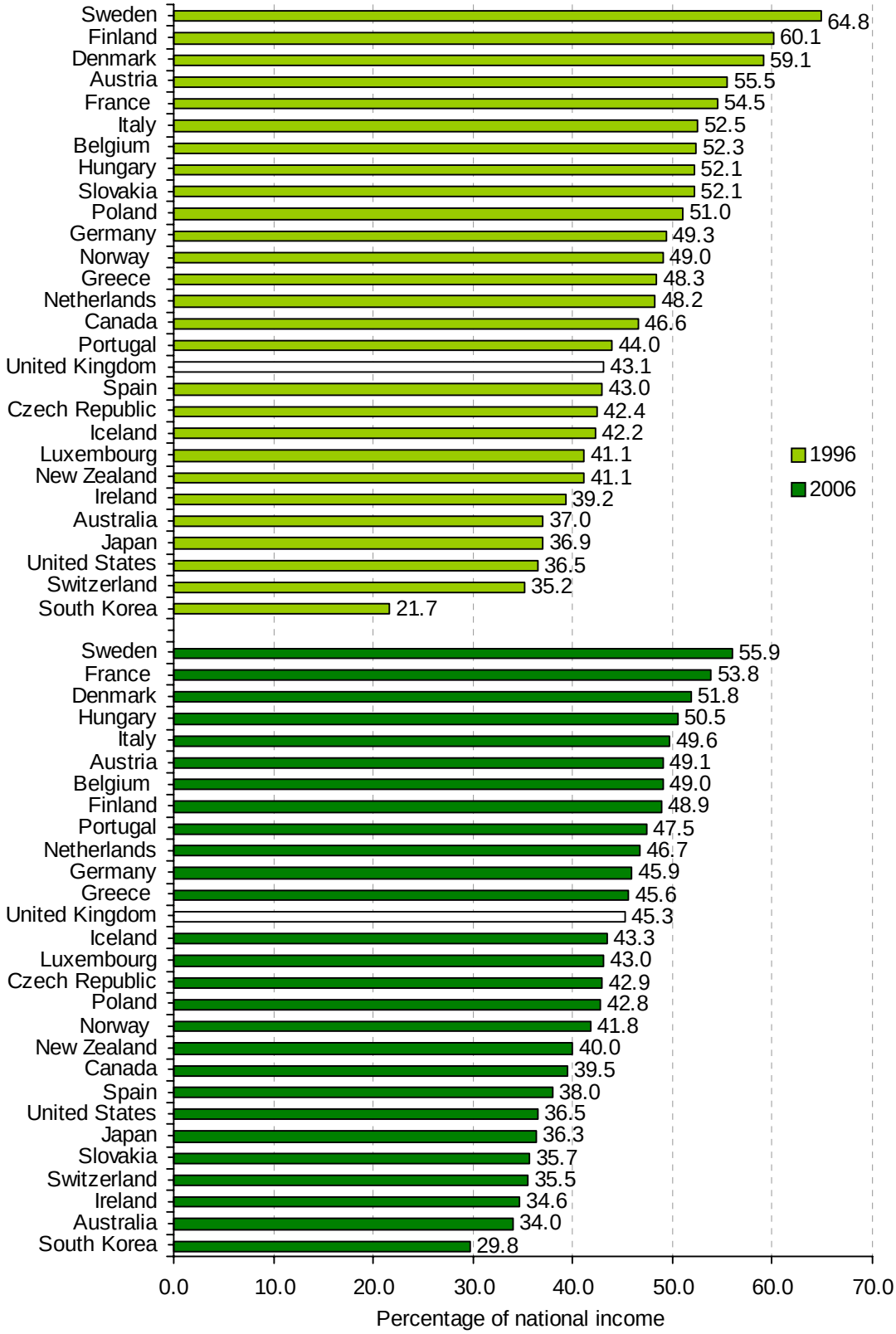
International comparison of total spending

A snapshot comparison of total general government outlays in both 1996 and 2006 across 28 OECD countries is presented in Figure 7.3. The UK moved from having the 17th highest level of public spending in 1996 to the 13th highest in 2006. Both could be regarded as 'mid-table' positions. In both 1996 and 2006, the highest spenders were countries such as Sweden, France and Denmark where general government spending is over half of national income. At the other extreme, in Australia and Ireland government outlays in 2006 were just over one-third of national income, while in South Korea they were just under 30%. Among the G7 countries, Japan, the US and Canada all have lower levels of public spending than the UK, while Italy and France have higher levels. Public spending in Germany is similar to (although still slightly higher than) the level in the UK.

In terms of the change in total government outlays over the period from 1996 to 2006, the UK has the third largest increase (+2.2% of national income) with only Portugal (+3.5%) and the very low-spending South Korea (+8.1%) seeing larger increases.

The growth in public spending as a share of national income that has occurred in the UK since Labour came to power in 1997 has not been shared equally across spending areas. Figure 7.4 shows the composition of public spending in 1996–97 and 2005–06, with the figures giving the share of national income allocated to each area. The areas are sorted so that those with the biggest proportionate increases in spending appear at the bottom of the chart and those with the biggest falls in spending appear at the top. Health has seen the largest increase (from 5.5% to 7.2% of national income, as a result of the large increases in spending that we describe in the next subsection), and public sector debt interest has fallen the most (from 3.6% to 2.2% of national income, as a result of falling public sector net debt and lower nominal and real interest rates).

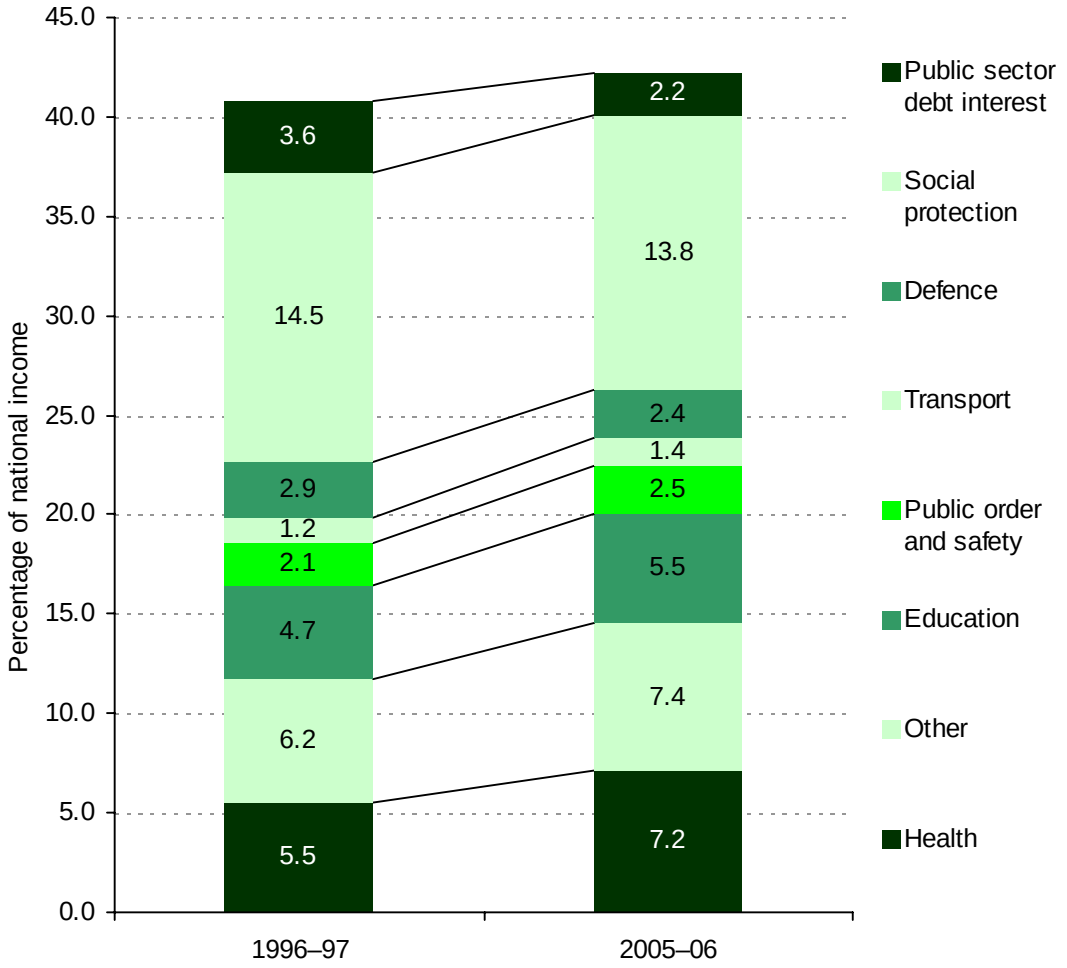
Figure 7.3. Total public spending, OECD countries, 1996 and 2006



Note: Figures refer to general government total outlays. Figures for the US include outlays net of operating surpluses of public enterprises.

Source: Annex table 25 of OECD, *Economic Outlook No. 80*, December 2006 (http://www.oecd.org/document/18/0,2340,en_2649_201185_20347538_1_1_1_1,00.html).

Figure 7.4. Changing composition of public spending under Labour



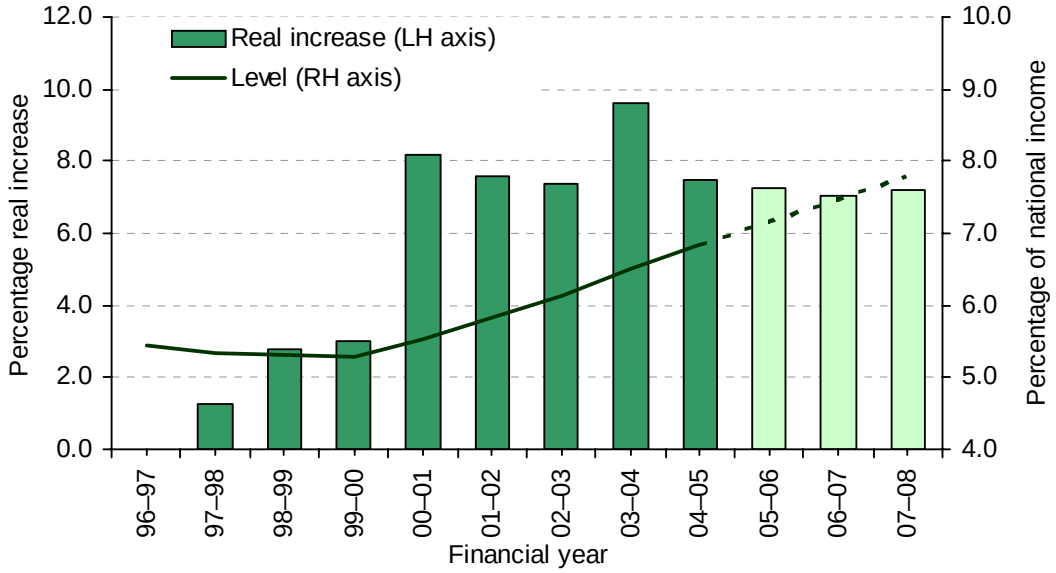
Source: HM Treasury, *Latest Functional Data*, December 2006 (http://www.hm-treasury.gov.uk/media/588/F4/Excel_file_of_latest_functional_data,_6th_December_2006.xls).

Health spending

The level of UK health spending as a percentage of national income is shown in Figure 7.5 (on the right-hand axis) from 1996–97 to 2007–08, which is the last year for which we have firm Treasury spending plans. Also shown in the chart is the real increase in health spending each year. The increases in health spending during Labour's first three years in office were lower than growth in the economy – therefore health spending declined slightly as a share of national income (from 5.4% of national income in 1996–97 to 5.3% of national income in 1999–2000). Since then, the NHS has received the largest sustained increase in spending since its inception in 1949.[6] This has increased spending to 7.5% of national income in 2006–07. Under the plans set out in Budget 2002 (and re-confirmed in Spending Review 2004), health spending is set to increase further to 7.8% of national income in 2007–08.

[6] For more details of NHS spending over time, see C. Emmerson, C. Frayne and A. Goodman, *Pressures in UK Healthcare: Challenges for the NHS*, IFS Commentary 81, 2000 (http://www.ifs.org.uk/comms/nhsspending.pdf).

Figure 7.5. Health spending



Note: Figures refer to public sector health spending figures based on the UN Classification of the Functions of Government (COFOG), the international standard, as used in the Public Expenditure Statistical Analysis.
Sources: Period to 2004–05 from HM Treasury, *Latest Functional Data*, December 2006 (http://www.hm-treasury.gov.uk/media/588/F4/Excel_file_of_latest_functional_data,_6th_December_2006.xls). Period from 2004–05 onwards from table 8.2 of HM Treasury, *2004 Spending Review*, Cm. 6237, July 2004 (http://www.hm-treasury.gov.uk/spending_review/spend_sr04/report/spend_sr04_repindex.cfm).

In contrast to other departments, Mr Brown gave the NHS a five-year settlement in Budget 2002. This was justified on the basis of supporting evidence from the Treasury-commissioned Wanless Review. This recommended that to improve both health outputs and outcomes and to close the 'considerable gaps in performance between the UK and other developed countries', NHS spending increases would need to exceed the expected growth in the economy at least until 2017–18. Over the period from 2007–08 to 2012–13, the Wanless Review set out three different scenarios for NHS spending.[7] These are referred to as 'slow uptake', 'solid progress' and 'fully engaged', with the cost to the taxpayer being lowest under the 'fully engaged' scenario and highest under the 'slow uptake' scenario.

The Wanless Review (page 35) stated that the 'fully engaged' scenario would require the following:

> levels of public engagement in relation to their health are high: life expectancy increases go beyond current forecasts, health status improves dramatically and people are confident in the health system and demand high quality care. The health service is responsive with high rates of technology uptake, particularly in relation to disease prevention. Use of resources is more efficient.

The Wanless Review estimated that under this 'fully engaged' scenario, NHS spending would need to grow by an average 4.4% a year over the five-year period from 2007–08 to 2012–13. Increases of 4.7% a year would be required under the 'solid progress' scenario and 5.6% a year under the 'slow uptake' scenario. Given that the Wanless Review was published in 2002,

[7] The report also contained spending plans for 2013–14 to 2017–18 and for 2018–19 to 2022–23 under each of the same three scenarios. See table 5.1 of HM Treasury, *Securing Our Future Health: Taking a Long-Term View, Final Report of the Wanless Review*, 2002, London.

it is possible that a lower or higher increase in spending would now be thought necessary to progress towards the standard of healthcare that was deemed 'world-class' by that report. Indeed, the Treasury is re-evaluating the Wanless Review calculations and it could conclude that larger or smaller allocations would be appropriate.[8]

A comparison between the average real growth in health spending seen over recent years and other periods of interest is shown in Table 7.3. This highlights the generosity of the average real increases of 7.2% a year over the nine years from April 1999 to March 2008. Over the 18 years of Conservative government after 1979, health spending increased by an average of 3.0% a year (which was still faster than average growth in the economy of 2.1% a year), while over the longer period from the birth of the NHS to March 1997 real health spending grew by an annual average rate of 3.4%.

Table 7.3. Trends in health spending

Period	Total	*GDP growth*
Labour		
Plans to date: April 1997 to March 2008	+6.2	*+2.8*
First two years: April 1997 to March 1999	+2.0	*+3.2*
Spending reviews: April 1999 to March 2008	+7.2	*+2.7*
Conservatives		
April 1979 to March 1997	+3.0	*+2.1*
Long-term trend (pre new Labour)		
April 1950 to March 1997	+3.4	*+2.5*

Note: Figures are for average annual growth.

Sources: As Figure 7.5 and C. Emmerson, C. Frayne and S. Love, *A Survey of Public Spending in the UK*, IFS Briefing Note 43, 2004 (http://www.ifs.org.uk/publications.php?publication_id=1791).

International comparison of health spending

In November 2001, the Prime Minister confirmed that he would like to see UK health spending reach the European average by 2005.[9] At the time, the most recent information on health spending across EU countries was from 1998. As a result of the increases in NHS spending in recent years, the UK met the 1998 unweighted average (8.1% of national income) across the other EU15 countries in 2004 and is set to meet the 1998 weighted average (8.9% of national income) in 2007–08. The unweighted average is less meaningful as it gives as much weight to Luxembourg, which in 1998 had the lowest health spending in the EU (5.8% of national income), as it does to Germany, which had the highest spending (10.6% of national income), despite the fact that the German economy in 1998 was around 115 times larger than the Luxembourg economy.

However, health spending is unlikely to reach the contemporaneous weighted European average by 2007–08 because recent years have also seen increases in health spending in many other EU countries. The unweighted average across the other EU15 countries increased by 1% of national income between 1998 and 2003 (the latest year for which comparable OECD figures for EU countries are available), the same as the increase in UK health spending over

[8] Source: 'National Health Service: winter crisis', *The Economist*, 8 December 2005 (http://www.economist.com/World/europe/displayStory.cfm?story_id=5280734&no_na_tran=1).

[9] See *Hansard*, 28 November 2001, column 964.

this period. There were particularly large increases in Belgium (from 8.3% to 10.1% of national income), Portugal (from 8.4% to 9.8% of national income) and France (from 9.1% to 10.4% of national income).

In 2003, the UK spent 7.8% of its national income on healthcare (public and private). This was below both the unweighted average of health spending across the other EU15 countries (9.1% of national income) and the more meaningful weighted average of 9.6% of national income.[10] NHS spending, as shown in Figure 7.5, is set to grow by 1.3% of national income between 2003–04 and 2007–08. Assuming that non-NHS health spending (public and private) remains constant as a share of national income, this would bring the UK's health spending up to 9.1% of national income.[11] Were health spending in other countries to remain unchanged, the UK would meet the unweighted EU-14 average in 2007–08 but would still be below the more meaningful weighted average.

Looking further afield, the US stands out in any comparison of health expenditure. In 2003, the UK spent 6.7% of national income on health publicly and a further 1.1% on healthcare privately.[12] In the US, public health spending in 2003 was 6.8% of national income – i.e. slightly above the UK level – with a further 8.4% of national income being spent on private healthcare. As a result, total health spending in the US, at 15.2% of national income, was almost twice the 7.8% of national income spent in the UK.

Private spending on healthcare

An additional reason why less progress has been made towards the contemporaneous average EU level of health spending in recent years is that some of the increase in NHS spending has been offset by a fall in private healthcare spending. Figure 7.6 shows public and private health spending as a share of national income from 1960 to 2005. While public spending on health has typically increased as a share of national income over time, we see a less consistent pattern for private spending. Private spending fell from 0.7% of national income in 1964 to 0.5% in 1975, then rose to 1.4% by 2000, before falling again to 1.1% by 2005. This latest decline has coincided with the large increases in NHS spending. Between 2000 and 2005, public health expenditure grew by 1.4% of national income, equivalent to £18½ billion in today's terms. This has been associated with a 0.3% of national income fall in private healthcare spending, which is equivalent to £4 billion in today's terms. As a result, total health spending rose by 1.1% of national income, or £14½ billion in today's terms, over the first five years of this century. The decline in private health spending over this period could, at least in part, have been caused by the increases in public spending. This would be the case if there were improvements in the quality of the NHS – or at least the perception of an improvement in the NHS – which led to individuals choosing not to purchase private medical insurance or not resorting to purchasing private healthcare directly. For example, since Spring

[10] Health spending from OECD, *Health Data 2006: Statistics and Indicators for 30 Countries*, 2006 (http://www.oecd.org/document/16/0,2340,en_2649_37407_2085200_1_1_1_37407,00.html); weighted average calculated using OECD figures on GDP in US$ using PPPs from http://titania.sourceoecd.org/vl=4774071/cl=28/nw=1/rpsv/factbook/index.htm.

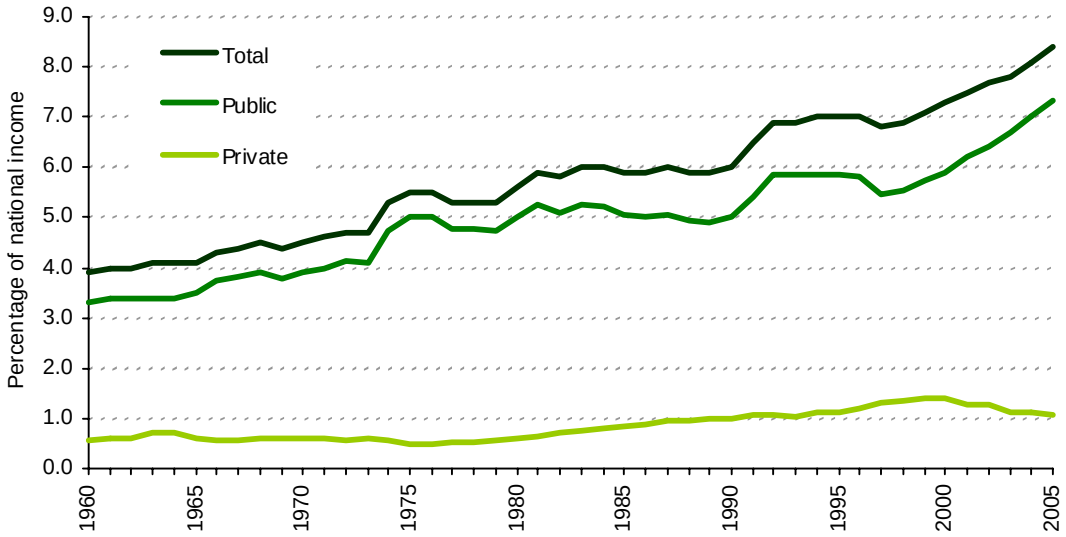
[11] The OECD figures suggest that UK health spending reached 8.4% of national income in 2005. Adding the planned increase in NHS spending between 2005–06 and 2007–08 to this figure gives a projection of health spending in 2007–08 of 9.0% of national income.

[12] Source: OECD, *Health Data 2006: Statistics and Indicators for 30 Countries*, 2006 (http://www.oecd.org/document/16/0,2340,en_2649_37407_2085200_1_1_1_37407,00.html).

1998, there have been sharp falls in hospital waiting lists, and previous research has shown that shorter hospital waiting lists lead to fewer individuals choosing to purchase private medical insurance.[13]

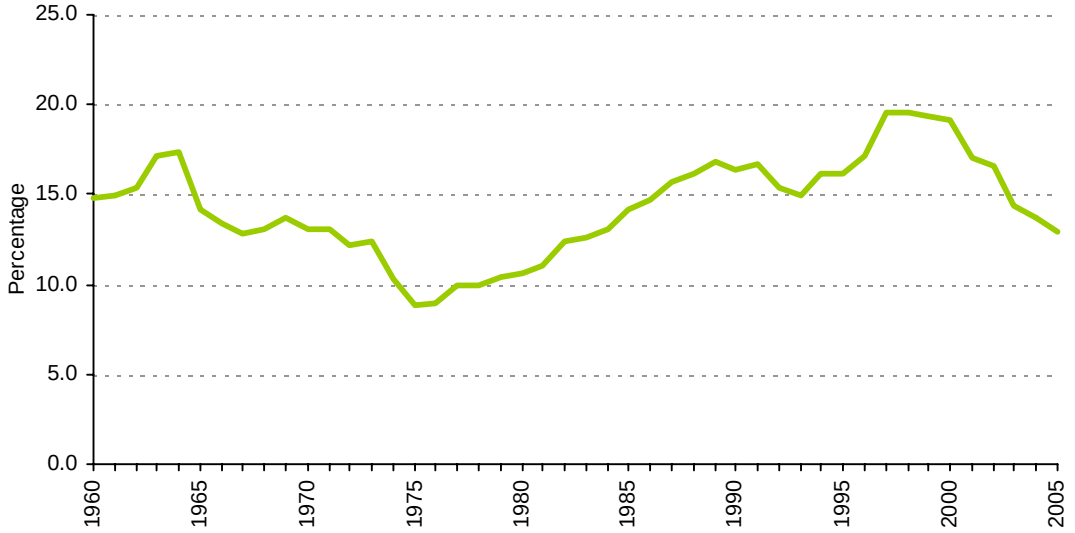
Figure 7.7 contains the same underlying data as Figure 7.6 but instead gives the percentage of UK healthcare expenditure that was privately rather than publicly funded. This shows that private spending declined as a share of total health spending between 1964 and 1975, climbed to a peak of 19.6% of total spending in 1997 and has since fallen back to 12.9%.

Figure 7.6. Public and private health spending



Source: OECD, *Health Data 2006: Statistics and Indicators for 30 Countries*, 2006 (http://www.oecd.org/document/16/0,2340,en_2649_37407_2085200_1_1_1_37407,00.html).

Figure 7.7. Private health spending as a share of total health spending



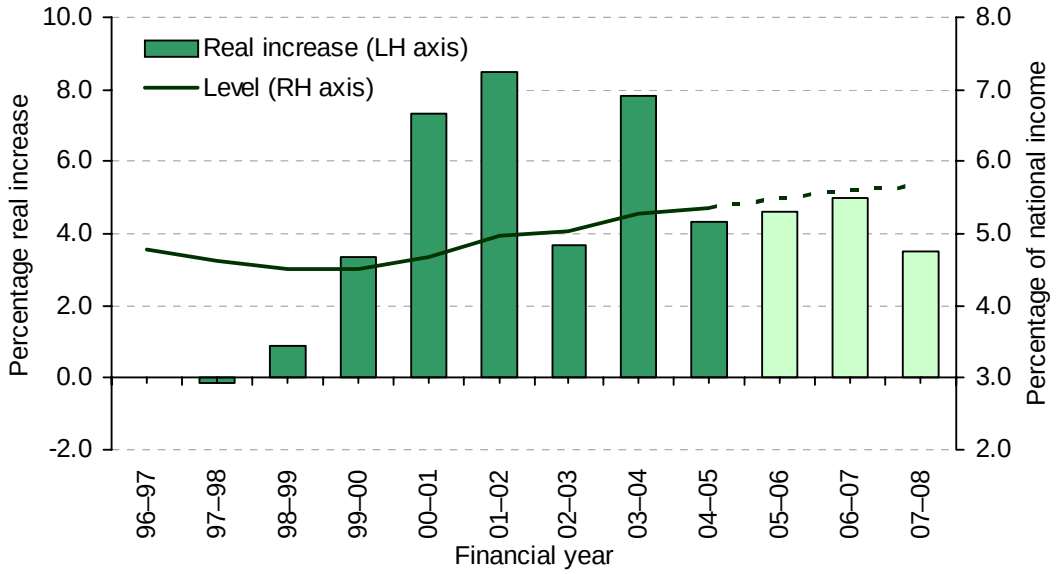
Source: As Figure 7.6.

[13] T. Besley, J. Hall and I. Preston, 'The demand for private health insurance: do waiting lists matter?', *Journal of Public Economics*, 72, 155–81, 1999.

Education spending

The level of UK education spending as a percentage of national income is shown in Figure 7.8 (on the right-hand axis) from 1996–97 to 2007–08, the last year for which we have firm Treasury spending plans. Also shown in the chart is the real increase in education spending each year. As with health spending, the increases in education spending during Labour's first three years in office were lower than growth in the economy. As a result, education spending declined as a share of national income (from 4.8% of national income in 1996–97 to 4.5% of national income in 1999–2000). This was despite the 1997 Labour manifesto pledge to 'increase the share of national income spent on education'. However, the pledge was met over Labour's first five years, as the increases in 2000–01 and 2001–02 were sufficient to take education spending to 5.0% of national income in 2001–02, slightly higher than in 1996–97. The large increases in education spending over the following five years have brought education spending up to 5.6% of national income in 2006–07, significantly above the level that Labour inherited.

Figure 7.8. Education spending



Notes: Figures refer to public sector education spending figures based on the UN Classification of the Functions of Government (COFOG), the international standard, as used in the Public Expenditure Statistical Analysis.
Sources: Period to 2004–05 from HM Treasury, *Latest Functional Data*, December 2006 (http://www.hm-treasury.gov.uk/media/588/F4/Excel_file_of_latest_functional_data,_6th_December_2006.xls). Period from 2004–05 onwards from table B18 of HM Treasury, *Pre-Budget Report*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

Table 7.4 highlights the extent to which the average annual increases in education spending seen over the spending review period (5.3%) are relatively large compared with the increases seen over the 18-year period of Conservative governments after 1979 (1.5%).

Total education spending plans for 2008–09, 2009–10 and 2010–11 have not yet been set. These could be announced at the time of the 2007 CSR, or potentially earlier – for example, the March 2004 Budget announced the education spending figures for 2005–06, 2006–07 and 2007–08 ahead of the July 2004 Spending Review. Mr Brown has, however, already announced the capital spending settlement for education spending for the three years to be

Table 7.4. Trends in education spending

Period	Total	*GDP growth*
Labour		
Plans to date: April 1997 to March 2008	+4.4	*+2.8*
First two years: April 1997 to March 1999	+0.4	*+3.2*
Spending reviews: April 1999 to March 2008	+5.3	*+2.7*
Conservatives		
April 1979 to March 1997	+1.5	*+2.1*
Long-term trend (pre new Labour)		
January 1953 to December 1996	+4.0	*+2.6*

Note: Figures are for average annual growth.

Sources: As Figure 7.8 and C. Emmerson, C. Frayne and S. Love, *A Survey of Public Spending in the UK*, IFS Briefing Note 43, 2004 (http://www.ifs.org.uk/publications.php?publication_id=1791).

covered by the 2007 CSR, and for the last year (2010–11) has announced how this will be split into schools and non-schools capital spending.[14] As a result, capital spending on education is set to grow by 4.3% a year in real terms over the next spending review period. While this will increase capital education spending as a share of national income, it is a considerably lower rate of increase than has occurred in recent years (15.8% a year on average over the 10 years between April 1998 and March 2008). Also known is the split between growth in schools and non-schools capital spending: 4.9% and 2.2% a year in real terms respectively. These are both lower than their growth rates over recent years (16.3% and 14.4% on average a year for schools and non-schools respectively over the nine years between April 1998 and March 2008). So, schools capital spending is projected to rise as a share of national income, while non-schools capital spending is projected to fall slightly as a share of income.[15]

In the March 2006 Budget, Mr Brown also announced that 'our long-term aim should be to ensure for 100 per cent of our children the educational support now available to just 10 per cent'. Subsequent details show that the pledge is to increase real spending per pupil in the state sector to that currently being spent per pupil in the private sector. The gap between the two in 2005–06 was considerable: spending per pupil in state schools was around £5,000 while in private schools it was around £8,000. The increases in schools spending already pledged between 2005–06 and 2010–11 will be sufficient to reduce the gap to £2,400 pupil. To close the gap completely in 2010–11 would cost approximately £17 billion in today's terms, which, given the constraints placed on the Chancellor by the fiscal rules (see Chapter 3), would not be achievable over the period covered by the 2007 CSR without significant further tax-raising measures. In practice, the pledge will have to be met over a longer time frame. If school spending per pupil were increased in line with expected growth in the economy (2½% a year) then it would take around 14 years to meet the pledge, whereas if it were increased at twice this rate (5% a year) then it would take around seven years to meet it. It is also the case that bringing state spending per pupil up to the 2005–06 private school level of spending per pupil is unlikely to close the contemporaneous gap, as private spending is

[14] Paragraph 6.47, page 148, of HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

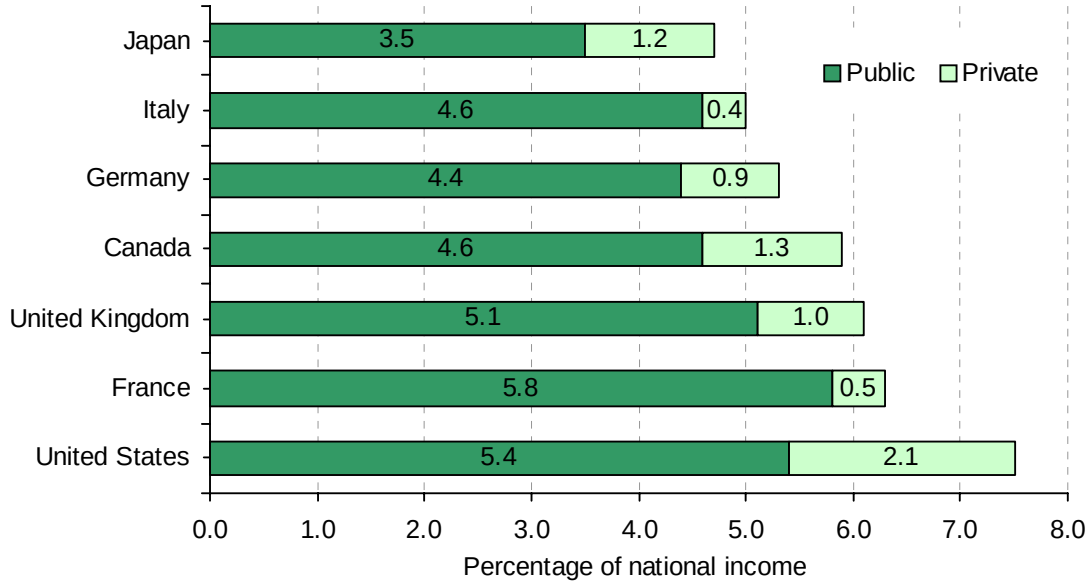
[15] Figures on education capital spending on schools and other, unlike the other public spending figures in this chapter, include capital spending financed through the Private Finance Initiative.

likely also to increase in real terms. Indeed, real increases since 1998 have brought state spending per pupil up to the level spent in the private sector in 1996–97,[16] but increases in per-pupil spending in the private sector over the same period mean that (as mentioned above) the contemporaneous difference in per-pupil spending between state and private schools remains large.

International comparison of education spending

Compared with the other G7 countries, the UK is not a low spender on education, as shown in Figure 7.9. Public spending on education – at 5.1% of national income in 2003 – is slightly below that spent in the US (5.4%) and France (5.8%) but is higher than that spent in Canada, Germany, Italy and Japan. Once private spending on education is included, the UK still devotes the third highest share of national income to total education spending among the G7 economies. One obvious reason why countries might choose to spend different shares of their national income on education is differences in numbers of school-age children.

Figure 7.9. Education spending across the G7 economies, 2003



Note: Figures for Canada refer to 2002.
Source: Table B2.1a of OECD, *Education at a Glance, OECD Indicators 2006*, 2006 (http://www.oecd.org/edu/eag2006).

When we look at per-pupil spending, a slightly different picture emerges. Table 7.5 shows spending per pupil relative to national income across G7 countries. Most striking is Japan. Having relatively few children, Japan spends more per pupil on primary, secondary and tertiary education than the UK despite devoting a smaller share of national income overall to education. At the primary level, the UK spends more per pupil than Germany or France, but less than Italy or the US (as well as Japan). At the secondary level, the UK spends a comparable amount per pupil to Germany, the US and Japan, substantially more than Canada, but substantially less than France and Italy. At the tertiary level, the UK spends substantially less per pupil than the US but substantially more than Germany or Italy.

[16] For further discussion about the pledge, see A. Goodman and L. Sibieta, *Public Spending on Education in the UK*, IFS Briefing Note 71, 2006 (http://www.ifs.org.uk/bns/bn71.pdf).

Table 7.5. Education spending per pupil relative to national income, 2003

	% of GDP	Spending per student relative to GDP, UK = 100			
		Primary	Secondary	Tertiary	All
United States	7.5	112	104	160	129
France	6.3	88	124	94	110
United Kingdom	6.1	100	100	100	100
Canada	5.9	n/a	83	102	89
Germany	5.3	76	102	65	83
Italy	5.0	140	121	82	120
Japan	4.7	114	105	103	111

Note: Figures for Canada refer to public institutions in 2002 only.
Sources: Table B1.4 and B2.1a of OECD, *Education at a Glance, OECD Indicators 2006*, 2006 (http://www.oecd.org/edu/eag2006).

7.3 Scenarios for the 2007 CSR

This section takes the overall spending plans set out in the December 2006 Pre-Budget Report and shows possible allocations to (in particular) health and education, given the spending plans that Mr Brown has already announced. One interesting difference between this spending review and the last three spending reviews regards the timing of the spending announcements. In the Budgets of March 2000 and April 2002, Mr Brown announced the spending totals for the NHS (for the periods of 2001–02 to 2003–04 and of 2003–04 to 2007–08 respectively), while in the Budget of March 2004 he announced the spending totals for education (for the period of 2003–04 to 2007–08). To date, the 2007 CSR has followed a different pattern. While the overall spending envelope is yet to be confirmed, several small departments have already had their allocations announced. Settlements for the Home Office and four smaller departments were unveiled in the March 2006 Budget, while settlements for the Department for Constitutional Affairs (DCA) and five further smaller departments were announced in the December 2006 Pre-Budget Report. Not only are more departments' totals being announced sooner (which could be due to the fact that the forthcoming CSR was originally scheduled for 2006) but also, rather than announcing large increases in spending in the headline areas of health and education, Mr Brown is instead choosing to announce early tight budget settlements in areas of spending that might be considered less headline-grabbing.

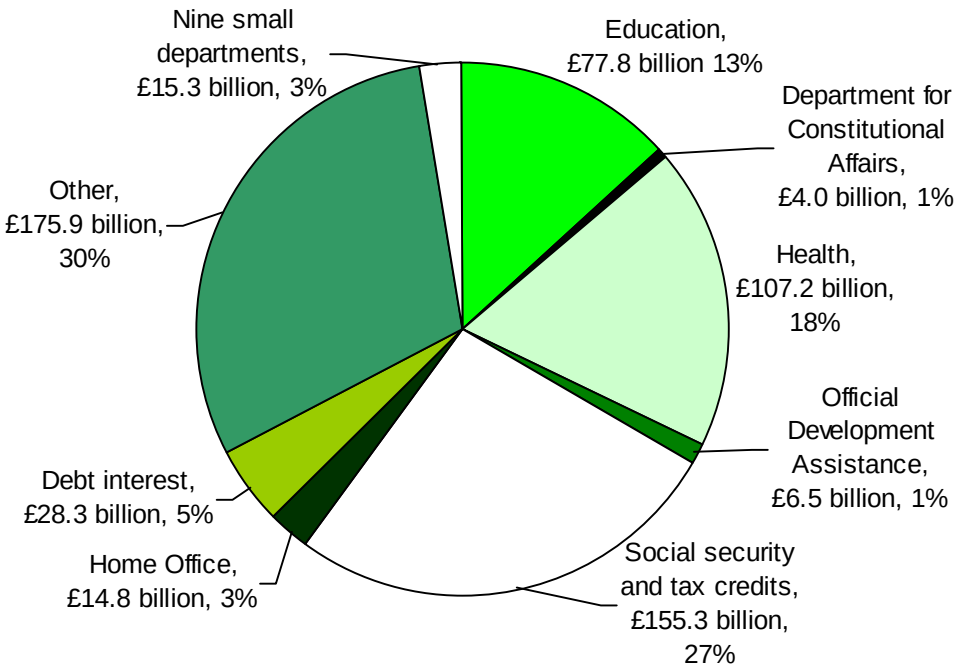
The areas of spending that have already been announced by Mr Brown are the Home Office (a real freeze), the DCA (an annual average cut of 3.5% a year in real terms) and for nine smaller departments (an annual average cut of 5% a year in real terms).[17] Taken together, in 2007–08, these 11 departments have total spending of £34.1 billion or 5.8% of forecast TME in that year. As shown in Figure 7.10, other larger areas of public spending include health,

[17] The nine smaller departments are HM Revenue & Customs, HM Treasury, the administrational part of the Department for Work and Pensions, the Cabinet Office, the Privy Council Office, National Savings & Investments, the Central Office of Information, the Food Standards Agency and the Government Actuary's Department. For more details, see box 6.3, page 143, of HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

education and social security. This section will consider each of the areas of spending shown in Figure 7.10.

An indication of how tight the settlements are for the Home Office, the DCA and the nine smaller departments is given in Table 7.6. Across all 11 departments, the 2007 CSR allocation is for an average annual cut, after nationwide inflation, of 2.6% a year. This compares with an average real cut of 0.3% a year over the two-year period from April 2006 to March 2008. Delivering these cuts without any unacceptable detrimental impact on service quality will

Figure 7.10. Planned public spending in 2007–08



Note: The largest components of 'other' spending are defence, transport, culture, housing and environmental protection.
Sources: Table 1.12 of HM Treasury, *Public Expenditure Statistical Analyses 2006*, Cm, 6811, May 2006 (http://www.hm-treasury.gov.uk/media/375/5A/cm6811_comp.pdf); HM Treasury, *2004 Spending Review*, Cm. 6237, July 2004 (http://www.hm-treasury.gov.uk/spending_review/spend_sr04/spend_sr04_index.cfm); table B16, page 240, of HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

Table 7.6. Early tight settlements for 2007 CSR

Real average annual growth in:	Planned growth over 2 years from April 2006 to March 2008	2007 CSR, 3 years from April 2008 to March 2011
Provisional spending plans		
Home Office	+1.6	0.0
DCA	–0.2	–3.5
Nine smaller departments	–2.1	–5.0
All early settlements	–0.3	–2.6

Sources: For 2007 CSR plans, see footnote 17. Planned growth in expenditure from table 1.12 of HM Treasury, *Public Expenditure Statistical Analyses 2006,* Cm. 6811, May 2006 (http://www.hm-treasury.gov.uk/media/375/5A/cm6811_comp.pdf) and HM Treasury, *2004 Spending Review*, Cm. 6237, July 2004 (http://www.hm-treasury.gov.uk/spending_review/spend_sr04/spend_sr04_index.cfm).

undoubtedly be difficult. Indeed, if it were not, then presumably the government would have announced larger reductions in spending in these areas in the July 2004 Spending Review, or preferably even earlier.

Given the overall spending plans set out in the December 2006 Pre-Budget Report, Table 7.7 sets out the growth in spending that could be available for different areas once the allocations shown in Table 7.6 are taken into account. Total managed expenditure is projected by the December 2006 Pre-Budget Report to grow by an average of 2.0% a year over the three-year period from April 2008 to March 2011.

Table 7.7. Possible 2007 CSR allocation under PBR 2006 spending plans

Real average annual growth in spending on:	
Provisional spending plans	
Total managed expenditure	+2.0
Total managed expenditure after refilling AME margin	+1.8
Known allocations	
Home Office	+0.0
DCA	–3.5
Nine smaller departments	–5.0
Remainder	+2.1
Assumptions	
Official Development Assistance	+11.2
Debt interest payments	+2.0
Underlying social security and tax credit expenditure	+1.6
Remainder	+2.1

Sources: As Table 7.6; plus table B16, page 240, of HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

One of the first decisions for the Chancellor at the time of the 2007 CSR will be to determine how much should be allocated to the AME margin (previously known as the contingency reserve). These are funds not allocated to a particular spending area but kept aside for any unforeseen events – for example, in recent years, tackling BSE and foot-and-mouth disease. To date, Mr Brown has always allocated £1 billion to the first year of a spending review period, £2 billion to the second year and £3 billion to the third year. In Table 7.7, we assume that the same decision is made, which would lead to the remainder of TME growing by 1.8% a year in real terms. Once the departments whose allocations are already known are taken into account, this leaves the remainder of public spending growing at 2.1% a year in real terms.

The bottom panel of Table 7.7 also makes assumptions for growth in spending on Official Development Assistance (ODA), debt interest payments and underlying social security and tax credit expenditure. Recent years have seen very large increases in ODA spending, bringing it up to 0.47% of national income in 2005, a level only exceeded once since 1970 (in 1979).[18] We assume that the government will implement constant real increases in spending

[18] See figure 7, page 21, of Department for International Development, *Statistics on International Development 2001/02–2005/06*, 2006 (http://www.dfid.gov.uk/pubs/files/sid2006/sid06-full.pdf).

to bring ODA spending up to 0.7% of national income in 2012–13 (since it has an election manifesto pledge to meet this level in 2013).[19] This would imply real increases of 11.2% a year in real terms over the period covered by the 2007 CSR. While this would be a substantial increase (a £3.2 billion cash increase in annual spending over the three-year period), it is actually slightly lower than the 11.9% a year that is planned on average in 2006–07 and 2007–08.

Spending on debt interest payments and underlying expenditure on social security and tax credits are, in large part, out of the government's hands. As a baseline, we assume that spending in both these areas increases over the 2007 CSR period at the same rate that it is forecast to increase over the two-year period from April 2006. This implies that debt interest spending would grow by 2.0% a year and that underlying expenditure on social security and tax credits would grow by 1.6% a year in real terms; the latter would be less than expected growth in earnings. These assumptions are particularly important since, as shown in Figure 7.10, expenditure on social security and tax credits is over a quarter of total public spending. However, delivering large reductions in future social security spending would, at least in the near term, not be possible without leaving a combination of pensioners, families with children and those receiving incapacity benefits worse off than they would be under current policies.

Table 7.8. Possible scenarios for spending on health and education, given child poverty target and growth in 'other' spending

	'Other spending'	
	grows at current rate (+0.8% a year)	**frozen in real terms (+0.0% a year)**
Additional £4½ billion allocated to meeting child poverty target		
Social security and tax credit expenditure	+2.5	+2.5
Education and health spending	+2.6	+3.3
No additional funds allocated to meeting child poverty target		
Social security and tax credit expenditure	+1.6	+1.6
Education and health spending	+3.3	+4.1

Notes: Figures are for average annual growth. The largest components of 'other' spending are defence, transport, culture, housing and environmental protection.
Sources: As Table 7.7.

Under this scenario, the remainder of TME would be able to grow by 2.1% a year in real terms. Table 7.8 shows the amounts left over for health and education, given different possible allocations for reducing child poverty and other areas of government such as transport, defence, housing and environmental protection. The top half of the table assumes that the Chancellor makes a further £4½ billion available for increased expenditure on targeted support for lower-income families with children, raising the growth rate of social security and tax credit spending from 1.6% to 2.5%. This is the minimum amount that recent analysis suggests will be needed by 2010–11 in order to give the government a 50:50 chance

[19] The UN General Assembly has had a target for ODA spending as a share of gross national income of 0.7% since 1970.

of meeting its challenging target for child poverty in that year.[20] This would leave a very tight settlement for health and education.

If spending on 'other' areas of public spending were increased by 0.8% a year in real terms – the average increase forecast in the 2004 Spending Review for the two-year period from April 2006 to March 2008 – the combined health and education budget could grow by just 2.6% a year in real terms, approximately in line with growth in the economy. Even if spending over all other areas of government were frozen in real terms, the combined health and education budget could only grow by 3.3% a year on average in real terms. This would be almost half the average rate of increase delivered by Labour over the seven-year period from April 1999 to March 2006 (6.5% a year in real terms).

This suggests that it is unlikely that the Chancellor could allocate £4½ billion extra for targeted support to reduce child poverty within the spending totals set out in the December 2006 Pre-Budget Report without compromising stated aspirations for public services, including health and education. The lower half of Table 7.8 sets out an alternative scenario where no additional funds are allocated to reducing child poverty (which would make it very unlikely that the target for reducing child poverty would be met). Under this scenario, allowing other areas of public spending to grow at 0.8% a year in real terms would leave the combined health and education budget growing at 3.3% a year on average in real terms. Freezing spending on other areas would allow the combined health and education budget to grow by 4.1% a year in real terms.

Under the scenarios set out in Table 7.8, one of the more difficult decisions for the Chancellor in the 2007 CSR will be the trade-off between allocating additional funds to education as opposed to health. As described in Section 7.2, Mr Brown's pledge to increase per-pupil schools spending in the state sector to that seen in the private sector in 2005–06 would, if it were to be achieved by the middle of the next decade, require a generous settlement for schools, which in turn is likely to imply a generous settlement for education overall.[21] However, traditionally, the NHS has received a larger increase in finance than the education budget. The Wanless Review suggested that the NHS budget would, in its most optimistic (i.e. lowest cost to the taxpayer) scenario for health spending, require increases in funding of 4.4% a year over the 2007 CSR period. As shown in Table 7.8, within the spending totals set out in the December 2006 Pre-Budget Report, it does not seem plausible for the budgets of both health and education to receive increases of this amount. The largest increase for the combined budgets that the figures in Table 7.8 suggest is growth of 4.1% a year in real terms.

Table 7.9 shows some potential allocations for health and education under the assumption that the combined budgets of these departments grow by (a) 3.3% a year in real terms and (b) 4.1% a year in real terms. These were the figures shown in Table 7.8, based on the assumptions that no additional funds are found for reducing child poverty and that spending on other areas of public spending is either increased by (a) 0.8% a year or (b) held constant in real terms.

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[20] M. Brewer, J. Browne and H. Sutherland, *Micro-Simulating Child Poverty in 2010 and 2020*, Joseph Rowntree Foundation, York, 2006 (http://www.jrf.org.uk/bookshop/eBooks/9781859355091.pdf).

[21] While some scope for higher spending on schools could come from trade-offs within the education budget, this would require lower growth in spending on either early years, further education or higher education.

Table 7.9. Illustrative trade-offs between health and education spending

	Health spending	Education spending
Health and education spending growth of 3.3% p.a.		
Health receives Wanless recommended increase	+4.4%	+1.8%
Health receives same increase as under Conservatives	+3.0%	+3.8%
Education spending increases at rate seen over 1997 to 2008	+2.5%	+4.4%
Education spending increases in line with economic growth	+3.9%	+2.4%
Health and education spending growth of 4.1% p.a.		
Health receives Wanless recommended increase	+4.4%	+3.7%
Health receives same increase as under Conservatives	+3.0%	+5.6%
Education spending increases at rate seen over 1997 to 2008	+3.9%	+4.4%
Education spending increases in line with economic growth	+5.3%	+2.4%

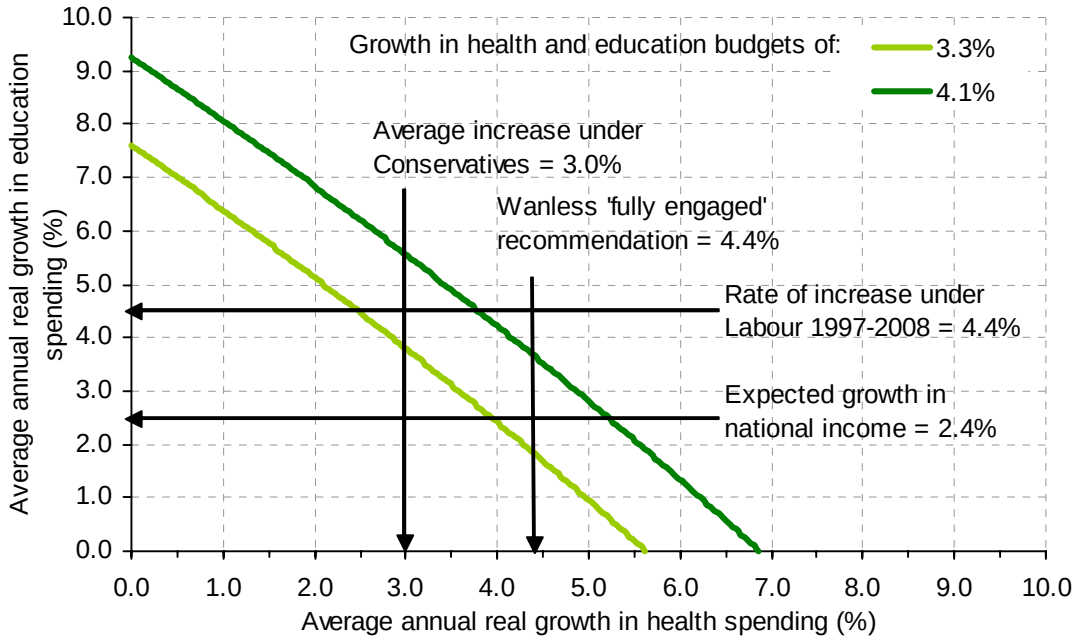
Note: Figures are for average annual growth.
Sources: As Table 7.7.

Under the assumption that the total health and education budget grows by 3.3% a year, and that health receives 4.4% a year, which is the least generous award envisaged in the 2002 Wanless Review, then education spending could grow by only 1.8% a year in real terms – less than expected growth in the economy. This would seem inconsistent with Mr Brown's rhetoric about the need to increase per-pupil spending in state schools. Increasing health spending by 3.0% a year in real terms, which is the same increase achieved on average by the Conservatives during their 18-year period in office (and led to Tony Blair claiming the day before the May 1997 election that the public had '24 hours to save the NHS'), would allow education spending to grow by 3.8% a year. Continuing to increase education spending at the rate seen in recent years (4.4% a year) would require health spending to grow less quickly than it did on average over the Conservative years in office.

The lower half of Table 7.9 shows similar trade-offs under the assumption that the overall health and education budget can increase by an average of 4.1% a year in real terms. Under this scenario, increasing NHS spending by 4.4% a year would allow education spending to grow by 3.7% a year. While this would still be lower than recent increases, it would lead to an expected increase in education spending as a share of national income. This is perhaps around the most likely outcome. However, this scenario assumes that no additional funds are made available for reducing child poverty and that other spending areas – including defence and environmental protection – see no increase in their budgets in real terms. (Other spending also includes transport and housing. However, the fact that capital spending is likely to grow faster than current spending over the 2007 CSR period (as shown in Table 7.2) means that these capital-intensive areas might be less likely to receive a very tight settlement.)

The diagonal lines in Figure 7.11 show all the possible trade-offs between education and health spending were the total budget of these two spending functions to be increased by either 3.3% a year or 4.1% a year in real terms. Also shown are the illustrative trade-offs from Table 7.9.

Figure 7.11. Potential trade-off between spending on education and health



Sources: As Table 7.7.

An alternative spending envelope

The Chancellor might decide to allocate more funds to the 2007 CSR than have been pencilled in by the December 2006 Pre-Budget Report projections. Table 7.10 shows the possible growth rates for the combined health and education budget if spending were to be kept constant as a share of national income, rather than being reduced by 0.5% of national income. In 2006–07 terms, this would make another £7 billion available for spending departments.

Table 7.10. Possible scenarios for spending on health and education, given child poverty target and growth in 'other' spending, under assumption of spending constant as a share of national income

	'Other spending'	
	Grows at current rate (+0.8% a year)	**Frozen in real terms (+0.0% a year)**
Additional £4½ billion allocated to meeting child poverty target		
Social security and tax credit expenditure	+2.5	+2.5
Education and health spending	+3.9	+4.6
No additional funds allocated to meeting child poverty target		
Social security and tax credit expenditure	+1.6	+1.6
Education and health spending	+4.7	+5.4

Note: Figures are for average annual growth.
Sources: As Table 7.7.

Table 7.10 shows that if no additional funding is required for reducing child poverty, and if the budgets of other spending areas can be frozen in real terms, then combined spending on health and education could grow by an average of 5.4% a year in real terms, which would be the same average increase that Labour is intending to deliver over the period from April 1997 to March 2008. Alternatively, if £4½ billion is used to reduce child poverty and the budgets of other spending departments are increased in line with the 2004 Spending Review settlements, the combined budgets of health and education could grow by 3.9% a year in real terms.

Perhaps most plausibly, with this spending envelope, the Chancellor could settle for a 50:50 chance of meeting the child poverty target by allocating £4½ billion towards it, freeze other spending and increase the combined health and education budgets by 4.6% a year in real terms. This would allow the NHS to receive a settlement in line with the lowest envisaged by the 2002 Wanless Review (4.4%) and for large increases in schools spending to be made in order to progress towards Mr Brown's aspiration of increased per-pupil schools spending. In this scenario, were the NHS to receive a settlement of 4.4% a year in real terms, then education spending could grow by 5.0% a year.

While the spending settlements set out in Table 7.10 may look more appealing to the Chancellor than those set out in Table 7.8, they would require an additional £7 billion of finance. Given the lack of room to manoeuvre against the fiscal rules (as described in Chapter 3), this is likely to require greater tax revenues (as opposed to higher borrowing).

In the past, spending settlements have not in fact been 'firm and fixed', despite Mr Brown's rhetoric which suggests they have been. In particular, the spending plans set out in the 1998 Comprehensive Spending Review for 2000–01 and 2001–02, and the plans that were set out in the Spending Review of 2000 for 2003–04, were subsequently revised upwards.

This might suggest a strategy for the Chancellor with respect to the 2007 CSR. He could announce spending plans along the lines of Tables 7.8 and 7.9, but then increase them at a later stage if necessary. This 'wait and see' strategy might be particularly attractive for additional transfer payments to reduce child poverty. Unless there is an unexpected fall in public spending elsewhere (which, as a result of lower-than-expected unemployment and debt interest payments, is what happened during the period covered by the 1998 CSR), or tax revenues come in more strongly than expected, then fresh tax-raising measures would be required to finance spending beyond that envisaged by the December 2006 Pre-Budget Report. However, by delaying the decision, the Chancellor would have more information on the quality of public services, the evolution of child poverty and the underlying buoyancy of tax revenue.

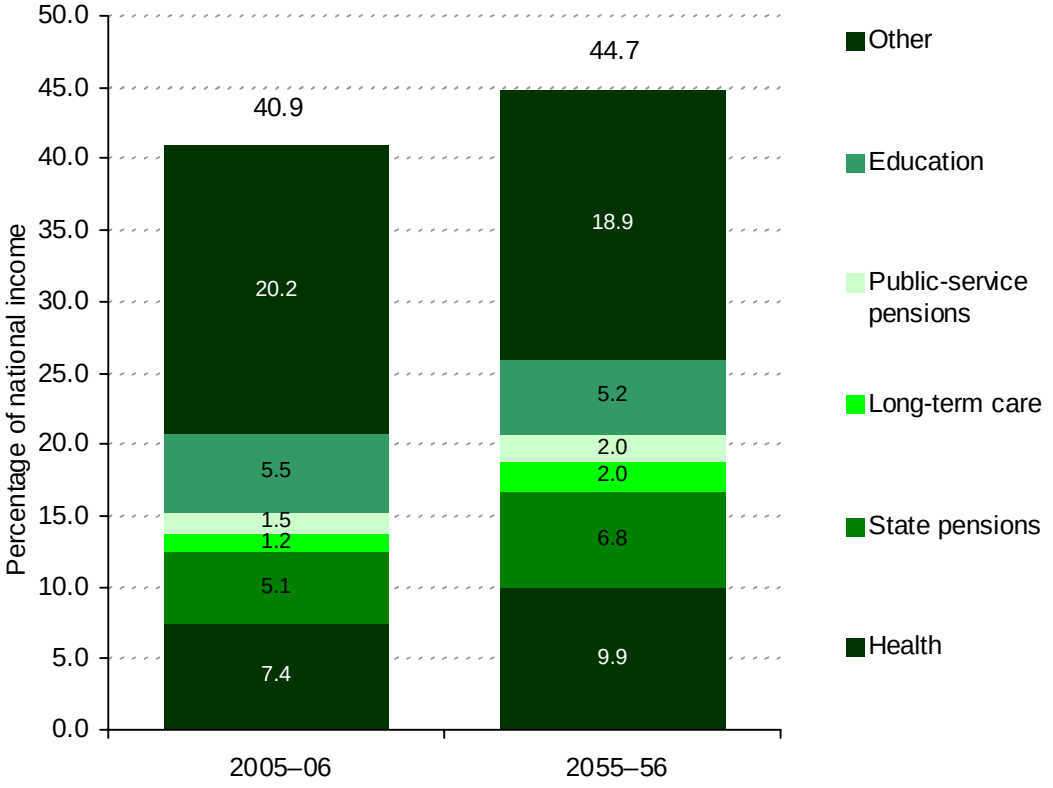
7.4 Longer-term spending pressures

This chapter has focused on past trends in public spending and the key trade-offs for the 2007 CSR. This section provides a short discussion of the Treasury's longer-term spending projections.

Figure 7.12 shows the Treasury's latest projections for spending in 2055–56, compared with the latest estimates for spending in 2005–06. Importantly, these projections take into account

the estimated fiscal implications of the 2006 Pensions White Paper.[22] They suggest that public spending will increase by 3.9% of national income (around £50 billion in today's terms) over the next 50 years. This is due to increases in spending on health (2.5% of national income), state pensions (1.7%), long-term care (0.8%) and public-service pensions (0.5%), which are partially offset by falls in spending on education (0.3%) and other spending (1.3%).

Figure 7.12. Latest HMT long-term spending projections

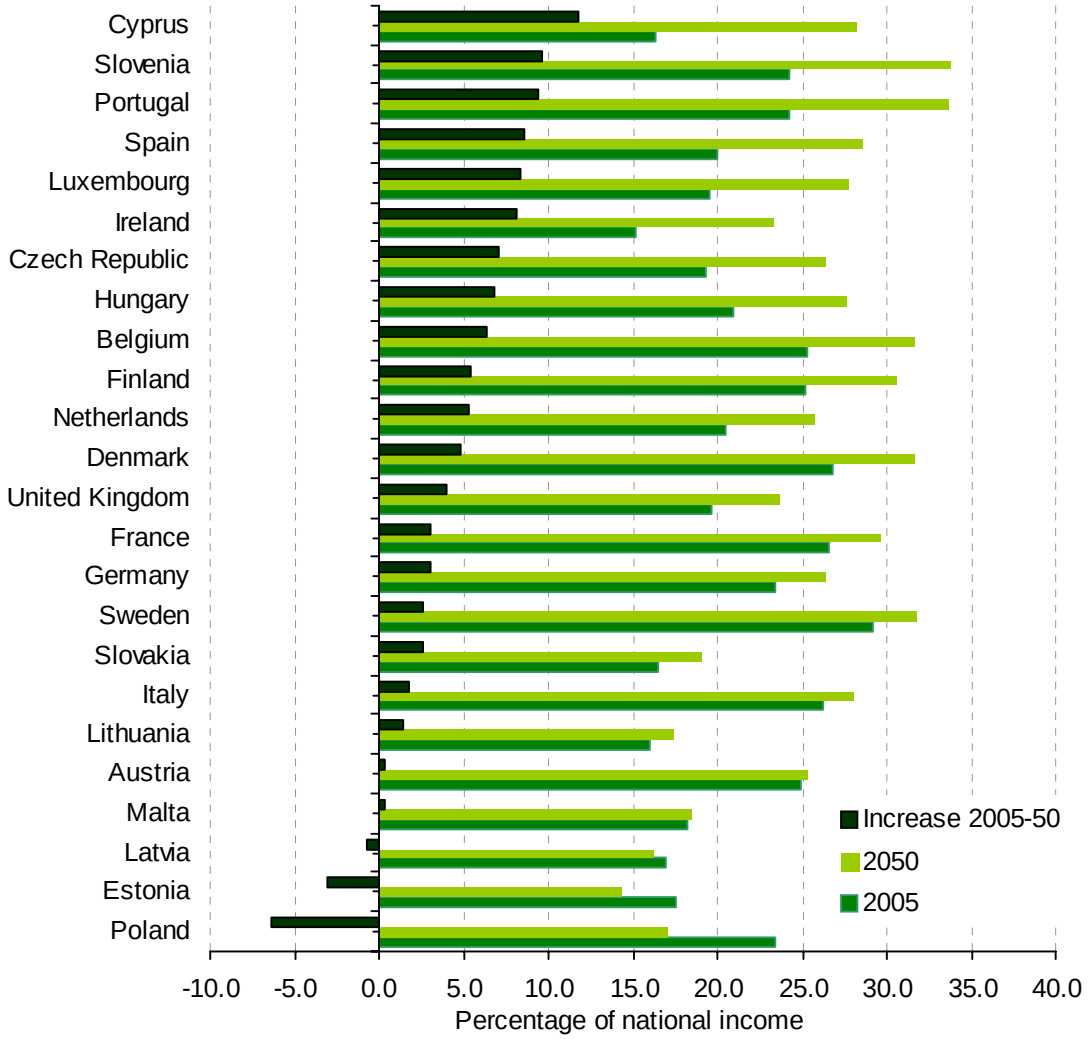


Notes: State pension spending is defined as the sum of the basic state pension, state second pension, pension credit, winter fuel payments, over-75 TV licences and Christmas bonus. Health spending is gross NHS spending. Long-term care spending excludes long-term care provided within the NHS, which is accounted for under Health. Total spending includes gross investment but excludes interest and dividend payments.
Source: Table 5.1, page 40, of HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adlongterm.cfm).

This increase in public spending, if it materialises, would require increases in tax revenues as a share of national income. Whether or not any required tax increases would lead to concerns about the international competitiveness of the UK tax system will in part depend on the extent to which the increase in spending in the UK is small or large relative to those in other countries.

[22] See Department for Work and Pensions, *Security in Retirement: Towards a New Pensions System*, Cm. 6841, 2006 (http://www.dwp.gov.uk/pensionsreform/whitepaper.asp). For a discussion of the impact of state pension reforms, see C. Emmerson, G. Tetlow and M. Wakefield, 'The Pensions White Paper: who wins and who loses?', *PMI News*, August 2006 (http://www.ifs.org.uk/publications.php?publication_id=3717).

Figure 7.13. Projected age-related spending, EU countries, 2005 and 2050



Note: Age-related expenditure consists of total age-related public spending, i.e. spending on pensions, healthcare, long-term care, education and unemployment transfers. Greece excluded due to missing pensions information.
Source: Table 1.1 of Economic Policy Committee and European Commission, *Report on the Impact of Ageing Populations on Public Spending*, 2006 (http://ec.europa.eu/economy_finance/epc/epc_sustainability_ageing_en.htm).

Figure 7.13 shows the percentage of national income spent on age-related expenditures (i.e. pensions, healthcare, long-term care, education and unemployment transfers) across EU countries in 2005 and projections for spending in 2050. The countries are sorted in order of the size of the expected increase. It shows that, of the other 23 countries,[23] 12 expect a larger increase in age-related spending than the UK while 11 expect a smaller increase.

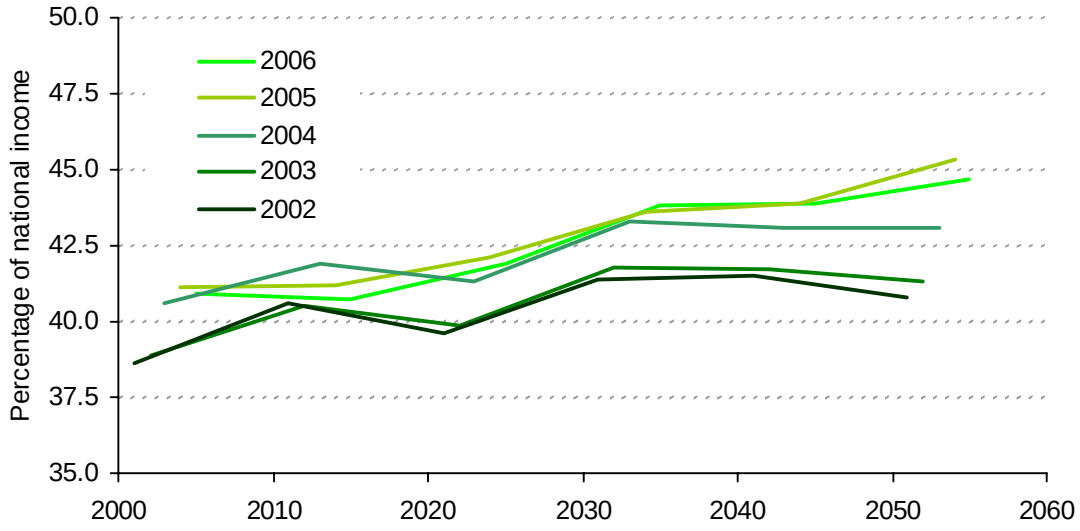
This might suggest that there should be no concern over the affordability of the likely increase in spending in the UK. But the larger EU economies (Germany, France and Italy) are expecting smaller increases in age-related spending, albeit from much larger current, and to

[23] Greece has been excluded from this comparison as data on comparable Greek pension spending are not available. However, previous European Commission estimates suggest that Greece has the largest increase, to the highest level, in pension spending as a share of national income over the next 50 years (see tables I.18 and I.19, pages 59 and 60, of European Commission, 'Public finances in the EMU', *European Economy* 3/2005 (http://europa.eu.int/comm/economy_finance/publications/european_economy/2005/ee305en.pdf)). Thus Greece is likely to face a much larger increase in age-related spending over the next 50 years than the UK.

much larger future, levels than in the UK. How such a pattern of increases in age-related spending would translate into overall public spending will depend on trends in the other components of spending (which, as shown in Figure 7.12, the Treasury believes will fall in the UK). Were a similar fall to occur in the other large EU economies, the share of national income spent publicly in the UK would remain below the share spent in both France and Italy, but would move slightly above the share spent publicly in Germany.

There is considerable uncertainty surrounding the projections for public spending over the next 50 years shown in Figures 7.12 and 7.13. Figure 7.14 compares the successive projections for long-term public spending that have been made by the Treasury since its first *Long-Term Public Finance Report* in 2002. They have shown considerable variation in the near term as well as the longer term. In addition, the variation in estimates for spending in the last year of the long-term forecast horizon is more substantial (at 4.5% of national income) than the largest change in spending over time projected by any one forecast (4.2% of national income). In part, these changes have occurred as a result of estimates of longevity being revised upwards by the Government Actuary's Department. This is not to say that there is no value in producing such projections (not least because publishing details of assumptions and modelling techniques should help to improve the quality of future projections), but it is important to bear in mind that the uncertainties over a long-term horizon will always be considerable.

Figure 7.14. Recent long-term projections for public spending



Note: Years refer to the financial year in which three quarters of the calendar year lies.
Sources: HM Treasury, *Long-Term Public Finance Report: An Analysis of Fiscal Sustainability*, various years, (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adlongterm.cfm).

7.5 Conclusion

The 2007 CSR looks set to be a particularly 'Challenging Spending Review'. The overall spending projections set out in the December 2006 Pre-Budget Report would, if implemented, reduce public spending by 0.5% of national income over the three-year period to be covered by the 2007 CSR. This would be equivalent to £7 billion in today's terms.

This chapter has shown that keeping to these spending plans would require difficult choices to be both made and delivered. Under a plausible scenario for debt interest payments, for growth in underlying social security benefit and tax credit expenditure and for spending on overseas aid, the combined budgets of health and education would be able to grow by 4.1% a year in real terms, as long as there were a real freeze across the budgets of all other departments. Such an increase would be lower than the 6.4% set to occur over previous Labour spending reviews from April 1999 to March 2008. It would also require other areas of spending – including defence and environmental protection – to receive no increase in their budgets, and it would not make any additional funds available for further progress towards the government's challenging 2010–11 child poverty target.

Previous analysis suggests that an additional £4½ billion of spending on the child element of the working tax credit would be the minimum required to give the government a 50:50 chance of meeting the child poverty target.[24] It would be extremely difficult for the Chancellor to find this without reducing growth in the combined budgets of health and education further. Freezing all other budgets in real terms would allow the health and education budgets to grow by 3.3% a year in real terms, which would lead to the difficult decision over whether to allocate the NHS less than the 4.4% a year minimum recommended by the 2002 Wanless Review or to cut education spending as a share of national income, which seems inconsistent with Mr Brown's rhetoric over the need to increase spending per pupil in state schools.

Perhaps the most plausible scenario is a tight CSR, with additional finance found for reducing child poverty, and possibly also for improving public services, in later Budgets and Pre-Budget Reports. However, this scenario would require additional resources. Keeping public spending constant as a share of national income over the three-year period to be covered by the 2007 CSR would require an additional £7 billion in today's terms.

The Treasury's own public finance projections suggest that there is little room for additional borrowing. As a result, additional finance would require either a pleasant surprise in terms of reduced public expenditure or increased tax revenues on existing policies. There is a parallel here with the last Comprehensive Spending Review of 1998, where the initial spending plans were topped up during a period of lower-than-expected expenditure on social security benefits and debt interest payments as unemployment, debt and interest rates all fell. A similar pleasant surprise on the spending side over the next few years is less likely – not least because unemployment and interest rates have less room to fall. Should greater-than-expected tax revenues not materialise over the next few years, then the Chancellor, whoever he or she may be, will face a difficult choice: whether to downplay the child poverty target, implement further tax-raising measures or tighten further the settlement for public services. Furthermore, as argued in Chapter 5, were revenues to exceed expectations, then the Chancellor should be wary of repeating the history of recent years – spending the proceeds of good fortune early in the economic cycle only to find him or herself having to retrench later on.

[24] M. Brewer, J. Browne and H. Sutherland, *Micro-Simulating Child Poverty in 2010 and 2020*, Joseph Rowntree Foundation, York, 2006 (http://www.jrf.org.uk/bookshop/eBooks/9781859355091.pdf).

8. Public services performance

Luke Sibieta and Helen Simpson (IFS)

Summary

- The output of public services is complex, multi-dimensional and difficult to measure.
- Using National Accounts measures, the output of the health and education sectors has been rising but productivity has not. However, these output measures may not be accurately capturing changes in the quality of services. Accounting for quality change typically increases measured output growth.
- Short-term falling productivity may not, however, be a problem. Increased output, even without productivity gains, may be desirable, and productivity improvements may be difficult to achieve in some sectors.
- To get an accurate picture of performance, measures should, as far as possible, incorporate non-targeted outputs in addition to those that are subject to performance targets.

8.1 Introduction

Spending on public services – notably health and education – has risen strongly since 2000, as Chapter 7 discusses in detail. So it is a natural time to ask, 'What has this delivered?'. This is not an easy question to answer objectively. This chapter attempts to do so by providing evidence on recent trends in the output and productivity of the health, education and social security administration sectors, which together comprised nearly one-third of total public spending in 2005–06. It also discusses difficulties in measuring the output of public sector services.

When considering what increased spending on public services has delivered, it is useful to step back and ask, 'What would we like it to deliver?'. A standard answer for the NHS might begin by suggesting a need for a greater volume of *inputs*, such as doctors, nurses and medical equipment, so as achieve a higher level of *output*, such as faster and higher-quality treatment. Higher levels of output could then improve health *outcomes*, which could include life expectancy and quality of life. For the education sector, society again might want more inputs, such as teachers and school buildings, in order to deliver higher levels of output, such as high levels of achievement across the board. This could then help deliver improved outcomes, which could include higher earnings later in life and improved social skills.

Evidently, both the outputs and outcomes we want from our public services are complex and multi-dimensional, including many attributes that are difficult to measure. Establishing the precise links between public service outputs and outcomes is also clearly a very difficult task. These observations permeate all of our discussions.

As well as providing a greater volume of output, we might also want a more 'productive' public sector. Bringing together both inputs and outputs, productivity boils down to capturing how effectively inputs are transformed into output, such as healthcare received by patients. More specifically, it relates a measure of the *volume* of output delivered to a measure of the *volume* of inputs used to do so. Productivity measures can be used to assess whether, for a given amount of resources, service providers are delivering increases in output over time or, put another way, whether they are able to deliver the same quality of service using fewer resources. Measuring productivity in the private sector is challenging in itself, but the public sector brings its own challenges, which, as alluded to above, centre on the completeness of the measurement of outputs.[1]

The government hopes that the efficiency of public services can be improved through the delivery of the recommendations of the recent Treasury-sponsored Gershon Review. However, as described in Box 8.1, it will be very difficult to establish whether or not the objective of nearly £21.5 billion of savings by 2007–08 is delivered, and the extent to which this was due to the implementation of the Gershon Review as opposed to efficiency improvements that would have happened even in the absence of the study.

The productivity of public sector services is, however, only one factor in determining how effectively public money is being spent. Society may prefer public sector providers to deliver more services or improvements in quality even at the expense of a decrease in productivity. Equally, an increase in productivity may not be welcome if it came at the expense of a decrease in the outputs of public services. Moreover, we might expect falling productivity and rising output to go hand in hand if particular public services are subject to decreasing returns to scale. However, falling productivity unaccompanied by any increase in outputs might raise concerns, as might significant discrepancies in productivity across providers in the same sector. Productivity also differs from a cost–benefit analysis, which might be used to assess the 'value for money' of a new government programme.

A further issue regards the fact that many of the measures of the outputs of public services are subject to targets. One might speculate that improved performance on targeted outcomes could have come at the cost of worsening non-targeted outcomes, if resources have to be diverted away from non-targeted outcomes towards the production of targeted ones. On the other hand, non-targeted outcomes might improve if they are delivered jointly with those subject to performance targets. Under either scenario, using these targeted measures as outputs, without taking into account the change in non-targeted measures, would lead to total outputs and therefore productivity being mismeasured.

The chapter is structured as follows. In Section 8.2, we discuss issues arising in the measurement of the output and productivity of public sector services. In Section 8.3, we present evidence on trends in output and productivity for the health, education and social security administration sectors. Section 8.4 concludes.

[1] For more detailed discussion of the measurement of public sector productivity, see H. Simpson, 'Productivity in public services', CMPO Working Paper 07/164, 2006.

Box 8.1. The Gershon Review and public sector efficiency

In August 2003, Sir Peter Gershon, then Chief Executive of the Office for Government Commerce (OGC), was asked by the government to lead a cross-cutting review of public sector efficiency. Accepting his conclusions, the Chancellor promised in the 2004 Spending Review to deliver efficiency gains of just under £21.5 billion a year by the end of the spending review period in 2007–08 – implying average productivity increases of 2½% a year.[a] The Treasury has now set a target for spending departments for productivity improvements of 3% a year over the 2007 Comprehensive Spending Review period to 2010–11.[b]

The Treasury claims to have been making steady progress towards the £21.5 billion Gershon target, with efficiency gains worth £2.0 billion by March 2005, £4.7 billion by September 2005, £6.4 billion by December 2005, £9.8 billion by March 2006 and £13.3 billion by September 2006.[c] Stephen Timms, Chief Secretary to the Treasury, told MPs in December 2006 that of the gains achieved by September 2006, £5.5 billion came from procurement ('getting better values from goods and services bought by government'), £2.4 billion from productive time ('freeing up more time for frontline service delivery') and £1.5 billion from policy, funding and regulation ('streamlining government machinery').[d]

External experts have complained that the Treasury does not provide adequate information to judge whether these figures are reliable. Referring to gains claimed in the 2005 Pre-Budget Report, the National Audit Office (NAO) said last February:

> In many of the projects we examined we saw that good progress towards delivering efficiency savings is being made. However… there were still significant risks that efficiencies were not being measured accurately and in many cases departments could not be sure that service quality had not deteriorated as a result of efficiency-related reforms… In some sectors there are time lags in reporting where some data is collected only once a year, meaning that there could be further gains beyond the £4.7 billion reported. Given these difficulties we conclude that the £4.7 billion of efficiency gains should be considered provisional and subject to further verification.[e]

The Treasury said in the 2006 Pre-Budget Report that the OGC had developed a framework, in consultation with the NAO, that 'has improved the way the Government is able to measure and assess efficiency gains'.[f] Future NAO reports will presumably indicate to what degree it believes we can have greater confidence in Treasury estimates of efficiency savings as a result of this new framework.

[a] Source: P. Gershon, *Releasing Resources to the Front Line: Independent Review of Public Sector Efficiency*, HM Treasury, London, 2004 (http://www.hm-treasury.gov.uk/media/B2C/11/efficiency_review120704.pdf).
[b] Page 133 of HM Treasury, *Pre-Budget Report 2006*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).
[c] Sources: Successive Budgets and Pre-Budget Reports; HM Treasury, *Releasing the Resources to Meet the Challenges Ahead: Value for Money in the 2007 Comprehensive Spending Review*, Cm. 6889, July 2006 (http://www.hm-treasury.gov.uk/media/67B/68/csr07_releasingresources1_130706.pdf).
[d] *Hansard*, 7 December 2006, col. 435.
[e] Page 29 of National Audit Office, *Progress in Improving Government Efficiency*, HC802-I, Session 2005–2006 (http://www.nao.org.uk/publications/nao_reports/05-06/0506802i.pdf).
[f] Page 140 of HM Treasury, *Pre-Budget Report 2006*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

8.2 Measuring public sector output and productivity

It is not easy to measure the output of a hospital – the amount of healthcare received by patients – or of a school – the amount of education received by pupils. The type of information available to measure output, typically counts of activities such as medical treatments or counts of service users such as numbers of pupils, may not be comprehensive enough to reflect all of the outputs of public services that are valued by society. For example, just as people are willing to buy contents insurance even if they never make a claim, they may also place a value on hospital treatment or help from the police being available should they need to use it. Output measures based on observable activities might be potentially misleading in cases where an important part of the service is hard to measure, such as fire or crime prevention. A decrease in the number of fires extinguished might incorrectly imply a fall in output, if the measure used did not encompass any offsetting increase in the extent of fire prevention activity. For other public services such as defence that are consumed collectively by society, no activity or output measures may be available at all.

Using measures of activities, such as counts of medical interventions, can also make it very difficult to measure improvements in the *quality* of service provided. For example, if scientific advances meant that fewer medical interventions were required to successfully treat a particular condition, this might be wrongly recorded as a decrease in output. One way around this is to try to incorporate information on *outcomes* such as levels of health or crime which will capture quality. But this poses a difficult measurement problem – how can we isolate, say, improvements in health that are due to public healthcare provision and not to other factors such as changing diet?

Using information on a comprehensive range of activities may be the best approach, but to measure the output of a whole sector such as education, it is often necessary to combine these various activities into a single output measure. The issue then is how to do so. Ideally, different outputs would be weighted together using information on the marginal social valuation of a unit of each output as a weight (e.g. the value of an extra GCSE grade compared with the value of an extra A level grade). In constructing aggregate measures of output for market sectors, prices provide the necessary information on marginal valuations of different goods and services and serve as weights. However, most public services are provided free at the point of use, so no price information is available to reflect the relative values of the various activities. Potential solutions include using information on the costs of different activities as weights or, for example in the health sector, aggregating different treatments using information on how each affects individuals' quality and length of life, captured by 'Quality Adjusted Life Years'.[2]

A recent review of the measurement of government output and productivity for the National Accounts, the Atkinson Review, made a number of recommendations for the measurement of output for public services.[3] Table 8.1 summarises some of the methods used (at that time) by

[2] See D. Dawson et al., 'Developing new approaches to measuring NHS outputs and productivity, Final Report', CHE Research Paper 6 / NIESR Discussion Paper DP.264, 2005 (http://www.niesr.ac.uk/pdf/nhsoutputsprod.pdf).

[3] T. Atkinson, *Atkinson Review: Final Report – Measurement of Government Output and Productivity for the National Accounts*, HMSO / Palgrave Macmillan, 2005
(http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/final_report.asp).

the Office for National Statistics (ONS) and some of the recommendations from the final report. Many of the recommendations involve increasing the comprehensiveness of the output indicators collected for each service, improving the weights used to aggregate the different indicators and incorporating better measures of quality change. For example, with regard to quality change in the case of education, suggestions included using information on

Table 8.1. Measuring the output of public sector services: recommendations from the Atkinson Review

Function	Main components of measure	Main recommendations going forward
Health	Hospital cost-weighted activity index, Family Health Services (number of GP consultations etc.).	Better measures for primary care. Movement towards measuring whole courses of treatment. Ideas for measuring quality change.
Education	Pupil numbers – quality adjustment of 0.25% to primary and secondary schools. Cost weights by school type (nursery, primary, secondary and special schools).	Measure pupil attendance not pupil numbers. School cost weights to be updated annually. Update the quality measure for schools and develop a new extended measure, which might include measuring the value of education through increased earnings. New measures of output for initial teacher training and publicly funded nursery places.
Administration of social security	Number of benefit claims for 12 largest benefits. No allowance for collection of contributions.	Update the index for social security administration to include a wider range of benefits and more accurate measures of unit costs. Include an adjustment for accuracy and timeliness.
Administration of justice	Number of prisoners, legal aid cases, court cases and probation cost-weighted activity index.	More detailed measures for the criminal justice system, with possible quality adjustment to reduce value accorded to overcrowded prison cells. Further development of measures of the output of the criminal justice system as a whole.
Fire	Number of fires, fire prevention and special services. Then split into further sub-categories. Weights proportional to average staff hours spent on each sub-category.	Measure output on basis of weights that reflect the cost to the community of fire (damage to life and property).
Personal social services	Children and adults in care and provision of home helps. Cost-weighted index.	Wider and more detailed coverage in the measure of adult social services output. Extension of children's social services output measure. Development work on quality adjustments.

Source: Adapted from table 2.1 plus later chapters of T. Atkinson, *Atkinson Review: Final Report – Measurement of Government Output and Productivity for the National Accounts*, HMSO / Palgrave Macmillan, 2005 (http://www.statistics.gov.uk/about/data/methodology/specific/PublicSector/Atkinson/final_report.asp).

examination results at different ages and considering an adjustment to reflect the valuation of education for future earnings.

Constructing productivity measures also requires information on inputs, which is typically easier to come by, but issues still arise with regard to measuring quality. For example, measures such as simple headcounts of staff can be improved by taking account of numbers of hours worked and the skills of those employees.

In the case of some public services, the individuals using them can in a sense be thought of as inputs themselves, which has implications for the measurement of output and productivity. It might be desirable for productivity comparisons across different hospitals or schools, say, to take account of the characteristics of individuals using the service, such as their underlying health or initial numeracy skills. One way to do this would be to only compare providers operating in similar environments – for example, to compare the productivity of hospitals serving areas with similar demographic characteristics. An alternative would be to adjust the output measures used, using 'value added' measures of education outputs to take account of the fact that different schools may have intakes of pupils of different abilities.

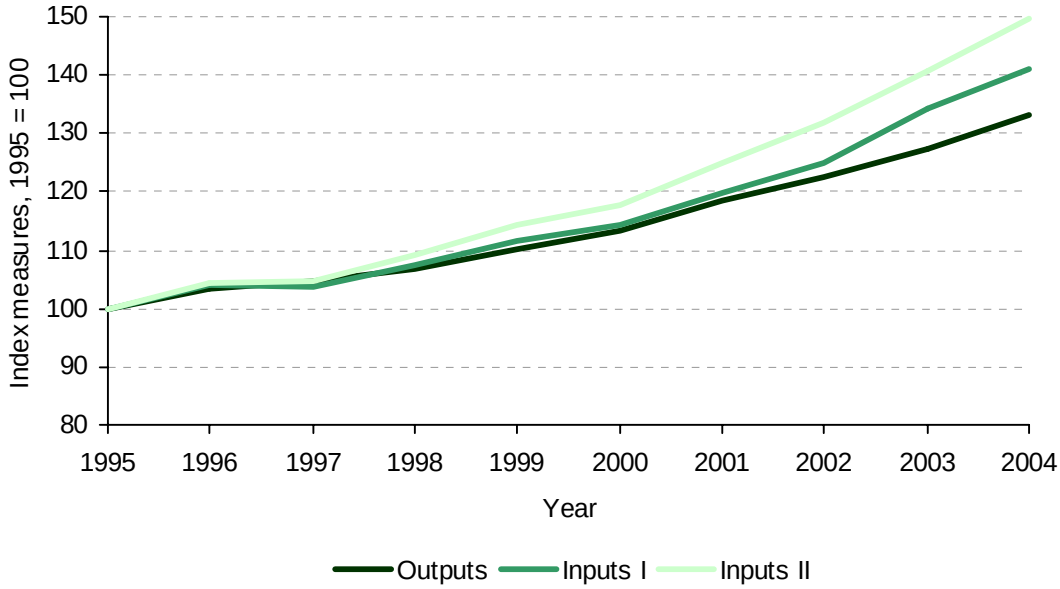
8.3 Trends in public sector performance

This section documents and discusses trends in output and productivity in three areas of public spending – health, education and social security administration.

Health

Figure 8.1 shows index measures of NHS outputs and two measures of inputs for the NHS, with base year 1995 = 100. The two indices of the volume of inputs are ONS upper- and

Figure 8.1. Measures of health outputs and inputs, 1995=100



Sources: Output measure is National Accounts 2005. Input measures I and II are lower and upper bounds from table 13 of ONS, 'Public service productivity: health', *Economic Trends*, 628, 26–57, March 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET628_Productivity_Heath.pdf).

lower-bound estimates. Even on the lower-bound estimate, it is clear that the growth in the volume of inputs outstrips the growth in the volume of outputs using this National Accounts measure.[4] But before inferring that productivity has fallen in later years, it is important to note that this output measure does not take account of potential quality improvements.

The Department of Health (DH) recently commissioned a study to investigate potential improvements to the measurement of the output and productivity of the NHS.[5] As shown in Table 8.1, the main measure of the output of the NHS is a cost-weighted index of activities covering hospital, primary care and community health services. The study makes methodological recommendations and suggestions for data collection to enable the construction of an output index using value weights based on health outcomes associated with different activities, using information on the effect of each activity on quality-adjusted life years, together with a value on waiting times.

The study also suggests ways of adjusting cost-weighted output measures for quality by incorporating factors such as survival rates, waiting times and patient satisfaction. Using data from 1999 onwards and incorporating these and other DH quality adjustments leads to an increase in the measured growth rate of output. Using this quality-adjusted output series, the ONS estimates that over the period 1999 to 2004, productivity growth was on average between –0.5% and +0.2% per year depending on which measure of the volume of inputs is used (using Inputs I versus Inputs II in Figure 8.1).[6]

Following the Atkinson Review, the ONS has also considered, and consulted on, a potential further adjustment to the measurement of the output of public services, concerned with how the value of public services changes in a growing economy – in the specific context of the health sector, whether or not the output of the NHS becomes more valuable in real terms as the economy grows, for example due to individuals valuing being in good health more as the returns to working (real earnings) rise. By making a further adjustment to the output series, allowing it to grow by 1.5% a year (the estimated rise in real earnings), in addition to the quality adjustments mentioned above, leads to estimated productivity growth being greater over the period 1999 to 2004, at on average between 0.9% and 1.6% per annum.[7]

But how informative is a measure incorporating this real earnings adjustment about the performance of the NHS? If the objective is to measure productivity growth for an individual organisation or service to determine whether or not there has been an increase in the efficiency with which it delivers goods and services, then any change in the valuation of that output should only translate into an increase in the real volume of output to the extent that it reflects a quality improvement, rather than any change in valuation driven by factors other than the actions of the service provider. Thus it seems that such an adjustment might only serve to muddy the waters in terms of understanding provider efficiency.

[4] Health spending has grown particularly strongly since 2000; see Chapter 7.

[5] D. Dawson et al., 'Developing new approaches to measuring NHS outputs and productivity, Final Report', CHE Research Paper 6 / NIESR Discussion Paper DP.264, 2005 (http://www.niesr.ac.uk/pdf/nhsoutputsprod.pdf).

[6] Source: ONS, 'Public service productivity: health', *Economic Trends*, 628, 26–57, March 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET628_Productivity_Heath.pdf).

[7] Source: ONS, op. cit.

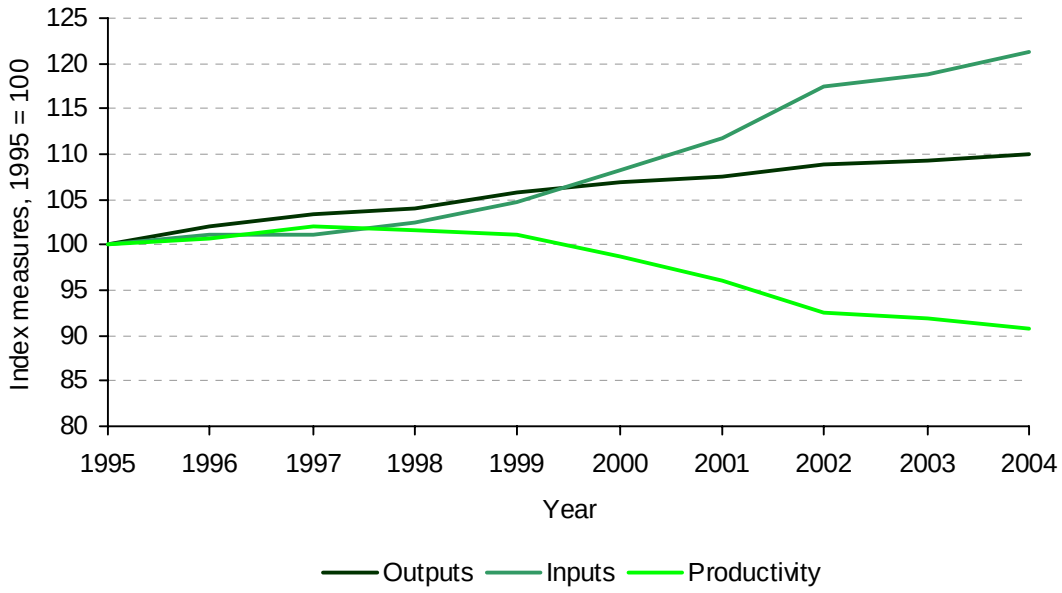
It is also informative to benchmark estimates of output and productivity growth against trends in related outcomes. For example, statistics from the early 1980s onwards show continued falls in infant mortality rates and increases in life expectancy and in 'healthy life expectancy'.[8] However, for outcomes such as life expectancy, it is difficult to isolate the contribution of the NHS as opposed to other factors such as diet and housing.

In summary, using the measures discussed in this section, the output of the NHS has certainly grown in recent years, and broad outcome measures such as life expectancy have improved. However, the measures do not provide strong evidence of productivity growth.

Education

Figure 8.2 shows index measures of outputs, inputs and productivity (the ratio of the output and input indices) as in the National Accounts for the education sector. For schools, output is measured using pupil attendance (following the Atkinson Review recommendation) with a +0.25% per annum quality adjustment.[9] For nursery schools and classes, output is measured using full-time-equivalent pupil numbers; for nursery free places, it is measured by the number of free places filled. Numbers of students are used to measure the output of initial teacher training courses and health professional courses. These different volume measures of output are aggregated together using costs as weights.[10]

Figure 8.2. National Accounts measures of education outputs, inputs and productivity, 1995=100



Source: ONS, 'Public service productivity: education', *Economic Trends*, 626, 13–37, January 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET626_CeMGA.pdf).

[8] See ONS, op. cit.

[9] The quality adjustment used here is the estimated trend improvement in GCSE results year-on-year in the mid-1990s, so naturally assumes that GCSE results can proxy for overall quality.

[10] Output is measured as in the National Accounts 2005.

The volume of inputs is measured by deflating nominal government expenditure on education by a series of price deflators (some of which are education-specific, some not).[11] Education expenditure includes expenditure on labour inputs (e.g. teaching and support staff), expenditure on goods and services (teaching aids, electricity, transport etc.) and capital consumption (an estimate of the amount of capital services delivered in each year from durable inputs such as computers and buildings). In terms of expenditure, labour inputs account for around three-quarters of total education inputs.

In each case, the indices are based at 100 in 1995. Over the period, inputs grow strongly, as might be expected given that there were 35,000 more teachers in 2006 than in 1997[12] and schools capital spending in England has grown from £1.4 billion in 1997–98 after adjusting for economy-wide inflation to £4.0 billion in 2004–05. In pure volume terms, overall inputs were about 20% higher in 2004 than in 1997 when Labour came to power.

Output also rises using the National Accounts measure, due mainly to rising levels of pupil attendance over the period. However, for much of the period, annual increases in the input index outstrip the corresponding increase in the output index; hence the index for this measure of productivity is falling for a large part of the period.

However, given that the output series is based on the number of full-time-equivalent pupils in the state sector adjusted by a constant +0.25% per year, the only way the government could have influenced the trend is to alter school attendance levels,[13] since the quality adjustment is constant.

A carefully constructed annual quality adjustment would provide a more accurate measure of performance. Experimental output series of this type have been produced by the ONS.[14] The first output series in Figure 8.3 reweights pupil attendance by the proportion of pupils achieving five GCSEs at grades A*–C each year – this is the GCSE threshold adjusted output series. The second output series reweights pupil attendance by the average progress made by cohorts over the four Key Stages (KS)[15] – this is the adjusted KS progress output series. Also shown on Figure 8.3 is how the output series evolved under the constant quality adjustment of +0.25% per year.

Looking at Figure 8.3, it can be seen that the two quality weighting techniques produce quite different results. The GCSE threshold methodology leads to output rising over the entire period and more quickly than under the old constant quality adjustment. This is primarily due to the fact that the proportion of pupils achieving five GCSEs at grades A*–C has risen much faster each year between 1998 and 2004 – an annualised average of 2.5% per year – than the constant quality adjustment of 0.25%, which is based on the average improvement in the mid-

[11] For more details, see ONS, 'Public service productivity: education', *Economic Trends*, 626, 13–37, January 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET626_CeMGA.pdf).

[12] Measured as the change in the number of full-time-equivalent teachers in the maintained sector between January 1997 and January 2006 according to http://www.dfes.gov.uk/trends/index.cfm?fuseaction=home.showChart&cid=3&iid=15&chid=58.

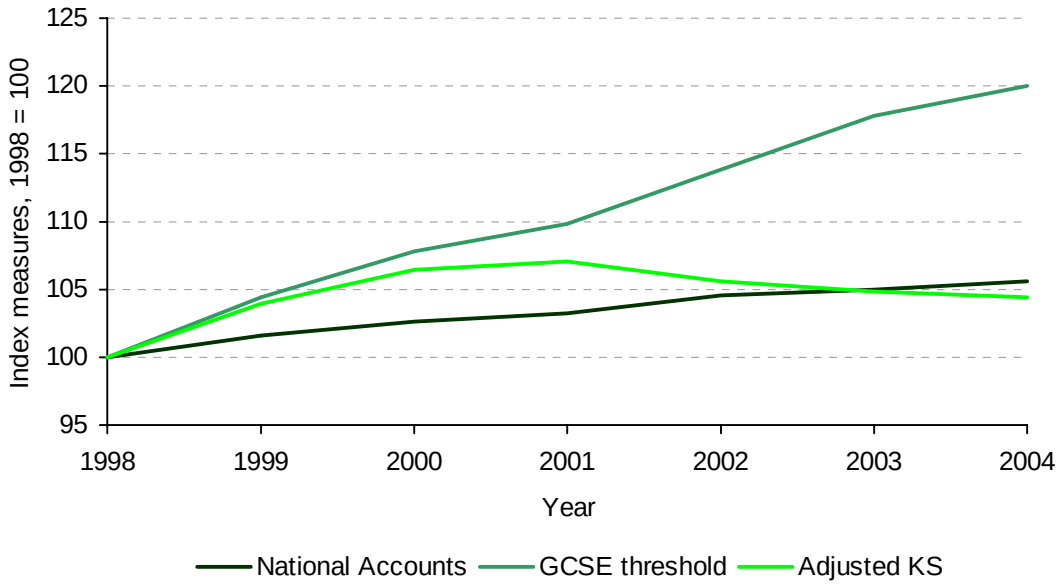
[13] For example, by reducing truancy, increasing staying-on rates or attracting more pupils who would otherwise have gone to the independent sector.

[14] ONS, op. cit.

[15] For precise details of how this is calculated, see Department for Education and Skills, *Measuring Government Education Output in the National Accounts*, 2005 (http://www.dfes.gov.uk/research/data/uploadfiles/RW45.pdf).

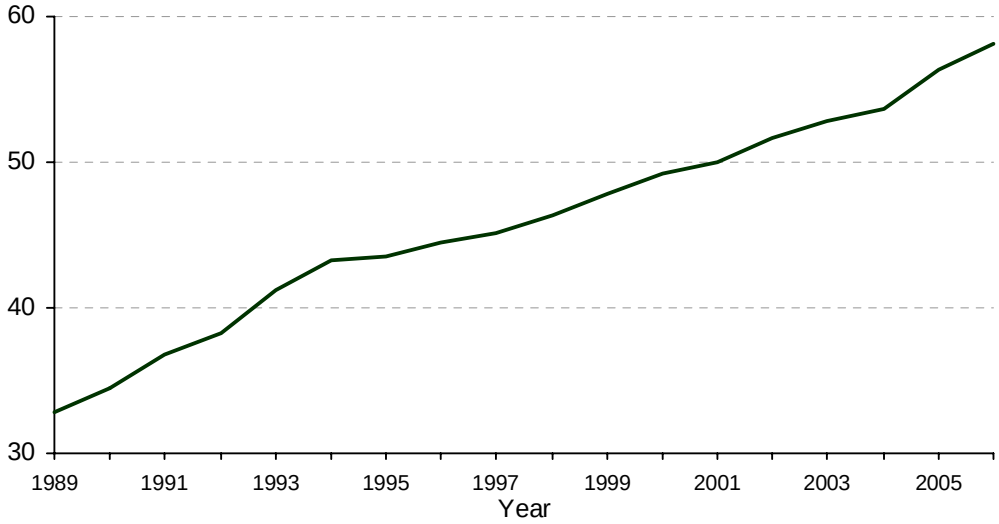
1990s. This can be seen in Figure 8.4, which shows the proportion achieving five GCSEs at grades A*–C between 1989 and 2006, but only for England. The improvement in this measure during the mid-1990s (e.g. 1994–95) also appears slightly anomalous compared with the much stronger growth over other years. The average annualised growth rate over the whole period from 1989 to 2006 is in fact 3.4%; hence the constant quality adjustment does not appear to be representative of longer historical trends.

Figure 8.3. Experimental measures of education outputs, 1998=100



Source: ONS, 'Public service productivity: education', *Economic Trends*, 626, 13–37, January 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET626_CeMGA.pdf).

Figure 8.4. GCSE results: proportion of 15-year-olds achieving five GCSEs at grades A*–C, 1989–2006

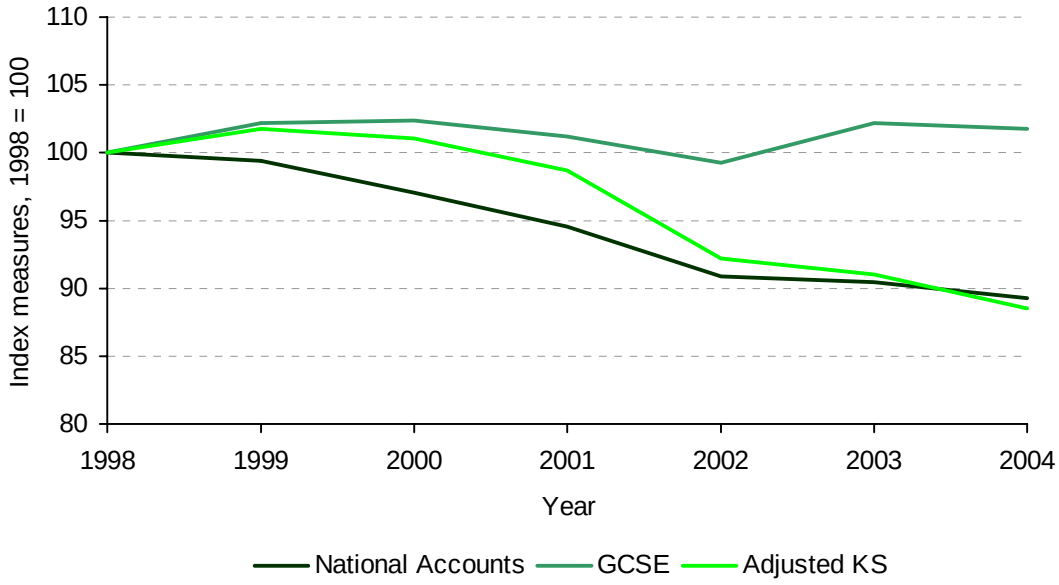


Note: These figures are for England only.
Source: http://www.dfes.gov.uk/trends/upload/xls/5_5t.xls.

The adjusted KS progress methodology shows a quite different pattern from both measures that adjust for quality using solely GCSE results. It shows output rising between 1998 and 2001, then falling slightly between 2001 and 2004, although output still remains higher at the end of the period than at the start. The different output trends are primarily due to different trends in the average progress between Key Stages and the proportion of pupils achieving five GCSEs at grades A*–C. The KS progress quality index used to adjust the output series increased between 1998 and 2001 at an annualised average of 2.1% per year, but then fell at an annualised average of 1.1% per year (driven mainly by lower changes in average points scores between KS2 and KS3, and between KS3 and GCSE).[16]

Figure 8.5 shows productivity as measured using the two experimental series. It shows largely constant productivity according to the GCSE threshold methodology and, from 1999, continually falling productivity with the adjusted KS progress measure. Taking the three methodologies together, it is clear that the trends are highly dependent on the quality adjustment chosen, with productivity either falling or remaining roughly constant.

Figure 8.5. Experimental measures of education productivity, 1998=100



Source: ONS, 'Public service productivity: education', *Economic Trends*, 626, 13–37, January 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET626_CeMGA.pdf).

So, which feels like the better measure to account for changing quality? The constant adjustment by definition does not take into account the fact that quality may have changed at different rates over the period, and does not seem representative of longer historical trends in that particular indicator. Comparing the annual quality adjustments, the adjusted KS progress may have an advantage in that it takes account of more than just one cohort of pupils in each year and covers performance across the whole schooling system rather than just at age 16. However, the ONS also highlights drawbacks with this measure – for example, difficulties in

[16] See Department for Education and Skills, *Measuring Government Education Output in the National Accounts*, 2005 (http://www.dfes.gov.uk/research/data/uploadfiles/RW45.pdf).

constructing a UK-wide measure due to differences in examination systems in different nations.

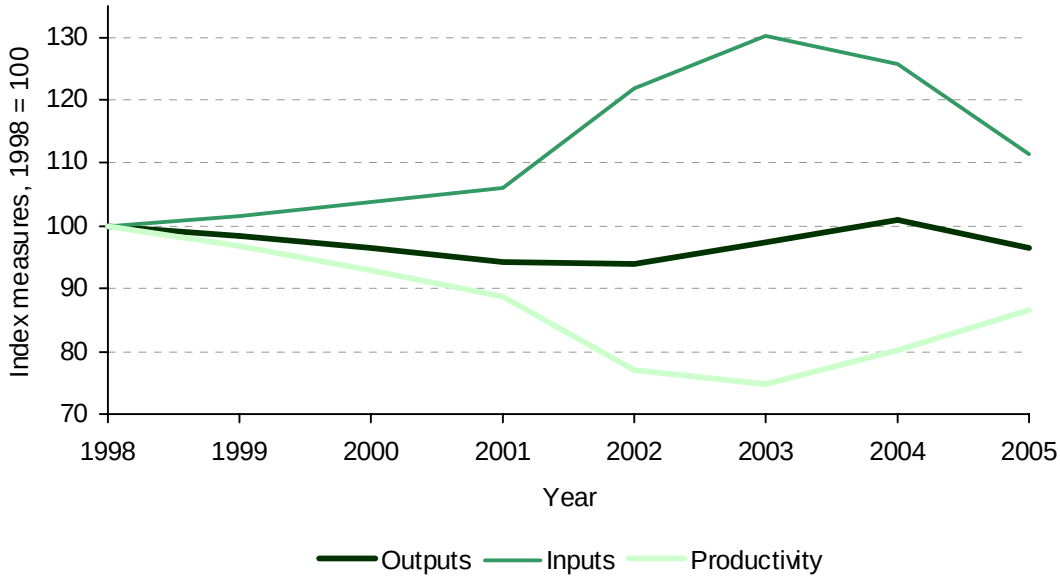
Naturally, more general outcomes associated with the education sector are important. These might include higher earnings for individuals, lower crime rates or improved social cohesion. However, even if some of these outcomes are measurable, it can be difficult to identify the exact contribution the education sector makes to them.

In summary, the figures presented show at least modest rises in the output of the education sector in recent years, possibly combined with lower productivity. However, it is worth noting that higher output may be desirable, even if it comes at the cost of reduced productivity. Moreover, it could well be that the higher levels of inputs observed are also improving outputs that are not easily measured. For instance, lower class sizes may not be substantially improving exam results, but they could allow teachers to spend more time with students to develop other skills. One good example would be social skills, which have been found to be important for determining future labour market outcomes.[17] However, by virtue of being difficult to measure, particularly on a UK-wide basis over time, it is very difficult to say what has happened to non-cognitive outcomes over recent years, or whether lower class sizes can improve them for that matter.

Social security administration

Figure 8.6 shows ONS index measures of outputs, inputs and productivity for social security administration (SSA). Note that the relevant expenditure is the cost of *administering* social

Figure 8.6. Measures of social security administration outputs, inputs and productivity, 1998=100



Source: ONS, 'Public service productivity: social security administration', *Economic Trends*, 634, 47–58, September 2006 (http://www.statistics.gov.uk/downloads/theme_economy/ET634.pdf).

[17] See P. Carneiro, C. Crawford and A. Goodman, 'Which skills matter?', CEE Discussion Paper CEEDP0059, 2006 (http://cee.lse.ac.uk/cee%20dps/ceedp59.pdf).

security, rather than the total cash value of social security benefits (these are discussed briefly below). For SSA, output is measured as the sum of new claims that have been processed and the load arising from the continuation of existing payments on 24 different SSA activities, including the provision of working-age benefits, disability and carer benefits, pension services, and housing and child benefit. Following the Atkinson Review recommendations, these are weighted by the unit costs associated with each activity in 2004–05 and by estimated unit costs where appropriate. This leads to the cost-weighted activity index shown in Figure 8.6, with base year 1998 = 100.

The volume of inputs is measured by deflating nominal government expenditure on SSA using separate deflators for Department for Work and Pensions (DWP) and non-DWP expenditure. SSA expenditure includes expenditure on compensation of employees (e.g. Jobcentre Plus staff), procurement (office consumables, consultancy services etc.) and capital consumption.[18] In terms of expenditure, labour inputs and procurement account for just less than one-half of total SSA expenditure *each* – capital consumption accounts for only a small proportion. The input series is presented in Figure 8.6 as an index with base 1998 = 100.

Over the entire period, measured output has fallen slightly, whilst inputs have risen, leading to a fall in productivity. This, however, masks quite strong changes within the period. First, inputs rose sharply between 2001 and 2002, almost certainly due to extra inputs required to set up DWP in June 2001 and continued DWP modernisation programmes.[19] Inputs also rose sharply in 2003 to cover the extra costs of administering the new pension credit (introduced in October 2003), which had a wider coverage than its predecessor the minimum income guarantee. Inputs have since fallen back to levels comparable to those in 2001. The fall in output over the period is interrupted by a brief increase in output in 2003 and 2004 associated with the new pension credit (ONS shows that of the 3.4 percentage points of output growth in 2003, 3.9 percentage points can be attributed to the Pension Service, with other items contributing negative amounts).

As a result of these trends in inputs and outputs, productivity is seen to fall between 1998 and 2003, after which it experiences an increase, though still remaining below the 1998 level at the end of the period in 2005.

These estimates of inputs, outputs and productivity do not account for qualitative changes in SSA, which could include the accuracy and speed at which new and existing claims are processed. Evidence from DWP suggests that both of these are improving, and thus trends in output and productivity as presented may be too low once quality improvements are accounted for. Other qualitative changes that it would be sensible to account for include the degree of fraud, customer compliance costs and customer satisfaction levels.

One significant quantitative omission from SSA is tax credits administered by HMRC. These are not included as they are deemed to be part of the tax system. Much evidence suggests that the working tax credit and the child tax credit have been poorly administered compared with

[18] Note that it is only expenditure on *social security* administration that is counted here; *economic affairs* administration on, for example, welfare-to-work programmes has not been counted.

[19] DWP was formed from the former Department for Social Security and the Employment Service, and since then various DWP agencies have been created such as Jobcentre Plus and the Pension Service.

other benefits, since their introduction in April 2003.[20] However, in terms of staff cost per application, tax credits come out quite favourably (£34) compared with some other major benefits such as income support (£60) and incapacity benefit (£47).[21] This does not necessarily mean that tax credits are actually delivered in a more productive manner, as the quality of administration may be lower. Given that over half of all complaints to HMRC for the last three years were regarding tax credits and that overpayments totalled £1.8 billion in 2004–05,[22] this may well be the case. Moreover, this measure does not account for non-staff expenditure (i.e. spending on items such as computers and buildings), which we know to be quite high for tax credits (£270 million in 2004–05[23]) but do not know for individual DWP benefits such as income support (IS) or incapacity benefit (IB).

Tax credits do not come out as favourably when looking at a measure of total staff costs as a proportion of the value of benefits paid out. For every £1 spent on tax credits, about 1.3p is spent on staff costs, compared with less than 1p for IB and IS, although this is less than the 2p spent on jobseeker's allowance. Once non-staff costs are included, for every £1 spent on tax credits, 3p is spent on administration.[24]

It is also interesting to look at *outcomes* that are to some extent associated with the administration of social security, though more so with the value of benefits delivered, alongside the measures of SSA output. The most prominent of these outcomes are levels of child poverty and pensioner poverty. Child poverty was about 700,000 lower in 2004–05 than in 1998–99[25] – a substantial fall of about 21%, but not large enough to meet the government's target to reduce it by one-quarter in 2004–05 compared with 1998–99. Moreover, measured after housing costs, a pensioner is now less likely to be in poverty than a non-pensioner.[26]

While these are informative, clearly such outcomes are also affected by a range of factors other than the output of the administration of social security and the value of benefits provided – note that entitlement to benefits has increased quite substantially in recent years for both pensioners and families with children. Indeed, it is very difficult to attribute the degree to which changes in these measures are due to changes in the performance of SSA. One should again note a potential tension between outcomes that society values, such as

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[20] See the Comptroller and Auditor General's report on the Inland Revenue's accounts for 2003–04, Inland Revenue, *Annual Report and Accounts*, HC1062, TSO, London, 2004 (http://www.hmrc.gov.uk/pdfs/report2004.pdf).

[21] Note that the figures for tax credits relate to 2004–05 and are taken from House of Commons Committee of Public Accounts, *Filing of Income Tax Self Assessment Returns*, HC681, Session 2005–06 (http://www.parliament.the-stationery-office.co.uk/pa/cm200506/cmselect/cmpubacc/681/681.pdf), whilst the figures for IS and IB relate to 2003–04 and are taken from National Audit Office, *Helping those in Financial Hardship: The Running of the Social Fund*, HC179, Session 2004–05 (http://www.nao.org.uk/publications/nao_reports/04-05/0405179.pdf).

[22] Taken from HMRC, *2005–06 HMRC Resource Accounts and Trust Statement*, HC1159, Session 2005–06 (http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageVAT_ShowContent&propertyType=document&columns=1&id=HMCE_PROD1_025710).

[23] This is calculated by subtracting staff costs as documented in http://www.parliament.the-stationery-office.co.uk/pa/cm200506/cmselect/cmpubacc/681/681.pdf from total administrative costs as documented in http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageVAT_ShowContent&propertyType=document&columns=1&id=HMCE_PROD1_025710.

[24] Taken from HMRC, *Annual Report and Accounts 2004–05*, Cm. 6691, Session 2005–06 (http://customs.hmrc.gov.uk/channelsPortalWebApp/downloadFile?contentID=HMCE_PROD1_025022).

[25] Child poverty measured as the number of children living in households with incomes below 60% of the median before housing costs.

[26] Department for Work and Pensions, *Households Below Average Income 1994/95–2004/05*, 2006, (http://www.dwp.gov.uk/asd/hbai/hbai2005/contents.asp).

reductions in income poverty and inequality, and productivity in the administration of benefits and tax credits. For instance, increasing productivity in administration may help to reduce poverty and inequality. On the other hand, if the use of means-tested benefits implies more complex administrative procedures but is better at directing resources towards those in poverty, a move in this direction might improve outcomes at the potential expense of reduced administrative productivity. The use of means-tested benefits (e.g. pension credit) may also help to improve outcomes such as poverty and inequality with lower increases in benefit expenditure, as compared with what might be necessary with non-means tested benefits (e.g. basic state pension). This is an argument the government used in its 2002 Pensions Green Paper.[27]

8.4 Conclusion

The demands we place upon our public services are many and multi-dimensional, so it is unsurprising that accurately measuring their output is very difficult indeed. Outputs that society values, such as fire prevention, are not easy to quantify, and an absence of price information means that it is difficult to aggregate up individual outputs into a provider- or sector-level measure.

Using National Accounts measures, the output of the health and education sectors has been rising but productivity has not, as increases in the volume of inputs have outstripped measured output growth. The National Accounts output measures are unlikely to be accurately capturing changes in the quality of services. Adjustments for quality change in these sectors typically increase measured output growth, but the exact magnitude of changes appears to be quite sensitive to the specific quality adjustment chosen. However, it is possible that increased output might be desirable even in the absence of productivity gains, and further productivity growth might be difficult to achieve in some sectors.

In general, output measures should aim to be as comprehensive as is feasible – for example, to provide an accurate picture of performance, measures should, as far as possible, incorporate non-targeted outputs in addition to those that are subject to performance targets. The presence of unmeasured outputs, which are nonetheless valued by society, should also be taken into consideration when interpreting performance measures.

[27] Department for Work and Pensions, *Simplicity, Security and Choice: Working and Saving for Retirement*, Cm. 5677, 2002 (http://www.dwp.gov.uk/consultations/consult/2002/pensions/gp.pdf).

9. VAT fraud and evasion

Stephen Smith (IFS and UCL)

Summary

- VAT revenue losses through evasion jumped sharply in 2005–06, reaching £12.4 billion or 14.5% of potential VAT revenues. HM Revenue and Customs estimates that missing trader and carousel frauds account for less than a quarter of these losses, but that they have been growing rapidly despite its best efforts.
- HMRC estimates that the VAT gap increased by £2.7 billion in 2005–06, with missing trader fraud increasing by around £1 billion. If the jump in the VAT gap is genuine, either missing trader fraud is significantly higher than HMRC suggests or there has been an abrupt, significant and unexplained rise in other VAT fraud.
- Carousel frauds exploit opportunities provided by the VAT zero-rating of exports. The vulnerability of the VAT systems of EU member countries has increased as a result of the abolition of internal EU frontiers at the end of 1992.
- The UK government has sought EU agreement to extend reverse charging for certain categories of transaction, and, if agreed, this may help to check the growth in carousel fraud. But the underlying problem is unlikely to be resolved without a fundamental reform to the VAT treatment of international transactions, which would end the zero-rating of exports.

9.1 Introduction

Shortfalls in VAT receipts have torn holes in the Chancellor's Budget arithmetic. For the financial year 2005–06, the eventual £72.9 billion VAT revenue out-turn was £4.4 billion (almost 6%) lower than the revenue forecast made only two years earlier, in the 2004 Pre-Budget Report (Table 9.1). Even the 2005 Pre-Budget Report, which made a substantial downward revision of the revenue projection for 2005–06, based on data for actual receipts in the first eight months of the year, overestimated 2005–06 revenues by £1.5 billion. The revenue estimates for 2006–07, likewise, have been adjusted downwards from the £77.3 billion projected in the 2005 PBR to £76.2 billion in the 2006 PBR. What has been going on, and is the experience of 2005–06 good reason to be sceptical about the substantial increase in VAT receipts (to £80.1 billion) projected for 2007–08? Equally importantly, how can the underlying problem causing these revenue shortfalls be fixed?

The over-projection of VAT revenues is, it should be noted, a recent phenomenon. As the data for earlier years in Table 9.1 show, the VAT projections for 2004–05 were quite close to the final revenue out-turn, while those for 2003–04 were actually pessimistic, under-predicting revenues by a significant margin.

Table 9.1. The evolution of VAT revenue estimates

	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
PBR 2006				72.9	76.2[e]	80.1[p]
FSBR 2006			73.0	73.7[e]	76.5[p]	
PBR 2005			73.0	74.4[e]	77.3[p]	
FSBR 2005		69.1	72.3[e]	76.3[p]		
PBR 2004		69.1	73.5[e]	77.3[p]		
FSBR 2004	63.5	69.7[e]	73.1[p]			
PBR 2003	63.5	69.0[e]	72.2[p]			
FSBR 2003	63.6[e]	66.6[p]				

Notes: [e] denotes full-year estimates based on actual receipts for part of the year only. [p] denotes revenue projections.
Sources: HM Treasury Pre-Budget Report 2006, annex B, table B13; corresponding tables in previous FSBRs and PBRs.

In this chapter, we focus on one explanation for the VAT revenue lost to fraud and evasion, namely the large-scale 'carousel' frauds that have hit the headlines in recent months. In Section 9.2, we outline the existing VAT system (see Box 9.1) and explain the particular ways in which VAT is vulnerable to evasion and large-scale organised fraud, and Section 9.3 discusses the evidence on the scale of VAT revenue losses from this source. Section 9.4 assesses the range of policy options available to tackle VAT evasion and fraud.

9.2 The vulnerability of VAT to evasion and fraud

Like all taxes, VAT is subject to evasion. For example, traders may fail to register for the tax, they may under-report sales or, where different goods are subject to tax at different rates, they may reduce their tax payments by misclassifying sales into the category subject to a lower rate (or zero rate) of tax. In some respects, the particular structure of VAT may reduce its exposure compared with other systems of sales taxation. In particular, the gradual cumulation of the tax at each stage of the chain of production and distribution may reduce the amount of tax at stake at each stage, and hence the gains to be made from making untaxed sales. This does not make the VAT 'self-enforcing', as sometimes claimed, but it does reduce its exposure to evasion compared with alternative single-stage sales taxes levied at a comparable rate, such as the retail sales taxes common in the US.

In other respects, however, VAT offers distinctive opportunities for evasion and fraud, especially through abuse of the credit and refund mechanism. Revenue may be lost through exaggerated claims for credit for VAT paid on inputs to production. Moreover, the opportunity exists for outright fraud through the construction of business activities with the sole purpose of defrauding the exchequer, because some categories of business can be entitled to net refunds of VAT from the revenue authorities. These can include firms selling predominantly zero-rated goods (see Box 9.1) while claiming credit for significant amounts of VAT paid on standard-rated production inputs. While zero-rated domestic sales can create opportunities of this sort, the main point of vulnerability in the current system arises because of the VAT zero-rating of exports.

Box 9.1. A brief VAT primer

Value added tax (VAT) is levied on the sale of goods by registered businesses (those with annual turnover above a minimum threshold, currently £61,000). VAT is applied to sales both to private consumers and to other businesses (in contrast to the retail sales taxes levied in the US, which generally tax sales to final consumers only).

Business purchasers are, however, able to offset the VAT they have paid on their purchases ('input VAT') against their 'output VAT' liability on their sales. The result is that no net revenue is collected from the taxation of intermediate goods sales (business-to-business or B2B sales), but the tax revenue is collected gradually, throughout the chain of production and distribution. This reduces the scope for evasion compared with a retail sales tax levied at the same rate on sales, and it avoids the need for businesses and the revenue authorities to draw a distinction between the taxation of a firm's sales to final consumers and to other businesses.

For example, consider a simple chain of production consisting of two firms. Firm X makes sales of £30,000 to final consumers and no B2B sales. In the course of production, it uses inputs purchased from Firm Y at a cost of £10,000 plus VAT. Firm Y makes no sales to consumers and uses no taxed inputs; its entire £10,000 output is sold to firm X.

If the sales of both firms are subject to VAT at the UK standard rate of 17.5%, Firm Y will be liable for £1,750 in VAT on its sales to X. Firm X will be liable for output VAT of £5,250 on its sales of £30,000, but can offset the £1,750 tax paid on its inputs against this, giving a net VAT liability of £3,500. The VAT collected from Firm Y is thus, in effect, refunded to Firm X. Total VAT collected from the two firms taken together is £1,750 + £3,500 = £5,250, which is equivalent to 17.5% of the (tax-exclusive) value of the sales made to final consumers.

Where goods are VAT ***zero-rated***, the seller charges a VAT rate of zero on its sales but is still entitled to credit for the input VAT paid. This can lead to negative VAT payments (i.e. refunds) where firms sell zero-rated goods but have standard-rated inputs. *For example, if the sales of Firm X in the above example are zero-rated, while Firm Y's sales are standard-rated, Firm X would charge no VAT on its sales and would be due a refund of the £1,750 VAT paid on its purchased inputs.*

Where goods are ***VAT-exempt***, the firm's sales are not subject to VAT but the firm does not have the right to reclaim the VAT paid on its inputs. *If Firm X in the example is selling VAT-exempt goods, it would charge no VAT on its sales but would not be able to reclaim the £1,750 VAT paid on the inputs purchased from Firm Y. Firm X's sales would thus indirectly bear some VAT, in the form of the VAT charged earlier on the inputs purchased from Firm Y. This VAT would 'stick', and the price at which Firm X makes its sales would need to reflect this input tax.*

The VAT systems of the member states of the European Union tax trade transactions (both between member states and with the rest of the world) on a 'destination' basis. Exported goods are VAT zero-rated, meaning not only that a tax rate of zero is applied to their sale but also that the seller is entitled to reclaim the VAT paid on taxed production inputs. Symmetrically, imported goods are taxed on their full value by the importing country.[1] Businesses that make a high proportion of sales to customers abroad can thus be entitled to net payments from the exchequer. The level of VAT refunds can be a high proportion of gross VAT receipts – in the UK (which zero-rates around 13% of consumer expenditure – including items such as food, books and newspapers – as well as zero-rating exports), refunds amount to about 40% of gross VAT receipts.[2]

'Missing trader intra-community' (MTIC) frauds, of which 'carousel frauds' are the best-known example, exploit the refund of VAT to exporters to milk the VAT system of revenues through a series of contrived transactions. Box 9.2 illustrates the mechanism involved with a simple example; in practice, many layers of additional complexity are added to the simple structure in order to obscure the fraud. The two key features of the VAT that are exploited in the carousel fraud in Box 9.2 are the ***VAT zero-rating of exports*** and the system of ***'deferred payment' for VAT on imports***, adopted in the EU since the removal of fiscal frontiers in 1992.[3] Under deferred payment, VAT on imports from one member state into another is levied not at the border but at the time of the importer's next periodic VAT return. As a result, there may be a considerable time lag between the date at which the importing firm (Company B in the example) imports the goods and the time at which the VAT authorities seek payment of the VAT due. In the mean time, the goods are sold on, via complicit – or perhaps unwitting – 'buffer' companies in the UK, to Company D, which exports the goods, claiming a refund of the VAT that it paid when it purchased the goods from Company C. In the basic carousel illustrated, the exported goods are then re-imported by Company B, and so on, following a cycle in which VAT refunds are claimed repeatedly whenever the goods are exported, while the corresponding import tax liability accumulates but is never paid. After a while, Company B, which would be liable to a substantial level of VAT on its imports, disappears, without paying any VAT.

As noted above, the basic structure of the fraud may be concealed by further complications. Indeed, innovation has been a constant feature of these forms of fraud, as those perpetrating them seek to stay one step ahead of the authorities' ability to detect fraudulent transactions.

The problems for enforcement are compounded by the difficulty of identifying which of the traders are actively and knowingly involved. With the exception of the key player, the eventual missing trader, and the exporter, to whom the financial benefit of the fraud accrues in the form of VAT refunds, the other participants need not be knowingly involved in the

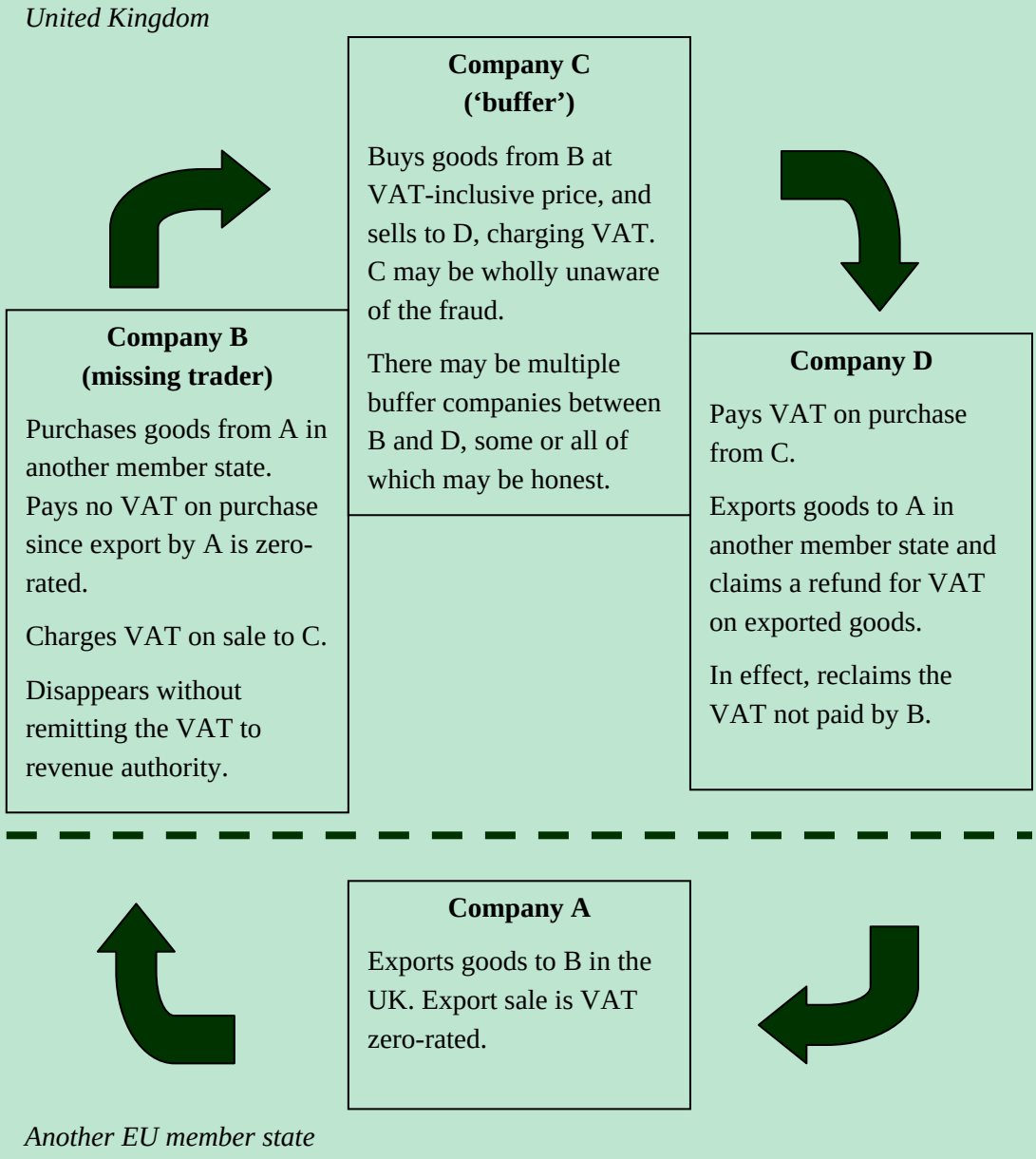
[1] Tax is imposed on import from goods imported from non-EU countries, and a deferred payment mechanism applies for imports from other EU member states, under which any VAT due is included in VAT accounting and payments of the importing firm.

[2] G. Harrison and R. Krelove, 'VAT refunds: a review of country experience', IMF Working Paper WP/05/218, 2005 (http://www.imf.org/external/pubs/ft/wp/2005/wp05218.pdf).

[3] There are indications that the general level of VAT revenue losses rose by about one-third by the mid-1990s compared with pre-1992 levels (table 2.1 of HM Customs and Excise, *Measuring Indirect Tax Losses*, 2002, http://www.hm-treasury.gov.uk/media/389/E5/admeas02-297kb.pdf). It is unclear what has sparked the recent sharp growth in organised, large-scale fraud.

process. Some may have their suspicions, and some may be more actively engaged – for example, in adjusting prices so as to transfer the benefit of the VAT refunds to other players in the carousel.

Box 9.2. The basic carousel fraud: an illustration



9.3 Estimates of losses through evasion and fraud

How much revenue is lost through VAT evasion in general and through carousel fraud and other MTIC fraud in particular?

Since 2002, the UK government has published an annual estimate of VAT losses, based on a comparison between actual VAT receipts and an estimate, largely from National Accounts

data on household spending, of the hypothetical VAT revenue that would be obtained with full compliance: the 'theoretical total VAT liability' (VTTL) – see Table 9.2.

In principle, the approach adopted by HMRC in calculating this 'VAT gap' is straightforward, although in practice a number of steps involve significant judgement and imprecision. The methodology was scrutinised in 2004 by the National Audit Office, which concluded that it was the best available approach.[4] The starting point is aggregate data on consumer spending, with a commodity breakdown corresponding to the pattern of VAT rates. The UK applies a standard rate of 17.5% to most goods and services, but a reduced rate of 5% to domestic energy expenditures, and a zero rate to food, children's clothing, books and newspapers, and various other items. These zero-rated items correspond to about 13% of all consumer expenditure. A further 30% of total consumer spending is VAT-exempt (see Box 9.1), including items such as financial services and some health and education services. Applying the relevant tax rates to each spending category gives an initial estimate of VAT revenue.

Various adjustments are then made to this initial figure to compute the hypothetical maximum level of VAT revenue (VTTL):

- Amounts are deducted in each taxed spending category to reflect sales by small businesses with turnover below the VAT registration threshold. Small firms with annual turnover below the VAT registration threshold (currently £61,000 per annum) are not required to register for VAT, so their sales do not directly generate VAT revenues. However, these firms also cannot recover input VAT, so may experience an effective rate of VAT likely to be in the order of 3–6% depending on sector.
- An adjustment is made to reflect the effective rate of VAT on supplies of explicitly exempted items, such as the financial sector, health and education services, and clubs. Again, this reflects the inability of businesses to recover input VAT.
- Timing adjustments are needed to reflect the average lag of approximately one quarter between a transaction and the corresponding VAT receipt. Roughly speaking, this means that the VAT theoretical liability calculated on a calendar-year basis can be compared with fiscal-year receipts (the fiscal year beginning at the start of April).

Table 9.2. HMRC's estimates of the 'VAT gap'

Time period	Net VTTL £bn	Net VAT receipts £bn	Revenue loss £bn	VAT gap % ***PBR06*** *(PBR05)*
2001–02	72.1	61.0	11.1	***15.4%*** *(15.7%)*
2002–03	75.6	63.6	12.0	***15.9%*** *(16.8%)*
2003–04	78.8	69.1	9.7	***12.4%*** *(13.5%)*
2004–05	82.4	72.7	9.7	***11.7%*** *(13.5%)*
2005–06	85.5	73.1	12.4	***14.5%*** (n.a.)

Source: HM Revenue and Customs, *Measuring Indirect Tax Losses – 2006*, available at http://www.hmrc.gov.uk/pbr2006/supplementary.htm.

[4] National Audit Office, *HM Customs and Excise: Tackling VAT Fraud*, Report by the Comptroller and Auditor General, HC357, Session 2003–2004, 3 March 2004.

Estimates of the VTTL, the revenue shortfall and the percentage revenue 'gap' from the 2006 exercise are shown in Table 9.2. In the most recent financial year, 2005–06, the VAT gap is estimated at some 14.5% of the net VTTL, corresponding to a revenue loss from all forms of VAT evasion of some £12.4 billion. Changes to the data and the methodology mean that the figures for 2004–05 and earlier years have been revised downwards compared with those given in the 2005 publication. But the broad time profile of the figures remains unchanged: the percentage VAT gap appeared to peak at nearly 16% of potential revenues in 2002–03, but then dropped sharply, perhaps because of the additional resources that HMRC began to devote to tackling VAT fraud. The estimates for 2005–06 show a marked reversal of the downward trend, and a sharp jump of nearly £3 billion in the amount of revenue lost compared with the previous year. This increase in evasion losses could thus account for perhaps two-thirds of the shortfall in forecast revenues for 2005–06 seen in Table 9.1.

Much of this VAT gap reflects revenue lost through relatively mundane forms of fraud and evasion – under-declaration of sales, exaggeration of input VAT, non-registration and the like. The high-profile missing trader frauds, including carousel fraud, may have accounted for less than a quarter of the total revenue loss of £12.4 billion. HMRC estimates that *attempted* missing trader (MTIC) fraud in 2005–06 was likely to have been £3.5–4.75 billion, of which a proportion would have been thwarted as a result of investigation work. The final loss in revenue in 2005–06 from MTIC fraud would, according to HMRC, be of the order of £2–3 billion. The basis of the estimate of MTIC fraud is not fully disclosed, and it is difficult therefore to assess its robustness and likely margin of error. It is higher than the corresponding estimate for 2004–05, when losses through MTIC frauds were assessed at £1.12–1.9 billion. Part of the increase can be explained by a change in HMRC's method for estimating losses through MTIC fraud,[5] and it is possible that the MTIC fraud estimate for 2004–05 understated the true level of such fraud. However, even if all of the difference (of some £1 billion) between the estimates of MTIC fraud for 2004–05 and 2005–06 reflects growth in the level of this fraud over the past year, this would still be insufficient to explain the £2.7 billion jump in the VAT gap between the two years. If the jump in the VAT gap is genuine, and not simply a statistical artefact, one of two things must be true: either the rise in MTIC fraud losses is substantially higher than HMRC's figures suggest, or else there has been an abrupt, significant and unexplained rise in other forms of VAT non-compliance.

An indication of the enormous volatility of the level of missing trader fraud in the UK is provided by recent adjustments made by the Office for National Statistics (ONS) to published trade data.[6] These show a sharp growth in the trade flows associated with fraudulent activity, from £2.6 billion in 2004, to £11.2 billion in 2005, and a staggering £24.8 billion in the first half of 2006. From the start of the third quarter, however, the adjustments to trade statistics for trade associated with VAT fraud have dropped sharply, to barely £3 billion in the five months to November 2006.[7] For the year as a whole, this might suggest total exports associated with MTIC fraud of around £26 billion, and, applying the UK standard VAT rate

[5] Using the previous methodology, MTIC fraud in 2005–06 would have been estimated at £1.4–2.4 billion.

[6] See the discussion of these trade adjustments on page 23 of Bank of England, *Inflation Report*, August 2006 (http://www.bankofengland.co.uk/publications/inflationreport/ir06aug.pdf).

[7] Page 8 of National Statistics, *First Release: UK Trade*, November 2006 (http://www.statistics.gov.uk/pdfdir/trd0107.pdf).

of 17.5%, associated revenue losses of some £4.5 billion, about 5% of VTTL. This is about 50% higher than the upper bound of HMRC's estimate of the revenue lost through missing trader fraud in 2005–06, although broadly similar to HMRC's estimate of *attempted* MTIC fraud in 2005–06.

Whether these trends in the UK have been accompanied by similar increases in VAT fraud elsewhere in Europe is difficult to assess. The UK revenue authorities have been particularly open about their assessment of VAT revenue losses, and the annual publication of this estimate may have raised the profile of the issue. Similar estimates are not routinely published by the revenue authorities of other EU countries, and there are no reliable comparative studies of rates of VAT evasion and MTIC fraud in different member states.[8] It is, however, evident that the revenue authorities in some other member states have concerns about the vulnerability of the VAT system to organised fraud.

9.4 Policy options to tackle VAT evasion and fraud

Key design features of the VAT system influence the extent to which it is exposed to systematic missing trader frauds. Many of these, such as the stylised carousel fraud illustrated in Box 9.2, exploit opportunities provided by the VAT zero-rating of exports to claim fraudulent refunds for contrived transactions, while at the same time failing to pay VAT due on imports. Aspects of the VAT system that affect the scope for profitable carousel fraud include the extent to which the system allows intending missing traders (such as Company B in Box 9.2) to register for VAT, and the relative timing of VAT payments and receipts. These design features play a critical role in preventing revenue loss through carousel fraud. *Ex post* audit and investigation, while important, is unlikely to forestall considerable loss of revenue, because the essence of the fraud is that money is made quickly, in the time gap before the missing trader is required to remit the VAT it has supposedly charged on its sales. Once the money has disappeared into the complex web of transactions, tracing and recovering unjustified VAT refunds becomes time-consuming and costly.

Other than more vigorous investigation, two broad approaches may be taken to designing-out the opportunities for carousel fraud within the VAT system. One is essentially administrative, in the sense that it retains the zero-rating of intra-community supplies. The other, more fundamental to the structure of the tax itself, removes export zero-rating altogether.

Measures that could be taken within the context of the existing system include, for example: tighter checks on firms seeking to register for VAT (for example, with an on-site visit) and requiring guarantees in dubious cases; slowing down the payment of VAT refunds relative to the collection of VAT due (although this can impose severe cash-flow burdens on legitimate businesses); adopting or strengthening joint and several liability rules by which traders can be held responsible for fraud elsewhere in the chain that they might reasonably have been expected to be aware of; and establishing better and quicker information exchange between national tax authorities (so that the country of import can become promptly aware that exports

[8] The UK authorities have been very dismissive of figures from a Belgian government task-force, which estimated that revenue losses from VAT fraud were at least four times higher in the UK than in other large EU countries, because the figure used for UK losses (about £8.4 billion) greatly exceeds UK official estimates.

to it that have been reported in another member state have not shown up in its own VAT system). However, while measures of this sort may reduce the risk of VAT fraud, some of them may have less-desirable side-effects. More bureaucratic VAT registration procedures and slower payment of VAT refunds might harm legitimate businesses as well as discouraging fraud, and these effects may outweigh the enforcement gains. The authorities have a difficult balance to strike, between ensuring that VAT administration does not impose excessive burdens on business in general and ensuring that it is not unduly exposed to fraud. Some level of VAT evasion may well have to be tolerated in the wider business interest.

More radical measures within the context of a system that preserves zero-rating include:

- The use of **'reverse charging'**, by which liability in a business-to-business (B2B) transaction is placed on the buyer rather than the seller. This would deal effectively with the carousel fraud in Box 9.2, because the VAT due on the sale by B (the missing trader) would become the responsibility of the buyer, C. In turn, the tax due on the sale from C to D would be the responsibility of D. The zero-rating of the subsequent export sale would then offset D's tax liability on its purchases from C, reducing the tax payment by D but not requiring outright refunds. The opportunity to make fraudulent gains by claiming refunds of tax that have not in fact been paid would thereby be eliminated. Last year, the UK proposed applying reverse charging for mobile phones, computer chips and other particular goods that have proved popular instruments for carousel fraud, but member states have yet to agree on whether this should be permitted. More radically still, Austria and Germany have both proposed allowing reverse charging for all B2B transactions above a certain size (€10,000 in the case of the Austrian proposal and €5,000 in the German proposal). The proposals differ in terms of the scale of the reporting obligations placed on firms and their customers: the German proposal would require both parties to a B2B transaction to report it to the tax authorities, and electronic cross-checking of this information, while the Austrian proposal would place fewer reporting burdens on firms.

  The difficulty of reverse charging limited to certain products – as proposed by the UK – is that MTIC frauds may simply move on to other goods, not covered by reverse charging. There would also be new enforcement issues, at the 'boundary' between commodities subject to reverse charging and those subject to 'normal' VAT. By contrast, universal reverse charging – as proposed by Austria and Germany – avoids these difficulties but, in effect, turns the VAT into something closely akin to a single-stage retail sales tax, with tax payments suspended until goods are sold to final consumers (albeit with the possibility of cumbersome reporting procedures for B2B transactions). The danger of this is obvious: by ending the gradual cumulation of VAT payments through various stages of production and distribution and instead collecting all VAT revenue at the final sale, the system is exposed to substantially greater risks of revenue loss through unreported sales to final consumers. With a retail sales tax all tax revenue is lost if a sale to final consumers somehow goes unreported, while with a VAT the losses are limited to the difference between the VAT due on the final sale and the VAT already collected at earlier stages. Extensive reverse charging might help to stem losses from MTIC frauds, but might expose the VAT to other risks of revenue loss through more mundane forms of evasion.

- **'Reverse withholding'** schemes would tackle VAT frauds in a broadly similar way to reverse charging, by requiring the purchaser in a B2B transaction to make a direct payment to the authorities of part or all of the VAT due on its purchase. The difference is that the seller would remain liable for output VAT, receiving a credit for the amount withheld by the purchaser. Depending on the proportion of the VAT that the purchaser is required to withhold, this would diminish or even eliminate the scope to generate revenues through fraudulent refund claims, since exporting firms will themselves have paid part or all of the VAT on their purchases that they subsequently reclaim on export. The principal drawback of reverse withholding (which is quite common in Latin America but untried in Europe) would be its administrative complexity, which arises because of the need to ensure that the seller is given credit for withholding only when this has actually taken place.
- Adoption of a system of **'VAT accounts'**, under which traders would be required to open a distinct bank account into which they would transfer the amount of VAT charged to their customers. VAT refunds would only be paid if the authorities were able to verify that the corresponding VAT payment had been made. This has been proposed by Germany's CESifo research institute[9] as a solution to the problem of VAT fraud, and a system of this sort has been running in Bulgaria. The key feature is that it requires the VAT payment to be made *earlier* than in the present system, so that when refunds are paid, they can be checked against past payments made. Apart from this matter of timing, however, it does not fundamentally alter the situation. It is not clear that cross-checking refund claims against past payments to a bank account would be any easier, or more reliable, than checking that past payments have been made to the revenue authorities themselves.
- The **compulsory use of a third party to guarantee VAT payments**, either in general or for particular sectors, as set out by Ainsworth.[10] In the example set out in Box 9.2, Company B, the future missing trader, would be required to obtain a guarantee that its VAT payments would be made. The principal difficulty with this is the cost involved; it is far from clear that banks or other potential guarantors would be any better placed than the revenue authorities to prevent firms disappearing with outstanding VAT liabilities, and the premium required to cover this risk would place substantial burdens on honest firms operating in the sectors most subject to VAT fraud.

These various administrative solutions all have weaknesses, either in creating other opportunities for fraud and/or in increasing taxpayers' compliance costs. In a paper in the December 2006 *National Tax Journal*,[11] Keen and Smith have argued that a longer-run and durable solution to the problem of missing trader fraud requires a fundamental redesign of the VAT treatment of international transactions. The opportunity to claim fraudulent VAT refunds arises principally because of the break in the VAT chain that occurs as a result of the zero-rating of exports. Export zero-rating requires substantial amounts of VAT receipts to be

[9] H-W. Sinn, A. Gebauer and R. Parsche, 'The Ifo Institute's model for reducing VAT fraud: payment first, refund later', *CESifo Forum*, 2, 30–4, 2004.

[10] R.T. Ainsworth, 'Carousel fraud in the EU: a digital VAT solution', *Tax Notes International*, 1 May, 443–8, 2006.

[11] M. Keen and S. Smith, 'VAT fraud and evasion: what do we know and what can be done?', *National Tax Journal*, 59(4), 2006.

paid back as refunds (about 40% of gross VAT receipts are refunded in the UK), and a system that requires refunds on such a large scale creates opportunities for correspondingly large-scale revenue fraud. Ending VAT zero-rating for trade between EU member states would sharply reduce the scale of refunds and eliminate some of the most tempting opportunities for missing trader frauds.

A range of possible schemes exist that could replace the VAT zero-rating of intra-EU trade. One, proposed by the European Commission in the run-up to the abolition of internal EU frontier controls at the end of 1992, was that goods exported from one member state to another would bear the exporting member state's VAT, with credit given for this by the tax authorities of the importing member state in just the same way as if the transaction had been conducted within a single member state. This would eliminate the opportunity for the carousel fraud illustrated in Box 9.2 because it would eliminate the VAT refund paid to Company D. While member states were concerned about other aspects of this proposal, including the much greater level of administrative cooperation that would be needed between the revenue authorities of member states, and the role that would have been played by the EU in redistributing the revenues collected on exports (to compensate for the credits that member states would give on imports), the key attraction of the proposal – that it would maintain the integrity of the VAT chain across the EU's internal frontiers – was perhaps dismissed too lightly. In the face of the growing revenue losses that the UK and other member states are now experiencing from frauds that exploit export zero-rating, there is a case for revisiting this debate. In the last decade, a wider range of possible international VAT mechanisms have been developed,[12] which would retain the VAT chain across frontiers while fixing some of the less desirable features of the Commission's original proposals.

Systematic reform that eliminates the root cause of missing trader fraud would be a much more appealing long-term strategy than the combination of resource-intensive enforcement operations and ad hoc 'fixes' such as extended reverse charging, which may provide temporary relief but do not address the underlying problem.

[12] See M. Keen and S. Smith, 'Viva VIVAT!', and other symposium contributions on this issue in *International Tax and Public Finance*, 7(6), 2000.

10. Taxation of multinationals and the ECJ

Stephen Bond (IFS and Oxford)[1]

Summary

- Recent cases at the European Court of Justice have prompted changes to UK Controlled Foreign Companies rules and a broader consultation on the taxation of foreign profits.
- The tax treatment of dividend income from overseas subsidiaries of UK companies is a complex but increasingly important area of the corporation tax system, given the growing importance of multinational firms.
- The announced review is welcome and should be wide-ranging. It should consider the option of replacing the UK's complex credit system with the simpler exemption system used in many other EU countries. Estimating the potential cost of this to the exchequer is extremely difficult and a matter of some debate.
- Corporate tax rates have fallen faster in other EU countries than in the UK over the last decade, and particularly since 1999; this has contributed to growing concerns about the impact of UK corporation tax on business investment and location choices.

10.1 Introduction

The influence of the European Court of Justice (ECJ) continues to loom large over developments in UK company taxation. Two important cases over the last year have affected the operation of Controlled Foreign Companies (CFC) rules and prompted a broader government review of the tax treatment of dividends received by UK companies from their overseas subsidiaries. This chapter briefly reviews the background to these developments and discusses some of the main issues in the taxation of foreign profits that are likely to be covered by the consultation process announced for 2007.

10.2 Background

Individual member states of the European Union retain their sovereignty over direct taxation, allowing countries to determine their own tax rules and tax rates. However, they are required to exercise this competence over direct taxation in accordance with EU law, as enshrined in the Treaties that established the European Community and, subsequently, the European Union. Both national courts and the European Commission can refer cases to the ECJ to test the compatibility of national tax rules with EU law. The last decade has seen a proliferation of

[1] Thanks to Michael Devereux for useful comments on this chapter.

legal challenges by taxpayers to important elements of national corporate income taxes. These have particularly affected cross-border transactions – for example, the taxation of foreign firms operating in the UK and the taxation of UK multinational firms in respect of their overseas operations.

Case law at the ECJ suggests two important principles that determine whether particular tax rules are incompatible with EU law.[2] The non-discrimination principle requires that tax measures imposed by one EU country should not discriminate against nationals of another member state. This primarily affects how firms from different countries are taxed within a single member state. For example, UK corporation tax rules may not treat a UK subsidiary of a French company less favourably than they treat a UK subsidiary of a UK company.

The market access principle, on the other hand, primarily affects how firms resident in one country with operations in other member states are taxed in their home country. EU law requires that tax measures imposed by one member state should not act as barriers to the exercise of freedoms guaranteed by EU Treaties – namely, the free movement of goods, persons, services and capital, and the freedom to establish business activities and subsidiary companies anywhere within the EU. For example, UK corporation tax rules may not treat a UK firm that establishes or invests in France less favourably than they treat a UK firm that establishes or invests in the UK.

Neither of these principles requires that cross-border operations of firms from different EU countries face the same overall tax rate, when taxes imposed by both the home country and the host country are considered jointly. For example, a UK firm that invests in Ireland may face a higher overall tax rate than a domestic Irish firm. While their operations in Ireland will be subject to the same corporate income tax rate in Ireland, the UK firm may face an additional UK corporation tax charge when dividends are paid from an Irish subsidiary to the UK parent company. This additional tax may arise under the credit method of relief for double taxation of foreign-source dividend income that is used in the UK, and which we discuss further below. Similarly, a UK firm that invests in Ireland may face a higher overall tax rate than a German firm that invests in Ireland – dividends paid from an Irish subsidiary to a German parent company will not be subject to additional corporate income tax in Germany, under the exemption method of double tax relief used in Germany, which we also discuss further below. The key point is that these differences in tax treatments arise from interactions between the national tax systems of two or more member states, and not from discrimination within the tax system of one member state or from the tax rules of one member state acting as a barrier to market access.

Landmark legal cases at the ECJ over the last decade have ruled that important elements of the national corporate income taxes of several member states were inconsistent with EU law. This has led to significant tax reforms in a number of EU countries, affecting areas such as the personal taxation of dividends received by shareholders from companies, and anti-

[2] Interested readers can find a more detailed discussion of these legal principles in M.J. Gammie, 'The role of the European Court of Justice in the development of direct taxation in the European Union', *International Bureau of Fiscal Documentation Bulletin*, 57(3), 86–98, 2003. Our discussion in this section draws heavily on S.R. Bond, M.J. Gammie and S. Mokkas, 'Corporate income taxes in the EU: an economic assessment of the role of the ECJ', 2006, available at http://www.etpf.org/research/Phase1/etpf_bond.pdf.

avoidance rules that limit the ability of multinational firms to shift their taxable income between countries with different corporate tax rates.

10.3 Controlled Foreign Companies rules

The impact of the ECJ on UK anti-avoidance rules of this kind continued during 2006 with the ruling in a case brought by Cadbury Schweppes concerning the application of UK Controlled Foreign Companies (CFC) rules.[3]

Overseas subsidiaries of UK companies are not normally subject to UK corporation tax. Dividends received by UK parent companies from their overseas subsidiaries are normally subject to UK corporation tax, with credit given for foreign corporate income taxes that have been paid on the underlying profits by the overseas subsidiaries.[4] Companies with subsidiaries in countries with lower corporate tax rates than the UK and that retain profits in those subsidiaries for long periods can thus normally benefit from a significant deferral of taxation at the higher UK rate, compared with a situation in which the same profits are earned (and taxed immediately) in the UK.

The UK, in common with many other countries, applies CFC rules to limit the extent to which parent companies can benefit from this deferral of taxation. For subsidiaries that are located in countries with significantly lower corporate tax rates than the UK and that do not meet one of several conditions designed to distinguish between tax avoidance and normal commercial practices, the profits of those subsidiaries may be apportioned back to the UK and taxed as income of the parent company, as if they had been distributed as dividends, whether they are actually distributed as dividends or not.

Many EU countries have their own form of CFC or similar anti-avoidance rules, and their application against subsidiaries located in 'tax havens' outside the EU is not subject to EU law. The UK government sought to apply its CFC rules against two subsidiaries of Cadbury Schweppes located in Ireland that did not meet the UK tests for normal commercial entities. At the relevant time, Ireland was an EU member state with a corporation tax rate of 10%, compared with 33% in the UK.[5] The legality of this application of UK CFC rules was challenged by Cadbury Schweppes on several grounds. In a ruling on 13 September 2006, the ECJ judged that the UK CFC legislation breached the Treaty right to freedom of establishment in the Cadbury Schweppes case. However, the ruling indicates that CFC rules could in principle be used against subsidiaries located in other EU member states, if these are 'wholly artificial arrangements aimed solely at escaping national tax normally due'.[6] National courts may determine whether particular subsidiaries conduct genuine business activities (even if these are partly tax-motivated) or are 'wholly artificial arrangements'.

[3] Case C-196/04.

[4] We discuss this credit system in more detail in the following section.

[5] The current rates are 12.5% in Ireland and 30% in the UK.

[6] A summary of the Court's ruling can be found at http://curia.europa.eu/en/actu/communiques/cp06/aff/cp060072en.pdf.

The December 2006 Pre-Budget Report announced changes to UK CFC legislation in order to comply with this ECJ ruling. In effect, this weakens the conditions that subsidiaries located in EU member states must meet in order to be treated as normal commercial entities and not subjected to CFC rules. This change does not directly affect the use of CFC rules against subsidiaries located outside the EU. In the longer term, however, this may allow UK (and other EU) multinational companies to make more effective use of tax havens, by structuring their ownership of subsidiaries in non-EU tax havens to take advantage of EU member states that have relatively weak CFC regimes. This would mean moving profits from a non-EU tax haven to an EU country with weaker CFC rules than the UK, before bringing them into the UK or using them to finance other activities in the multinational group.

10.4 Taxation of foreign profits

While the decision in the Cadbury Schweppes case affects the taxation of profits of overseas subsidiaries of UK parent companies in limited circumstances, the outcome of a separate ECJ case during 2006 has the potential to affect the taxation of foreign-source dividend income more generally. This case, known as the Franked Investment Income Group Litigation case,[7] addressed among other questions the legality of the credit method of cross-border double taxation relief as it operates in the UK.

Bilateral tax treaties between countries have for many years acted to prevent profits that have been earned by a subsidiary company and taxed in the host country from being fully taxed again when they are paid out as dividends to a parent company in the home country. Two different systems of double taxation relief are commonly used, the credit method and the exemption method. The UK operates the credit method, under which dividends received by the parent company from an overseas subsidiary are treated as taxable income, but a credit is given for foreign corporate income tax that has been paid by the overseas subsidiary on the underlying profits. A broadly similar credit system is used in the US. Many other EU countries use the conceptually simpler exemption method, under which dividends received by the parent company from an overseas subsidiary are not treated as taxable income in the home country.

To illustrate how the credit method operates, suppose that a subsidiary of a UK firm located in Austria (which has a 25% corporate tax rate) earns profits of £100, pays £25 in corporate income tax to the Austrian government and pays the remaining £75 as a dividend to its UK parent. The UK parent company is taxed on the grossed-up (or pre-tax) value of the dividend (i.e. £100 rather than £75), but with a credit for the corporate income tax of £25 that has already been paid to the Austrian government. As the UK corporation tax rate is 30%, the tax liability on the underlying £100 is calculated to be £30, with £25 of this liability accounted for by the tax credit. In this example, the UK parent company would pay the remaining UK corporation tax liability of £5, leaving it with net dividend income of £70 – the same net income as would be the case if the underlying £100 profits had been earned and taxed in the UK.

[7] Case C-446/04.

If, instead, the subsidiary is located in a country that has a higher corporate tax rate than the UK, the value of the credit is limited to the UK corporation tax that would have been paid if the underlying profits had been earned in the UK. For example, if a subsidiary located in Spain (which has a 35% corporate tax rate) earns profits of £100, pays £35 in corporate income tax to the Spanish government and pays the remaining £65 as a dividend to its UK parent, the foreign tax credit can be used to fully offset the UK corporation tax liability of £30 on the underlying profits, but cannot be used to offset the parent company's tax liability on income from domestic sources. In this case, there is no additional UK corporation tax to pay on the dividend income received from the overseas subsidiary, and the net dividend income of £65 is the same as would be the case under an exemption system.

The main difference between the credit method and the exemption method thus relates to the treatment of dividends received from subsidiaries located in countries with lower corporate tax rates than the home country. Returning to our first example, while the net dividend income of £70 received by a UK parent from an Austrian subsidiary distributing £100 of pre-tax profits is the same as the net income it would get from £100 of profits earned in the UK, this is lower than the net income of £75 that would be received if the parent company were Austrian, or resident in any country that operates the exemption system. Put differently, UK firms investing in Austria, or in any country with a lower corporate tax rate than the UK, may face a higher overall tax rate under the credit system than, say, German firms investing in Austria.

As we noted earlier, this difference *per se* does not seem to be inconsistent with EU law, essentially because it results from interactions between two national tax systems and not from the rules of the UK tax system considered in isolation. Indeed, the EU's Parent-Subsidiary Directive[8] specifically recognises both the credit method and the exemption method as ways of relieving cross-border double taxation of dividends paid from subsidiaries to parent companies. Nevertheless, the legality of the credit system that operates in the UK was questioned in the Franked Investment Income case. The challenge related to the different treatments that apply when a UK parent company receives dividends from an overseas subsidiary and when it receives dividends from a domestic subsidiary. In the former case, as we have outlined, the dividend is treated as taxable income, with credit given for corporate income tax paid by the overseas subsidiary to a foreign government. In the latter case, however, dividends received from domestic subsidiaries are not treated as taxable income of UK parent companies. In effect, the UK applies a credit treatment to dividends received from overseas subsidiaries and an exemption treatment to dividends received from domestic subsidiaries.

In most circumstances, where both the UK parent company and the UK subsidiary pay corporation tax at the standard 30% rate, applying either the exemption method or the credit method would result in the same outcome. Consider again our example of a subsidiary that earns £100 profits, pays corporation tax of £30 and pays the remaining £70 to its parent company. Under the credit method, the parent company would be liable to corporation tax of £30, but this is fully accounted for by the credit of £30 that recognises the corporation tax paid by the subsidiary, leaving the parent company with no additional tax to pay. Applying

[8] Council Directive of 23 July 1990 (90/435/EEC).

the credit method to dividends received from domestic subsidiaries would impose higher administrative costs on HMRC and higher compliance costs on the company, but in this case would result in the same tax payments as exempting dividends received from domestic subsidiaries from UK corporation tax.

However, there are other circumstances in which the outcomes in terms of tax payments would be different under the two treatments. If, for example, the UK subsidiary paying the dividend is small enough to pay corporation tax at the lower small companies' rate (currently 19%), rather than the standard rate (currently 30%), the parent company would face an additional corporation tax charge if the credit method were applied, which it does not pay under the current exemption treatment. This could also be the case if the UK subsidiary paying the dividend has tax losses brought forward from previous years that it can use to set against its corporation tax liability on the current year's profits. In these examples, the exemption treatment applied to dividends received by UK parent companies from domestic subsidiaries would appear to be more generous, and result in lower tax payments, than the credit treatment applied to dividends received by UK parent companies from overseas subsidiaries.

Whether these differences in treatments are in breach of EU law remains to be fully resolved. At first sight, it would appear that the rules of the UK corporation tax (in isolation) may treat a UK firm that establishes a subsidiary in another member state less favourably than a UK firm that establishes a subsidiary in the UK, so violating the market access principle. However, the ruling of the ECJ in the Franked Investment Income case on 12 December 2006 indicates that the UK can apply different methods to dividends received from domestic and overseas subsidiaries, provided these different methods result in the comparable tax charges.[9] The case has been referred back to the UK High Court to decide whether or not this applies.

Interestingly, the Opinion of the ECJ's Advocate General on this case, published on 6 April 2006, had suggested that this aspect of the operation of the credit system in the UK may be inconsistent with EU law.[10] Partly as a result of this, the UK government has had to consider how it would respond if some aspects of the existing credit system were ruled to be in breach of EU law. The December 2006 Pre-Budget Report announced that a consultation process to consider possible reforms to the taxation of foreign profits will be conducted during 2007.

While the scope of this consultation is not yet clear, we would hope that it will be wide-ranging and consider possibilities for radical reform, such as replacing the credit system with an exemption system, as well as more technical changes to ensure that the operation of the credit system is fully compliant with EU law. As we discussed earlier, the main difference between the credit method and the exemption method relates to dividends received from subsidiaries located in countries with lower corporate tax rates than the UK. In principle, the credit method imposes an additional tax charge on UK parent companies, while the exemption method would not. The credit system thus places UK companies investing in many other EU countries[11] at a disadvantage compared with parent companies that are resident in

[9] A summary of the Court's ruling can be found at http://curia.europa.eu/en/actu/communiques/cp06/aff/cp060096en.pdf.

[10] Advocate General Opinions are published in advance of ECJ rulings. These provide guidance to the Court on relevant aspects of EU law, although the Court is not bound to follow these Opinions when deciding on cases.

[11] The following section discusses the UK corporation tax rate in relation to corporate tax rates in other EU countries.

countries that operate exemption systems. On the other hand, this raises some revenue for the UK exchequer, and the revenue currently raised may not represent the limit of the revenue cost of moving to an exemption system. The government is concerned that new tax planning opportunities could be created by moving to an exemption system, which could lead to substantial amounts of UK taxable income moving out of the country, with more serious revenue consequences. How far this would occur is a matter of some dispute. Overall, the trade-off between these costs and benefits of the credit system compared with the exemption system is unclear, and the theoretical case for retaining the credit system does not appear to be compelling.

A different question that should also be considered in this context is the extent to which an exemption system would differ from the current credit system in practice. The credit method raises additional revenue only to the extent that UK parent companies receive dividend payments from subsidiaries in lower-tax-rate jurisdictions. This additional tax charge can be deferred by the simple expedient of retaining profits in such subsidiaries, in so far as these profits can be used to finance profitable additional investments. Large multinational firms may also have considerable scope to structure their global operations in ways that ensure that dividends paid back to the UK parent tend to come from subsidiaries located in countries with a higher corporate tax rate than the UK, and thus generate no additional UK corporation tax liability under the current credit system. While smaller firms with simpler structures may find it more difficult to avoid paying this additional tax, it is not at all clear why tax policy should be designed particularly to deter such firms from expanding internationally.

The main attraction of the exemption method in this context may well be its simplicity. However, if this is the case, it would be important to preserve this advantage in any package of proposed reforms. There are various ways in which the UK government could seek to recoup any significant amount of revenue lost by replacing the credit system with an exemption system. One suggestion would be to restrict the extent to which interest payments on debt that is used to finance overseas investments could be deducted against profits in the computation of UK corporation tax liabilities, along the lines of interest allocation rules used in the US.[12] Unfortunately, since it is extremely difficult, if not impossible, to determine which particular borrowing funds which particular expenditures, restrictions of this kind run the risk of becoming both complex and arbitrary. It would be difficult to be confident that the combination of an exemption system with interest allocation rules would result in a system that would be significantly simpler than the current credit system. It is also very hard to estimate the net revenue consequences and precisely who the winners and losers would be.

The taxation of foreign profits, in a world where different countries tax corporate income at different rates, is a source of considerable complexity in many corporate tax systems. In the EU context, this is further complicated by the requirement to comply with EU laws and Treaty obligations. Nevertheless, this area of the tax system is becoming increasingly important as international firms account for a growing share of economic activity. The government's consultation on UK tax policy in this area is particularly important at this time,

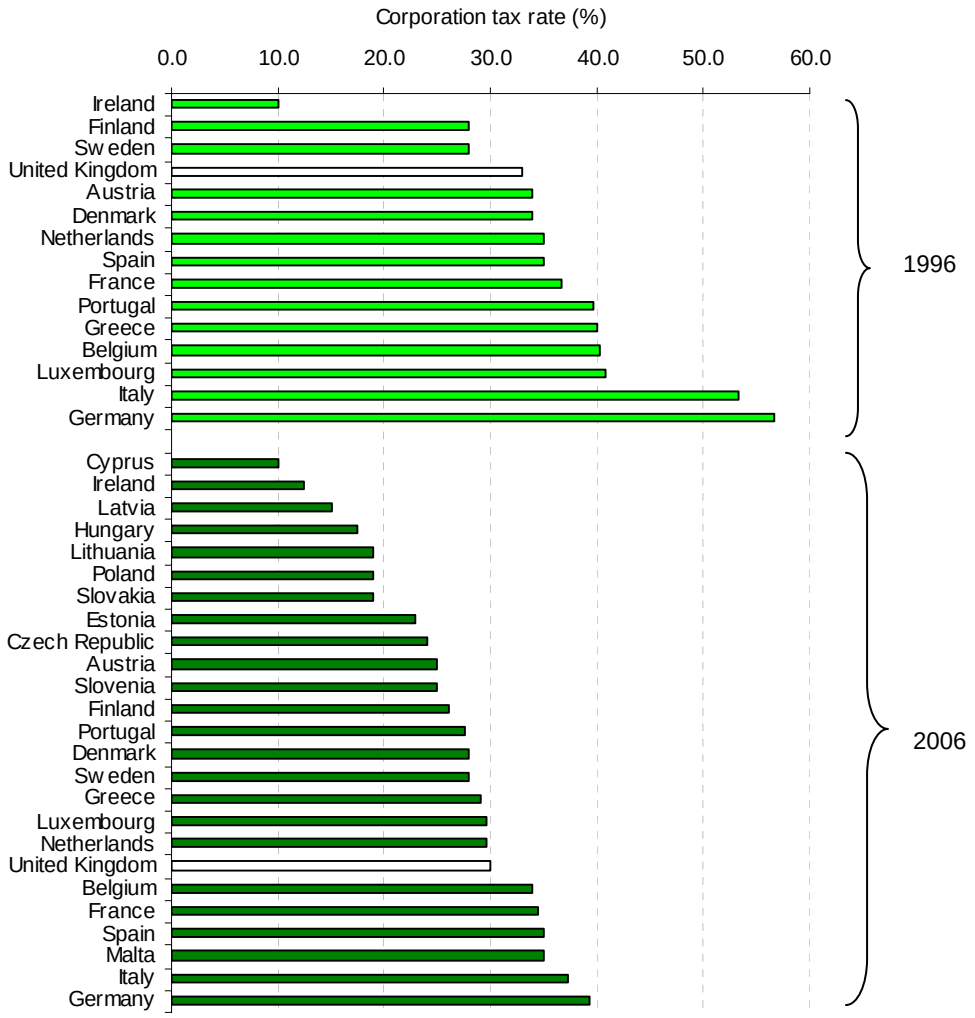
[12] Interest allocation rules and other possible restrictions on interest deductibility are discussed in more detail in M.P. Devereux, S. Mokkas, J. Pennock and P. Wharrad, *Interest Deductibility for UK Corporation Tax*, 2006, available at http://www.sbs.ox.ac.uk/Tax/publications/reports/Reports.htm.

and could play a significant role in deciding whether the UK remains an attractive location of residence for major multinational companies.

10.5 Corporate tax rates

EU law does not restrict the ability of individual member states to set their own corporate income tax rates, and there remains considerable variation in corporate tax rates within the EU countries. Focusing on rates in 2006 for the 15 countries that comprised the EU prior to May 2004, and accounting for local as well as national corporate income taxes, tax rates varied from 12.5% in Ireland to about 39% in Germany, according to Eurostat estimates. Nine of the 10 countries that joined the EU in May 2004 have corporate tax rates of 25% or less, with the exception being Malta at 35%. In addition, Bulgaria and Romania – which joined the

Figure 10.1. EU corporation tax rates, 1996 and 2006



Source: Figures for 1996 are obtained from Eurostat, *Structures of the Taxation Systems in the European Union, 1995–2004*. Figures for 2006 are obtained from Eurostat Press Release STAT/06/62.

EU on 1 January 2007 – both have corporate tax rates significantly below the UK level (at 15% and 16% respectively).

In recent years, there has been a strong downward trend in corporate income tax rates in most developed countries, and particularly within the EU. Using Eurostat figures, the unweighted average of corporate tax rates for the EU-15 countries has fallen from around 36.3% in 1996 to around 34.7% in 1999 and to around 29.5% in 2006.[13] Over the same period, the UK corporation tax rate has fallen from 33% in 1996 to 30% in 1999, but it has remained at 30% since then. Strikingly, the UK has gone from having the fourth lowest corporate tax rate among these 15 countries in both 1996 and 1999, to having the sixth highest corporate tax rate among the EU-15 countries in 2006. Among the long-term EU member states, only Belgium, France, Spain, Italy and Germany now have higher corporate tax rates than the UK. While the UK continues to have the lowest corporate income tax rate among the G7 countries, it is no longer the case that the UK can claim to have one of the lowest corporate tax rates among the EU member states.

The UK government continues to express its desire to maintain a competitive tax regime that will be attractive to international firms making location choices. Nevertheless, it seems highly unlikely that the UK corporate tax system in 2007 would appear as attractive to firms contemplating investments in Europe as it would have done, compared with other EU locations, a decade earlier. This conclusion stems partly from the developments in corporate tax rates described above, partly from the expansion of the EU itself and partly from the crackdown in anti-avoidance measures targeted at activities of multinational firms.[14] How much this matters remains an open question, given other factors that influence the attractiveness of the UK as a location for business investment.

[13] Figures for 1999 are obtained from Eurostat, *Structures of the Taxation Systems in the European Union, 1995–2004*. For the 1996 and 1999 averages, we use the lower 10% tax rate that was available in Ireland.

[14] These measures were discussed in detail in chapter 10 of R. Chote, C. Emmerson, R. Harrison and D. Miles (eds), *The IFS Green Budget January 2006*, IFS Commentary 100 (http://www.ifs.org.uk/budgets/gb2006/06chap10.pdf).

11. Environmental taxation

Ben Etheridge (IFS and UCL) and Andrew Leicester (IFS)[1]

Summary

- The government has implemented several tax reforms in recent years that have improved environmental incentives, most notably: linking vehicle excise duty and company car tax rates to the emissions ratings of vehicles; imposing an energy tax on businesses; and developing domestic and international emissions trading.
- Despite these reforms, receipts from environmental taxes have fallen as a share of national income since 1999. The measures announced in the Pre-Budget Report will do little to reverse this. However, the UK still takes a higher share of national income from green taxes than the OECD average.
- The decline in green tax revenue as a share of national income is largely due to the government's decision to abandon annual above-inflation increases in fuel duty. Raising green tax revenues substantially through the existing tax system will be difficult without significantly higher rates of fuel duty.
- Longer-term reforms may dramatically alter the structure of green taxes. But increasing green taxes may conflict with government targets for fuel poverty (or poverty in general) or with the desire to promote business competitiveness.

11.1 Introduction

The environment has risen high up the political agenda in a very short space of time. The publication of the Stern Review in 2006[2] (see Box 11.1) laid the scientific and economic background for a case for further action, and both main opposition parties have argued for raising environmental taxes and cutting others. Perhaps motivated by both these developments, the December 2006 Pre-Budget Report contained several key environmental measures and indicated more to come in Budget 2007.

The case for the use of taxes and other economic instruments such as emissions trading schemes as a part of the arsenal of environmental policy has been known for some time and theoretical developments in this area have continued in recent years. The Kyoto Protocol, committing many developed nations to greenhouse gas emission reductions, was signed in 1997 and in 2000 the government adopted its own domestic targets to reduce carbon dioxide

[1] Data from the Expenditure and Food Survey (EFS) used in this chapter are Crown Copyright and used with the permission of the Controller of HMSO and the Queen's Printer for Scotland. The EFS is sponsored by the ONS and DEFRA, which bear no responsibility for its analysis or interpretation.

[2] N. Stern, *The Economics of Climate Change*, HM Treasury, London, 2006. The full executive summary is at http://www.hm-treasury.gov.uk/media/8AC/F7/Executive_Summary.pdf; the whole report is available on the HM Treasury website.

(CO_2) emissions by 20% from their 1990 levels by 2020. A 2003 White Paper[3] set out an additional longer-term target for a 60% emissions reduction by 2050. More recently, the Climate Change Act outlined in the 2006 Queen's Speech proposes an independent Climate Change Committee to help the government meet its emissions targets.

This chapter focuses on the history and likely future direction of environmental tax policy. The main analysis centres on domestic taxation, though in recognition that emissions trading

Box 11.1. The Stern Review

Given the attention it has received and the government's endorsement of its conclusions, the Stern Review is likely to set the policy agenda on climate change for some time. The Review's main conclusion was that strong and urgent action is needed to tackle climate change: under a 'business as usual' scenario, global temperatures are likely to rise by between 1.4 and 5.8° Celsius by 2100. The expected economic impact would be equivalent to a cut in world national income of at least 5%, with developing countries experiencing a greater cost. This estimate also neglects any non-market impacts of increased disease or loss of biodiversity.

The Review estimated that the optimal policy response implies a cut in world national income that reaches 1% in 2050 and each year thereafter – alternatively expressed as the world reaching the same living standard 6 months later than if there were no global warming. The net present value to the world of optimal abatement compared with business as usual is estimated at $2.5 trillion per year – approximately equal to the current value of UK national income.

The policy recommendations centre on targeting the optimal concentration of CO_2 in the atmosphere, while current policy targets (Kyoto and UK domestic targets being two examples) are expressed as absolute reductions in greenhouse gas emissions. The Review recommends global policy action on several fronts: reducing demand for energy-intensive goods and services, increasing energy efficiency, reducing non-energy emissions (for example, by preventing deforestation) and supporting investment in low-carbon technologies. In terms of immediate action for the UK, policy should try to create a uniform price of carbon across the economy.

Criticisms of the Review mainly centre on the climatic predictions and the weighting given to the welfare of future generations compared with the present. It is claimed that Stern reaches his conclusion by taking only high damage estimates from the literature, and by adopting near-zero discounting, which places far more weight on future outcomes. Nordhaus[a] points out that with near-zero discounting, and standard growth estimates, a policy to sacrifice 15% of consumption this year to avoid a 0.01% reduction in national income from 2200 onwards would yield positive net present benefits.

[a] W. Nordhaus, *The* Stern Review *on the Economics of Climate Change*, 2006 (http://nordhaus.econ.yale.edu/SternReviewD2.pdf).

[3] Department of Trade and Industry, *Our Energy Future – Creating a Low Carbon Economy*, Cm. 5761, London, 2003 (http://www.dti.gov.uk/files/file10719.pdf).

at both national and international level is highly likely to play a key role in environmental policy in the future, we also discuss existing trading schemes and their possible development. We examine the environmental impact of green tax policy and how revenues have changed since the 1980s, placing the current position in both historic and international context. We analyse the crucial issues facing the Chancellor in determining whether and how to raise revenues from green taxes, and how environmental policy objectives can sometimes conflict with other key targets. We also discuss briefly some of the issues to do with longer-term reform of environmental policy.

The chapter proceeds as follows: Section 11.2 discusses briefly the economics of environmental taxation; Section 11.3 details the current system of environmental taxes and revenues; and Section 11.4 looks back at the history of green tax revenue and assesses how the UK compares with other economies. Section 11.5 then discusses options for the Chancellor in Budget 2007 – can additional revenues be raised from green taxes, what issues are faced in doing so, and what longer-term options for reform might exist? Section 11.6 concludes.

11.2 The economics of environmental taxation

The primary rationale for environmental taxation is the externalities argument. This says that in deciding how much, and in what way, to produce or consume, a polluter will not take into account the costs imposed on society at large from their private actions. This means that, from a social point of view, too much pollution will be generated. One solution to this problem, as first advocated by Pigou,[4] is to levy a tax on the pollution-generating activity. If the right level of taxation can be found, the social costs of pollution can be 'internalised' to the agent (who must pay the tax) and the socially optimal level of pollution would occur. This argument recognises that, in general, it is not best to *eliminate* pollution altogether: the cost to society of doing so may well outweigh the benefits of continuing some level of pollution associated with production or consumption.

In deciding at what rate to set a green tax, it is necessary to take into account the cost of abating pollution (either from changing technology or from curbing activity altogether) and the value (in terms of our welfare) of the reduced damage resulting from lower pollution. The socially optimal level of pollution is that where the marginal abatement cost (i.e. the cost to the polluter of eliminating an extra unit of pollution) is equal to the marginal damage cost (the net social damage caused by that last unit).

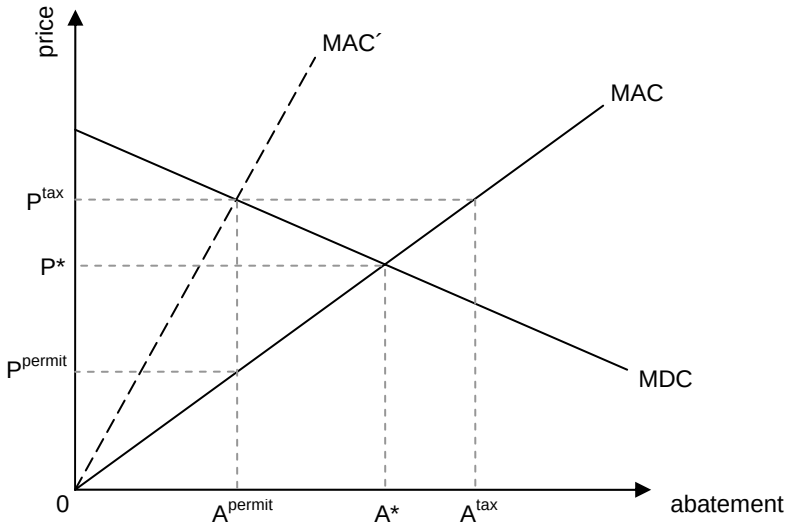
In practice, of course, knowing the 'correct' tax rate is extremely difficult, particularly for large-scale problems such as global warming and atmospheric pollution. The damage costs may include costs to future generations, and, as some of the controversy over the Stern Review suggested (see Box 11.1), estimating and weighting these with any accuracy is extremely difficult. There is also considerable difficulty in estimating abatement costs, such as what is the expected impact of R&D in new abatement or production technologies. Therefore, it is unclear how polluters will respond to tax incentives. This uncertainty may

[4] A.C. Pigou, *The Economics of Welfare*, Macmillan, London, 1920.

lead to too much or too little pollution reduction relative to the desired outcome and therefore some period of tax rate adjustment might be required. However, the trade-off for this uncertain outcome is that taxes will provide incentives for low-cost abaters to reduce pollution more and high-cost abaters to reduce pollution less, preferring to pay extra tax than incur the higher costs of pollution reduction. This would mean a more efficient pattern of abatement than simply imposing targets on each polluter to reduce emissions by the same amount. This 'static efficiency' argument for green taxes is accompanied by a 'dynamic efficiency' argument, that taxes provide ongoing incentives to reduce pollution and therefore tax liability, by investing in new clean technologies, for example. An emissions cap imposed by a regulator does not provide incentives to reduce pollution below the target level.

Emissions trading schemes provide an alternative approach to the problem: the total level of pollution is guaranteed by the number of permits allocated and then the permits are traded such that more efficient abaters can sell excess allowances to less efficient abaters, giving a certain outcome at lowest cost. Both taxes and emissions trading schemes therefore offer efficiency advantages over simple regulation. With taxation, policymakers effectively set the pollution price but leave the resulting emissions level uncertain, whilst with trading the level is fixed and the resulting price uncertain, determined by the market trading patterns.

Figure 11.1. Taxes and permit trading under uncertainty



When abatement costs are known with certainty, permit trading schemes and taxation theoretically yield identical results in terms of final pollution and the pollution price. Under uncertainty over marginal abatement costs, however, the results will differ: when abatement costs are overestimated (underestimated), taxes will yield too much (too little) abatement, while a permit scheme will yield too little (too much) abatement. Figure 11.1 illustrates this point. The horizontal axis shows the total level of abatement carried out. The marginal abatement cost (MAC) curve rises with the total amount of abatement – firms will carry out easy abatement first and more costly abatement only once these options are exhausted. The marginal damage cost (MDC) curve represents the benefit to society from reduced environmental damage from each additional unit of abatement. With no tax or trading scheme, no abatement is carried out. The optimal social outcome is for a level of abatement

A*, which generates a tax rate or emissions price P* – at this point, the marginal abatement and damage costs are equalised. Now suppose that the government knows the MDC curve with certainty but overestimates the costs of abatement, assuming a new curve MAC´. Faced with setting an environmental tax under this scenario, the government would choose a tax rate of P^{tax}, too high relative to the correct rate which generates the social optimum. Firms would now find it in their interests to do *more* abatement than is optimal to avoid paying the tax at this high rate. Total abatement at this price is A^{tax}. If instead the government wanted to allocate emissions permits, it would allocate enough that the total amount of abatement was A^{permit} since this would appear to be the social optimum under its assumed abatement costs. This would result in a permit price of P^{permit}, below the actual social optimum.

A key question in the choice between taxes and trading, therefore, has to be the level of uncertainty over abatement and damage costs. Over the short term, the emissions level will not alter the climate significantly and there may be advantages in terms of efficient planning and decision-making over a certain price of emissions generated by a tax. Over the longer term, however, it becomes more important to reach the optimal emissions level: here, it may be better to set quotas through a trading scheme rather than prices via a tax. Trading schemes may also represent the most effective way to reach international or domestic emissions targets for a fixed point in time, such as those set by Kyoto or the British government, as the terms of the scheme can be set so that the amount of permits issued matches the target level in the target period.

In reality, both systems are likely to coexist for different types of pollution and different industries. Trading schemes may be more easily internationally regulated: it is hard to enforce an international common tax rate on emissions, but an international permit trading scheme (the EU Emissions Trading Scheme) is already operating. On the other hand, taxes may be more flexible, and can be levied on consumers and small firms for whom it is currently impractical to measure emissions. The practical issues behind the use of taxes and permit schemes are discussed further in Section 11.5.[5]

The use of economic instruments in environmental policy is not without possible drawbacks. One of the key problems may be the typically regressive nature of taxes on pollution. Taxing energy or transport, key sectors in emissions generation, is likely to impact more on the poor than the rich since both goods are economic necessities (in the sense that the poor spend a proportionately higher share of their income on them than the rich). In addition, if increased environmental revenues are used to lower labour taxes, this might not help make the package of measures less regressive, because such changes typically benefit middle- and high-income taxpayers, and certainly not those with incomes below the personal allowance.

It is also often argued that receipts from green taxes ought to be recycled, either towards green projects or to reduce other taxes such as income tax or National Insurance rates. However, there is no economic logic in tying expenditures on particular items to receipts from particular taxes, or 'hypothecation'. With fully binding hypothecation, where all expenditures are tied to particular tax receipts, the resulting pattern of government spending is unlikely to be optimal (in the sense that money could be reallocated from one project to another to

[5] See also chapter 14 of N. Stern, *The Economics of Climate Change*, HM Treasury, London, 2006 (http://www.hm-treasury.gov.uk/media/8A7/FB/Chapter14_Harnessing_markets.pdf).

improve overall social welfare), and uncertainty over receipts from one year to another will lead to difficulties in long-term expenditure planning.[6] With only partial hypothecation, where some revenues are ring-fenced and others are not, it is extremely difficult to account for any given pound of receipts, which makes the concept essentially meaningless. However, it may be that higher green taxes are deemed more politically acceptable if, in principle at least, the revenue is seen to be used in a particular way.

11.3 Current environmental taxes

Table 11.1 details the current system of environmental taxes in the UK.[7] It covers all the main taxes included in the current ONS classification of environmental taxes (see Section 11.4) and some currently not included but that may have environmental impacts.

Table 11.1. Current UK environmental taxes

Tax	Description	Rate(s)	Latest receipts
Transport taxes			
Fuel duty	A tax per litre of road fuel purchased. Subject to the 'fuel price escalator' between 1993 and 1999 which saw annual real-terms increases in rates. Since the announcement of this being abandoned in November 1999, nominal rates for most fuels have increased only three times, each time in line with inflation.	48.35p/litre for the most commonly purchased petrol and diesel. Reduced rates for alternative fuels and for 'red diesel' for certain off-road vehicles; zero rate for most aviation fuel.	£23.35bn (2005)
Vehicle excise duty	An annual tax on vehicle use. Rates were flat-rate per vehicle until 1999, when a two-tier rate that varied with engine size was introduced. In 2001, six rate bands were introduced that varied according to the CO_2 emissions rating of the vehicle. This was increased to seven bands in 2006, with the rate for the least-polluting vehicles reduced to zero.	Vary according to vehicle type and fuel type. For cars that run on petrol, current rates range from £0 to £210 per year.	£4.81bn (2005)
VAT on fuel duty[a]	VAT of 17.5% is charged on top of the fuel duty rate as well as the pre-tax price of fuel.	Effectively 8.46p/litre on top of fuel duty.	£4.09bn (2005)

Continues

[6] This may be a particular concern for environmental taxes if, in the long term, the revenue base were eroded by changing consumer or producer behaviour.

[7] More details on the current UK environmental tax system can be found in A. Leicester, *The UK Tax System and the Environment*, IFS, London, 2006 (http://www.ifs.org.uk/publications.php?publication_id=3774).

Table 11.1 continued

Tax	Description	Rate(s)	Latest receipts
Company car taxation[b]	A tax on the estimated income value of a company car and fuel as a benefit in kind. From April 1994, the imputed income was taken as 35% of the list value. In 2002, this was reformed so that the percentage of list value taken varied according to the emissions rating of the car provided. The amount of income imputed from company-provided fuel also depends on the emissions rating of the vehicle.	*Company car tax:* Depending on the emissions rating and fuel type, between 15% and 35% of the list value is assumed as imputed income each year. *Company fuel tax:* The same percentage value is applied to £14,400 to derive imputed income.	*Company cars / vans (tax + NI):* £2.13bn (2004–05) *Company fuel (tax + NI):* £0.58bn (2004–05)
Air passenger duty	A per-passenger tax on flights from UK airports. Exemptions apply for passengers under 2 years of age, small pleasure aircraft, connecting flights and flights from the Scottish Highlands or Islands. Rates vary according to destination and class of flight. From February 2007, the rates will double following a policy decision in the December 2006 Pre-Budget Report.	(From Feb. 2007) *Flights within EEA:* Economy £10 Other classes £20 *Flights outside EEA:* Economy £40 Other classes £80	£0.90bn (2005); forecast to double as a result of policy change
Energy taxes			
VAT on domestic fuel[c]	Domestic fuel is charged VAT at a rate of 5%. This was reduced from 8% in 1997. VAT on domestic fuel was originally introduced in 1994 at 8%; a planned increase to 17.5% in 1995 did not go ahead.	5%	£0.88bn (est.)[e]
Climate change levy[d]	A tax on the supply of energy to business. Rates vary according to the type of energy supplied, and energy supplied through renewable resources is exempt. Energy-intensive industries can sign 'climate change agreements' (CCAs), which reduce their liability by 80% in return for commitments to increase energy efficiency.	*Electricity:* 0.43p/kWh *Gas:* 0.15p/kWh *LPG:* 0.07p/kWh *Solid fuel:* 0.15p/kWh	£0.75bn (2005)
Renewables obligation[b]	From 2002, electricity suppliers have an obligation to source a proportion of their total output from renewable resources (6.7% in 2006–07), obtaining a 'certificate' for each megawatt-hour they source from such sources. Failure to receive enough certificates to meet the target incurs a penalty payment into a buy-out fund for each MWh below it. Revenues from the fund are repaid to suppliers according to the number of certificates they present each year.	Buy-out payments are £33.24 per MWh in 2006–07.	n/a

Continues

Table 11.1 continued

Tax	Description	Rate(s)	Latest receipts
Resource taxes			
Landfill tax[d]	A tax levied on local authorities or organisations for the volume of waste sent to landfill. Decomposition of waste in landfill sites accounts for around 40% of UK emissions of methane, a greenhouse gas. 'Inert' wastes such as rocks are subject to a lower rate than other waste products. Since 1999, the 'landfill tax accelerator' has seen rates increase each year. The current target is to reach a rate of £35 per tonne of non-inert waste, though this target may be increased. Landfill owners (on whom the tax is formally incident) can receive credits for up to 6% of their total tax liability each year by donating to approved projects as part of the Landfill Tax Credit Scheme.	*Standard rate:* £21/tonne *Reduced rate:* £2/tonne	£0.73bn (2005)
Aggregates levy[d]	A tax on the extraction of primary aggregates (rock, sand). Aggregates extracted and used in Northern Ireland receive an 80% discount. Clay and coal (amongst other materials) are exempt.	£1.60/tonne	£0.33bn (2005)
Water abstraction charges[c]	A charge levied by the Environment Agency (EA) on businesses that extract under- and over-ground water sources. The tax depends on the volume of water *licensed* for abstraction rather than the actual abstraction itself, and varies according to region, source of water, season and final use. The revenue is used to cover the EA's cost of water resource management.	Varies – for 2006–07 rates, see Environment Agency, *Environment Agency Scheme of Abstraction Charges*, 2006.	£0.13bn (estimate, 2006–07)
Emissions trading			
UK[c]	The UK Emissions Trading Scheme (ETS) began in 2002 and ran until the end of 2006. It involved around 30 'direct participants' and 6,000 firms covered by climate change agreements as part of the climate change levy. Direct participants bid on greenhouse gas emissions reductions in return for incentive payments for hitting their targets. By the end of 2005, total emissions from direct participants were around 7.1 million tonnes of carbon equivalent below baseline.	Total incentive payments were worth £215 million over the period.	n/a
EU[b]	The EU ETS began in 2005 with Phase 2 due to begin in 2008. It is a compulsory scheme for energy-intensive industries. National governments submit an annual allocation of CO_2 emissions permits over a three-year period for firms covered – the UK allocated around 736 million permits in Phase 1. EU emissions after one year were around 1.79 billion tonnes of CO_2, compared with total permits of 1.83 billion tonnes, suggesting some overcompliance.	€40/tonne of CO_2 for each unit of emissions over a firm's allocation.	n/a

Notes: See next page.

Notes to Table 11.1:
[a] Currently included in official ONS environmental tax revenue data but due to be excluded from Spring 2007.
[b] Not currently included in official ONS environmental tax revenue data but will be included from Spring 2007.
[c] Not currently included in official ONS environmental tax revenue data and not planned to be included.
[d] These taxes were accompanied by a reduction in the rate of employer National Insurance contributions designed to be revenue-neutral.
[e] Estimated for 2006–07 from HM Treasury, *Tax Ready Reckoner*, 2006 (http://www.hm-treasury.gov.uk/media/77C/B3/pbr06_taxreadyreckoner.pdf).
Sources to Table 11.1: Various HM Treasury Budget Documents, ONS Environmental Accounts Documents, EU (http://europa.eu/rapid/pressReleasesAction.do?reference=IP/06/612&format=HTML&aged=0&language=EN&guiLanguage=en), DEFRA UK Emissions Trading Results; authors' calculations.

11.4 Environmental tax revenues

What is an environmental tax?

There is no single 'correct' definition of what should and should not be included in any account of environmental taxes. Eurostat has argued that an environmental tax is 'A tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment'.[8] This definition ignores the possible *intent* behind taxes that may have environmental effects but were not explicitly introduced as such. One example in the UK is air passenger duty (APD), announced in the Autumn 1993 Budget and introduced in 1994 with the argument that aviation was a relatively under-taxed sector since flights did not incur VAT and aviation fuel is exempt from fuel duty. The Eurostat definition also allows taxes that are clearly not just focused on environmental objectives to be included. Fuel duty, for example, may in part be justified by environmental externalities but is also in principle designed to cover the external costs of congestion, accidents and road damage.

In 2006, the ONS published a review[9] of which taxes should be classified as environmental for the purposes of the biannual *Environmental Accounts* publication, which details revenues from environmental taxes. The report reached two key conclusions: first, to reclassify receipts from company car and company fuel taxes as environmental; and second, to remove the VAT charged on top of fuel duty as an environmental tax. Company car taxes add around £2 billion to the total environmental tax take, but the loss of VAT on fuel duty removes around £4 billion. Typically, the net effect is to reduce estimates of environmental tax receipts by around 5% in each year such that whilst the levels change across the old and new definitions, the trends do not.

The decision to include company car taxes is relatively uncontroversial: the payment depends on the emissions rating of the vehicle and so the structure is very similar to vehicle excise duty (VED), which has always been categorised as an environmental tax.

Removing the VAT component of fuel duty is more debatable. The ONS argues that since VAT does not raise the relative price of goods (because it is charged on most expenditures), it does not affect behaviour in the way other environmental taxes do. Indeed, the Eurostat guide

[8] Page 9 of Eurostat, *Environmental Taxes – A Statistical Guide*, 2001 (http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-39-01-077/DE/KS-39-01-077-DE.PDF).

[9] I. Gazley, 'UK environmental taxes: classification and recent trends', *Economic Trends*, 635, October 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET635Gazely.pdf).

goes on to explicitly exclude VAT-type taxes from its definition of green taxes for this reason. However, since the VAT component is charged on top of duty, all it does is effectively raise the rate of fuel duty by 17.5%. The government could conceivably abolish VAT on fuel duty and raise the rate of fuel duty by 17.5% without affecting either the pump price of fuel or the tax component of the price (though clearly there would be an effect on firms that can reclaim VAT but not fuel duties). However, the decision does square with the exclusion of VAT on domestic fuel and VAT on the pre-tax petrol price from environmental tax revenues, which was the case both before and after the ONS review. In addition, the decision will bring UK figures in line with international data from the EU and OECD, which have never included VAT on fuel duty in their figures.

The ONS review also included a provisional decision to include money exchanged between firms as part of the EU Emissions Trading Scheme (ETS) in green tax revenues. It argued that since the scheme was compulsory for some firms in the EU (unlike the UK ETS) and the payments were made for licences to emit CO_2, the EU ETS was in effect an environmental tax where the payments could be treated as imputed taxes and subsidies (i.e. if firm A pays £1,000 to firm B to buy some of its emissions permits, that could be seen as a tax of £1,000 on firm A and a subsidy of £1,000 to firm B). Whilst this is true in an accounting sense, the 'revenues' from the EU ETS are not like tax revenues from other taxes, which the government is in principle free to allocate as it pleases. The money is effectively ring-fenced to be redistributed to other firms participating in the scheme. It is unclear how this decision, and the additional decision to include payments made as part of Renewable Obligation Certificates (see Table 11.1), will affect measures of environmental tax revenues, as no data are currently available.

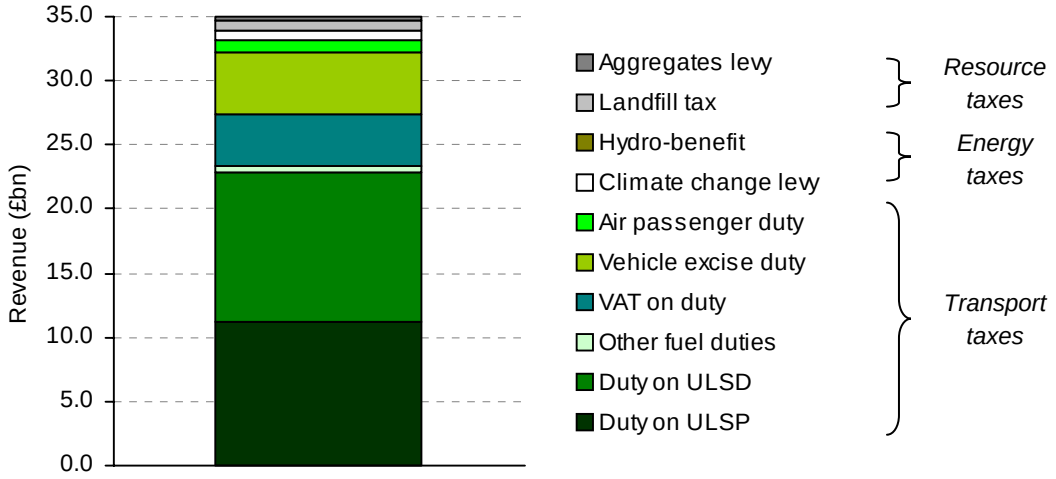
The rest of this section discusses current and historical environmental revenues using the current definition of green taxes. Before discussing total revenue, a couple of words of caution are important. The total amount of revenue received should not necessarily be taken as a direct indicator of the level of importance or significance that the government is attaching to the environment or its own environmental objectives. A high or increasing amount of revenue could reflect a large tax base or high tax rates (perhaps higher than those that might be justified by the external costs of the activity); equally, a decline in revenues may indicate an erosion of the tax base, something we may expect to occur over the long term as people change their behaviour in response to the tax. Further, not all environmental measures are revenue-raising. The UK and EU Emissions Trading Schemes do not raise revenue directly for the government but form an increasingly important plank of environmental policymaking. Reduced-rate VAT on energy-saving materials, introduced in 1998 and since extended, is another green incentive that is not reflected in environmental revenue figures (indeed, it has a negative effect on total revenues). Other policy may also reform existing taxes to make them more environmental in intent without changing revenues substantially – reforms to the taxation of company cars and VED are examples here, as is the use of fuel duty differentials to encourage a shift to less polluting fuels (such as the move from leaded to unleaded to ultra-low-sulphur petrol). Environmental regulation is also a central part of policymaking that does not generate revenues – for example, since 1993, all new cars have had to be fitted with a catalytic converter.

However, green taxes remain a significant part of environmental policy, and trends in revenue over time will tell us something about the range and scale of measures being employed to use the fiscal system for environmental objectives. It is unlikely that revenue erosion through behaviour changes currently represents a major obstacle to collecting significant revenues, and over a short time period revenue trends are probably much more dependent on the tax rates themselves. Indeed, there is no good economic reason why, even in the long run, revenues would disappear completely – as discussed at the start of the chapter, tax rates should be set such that marginal social benefits and costs of a particular polluting activity are equalised, not so that the activity is ended altogether.

Latest revenue data

In 2005, the government received a total of £35.0 billion in environmental tax revenue.[10] This represented 7.7% of total receipts, or 2.9% of national income. Figure 11.2 shows how this was broken down between the various taxes included in the ONS figures.

Figure 11.2. UK environmental tax receipts, 2005



Note: ULSD is ultra-low-sulphur diesel and ULSP is ultra-low-sulphur petrol.
Source: ONS, *Environmental Accounts, Autumn 2006* (http://www.statistics.gov.uk/downloads/theme_environment/EANov2006.pdf).

Clearly, transport taxes, and in particular fuel duties (largely those on ultra-low-sulphur petrol and ultra-low-sulphur diesel, which together accounted for 86% of fuel sold in 2006[11]), dominate the total. Around £11.5 billion was raised from each of ULSD and ULSP and almost £0.5 billion from other duties on fuels, such as leaded petrol, red diesel and AVGAS (aviation gasoline). Total revenue from fuel duty was £23.3 billion, or just over two-thirds of

[10] ONS, *Environmental Accounts, Autumn 2006* (http://www.statistics.gov.uk/downloads/theme_environment/EANov2006.pdf).

[11] Data from table 1 of HM Revenue and Customs, *Hydrocarbon Oils Duties Bulletin January 2007* (http://www.uktradeinfo.com/index.cfm?task=bullhydro). Note that this figure also includes sales of sulphur-free diesel (SFD), which is taxed at the same rate as ULSD but was largely unavailable before 2006 and so is not included in the 2005 revenue series presented in Figure 11.2.

the entire total of green tax revenues in 2005. Adding in receipts from VAT on fuel duty as well brings the total to £27.4 billion, 78% of total environmental tax revenues.

Vehicle excise duty represents the next-most significant tax, at £4.8 billion or 14% of receipts. Fuel duty, VAT on fuel duty and VED are the only individual taxes to raise more than £1 billion – the next-highest is air passenger duty at £0.9 billion, just 3% of the total (though from 2007 this revenue should roughly double as a result of the doubling of the rates of APD from February). The largest four taxes are all the transport taxes, which collectively account for £33.1 billion of revenue, 95% of the total. When included from Spring 2007, company car tax will probably account for around £1.6 billion and company fuel tax around £0.5 billion, whilst the loss of VAT on duty will see £4.1 billion removed from the transport total.[12] This will represent a net loss to recorded total revenue from environmental taxes, and transport revenue, of around £2 billion from the official figures.

Figure 11.2 makes clear the small scale of most individual green taxes, aside from fuel duty, VAT on fuel duty and VED. The energy taxes – climate change levy (CCL) and hydro-benefit – raise just £0.8 billion, or 2% of total revenues. This is almost entirely CCL – hydro-benefit is a payment to reduce the transmission costs of Scottish hydro-electric power and raises just £10 million. The resource taxes – aggregates levy and landfill tax – raise £1.1 billion, or 3% of the total.

Historical revenue data

Figure 11.3 shows total environmental tax receipts on the current ONS definition between 1987 and 2005. The top half shows the level in nominal terms and after adjusting for economy-wide inflation. The bottom half translates this into shares of total receipts and national income in each year.

UK receipts grew fairly steadily in nominal terms throughout the late 1980s and the 1990s, though after taking inflation into account, real-terms growth in receipts did not begin until around 1993. Between 1992 and their peak in 2000, real receipts rose from £25.7 billion to £37.8 billion, a rise of 47%. Between 2000 and 2001, however, nominal receipts actually fell, and whilst they have risen gradually since, to a new nominal peak of £35.0 billion in 2005, real-terms receipts stabilised, and were 7.5% lower in 2005 than in 2000.

Similar pictures emerge when we look at environmental tax revenues as a share of total receipts and of national income. As a share of total revenue, green tax receipts rose in the 1990s, from 7.8% in 1989 to a peak of 9.7% in 1999. Since then, this share has declined almost year on year and in 2005 it fell to 7.7%, the lowest over the last 20 years. As a share of national income, the upward trend in the 1990s is also evident, from 2.9% in 1989 to 3.6% in 1999. This share has since declined to 2.9% in 2005, the lowest since 1989 and the joint-lowest recorded over the whole period.

[12] Source: I. Gazley, 'UK environmental taxes: classification and recent trends', *Economic Trends*, 635, October 2006 (http://www.statistics.gov.uk/articles/economic_trends/ET635Gazely.pdf).

Figure 11.3. UK environmental tax receipts

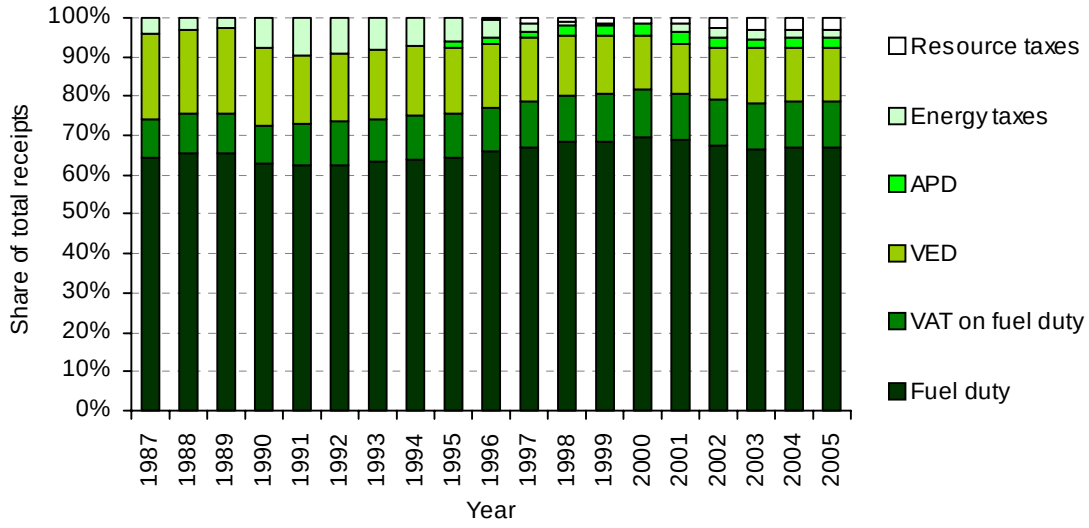
Note: Real series is deflated using a calendar-year GDP deflator calculated from ONS data, to 2005 values.
Source: Authors' calculations from *Environmental Accounts* and ONS data.

Figure 11.3 described the overall revenue, but how has the composition of revenues changed over time? Figure 11.4 breaks down total revenue into six components each year: fuel duty, VAT on duty, VED, APD, energy taxes and resource taxes.

Clearly, fuel duty has always dominated total green tax receipts, by itself accounting for 60–70% of revenues over the whole period. Including associated VAT, fuel duty typically makes up around three-quarters of receipts, peaking at just over 80% in 2000 at the end of the fuel duty escalator period. Since 2000, the share accounted for by fuel duty and the VAT on fuel duty has fallen back slightly.

Other taxes are very small by comparison. VED has accounted for around 15% of receipts since the late 1990s, compared with just over 20% in the late 1980s. Of course, the introduction of other taxes has played a part in the relative decline in importance of VED. APD has typically accounted for around 2–3% of total revenues since 1998 (and around 1–2% in 1995 to 1997).

Figure 11.4. Composition of total environmental tax receipts



Source: Authors' calculations from ONS data.

Energy taxes began to play an increasing role in environmental tax receipts in the early 1990s with the introduction of the fossil fuel levy in 1990, a tax paid by electricity suppliers using non-renewable resources but passed on to consumers. The fossil fuel levy was gradually wound down in the late 1990s (as a result of the privatisation of British Energy and the announcement of the climate change levy). In 1998–2000, energy taxes accounted for less than 1% of total revenues. Another factor was the decline of the gas levy, which raised about £½ billion annually in the mid-1980s but was phased out by 1999. The gas levy was a tax on some gas suppliers who arranged gas supply contracts in the 1970s at substantially lower prices than later market prices and with exemptions from petroleum revenue tax, and so benefited from an economic rent.

Resource taxes – the landfill tax and aggregates levy – have contributed a small but growing share of revenues over time, largely due to the real-terms increases in landfill tax that have been taking place since 1999 and the introduction of the aggregates levy in 2002. In 2005, these together accounted for 3% of revenues, slightly more than either energy taxes or APD.

What Figures 11.4 and 11.2 make clear, however, is that the green tax story in the UK is dominated by fuel duty. No other tax comes close to its receipts – indeed, as a tax measure in isolation, it raises more revenue for the UK exchequer than any other besides income tax, VAT, National Insurance and corporation tax.

What do we know about future receipts?

It seems very unlikely that environmental tax receipts will be significantly different this financial year from last.[13] Figures in the December 2006 Pre-Budget Report for the major green taxes suggested nominal receipts in 2005–06 of £35.1 billion and estimated receipts in 2006–07 at £35.9 billion. Once inflation adjustments are taken into account, real receipts for

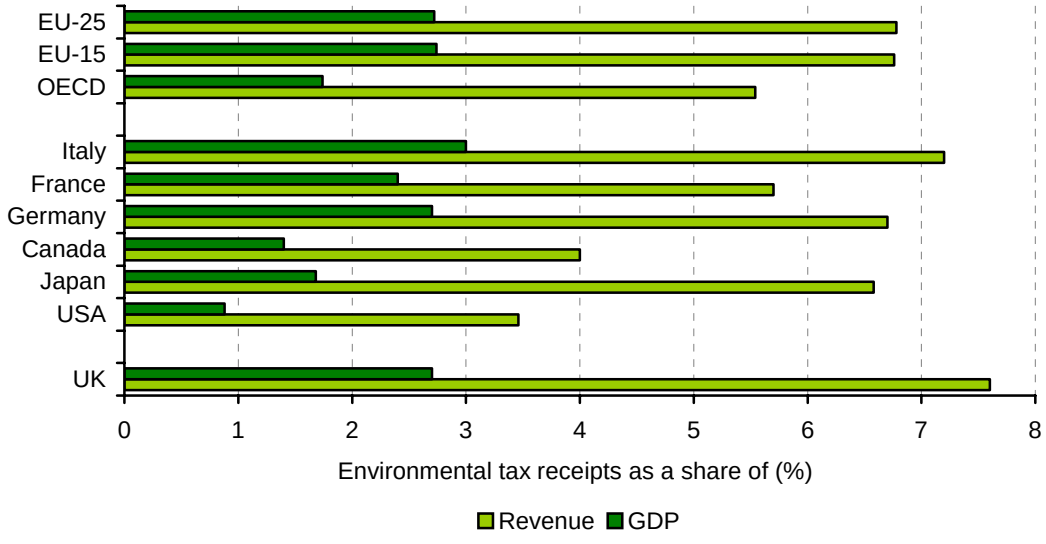
[13] Other than the change in definitions discussed already. The figures here represent a consistent definition of which taxes are included in revenues.

2006–07 will be similar to or slightly lower than those for 2005–06, and as a share of total revenue and national income they are projected to fall. For 2007–08, the figures project nominal receipts of £39.0 billion, which, after adjusting for inflation, will represent an expected increase of 5.8% on the 2006–07 estimates. This comes mainly from higher APD receipts (£1.1 billion in 2006–07, projected to be £2.0 billion in 2007–08) and higher fuel duty receipts (including associated VAT rising from £27.9 billion to £29.6 billion). A real increase of around 5–6% in receipts for 2007–08 would be the highest year-on-year rise probably since the late 1990s, certainly since the fuel duty escalator was abandoned. However, such an increase is forecast to only raise receipts as a share of national income by around 0.1%.

The UK in international perspective

How do UK revenues compare with those in other developed economies? Figure 11.5 shows data from 2003 for the percentage of total revenue and national income taken in environmental taxes for the G7 countries and various international averages (all of which exclude the UK figure). The UK appears to take a relatively high share of total revenues from environmental taxes – higher in 2003 than any of the other G7 economies and above the OECD and EU averages. In part, this reflects a relatively low total tax take, since as a share of national income the UK only broadly matches the EU average, though it is still significantly above the OECD average, which is depressed by the very low figure for the US. Indeed, on average, European economies extract a significantly higher share of total revenues and national income from green taxes than other developed nations. There is, however, relatively

Figure 11.5. International green tax revenues, 2003



Notes: EU and OECD averages are weighted by 2003 national income. International averages exclude the UK, the broader EU average excludes Hungary and Slovakia, for which information was unavailable, and the OECD average excludes Australia and Portugal, for which information was unavailable for 2003. The UK figures do not match those in Figure 11.3 for 2003 since the definitions of environmental taxes differ between the ONS and Eurostat.
Sources: UK and European figures from Eurostat; OECD and non-EU national figures from OECD, *Consumption Tax Trends: VAT/GST and Excise Rates, Trends and Administration Issues*, Paris, 2006. Weighted averages calculated by the authors.

little difference between members of the EU-15 and the 10 newest members.[14] The US looks substantially different from other countries, with only 0.9% of GDP and 3.5% of revenues coming from environmental taxes.

Leicester[15] shows that amongst OECD economies, between 1994 and 2003, green tax revenues fell as a share of national income but remained broadly unchanged as a share of total revenues. There was considerable variation across countries, but the UK was certainly not alone in experiencing a decline in environmental tax revenues as a share of national income.

Emissions impact of green taxes

Environmental taxes should not, of course, be considered merely in terms of their revenue but also in terms of their effect on environmental outcomes. It is, however, very difficult to make direct comparisons of the overall effects of different taxes even in terms of CO_2-equivalent emissions reductions. Taxes such as the aggregates levy are clearly not designed to have a direct emissions impact. In all cases, trying to discern the effect of the tax requires estimates of what would have happened to emissions without it, a very difficult counterfactual to construct.

The Treasury publishes estimates for some taxes of the environmental impact of any changes made at the time of the Budget or Pre-Budget Report. For example, it estimates that the CCL will reduce emissions by 3.5 MtC by 2010[16] (and the climate change agreements an additional 2.8 MtC per year). In terms of the two key reforms announced in the December 2006 PBR, the doubling of APD is expected to reduce greenhouse gas emissions by 0.75 MtC-equivalent by 2010 (including the radiative forcing effect of emissions at high altitude), and the revalorisation of fuel duty (an increase of 1.25p/litre plus associated VAT) will reduce emissions by around 0.1 MtC per year. The revalorisation represented a rise of about 2.7% in the rate of fuel duty. Assuming that the behavioural response to price increases is roughly constant around current prices, this suggests that an additional rise in fuel duty rates of some 16.5%, enough to take them back roughly to their peak real-terms values before the escalator was abandoned (see Section 11.5), would generate additional emissions reduction of around 0.5–0.6 MtC per year. To put all these figures into context, total UK emissions of greenhouse gases in 2005 were around 180 MtC-equivalent, and emissions of CO_2 were around 153 MtC-equivalent.[17] To meet the government's domestic target to reduce CO_2 emissions by 20% compared with 1990 levels by 2010, emissions would need to be just under 130 MtC-equivalent in that year, a reduction of 23 MtC-equivalent from 2005 levels.

[14] No data are yet available for Romania or Bulgaria, which joined the EU in January 2007.

[15] A. Leicester, *The UK Tax System and the Environment*, IFS, London, 2006 (http://www.ifs.org.uk/publications.php?publication_id=3774).

[16] Emissions estimates for this and other taxes discussed in this paragraph come from table 7.2 of HM Treasury, *Pre-Budget Report 2006* (http://www.hm-treasury.gov.uk/media/571/CF/pbr06_chapter7.pdf).

[17] Department for Environment, Food and Rural Affairs, *e-Digest of Environmental Statistics*, 2006 (http://www.defra.gov.uk/environment/statistics/index.htm).

11.5 Possible reforms

This section discusses possible ways in which existing taxes could be increased or reformed to raise further revenue and increase their environmental incentives. All the main political parties have more or less directly stated an aim to increase environmental taxes at the expense of other taxes. As far back as Gordon Brown's first Budget in July 1997, the government stated a desire to 'shift the burden of tax from "goods" to "bads"; encourage innovation in meeting higher environmental standards; and deliver a more dynamic economy and a cleaner environment, to the benefit of everyone.'[18] This 'statement of intent' on environmental taxation has been reiterated several times since.[19] The Conservative Shadow Chancellor, George Osborne, has stated a principle of 'pay as you burn, not as you earn' and proposed a new carbon levy to replace the CCL with revenues recycled to business (see below).[20] The Liberal Democrats have been most explicit in announcing a 'Green Switch':[21] they plan to raise £8.1 billion of environmental taxes and to return green tax revenue as a share of national income to the peak 1999 level over the course of a four-year Parliament, mostly through higher VED for the most polluting vehicles and revenue-raising reforms to APD, along with at least inflation-rises in fuel duty; they also plan to reduce other taxes, in particular income tax.[22]

The idea of using green tax revenue to reduce tax rates on income is not new: the introduction of three key taxes (aggregates levy, CCL and landfill tax) was in each case accompanied by a reduction in employer National Insurance contributions. The political rhetoric sounds as if it is endorsing the so-called 'double dividend' of environmental taxes – the idea that a revenue-neutral swap between an environmental tax and an existing tax can create economic benefits over and above those that come from correcting environmental externalities alone. The principle is that taxes on labour or production, say, create distortions whereas environmental taxes correct distortions. Thus such a swap can reduce the overall level of distortion in the tax system. However, the double dividend hypothesis is extremely controversial and there is considerable doubt as to whether green taxes really are a more efficient way to raise revenue than other taxes. For example, a tax on business energy use that is passed on to consumers in the form of higher product prices will raise the price level, reduce real wages and therefore affect labour supply decisions in a similar way to a direct tax on wages.[23] Furthermore, if green taxes are on average regressive, and if (as is commonly assumed) we value the welfare of the poor more highly than that of the rich when determining overall social welfare, then the distributional implications of green taxes may (depending on how the revenue raised is used) make them less desirable. Of course, even if there is no double dividend, there is still

[18] HM Treasury, *Financial Statement and Budget Report 1997*, (http://archive.treasury.gov.uk/budget/1997/report/chap1a.htm).

[19] See, for example, page 5 of HM Treasury, *Tax and the Environment: Using Economic Instruments*, 2002 (http://www.hm-treasury.gov.uk./pre_budget_report/prebud_pbr02/assoc_docs/prebud_pbr02_adtaxenvir.cfm).

[20] http://www.conservatives.com/tile.do?def=news.story.page&obj_id=133795.

[21] http://www.libdems.org.uk/media/documents/parliament/green_switch_180506.pdf.

[22] For figures, see http://www.libdems.org.uk/media/documents/policies/Tax%20Supplement.pdf. Note that inflation-linked increases to fuel duty rates should not be counted as 'revenue gains' to the exchequer, as the default option assumed in the public finances is inflation-indexing.

[23] Sometimes called the 'tax-interaction effect' – see A.L. Bovenberg and R.A. de Mooij, 'Environmental levies and distortionary taxation', *American Economic Review*, 84, 1085–89, 1994.

justification for environmental taxes from the single dividend of environmental improvement alone.

As the earlier sections stressed, revenue-raising should not be the guiding principle for environmental taxes: the aim is to balance the social costs and benefits of particular activities and encourage agents to include the environmental impact of their actions in their private decision-making behaviour. The 'revenue-maximising' set of environmental taxes would almost certainly not be the same as the socially-optimal set. Nevertheless, the recent decline in real tax revenues has been a cause for some concern amongst many[24] and, given the Stern Review and the policy agenda of the opposition parties, it is likely that the impetus for higher green taxes – and higher revenue from green taxes – is set to remain strong. This section therefore analyses the issues surrounding changes to each major tax – how much could be raised, what problems may be inherent with existing taxes and, briefly, what longer-term reforms may be ahead on the policy horizon.

Reforms of existing green tax system

In 2005, environmental taxes raised £35.0 billion, representing 2.9% of national income. In real terms, revenues peaked at £37.8 billion in 2000 – to be at that level in 2007 would require revenue of £39.9 billion once additional inflation is taken into account. As a share of national income, the peak occurred in 1999 at 3.6%. To reach that figure in 2007 would require revenues of around £48.8 billion. Either shift by this year is unlikely, particularly since the 2006 Pre-Budget Report did not contain any indication that substantial new revenues would be raised in 2007–08 from environmental taxes beyond the doubling of APD and a pre-announcement of higher landfill tax. Between 2000 and 2005, the period since the fuel duty escalator was ended, annual changes in nominal revenue have varied only from around –3% to +3%. In the absence of substantial new measures, any movement towards higher revenues is therefore likely to be fairly gradual.

Table 11.2 shows the percentage increase in various key tax rates that would be required to increase revenues from that tax by £1 billion, using information from the Treasury's *Tax Ready Reckoner* published alongside the 2006 Pre-Budget Report. It also indicates the level to which such an increase would take the tax rate, were it to be implemented. Except where indicated, these increases do not take into account *behavioural* responses – that is, they assume that behaviour will be unaffected by the tax increase. To the extent that people change their behaviour, the actual increases required to raise £1 billion would be greater than suggested by these figures.

These figures suggest that a £5 billion green tax-raising package[25] could (but no means necessarily should) include, say, an 8% rise in fuel duties (approximately an additional year of inflation + 6% escalator), another doubling of APD on top of the doubling in the Pre-Budget Report and a doubling of the landfill tax rates. What is also clear is that raising a

[24] See, for example, the House of Commons Environmental Audit Committee, *Pre-Budget 2005: Tax, Economic Analysis, and Climate Change*, Fourth Report of Session 2005–06, HC882, 2006 (http://www.publications.parliament.uk/pa/cm200506/cmselect/cmenvaud/882/882.pdf).

[25] Roughly the increase needed between 2006 and 2007, assuming nominal revenue in 2006 is roughly unchanged from 2005 figures, to return to the real-terms revenue peak of 1999.

Table 11.2. Change in tax rates required to raise £1 billion, 2007–08

Tax	Required change	New rate(s)	Comments
Fuel duty + associated VAT[a]	4%	50.28p/litre	In December 2006 prices, a tax rate of this level was last seen in September 2004.
VED	18%	Petrol car band E: £177	Assumes all bands raised by 18%; a more environmentally beneficial alternative would be to raise rates for more polluting cars by more than those for less polluting cars.
APD	50%	Standard rate in EEA: £15	Based on February 2007 rates.
Landfill tax	100%	Standard rate: £42/tonne	Figure based on doubling of both rates (standard and reduced) from April 2006 values. In practice, reduced rate has stayed fixed at £2, so upper rate may have to more than double. Upper rate set to rise to £24/tonne from April.
Climate change levy	200%	100kWh of electricity: £1.29	CCL rates fixed in nominal terms between 2001 and 2006. Set to rise with inflation from April.
Aggregates levy	200%	£4.80/tonne	Levy has remained unchanged in nominal terms since introduction.

[a] Includes behavioural response estimates.
Source: HM Treasury, *Tax Ready Reckoner*, 2006 (http://www.hm-treasury.gov.uk/media/77C/B3/pbr06_taxreadyreckoner.pdf).

substantial amount of additional green tax revenue is hard without including at least some real-terms rise in fuel duties – the scale of increase required for many of the other taxes, even to raise a single billion, is very large. It is no coincidence that it is only since the fuel duty escalator was abandoned that the ratio of green tax revenue to GDP has declined.

Fuel duty

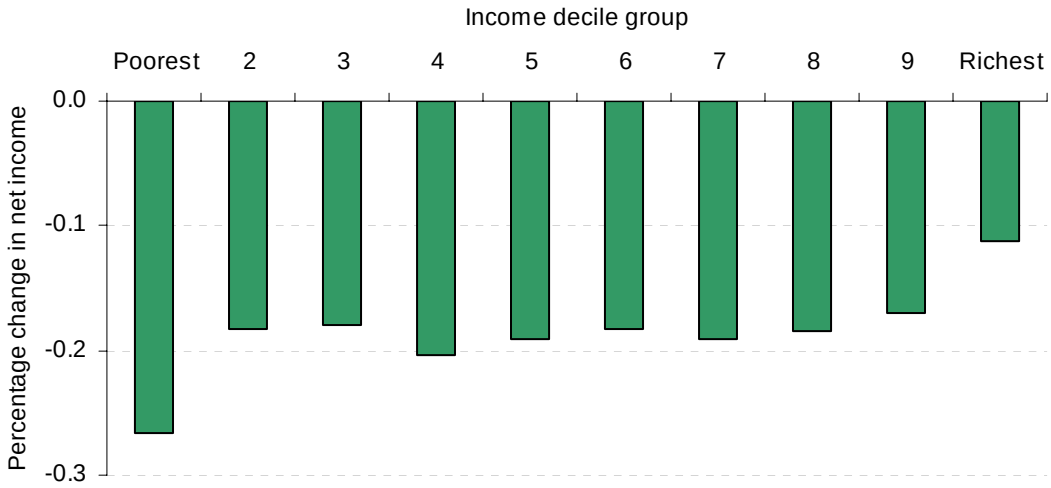
As it is by far the largest green tax, even small changes in fuel duty can have substantial revenue effects – a 1% rise in key fuel duty rates raises an estimated £250 million per year. The increase in nominal fuel duty rates for the most commonly purchased fuels from 47.10p/litre to 48.35p/litre from December 2006 was the first nominal rise in key rates since October 2003 and only the third nominal increase since the abandonment of the fuel duty escalator was announced in November 1999.

As discussed above, the fuel duty escalator was a key policy for both Conservative and Labour governments between 1993 and 1999. Nominal duty rates for diesel, for example, rose from 22.85p/litre in March 1993 to 50.21p/litre in March 1999. Whilst it is often argued that the fuel price protests led to the escalator being abandoned, the protests in fact came around nine months after the policy announcement. However, it may be that the protests have been a factor behind continued freezes in nominal duty rates in recent years and the explicit decision

in the December 2006 Pre-Budget Report not to return to above-inflation increases in duties in 2006–07. Whilst neither the Report nor Mr Brown's accompanying statement ruled out above-inflation increases in future years, there is no evidence that a return to a sustained escalator in duty rates is at all likely.

Adjusting for inflation, duty rates for ULSP and ULSD peaked at around 57.89p/litre (December 2006 prices) in April 2000.[26] Current duty rates of 48.35p/litre are therefore around 16.5% below this peak. An increase in duty rates of this magnitude would generate revenues of around £4 billion per year.

Figure 11.6. Distributional impact of a 5% rise in fuel duty, 2004–05



Note: Households with incomes or expenditures of less than £5 per week are excluded.
Source: Authors' calculations from 2004–05 Expenditure and Food Survey (EFS).

Given the size of fuel duty relative to other green taxes, there may be a very legitimate concern over the distributional impact of higher duty rates. Figure 11.6 shows the effect of a 5% rise in fuel duty across the income distribution. It is not immediately clear that fuel duty increases are regressive – although the largest impact is on the poorest 10% of households, losing on average around 0.27% of income, and the smallest impact is on the richest 10%, losing on average 0.11%, the effect appears to be roughly equal over the rest of the distribution. It is also important to bear in mind that within deciles, there is considerable variation in the impact of higher fuel prices. More than half of households in the poorest decile are not car owners and thus are unaffected directly by the change – the large average effect comes from the minority of households that are quite adversely affected. Some households in the poorest decile will be temporarily low-income – moving between jobs, say, or taking time out from employment. Such households may maintain relatively high levels of spending by running down savings, such that the high proportion of their income lost may be misleading about their actual financial circumstances. This is not to say that all low-income households are in this position, and there may well be a legitimate cause for concern over some poor households that nevertheless have to spend a significant share of their income on

[26] Data from Department of Trade and Industry, *Energy Statistics* (http://www.dtistats.net/energystats/qep411.xls).

fuel, in particular if it is precisely these households that are least able to switch to alternatives as a result of a price rise.

Vehicle excise duty

In 2001, vehicle excise duty was reformed so that the payment depended on the emissions rating of the vehicle. It is not a marginal tax: once the payment is made, drivers can drive as far as they like without incurring additional payments. The key environmental incentives of VED therefore come in terms of encouraging switching to lower-emissions vehicles and the scrapping of older models.

Under the old flat-rate structure, the burden of VED fell, on average, most on middle-income households as a proportion of income.[27] Since the introduction of the graduated rates, it has become more difficult to estimate the progressivity of the duty. To the extent that richer households own larger and therefore more polluting cars, VED may be more progressive than before, but if richer households can afford newer, more efficient cars to replace older models, it may be less progressive.

The structure of VED is unlikely to change substantially in the short term – current receipts of around £5 billion per year make it one of the most significant environmental taxes, and the most likely reforms are to increase tax rates for the most polluting vehicles.[28] The Liberal Democrats propose a large increase in VED rates for the most polluting cars. Within the present six bands, they propose to lift rates from £150 to £810 for cars emitting 160–180 grams of CO_2/km (the average emissions rate for new cars is around 165 g/km), and to raise the top rate to £2,100 for vehicles emitting more than 225 g/km. They also propose to give discounts to people living in rural areas where there is little substitute to car ownership. This would appear to add a considerable layer of complexity to the administration of VED, however, given that they wish to limit the discount to the least densely populated 5% of the country, to first cars and to vehicles not in the top VED band. It might also be difficult to police effectively. They forecast their proposals would raise an extra £750 million per year including behavioural changes.

Air passenger duty

Air passenger duty is forecast to raise £1.1 billion in 2006–07. The government estimates that the doubling of duty rates announced in the December 2006 Pre-Budget Report will approximately double revenues by 2007–08. Although air travel seems to be quite price-elastic – so the increase in the price of flights should reduce demand – it is also highly income-elastic – so the increase in real incomes expected between this year and next should increase demand. As a result, the tax base tends to increase over time, in contrast to other environmental taxes, which might explain the apparent lack of behavioural response implied by the Treasury's estimate. This should not be interpreted as price having no impact on the

[27] L. Blow and I. Crawford, *The Distributional Effects of Taxes on Private Motoring*, IFS Commentary 65, 1997 (http://www.ifs.org.uk/comms/comm65.pdf).

[28] Currently, the least polluting vehicles with emissions of less than 100 grams of CO_2 per km pay no VED, though cars in this emissions class make up a very tiny number of new car sales each year. This may change in the future as technologies change – a similar argument can be made about biofuels and other alternative fuels, which attract lower fuel duty rates but currently power very few vehicles. The aim of low taxes on such cars is to encourage switching as the technologies become more widely available.

demand for air transport – presumably without the doubling of APD, demand growth would have been even stronger.

Good estimates of the distributional effects of APD are difficult to make, as they depend on the number of flights taken, and the class and destination, across the income distribution. In 2005–06, around 78% of passengers flew in the lowest APD class (economy flights within the EEA), though a significant minority of passengers paid a higher rate.[29] Estimates from the ONS suggest that APD impacts most strongly on the very poorest and those in the middle of the income distribution, both losing about 0.1% of their income as a result of the doubling of APD, though these estimates assume the same rate of APD paid on each flight.[30] However, the extent to which those concerned with the detrimental impact of environmental taxes on the poor should be worried about losses among individuals who, despite their low income, make several flights is far from clear.

A study by Pearce and Pearce[31] estimated the marginal external costs of noise pollution and greenhouse gas emissions (including the radiative forcing effect of emissions at high altitude) for flights from Heathrow Airport for various aircraft types and recommended an optimal tax per 'aircraft movement' (arrival and departure). Their figures suggest a tax of £368 for a short-haul A310 movement and of £1,737 for a long-haul movement on the same aircraft. For a Boeing 747-400, they suggest a short-haul tax of £897 and a long-haul tax of £3,753. On a per-passenger basis, these results suggest a tax of typically around £3 for short-haul destinations and £15 for long-haul destinations. These estimates imply that APD has risen above the external costs of aviation. However, their estimates are sensitive to the assumptions made about the costs of emissions and noise, and neglect congestion externalities.

At present, the taxing of aviation fuel for international journeys is banned under the 1944 Chicago Convention,[32] and the US and Australia are opposed to altering this arrangement. The British government has therefore supported the inclusion of aviation in the EU Emissions Trading Scheme as soon as possible as a means to tackle emissions on intra-EU flights. If international agreement can be reached, aviation seems ideally suited to the EU ETS, given the high industrial concentration in civil aviation, though there are fears over legal action by non-EU countries if flights into the EU from outside are included in the scheme.[33] Until this reform to the EU ETS, and following the doubling of APD in the December 2006 Pre-Budget Report, it is unlikely that APD will change again in the short term. Interestingly, however, a note in the 'Budget measures' table that accompanied the PBR suggests that the default option from 2008–09 onwards will be price-indexation of APD rates at each Budget. This did

[29] See table 2 of UK Trade Info, *Air Passenger Duty Bulletin*, December 2006 (http://www.uktradeinfo.com/index.cfm?task=airpass).

[30] F. Jones, *The Effects of Taxes and Benefits on Household Income 2004–05*, ONS, London, 2006 (http://www.statistics.gov.uk/articles/nojournal/taxesbenefits200405/Taxesbenefits200405.pdf).

[31] B. Pearce and D. Pearce, 'Setting environmental taxes for aircraft: a case study of the UK', University College London, CSERGE Working Paper GEC 2000-26, 2000 (http://www.uea.ac.uk/env/cserge/pub/wp/gec/gec_2000_26.pdf).

[32] http://www.icao.int/icaonet/dcs/7300.html.

[33] Current proposals are to include intra-EU flights from 2011 and all flights into the EU from 2012. See http://news.bbc.co.uk/1/hi/sci/tech/6195567.stm.

not appear to be the case before, as previous freezes of nominal rates in Budgets and Pre-Budget Reports were not counted as revenue losses.[34]

The Liberal Democrats propose to replace APD with an aircraft tax, levied on all departures, including freight and transit flights.[35] The tax would adjust with the emissions level of each aircraft (in much the same way as VED varies with vehicle emissions) and the congestion at each airport. One effect of the tax would be to encourage higher load factors on flights and technological improvements to emissions levels. The Democrats also propose to increase the tax rate sufficiently to raise £3 billion, but argue that since the tax base is enlarged and the tax would fall disproportionately on less popular flights, the tax increase on full flights would be limited. In the longer term, they propose to tackle congestion externalities by introducing the auctioning of landing slots. However, they recognise that such a scheme would require changes to EU legislation and so is some way off.

Climate change levy

The climate change levy operates as a downstream energy tax for industry and services. The December 2006 Pre-Budget Report claims that the levy, alongside the climate change agreements,[36] will deliver over 6 MtC of emissions savings by 2010. The CCL or a similar alternative is likely to be in place for the foreseeable future, as it covers small and medium enterprises (SMEs) too small to enter the EU ETS and delivers the benefits of a certain price on carbon. The main criticism of the tax has been that it is a blunt instrument for pursuing its environmental objectives. In particular, the tax has a flat rate on electricity generated from non-renewable sources regardless of how it is generated, though electricity generated from renewables is exempt. Therefore, most policy discussion has focused on reforming it to become more like a carbon tax. The Conservatives have stated their intent to pursue this aim[37] and are investigating raising the tax, recycling revenues through a reduction in rates of National Insurance contributions, and investigating alternatives to the CCAs, although they have not specified detailed proposals.

If the CCL were extended to all small consumers of electricity, gas and coal (i.e. including domestic use, but not necessarily including transport fuels), then it could be simplified greatly by becoming an upstream tax. It would then be easy to apply a variable rate to electricity, as well as to minimise transaction/monitoring costs and evasion. Under this system, all (large) companies in an emissions trading scheme could gain a rebate on their fuel purchases. However, both the government and the opposition have ruled out extending the tax to cover households through concerns about the distributional implications. The feasibility of ultimately covering domestic use of fuel under a carbon tax is discussed below.

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[34] Source: Footnote 4, table 1.2, page 10, of HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm).

[35] See page 27 of Liberal Democrats, *Fairer, Simpler, Greener*, Policy Paper 75, 2006 (http://www.libdems.org.uk/media/documents/policies/PP75%20Fairer%20Simpler%20Greener.pdf).

[36] An agreement by some industries to reduce emissions in return for a discount of 80% on the levy.

[37] Conservative Party, *An Effective Carbon Levy for the UK: A Consultation*, 2006 (http://www.conservatives.com/pdf/carbonlevy.pdf).

Landfill tax

Fiscal policy on landfill seems to be driven by the need to meet targets on the proportion of waste sent to landfill set in the EC's 1999 Landfill Directive. These include a requirement to send to landfill no more than 75% of the 1995 level of biodegradable waste by 2010, 50% by 2013 and 35% by 2020. The landfill tax is augmented by the Landfill Allowance Trading Scheme, which allows municipalities to trade permits to landfill, and the Landfill Tax Credit Scheme.[38] The major criticism of these policy objectives is that the tax rate is now far above the estimated negative externalities of landfill. A 1993 report by CSERGE and others[39] estimated marginal external costs of landfill at £7 per tonne of active waste and £2 per tonne for inert waste, matching initial rates of the tax in 1996. The present rate (£21 per tonne for active waste, rising to £24 from April) is far above these costs, unless they have changed significantly or the estimates were too low.

The landfill tax is still on course to reach the medium-term objective of £35/tonne by 2011–12, driven by the need to meet the Directive. Beyond that tax rate, much will depend on progress towards hitting the targets and contributions made to that by the Landfill Allowance Trading Scheme. The government stated its intention in the December 2006 Pre-Budget Report to consider a higher target rate and/or to increase the level of annual increases towards the target from 2008.

Aggregates levy

The 2006 Budget forecast revenues from the aggregates levy of £300 million in both 2005–06 and 2006–07. There appears to be little sign that the rate or structure of the levy will change in the immediate future. The government has left the rate unchanged for four years; the most likely change will be a 'correction' for inflation sometime in the next few years.

Longer-term reforms

One of the key policy conclusions of the Stern Review was the need to achieve a uniform price for carbon across the economy as quickly as possible. This can be achieved either explicitly, through taxation or allocation of permits, or implicitly, through regulation. Stern also urged that this price mechanism be credible (i.e. that agents believe that carbon pricing will persist indefinitely), in order to create the right incentives for investment, and flexible, to allow for changes or revised estimates of the cost of carbon or to allow for the sensitivities of a particular industry. This section considers two longer-term reforms that might help achieve this through economic instruments: an economy-wide carbon tax and the use of emissions trading schemes in the context of the existing UK and EU measures. It then goes on to consider longer-term transport policy reform in the context of road pricing.

Carbon tax

A tax on carbon provides one obvious way to create a national carbon price. As direct carbon emissions by households or individuals are not observable, the way such a tax would be

[38] For an account of these schemes, see pages 49–50 of A. Leicester, *The UK Tax System and the Environment*, IFS, London, 2006 (http://www.ifs.org.uk/publications.php?publication_id=3774).

[39] CSERGE, Warren Spring Laboratory and EFTEC, *Externalities from Landfill and Incineration*, HMSO, London, 1993.

introduced would be to tax energy according to the carbon content of the fuel. Households would face the price in their fuel bills. Business fuel use is already subject to the CCL, which makes some differential for different energy types but is not directly targeted on the carbon content of fuels. A carbon tax would provide direct incentives to switch supply to low-carbon generators. One concern over any business carbon tax would be the impact on national competitiveness, since it would clearly raise the production cost for domestic firms. If it led to consumers switching towards imported goods that were produced in countries without such measures, the impact on global emissions might be reduced. Typically, though, recent green taxes that have been incident on firms have been offset by reductions in employer payroll taxes.

A key issue in any carbon pricing scheme is the impact on domestic households. Any increase in input prices resulting from the tax applied to the business sector is likely to be passed on to some extent to the household sector in the form of final product prices. A carbon tax applied to the domestic use of fuel, however, would be much more controversial. The present government has been strongly opposed to further taxes on domestic fuel use as this would counteract its policy objective of ending fuel poverty for vulnerable households by 2010 (a household is defined as being in fuel poverty whenever it needs to spend 10% or more of its income on heating).[40] Indeed, the government reduced the rate of VAT on domestic fuel consumption from 8% to 5% in its first Budget in 1997, fulfilling an election manifesto promise, and has ruled out any extension of the CCL to the household sector. The Conservatives, proposing a carbon tax for the business sector, have also explicitly stated it would not apply to households.[41] In addition to the problem of a household carbon tax conflicting with the desire to reduce fuel poverty, any increase in fuel bills would be highly regressive: since fuel is a necessity, the poor would lose a greater share of their income as a result than the rich. Dresner and Ekins[42] estimate a putative household carbon tax that applies at the same rates as the existing CCL for businesses as costing on average 0.22% of household incomes, with the poorest households losing over 0.5% compared with just over 0.1% for the richest households. Attempts to mitigate regressivity by using the revenue from a carbon tax to compensate poor households may be partially successful, but there is considerable variation in energy use even within income bands, such that it would be hard to compensate all badly-affected lower-income households.

As an alternative to a carbon tax, the 'personal carbon allowance' could be introduced – individuals would be allocated a certain amount of carbon they could emit each year that is 'spent' on heating, motoring, aviation and so on. In principle, this is similar to emissions trading with allowances being bought and sold. Both Labour and the Liberal Democrats have pledged a long-term commitment to developing personal carbon allowances.[43] If this scheme

[40] Estimates for 2004 put the level of fuel poverty amongst vulnerable households at around 1.5 million (Department for Environment, Food and Rural Affairs, *The UK Fuel Poverty Strategy: 4th Annual Progress Report*, 2006, London (http://www.dti.gov.uk/files/file29688.pdf)). This may have risen in recent years as a result of higher energy prices.

[41] Conservative Party, *An Effective Carbon Levy for the UK: A Consultation*, 2006 (http://www.conservatives.com/pdf/carbonlevy.pdf).

[42] S. Dresner and P. Ekins, 'Economic instruments to improve UK home energy efficiency without negative social impacts', *Fiscal Studies*, 27, 47–74, 2006.

[43] See, for example, http://www.defra.gov.uk/corporate/ministers/speeches/david-miliband/dm060719.htm and Liberal Democrats, *Fairer, Simpler, Greener*, Policy Paper 75, 2006 (http://www.libdems.org.uk/media/documents/policies/PP75%20Fairer%20Simpler%20Greener.pdf).

were to be introduced, it would have to replace many of the existing taxes, so would radically change the public finances of environmental taxation. Whether or not each individual would be given a free personal allowance and how large this would be will most likely be a political decision; clearly, the larger the free allocation of permits, the more progressive would be this 'tax', but the lower would be the revenues. Any such reform would be some time ahead.

Emissions trading systems

Emissions trading will almost certainly play a key role in economic environmental policy in future years. The EU ETS is the largest cross-national scheme in the world and a longer-term objective may be to bring in other developed and developing economies as part of the scheme, moving towards the creation of a global carbon market. The scheme is likely to expand with the eventual introduction of aviation and possibly even road transport, though neither will happen in the very short term, which still leaves a key role for national taxation policies.

The UK ETS expired at the end of 2006 and DEFRA is currently consulting on its replacement, at the moment entitled the 'Energy Performance Commitment' (EPC).[44] This will likely lead to some specific recommendations as part of the forthcoming Energy White Paper. The EPC will restrict its attention to emissions of CO_2 (the UK ETS considered a basket of Kyoto-relevant greenhouse gases) and will operate as a compulsory cap-and-trade system for medium-sized energy-using firms (those with bills in excess of £250,000 per year). This will make it much larger in scope than the UK ETS and will make the features of the domestic scheme look much more similar to those of the EU system, which also focuses only on CO_2 and is compulsory for large energy users.[45] Smith and Swierzbinski[46] argue that one of the problems with the UK ETS was that whilst it was aimed as a forerunner of the EU system to give UK firms and the London trading markets a 'first-mover' advantage in emissions trading, the differences between the UK and eventual EU schemes reduced the potential benefits of such an advantage and also made integration of the two systems harder. The proposed EPC will cover medium-sized enterprises not currently covered by the EU scheme, but closer alignment of the structures might reduce any future integration problems should the EU scheme also expand to cover smaller firms.

Unlike the EU and UK ETSs, the EPC proposes to auction permits (with revenues recycled to business) rather than 'grandfathering' them (allocating them for free). Auctioning ought to provide proper incentives for firms to reveal their abatement costs. One of the key issues with grandfathering permits to firms is that the government is at a severe informational disadvantage in terms of the firms' ability to abate emissions; firms acting strategically may therefore be able to procure more permits than they might otherwise require by withholding information, effectively handing them free excess permits that can be sold, raising profits for the firm.[47] Oversupply of permits has been a feature of both the UK and EU schemes – in

[44] See http://www.defra.gov.uk/corporate/consult/carbon-emissions/consultation.pdf for full details.

[45] Though the EU ETS is considering including other greenhouse gases from its Third Phase, beginning in 2013.

[46] S. Smith and J. Swierzbinski, 'Assessing the performance of the UK Emissions Trading Scheme', *Environmental and Resource Economics*, 2007, forthcoming.

[47] Even under a cap-and-trade system using full auctioning, this informational problem can still exist. Governments need to set the overall level of emissions allowed under the scheme and this assumes they know what the optimal

each case, the 'price' of permits traded has been far below expectations, suggesting excess supply, and in the UK, 'over-abatement' relative to target levels was a feature even in the very first year of operation, which led many to criticise the scheme as essentially paying firms to do what they would have done anyway.[48] The Stern Review was, however, sympathetic to grandfathering and to regulation in the short term as a way to price carbon without causing disruption and loss of competitiveness to (energy-intensive) industries, though argued it should not become a long-term feature of such schemes.[49] Stavins[50] argued that the focus on grandfathering in practice thus far has been driven by political acceptability: it allows closer control by governments over who receives permits (which might allow it to mitigate against particular distributional or regional concerns) and is more acceptable to business since the price is not upfront and is therefore more 'hidden'.

Road pricing

Road pricing schemes have been reasonably high on the political agenda for some time, but the publication of the Eddington Review in 2006 brought the issue to wider attention (see Box 11.2). Even before this, the government had been contemplating road pricing – a 2006 Department of Transport study examined public attitudes to road pricing and a 'lorry road user charge' (LRUC) was planned to be launched in 2008, until it was abandoned as a policy in 2005.

A road pricing scheme works in a similar way to fuel duty, acting as a marginal cost of each journey. However, unlike fuel duty, which charges a fixed amount for each litre of fuel purchased, a road pricing scheme would charge different amounts for driving a fixed distance in certain locations or at certain times of the day, with cars fitted with a location monitoring device. Driving in central Birmingham at 8:30am would attract a much higher charge than driving in a rural area at 4:00am, for example. From an economic efficiency point of view, road pricing is preferable to fuel duty as a marginal motoring charge because the external costs of motoring vary according to time and location. Work by Sansom et al.,[51] for example, concluded that the marginal external congestion cost on non-major rural roads was around 1.3–2.9p/km, compared with around 85.8p/km in peak-time Central London.

There may be considerable practical and political (possibly legal) opposition to a system that required accurate monitoring of vehicle location at all times. Other possibilities could be a growing use of road tolls or zonal congestion charges, such as that in central London, which charge drivers a fixed one-off payment to enter the zone on a particular day but allow unlimited driving within the zone once paid. Clearly, these alternatives do not quite accurately

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level of permits to allocate in total is or at least have information on projected 'business as usual' emissions without the scheme being in place in order to set a target below this level.

[48] For a summary, see the same Smith and Swierzbinski paper.

[49] See page 319 of N. Stern, *The Economics of Climate Change*, HM Treasury, London, 2006 (http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm).

[50] R.N. Stavins, 'What can we learn from the grand policy experiment? Lessons from SO2 allowance trading', *Journal of Political Economy*, 12(3), 69–88, 1998.

[51] T. Sansom, C.A. Nash, P.J. Mackie, J. Shires and P. Watkiss, *Surface Transport Costs and Charges: Great Britain 1998*, Institute for Transport Studies, Leeds, 2001 (http://www.its.leeds.ac.uk/projects/STCC/downloads/SurfaceTransportCostsReport.pdf).

Box 11.2. The Eddington Review and road pricing

The Eddington Review on the future of UK transport policy was published in December 2006.[a] With regard to transport's impact on climate change, the Review accepts Stern's view that transport is likely to be the last sector to reduce CO_2 emissions substantially, and that it will likely still be oil-based in 2050. With this in mind, Eddington stressed that, although environmental externalities should be priced into all end-user and investment decisions, there are still great welfare gains from many transport projects. The report concludes that policy should focus on improving the existing transport network rather than building extensive new ones, with a priority placed on three key areas: congested urban centres, key inter-city arteries and international trade hubs (principally airports, with support in the Review for an expansion of runway capacity in the south-east).

However, the most important conclusion of the report is the need for road user pricing. Eddington estimates the potential welfare benefits from pricing at £28 billion per year, including a £15 billion per year increase in national income and direct environmental benefits of £500 million per year. Road user charging could cut congestion by 50% and reduce the need for additional investment by 80%: Eddington stresses that unless road user charging is operable by 2015, substantial new investment in road building would be needed to avoid excessive congestion.

[a] R. Eddington, *Transport's Role in Sustaining UK's Productivity and Competitiveness*, HM Treasury, London, 2006. See http://www.hm-treasury.gov.uk/media/39A/41/eddington_execsum11206.pdf for a summary. The full report is available at http://www.hm-treasury.gov.uk/independent_reviews/eddington_transport_study/eddington_index.cfm.

create the 'right' price of motoring in the same way as a road price, but this needs to be weighed against practical considerations from a policy point of view.

From an environmental perspective, the key consideration is whether and how environmental incentives could be built into the road pricing system. Whilst marginal costs of congestion, noise and accident risk vary by time and location, the cost of a tonne of CO_2 emissions does not. It may be possible to include as part of the price an estimate of the external cost of carbon emissions, which could vary according to vehicle type in the same way that VED varies with emissions ratings now. However, even if the environmental costs were accurately incorporated into any road pricing scheme,[52] it is still conceivable that road transport emissions could *rise* rather than fall, depending on how the scheme was implemented. By providing the right incentives to drivers, road pricing would presumably distribute the flow of vehicles more efficiently, encouraging drivers to choose different routes or different periods in which to travel. Reduced congestion as a result may make driving a more attractive option and increase total distance driven. The key question is how existing policies are reformed in the event of road pricing being introduced. One possibility would be to abolish or substantially reduce VED and fuel duty, leaving overall revenue broadly unchanged. Glaister and Graham[53] suggest that in that event, there would be an increase in traffic volumes of

[52] The same Sansom et al. study suggested that, *on average*, congestion costs dominate the total externalities of motoring, being responsible for perhaps 90% of the total marginal external cost. Where congestion costs are low, such as in rural areas, the environmental consequences would make up a much higher share of the total costs.

[53] S. Glaister and D. Graham, *Road Pricing in Great Britain: Winners and Losers – Technical Report*, Imperial College London, 2006 (http://trg1.civil.soton.ac.uk/itc/rpgb_main.pdf).

perhaps 25% across much of Scotland, Wales, East Anglia and the South West, and a reduction in volume of one-third in urban centres. The overall environmental impact would be unclear. However, introducing road pricing *on top* of existing motoring taxes – and, for example, using the revenue to reduce other taxes – might be politically difficult.

11.6 Conclusions

With green issues high on the political agenda, there will doubtless be considerable pressure on the Chancellor to further raise the total level of receipts from green taxes in the forthcoming Budget. At a time when even a modestly generous spending settlement in the 2007 Comprehensive Spending Review might require additional tax revenues (see Chapter 7), green taxes could be a tempting option if their benefits beyond revenue-raising provide sufficient public support for any increase. However, within the existing framework of tax options, the scope to raise significant sums of money is fairly limited unless above-inflation rises in fuel duty rates are once again enacted. Experience since 2000 suggests this is unlikely.

The government will be keen, and will be correct, to point out that its environmental policy should not be judged on green tax receipts alone. There has been considerable development in recent years that does not show up in these figures. Looking ahead, there is also considerable uncertainty about the long-term structure of environmental taxes – any move towards carbon pricing, personal carbon allowances or road pricing would mean significant changes to the existing system. Nevertheless, given the findings of the Stern Review and the developing environmental agendas of the opposition parties, it would be surprising if the fall in green tax revenues in real terms and as a share of national income that has been seen in recent years were allowed to continue in the near term.

12. Supporting couples with children through the tax system

Mike Brewer (IFS)

Summary

- The tax and tax credit system treats some married or cohabiting couples with children less generously than if the parents live (or claim to live) apart. Some 'couple penalty' or 'couple premium' is inevitable if you want to be proportionately more generous to people on lower incomes and if you assess entitlement to help according to family rather than individual circumstances.
- But critics variously argue that the current system is inefficient in lifting couples with children out of poverty, that it encourages parents to live apart to the detriment of their children and that it gives insufficient support to couples where one partner gives up work to care for young children.
- We assess three recent proposals to alter the tax treatment of couples with children in order to ameliorate one or more of these perceived problems. Reflecting the different objectives that motivate them, these proposals would have different effects on family incomes and financial work incentives.
- Increasing the working tax credit for all couples with children would particularly help low-income one-earner couples, but would discourage them from increasing their income, for example through adding an earner or working longer hours.
- Increasing the working tax credit only for two-earner couples would reverse a recent trend by strengthening the incentive for low- to middle-income couples to have both adults in work, but would also discourage such families from seeking increases in income through other means.
- A transferable personal allowance for families with a child under 6 would benefit the majority of one-earner couples with a young child, regardless of income, but would act to discourage such families from having both adults in work.
- All three proposals would reduce the 'couple penalty' in the tax credit system because they give extra support to couples with children but not to lone-parent families.

12.1 Introduction

Deciding how personal taxes, tax credits and means-tested benefits should treat parents in different family structures is an extremely difficult policy design issue. As usual, the difficulty arises because governments often face conflicting objectives.

At present, the tax and benefit system treats some married or cohabiting couples with children less generously than if the parents live (or claim to live) apart. As we discuss in Section 12.2, some 'couple penalty' (or 'couple premium') is inevitable if you want to be proportionately more generous to people on lower incomes and if you assess entitlement to financial help through benefits and tax credits (or liability to income tax) according to household rather than individual circumstances.

The purpose of this chapter is to compare some specific suggestions that have been made recently for changing the way that couples with children are treated by the tax and benefit system. The suggestions are:

- increasing the value of the working tax credit for couples with children;
- strengthening the financial incentive to work of a second earner in a couple by changing some aspect of the working tax credit; and
- a transferable personal income tax allowance, perhaps restricted to those with young children or couples with children who are married (or in a civil partnership) rather than cohabiting.

Although none of these proposals is yet advocated by any political party, all have been at least discussed at a high level. The Liberal Democrats have criticised the current tax credit system for providing apparent penalties for adults who decide to cohabit. In a report commissioned by the government, Lisa Harker recommended reforms similar to the second proposal. The Conservative Party has in the past proposed a transferable personal income tax allowance, and certainly seems sympathetic to the idea of supporting one-earner couples with children.

Section 12.2 discusses in general terms why designing a tax and benefit system for couples is more complicated than designing one for single people. Section 12.3 outlines the current system and the various criticisms made by the proponents of these reforms. Section 12.4 sets out the reforms and analyses their impact on family incomes, the 'couple penalty' and measures of financial work incentives.[1]

12.2 What should governments think about when designing taxes and benefits for couples?

When considering how to structure a tax and benefit system for single people (meaning how generous to make benefits and tax allowances, how quickly to withdraw benefits and what rate to set for income tax), the key issues for a government to decide are how much support to give to those with low incomes, how quickly to reduce that support and then what rate of income tax to set, and how much money to raise overall (revenue from taxes less spending on benefits). In other words, there will generally be a three-way trade-off between:[2]

[1] The Family Resources Survey is used with permission of the Department for Work and Pensions (DWP), and is also available at the UK Data Archive.

[2] S. Adam, M. Brewer and A. Shephard, *The Poverty Trade-Off: Work Incentives and Income Redistribution in Britain*, Policy Press, Bristol, 2006, explores these issues empirically.

- redistribution to the poor (generally achieved with high levels of benefits for the poor, low levels of benefit withdrawal and high rates of income tax);
- keeping work incentives strong (generally achieved with low levels of benefits for the poor, low rates of benefit withdrawal and low rates of income tax); and
- raising money for public spending elsewhere (generally achieved with low levels of benefits for the poor, high rates of benefit withdrawal and high rates of income tax).

One way to design a tax and benefit system for couples is not to treat them differently at all: in other words, to have a tax and benefit system that only ever depends upon an individual's circumstances. In this case, the tax and benefit treatment of a couple will be identical to the tax and benefit treatment of the two adults in the couple if they had been living apart. This can be thought of as a fully individualised tax and benefit system. This would be an appropriate way to design a tax and benefit system if it were thought that people's well-being (and ability to pay) depends upon their own income, and not the income of any partner who may be present, or if an overriding concern about individual autonomy ruled out a jointly assessed tax and benefit system.[3]

At the extreme, a fully individualised tax and benefit system would involve paying benefits or tax credits to a non-working or poorly-paid individual regardless of whether they were living alone or married to a millionaire. Although it is possible to argue that low-individual-income partners of millionaires are in need of state support – and such individuals in the UK would be entitled to child benefit (if they had children), a state pension (if they had made contributions before retiring) and certain disability benefits (if they were long-term sick or disabled) – most governments in developed countries have a tax and benefit system that redistributes income to couples who have a low combined income, rather than to individuals who have a low individual income. They achieve this by having a system where social security or means-tested benefits at least, and often income tax too, depend in some way upon the combined circumstances of the couple. Such a system makes sense if it is thought that couples in the same household share their income to some extent, and if it costs couples in the same household less to maintain the same level of living standards than two individuals living separately (e.g. because accommodation suitable for two people living together is less than twice the cost of suitable accommodation for one person).

If a government decides that it wants the tax and benefit system to take some account of couples' circumstances, then there are more factors to take into consideration.

- First, the government will need to consider the extent to which the tax and benefit system creates financial penalties or bonuses for adults who choose to live as a couple rather than as single adults. Such penalties or bonuses, even if not intentional, are almost inevitable: the only two ways to design a tax and benefit system for couples that does not give financial penalties or bonuses for adults who choose to live as a couple are either to have a fully individualised tax and benefit system or to have a purely proportional joint tax system with no tax-free allowance.

[3] One feature of an individualised income tax system is that the net income available to a couple can depend on which partner earns it: for example, in a tax system where the average rate of tax rises with income, a two-earner couple would have a higher net income than a single-earner family with the same gross income as the two adults combined.

- Second, when considering the impact on work incentives, the government will need to think about how any tax and benefit system affects the work incentives of both first and second earners in a couple. This is because a tax and benefit system that is based on family income will tend to have different impacts on the financial work incentives of the first potential earner in a couple from those of the second potential earner. (Box 12.1 outlines a recent paper that uses economic principles to examine this issue, but which abstracts from the other two factors listed here.)
- Third, the government will also have to decide when two individuals should count as a couple and when they should be treated as two single individuals, and then be prepared to police this definition. For example, a government may decide to distinguish between married couples (which would now probably include those in civil partnerships) and all other living arrangements. Alternatively, it may decide that the legal state of marriage (or civil partnership) is not relevant, in which case the distinction is between single individuals on the one hand and all couples on the other; in this situation, a government will need to decide whether to treat same-sex cohabiting couples differently from other cohabiting couples. In current social security and tax credit legislation in the UK, the legal state of marriage (or civil partnership) is not relevant: both define a couple as a married couple (who are not separated) or an unmarried couple who are 'living together as husband and wife'. Other parts of the tax system, though, maintain a distinction between married couples and all other arrangements.[4] Whatever the definition, a government will have to deal with the fact that family circumstances are not fixed over time, and in the real world there may not be an obvious divide between being a single adult and living as a couple.[5]

To conclude, there are at least four considerations affecting how a government would design a tax and benefit system that treats couples and single people differently:

- how much to redistribute to single adults with a low income and couples with a low joint income;
- to what degree to keep work incentives strong for both first and second earners in a couple (by having low rates of benefit withdrawal and low rates of income tax);
- how to define a couple, and whether to have financial penalties or bonuses for adults who live in couples; and
- how much money should be raised in taxes net of benefits for other public spending.

Furthermore, the nature of the trade-offs is more complicated than it is when considering tax and benefit design for single adults. The following sections, which look at specific reforms affecting couples, will help illuminate some of these trade-offs.

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[4] See R. Sax, 'The interaction of tax and family law in England and Wales', paper presented at IFS conference Tax and the Family, New Hall College, University of Cambridge, April 2005 (http://www.ifs.org.uk/conferences/sax.pdf).

[5] This is reflected in the detailed guidance used by DWP and HMRC officials when deciding whether two adults should count as living together as husband and wife (LTAHAW); ultimately, the issue is one of an official's judgement. Although this may be a reflection of how people live their lives, such imprecision will cause difficulties in the operation of the tax and benefit system if people are not clear whether they are a single person or LTAHAW, or if HMRC or DWP finds it hard to enforce a particular definition. For further discussion, see M. Brewer and J. Shaw, *How Many Lone Parents Are Receiving Tax Credits?*, IFS Briefing Note 70, 2006 (http://www.ifs.org.uk/bns/bn70.pdf).

Box 12.1. Applying the optimal income tax problem to couples

Optimal tax theory is an area of economic research that attempts to determine how generous benefits and tax allowances should be, and what rates of benefit withdrawal and income tax to set, given information on how labour supply depends on financial incentives to work at all or earn more, and given to what extent a government wants to equalise incomes. Most theoretical and empirical applications have considered economies with only single individuals. A recent working paper has considered what happens if the economy has only individuals living in couples.[a]

One result of that paper is that it is not sensible to have fully individualised tax and benefit schedules if the government considers that an individual's well-being depends on family (rather than individual) income. Another result suggests that the optimal tax treatment for the second earner in a couple is to have relatively high marginal effective tax rates (these are defined in Box 12.3) for a second earner with a low-earning partner, and relatively low marginal effective tax rates for a second earner with a high-earning partner. The authors argue that this tends to be found in tax and benefit systems that combine individual-level income tax with jointly assessed benefits or tax credits for low-income families, such as that found in the UK.

But the analysis abstracts from much real-world complexity. It assumes that each individual's well-being depends upon family income, not individual income. And it assumes that every adult lives in a couple and does so permanently, which means that it does not need to consider the extent to which the optimal tax system creates penalties or bonuses for couples.

[a] H. Kleven, C. Kreiner and E. Saez, 'The optimal income taxation of couples', NBER Working Paper 12685, 2006.

12.3 The current system and its perceived drawbacks

This section first explains how the current tax and benefit system provides support to couples with children and then sets out some of the criticisms made of the current system. The following section then describes the reforms modelled in this chapter and how they would address these various criticisms.

The current system

Since April 2003, support to families with children has been provided through two main programmes: child benefit and the combination of child and working tax credits.

Child benefit is a universal benefit payable to all families with children, regardless of income and family structure; reforms to this are not considered in this chapter.

The child tax credit (CTC) and working tax credit (WTC) together provide income-related support to the majority of families with children. The CTC consists of a small amount payable to each family with children (the family element), and much larger payments per child (the per-child element). The WTC provides support to families with at least one adult in work of at least 16 hours a week.

A combined means-test against a couple's joint annual income applies to CTC and WTC together: families with gross family income of £5,220 or less per year are entitled to the full CTC and WTC payments appropriate for their circumstances. Once family income exceeds this level, the tax credit award is reduced by 37p for every £1 of family income above this level. Formally, entitlement to WTC is withdrawn first, then the child elements of the CTC. In practice, this means that the WTC and CTC interact: increases in the generosity of the WTC automatically increase the point at which the CTC starts to be withdrawn as income rises, and so increases in the WTC (such as those considered in Section 12.4) benefit not only all families receiving the WTC, but also those families on the first taper of the CTC and those families who are brought onto the taper after any increase in WTC.

Perceived drawbacks of the current tax and benefit system for couples with children

Between them, the proponents of the three reforms analysed in this chapter identify a number of drawbacks of the current tax and benefit system and the way that it affects couples with children.[6] The criticisms are:

- that tax credits do not do enough to ensure that couples with children with at least one worker can escape relative poverty, according to the way it is measured by this government;
- that the financial incentive to work for potential second earners is too weak;
- that insufficient support is given to one-earner couples with children; and
- that the means-tested benefit and tax credit systems treat some married or cohabiting couples with children less generously than if the parents live (or claim to live) apart.

Below, we discuss these in more detail.

Too many working couples with children remain in relative poverty

One criticism made of the government's policies for tax credits is that, in order to be better targeted at reducing child poverty, they need to do more to reduce the risk of working poverty amongst couple families. Forty-two per cent of children in relative poverty in 2004–05 were living in couple families with at least one working parent and only 8% were in working lone-parent families, and so the extent to which tax credits can reduce working poverty amongst couple families will be crucial in determining future levels of child poverty.[7] The government's official analysis of low-income households states that 9% of children living with lone parents working full-time and 14% of those living with couples with one full-time worker were in poverty in 2004–05. For children living with lone parents working part-time,

[6] The reforms are not intended by their proponents to address all four criticisms.

[7] The numbers are from table 4.7 of Department for Work and Pensions, *Households Below Average Income 1994/95–2004/05*, Corporate Document Services, Leeds, 2006. Being in poverty is defined as living in a household with an equivalised income less than 60% of the median, measured before housing costs (BHC) and using the McClements equivalence scale. Prospects for child poverty in 2010 are discussed in D. Hirsch, *What Will It Take to End Child Poverty? Firing on All Cylinders*, Joseph Rowntree Foundation, York, 2006, and M. Brewer, J. Browne and H. Sutherland, *Micro-Simulating Child Poverty in 2010 and 2020*, Joseph Rowntree Foundation, York, 2006 (http://www.jrf.org.uk/bookshop/eBooks/9781859355091.pdf). The same pattern is evident if incomes are measured after housing costs (AHC).

the poverty rate in 2004–05 was 15%; for children living with couples with one or two part-time workers (and no full-time workers), it was 40%.[8]

These results are driven by the fact that, when calculating poverty rates for households of different compositions, the government's official statistics assume that larger households need more income to achieve a given standard of living than smaller households.[9] In particular, the methodology implies that a couple with two children needs 30% more income than a lone-parent family with the same number of children. In 2004–05, this led to an implicit poverty line of £225 a week for a lone parent with two children, but £294 a week for a couple with two children. However, the tax credit system is designed so that couples with children and lone-parent families with the same number of children and the same gross incomes receive the same amount of tax credits. This implies that the level of earnings required by a couple with children to escape poverty using the government's current definition is significantly higher than that for a lone-parent family with the same number of children. For example, in 2004–05, a couple with two children would have needed a full-time job paying a gross wage of £240 to have a net income of £295, just above the poverty line for that family in that year. But a lone parent with two children working just 16 hours a week at the minimum wage (weekly gross earnings of £76) would have had a weekly net income of £222, £10 higher than the poverty line in that year for such a family of £212.[10]

This mismatch between the principles used when calculating poverty rates and the structure of tax credits is what leads to the situation that couples need to earn more than otherwise-equivalent lone parents to be considered as well off in official statistics on low-income households. It is possible to dispute the implication in the modified OECD equivalence scale that a couple with children necessarily has lower living standards than a lone-parent family with the same income: although the couple family will presumably need to spend more on most goods and services, they will probably benefit (compared with the lone-parent family) from having less need to find and pay for childcare, and from having one adult able to engage in home production – factors not considered when calculating official poverty rates.[11] Indeed, some research has suggested that couples with children enjoy a higher standard of living on average than lone parents with the same disposable income, a finding that could be used to justify significant increases in tax credits for lone parents rather than couples with children.[12] On the other hand, the government chose the modified OECD scale to equivalise incomes when calculating poverty rates for its 2010–11 target after a comprehensive consultation and review on how child poverty should be measured, so presumably it is happy with the

[8] Again, the numbers come from table 4.7 of Department for Work and Pensions, *Households Below Average Income 1994/95–2004/05*, Corporate Document Services, Leeds, 2006.

[9] The jargon is that incomes are equivalised for household size and composition. The government is now using the modified OECD scale to adjust incomes (see appendix 3 of *Households Below Average Income 1994/95–2004/05* or appendix A of M. Brewer, A. Goodman, J. Shaw and L. Sibieta, *Poverty and Inequality in Britain: 2006*, IFS Commentary 101, 2006).

[10] Measuring incomes BHC and using the modified OECD equivalence scale.

[11] Spending on childcare is not deducted from the measure of disposable income, and the measure takes no account of leisure or home production (i.e. the amount of time spent not in paid work).

[12] Page 67 of R. Berthoud, M. Bryan and E. Bardasi, *The Dynamics of Deprivation: The Relationship between Income and Material Deprivation over Time*, DWP Research Report 219, Corporate Document Services, Leeds, 2004. This result may reflect the fact that having low income is a more permanent state for lone parents than it is for couples with children, and therefore that having a low income is a weaker indicator of long-run living standards for couples with children than it is for lone parents.

implications. If this is the case, then the mismatch between the principles used when calculating poverty rates and the structure of tax credits probably reflects that the government has multiple and competing objectives in mind when structuring tax credits, and is not solely concerned with reducing relative child poverty. One could also argue that when comparing poverty rates between couple and lone-parent families, families with the same number of non-workers (i.e. adults available to care for the children) – rather than the same number of workers – should be compared. If so, then the poverty rate of 9% amongst children living with lone parents working full-time should be compared with the poverty rate of 1% amongst children living with two-earner couples, and the poverty rate of 15% amongst children living with lone parents working part-time should be compared with the rate of 4% amongst children living with one full-time worker and one part-time worker. Using these comparisons, the tax credit system would seem to favour couple families at the expense of lone-parent families.

Second earners in couples with children have weak incentives to work

Another criticism that is made is that changes to tax credits since 1997 have weakened the financial incentive to work of second potential earners in couples with children.

Compared with a tax and benefit system without it, WTC strengthens the incentive for the first potential earner in a couple to work and weakens the incentive for the second potential earner to work. This is because WTC is available only if there is at least one adult in a couple in work, but it is then means-tested against the income of both adults. An evaluation of the impact of the former working families' tax credit (WFTC, which was structured very similarly to WTC) on employment patterns of couples with children estimated that it increased employment amongst parents whose partner did not work and reduced it amongst parents whose partner did work.[13] Analysis of how financial work incentives in the UK have changed under the current government shows that tax and benefit changes alone have tended to worsen both the incentive to work at all and the incentive to earn a little more for second potential earners in couples.[14] In fact, the same is also true (on some measures of financial work incentives) for first earners in couples, but what will be particularly relevant when considering the ability of tax credits to help reduce child poverty is that potential second earners in low- to middle-income families with children are more likely than those in high-income families to have seen their financial work incentives weaken thanks to tax and benefit reforms.[15] It remains the case that lone parents tend to face weaker work incentives than both first and second potential earners in couples.

[13] See M. Brewer, A. Duncan, A. Shephard and M. José Suárez, 'Did working families' tax credit work? The impact of in-work support on labour supply in Great Britain', *Labour Economics*, 13(6), 699–720, 2006.

[14] See section 4 of M. Brewer and A. Shephard, *Employment and the Labour Market*, IFS Election Briefing Note 5, 2005 (http://www.ifs.org.uk/bns/05ebn5.pdf).

[15] Potential second earners in high-income families will have seen their financial work incentives hardly altered by the expansion of tax credits since 1999: the family element of the child tax credit is available to high-income families with children, but it has little impact on financial work incentives because it is not related to income until gross annual income reaches £50,000.

The tax and benefit system gives insufficient support to single-earner couples with children

A criticism that is made of the income tax system (but not the tax credit system) is that it is unfair to single-earner couples with children compared with two-earner couples with children because a two-earner couple can use two sets of personal allowances whereas a single-earner couple can only use one. For example, a two-earner couple where each earns £15,000 a year would pay a total of £74.40 (£37.20 each) a week in income tax, but a one-earner couple where the worker earned £30,000 a year would pay £100.66 a week.

This can be viewed as unfair, but only if the income tax system is viewed from the point of view of the couple: if it is believed that income tax should reflect only the individual's circumstances, then there is no unfairness in the current arrangement (indeed, if it is believed that income tax should reflect only the individual's circumstances, then it would be unfair that an individual's income tax bill depended on the work status of that individual's partner).

The benefit and tax credit systems treat some couples with children less generously than if the parents live apart

The final criticism relevant to the reforms considered in this chapter is that the current structure of tax credits and means-tested benefits treats some couples with children less generously than if the parents live apart (often described as reflecting a 'couple penalty' in tax credits, and this shorthand is used in this chapter).

The existence of a 'couple penalty' is usually shown by comparing how much state support a lone parent and a single adult without children would be entitled to if they lived apart with what they would be entitled to if they lived together; many (but not all) would be entitled to less if they were living together than if they were living apart.[16]

The existence of such 'couple penalties' is chiefly due to the fact that couples with children and lone-parent families are entitled to the same amount of tax credits if they have the same gross incomes (this criticism, therefore, is due to the same design feature of tax credits that motivated the first criticism above, that in order to be better targeted at reducing child poverty, tax credits should do more to reduce the risk of working poverty amongst couple families). Entitlement to both the WTC and the CTC does not take explicit account of the number of adults in the family, but does depend upon the joint income of the couple. This means that, if a lone parent who is already entitled to WTC and CTC starts to cohabit, that family's entitlement to tax credits will fall because of the extra income brought in by the new partner. Furthermore, the new partner will, in general, cease to be entitled to any means-tested support that he/she received when living alone.

In practice, the existence of a 'couple penalty' depends on the detailed circumstances of both the lone parent and the potential partner, and the assumptions made about how working and living arrangements might change when adults start or stop living together. It should also be stressed that some adults would experience a 'couple bonus' if they were to live together. But

[16] See 'Tax credits leave couples worse-off living together', CARE press release dated 24 November 2006. Past work on this issue includes: Civitas, *The Lone Parent Trap*, London, 2002; J. Kirby, *The Price of Parenthood*, Centre for Policy Studies, London, 2005; and 'Government paying tax credits and benefits to 200,000 more lone parents than live in the UK', IFS press release dated 12 March 2006. An additional 'couple penalty' can arise from differential access to benefits in kind, notably social housing.

the design of tax credits does make it more likely that 'couple penalties' exist for families with children than for adults without children: this is because a couple without children is entitled to more WTC than a single adult without children with the same gross income.

It is difficult to find robust evidence that this situation genuinely affects how people make their living arrangements:

- By comparing the circumstances of women who live with a partner with those who do not, a recent paper estimated that a £100/week 'couple penalty' from the tax and benefit system reduces the probability of a woman having a partner by about 7 percentage points.[17]
- That same paper estimated that WFTC led to more couples with children (by financially encouraging lone parents to cohabit), but this result does not match that of an earlier paper, which estimated that the reverse had happened.[18]
- It has been reported in the media that some advice centres are asked to undertake 'better off' calculations for people considering cohabiting but who are concerned that they would be much worse off if they did so.

But there is good evidence that the situation at least affects how people *report* their living arrangements:

- During 2004–05, around 200,000 more lone parents were receiving tax credits (or the equivalent in means-tested benefits) than official surveys estimate to be living in the UK, in part, it was suspected, because some adults who were cohabiting were claiming state support as lone parents.[19]
- HMRC estimates that £305 million was paid out incorrectly in tax credit awards in 2003–04 because 90,000 couples incorrectly claimed tax credits as lone parents (whether through error or intentional fraud).[20]

Of course, even if the evidence that this aspect of the tax credit system distorts behaviour (and therefore leads to inefficiencies) is weak, it might be thought valid to criticise it purely on equity grounds – namely, that it is unfair to lone parents that they see such a considerable reduction in state support when they begin to cohabit.

12.4 Three proposals for reform

This section discusses the three proposals for reform, relates each back to some of the four criticisms of the current tax and benefit system outlined in the previous section, and then

[17] Around 70% of women aged 20–55 live with their partner: see D. Anderberg, 'Tax credits, income support and partnership decisions', paper presented at RES conference, University of Nottingham, March 2006.

[18] M. Francesconi and W. Van der Klaauw, 'The consequences of in-work benefit reform in Britain: new evidence from panel data', ISER Working Paper 2004-13, found that the WFTC reform meant that lone mothers were less likely to start to cohabit (a reduction of 2 percentage points), but Anderberg (op. cit.) estimated that the WFTC reform created around 50,000 new couples by increasing the partnership rate by 0.5 percentage points.

[19] M. Brewer and J. Shaw, *How Many Lone Parents Are Receiving Tax Credits?*, IFS Briefing Note 70, 2006 (http://www.ifs.org.uk/bns/bn70.pdf).

[20] HM Revenue and Customs, *Child and Working Tax Credits: Error and Fraud Statistics 2003–04*, 2006 (http://customs.hmrc.gov.uk/channelsPortalWebApp/downloadFile?contentID=HMCE_PROD1_025711).

compares their impact on family incomes, financial work incentives and the 'couple penalty'. The three proposals are:

- increasing the working tax credit for couples with children;
- changing features of the working tax credit to strengthen the financial incentives to work of a second (potential) earner in a couple; and
- introducing a transferable personal allowance restricted to couples with children.

To make fair comparisons, it is necessary to consider proposals for change that all cost the exchequer roughly the same amount. The cost of providing a transferable personal allowance for couples with a child under 6 is around £1 billion, and so the other reforms have been calibrated so that they cost around £1 billion. (The costs have been estimated assuming that families do not alter their work patterns or family structure. If they do, then the actual impact on net tax revenues may differ slightly from £1 billion. But as shown later, all three policies have mixed impacts on financial work incentives.)

Spending £1 billion can be achieved by:

- increasing the working tax credit for all couples with children by £15 a week (or £780 a year from its April 2006 level of £3,305);
- increasing the working tax credit for all couples with children where both adults work at least 16 hours a week by £40 a week (£2,080 a year); or
- making the income tax personal allowance transferable for couples with children under 6, restricted to the basic rate.

Below, we analyse the impact of these policies on families' budget constraints, incomes and financial work incentives. All costs and financial values are in 2006–07 prices.[21]

What are the reforms intended to achieve?

Increase the working tax credit for couples with children

This reform would give more support to low-income couples with children in order to:[22]

- target the working tax credit more efficiently on children in poverty; and
- reduce (or remove) possible financial penalties when a lone parent starts to cohabit, particularly amongst potential low-income couples with children.

These aims could be achieved by having a higher basic credit for couples with children than for lone parents, just as is currently the case for families without children (where a couple without children receives more WTC than a single adult without children with the same gross

[21] The analysis of these policies assumes that they were introduced on the April 2006 tax and benefit system. No changes have been made to housing benefit or council tax benefit, broadly in line with the practice of the current government when altering the working tax credit, so the £1 billion net cost to the government will comprise an increased spend on tax credits of more than £1 billion (or reduced income tax revenue of more than £1 billion from the transferable personal allowance) but also savings on housing benefit and council tax benefit. This also means that couples with children receiving HB or CTB will in general gain by less from these proposals than otherwise-equivalent families not receiving those benefits.

[22] For example, the reform has been put forward by CARE in D. Draper and L. Beighton, *Restructuring Tax Credits*, CARE Policy Paper, 2006.

income).[23] An increase in the WTC for couples with children of £15 a week (or £780 a year from its April 2006 level of £3,305) would cost around £1 billion and benefit 1.5 million families with children.

The direct impact of giving couples with children more tax credits would be to increase the incomes of low-income working couples with children. Because lone parents are unaffected by this proposal, it would also reduce any 'couple penalty' (or increase any 'couple bonus') that can exist when a lone parent starts to cohabit by precisely the same amount. That means that the 1.5 million couples with children who would benefit from this policy would find that any 'couple penalty' had reduced by an average of £667 a year (or any 'couple bonus' had increased by the same amount).[24]

There would also be implications for financial work incentives. The policy would:

- increase the incentive for some low-income couples with children to have one earner compared with no earners;
- reduce the financial incentive for the working partner in a one-earner couple with children to earn more, whether through additional hours or being paid more per hour; and
- reduce the financial incentive for some second earners (or potential second earners) in low-income couples with children to work at all, or to work additional hours.

These impacts on financial work incentives are discussed in more detail later in this section.

The proposal would increase the financial incentive for some couples to have children (because it increases the support received by some couples with children, and not of couples without children). Whether this would actually affect childbearing decisions, though, is not clear.

Encourage second earners through the working tax credit

In Lisa Harker's recent review for the Department for Work and Pensions (DWP) of what it would take for the government to meet its child poverty targets, she – like some of the proponents of the first reform – drew attention to the fact that 'in-work poverty is primarily a problem that affects couple families'.[25] However, Harker's proposed solution involved support and incentives for second earners to move into work – rather than increased financial support for one-earner families – with improved incentives coming about through 'changes to the working tax credit or extending eligibility for the In-Work Credit to second earners with children'.[26]

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[23] They could also be achieved by having a higher income threshold for WTC for couples with children than for lone parents: this would allow couples with children to earn more (both more than the current system and more than lone parents) before higher earnings led to smaller tax credit awards. An increased threshold could be structured to have almost identical impacts on couples with children to one that increased the credit in the working tax credit, apart from those very few couples with children who are receiving WTC but have earnings of £5,220 or less: this group, disproportionately likely to include the self-employed, would not benefit from the increased disregard.

[24] It would be very interesting, but beyond the scope of this chapter, to estimate how this policy would affect the potential 'couple penalty' amongst existing lone-parent families, were they to cohabit.

[25] Page 47 of L. Harker, *Delivering on Child Poverty: What Would It Take? A Report for the Department for Work and Pensions*, Cm. 6951, Session 2006/7 (http://www.dwp.gov.uk/publications/dwp/2006/harker/).

[26] Page 49 of Harker (op. cit.). The In-Work Credit is a policy being piloted by DWP in various areas around Great Britain. It pays £40 a week to people who leave out-of-work benefits and move into work of at least 16 hours a week,

Harker did not specify how the WTC might be changed: her brief was to examine DWP's policies in detail, not those of the Treasury and HMRC. But an obvious change would be to introduce an extra credit conditional on a couple having two adults in work (16 or more hours a week), with this credit being tapered away as income rises, just as WTC is tapered away at present.[27] An increase by £40 a week (£2,080 a year) in working tax credit for all couples with children where both adults work at least 16 hours a week would cost around £1 billion and benefit around 600,000 couples with children.[28]

Given that this policy has been suggested as a response to the weak incentives to work facing second earners in couples with children, it is reassuring to know that it would indeed increase the financial incentive for the second earner to work at least 16 hours a week (these effects are shown in detail later in this chapter). However, it would also weaken the financial incentive for some second earners in couples with children already working 16 or more hours a week to increase their earnings, whether through working longer hours or seeking a better-paid job: this is because the proposal would extend the range of earnings over which any additional earnings by the second earner would lead to a reduction in the family's tax credit award. So although this proposal would encourage some second earners to work (rather than not work), the fact that the extra support is ultimately tapered away means that the proposal cannot be described as being unambiguously good for potential second earners' financial work incentives.

Because the policy has no impact on lone parents, it would reduce the 'couple penalty' in tax credits (or increase any 'couple bonus'); because it would not be available to couples without children, it would increase the financial incentive to have children. Both effects, though, would be limited to relatively low-income two-earner couples.

Transferable personal allowance for couples with young children

This reform was recently proposed by the Tax Reform Commission established by the Conservative Party and headed by Lord Forsyth.[29] The proposal is that individuals in couples with children should be able to transfer their income tax personal allowance to their spouse if they are not making full use of it. The Forsyth Review proposed restricting this to couples with children aged under 6 and restricting the value of the transferred personal allowance

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but eligibility at present is limited to lone parents or partners of benefit claimants, and does not extend to non-working partners of working adults.

[27] Such a policy would have almost identical effects to introducing a higher income threshold (or earnings disregard) in the WTC for couples with children. At present, joint earnings in excess of £5,220 (from April 2007) reduce entitlement to WTC (and then to CTC). A proposal to achieve Harker's aims would be to increase this disregard in tax credits for two-earner couples (conditional on the second earner working 16 or more hours a week).

[28] This policy is similar to a policy in the Conservatives' 2005 election manifesto, and referred to since by David Cameron, which involved replacing the childcare element of the working tax credit with an extra credit in the working tax credit for working lone parents or for two-earner couples with children, perhaps targeted at parents with young children. That policy – like the alternative set out in this section – would improve the financial incentive for some second earners to work (particularly those who do not want to use formal childcare), but it would also make formal childcare more expensive: this could induce parents to use informal rather than formal childcare, or it could act as a financial disincentive to work for those parents who want to use formal childcare. (See M. Brewer, C. Crawford and L. Dearden, *Helping Families: Childcare, Early Education and the Work–Life Balance*, IFS Election Briefing Note 7, 2005 (http://www.ifs.org.uk/bns/05ebn7.pdf) for a more detailed analysis of the proposal in the Conservatives' 2005 election manifesto.)

[29] Tax Reform Commission, *Tax Matters: Reforming the Tax System*, 2006 (http://www.taxreformcommission.com/downloads/Tax%20Reform%20Commission%20Report.pdf).

(TPA) to the basic rate of income tax.[30] A similar proposal was included in the Conservative Party's 2001 election manifesto, but this proposed limiting the TPA to married couples: Box 12.2 discusses the implications of restricting a TPA to married couples.

Box 12.2. Supporting all couples or just married couples?

Several variants of a TPA have been proposed in the past. Some have been limited to married couples – which would create a tax incentive to marry – while some would be available to all couples with children.

Government may take a moral stance on the merits of marriage per se, but whether a tax incentive to marry would lead to more marriages and/or better outcomes for children is unclear.

Around 1.4 million children in Britain live in unmarried couple families and 8.1 million with married couples, so around 15% of children in couple families have unmarried parents.[a] The proportion living in income poverty is higher for children with unmarried parents than for those with married parents, at 24% rather than 15%.[b]

[a] Author's calculations based on the 2004–05 Family Resources Survey. ONS estimates are that 1.4 million and 8.6 million children live in unmarried and married couple families respectively in the UK (http://www.statistics.gov.uk/cci/nugget.asp?id=1163).

[b] In 2004–05, measuring incomes BHC and using the modified OECD equivalence scale. Author's calculations using the Family Resources Survey. Measuring incomes after housing costs (AHC) and using the McClements equivalence scale, the equivalent proportions are 29% and 19%.

The Forsyth Review (page 61) said that

> The financial disadvantages suffered by parents, usually women, who look after children while their partners are out at work, represent a major unfairness in the tax system … This unfairness can be addressed by giving parents an option to transfer their personal allowance to their partner while they have young children. Restricting the transferable allowance so that relief is only available at the basic rate would ensure that this reform is appropriately targeted.

The stated aim of the policy is to provide more help for single-earner couples.[31] If introduced in April 2007 and taken up by eligible couples, this proposal would mean that one-earner couples with young children would be better off by up to £1,149.50 a year. Around 1.3 million couples with children would benefit, so the average (mean) gain is around £770 a year. The policy would also reduce the 'couple penalty' inherent in tax credits (or increase any 'couple bonus'), and increase the financial support conditional on having children, but both effects would be limited to one-earner couples with children.

But the policy would also have a number of effects on financial work incentives (shown later in this section). Compared with the current tax and benefit system, a transferable personal allowance would:

[30] The restriction to the basic rate means that the policy would be of no benefit to two-earner couples where one adult pays income tax at the higher rate and the other pays income tax at the basic rate: these sorts of families would benefit from an unrestricted TPA, and the restriction to the basic rate means that the beneficiaries of the TPA proposed here are almost all one-earner couples.

[31] The proposal to make allowances transferable is sometimes described as recognising the value of caring, but the extra support would be received by the main earner in the form of higher net pay, and so it would increase (not reduce) intra-household differences in income.

- increase the incentive for couples with young children to have one earner rather than none; and
- decrease the incentive for couples with young children to have two earners rather than one. This is because, once someone has elected to transfer a personal allowance, any increase in that person's earnings in the future will effectively be liable to income tax from the first pound (rather than only after the 5,225th pound, as is the case at present). Because this policy provides up to £1,149.50 a year extra help to one-earner couples and not to two-earner couples, it follows that it must reduce the incentive to move from being a one-earner couple to being a two-earner couple by that same amount.

The proposal would take the income tax system in the UK a little further away from a fully individualised system, and a little bit closer to a jointly-assessed system like tax credits.

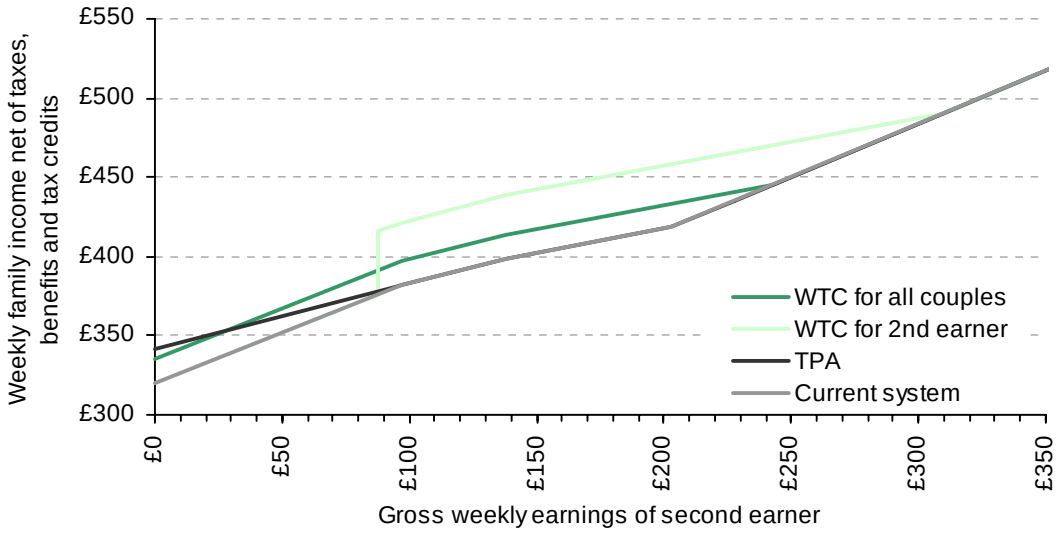
The impact of the proposals on budget constraints

Figures 12.1 to 12.3 show how the budget constraint – the relationship between gross earnings and family income after taxes, benefits and tax credits – would change for potential second earners under these three reforms. The impacts on the budget constraint vary with the earnings of each partner, so the budget constraints for three second earners are shown:

- a low-wage second earner with a low-earning partner (Figure 12.1);
- a high-wage second earner with a low-earning partner (Figure 12.2); and
- a low-wage second earner with a medium-earning partner (Figure 12.3).

The impact of the reforms is most dramatic for low-income couples with children (i.e. where both adults potentially earn low hourly wages).

Figure 12.1. The budget constraints for a low-wage second earner with a low-earning partner in a couple with children

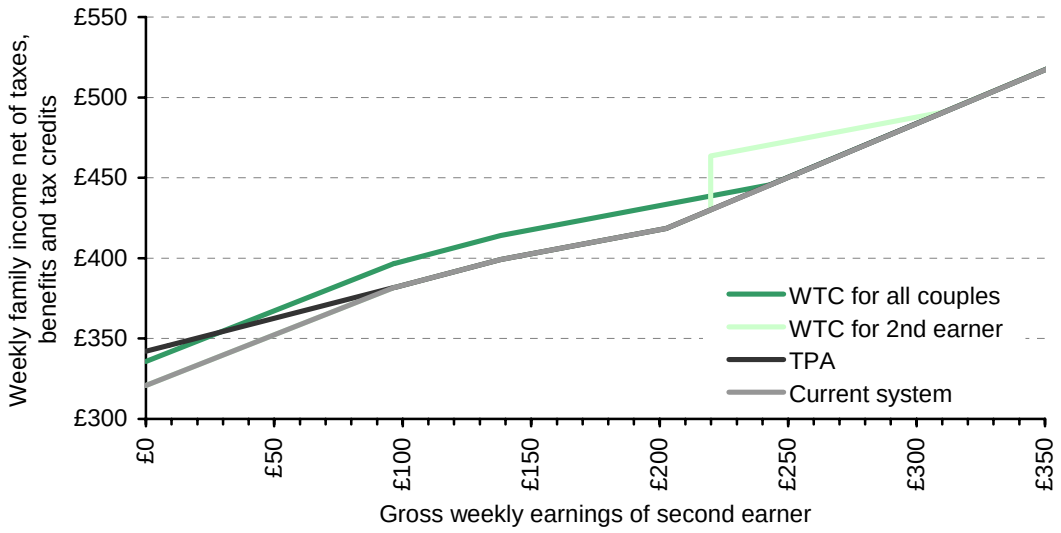


Notes: Assumes that first earner works at least 30 hours a week and has annual earnings of £15,000, that second earner earns £5.50 an hour and that the family has two children, both at least 1 year old. Both workers are contracted in to the state second pension. Ignores childcare costs.
Source: Author's calculations using the IFS tax and benefit model, TAXBEN.

Figure 12.1 shows that extra WTC for couples with children and a TPA both make this specimen family better off when the second earner does not work (i.e. has gross earnings of £0), but have no effect compared with the current system if the second earner earns more than £100 (for the TPA) or more than around £250 a week (for the extra WTC for all couples). For this relatively low-income family, though, extra WTC for two-earner couples would make a considerable difference to family income if the second earner worked 16 or more hours a week. But the WTC is means-tested, so there are no differences from the current tax and benefit system when the second earner earns over £300 a week (or a joint annual income of around £30,000).

Figure 12.2 shows the budget constraints when the second earner has a higher wage (and the first earner is still relatively low-paid). Compared with the low-waged second earner, the TPA and extra WTC for all couples have identical impacts, but the impact of extra WTC for two-earner couples is a little smaller: the fact that the extra credit for the second earner is means-tested means that it is worth less than £40 a week to the higher-waged second earner even when he/she is working 16 hours per week.

Figure 12.2. The budget constraints for a high-wage second earner with a low-earning partner in a couple with children



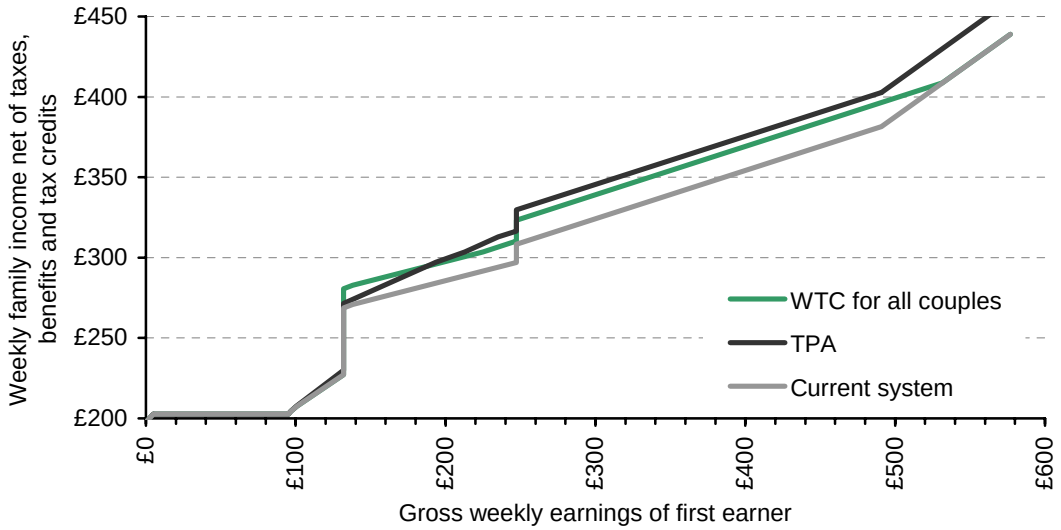
Notes: Assumes that first earner works at least 30 hours a week and has annual earnings of £15,000, that second earner earns £13.74 an hour (annual earnings of £25,000 at 35 hours a week) and that the family has two children, both at least 1 year old. Both workers are contracted in to the state second pension. Ignores childcare costs.
Source: Author's calculations using the IFS tax and benefit model, TAXBEN.

Figure 12.3 shows the budget constraints when the second earner is low-paid (as in Figure 12.1) but the first earner has a moderate wage. The impact of the TPA is again unchanged; but the impact of the two proposals to increase WTC are worth much less to this family than to the first two families: this time, it is because the higher earnings of the first earner mean that much of the extra WTC has been means-tested away even when the second earner does not work (indeed, for second earners in couples with even higher-paid first earners – not shown here – the two proposals to increase WTC would have no impact at all on the budget constraint of the second earner).

Figure 12.3. The budget constraints for a low-wage second earner with a medium-earning partner in a couple with children

Notes: Assumes that first earner works at least 30 hours a week and has annual earnings of £25,000, that second earner earns £5.50 an hour and that the family has two children, both at least 1 year old. Both workers are contracted in to the state second pension. Ignores childcare costs.
Source: Author's calculations using the IFS tax and benefit model, TAXBEN.

Figure 12.4. The budget constraints for a low-wage first earner in a couple with children



Notes: Assumes that first earner has hourly wage of £8.24 (annual earnings £15,000 at 35 hours a week) and that the family has two children, both at least 1 year old. Ignores childcare costs.
Source: Author's calculations using the IFS tax and benefit model, TAXBEN.

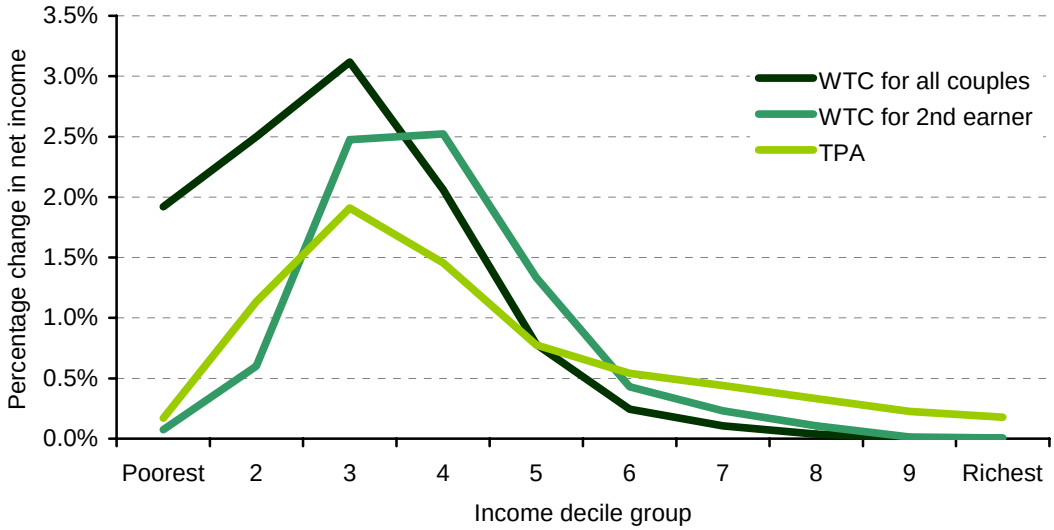
Figure 12.4 shows the budget constraints for the first earner in a couple with children. Extra WTC for two-earner couples would have no impact on this budget constraint and is not shown. Both the extra WTC for all couples and the TPA increase income for the family when the first earner is in work. For the extra WTC for all couples, this extra support is means-tested away completely when weekly earnings reach around £500, but this is not the case for

the TPA. (The budget constraints for a high-wage first earner would look very similar and so are not shown.)

The impact on the incomes of couples with children

This section discusses how the policies would affect the incomes of couple families with children. Figure 12.5 shows the gains amongst couples with children as a fraction of net income, ranked by their position in the overall income distribution (so the values for the poorest decile, for example, show the average change in family income experienced by those couples with children in the poorest tenth of the entire income distribution).

Figure 12.5. Distributional analysis across working-age couples with children



Notes: Income decile groups are derived by dividing all households into 10 equal-sized groups according to income adjusted for household size using the McClements equivalence scale. Decile group 1 contains the poorest tenth of the population, decile group 2 the second poorest, and so on up to decile group 10, which contains the richest tenth.
Source: Author's calculations using the Family Resources Survey 2004–05 and the IFS tax and benefit model, TAXBEN.

As mentioned earlier in this section, 1.5 million families with children would gain from the WTC for all couples with children, 0.6 million would gain from the WTC for two-earner couples with children and 1.3 million would gain from a TPA. Because all the policies cost the same, this means that the average (mean) gain among those benefiting is highest for the extra WTC for two-earner couples and lowest for the extra WTC for all couples.

Although these policies are intended to benefit couples with children, different families would gain under each. In general, the two proposals that involve changing the WTC are able to focus the gains on part of the income distribution, because the WTC has a relatively steep taper that ensures that high-income families do not benefit:

- The extra WTC for all couples is therefore targeted at low-income working couples with children, most of whom have only one earner.
- The extra WTC for two-earner couples is targeted at low-income two-earner couples with children.

- The TPA is less targeted by income, benefiting all one-earner couples with children of a certain age provided the main earner earns at least £5,225 a year, but is restricted to families with young children.

None of these reforms particularly helps very high-income couples with children: such couples tend to have both adults in work (and therefore cannot benefit from a TPA) and have too high an income to benefit from the working tax credit. And none of these reforms directly benefits couples with children with the lowest incomes: such couples tend to have both adults out of work (however, the TPA and extra WTC for all couples would increase the incentive for such families to have one adult in work).

For all the policies, the beneficiaries are concentrated in low- to middle-income couples with children: deciles 2, 3 and 4 (or 3, 4 and 5 in the case of extra WTC for two-earner couples) gain by the most on average as a proportion of net income. The policy that is most directly targeted at low-income couples with children is the extra WTC for all couples. The policy of most benefit to high-income couples with children is the TPA, but note that this policy is also of more benefit to couples with children in the bottom two income deciles, on average, than extra WTC for two-earner couples (but note that that policy would incentivise some of those couples to have two earners).

One complicating factor when comparing the distributional impact of these proposals is that the TPA is limited to families with young children but the other proposals are not.

Families with young children tend to have lower incomes than families with older children, partly because their parents are younger and therefore tend to have lower hourly wages, but more importantly because women are more likely to be taking time out of the labour market when they have young children.[32] The restriction of the TPA to families with young children probably reflects a desire by the Forsyth Commission to target help on families with young children (rather than those with older children) and a belief that it would be worse to encourage potential second earners not to work when they have older children than it is when they have young children.[33]

The impact on financial work incentives

Although these policies are reasonably similar in their impact on the income distribution, they have very different effects on financial work incentives, reflecting their different objectives. Below, we analyse how these policies would change two measures of financial work incentives: the marginal effective tax rate (METR) and the participation tax rate (PTR). The METR is a measure of the disincentive provided by the tax and benefit system to earning a little more, whether through working more hours or earning more per hour. The PTR is a measure of the disincentive provided by the tax and benefit system to working at all. Box 12.3

[32] For detailed analysis of how children affects women's labour market activity, see G. Paull, 'The impact of children on women's paid work', *Fiscal Studies*, 27(4), 473–512, 2006.

[33] Restricting the TPA to families with young children has more significance than, say, restricting child benefit to families with young children: in the long run, an increase in child benefit for the under-5s will benefit the same families and be worth the same amount of money to families as an equally expensive increase in child benefit for all children; but a family's eligibility to a TPA will in general vary as their children age, so a TPA available to all families with children will not benefit the same families (and will not be worth the same amount of money to families who do benefit) as an equally-expensive TPA restricted to families with young children, even in the long run.

explains how these numbers are calculated; higher numbers mean weaker incentives for both measures.

Box 12.3. The marginal effective tax rate and the participation tax rate

The participation tax rate (PTR) measures the extent to which the tax and benefit system provides a disincentive for people to work at all. It is calculated as 1 – (increase in family income when a person works / that person's gross earnings). It measures what fraction of an individual's earnings is lost to the government in taxes and forgone benefits or tax credits.

The marginal effective tax rate (METR) measures the extent to which the tax and benefit system provides a disincentive for people to increase their earnings. It is calculated as the proportion of a small rise in earnings that is lost to the government in taxes and forgone benefits or tax credits.

Both calculations ignore the temporary (one-year) disregard in tax credits that applies when gross earnings rise, so the short-run financial work incentives are, in practice, stronger than those shown here.

To calculate a measure of the incentive to work at all for those women in our data who are not working, it is necessary to impute the hourly wage that they would earn if they were to work. This was done by predicting what wage they would have earned, given the hourly wages earned by women who are working.[a] The PTR was then calculated for part-time and full-time work (16 and 37 hours a week respectively) at these wages.

Expenditure on childcare and entitlement to the childcare element of the working tax credit were ignored for these calculations.

[a] This was done using the customary log wage equation with a correction term to account for the selection into employment of those women with relatively high wages. The variables in the wage equation were age of women, region of residence, education level of women and number of children. The selection effects were identified using variables measuring age of youngest child and family income if the women did not work as instruments. Full details are available on request.

Below, we present some summary measures of the (dis)incentive to work at all. Table 12.1 shows various measures of the PTR for women in couples with dependent children calculated for part-time (top panel) and full-time work (bottom panel) (assumed to be 16 and 37 hours a week respectively).

Rather than showing how the mean (average) PTR changes, the panels show how PTRs at various points of the distribution change. In particular, they show the median (50^{th} percentile) PTR, as well as the 25^{th}, 75^{th} and 90^{th} percentiles of the PTR distribution, and how these values change under the three reforms. (The median PTR is the PTR such that half of working women in couples with dependent children have a PTR lower than that and half have a PTR higher than that; the 25^{th} percentile (75^{th} percentile) is the PTR such that a quarter of working women in couples with dependent children have a PTR lower (higher) than this and three-quarters have a PTR higher (lower) than this.)

Bearing in mind that lower PTRs correspond to stronger incentives to work, Table 12.1 shows that the extra WTC for two-earner couples tends to strengthen women's incentives to work

(according to these measures) and that the TPA tends to weaken them. The extra WTC for all couples is a little more complicated: it tends to weaken incentives to work for most women, but it strengthens incentives to work part-time for some women previously facing the weakest incentives. This is because it tends to strengthen incentives for those few women with children whose partner does not work and weaken them for the majority of women whose partner does work.

Table 12.1. Estimated participation tax rates for women in couples with dependent children

	Percentile of the participation tax rate distribution			
	25th (stronger-than-average incentives to work)	50th (average incentives to work)	75th (weaker-than-average incentives to work)	90th (very weak incentives to work)
Part-time work				
Current tax and benefit system	5.5	18.2	37.7	56.2
Extra WTC for all couples	6.4	22.0	38.2	51.5
Extra WTC for two-earner couples	0.0	7.1	19.2	49.7
TPA	14.0	24.3	46.3	59.0
Full-time work				
Current tax and benefit system	21.3	26.1	37.8	52.6
Extra WTC for all couples	22.3	27.4	41.3	53.7
Extra WTC for two-earner couples	20.8	25.6	34.0	46.0
TPA	23.7	28.8	40.1	54.7

Note: See Box 12.3 for details.
Source: Author's calculations using the Family Resources Survey 2004–05 and the IFS tax and benefit model, TAXBEN.

For men, the picture is slightly more complicated (and not shown here): the extra WTC for two-earner couples tends to lead to stronger work incentives for men, as it does for women. Extra WTC for all couples and TPAs, though, tend to strengthen incentives to work at all for men with relatively weak incentives to work, and to weaken incentives to work at all for men with relatively strong incentives to work (the PTR at the 75th percentile falls, but those at the median and 25th percentile rise). This is because both proposals would strengthen work incentives for people whose partner does not work (i.e. potential first earners) but weaken them for people whose partner does work (i.e. potential second earners), regardless of gender. Amongst women, the latter effect dominates, but for men, the former effect is evident in the fall in the PTR for those with relatively high PTRs (who tend to be one-earner couples with the man in work).

We now present some summary measures of the (dis)incentive to earn a little more, first for working adults (Table 12.2) and then for non-working adults (Table 12.3, where the table shows the effective tax paid on the first pound of earnings). Table 12.2 shows the median, 25th, 75th and 90th percentiles, and the mean METR for working women (top panel) and men (bottom panel) in couples with dependent children.

There is much less change in METRs than in PTRs. All three proposals would increase METRs for working women, on average. The two proposals that increase WTC would increase METRs for working men, on average, but the TPA would lower METRs for some

working men, who would see a lower METR if they benefited from a transferred personal allowance and as a result moved into a lower income tax band.

Both proposals that increase WTC tend to increase METRs because they increase the range of earnings over which individuals in working families with children are subject to a withdrawal of tax credits as their income rises. However, these two proposals would also lower some very high METRs, because increases in the WTC reduce the likelihood that families are subject to simultaneous withdrawals of tax credits and housing benefit (HB) or council tax benefit (CTB); this is not apparent in Table 12.2 because in practice this applies to very few couples with children.

Table 12.2. METRs for working adults in couples with dependent children

	Percentile of the METR distribution				Mean
	25th (stronger-than-average incentives to earn more)	**50th** (average incentives to earn more)	**75th** (weaker-than-average incentives to earn more)	**90th** (very weak incentives to earn more)	
Women					
Current tax–benefit system	31.4	33.0	38.1	66.4	34.1
Extra WTC for all couples	31.4	33.0	38.1	68.4	35.6
Extra WTC for two-earner couples	31.4	33.0	41.0	68.4	37.2
TPA	31.4	33.0	38.1	63.9	35.3
Men					
Current tax–benefit system	31.4	37.0	47.7	70.0	43.2
Extra WTC for all couples	31.4	41.0	68.4	70.0	44.6
Extra WTC for two-earner couples	31.4	41.0	68.4	70.0	45.5
TPA	31.4	37.0	47.7	70.0	42.9

Note: See Box 12.3 for details.
Source: Author's calculations using the Family Resources Survey 2004–05 and the IFS tax and benefit model, TAXBEN.

The TPA increases METRs for some working women who are earning less than the income tax personal allowance (and some who pay income tax at the 10% lower rate) and who elect to transfer their allowance to their partner. Such women would have previously paid no income tax on any extra earnings (or at the rate of 10%), but after transferring their allowance, they will effectively be paying 10% or 22%. On the other hand, the TPA will reduce METRs for a few working women who benefit from having their non-working partner's personal allowance transferred to them. The table shows that the former effect dominates.

The impact on METRs for those currently not working (this is the effective tax rate on the first pound of earnings) is shown in Table 12.3 for women (top panel) and men (bottom panel). Of course, many non-working adults have a METR of 0%: these are adults living in families with sufficiently high incomes not to be eligible to HB, CTB, WTC or the child element of the CTC.

The extra WTC for two-earner couples has absolutely no impact on METRs faced by non-workers, because the second earner in a family would need to work 16 hours a week before

becoming eligible to the extra credit. The TPA significantly increases METRs for non-working women (and slightly increases it for non-working men): this is because any non-working individual who does transfer their allowance to their partner then faces income tax from the first pound of earnings, as explained above.

The extra WTC for all couples increases METRs for some non-working adults and reduces it for others (this can be seen in the figures for women and men). As explained above, this is because an increase in WTC lengthens the range of earnings over which individuals in working families with children are subject to a withdrawal of tax credits as their income rises. However, it can also lower some very high METRs because increases in the WTC reduce the likelihood that families are subject to simultaneous withdrawals of tax credits and HB or CTB.

Table 12.3. METRs for non-working adults in couples with dependent children

	Percentile of the METR distribution				Mean
	25th (stronger-than-average incentives to earn more)	50th (average incentives to earn more)	75th (weaker-than-average incentives to earn more)	90th (very weak incentives to earn more)	
Women					
Current tax–benefit system	0.0	0.0	37.0	38.1	19.0
Extra WTC for all couples	0.0	6.7	37.0	37.0	19.4
Extra WTC for two-earner couples	0.0	0.0	37.0	38.1	19.0
TPA	0.0	22.0	49.6	59.0	30.0
Men					
Current tax–benefit system	0.0	0.0	28.7	49.6	17.3
Extra WTC for all couples	0.0	0.0	33.0	47.0	17.3
Extra WTC for two-earner couples	0.0	0.0	28.7	49.6	17.3
TPA	0.0	0.0	28.7	59.0	17.5

Note: See Box 12.3 for details.
Source: Author's calculations using the Family Resources Survey 2004–05 and the IFS tax and benefit model, TAXBEN.

In summary, then:

- The extra WTC for all couples strengthens the incentives for couples to have one person in work but reduces the incentive for the second earner to work. It also tends to lead to higher METRs, or weaker incentives to earn more, for both first and second earners in relatively low-income families.
- The TPA also strengthens the incentives for couples to have one person in work but reduces the incentive for the second earner to work. It slightly reduces the METRs faced by working men (who will make up the majority of beneficiaries of a transferred personal allowance) and slightly increases the METR faced by a few low-earning working women who elect to transfer their allowance. All effects, of course, are limited to couples with children aged under 6.

- The extra WTC for two-earner couples significantly improves the incentive for couples to have two earners in work, although this chapter has shown the impact only on women's incentives. But, by expanding the range of earnings over which tax credit withdrawal applies, it weakens the incentives for working adults in relatively low-income two-earner couples to earn more.

Of course, the very different impacts of these policies on financial work incentives directly reflect the differing motivations of the policies' proponents:

- The extra WTC for two-earner couples is intended to encourage second earners to work, and does just that.
- The extra WTC for all couples is intended to raise the incomes of low-income couples with children, who tend to have only one earner; but the fact that this extra help is means-tested inevitably means that incentives to earn more – whether through adding a second earner, increasing hours or earning more per hour – are weakened.
- The TPA is intended to recognise the value of caring and to support one-earner couples with young children. But the fact that such support is not of benefit to most two-earner couples inevitably means that financial incentives to have a second earner are reduced.

12.5 Conclusions

This chapter has compared three proposals for changing the way in which couples with children are treated in the tax credit and income tax systems, each of which has been proposed to address different perceived problems with the current system.

The impact on the distribution of income and the impact on financial work incentives are quite different. Of the three proposals:

- The proposal to increase WTC for all couples with children is the most targeted on the poorest working couples with children, but as a result does the most to weaken the financial work incentives for adults in such families.
- The proposal to increase WTC for two-earner couples is the best policy for encouraging second earners in relatively low-income families, but at the cost of extending the range of incomes over which adults in such families face high METRs.
- A transferable personal allowance for couples with young children is the least targeted, so it helps some on relatively high incomes as well as some on relatively low incomes. By recognising the value of unpaid work by adults in couples, it weakens financial incentives to do paid work for those same adults. Unlike the other proposals, though, these effects are restricted to families with children aged under 6.

All three proposals would reduce the extent to which the tax credit system treats some married or cohabiting couples with children less generously than if the parents live (or claim to live) apart – indeed, some families might find that these reforms lead to a 'couple bonus'. This would occur because lone-parent families would not gain anything from any of the changes.

Appendix A: Forecasting public finances

Carl Emmerson, Christine Frayne and Gemma Tetlow (IFS)

This appendix looks at the techniques used for the Green Budget public finance forecasts. It starts by comparing the forecasts made for borrowing in 2005–06 in last year's Green Budget and the December 2005 Pre-Budget Report with the eventual out-turn. It then goes on to provide more background information to the short-term and medium-term public finance forecasts that are set out in Chapter 5.

A.1 The accuracy of our previous forecasts

The January 2006 IFS Green Budget forecasts for the main fiscal aggregates were similar to those published by the Treasury in the December 2005 Pre-Budget Report. As such, the errors for each of the forecasts *ex post* are similar. The December 2006 Pre-Budget Report estimated that public sector net borrowing in 2005–06 was £37.5 billion. This is higher than both the Treasury's December 2005 Pre-Budget Report forecast of £37.0 billion and the January 2006 IFS Green Budget forecast of £36.8 billion. The deficit on the current budget was £15.1 billion, which was a larger deficit than either the Treasury forecast in the December 2005 Pre-Budget Report (£10.6 billion) or IFS forecast in the January 2006 Green Budget (£10.5 billion).

Current receipts came in stronger than forecast in either the December 2005 Pre-Budget Report or the January 2006 IFS Green Budget. However, between the publication of these forecasts and the end of the financial year, there was a reclassification of BBC licence fee receipts and corresponding spending. The effect of this was to increase both receipts and current spending by about £3 billion; so overall there was no net effect on borrowing or the current budget.[1] In the absence of this reclassification, receipts would have come in just below both the Treasury and Green Budget forecasts.

Current spending (including depreciation) came in £7 billion higher than both the Treasury and the January 2006 Green Budget forecasts. However, around half of this difference is due to the reclassification of spending financed by the BBC licence fee and was directly offset by higher receipts. Public sector net investment, in contrast, was lower than either the December 2005 Pre-Budget Report or the January 2006 IFS Green Budget forecast suggested.

Table A.2 shows the breakdown of the main errors in the forecasts for tax receipts contained in the December 2005 Pre-Budget Report and the January 2006 IFS Green Budget. Both sets of predictions underestimated total receipts. Net income tax receipts were overestimated by both the December 2005 Pre-Budget Report and the January 2006 IFS Green Budget by about

[1] Source: Paragraph 3.36, page 27, and paragraph 4.32, page 38, of HM Treasury, *End of Year Fiscal Report*, 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adfiscal.cfm). For more details, see M. Kellaway and H. Shanks, *National Accounts Classifications: Public Sector Broadcasting*, ONS, 2006 (http://www.statistics.gov.uk/articles/nojournal/PSB_article_190106.pdf).

Table A.1. A comparison of last year's IFS Green Budget forecast and the Treasury's December 2005 Pre-Budget Report forecast with the estimated out-turn for 2005–06 from the December 2006 Pre-Budget Report

£ billion	HM Treasury Pre-Budget Report forecast, December 2005	IFS Green Budget forecast, January 2006	Estimate, Pre-Budget Report, December 2006
Current receipts	483.0	483.1	485.3
Current expenditure[a]	493.6	493.6	500.4
Net investment	26.3	26.3	22.4
Public sector net borrowing	37.0	36.8	37.5
Surplus on current budget	–10.6	–10.5	–15.1

[a] Includes depreciation.

Sources: Out-turn figures for 2005–06 from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm). Forecasts from HM Treasury, *Pre-Budget Report 2005*, Cm. 6701, December 2005 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr05/prebud_pbr05_index.cfm), and table 5.2 of R. Chote, C. Emmerson, R. Harrison and D. Miles (eds), *The IFS Green Budget: January 2006*, IFS Commentary 100 (http://www.ifs.org.uk/budgets/gb2006/index.php).

Table A.2. IFS Green Budget and Treasury main errors in forecasting tax receipts, 2005–06

£ billion	Pre-Budget Report, December 2005	IFS Green Budget, January 2006
Income tax (net of tax credits)	0.8	1.1
National Insurance contributions	–1.3	–1.3
Value added tax	1.5	1.5
Corporation tax (net of tax credits)	–0.6	–0.4
Net taxes & National Insurance contributions	*1.0*	*1.2*
Non-tax receipts[a]	–3.3	–3.4
Total current receipts	*–2.3*	*–2.2*

[a] Includes accruals adjustments on taxes, the tax credits adjustments, interest and dividends, gross operating surplus and rent; net of oil royalties and business rate payments by local authorities, the own resources contribution to the EU budget and PC corporation tax payments.

Source: Out-turn figures for 2005–06 from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm). Forecasts from HM Treasury, *Pre-Budget Report 2005*, Cm. 6701, December 2005 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr05/prebud_pbr05_index.cfm), and table 5.3 of R. Chote, C. Emmerson, R. Harrison and D. Miles (eds), *The IFS Green Budget: January 2006*, IFS Commentary 100 (http://www.ifs.org.uk/budgets/gb2006/index.php).

£1 billion. However, this was offset by an underestimate of £1.3 billion in both forecasts of receipts from National Insurance contributions. The largest absolute forecast error in tax receipts was in the forecasts for VAT receipts: both the December 2005 Pre-Budget Report and the January 2006 IFS Green Budget overestimated VAT receipts by £1.5 billion. However, the largest absolute error overall for both forecasts was in non-tax receipts: the December 2005 Pre-Budget Report underestimated these by £3.3 billion, while the January 2006 IFS Green Budget underestimated them by £3.4 billion, with both errors largely being caused by the reclassification of the BBC licence fee receipts.

A.2 Techniques used in our forecasts

For the current financial year, three different sources of information are examined before coming to a judgement for each element of government revenue. In addition to the latest Treasury forecast from the December 2006 Pre-Budget Report, we use information from the revenues implied by a current receipts method, and the IFS modelled approach.[2]

1. **Information from current receipts.** The current receipts method uses the information on receipts received in the current financial year compared with those received up to the same point in the previous financial year. An estimate for the current year's receipts is then calculated using the following formula:

$$\textit{2006–07 forecast} = \frac{\textit{Receipts received so far this year}}{\textit{Receipts received to the same point last year}} \times \textit{2005–06 receipts}.$$

   While this is useful when forecasting revenues in the current financial year, it cannot provide projections for borrowing in future years. Also, particular caution should be used when revenues are cyclical or changes have been made that may affect the timing of payments.

2. **The IFS modelled receipts approach.** This estimates growth in each of the taxes using forecasts for the growth in the tax base relevant to each tax, combined with an estimate of the elasticity of revenue with respect to the growth in the tax base. Information on the revenue effects of pre-announced tax changes from previous Budgets is then added in order to reach a forecast. Hence, modelled receipts can be summarised by the following formula:

$$\textit{2006–07 forecast} = (\textit{2005–06 receipts} \times \textit{Tax-base change} \times \textit{Elasticity}) + \textit{Tax changes}.$$

   This technique enables forecasts to be made for future years, given the expected structure of the tax system. It should be noted that these forecasts become considerably less accurate for later years, since forecasts for changes in tax bases, estimates of elasticities and the impact of tax changes all become less accurate.

   The elasticities are largely estimated from TAXBEN, the IFS tax and benefit model. The estimates for income tax elasticities are supplemented by a model of the responsiveness of income tax revenues to changes in employment and wages. For fuel, an elasticity calculated from previous IFS research is used.[3] Elasticities for beer, spirit, wine and tobacco duties are taken from the median elasticity found in a range of UK studies.[4]

[2] For a more detailed explanation of both these techniques, see C. Giles and J. Hall, 'Forecasting the PSBR outside government: the IFS perspective', *Fiscal Studies*, 19, 83–100, 1998.

[3] L. Blow and I. Crawford, *The Distributional Effects of Taxes on Private Motoring*, IFS Commentary 65, 1997.

[4] M. Chambers, 'Consumers' demand and excise duty receipts equations for alcohol, tobacco, petrol and DERV', Government Economic Service, Working Paper 138, August 1999.

A.3 Forecasts for 2006–07

The Green Budget forecast is a judgement based on the Treasury's latest forecast contained in the December 2006 Pre-Budget Report, the current receipts method and the IFS modelled approach. Each of these is presented in Table A.3. There is very little divergence between our expectation of receipts and spending in 2006–07 and those published in the Pre-Budget Report.

HM Revenue and Customs receipts

For **income tax** (net of tax credits), we forecast £141.0 billion, which is below the PBR forecast, reflecting weaker in-year current receipts (£144.4 billion including capital gains tax) and lower forecasts from the IFS forecasting model of £139.3 billion than that projected by the PBR.

Our forecast for **corporation tax** (net of tax credits) is £47.4 billion. This is the same as the Treasury forecast. The current receipts forecast suggests that net receipts will be £49.7 billion, but this is inflated due to the fact that the profile in 2005–06 was distorted by policy changes announced in the March 2005 Budget. As a result of these, there was a large increase in revenues in January 2006 that is not expected to be repeated this year. The IFS modelled forecast suggests receipts of just £44.2 billion. However, we discount this given that the Treasury should have significantly more information on short-term corporation tax receipts in particular.

Our forecast for receipts from **stamp duties** of £13.0 billion is slightly higher than the Treasury's forecast of £12.7 billion, and lies between the IFS modelled forecast (£11.9 billion) and the current receipts projection (£13.6 billion).

Our forecast for **National Insurance contributions** matches that of the Treasury (£88.5 billion). This is roughly halfway between the current receipts forecast (£87.7 billion) and the IFS modelled receipts forecast (£89.8 billion).

We forecast **VAT** receipts of £77.0 billion, which is higher than the Treasury's forecast (£76.2 billion) and between the forecast from the current receipts projection (£77.2 billion) and the IFS modelled receipts (£76.8 billion).

We forecast that **fuel duties** will yield £23.7 billion, which is the same as the Treasury's projection. This is between the current receipts forecast (£23.4 billion) and the IFS modelled receipts forecast (£24.9 billion).

Other government receipts

For all other receipts, we take the Treasury's forecasts for 2006–07.

Government expenditure

We forecast that **current spending** in 2006–07 will be £527.7 billion, which is £2.0 billion higher than the Treasury's forecast. So far this year, central government has overspent and requires a slowdown in order to meet the Pre-Budget Report forecast for current spending for the year as a whole. The slowdown has begun in recent months, but it needs to continue and be accelerated further. Whilst some of the apparent overspend earlier in the year may be due to changes in the timing of spending, we assume that some of it will not be fully compensated

by lower spending in the last three months of this financial year and that over the remaining months of 2006–07 only half of the required slowdown will be achieved. We therefore forecast a £2.0 billion overspend in 2006–07.

Table A.3. Forecasts for government borrowing in 2006–07

£ billion	PBR Dec. 2006	Current receipts method	IFS forecasting model	IFS forecast judgement
HM Revenue and Customs				
Income tax (net of tax credits)	141.5	144.4[e]	139.3	141.0
National Insurance contributions	88.5	87.7	89.8	88.5
Value added tax (VAT)	76.2	77.2	76.8	77.0
Corporation tax (net of tax credits)	47.4	49.7	44.2	47.4
Petroleum revenue tax	2.3	2.8	2.0	2.3
Fuel duties	23.7	23.4	24.9	23.7
Capital gains tax	4.0	n/a[e]	3.6	4.0
Inheritance tax	3.6	3.7	3.5	3.6
Stamp duties	12.7	13.6	11.9	13.0
Tobacco duties	8.0	7.7	8.4	8.0
Spirits duties	2.3	2.2	2.6	2.3
Wine duties	2.4	2.3	2.5	2.4
Beer and cider duties	3.3	3.2	3.5	3.3
Betting and gaming duties	1.4	1.4	1.5	1.4
Air passenger duty	1.1	1.0	1.1	1.1
Insurance premium tax	2.3	2.3	2.4	2.3
Landfill tax	0.8	0.8	0.5	0.8
Climate change levy	0.7	0.7	0.7	0.7
Aggregates levy	0.3	0.3	0.3	0.3
Customs duties and levies	2.3	2.4	2.4	2.3
Total HMRC	**424.7**	**426.8**	**421.8**	**425.4**
Vehicle excise duties	5.1	5.1	5.4	5.1
Business rates	21.5	21.5	20.6	21.5
Council tax[a]	22.5	22.5	22.5	22.5
Other taxes and royalties[b]	13.3	13.3	13.4	13.3
Net taxes and NI contributions[c]	**487.1**	**489.2**	**483.7**	**487.8**
Other adjustments[d]	30.7	30.7	30.7	30.7
Current receipts	**517.9**	**519.9**	**514.4**	**518.5**
Current spending	**525.7**	**525.7**	**527.7**	**527.7**
Current balance	**–7.9**	**–5.8**	**–13.3**	**–9.2**
Net investment	28.9	28.9	28.9	28.9
Public sector net borrowing	**36.8**	**34.7**	**42.2**	**38.1**

[a] PBR figures are based on stylised assumptions rather than government forecasts.
[b] Includes VAT refunds and money paid into the National Lottery Distribution Fund.
[c] Includes VAT and the traditional 'own resources' contributions to the EU budget.
[d] This line is a sum of accruals adjustments on taxes, tax credit adjustment, interest and dividends, and other receipts, less own resources contribution to EU budget and PC corporation tax payments.
[e] Current receipts estimate of income tax revenues includes capital gains tax.
Sources: PBR forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm); this table is similar to table B13, page 234. IFS calculations.

We assume that the Treasury's forecast for £28.9 billion of **public sector net investment** in 2006–07 is accurate. Despite the fact that net investment is running ahead of the level consistent with the PBR projection being met, there remains a chance that the Treasury will in fact underspend on public sector net investment, as in recent years net investment has tended to be revised down *ex post*. Either way, a deviation on the Treasury's forecast on net investment would have no impact on the golden rule.

Government borrowing

As a result of forecasting higher current expenditure (which is only partially offset by our forecast of slightly higher government revenues), we forecast a **deficit on current budget** of £9.2 billion for 2006–07. This is £1.3 billion more pessimistic than the £7.9 billion deficit forecast by the Treasury.

Since we forecast the same level of net investment in 2006–07 as the Treasury does, our forecast for **public sector net borrowing** (£38.1 billion) is also £1.3 billion higher than the Treasury forecast of £36.8 billion.

A.4 Medium-term forecasts

Compliance with the golden rule is judged over the economic cycle, and any assessment of the fiscal stance should take into account the performance of the economy. Table A.4 presents the macroeconomic forecasts underlying the Green Budget forecasts in each of the three economic scenarios used.

For the Green Budget baseline forecast, the Treasury's macroeconomic forecasts are used. These assume that national income will grow by 2¾% in 2006–07 and 2007–08 and thereafter at 2½% (which for the period from 2007–08 onwards is a ¼ percentage point below the Treasury's central estimate of trend growth). Under the first alternative Green Budget scenario (the Morgan Stanley central case), growth in national income is expected to be the same this year, lower next year, the same in 2008–09 and 2010–11 but higher in 2009–10 and 2011–12. The second alternative Green Budget scenario (the Morgan Stanley 'pessimistic' case) growth is the same in 2006–07 but lower in every year thereafter. This is associated with lower real consumer spending growth, which is also shown in the table, alongside employment, real earnings growth and the GDP deflator.

The Green Budget baseline scenario uses published Treasury forecasts for all macroeconomic assumptions, where these are available. Under all the scenarios, the growth in corporate profits is not used for corporation tax figures, due to difficulties in forecasting these profits in the current climate. Instead, we assume that in the medium term, underlying corporation tax receipts remain constant as a share of national income.

Table A.4. Medium-term public finances forecasts under different macroeconomic assumptions

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Green Budget baseline (PBR assumptions)						
Gross domestic product (GDP)	2¾	2¾	2½	2½	2½	2½
Real consumers' expenditure	2	2¼	2¼	2¼	2½	2½
Employment	0.9	0.8	0.8	0.8	0.8	0.8
Real wages	¾	1	1½	1½	1½	1½
GDP deflator	2¾	2¾	2¾	2¾	2¾	2¾
Alternative Green Budget scenario I (Morgan Stanley central case)						
Gross domestic product (GDP)	2¾	2¼	2½	2¾	2½	2¾
Real consumers' expenditure	2	2	1¾	2½	2¼	2½
Employment	0.8	0.7	0.7	1.0	1.0	1.1
Real wages	¼	1½	1¾	1¾	1¾	1¾
GDP deflator	3	2½	2¼	2½	2½	2½
Alternative Green Budget scenario II (Morgan Stanley 'pessimistic' case)						
Gross domestic product (GDP)	2¾	1¾	2	2¼	2¼	2¼
Real consumers' expenditure	2¼	1	1¼	2	2	2
Employment	0.7	0.5	0.5	1.0	1.0	1.1
Real wages	½	1¼	1¾	1¾	1¾	1¾
GDP deflator	3¼	3	2½	2½	2½	2½

Sources: Authors' calculations and Treasury forecasts from HM Treasury, *Pre-Budget Report 2006*, Cm. 6984, December 2006, http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/report/prebud_pbr06_repindex.cfm

Appendix B: Headline tax and benefit rates and thresholds

	2006–07 level	2007–08 level[a]
Income tax		
Personal allowance: under age 65	£5,035 p.a.	£5,225 p.a.
aged 65–74	£7,280 p.a.	£7,550 p.a.
aged 75 and over	£7,420 p.a.	£7,690 p.a.
Married couple's allowance, restricted to 10%:		
aged 65 or over on 6 April 2000	£6,065 p.a.	£6,285 p.a.
aged 75 or over	£6,135 p.a.	£6,135 p.a.
Lower rate	10%	10%
Basic rate	22%	22%
Higher rate	40%	40%
Starting rate limit	£2,150 p.a.	£2,230 p.a.
Basic rate limit	£33,300 p.a.	£34,600 p.a.
Tax rates on interest income	10%, 20%, 40%	10%, 20%, 40%
Tax rates on dividend income	10%, 32.5%[b]	10%, 32.5%[b]
National Insurance		
Lower earnings limit (LEL)	£84 p.w.	£87 p.w.
Upper earnings limit (UEL)	£645 p.w.	£670 p.w.
Earnings threshold (employee and employer)	£97 p.w.	£100 p.w.
Class 1 contracted-in rate: employee – below UEL	11%	11%
– above UEL	1%	1%
employer – below UEL	12.8%	12.8%
– above UEL	12.8%	12.8%
Class 1 contracted-out rate: employee – below UEL	9.4%	9.4%
(salary-related schemes) – above UEL	1%	1%
employer – below UEL	9.3%	9.1%
– above UEL	12.8%	12.8%
Corporation tax		
Rates: small companies' rate	19%	19%
standard rate	30%	30%
Capital gains tax		
Annual exemption limit: individuals	£8,800 p.a.	£9,200 p.a.
trusts	£4,400 p.a.	£4,600 p.a.
Non-business assets: higher-rate taxpayers	24%–40%	24%–40%
basic-rate taxpayers	12%–20%	12%–20%
Business assets: higher-rate taxpayers	10%–40%	10%–40%
basic-rate taxpayers	5%–20%	5%–20%
Inheritance tax		
Threshold	£285,000	£300,000
Rate for transfer at or near death	40%	40%

Continues

Continued

	2006–07 level	2007–08 level[a]
Value added tax		
Standard rate	17.5%	17.5%
Reduced rate	5%	5%
Registration threshold	£61,000 p.a.	£64,000 p.a.
Excise duties		
Beer (pint at 3.9% abv)	29p	30p
Wine (75cl bottle at 12% abv)	129p	133p
Spirits (70cl bottle at 40% abv)	548p	566p
20 cigarettes: specific duty	210p	218p
ad valorem (22% of retail price)	106p	109p
Ultra-low-sulphur petrol (litre)	48p[c]	50p
Ultra-low-sulphur diesel (litre)	48p[c]	50p
Air passenger duty		
European destinations: economy	£5[d]	£10[d]
club/first class	£10[d]	£20[d]
Non-European destinations: economy	£20[d]	£40[d]
club/first class	£40[d]	£80[d]
Betting and gaming duty		
Gross profits tax	15%	15%
Spread betting rate: financial bets	3%	3%
other bets	10%	10%
Insurance premium tax		
Standard rate	5%	5%
Higher rate (for insurance sold accompanying certain goods and services)	17.5%	17.5%
Stamp duty		
Land and buildings:		
standard residential threshold	£125,000 p.a.	£125,000 p.a.
residential threshold in disadvantaged areas	£150,000 p.a.	£150,000 p.a.
non-residential threshold	£150,000 p.a.	£150,000 p.a.
rate: up to threshold	0%	0%
threshold–£250,000	1%	1%
£250,000–£500,000	3%	3%
above £500,000	4%	4%
Stocks and shares: rate	0.5%	0.5%
Vehicle excise duty		
Graduated system (for new cars from 1 March 2001)	£0–£215 p.a.[e]	£0–£220 p.a.[e]
Standard rate	£175 p.a.	£180 p.a.
Small-car rate (engines up to 1,549cc)	£115 p.a.	£120 p.a.
Heavy goods vehicles (varies according to vehicle type and weight)	£160–£1,850 p.a.	£165–£1,920 p.a.
Landfill tax		
Standard rate	£21 per tonne	£24 per tonne
Lower rate (inactive waste only)	£2 per tonne	£2 per tonne

Continues

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		2006–07 level	2007–08 level[a]
Climate change levy			
Electricity		0.430p/kWh	0.441p/kWh
Natural gas		0.150p/kWh	0.154p/kWh
Coal		1.170p/kg	1.201p/kg
Liquefied petroleum gas		0.960p/kg	0.985p/kg
Business rates			
Rate applicable for high-value properties[f] in:	England	43.3%	44.4%
	Scotland	45.3%	44.4%
	Wales	43.2%	44.8%
Council tax			
Average rate band D council tax in England and Wales		£1,250 p.a.	Councils to set
Income support / income-based jobseeker's allowance			
Single (aged 25 or over)		£57.45 p.w.	£59.15 p.w.
Couple (both aged 18 or over)		£90.10 p.w.	£92.80 p.w.
Basic state pension			
Single		£84.25 p.w.	£87.30 p.w.
Couple		£134.75 p.w.	£139.60 p.w.
Winter fuel payment:	for those aged 60–79	£200	£200
	for those aged 80 or over	£300	£300
Pension credit			
Guarantee credit for those aged 60 or over:	single	£114.05 p.w.	£119.05 p.w.
	couple	£174.05 p.w.	£181.70 p.w.
Savings credit for those aged 65 or over:			
threshold – single		£84.25 p.w.	£87.30 p.w.
threshold – couple		£134.75 p.w.	£139.60 p.w.
maximum – single		£17.88 p.w.	£19.05 p.w.
maximum – couple		£23.58 p.w.	£25.26 p.w.
withdrawal rate		40%	40%
Child benefit			
First child		£17.45 p.w.	£18.10 p.w.
Other children		£11.70 p.w.	£12.10 p.w.
Child tax credit			
Family element (doubled for first year of a child's life)		£545 p.a.	£545 p.a.
Child element		£1,765 p.a.	£1,845 p.a.
Disabled child element		£2,350 p.a.	£2,440 p.a.
Working tax credit			
Basic element		£1,665 p.a.	£1,730 p.a.
Couples and lone-parent element		£1,640 p.a.	£1,700 p.a.
30-hour element		£680 p.a.	£705 p.a.
Disabled worker element		£2,225 p.a.	£2,310 p.a.
Childcare element:			
maximum eligible cost for one child		£175.00 p.w.	£175.00 p.w.
maximum eligible cost for two or more children		£300.00 p.w.	£300.00 p.w.
proportion of eligible costs covered		80%	80%

Continues

Continued

	2006–07 level	2007–08 level[a]
Features common to child and working tax credits		
First threshold	£5,220 p.a.	£5,220 p.a.
First threshold if entitled to child tax credit only	£14,155 p.a.	£14,495 p.a.
First withdrawal rate	37%	37%
Second threshold	£50,000 p.a.	£50,000 p.a.
Second withdrawal rate	1 in 15	1 in 15
Maternity benefits		
Sure Start maternity grant	£500	£500
Statutory maternity pay: weeks 1–6	90% earnings	90% earnings
weeks 7–26	£108.85 p.w., or 90% earnings if lower	£112.75 p.w., or 90% earnings if lower
weeks 27–33	Zero	£112.75 p.w., or 90% earnings if lower
Maternity allowance	£108.85 p.w.	£112.75 p.w.

a. 2007–08 figures take pre-announced values where available and estimated results of standard indexation otherwise.
b. Offsetting tax credit available, which reduces effective tax rates to 0% and 25%.
c. Applied from 7 December 2006 rather than the beginning of the tax year. Up to that point, the duty rates were 47p on both petrol and diesel.
d. 2007–08 rates apply from 1 February 2007 rather than the beginning of the tax year. European refers to flights within the European Economic Area (EEA) up to 31 January 2007 and to the European Common Aviation Area Agreement (ECAAA) areas from 1 February 2007.
e. Highest rate applies only to cars registered on or after 23 March 2006. For cars registered before this date, the highest rates are £195 and £200 for 2006–07 and 2007–08 respectively.
f. Applies where rateable values are at least £21,500 in Greater London, £15,000 in the rest of England, £29,000 in Scotland, and to all non-domestic properties in Wales. Lower rates apply below these thresholds.
Sources: Various HM Treasury and HM Revenue and Customs Press Releases, March 2006 and December 2006; HM Treasury, *2006 Pre-Budget Report*, December 2006 (http://www.hm-treasury.gov.uk/pre_budget_report/prebud_pbr06/prebud_pbr06_index.cfm); HM Treasury, *Tax Ready Reckoner and Tax Reliefs*, December 2006 (http://www.hm-treasury.gov.uk/media/77C/B3/pbr06_taxreadyreckoner.pdf); http://www.hmrc.gov.uk/; http://www.dwp.gov.uk/mediacentre/pressreleases/2006/dec/hsc-14-071206-rates.pdf; http://direct.gov.uk/Motoring/OwningAVehicle/HowToTaxYourVehicle/HowToTaxYourVehicleArticles/fs/en?CONTENT_ID=4022118&chk=7JgfMw; http://www.statistics.gov.uk/pdfdir/cpibrief0107.pdf; http://www.local.odpm.gov.uk/finance/ctax/ctax067.pdf; http://www.local.dtlr.gov.uk/finance/busrats/bri62006.pdf; http://www.scotland.gov.uk/Topics/Government/local-government/17999/11199; http://new.wales.gov.uk/news/archivepress/localgovculpress/locgovpress2006/1086396/?lang=en.

For descriptions of the tax and benefit systems, see S. Adam and J. Browne, *A Survey of the UK Tax System*, IFS Briefing Note 9, 2006 (http://www.ifs.org.uk/bns/bn09.pdf) and D. Phillips and L. Sibieta, *A Survey of the UK Benefit System*, IFS Briefing Note 13, 2006 (http://www.ifs.org.uk/bns/bn13.pdf) respectively.

For a summary of the main tax measures introduced in each Budget and Pre-Budget Report since 1979, see http://www.ifs.org.uk/ff/budget_measures.xls.

For estimates of the effects of various illustrative tax changes on government revenues, see HM Treasury, *Tax Ready Reckoner and Tax Reliefs*, December 2006 (http://www.hm-treasury.gov.uk/media/77C/B3/pbr06_taxreadyreckoner.pdf).