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Rebalancing the British economy: a strategic assessment

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Acknowledgements

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1 Introduction and Summary

In his meticulous study of the British economy, Christopher Dow concluded that major recessions are not like normal recessions.[1] Following a large blow to demand, the economy does not bounce back to full employment and to full use of productive capacity. Instead, capacity itself becomes impaired, supply follows demand downwards and the economy becomes stuck with under-employed resources.

After the worst contraction since the Great Depression, Britain faces precisely this danger. Companies are unlikely to invest, making good the collapse in capital spending, if expectations of growth remain depressed. Small and medium-sized businesses afflicted by an enduring credit crunch may permanently cut mothballed capacity. Output could stay below a level consistent with full employment. This is the message that comes from any number of historic studies of banking crises.

The danger does not end with under-employment. Years of slow growth would put further pressure on the government's budget and weaken the economy's taxable capacity. Large and persistent budget deficits may be financed without difficulty, as they have been in Japan, by tapping high private sector savings. But the financial markets may prove less accommodating. Market fears of default may rise, and with possible cause, should the economy and its institutions become chronically weak and beleaguered taxpayers take exception to the cost of servicing ever-rising levels of government debt. In a market hiatus, the budget might not be financeable at any price.

The risk of secular stagnation can be reduced, although not eliminated, by domestic macroeconomic policies that support the revival of demand, subject to the speed limits imposed by the economy's short-term ability to respond. With fiscal policy constrained, the onus falls on monetary policy to keep private demand on a gradual upward path that should, in time, encourage an expansion of supply. The Bank of England appears to accept this logic, but a stimulus aimed at supporting private spending alone would not suffice. A balanced recovery requires an expansion of exports relative to imports to lessen the risk to Britain's international balance of payments. A further large fall in sterling may well be required over the medium term.

These are the main policy conclusions of the present study. Far less ambitious than Dow's, it covers in three sections the key developments in the British economy leading up to the recession, the recession itself, and the medium-term outlook.

Section 2 looks at Britain's New Golden Age, the long pre-recession period of low inflation and steady expansion that began in the 1990s and that encouraged an optimistic assessment of the economy's potential and its resilience. However, this unusually fine economic performance disguised a number of underlying weaknesses that built up in two phases, each dominated by an asset price bubble.

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1 Dow (1998).

In the first phase, from 1995 to 2000, the economy grew at a rapid pace – about 3½% a year on average - notwithstanding a firm monetary policy and, for most years, a tight fiscal policy. Moreover, sterling's appreciation in the second half of the 1990s more than wiped out earlier improvements in Britain's international competitiveness. By 1997, exporters were losing volume share in overseas markets.

The economy's fast expansion between 1995 and 2000 was partly supported by the strength of exports of financial and business services, a structural development. But the main drivers were, first, a resurgence of activity overseas, leading to a significant acceleration of world trade seen from a UK point of view, and, second, favourable asset price developments that reflected and reinforced rising domestic confidence. Higher property and stock market prices, the latter an echo of the super bubble developing in America, encouraged both households and companies to raise their expenditure in relation to disposable income.

The result was a record downswing in the private sector's financial surplus – the excess of private disposable income over private expenditure. By 2000, the private sector was running a financial deficit worth nearly 4% of the economy's gross domestic product. Balance sheet developments were therefore conducive to an upsurge in private spending that more than compensated for the depressing impact on activity of tight fiscal policy, conditions that do not apply today.

In the second phase of the New Golden Age, from 2001 to 2007, the economy grew at a subdued 2½% a year, notwithstanding the rapid growth of public expenditure on health and education and unusually low interest rates. Social demands, emboldened by the emergence of budget surpluses at the top of the boom, explain the shift to expansionary fiscal policy. The abnormally low level of interest rates, like the preceding stock market bubble, was imported from America. After the bubble burst, America's central bank cut interest rates and kept them low in order to protect American jobs. To prevent a further appreciation of sterling incompatible with the Government's inflation objective, the Bank of England was obliged to reduce interest rates in line, and thereby underwrote and encouraged an excess expansion of bank credit, the escalation of house prices and households' continued exuberance.

But there was no overall boom. Growth was held back, first, by a deceleration of goods exports, partly a reflection of a slowdown in Britain's overseas markets, and second, by companies' caution. After the stock market bubble burst, companies' balance sheets were weakened and their pension obligations became far more onerous. While the growth of household spending continued to outpace disposable income, the reverse was true of companies. By 2007, their unusual financial surplus matched households' near-record financial deficit, worth 4% of GDP. Meanwhile, the combined impact of international competitiveness loss, the housing boom and the expansion of public services diverted resources into the less internationally exposed parts of the economy. The UK was running a 3% of GDP trade deficit.

By 2007, then, an outwardly successful economy had developed several systemic vulnerabilities: a house price bubble, an over-extended banking system, an over-indebted household sector, an uncompetitive exchange rate and a deteriorating overseas trade position.

A tentative counterfactual simulation using the author's model supports the conclusion that the economy's observed performance flattered its true potential over this long period. With both the stock market and housing market bubbles removed and with budgetary policy constrained by the then operative fiscal rules, the simulated counterfactual economy grows at just 2½% a year between 1995 and 2007. This rate of growth, close to the post-war norm, is materially below the 3% observed pace of annual expansion that gave credence to the idea of Britain's New Golden Age.

Section 3 asks a simple question: to what extent was the recession deepened by the banking crisis and a shortfall in the supply of bank credit? The answer may seem self-evident, but banks claim – not without some justification - that the fall in lending was due to a decline in the demand for credit, rather than a cutback in credit supply.

It is not possible to answer this question with any precision, but a process of elimination throws some light. Various drivers of the recession can be quantified and their impact compared with the course of the economy in 2008 and 2009. The residual "unexplained" fall in output can be used as a rough guide to the credit crunch impact.

Table A: Explaining the GDP output gap

Percentage points unless stated	2008	2009
Output gap, %	-1.8	-8.9
Identified factors:	-2.0	-5.2
of which:		
Export shortfall	-0.4	-3.1
Housing & stock market wealth loss	-1.6	-2.4
Confidence loss & other wealth effects	0.0	-0.7
Discretionary counter-cyclical fiscal policy	0.0	1.1
Unexplained residual	0.2	-3.7

Source: author's model simulations. The GDP output gap is derived from a mechanical extrapolation of 2001 to 2007 expenditure trends, implying annual growth in trend GDP of about 2½%. The gap is actual GDP less this measure of trend GDP, as a per cent of the trend. The impact of identified factors is calculated from a comparison of simulated output gaps with and without each shock. The total impact of the shocks is not exactly equal to their simple sum. Details are given in the main text.

After detailed analysis, little weight is placed on two much discussed aspects of the recession: the commodity price shock and the delayed macroeconomic policy response of 2008. Far more important were the collapse of exports, itself partly the consequence of the global nature of the banking crisis, and "wealth shocks", arising from the falls in house prices and stock markets. As Table A indicates, these two drivers provide a good explanation of the economic slowdown in 2008 but do not fully account for the fall in GDP below "trend" output in 2009.

The unexplained loss of output in 2009 amounts to over 3½% of GDP. Part of this large residual might be due to downward bias in the official statistics but most of the unexplained fall in output is most plausibly attributed to a shortfall in the supply of bank credit. The flow of credit also fell sharply in 2008 and without such ill effect on the wider economy, probably because households and companies were then still able to draw on their liquid savings. Once this liquidity cushion was depleted, the absence of credit forced households and businesses to contract, an impact amplified by the shock to confidence as banks teetered on the brink.

The failure of economists' models to capture these events, the large impact of the credit crunch and the uncertain prospects for the banking system's revival mean that policy makers can have little clue about the speed and scale of Britain's recovery. A minimum regret strategy is required that would work tolerably under sharply contrasting circumstances, none of which can be confidently ruled in or ruled out.

Table B: Recovery scenarios – unemployment and financial balances in 2014

Rate or share of GDP, % 2014	Scenario	
	Fast recovery	Slow recovery
Unemployment rate*	5.9	9.8
"Output gap"**	-5.9	-15.7
Private sector financial surplus	1.4	12.0
Budget deficit***	2.9	10.1
Current account of balance of payments	-1.8	1.6
of which:		
Goods & services balance	-1.5	2.2
memo:		
Average GDP growth, % p.a., 2010 to 2014	3.2	0.9
Public sector net debt ratio end-2014***	72	103

Source: author's calculations. * Labour Force Survey measure. ** GDP in 2014 relative to a "trend" level implied by 2½% growth maintained from 2007. *** public sector measure that excludes the temporary effect of bank bailouts.

Section 4 illustrates the policy problem by carefully quantifying two plausible scenarios each built around official fiscal plans and projections up to 2014:

- Under a fast recovery scenario, the economy enjoys a significant export revival; exports and imports respond substantially to the large gains in international competitiveness of 2008 and 2009; house and stock market prices rise at a moderate pace and the impact of the banking crisis gradually fades.

- Under a slow recovery scenario, the export revival and competitiveness benefits are more limited, consistent with supply-side impediments. Asset prices fall in real terms, in line with the findings of banking crisis studies. The fall in asset prices exacerbates balance sheet problems, including the banks'. As a result, the credit crunch persists and has a lasting detrimental impact.

Under the fast recovery scenario, the economy generally outperforms official projections, although unemployment remains high judged by pre-recession standards, as Table B shows. The budget deficit falls more quickly than planned. The 2010 Fiscal Responsibility Act encourages such opportunistic fiscal tightening.

Far more daunting is the slow recovery scenario in which the economy remains depressed with mass unemployment, persistently high budget deficits and rapidly rising government debt. The underlying story is of protracted balance sheet repair by the private sector, including the banks. The level of demand, and possibly supply, is chronically weakened by the private sector's debt reduction strategy, reflected in the persistence of abnormal private sector financial surpluses. The weakness of private demand also takes its toll on government finances, which worsen automatically as government spending rises relative to depressed levels of GDP and tax revenues fall.

Chart A: Fast recovery scenario with 25% sterling devaluation*

Unemployment rate & financial balances, % GDP, 2014; GDP growth, % p.a. 2010-2014
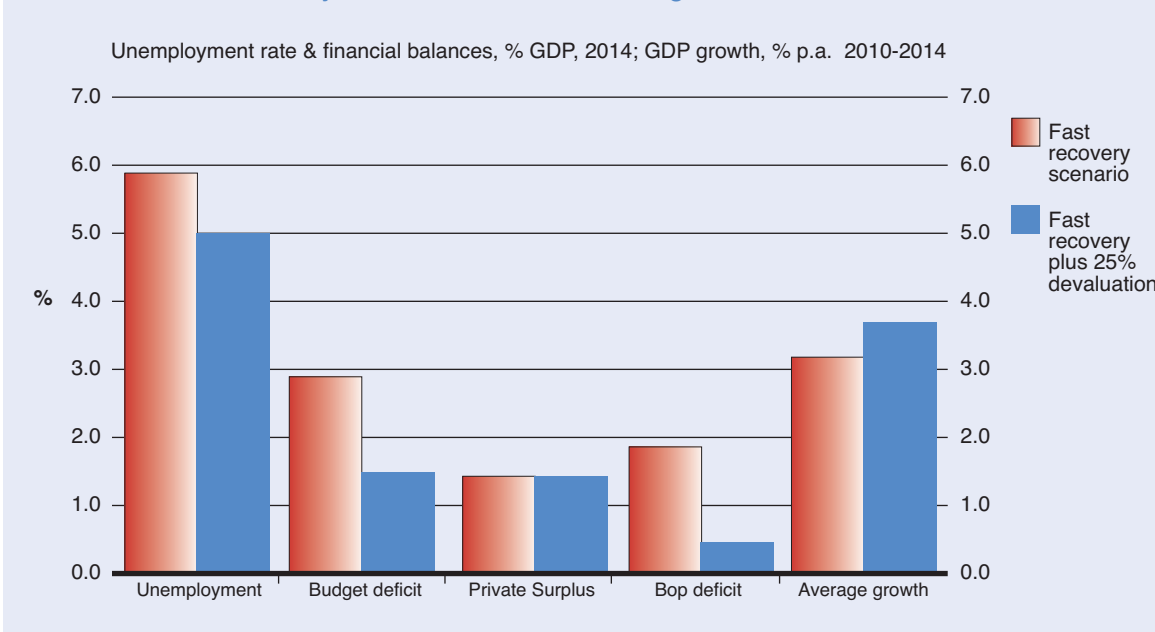
Source: author's calculations. * relative to the 2009 level of the sterling index.

In this scenario, the increase in the government's indebtedness is an automatic consequence of the private sector's need to reduce its own debt and to increase its financial wealth, wealth which includes financial claims on the government held in the form of Treasury bills and bonds. On this logic, high budget deficits could be financed on reasonable terms: the private sector may be a willing buyer (and in the case of regulated banks, possibly forced buyer) of government debt. However, an escalation of government indebtedness in circumstances of chronic economic malaise may cause a hiatus in financial markets, as perceived sovereign default risks rise, obliging the authorities to tighten policy and thereby drive the economy into slump.

The conclusion to be drawn is that the slow growth scenario is a trap. Macroeconomic policies that encourage a gradual revival of demand offer a possible escape, with the onus placed on monetary policy and supportive supply-side policies.

A continued stimulus that revived private spending alone may not suffice, however. Were private spending sufficiently high to restore full-employment, imports would also be higher and the international balance of payment worse. Simulations suggest that the full-employment balance of payments deficit might lie between 3½% and 6½% of GDP; in any event, too large for comfort. The UK has a latent balance of payments problem, currently disguised by the comparative depth of the recession.

It is estimated that a further 25% depreciation of sterling compared to its 2009 level might under favourable international and domestic circumstances help to promote a recovery that eventually achieves both internal and external balance, as Chart A suggests. In principle, a similar result could be achieved by an even larger depreciation should world activity or domestic conditions remain depressed, but there are limits to the cure. The reorientation of the economy towards internationally-trading sectors will take time and overseas governments might retaliate. The Bank may need to become a more active currency manager, attempting to steer the exchange rate gradually lower and resisting, by intervention, any appreciation that threatens the economy's chance of balanced medium-term expansion.

2 Britain's New Golden Age

Two puzzles

Britain's New Golden Age of steady expansion and low inflation began after sterling's exit from the European exchange rate mechanism in 1992, but attention is confined here to the period between 1995 and 2007. The economy's immediate recovery from the early-1990s recession was striking in one respect: it was led by growth in exports relative to imports thanks to the competitive pound. The fact that growth was above trend is unremarkable, however. Of far greater interest is the subsequent pace of expansion, when a reversion to trend might have been expected.

A second reason to begin in 1995 concerns developments overseas. That year marks the start of America's productivity renaissance and the gradual emergence on Wall Street of a massive stock market bubble, which powerfully affected developments worldwide.[2] The New Golden Age ends in 2007, the year the banking system began to fail but at that stage without much impact on the wider economy.

The full period from 1995 to 2007 is best considered in two phases demarcated by the top of the stock market bubble in 2000. In Phase I, from 1995 to 2000, economic growth was a vigorous 3½% a year; in Phase II from 2001 to 2007, annual growth was a more sober 2½%. Average growth over the two phases together was 3% a year. Although measurement problems abound, there is no strong reason to believe that these figures overstate Britain's pace of expansion.[3]

Two puzzles present themselves:
- The first puzzle is how the economy managed to grow so quickly in Phase I notwithstanding a firm monetary policy and a tightening of fiscal policy.

- The second puzzle, almost a mirror image, is why the economy grew so sedately in Phase II notwithstanding expansionary monetary and fiscal policies and an escalation in property prices. Hume and Sentence (2009) call this the "Growth Puzzle of the 2000s".

To unravel these puzzles, assessments are made, first, of developments in official policy and, second, of the other key drivers of activity and expenditure.

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2 Based on an examination of the predominantly technology and growth stocks that comprise the US Nasdaq stock price index, Phillips et al. (2009) conclude that explosive stock price behaviour began in July 1995 and ended around September 2000.

3 Weale (2009) argues that growth was overstated in Phase II by official figures that erroneously included (illusory) capital gains when assessing banks' contribution to national income. The case is not proven, however. Longer-term changes in real GDP growth are aligned by the official statisticians not to the income measure of GDP but to the expenditure measure of GDP – GDP(E). (ONS http://www.ons.gov.uk/about-statistics/user-guidance/ios-methodology/nat-acc/index.html.) It is of note that, since 1995, official statisticians have typically adjusted down the value added by business services and finance in the process of aligning the output measure of GDP with GDP(E). Some commentators (for example, Basu et al. (2008)) have queried the imputed GDP contribution of banks known as FISIM ("financial intermediation services indirectly measured"). In the UK, the impact is limited. GDP growth excluding FISIM was 3¼% a year in Phase I, a ¼ percentage point below the headline figure. In Phase II, FISIM made little difference to average GDP growth. More generally, analysis of revision bias suggests that first estimates of GDP growth are more likely to be revised up than down over the subsequent decade.

Policy developments

The middle section of Table 1 presents measures of the changing stance of official policy. Monetary policy can be roughly gauged from the estimates of real short-term interest rates.[4] Between 1995 and 2000, the average nominal three-month yield on Treasury bills less the then targeted rate of retail price inflation[5] was around 3½%, a figure barely distinguishable from the "natural" real interest rate, consistent with stable inflation, tentatively estimated using a similar definition by Bank of England economists Larsen and McKeown (2004).[6] On other definitions, real short-term interest rates were substantially higher than 3½%.[7] Retail price inflation averaged 2½%, falling towards 2% by 2000: a below-target outcome that invited accusations that monetary policy had been too tight.[8]

Fiscal policy was unquestionably tight. The years 1995 to 2000 included some of the staged tax increases initiated by the Conservative Government in 1993, and severe curbs on public expenditure that were maintained by the in-coming 1997 Labour Government until 1999. Total managed government spending grew on average by less than 1% a year in "real terms", that is after allowing for the rise in economy-wide prices measured by the price deflator for the gross domestic product. The volume of government spending on goods and services, a component (about half) of total managed spending which includes the government wage bill, recorded a similar slow rate of growth. This category of government spending adds directly to GDP. There was no growth in other types of government spending on various transfers, which add to private disposable (after-tax) incomes. Discretionary budget measures during this period raised taxes cumulatively by ½% of GDP and tax take grew rapidly. As a result of depressed government transfers and higher taxes, real private disposable income grew by a subdued 2½% a year, 1 percentage point below the rate of growth of GDP.

Official policy was very different in Phase II of the New Golden Age, between 2001 and 2007. Monetary policy was more relaxed. The Bank of England cut its policy interest rate, today known as bank rate, from 6% in 2000 to a low of 3½% in summer 2003. It was raised gradually to 4¾% by August 2004 and stayed within a ¼ percentage point of that level until late 2006, when the prospect of rising inflation prompted a more sustained policy tightening. Previously quiescent, targeted consumer price inflation rose briefly above 3% in March 2007, obliging the Governor of the Bank to write his first open explanatory letter to the Chancellor.[9] Bank rate was raised in stages to a peak of 5¾% in July 2007. Concerns about the deflationary impact of credit shortages prompted the Bank to cut bank rate to 5½% in December 2007, by which time consumer price inflation had fallen back close to 2%.

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4 If actual and expected inflation rates are similar over short periods, as seems likely, the realised real short-term interest rates shown in Table 1 will be close to expected real rates. The median inflation expectation recorded in the GfK NOP survey commissioned by the Bank was 2.4% between 2000 and 2007, compared with 2.5% retail price inflation excluding mortgage interest payments.

5 Retail prices excluding mortgage interest payments – RPIX.

6 Larsen and McKeown define the real rate in terms of the Treasury bill yield and the headline retail price inflation rate. On this definition, the real interest rate averaged 3¼% in Phase I, a ¼ percentage point below an average of the authors' alternative estimates of the natural rate.

7 Based on the nominal sterling three-month interbank rate, the average real interest rate lay between 3½% (after deducting retail price inflation) and 4½% (after deducting consumer price inflation).

8 See Treasury Committee (2001).

9 RPIX inflation was 3.9%. The RPIX target used prior to January 2004 was 2.5%; the harmonised index of consumer prices (HICP) inflation target is 2%.

Table 1: The UK's New Golden Age - Phases I and II and the earlier record

annual average growth, % unless stated	1987 to 1994	1995 to 2000	2001 to 2007
GDP	2.2	3.4	2.6
Total final expenditure	2.8	4.5	3.1
of which:			
Exports of goods & services	4.2	7.0	3.8
General government consumption & investment	1.5	1.1	2.8
Private consumption & investment	2.7	4.5	2.9
of which:			
Household consumption	2.8	4.0	2.7
Capital spending	2.5	6.7	3.8
Imports of goods & services	4.9	8.5	4.8
Policy indicators:			
Real short-term interest rate, level, %	4.6	3.4	1.9
Total managed general government expenditure	2.2	0.8	4.0
General government transfers and subsidies	2.8	-0.1	3.3
Relative price of government final expenditure	0.2	0.5	1.7
Cumulative tax change, level, % of GDP	-1.7	0.6	0.1
Real private disposable income	3.3	2.4	3.6
Other indicators:			
World trade (imports of goods & services)	5.3	8.9	5.9
UK international labour cost competitiveness	-0.8	-4.7	-0.3
Sterling effective exchange rate index	-1.4	3.0	0.0
Import prices (unit values of goods & services)	2.9	-0.9	0.6
Retail price index excluding mortgage interest	4.9	2.6	2.5
Unemployment level, %, period average	9.0	6.9	5.1

Source: ONS *UK Economic Accounts, Financial Statistics*; OECD Monthly *Economic Indicators*; IMF *International Financial Statistics*; HM Treasury; author's calculations. Note: GDP and its expenditure components are chained volume measures; household sector includes non-profit institutions serving households; private sector includes public corporations in order to avoid data distortions created by privatisations; real short-term interest rate is calculated from the three-month Treasury Bill yield and inflation measured by the retail price index excluding mortgage interest payments (RPIX); total managed government spending comprises general government current and capital final expenditure on goods and services and government current and capital transfers and subsidies, deflated by the GDP price deflator; the relative price of government final expenditure is the price deflator for general government current and capital final expenditure divided by the GDP price deflator; cumulative tax change is the sum of the calendar year revenue impacts, after allowing for inflation indexation, of discretionary tax changes expressed as a per cent of GDP calculated from fiscal year estimates in Budgets, Autumn Statements and Pre-Budget Reports; world trade is the OECD measure derived from the UK trade weighted average of growth rates of goods and services imported by overseas economies; UK international labour cost competitiveness is based on IMF estimates of the UK's effective exchange rate and cycle-adjusted unit labour costs in manufacturing compared to those overseas (a positive figure indicates an improvement in competitiveness); the sterling effective exchange rate is the IMF measure; unemployment is the International Labour Organisation measure used in the UK Labour Force Survey.

The overall result was a level of *real* interest rates in Phase II well below the Phase I norm. Real Treasury bill yields shown in Table 1 averaged 2%, a fall of 1½ percentage points from the previous period and a material distance below the natural rate estimates of Larsen and McKeown, whose figures end in 2002.[10] Other measures of the prevailing level of real interest also fell sharply; indeed, judged in terms of the escalation of house prices, itself the result of low interest rates,[11] real mortgage borrowing rates became substantially negative. Annual house price inflation over the period was about 11½% on average, implying a real borrowing rate on mortgages that track bank rate of *minus* 5½%, 6 percentage points lower than in Phase I.[12]

Table 2: Nominal short-term market interest rates: UK and overseas

annual average, %	1987 to 1994	1995 to 2000	2001 to 2007
UK	10.2	6.4	4.7
Major economies overseas	7.1	4.2	2.6
of which:			
US	6.3	5.7	3.2
Euro area	9.1	4.6	3.1
Japan	4.9	0.6	0.2
Memo:			
UK minus overseas	3.1	2.2	2.0

Source: ONS *Financial Statistics;* OECD *Monthly Economic Indicators;* IMF *World Economic Outlook;* author's calculations. The short-term rates are approximately three-monthly: sterling interbank rate (UK); euro-dollar deposit rate (US); euribor rate (Euro area), constructed from GDP weighted representative rates of individual major member countries before 1999; certificate of deposit rate (Japan); prime corporate paper (Canada), not shown. The overseas aggregate is a current-year US dollar GDP weighted average of the non-UK rates.

Why were UK interest rates so much lower in Phase II? The answer lies in international developments. Between Phase I and Phase II, short-term nominal market interest rates in the UK fell broadly in line with the overseas average, as Table 2 shows. This similarity is not coincidental. The era of low interest rates led by the US central bank after 2000[13] encouraged an expansion of the global "carry trade", making it more likely than not that a high interest rate currency would appreciate.[14] Had the Bank not cut UK interest rates in line with the overseas average, it is likely that sterling would have risen to a level incompatible with the Bank's inflation objective.

10 Using the authors' definition, the real rate was 2% in the two-year period 2001 to 2002 and 1½% in Phase II as a whole. The average of their natural rate estimates in 2001 to 2002 is about 3½%.

11 The fall in the real interest rate was the major driver of the house price escalation according to Waldron and Zampolli (2010).

12 This measure of real borrowing rates can be interpreted as a component of the real cost of home ownership, which depends on the real borrowing rate, defined relative to consumer price inflation, minus the expected rise in real house prices (also relative to consumer prices). To be interpreted in this way, expected and actual real house price appreciation should be equal. Approximate equality may occur during a price bubble fed by extrapolative expectations, conditions probably met in Phase II.

13 Bernanke (2005) attributes the low level of interest rates partly to a compression of real interest rates caused by a "global saving glut". This explanation is inconsistent with developments in global growth. A saving glut would have caused a shortfall in activity but global growth was on average as strong, if not stronger, after 2000 as it had been during Phase I (source: IMF World Economic Outlook).

14 The carry trade is the name of a strategy in which an investor borrows in a low interest rate currency and simultaneously invests in assets denominated in a high interest rate currency. The scale of carry trade positions is not easily measured but there is little doubt that they grew massively after the early-2000s (McCauley (2008)).

In so acting, the Bank was drawing on its experience in Phase I. A surprising appreciation of sterling had then contributed to a fall in import prices and, for a period after mid-1999, an under-target inflation rate.[15] Responding to criticism, the Bank amended its forecasting methodology in November 1999 in a way that made it more sensitive to the disinflationary implications of a strong exchange rate.[16] The upshot was that the Bank acted *as if* there were an exchange rate target: with inflation broadly under control in Phase II, the fall in overseas nominal interest rates forced a similar reduction in the UK in order to avert a stronger pound.

Budgetary policy also became expansionary in Phase II, and for reasons largely unconnected with the state of the business cycle. The turning point came at the end of Phase I in the March 2000 Budget.[17] The government was facing mounting pressures on several fronts: to reduce the incidence of poverty amongst families with children, to reduce taxation, notably on petrol, and, above all, to improve public services. By 2000, the government also believed it had the means. Previous fiscal restraint coupled with fast economic expansion had produced a budget surplus in excess of 1% of GDP in 1999, with more in prospect. The March 2000 Budget cut taxation in stages. The main change, confirmed in the July 2000 Spending Review, was a commitment to a sharply increased rate of spending on the National Health Service and on education. Real growth rates in excess of 6% a year were planned. Having fallen since the early-1990s, total managed public spending as a share of GDP was set to rise.

Subsequent budgets broadly upheld these intentions, although taxes were later raised, notably in the 2002 Budget, to "pay" for higher public spending. In addition, the 2004 public spending review sought to slow the pace of expenditure growth. For the period as a whole, the cumulative impact of discretionary tax changes was nugatory. The main shift in policy is registered by the expansion of real public spending, which grew at an average rate of 4% a year during Phase II, well above the growth of GDP.[18]

The volume of government spending on goods and services, which adds directly to GDP, grew more slowly, at about 3% a year. This was so even though in nominal terms government spending on goods and services grew at 7½% a year, rather faster than the nominal growth of total managed public spending. The rate of growth of government spending on goods and services in volume terms was depressed by the very sharp rise in the cost of government spending on procurement and wages, partly the result of a significant increase in public sector pay. Higher public sector pay and prices eroded the volume impact of the extra cash spending by the government.

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15 See Nickell (2002).

16 Prior to November 1999, the Bank typically assumed that sterling would decline in line with market interest rate differentials, an application of the uncovered interest parity (UIP) hypothesis. The assumed decline in sterling increased the projected inflation rate. Following criticism from Sushil Wadhwani, an external member of the Bank's Monetary Policy Committee, a compromise methodology was adopted in which sterling was assumed to fall by half the rate implied by UIP. A jump in sterling would tend to have a greater disinflationary impact under the compromise method than under the UIP convention.

17 The U-turn was foreshadowed by the then Prime Minister's announcement in January 2000, during a television interview, that the government would endeavour to raise expenditure on health care to the European average.

18 The national accounts consistent public spending figures used in Table 1 are less up-to-date than the official public finance statistics but the differences in the datasets are trivial for the periods shown.

Although the higher rate of public sector pay helps to explain the more limited rate of growth of the volume of government spending on goods and services, there was an offsetting effect on household disposable income, part of private disposable income, which includes the wages and salaries of all employees regardless of whether they work in the public or private sectors.[19] In Phase II, household and private incomes in cash terms ran substantially ahead of the prices of goods and services purchased by households and companies, implying substantial growth in real income. Government transfers were also supportive. Even though discretionary tax changes contributed nothing, real private disposable income grew by 3½% a year between 2001 and 2007, 1 percentage point higher than in the previous period.[20]

In summary, official policy was far more relaxed in Phase II, between 2001 and 2007, than in Phase I, between 1995 and 2000. Real interest rates fell and house price inflation escalated. The relaxation of fiscal policy was partly registered in a much faster rate of growth of government spending on goods and services. There was also a substantial impact on private disposable income and on its relationship with GDP. Having grown by 1 percentage point less than GDP in Phase I, real private disposable income grew by 1 percentage point more than GDP in Phase II.

Other drivers of GDP growth

The immediate reasons for the fast rate of GDP expansion in Phase I and for the more subdued rate in Phase II can be discerned from the upper part of Table 1, which, to aid comparison, gives averages across the earlier boom and bust years between 1987 and 1994. The faster rate of growth of GDP in Phase I was associated with an acceleration in total final expenditure, driven by exports and private domestic expenditure. Export growth ran at 7% a year in Phase I, substantially higher than the growth rates, around 4%, seen in the preceding and succeeding periods. A similar path is traced by private spending, which accelerated to a 4½% growth rate in Phase I, with sharp advances in both consumption and investment. Both before and after this period, private spending grew on average by 3% a year or less. What explains these developments?

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19 More precisely, household income includes the wages and salaries of permanent UK resident employees but excludes those on temporary assignment abroad.

20 Also supportive of private disposable income in this period was a sharp rise in foreign direct investment earnings. Overseas net investment income in total contributed 0.3 percentage points to the growth of real private disposable income during Phase II, but nothing in Phase I.

Other drivers (1): Exports

It is tempting to think that the export acceleration in Phase I sprang from the competitiveness gains secured after sterling left the European exchange rate mechanism in September 1992. However, the evidence points to other causes. One was an acceleration of world trade. The volume of goods and services imported by the UK's trading partners grew by about 9% a year during Phase I, significantly faster than the rates of growth averaging 6% or less seen in the adjoining periods.

The second driver was a sharp acceleration in the export of services. Table 3 gives a breakdown of exports, a very approximate exercise in the case of the volumes of different types of services, which are inferred using overall service export prices. The breakdown shows an acceleration in exports of both goods and services in Phase I but a very different pattern in Phase II. Exports of goods, notably of manufactures, decelerated sharply. By contrast, service exports maintained a very high rate of growth, reflecting the rapid expansion of financial and other business services. Export growth in these activities in both phases appears to have been partly structural, and probably related to the increasing globalisation of financial portfolios. Between end-1994 and end-2007, the share of the stock market capitalisation of UK quoted companies held by overseas investors rose from 16½% to over 43%. A similar shift towards overseas holdings is observed in the asset allocation of UK pension funds.

Table 3: Export developments

annual average growth, % volumes	1987 to 1994	1995 to 2000	2001 to 2007
Exports of goods & services	4.2	7.0	3.8
of which:			
Goods (70% of total exports in 2000)	4.6	7.0	1.6
of which:			
Goods excluding oil	5.0	7.4	1.9
Manufactures	5.4	7.9	2.0
Manufactures less MTIC adjustment	5.4	7.6	2.1
Services (30% of total exports in 2000)	2.9	7.3	7.9
of which:			
Transport and travel	2.7	2.9	3.3
Financial and insurance	3.8	9.5	12.8
Business services and other	2.7	10.4	7.7

Source: ONS *UK Economic Accounts*, Monthly Review of External Trade Statistics, Pink Book; author's calculations. Note: service exports by type are derived by deflating nominal service exports by the deflator for total service exports. "Financial and insurance" services include the exports of monetary financial institutions, fund managers, securities dealers and life insurance and pension funds. The main component of "Business services and other" is the ONS category "other business" which includes merchanting, legal, accounting and architectural services, advertising and market research. The goods trade figures are distorted by the activities of fraudsters who import goods from Europe for sale at Value Added Tax inclusive prices but fail to pay the VAT (Missing Trader Intra-Community – MTIC – fraud). The same goods are eventually exported. The trade statistics, based on VAT returns, capture the affected exports but not the imports. The official published figures for imports include an upward adjustment to correct for under-recording. The underlying export trade flows are better judged by deducting the adjustment.

Although acting as a boost in the years immediately after the early-1990s recession, it is improbable that changes in international competitiveness contributed much to the uplift in export growth after 1995. More likely, competitiveness changes constrained export performance on average in both Phases I and II. One piece of evidence relates to the UK's share of overseas export markets. In volume terms, export share increased between 1992 and 1996 on the back of post-ERM competitiveness gains but suffered a major reversal between 1997 and 2000. In Phase I as a whole, UK exports fell by 10% in relation to the volume of goods and services imported by Britain's trading partners. The loss of export market share continued in Phase II.[21]

A second piece of evidence comes directly from measures of competitiveness, which reveal a sustained deterioration during Phase I to a lower level that then persisted throughout Phase II. Although the measures differ in detail, there is broad agreement that the deterioration occurred after the mid-1990s (Chart 1). From peak or near-peak levels in 1995, the UK's international competitiveness measured by relative consumer prices or by unit labour costs fell by over 20% in the three years to 1998. Subsequent years saw both losses and gains, adding up to a further overall decline.

Chart 1: UK international competitiveness indices

UK international price & cost competitiveness, index 2Q 1975 = 100
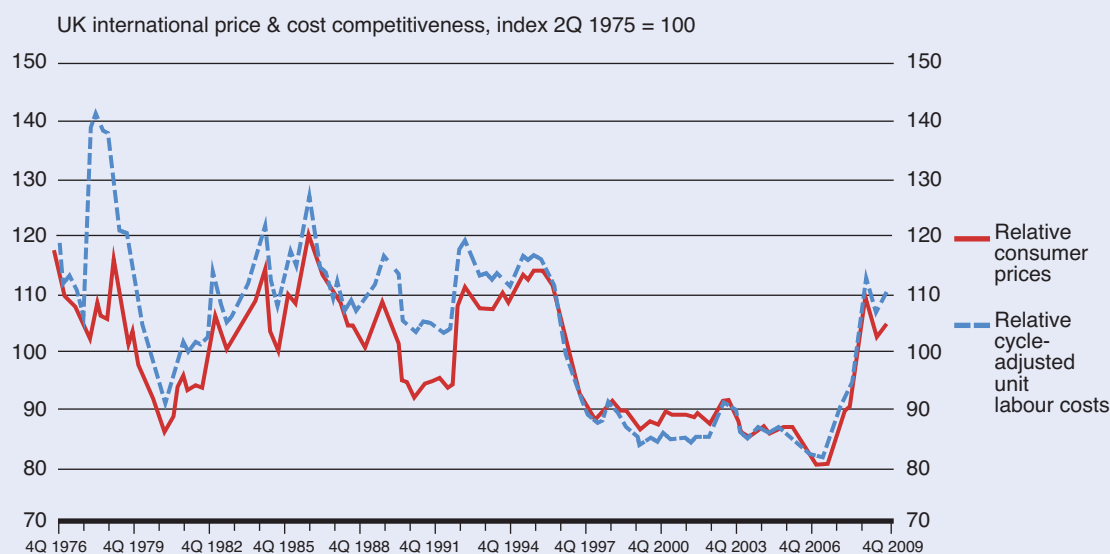
Source: IMF *International Financial Statistics*. Note: The indices rise when UK prices or unit labour costs fall relative to those overseas after adjusting for exchange rate changes, signifying an increase in competitiveness. See also Table 1.

21 OECD Economic Outlook (2009), Statistical Annex Table 44. The cumulative loss in Phase II was 13%. Annual average rates of change are −1.7% (Phase I) and −2.0% (Phase II).

The lower part of Table 1 highlights changes in cycle-adjusted unit labour cost competitiveness in manufacturing, arguably the measure most relevant to international trade in manufactures. During Phase I, labour cost competitiveness fell at an average rate of about 4½% a year, a cumulative loss of 25%. An appreciation of the exchange rate accounts for about two-thirds of this competitiveness decline. The nominal effective exchange rate, the basket of currencies used in the calculation of labour cost competitiveness, appreciated by a cumulative 20%.[22] In Phase II, labour cost competitiveness ended roughly where it began, as did the effective exchange rate.

Sterling's behaviour is key to these competitiveness developments, but the reasons for its strength are not well understood. After its ejection from the ERM, with a central rate of 2.95 against the Deutsche Mark, sterling had fallen to around DM2.20 by mid-1995. It then rose precipitously to about DM3.00 by summer 1997, broadly stabilising for a period before rising again in 2000. By comparison, the sterling-dollar rate traded within a narrow range.[23] Wadhwani (1999) attributes the re-rating of sterling against the Deutsche Mark to two main factors: the low starting point (below estimates of purchasing power parity) and the rise in unemployment in Germany relative to the UK, a sign, perhaps, of Britain's relatively improved supply-side performance.[24]

Chart 2: Currency movements
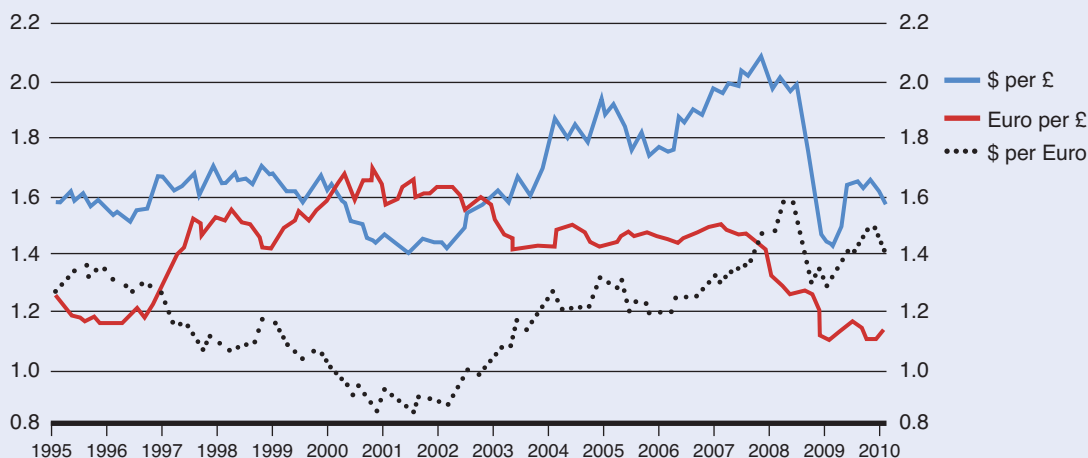
Source: Bank of England; author's calculations. Prior to 1999, the chart shows a synthetic euro exchange rate calculated as a weighted average of the (then) eleven euro area countries. The euro traded electronically from January 1999 and replaced the national currencies of member countries in January 2002.

22 This implied a fall in the reciprocal - sterling per unit of foreign currency - of 16½%, nearly two-thirds of the 25% loss of labour cost competitiveness.

23 Between December 1994 and December 2000, the rate changed from $1.56 to $1.46, although it rose above $1.60 in the late-1990s.

24 On comparable definitions, the German unemployment rate ranged between 7½% and 9½% during Phase I, ending the period much as it had begun. In the UK, the unemployment rate fell sharply. Wadhwani also argues that DM-sterling rate may have been driven up by the prospect of a worse German balance of payments position at lower levels of German unemployment.

Even if this explanation is correct, much of sterling's appreciation during Phase I remains puzzling. Although faring better than more conventional approaches,[25] Wadhwani's model left a third of sterling's appreciation to DM3.00 unexplained; nor was it able to explain the further surge to DM3.40 by May 2000, a rise that occurred, contrary to the model's predictions, in the face of perceived structural improvements in the German economy.[26]

In Phase II, sterling's decline against strengthening European currencies was broadly offset by sterling's appreciation against the dollar. Apart from a brief period of weakness in 2003, the sterling effective exchange rate remained remarkably stable. In terms of bilateral rates, shown in Chart 2, sterling fell over the year to spring 2003 from €1.60 to €1.40, recovering a little thereafter to an average of around €1.45 for the remainder of the period. During this time, the euro continued to appreciate against the dollar, recovering from a low point reached in October 2000. Sterling also strengthened against the dollar, from around $1.50 in 2000 to $2.00 in 2007.

Was sterling overvalued? Some affirmative evidence comes from estimates of the "equilibrium" sterling rate of exchange that would secure full employment and a zero international balance of payments on current account. Wren-Lewis (2004) estimated the equilibrium rates in 2002 at €1.38 and $1.63. Allowing for the greater importance of the euro area for UK trade, the implication was of a modest over-valuation of the sterling effective exchange rate in the early part of Phase II. An intensification of carry-trade speculation may have further elevated sterling after 2005.[27]

**Table 4**: Balance of payments developments

annual average, %	1987 to 1994	1995 to 2000	2001 to 2007
Current account of balance of payments	-2.7	-1.3	-2.3
of which:			
Net overseas investment income	-0.4	0.2	1.4
Other current account	-2.3	-1.4	-3.7
Goods and services balance	-1.6	-0.6	-2.8

Source: ONS *UK Economic Accounts.*

25 Even Groen and Balakrishnan's (2004) sophisticated estimates of the risk premium on UK assets fail to explain the late-1990s appreciation of sterling against the Deutsche Mark.

26 See Wadhwani (2000).

27 Galati et al. (2007) calculate that net long non-commercial open future positions in sterling rose markedly in 2006 and 2007.

Chart 3: UK Balance of payments and investment income

Balance of payments, % of GDP
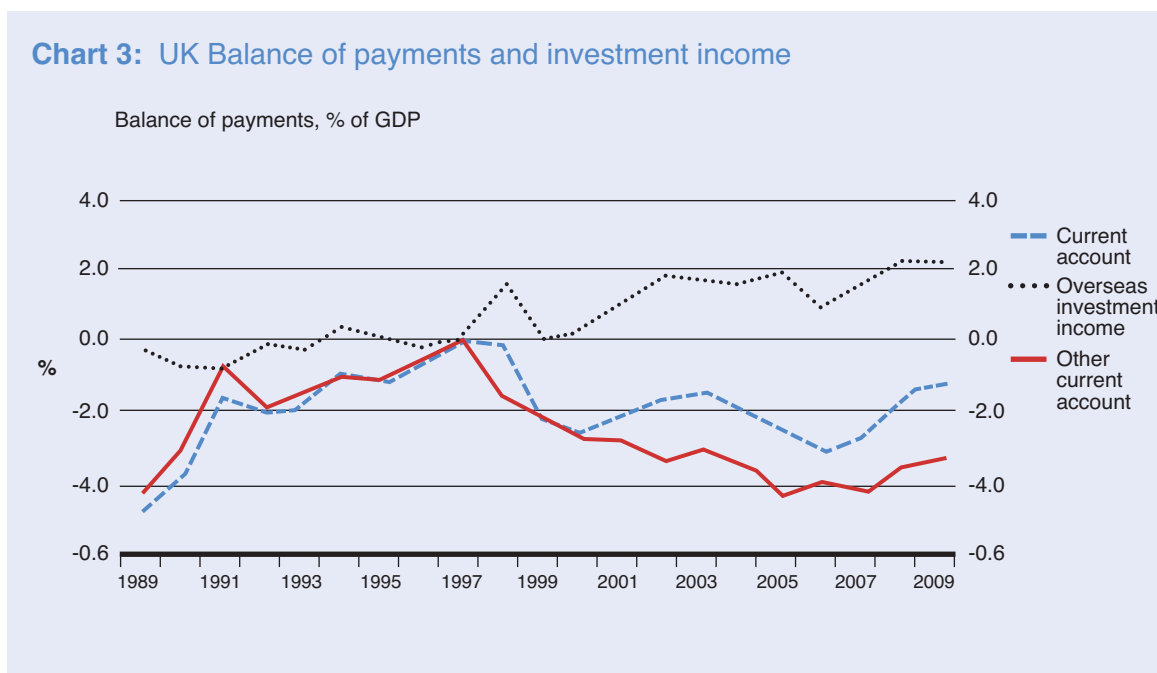
Source: ONS *UK Economic Accounts.*

Britain's trade performance also suggests that sterling was overvalued during this period. As Table 4 records, the trade deficit averaged nearly 3% of GDP, much larger than in Phase I, albeit accompanied by a lower level of unemployment.[28] The larger trade deficit came with a switch in domestic production towards sectors of the economy less, if at all, involved in international trade. The impact of the loss of competitiveness, the housing boom and the expansion of public services led to an increase of perhaps 2 percentage points in the non-internationally-trading sectors' share of the economy between 2000 and 2007.[29] However, the overall balance of payments was protected from the worsening trade performance by sharply rising foreign direct investment (FDI) income, which raised overall overseas investment income to about 1½% of GDP from a previously negligible level (Chart 3). The current account balance remained in deficit averaging 2½% of GDP.

In summary, the acceleration in GDP in Phase I and the deceleration in Phase II arose partly as a result of a similar rise and fall in export growth. This pattern was driven by the rise and fall in world trade growth and by the negative impact of sterling's strength on the UK's international competitiveness. The reasons for sterling's appreciation after 1995 are not fully understood: a low starting point, perceptions of the UK's improved performance and speculative carry trade activity may have played a part. The deterioration in Britain's trade performance and reorientation towards non-internationally trading activities suggest sterling became overvalued.

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28 Of the 2¼ percentage point increase in the trade deficit as a share of GDP, perhaps ½ percentage point might be attributed to the higher level of activity relative to capacity output in Phase II.

29 The non-internationally trading sector is defined also to include domestic energy production, distribution and household services. The boundary cannot be precisely defined.

Other drivers (2): Private expenditure

Private expenditure was the other main driver of the acceleration and deceleration of GDP growth in Phases I and II. Table 5 repeats, for convenience, the figures for the growth of private sector spending and disposable income shown in Table 1. Of note is the large excess in Phase I of the growth of expenditure in relation to the growth of private disposable income, the latter constrained by tight fiscal policy. Annual private expenditure growth averaging 4½% contrasts with growth of disposable income of only 2½% a year. Both households and companies contributed to the excess. The consumption and capital spending of households (deflated by overall private sector prices) grew by 4% a year; company capital expenditure grew annually by over 6%.

**Table 5:** Private sector disposable income and spending

annual average real growth, % unless stated	1987 to 1994	1995 to 2000	2001 to 2007
Expenditure	2.7	4.5	2.9
Disposable income	3.3	2.4	3.6
Memo:			
Income growth less expenditure growth, % pts	0.6	-2.1	0.7
of which:			
Households	0.3	-1.0	-0.7
Companies	2.2	-8.7	9.4

Source: ONS *UK Economic Accounts*; author's calculations. See Table 1 footnotes. Household and company incomes and expenditure are deflated using the private sector expenditure deflator.

In Phase II, the relationship between private expenditure and income growth reversed: expenditure grew rather less quickly than disposable income, the latter uplifted by expansionary fiscal policy. Moreover, households and businesses parted company. Expenditure by households continued apace: it grew by over 3% a year, about 1 percentage point less than in Phase I but faster than the growth in household disposable income. Companies, on the other hand, radically curtailed their expenditure, which grew at about 1% a year, 5 percentage points less than in Phase I. Judged in terms of its relationship with the growth of retained profits, companies' capital expenditure was as restrained in Phase II as it had been exuberant in Phase I.

The changing relationship between income and spending is registered in the financial balance of the private sector, which is identically equal to the difference between private disposable income and total private expenditure. Over the years in the post-World War II period for which reliable records exist,[30] the private sector ran a financial surplus worth about 1% of GDP, a level to which there was a strong tendency to revert.[31] By this standard, the private sector financial surplus was unusually high at the beginning of Phase I, at around 6% of GDP (Chart 4). The surplus then fell rapidly, turning to deficit during 1998. At the low point in 2000, the deficit was worth nearly 4% of GDP. Only at the peak of the (Lawson) boom in the late-1980s had a larger deficit been recorded. The downward swing in the financial surplus over the six years during Phase I was a post-war record, and led by the company sector. Both households and companies were in deficit in 2000.

Chart 4: Private financial surplus

Private financial surplus, % of GDP
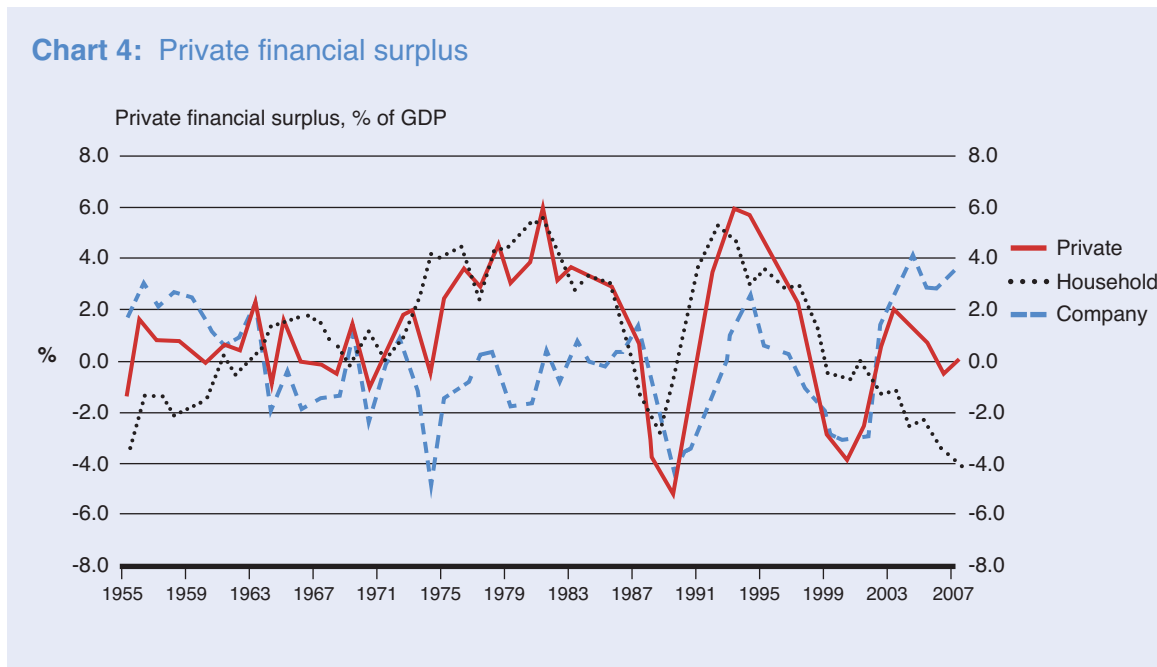
Source: ONS *UK Economic Accounts*, Martin; (2009a, 2009b); author's calculations. The private financial surplus includes public corporations' surplus and the national accounts residual error, divided equally between household and company sectors.

By 2007, the position of the two sectors had changed radically. The household sector deficit had increased by over 3 percentage points to 4% of GDP, the largest since the early post-war years.[32] The company sector, however, had swung from deficit to a surplus that matched, in size, the household deficit. The private sector was thus in financial balance, with disposable income roughly equal to total expenditure.

It is appropriate to mention two measurement problems that may affect the interpretation

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30   Reliable figures start in 1948 (Martin (2009b)).
31   See Martin (2009a) for extensive tests.
32   The household saving ratio, still positive at about 2%, was the lowest since the late-1950s. A record level of investment spending, especially on housing, further depressed the household financial balance.

of the company sector's position. Distortions may have arisen, first, from the inclusion of banks' capital gains that should have been expunged from the official figures.[33] A second distortion may have arisen from the inclusion of profits retained by the overseas branches and subsidiaries of UK multinational companies, and the deduction of retentions of foreign-owned businesses located in the UK. The difference between the two items - net FDI retentions – rose rapidly after 2000. These retentions may have financed capital investment, but overseas capital expenditure by UK multinationals is omitted from the company sector investment figures, which are confined to expenditure on capital assets located in the UK.[34]

In view of these reservations about the official data, it is reassuring that Chart 5 tells a similar story to that conveyed by the aggregate figures in Chart 4. The financial surplus of non-financial companies excluding net FDI retentions swung sharply upwards between the end of Phase 1 and the end of Phase II, consistent with a material shift of company mood from exuberance to restraint.

Chart 5: Non-financial company financial surplus

Non-financial company financial surplus, % of GDP
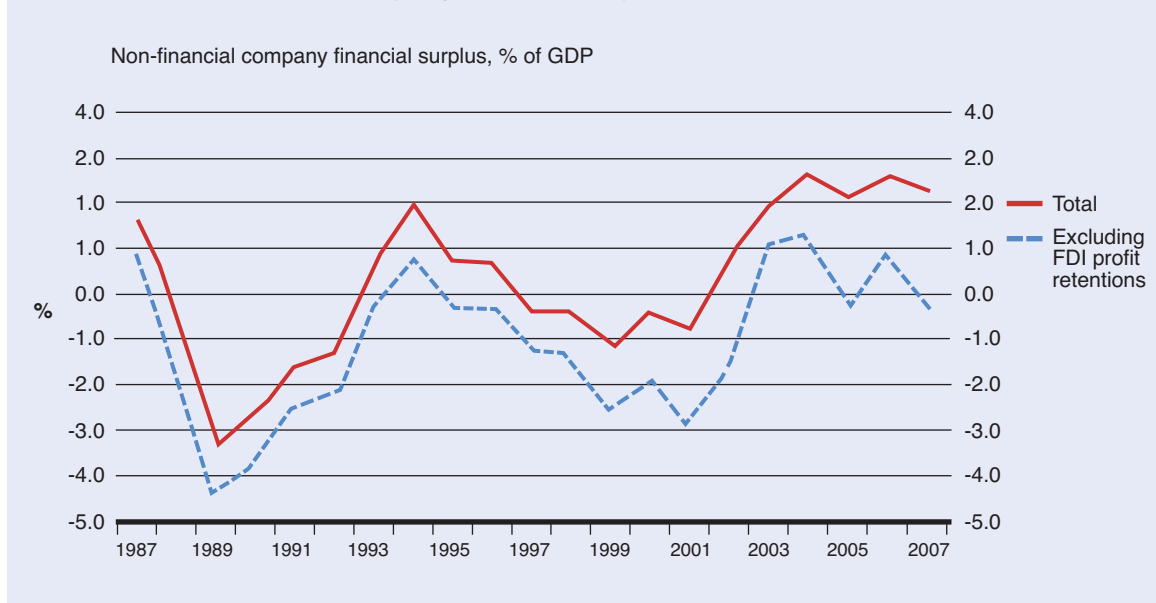
Source: ONS *UK Economic Accounts*; Martin (2009a, 2009b); author's calculations. The non-financial company sector includes private and public corporations.

Changes in asset prices, notably of equities and of property, related cycles in indebtedness and the feedback with the real economy go a long way to explain developments in UK private sector spending and saving. Rising asset prices are associated with, and encourage, greater confidence, an elongation of planning horizons, equivalent to a fall in subjective risk-adjusted discount rates, and a greater willingness to borrow and spend. Conversely, falling asset prices are associated with declining confidence, a truncation of planning horizons, and retrenchment, as the over-indebted attempt to repair balance sheets.

33 See Weale (2009).
34 Maurice (1968) p361 explains the concept of "gross domestic fixed capital formation". The omission of the term "domestic" in modern terminology is "without significance" (Doggett (1998), p241).

Of various asset price developments, those affecting property appear to have played a major role, especially since the early-1980s when the market in home loans was de-regulated.[35] The precise relationship between UK house prices and spending remains a matter of controversy, however.[36] During Phase II, the Bank came to believe that house price developments were of limited consequence for consumer spending.[37]

It is difficult to accept the Bank's interpretation. Since 2000, housing has accounted for over half household sector wealth and, unlike pension fund rights, which comprise the other main single component of household wealth, equity in housing can be readily used as collateral by households and small businesses wishing to borrow. There is convincing evidence of the impact of housing wealth on consumer demand and on the formation of small businesses.[38] Furthermore, like stock market prices, house prices are likely to be correlated with, and influence, expectations of future income and wealth.[39] If nothing else, house prices may provide a signal of the state of long-term confidence. It would also be surprising if the spending decisions of companies, who must anticipate household demand, were unrelated to house prices.

The behaviour of households and smaller companies is additionally affected by the terms - both price and non-price - on which they can borrow from banks. These terms are influenced by house prices. Banks' terms are relaxed during house price booms and tightened during slumps. This behaviour is characteristic even of cautious banks, which are threatened by competitors and new entrants. A mechanism that has become more important since the mid-1990s involves the perceived *value at risk* of banks' asset portfolios.[40] Perceived value at risk declined during the housing boom in Phase II, encouraging banks to borrow and lend more in order to keep the value of their assets at risk proportional to their equity capital. Their leverage – the ratio of their total assets to their shareholders' equity – therefore rose.[41] The swing in bank credit supply amplified the upswing in household spending in relation to disposable income.

Through these mechanisms, house price developments have played a key role since the early-1980s in shaping the large cycles in the UK's private sector and household sector financial surpluses shown in Chart 4. Chart 6 records an index of UK house prices in real terms: house prices after adjusting for the rise in the price of consumer goods and services. Of note is the house price boom of the late-1980s associated with a large fall in the private financial surplus; the slump in house prices until the mid-1990s associated with a jump in the financial surplus; and the recovery in house prices and large fall in the private and household financial surpluses during Phase I.

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35 Banks were permitted to enter the mortgage market from 1980. Shortly after, rules governing building societies were relaxed, enabling them to access wholesale financial markets. The Basel I Accord on banks' capital adequacy ratios, agreed in 1988, gave mortgage loans a preferred status. Further details are given in Fernandez-Corugedo and Muellbauer (2006).

36 The main controversy concerns the presence of a wealth effect arising from changing house prices. Buiter (2008) argues theoretically that a wealth effect may exist in the presence of a bubble or a propensity to spend by investors long of housing that exceeds that of investors short of housing.

37 See, for example, Benito et al. (2006); Bean (2008).

38 See, for example, Muellbauer (2007), Disney et al. (2008); Disney and Gathergood (2009).

39 Researchers who wish to isolate a causal link between house prices and expenditure attempt to remove the influence of income expectations, a practice that overlooks the likelihood that a buoyant housing market may reinforce household perceptions of their future prosperity.

40 Important spurs were the publication of the VaR methodology developed by the investment bank JP Morgan ("RiskMetrics") in the mid-1990s and the later endorsement of VaR by bank regulators.

41   Adrian and Shin (2008) document the pro-cyclical nature of US investment banks' leverage.

Some special factors were also at play after 1995. Although the recovery of the housing market in Phase I was modest compared with the late-1980s boom, the rise in house prices was of particular benefit to the many households – around 1 million in mid-1995[42] - whose outstanding mortgage debt exceeded the value of their homes. For those with "negative housing equity", the rise in house prices would have removed the need for very high rates of precautionary saving.[43] In addition, household spending was uplifted in 1996 and 1997 by large windfall gains, partly geared to the rising housing and stock markets, that arose from the conversion into financial companies of mutual building societies, notably the Halifax.[44]

Chart 6: UK house prices

House price index relative to consumer prices, end 1969=100, and post-1969 trend
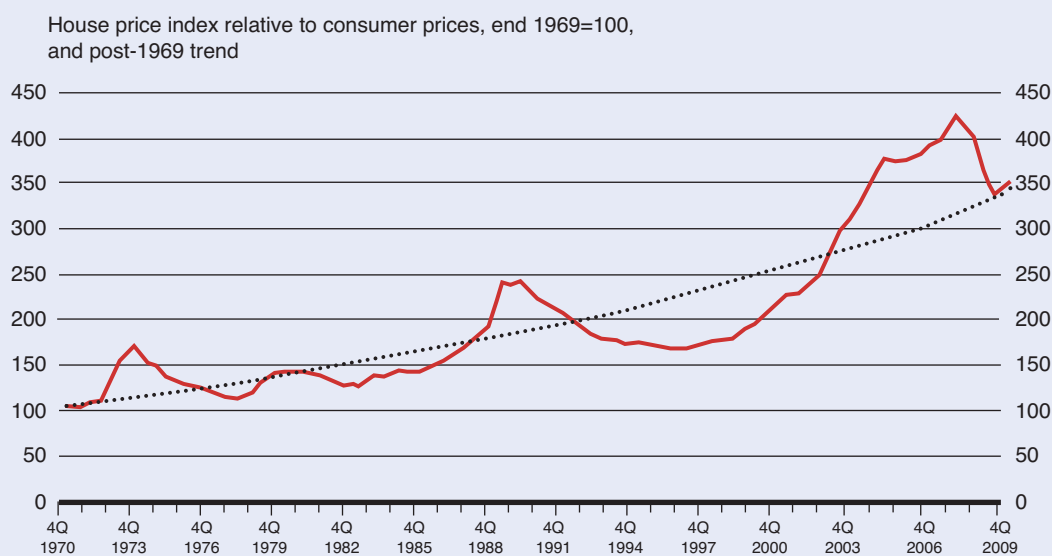
Source: ONS *Financial Statistics, UK Economic Accounts*; Land Registry; Halifax; Nationwide.

The relationship between house prices and private spending appears to fail in Phase II. Strongly rising house prices, which peaked in 2007 well above their previous upward trend, were not associated with an abnormally high rate of private spending or an abnormally low private financial surplus. Over Phase II as a whole, private spending grew less quickly than disposable income: the opposite of what would be expected were house price developments the sole driver. In 2007, the private sector's financial balance was zero, only a little below the historic norm. Contrast this with the late-1980s boom: at the peak, the private sector ran a financial deficit close to 6% of GDP.

This apparent breakdown in the relationship is explained by the contrasting behaviour of companies, whose financial surplus rose, and of households who went into almost unprecedented financial deficit. The contrasting behaviour is, in turn, explicable in terms of the different balance sheet constraints facing households and companies when stock prices fell, and the related changes in bank lending.

42 See Cutler (1995).
43 Disney et al. (2008) estimate that ".. households in negative equity have a marginal propensity to consume out of housing gains … six times the magnitude of [other] households..".
44 The Bank estimated that these and other windfalls added about ½% to household consumption in 1997 (Inflation Report, February 1997).

During Phase II, the household sector balance sheet remained strong, thanks to rising property prices, which more than offset the impact of the fall in stock market prices. As a result, the ratio of household debt to total wealth remained fairly stable notwithstanding a sharp rise in the ratio of debt to income, as Chart 7 shows. The combination of rising house prices and the low interest rates that underpinned them made an increase in indebtedness both possible and affordable.[45] A feedback developed as banks became more profitable, relaxed their credit terms, spurring more spending relative to income by households, thus a further rise in house prices, and, in turn, a further relaxation of bank lending terms, as banks reacted to the perceived reduction in the value of their assets at risk, a perception based on a (false) assumption of risk diversification.

Chart 7: Household sector gearing

Household sector outstanding debt ratios
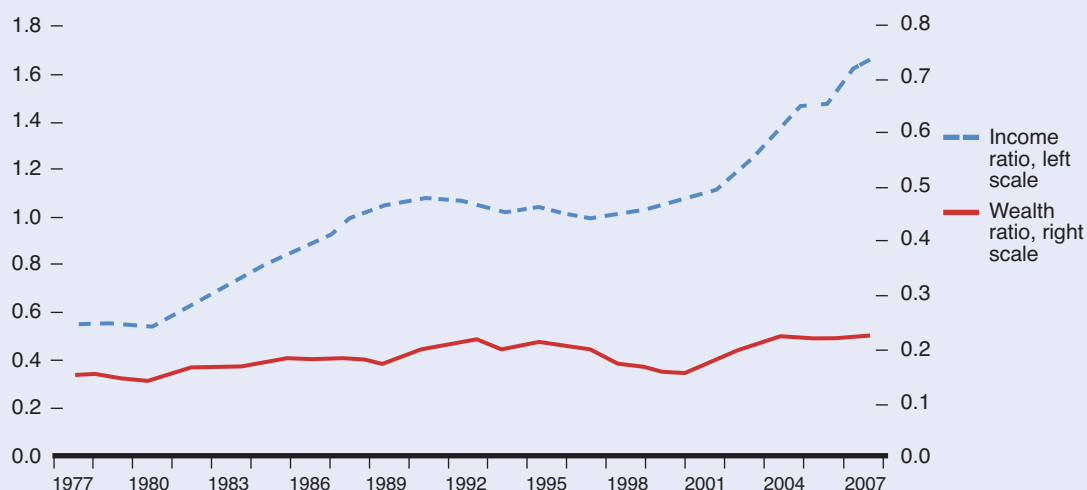
Source: ONS *UK Economic Accounts*, UK Blue Book; author's calculations. Debt is measured by household sector financial liabilities; wealth comprises net financial wealth and non-financial wealth excluding ONS-imputed non-marketable tenancy rights; income is household disposable income including net capital transfers.

This feedback was amplified by banks' circumvention of regulatory rules and banks' speculative investments. Conduits and structured investment vehicles (SIVs), part of the shadow banking system, were not required to hold regulatory capital in the same manner as a bank that retained loans on its own balance sheet. Banks exploited this loophole in the capital adequacy regulations.[46] The transfer of pools of mortgage loans to conduits and SIVs, to which the sponsoring banks had a contingent liability, enabled banks to boost profits and expand while avoiding the need to raise capital.

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45 The formal disaggregated model of Benito at al. (2007), which captures some of these feedbacks, explains about half of the decline in the household saving ratio between 1997 and 2006.

46 The corrective steps taken in the Basel II accord, which took effect in Europe in 2007, were too weak and too late (Brunnermeier (2009)). Moreover, the revised rules would have allowed UK mortgage lenders to hold less, not more, regulatory capital (Jaggar (2007)).

This process worked until the fear of losses caused a seizure of wholesale money markets in 2007, bringing down the conduits and SIVs and some of their sponsors.[47] The mortgage bank Northern Rock and its master trust Granite were early victims.

Banks also increasingly held, again with minimal capital backing, supposedly safe ("super senior") tranches of complex securities geared to the housing market, here and overseas; investments that arose from transactions within the financial system rather than between banks and households. The banks' holdings of these securities, which had the imprimatur of credit rating agencies and were frequently protected with under-priced insurance, inflated banks' profits, but were to become a major source of the catastrophic losses of the banks and of the insurers.[48] As Chart 8 shows, the gearing of banks and shadow banks rose abnormally throughout Phase II.

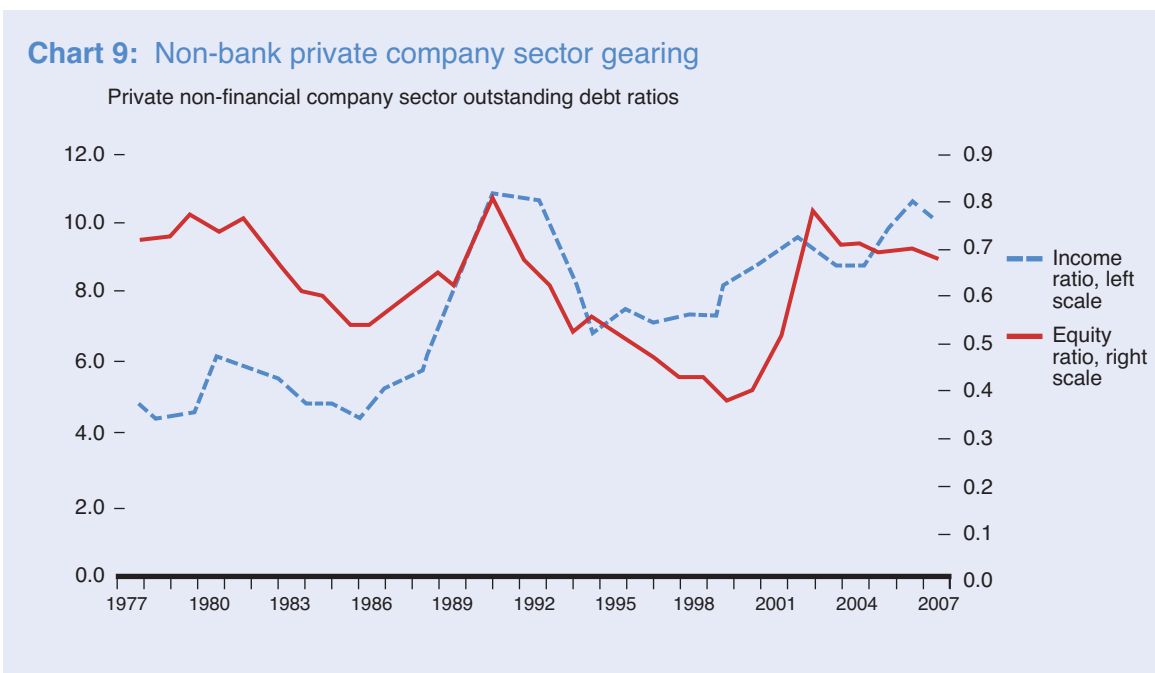**Chart 8:** UK banking sector gearing

Debt to equity ratio
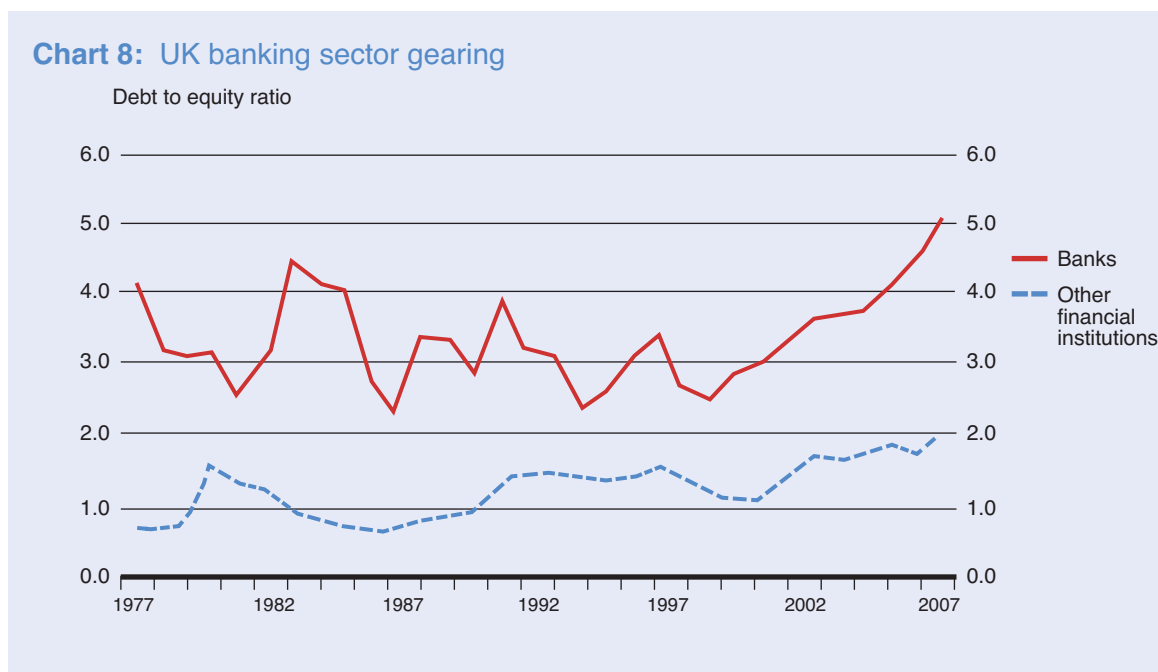
Source: ONS *UK Economic Accounts*; author's rough estimates based on discontinued official data before 1987. Debt comprises financial liabilities excluding currency and deposits and equity. The latter comprises quoted and unquoted equity, including re-invested earnings on inward foreign direct investment. Other financial institutions (OFIs) refer to financial intermediaries except banks, building societies, insurance corporations and pension funds. OFIs include financial vehicle corporations, created to be holders of securitised assets.

47 The trigger was a rise in defaults on (sub-prime) mortgages held by Americans with poor credit histories, a development which impugned the value of housing market related securities held by financial institutions. The impact was greatly magnified by the way in which these widely-held structured financial assets were priced (Coval et al. (2009)). Legally bound to invest safely, US money market funds reduced their holdings of short-term asset-backed commercial paper issued by conduits and SIVs who were forced to draw on agreed credit lines ("liquidity backstops") with their sponsoring banks, which in turn suffered a liquidity drain. The interbank market for unsecured, short-term borrowing and lending froze in early-August 2007 (Brender and Pisani (2009); Brunnermeier (2009)).

48 See, for example, UBS (2008). Super senior positions, half of which were fully protected by (under-capitalised) insurers, accounted for half of UBS's total losses reported at the end of 2007.

In contrast to the exuberance of the household sector, many companies after 2000 had to cope with the balance sheet consequences of the stock market collapse. During the preceding boom, companies had taken on more debt partly to finance the rapid growth of investment spending that outran retained profits. As Chart 9 shows, debt had risen in relation to annual retentions but fallen in relation to the equity capital of the non-bank company sector, thanks to the soaring stock market. The fall in stock prices that began in 2000 led to a sharp reversal: the debt to equity ratio more than doubled in the three years to the stock market trough in spring 2003.

These conventional measures of gearing understate the pressures on companies. An additional burden arose from their commitments to pay pensions related to employees' (typically final) salary. Although formally belonging to members, the assets and liabilities of these defined-benefit occupational schemes are viewed by financial markets as the property of the sponsoring company, which bears the prime responsibility for ensuring the scheme's solvency.[49] During the stock market boom, pension funds had built up substantial surpluses, which, partly thanks to UK tax laws, encouraged companies to suspend their pension contributions in the form of "pension holidays". The picture changed radically after 2000.

Chart 9: Non-bank private company sector gearing

Private non-financial company sector outstanding debt ratios

Source: ONS *UK Economic Accounts;* author's calculations. Debt comprises short-term and long-term debt, including loans and corporate bonds; income comprises profit retentions including net capital transfers; equity comprises quoted shares and unquoted equity, including FDI, the latter roughly adjusted to market value.

Companies that offered occupational pensions faced a more hostile environment for a number of reasons: the pension funds were predominantly invested in stocks, which had fallen in value;[50] the decline in long-term bond yields raised the present value of pension fund liabilities, as did the increase in assumed life expectancy of members; there was also tougher legislation[51] and a more transparent accounting standard.[52] Companies were burdened by pension fund deficits running at the equivalent of 2% to 3% of GDP by the end

49 For example, Standard & Poor's stated in 2003 that it "views unfunded post-retirement liabilities as debt-like in nature, given the future call on cash these liabilities necessarily represent" (cited in Trivedi and Young (2006)).

of 2002.[53] Even in relation to the restricted benefits payable under the UK Pension Protection Fund,[54] eligible defined benefit schemes remained in deficit until early-2006.[55]

A number of indicators reveal the resulting pressures. Employers' contributions to pension schemes rose sharply, from the equivalent of 2% of GDP in 2000 to a peak of 3½% in 2006,[56] although companies managed to pass on a substantial part of these extra costs. Between 2000 and 2007, pre-tax profits of non-financial companies fell as a share of GDP, but by only ½ percentage point, whereas the official measure of pre-tax profits of financial corporations rose. Companies also cut dividends and, possibly, capital investment, consistent with a strategy of preserving internal cash flow.[57] Pension fund benefits were scaled back and schemes were closed to new members or wound up. Active membership of defined-benefit private occupation schemes fell from 4.6 million in 2000 to 2.7 million in 2007. Employees resorted to defined-contribution plans, thereby taking on the risks previously shouldered by companies.

The increased burden of defined-benefit occupational pensions helps to explain companies' caution in Phase II, but the swing from financial deficit to surplus is still puzzling. In the first instance, an unexpected increase in pension contributions would reduce, not increase, companies' profits and cash flow. However, it is probable that the post-stock market bubble environment encouraged companies to run surpluses partly in order to rebuild their cash holdings; these were held as a precautionary buffer against the need to make further unplanned pension fund provision. Similar trends were observed overseas, but the build up of liquid assets by companies was especially marked in the UK, possibly a reflection of more demanding pension legislation.[58]

In summary, company behaviour across Phase I and II was closely allied to the stock market. The exuberance of companies in Phase I, with capital spending outrunning profit retentions, was associated with, and encouraged by, the sharp rise in equity valuations. Conversely, the retrenchment of companies in Phase II, with retentions outrunning capital spending, was associated with the repair of balance sheet damaged by excess debt (including pension fund liabilities) and the decline in stock market valuations. Notwithstanding the stock market crash of 1987, the same alliance of company behaviour and the stock market occurred during the late-1980s boom and the early-1990s recession.

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50 At the top of the stock market bubble, 75% of UK occupational pension scheme assets were invested in UK and overseas equities (UBS Global Asset Management (2002)).

51 The 1995 Pensions Act, implemented in 1997, introduced a minimum funding requirement. This was replaced in the 2004 Pensions Act by scheme-specific requirements. Since 2005, the Pension Protection Fund has imposed a levy on eligible schemes to finance compensation in the event of insolvency.

52 Financial Reporting Standard 17 (FRS17), introduced in 2001 and mandatory from January 2005, requires pension schemes' funding position to be fully recognised on company balance sheets.

53 Estimates cited by Davis (2004).

54 According to Pension Protection Fund (2008), eligible schemes on this method of valuation had a £74 billion surplus in March 2007. Under FRS17, the same schemes recorded a deficit of £129 billion. Were the schemes' benefits bought out and fully insured in the private sector, the deficit would have been £377 billion.

55 Pension Protection Fund (2009).

56 Source: ONS Blue Book 2009, Table 6.1.4S, funded pension schemes contributions (RIUO).

57 See, for example, Bunn and Trivedi (2005); Baumann and Price (2007); Chamberlin (2008).

58 See, for example, Cardarelli and Ueda (2006).

It is appropriate to note that company behaviour and the stock market have not always been so closely related, as many failed attempts formally to explain business investment expenditure attest.[59] Stock markets were notably depressed in the 1970s when investment spending remained strong. Akerlof and Shiller (2009) attribute this disconnection to the depressing impact of inflation on stock market valuations, a consequence of "money illusion" that was ignored by corporate management.

Another, arguably more plausible, explanation is that management and shareholder interests were not closely aligned during the 1970s but became so later, as increasingly powerful and deregulated financial institutions sought a better return from poorly-performing conglomerates. First in the US, later in the UK, management interests were re-aligned initially through management buyouts and, later, through takeovers, often hostile in the 1980s, financed by the issuance of low-grade, high-yield debt ("junk bonds"). High levels of debt acted as a discipline; management was encouraged to restructure in order to raise the value of the companies in which they increasingly held significant stakes, through executive stock options. Jensen (1993) refers to this transformation as the "modern industrial revolution".[60]

The rising proportion of compensation geared to the stock market drove the realignment of senior management objectives in favour of shareholder value. Although UK top executives received levels of stock market related compensation well below their counterparts in the US, the use of stock options in the UK grew dramatically after the mid-1980s, encouraged by tax concessions in the 1984 Budget, and helped significantly to align top executive pay with company performance.[61] From the mid-1990s onwards, greater emphasis was placed on long-term inventive plans, which geared executive compensation to firms' relative earnings-per-share performance rather than to their absolute share price.[62]

Unravelling the growth puzzles

This enquiry began by posing two, almost mirror image puzzles: why was UK GDP growth strong between 1995 and 2000, despite tight monetary and fiscal polices, and why was growth subdued between 2001 and 2007, despite expansionary policies and a house price bubble? The answers to these puzzles can be summarised as follows:

- *Exports* accelerated in Phase I and decelerated in Phase II, thanks to a similar oscillation in world trade growth and a severe loss of international cost competitiveness that began during Phase I, largely as a result of sterling appreciation. The competitiveness loss depressed exports of manufactures, especially in Phase II. The acceleration and deceleration of exports added and, subsequently, subtracted 1 percentage point to and from annual GDP growth across Phases I and II, as Table 6 shows. Induced changes in imports mean the true impact was somewhat less, a qualification that also applies to the direct growth contributions of domestic expenditure.

59 It is well established that Tobin's Q – the ratio of firms' market value to the value of their capital stock – provides a poor explanation of aggregate investment spending (Millard and Power (2004); Price and Schleicher (2006)).
60 See also, for example, Lazonick and O'Sullivan (2000); Holmstom and Kaplan (2001); Glyn (2006).
61 See, for example, Conyon and Murphy (2000); Main et al. (1996); Main (1999).
62 This shift was prompted by controversy over alleged abuse of stock options, the influential Greenbury (1995) report and a tightening of government restrictions on approved option awards. See also Buck et al. (2003).

- *Stock market* and house price movements were mutually supportive of private sector spending during Phase I but offsetting in their impact in Phase II.

- *In Phase I*, private spending of households and, especially, of companies outran disposable income, the result, with feedback, of the escalation in stock market prices and the revival of the depressed housing market, a revival of special benefit to households with negative home equity. Windfall gains from building society demutualisation provided further stimulus. The acceleration in private spending added directly 1½ percentage points to GDP growth.

- *In Phase II*, households remained exuberant but companies were restrained. With balance sheets underpinned by high property prices, household spending continued to outrun disposable income, a feedback process that added to the rise in house prices and encouraged banks to offer easier credit terms. By contrast, company balance sheets were impaired by the fall in stock market prices, by excess debt taken on during Phase I and by pension fund deficits. Companies built up liquid assets as a buffer. The deceleration in private spending in Phase II deducted directly 1¼ percentage points from growth.

Table 6: The UK's New Golden Age and before – growth contributions

annual average growth, % unless stated	1987 to 1994	1995 to 2000	2001 to 2007
GDP	2.2	3.4	2.6
of which contribution of:			
Exports of goods & services	1.0	1.9	1.0
Government consumption & investment	0.3	0.2	0.6
Private consumption & investment	2.2	3.6	2.4
Imports of goods & services	-1.3	-2.4	-1.4

Source: ONS *UK Economic Accounts;* author's calculations. The contributions are approximately equal to the product of the growth of each expenditure type and its previous share in GDP. The calculations are consistent with ONS chain-linking methodology. The sum of the contributions is equal to GDP growth, subject to minor rounding error and any statistical discrepancy. See also notes to Table 1.

Hume and Sentence (2009) suggest an additional explanation for the subdued rate of GDP growth (and therefore of inflation) in Phase II. They argue that demand spilled over onto imports. But as Table 6 shows, the negative contribution of imports to GDP growth was lower in Phase II than in Phase I, and the difference between the growth contributions of exports and imports was little changed. The contrasting behaviour of asset markets and the divergence in the behaviour of households and companies provide the most plausible explanation for the "Growth Puzzle of the 2000s".

Was Britain's New Golden Age an illusion?

By 2007, then, an outwardly successful economy had developed several systemic vulnerabilities: an over-extended banking system, an over-indebted household sector, an uncompetitive exchange rate and a deteriorating overseas trade position. These vulnerabilities had built up partly as a consequence of large asset price bubbles and raise an obvious question: to what extent was Britain's New Golden Age illusory?

A complete answer to this question is not possible: it would require the construction of a comprehensive counterfactual in which asset markets, here and abroad, were fairly priced with a detailed assessment of changes in activity, prices and policy. But an attempt can be made to provide a partial answer, which is still illuminating. A small macroeconomic model is used to construct a counterfactual that removes the impact on UK private spending of the stock market and house price bubbles.

Each bubble is very simply represented. For stocks, the counterfactual keeps stock market valuations constant at their end-1995 level, implying a peak misvaluation at end-1999 of around 40%, consistent with McGiven's (2001) careful estimates.[63] The results of the simulations are not excessively sensitive to the assumed level of fair prices; for example, similar conclusions would be drawn with fair stock market values 20% lower at the post-war average (Chart 10).[64]

Chart 10: Private company stock market capitalisation ratio

Ratio of stock market capitalisation to private company sector annual retentions
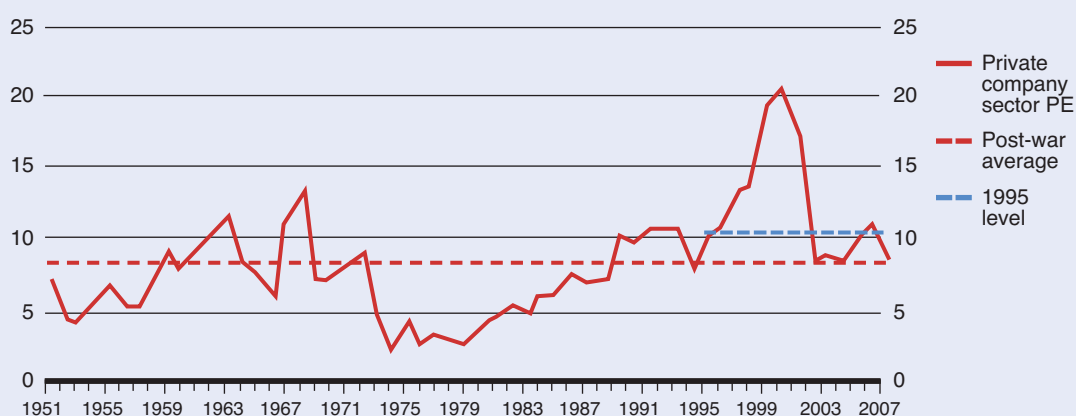
Source: ONS *UK Economic Accounts*; author's calculations.

For the housing market, the counterfactual sets the real level of house prices at their post-war trend from 2002, the year that many commentators pinpoint as the start of the bubble. This assumption implies a misvaluation in house prices of around 30% by 2004, with little change subsequently as house price appreciation slowed (Chart 6). Real house prices rose

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63 McGiven (2001) calculates misvaluation as the gap between fair and actual prices expressed as a per cent of the actual price. Note that a 40% misvaluation implies actual prices are 67% above fair prices.

64 The author's model uses the ratio of stock market capitalisation to private disposable income, a measure less affected than the standard price-earnings ratio by cyclical variations in earnings.

by 15½% a year in the three years to 2004 but by less than 4% a year in the next three years to 2007. The assumed overvaluation is within the wide range of competing estimates, although the view that there was little or no misvaluation is rejected.[65] The broad message of the simulations is not excessively sensitive to the assumed size of the house price bubble.

A key question concerns the impact of the bubbles on the private sector financial surplus: if the rise in confidence and the feedback between asset prices and the economy encouraged higher private spending relative to disposable income, reducing the financial surplus, economic activity would have been artificially raised. The answer to the question may seem self-evident: the stock market bubble contributed to the sharp decline in the financial surplus in Phase I and boosted activity. The impact of asset price developments in Phase II is not clear-cut, however. The fall in stock market valuations would have curbed spending; the rise in property prices would have had the opposite effect. The net impact cannot be inferred from first principles.

Chart 11: Simulation of private spending growth from 1979

Private expenditure growth, %
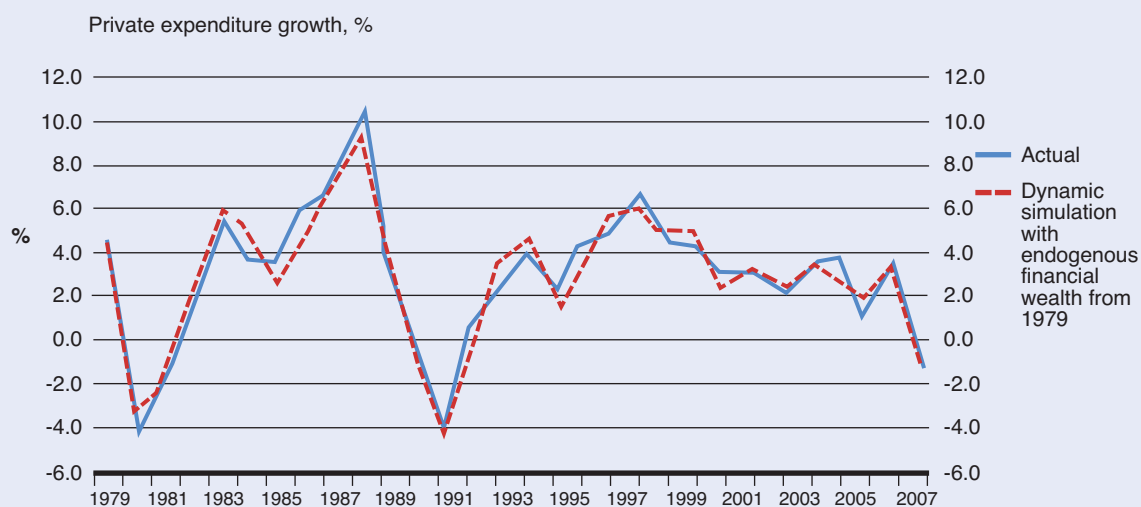
Source: author's calculations. Single equation simulation that takes private disposable income, consumer confidence, inflation and asset prices as given. Financial wealth and past levels of private spending are simulated.

The model used for this purpose captures the link between asset prices and spending in a summary fashion, using a relationship for total private expenditure. Expenditure is related positively to disposable income, consumer confidence, financial wealth, house and stock

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65 Compare, for example, on the one hand, Cameron et al. (2006) who, like Nickell (2005), argue there was no house price bubble in the mid-2000s and Muellbauer and Nickell (2009) who estimate only a modest overvaluation in mid-2007 with, on the other hand, Cardarelli et al. (2008); R. Martin (2008); Miles and Pillonca (2007); and OECD (2005, 2007). Cardarelli et al. (2008) estimate that UK house prices in 2007 were about "30 percent higher than justified by fundamentals" (implying a misvaluation of about 22%). R. Martin (2008) estimates that nominal house prices would need to fall from 1Q 2008 by between 30% and 50%, assuming rents grow at rates close to those seen in the last 5 years. Miles and Pillonca (2007) estimate that expectations of rising capital gains had raised UK real house prices over the previous decade by 39%, consistent with speculative excess. The level of house prices relative to rents, the measure stressed in OECD (2005), indicates a misvaluation of UK house prices of about 40% at end-2006 according to OECD (2007). Major uncertainties arise from the role played by unobserved, but possibly extrapolative, expectations of future house price appreciation, the feedback between house prices and supposedly fundamental factors (such as credit flows, which may well rise during a bubble) and the impact of real interest rates that may be below their natural level.

prices and negatively to inflation shocks.[66] As Chart 11 shows, the relationship describes the past with great accuracy. In addition, the model seeks to explain imports, the government's tax receipts and its debt interest payments. Exports, other government spending, tax policy and asset prices are the main drivers.[67] The model describes the past with acceptably small errors for the main variables of interest, such as the growth of GDP and private expenditure, and the evolution of financial balances, as Table 7 shows.

Table 7: Model errors simulated between 1979 and 2008

Annual volume growth, %		Sectors' financial balance, % of GDP		
GDP	Private spending	Private	Government	Overseas
0.5	0.7	0.3	0.3	0.3

Source: author's calculations. Root mean squared error of full model simulation.

Chart 12: Private financial surplus - with and without the twin bubbles

UK private financial surplus, % of GDP
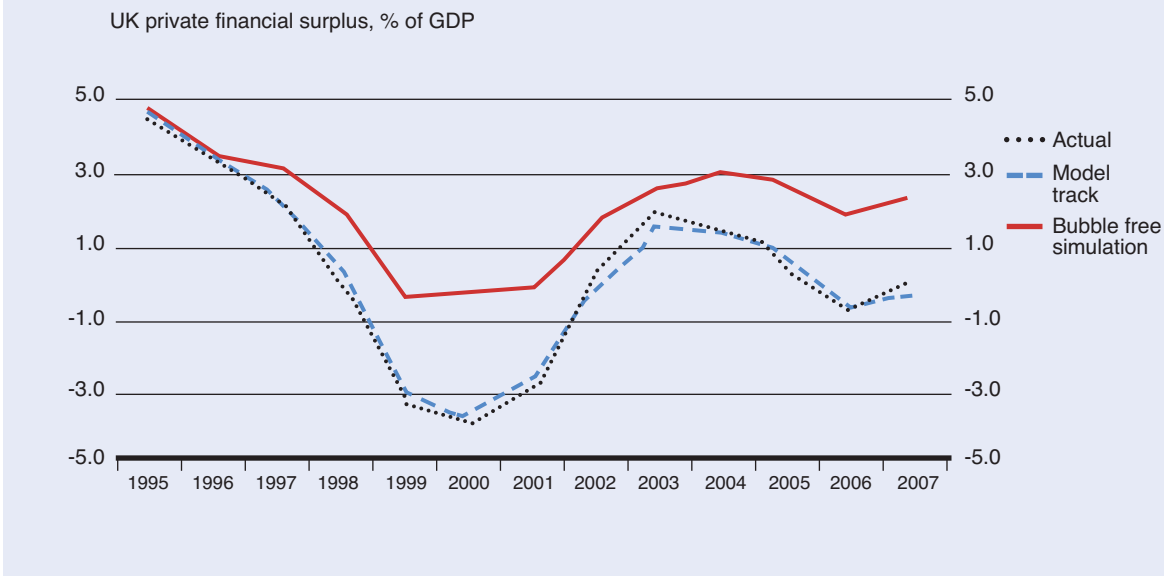
Source: ONS *UK Economic Accounts*; author's calculations.

To explore the impact of the bubbles, the model is simulated, first, historically with asset prices as they were and, second, counterfactually, with asset prices at fair levels. The impact of the bubbles and related feedbacks is revealed by the difference. Chart 12 shows the model simulations of the private sector financial balance as a share of GDP. Using actual

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66 The relationship, detailed in the appendix, is descended from the seminal "New Cambridge" equation pioneered by Wynne Godley and others, but adapted to allow for competing rates of return on assets (Martin (2009a)).

67 The model is a simple stock-flow-consistent demand-determined Keynesian model of the kind summarised in Martin (2008). Godley and Lavoie (2007) describe more complex models.

prices of stocks and of property, the model closely replicates ("tracks") the history of the balance, an important test if the results are to be taken seriously. With stock and property prices reset at fair values, the model depicts a counterfactual financial surplus that is both larger and evolves more smoothly than the model track. The counterfactual balance falls in Phase I to a level somewhat below the long-term norm, but nowhere near the scale of financial deficit observed at the 2000 peak. In Phase II, the counterfactual surplus remains comparatively elevated.

The implication is that private spending was higher than it would otherwise have been had stocks and property prices stayed at fair values. Asset price misvaluation raised the level of activity artificially. The largest impact occurs at the top of the stock market bubble: in 2000 the level of GDP is boosted by over 3%, probably enough to take 1¼ percentage points off the rate of unemployment.[68]

By 2007, the artificial boost to GDP is much smaller at about 1½%, worth perhaps ¾ percentage point off the unemployment rate. There are two reasons for the smaller impact. First, the stock market misvaluation largely disappears, reversing the uplift seen in Phase I. Second, the impact of the property bubble fades after 2004.

The logic behind this latter, perhaps surprising, result is as follows. Between 2002 and 2004, the property bubble encourages a large rise in private spending in relation to disposable income, at the expense of a depletion of private savings. This depletion subsequently acts to deter spending, offsetting the stimulus arising from high property prices. In fact, property prices decelerated after 2004. As a result, any stimulus after 2004 is more than offset by the private sector's need to rebuild savings depleted by the impact of the property bubble in earlier years. Of course, the model's logic provides a very abstract account of the complex decisions taken by households and companies. The abstraction is nevertheless helpful in highlighting one reason why the impact of the property bubble may have diminished after 2004, the consequence not of a disconnection between property prices and spending, but of the subtle relationship between expenditure, asset prices and accumulated savings.

Table 8: Estimated impact of twin bubbles on GDP growth

GDP growth % p.a.	1995 to 2000	2001 to 2007	1995 2007
Actual (1)	3.4	2.6	2.9
Estimated impact of:			
Stock market bubble & bust (2)	0.6	-0.5	-0.0
Property market bubble (3)	0.0	0.3	0.1
Bubble-free estimate (4) = (1)-(2)-(3)	2.8	2.8	2.8
with fiscal rules met	2.8	2.0	2.4

Source: author's calculations. Totals subject to rounding error.

68 The relationship between the decline in the unemployment rate and the uplift to GDP is defined by an "Okun coefficient", named after the late Arthur Okun. The average coefficient based on ten long-sample studies of the UK detailed by Petkov (2008) is 0.38. The average of four estimates using shorter sample periods beginning in the late-1980s is 0.53. An Okun coefficient of 0.4 is used here..

Chart 13 and Table 8 show the impact of the twin bubbles and stock market bust on rates of GDP growth. In Phase I, the stock market bubble uplifts growth by ½ percentage point a year on average, with the largest additions (each 1 percentage point) occurring in 1998 and 1999. The post-2000 deflation of the stock market bubble, and the response to the previous depletion of accumulated savings, sharply depresses GDP growth between 2001 and 2003, but the impact is partly offset by the uplift coming from the property price bubble. The combined effect between 2001 and 2003 is a decrement to GDP growth of between ¾ and 1 percentage point a year. After 2003, the combined impact is, on average, mildly positive, with opposing impacts from the property bubble and recovering stock market. The result over Phase II as a whole is a ¼ percentage point decrement to average GDP growth.

As Table 8 shows, GDP growth in Phases I and II taken together would have been 2¾% a year with asset markets fairly valued, only a very little less than the achieved rate of growth. It would be tempting therefore to conclude that the twin bubbles and stock market bust did not flatter or distort average performance during Britain's New Golden Age, even though the economy was significantly affected from year to year. But this conclusion would be premature.

Chart 13: GDP growth - impact of the twin bubbles

UK GDP growth impacts, % points
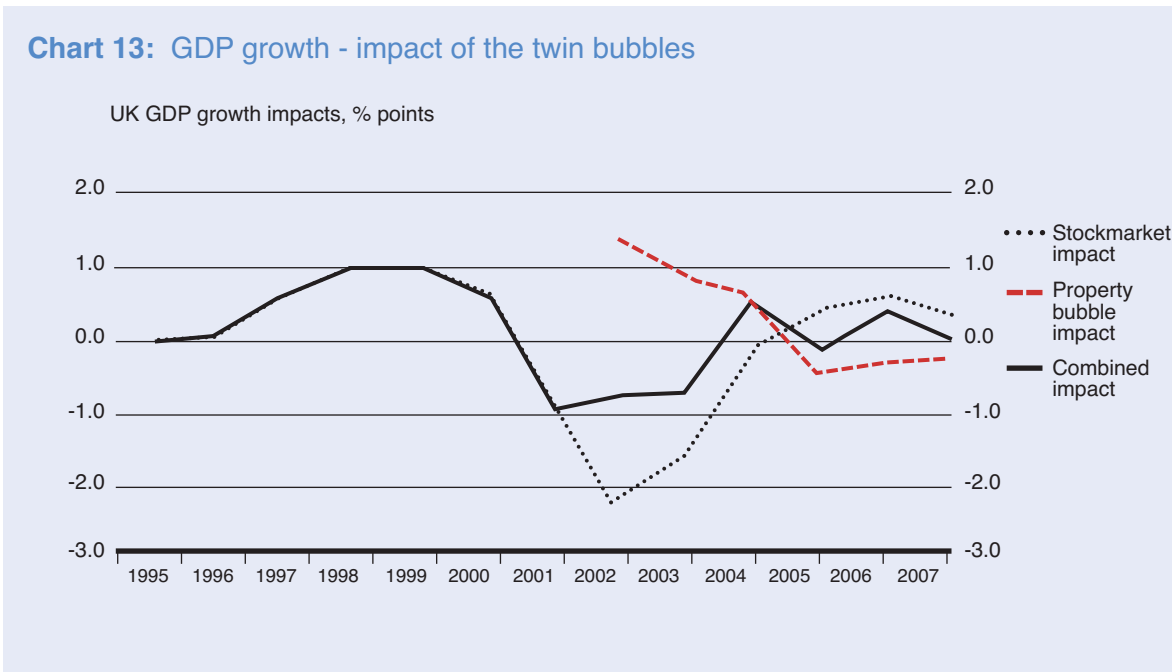
Source: author's calculations.

Chart 14: Government budget deficit - with and without the twin bubbles

Budget deficit, % of GDP
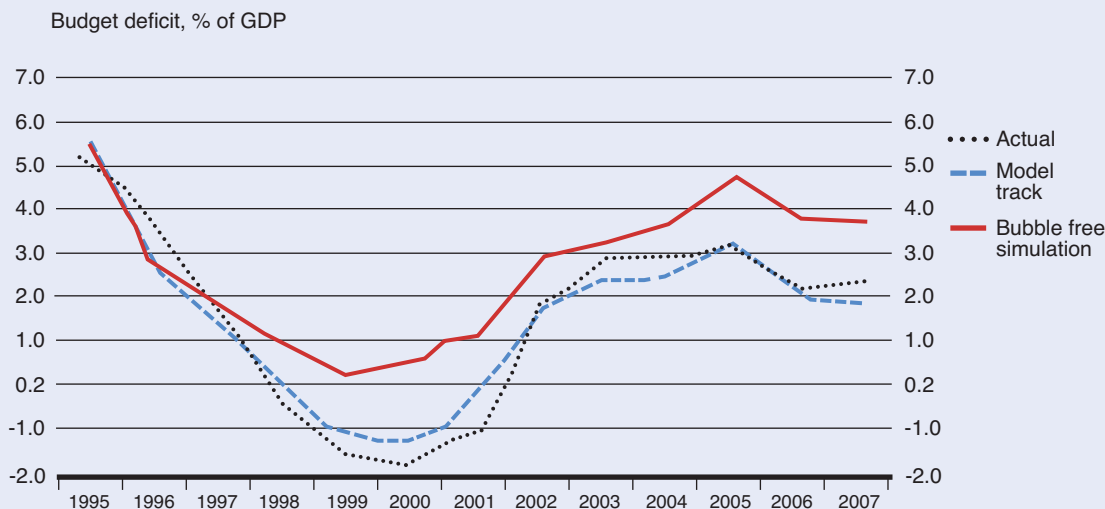
Source: O*NS UK Economic Accounts, Public Sector Finances*; author's calculations.

Important consequences of the artificially higher level of activity during Phase I are a level of taxes that is higher and a level of government spending that is lower, in relation to GDP, than would otherwise have occurred. In the absence of the stock market bubble stimulus, the government's budgetary position would have been weaker. Chart 14 shows the "bubble-free" government budget remaining in deficit, in marked contrast to the budget surpluses seen at the end of Phase I. In 2000, the bubble flatters the government budget position by the equivalent of 2% of GDP.[69]

The flattery continues in Phase II, notwithstanding the smaller uplift to the level of activity. The cumulative effect of annual budget balances each of which is artificially strengthened by asset price misvaluation is a reduced level of government debt, and thereby lower government debt interest payments. These lower payments also improve the budget position. Furthermore, tax take from, for example, stamp duty and inheritance tax, is given a special boost by the housing boom.[70] As a result, the budget deficit by 2007 is still 2% of GDP below what would otherwise have occurred had stocks and property been fairly valued. The uplift to GDP accounts for about half the budget deficit reduction in 2007; most of the rest comes from lower interest payments

The implication is that the bubbles may have played an instrumental role in enabling the Labour government to adhere to its two fiscal rules – the "golden rule" and the "sustainable investment rule" - introduced in its first budget in 1997 and suspended in November 2008. Under the golden rule, the government sought to run over the full economic cycle a "current budget" – a measure of the budget balance that excludes government investment – that was either in balance or in surplus. The aim was to borrow only to invest over the medium term.

69 A 1% rise in GDP reduces the budget deficit to GDP ratio by nearly 0.6 percentage points, a little below the ready-reckoner figure of 0.7 used by HM Treasury but within the range of alternative estimates (OECD: 0.45; European Central Bank: 0.65) surveyed by Farrington et al. (2008).

70 The model captures this effect broadly, using a term in household debt, which is related to the value of housing. Farrington et al. (2008) present evidence that links cycle-adjusted tax take to asset prices.

Monitoring of this rule is bedevilled by the need to define the duration of the economic cycle. The Treasury's latest estimate is that the cycle began in financial year 1997 and ended in financial year 2006. If so, the golden rule was met,[71] despite the succession of cycle-adjusted current budget deficits that began in 2002, accompanied by generally over-optimistic official forecasts.[72] The golden rule was met because of the cushion of surpluses built up in the earlier period of restraint. But it was a cushion partly inflated and sustained by asset market bubbles. Over the ten years to 2007, the "bubble-free" simulations show a current budget that is on average in deficit by about 1½ of GDP, a figure that over such a long period would probably be interpreted as "structural". This calculation suggests that, in the absence of the twin bubbles, the government would have breached its golden rule.

The same conclusion applies to the second fiscal rule, the "sustainable investment rule", which required that outstanding government debt be kept at a "stable and prudent level". The rule was quantified in 1998 - net public debt would be kept below 40% of GDP over the economic cycle - and strengthened in the 2003 Budget – the 40% ceiling would apply "in each and every year" of the then current cycle. As Chart 15 shows, this rule was met: the debt ratio fell as low as 30% in early-2002 before rising back towards, but not breaching, the 40% ceiling in 2007. The "bubble-free" simulations paint a very different picture. Only briefly does the counterfactual debt ratio fall below 40% in the early-2000s. By 2007, it is close to 50%.

Chart 15: Government debt - with and without the twin bubbles

Net public sector debt, % of GDP
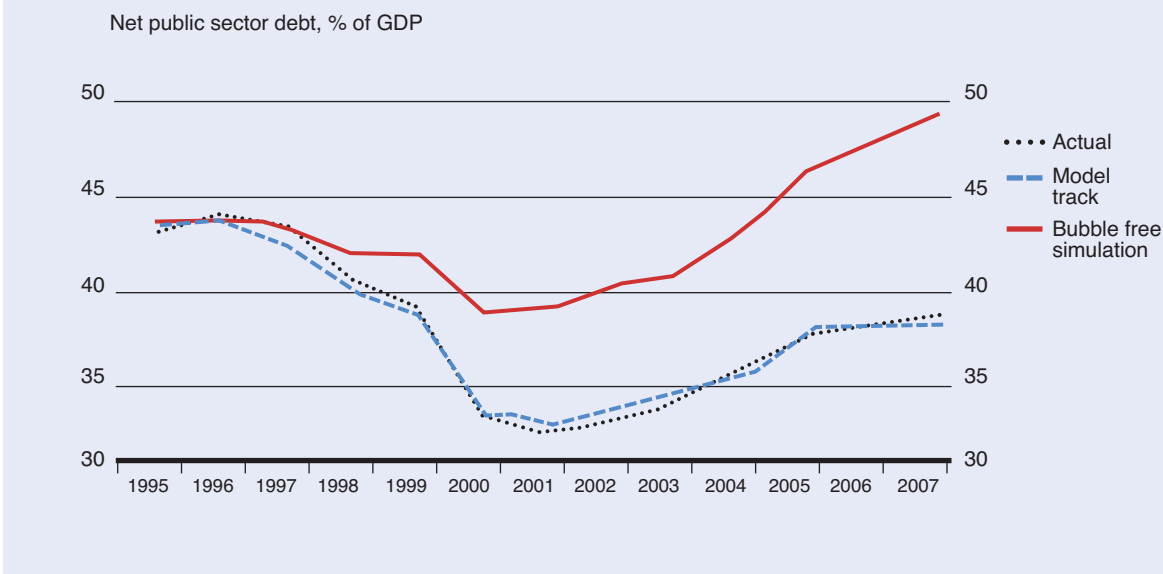
Source: ONS *UK Economic Accounts, Public Sector Finances;* author's calculations. The debt figures exclude the impact of the nationalisation of Northern Rock.

It is debateable how the government would have behaved had the stock and housing markets been fairly valued. Arguably pressures to improve public services would still have existed. Against that, the public finances would have been in a materially weaker state, much less able to support a rapid expansion of expenditure on health and education and the associated extra public sector pay.

71 November 2008 Pre-Budget Report.
72 IFS (2009).

The final row in Table 8 records the results of a further simulation in which the stock and housing markets are fairly priced and the post-2000 growth of current public spending is constrained to meet the fiscal rules. Real managed government expenditure in Phase II is set to grow at 1½% a year, less than half the actual rate of advance, although double the rate of growth in Phase I. In addition, it is assumed that public sector pay and procurement prices increase less quickly, so that the relative price of government spending on goods and services rises by 1% a year, as against the 1¾% observed. The golden rule over the ten years to 2007 is met and the government debt ratio stays close to, and does not breach, the 40% ceiling.

The result is a significantly weaker rate of GDP growth of just 2% a year in Phase II. The bubble-free, fiscal-rule-constrained, rate of growth over Phases I and II taken together is 2½% a year, ½ percentage point below the actual rate. By the end of 2007, the difference would be sufficient to add over 2½ percentage points to the rate of unemployment, leaving it close to the near-8% level seen at the end of 1996.

These simulations are suggestive rather than fully conclusive. They rely on a simple definition of bubbles, albeit one to which the results are not overly sensitive, and on an abstract model, albeit one that fits historical experience well. More important, the simulations do not attempt to encompass all the changes that might have come had the stock and housing markets been fairly priced. Much must remain conjecture. Would, for example, world trade growth have accelerated and then decelerated in Phases I and II? It is plausible to argue that, deprived of America's rapid stock market fuelled expansion, world trade growth in Phase I would have been more subdued, but perhaps stronger in Phase II. UK export growth might then have evolved more smoothly.

Sterling would also have been affected. Wadhwani's (1999) model identifies the role that differential rates of unemployment played in raising the value of sterling against the Deutsche Mark during Phase I. A higher UK unemployment rate might have limited sterling's rise. But the effect estimated by Wadhwani is not large, and Germany's unemployment rate might also have been higher in the absence of stock market exuberance.[73] More difficult to capture formally is the possible link between the "new era" stories that accompanied the American-led stock market bubble and sterling's strength. Wadhwani's detailed estimates are consistent with a "new era" interpretation. However other currency-positive developments – such as the strength of the UK's exports of finance and business services and the surge in FDI earnings after 2000 – suggest that it would be incorrect to assume that sterling's strength and the accompanying loss of international competitiveness that afflicted manufacturing during this period can be fully laid at the door of asset price misvaluation.

Could better economic policies have averted the impact of the bubbles? This too is a matter of conjecture. One debate has focussed on the role that central banks might play in "leaning against the wind".[74] Also under discussion is the notion of "macroprudential" regulation: imposing tougher, counter-cyclical, requirements on banks and bank lending. Such policies may have produced better outcomes – offsetting, for example, the impact on property prices of low interest rates in Phase II - had they been effectively applied.

73 According to Wadhwani, a 1 percentage point rise in the UK unemployment rate relative to that in Germany causes sterling to depreciate by nearly 4% against the Deutsche Mark.

74 Compare, for example, the opposing views of a current and of a former member of the Bank's Monetary Policy Committee: Posen (2006) and Wadhwani (2008).

However, judgement of past UK policy needs to reflect on the authorities' room for manoeuvre. During Phases I and II, British policy makers were responding to developments that were largely outside their control: the stock market bubble of Phase I and the unusually low interest rate environment of Phase II were both American-led. Higher interest rates may well have meant an even more uncompetitive exchange rate. In the absence of effective exchange controls, macroprudential restrictions on domestic mortgage lending in Phase II might have been undermined by an offsetting inflow of bank lending from overseas.[75] Without seeking to exonerate, these points emphasise the limited ability of even far-sighted policy makers fully to immunise a medium-sized, open economy from the impact of global forces.

In summary, asset price bubbles *and* the fiscal largesse they licensed may have substantially flattered Britain's growth performance between 1995 and 2007. Without the misvaluation of stock and housing markets, some, perhaps much, of the decline in unemployment might not have occurred and growth might have stayed close to its post-war 2½% norm, significantly below the 3% pace of annual expansion that gave credence to the idea of Britain's New Golden Age.

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75 Tucker (2009) and Bank of England (2009) stress the problem of "leakage": frustrated credit demand at home being supplied from abroad and from UK domiciled branches of foreign banks.

Britain's recession can be viewed as a consequence of unusual systemic weaknesses. Unlike previous major recessions in the post-war era, the recession of 2008 and 2009 was not the result of a preceding boom in output and the build-up of domestic inflation. Instead, the recession arose from a prolonged bubble in house prices and the fragilities of an over-geared banking system. Although the UK was particularly vulnerable,[76] the same weaknesses were evident in the US and in many countries across Europe. An initial contraction largely associated with the bursting of the bubble was therefore greatly amplified by two, related, developments: the collapse of world trade and the withdrawal of credit by enfeebled banks, domestic and foreign.

This section provides, first, a brief sketch of the UK's recession and, second, an assessment of the various shocks that triggered and amplified the contraction of output. The main question concerns the role played by the near-collapse of the banking system and its continuing problems. Did the economy become credit constrained? The answer here is a resounding "yes".

Recession sketch

Any description of the current state of the economy must have regard to the provisional nature of the official figures, which are likely to undergo considerable revision as new, and sometimes conflicting, sources of information become available. The various measures of GDP based on data for expenditure, income and output have to date been reconciled over periods up to, and including, 2007; the less reliable figures for 2008 and 2009 rely heavily on the output measure of GDP.

An important question concerns possible bias in these provisional estimates. Regular official studies report no evidence of bias: the average revision to early estimates of quarterly GDP growth in recent years has been close to zero, and not statistically significant.[77] However, an examination of revisions over a much longer period suggests a significant bias does exist, amounting to an average understatement of annual growth of perhaps ¾ percentage point.[78]

In this context, it is salutary to note that the fall in GDP in the early-1990s recession recorded today as 2.5% was originally estimated to be 4.3%. A large fall in consumer spending has since been revised down and export growth revised up.[79] Also of note is the "fact" that employment has held up "surprisingly" well in the current recession, notwithstanding the large contraction of GDP. This surprise may be partly the result of unexpected labour market flexibility.[80] A simpler interpretation is that the official data overstate the fall in GDP. In view of these statistical uncertainties, the focus here is on large changes in recorded activity rather than the minutiae.

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76 See, for example, IMF World Economic Outlook, April 2008, Box 3.1 and April 2009 Box 2.1; Bank of England Financial Stability Report, Section 3, June 2009.

77 See, ONS Revisions Triangles, http://www.statistics.gov.uk/statbase/Product.asp?vlnk=13560.

78 The mean revision after ten years to year-on-year GDP growth initially recorded in the period 2Q 1961 to 2Q 1999 is 0.7 percentage points, with a serial correlation corrected t-value of 4.2 (data source Brown et al. (2009)). The mean revisions after one and two years are 0.2 percentage points and 0.4 percentage points respectively.

79 2Q 1990 to 2Q 1992.

80 See, for example, Bank of England, Inflation Report, August 2009, p29.

The broad picture at the time of writing is of an economy that entered recession in the spring of 2008, suffered a severe collapse coincident with the worst moments of the global banking crisis in the winter of 2008 and early-2009 and continued to contract, but less sharply, until the autumn. GDP grew by ½% in 2008 and fell by 5% in 2009, the largest contraction since the 1930s Great Depression.[81]

Table 9: The recession – mild and intense phases and the earlier record

annual average growth, %	2001 to 2007	Year to 2Q	
		2008	2009
GDP	2.6	1.7	-5.9
Total final expenditure	3.1	2.2	-8.0
of which:			
Exports of goods & services	3.8	3.5	-13.4
Government consumption & investment	2.8	5.5	2.7
Private consumption & investment	2.9	0.9	-9.3
of which:			
Household consumption	2.7	1.5	-3.9
Capital spending	3.8	0.6	-30.7
Imports of goods & services	4.8	4.1	-15.7

Source: ONS *UK Economic Accounts*; author's calculations. See notes to Table 1.

Illustrated by the figures for the second quarter of 2008 in Table 9, the milder phase of the recession was accompanied by modest declines in private consumption, as the fall in the rate of household saving abated, and in private fixed investment, the latter comprising business investment (which was decelerating) and residential investment (which continued to fall). Government spending on goods and services accelerated. In the intense phase of the recession, seen in the figures for the second quarter of 2009, private spending, notably business investment, fell dramatically while government expenditure continued to grow. Further pressures came from the fall in world trade: the precipitous collapse of UK exports was a post-war record. The falls in exports and in private fixed investment were the main contributors to the 6% decline in GDP over the year to the second quarter of 2009, as Table 10 shows. Household consumption was the next largest direct contributor. Much less important was the fall in domestic inventories, although the inventory data are particularly unreliable.[82]

A similar picture emerges from the figures in the final column of Table 10, which shows mechanical estimates of the "output gap". In 2009 as a whole, GDP was around 9% below its "trend" level. The output shortfall is therefore greater than the decline in GDP itself, a result that follows from the assumptions that GDP was on trend at the end of 2007 and that the previous post-war "trend" growth rate of about 2½% a year was unimpaired by the recession. Neither assumption is uncontroversial, although there is little evidence to suggest that they are, *as yet*, wildly misleading.[83]

81 Hayes and Turner's (2007) quarterly interpolations of the output measure of GDP at factor cost estimated by Feinstein (1972) for the interwar period show a fall of 6.4% between 4Q 1929 and 1Q 1931. Benchmarked to the compromise estimate of GDP at market prices, the equivalent figure is 6.8%. From local peak to trough in the current recession, 1Q 2008 to 3Q 2009, GDP fell 6.2%.
82 The official inventory data include an adjustment (which adds to zero over a year) to align the expenditure measure of GDP with the output measure.

Table 10: Contributions to growth and the "output gap"

| annual average growth, % unless stated	2001 to 2007	2Q 2009	% of trend* 2009
GDP	2.6	-5.9	-8.9
of which contribution of:			
Total final expenditure	4.0	-10.4	-15.3
of which:			
Exports of goods & services	1.0	-3.7	-4.2
Government consumption & investment	0.6	0.6	0.6
Private consumption & investment	2.4	-7.4	-11.7
of which:			
Household consumption	1.7	-2.5	-4.8
Fixed investment	0.6	-3.6	-5.0
Change in inventories	0.0	-1.3	-1.9
Imports of goods & services	-1.4	4.8	6.6

Source: ONS *UK Economic Accounts;* author's calculations. See notes to Table 6. *The trend is a mechanical extrapolation from 4Q 2007 of expenditure components using rates of growth observed between 2001 and 2007. The contributions to the GDP output gap are equal to the product of the shortfall of each expenditure type and its share in trend GDP. Apart from rounding error and the official statistical expenditure discrepancy, the sum of the contributions is equal to the GDP output gap.

Of the 9% output shortfall, the largest contributions come from the shortfalls against trend in private fixed investment, consumers' spending and exports. It is worth noting that the fall in inventory building appears to have had a smaller impact on the decline in GDP than these other major components of demand. If so, the recession differs from more traditional contractions in which inventory cycles dominate. A question mark is thereby raised over the role that inventory rebuilding might play in the upturn.

The recession came with a substantial upswing in the private sector's financial surplus, as Chart 16 shows. From a position of balance in 2007, the private sector moved into financial surplus equivalent to around 3½% of GDP in 2008 and 10% of GDP in 2009, a post-war record. Companies ran a record 8% of GDP financial surplus in 2009, while households returned to surplus for the first time in eight years.

Real private disposable income grew much more quickly than GDP over this period, as Chart 17 and Table 11 indicate, while private spending collapsed. Private disposable income was supported by a fall in tax payments and an increase in receipts of state welfare benefits. Consequently, the record private financial surplus in 2009 went hand in hand with a record budget deficit. Meanwhile, the deficit on the current account of the balance of payments fell a little, largely thanks to a smaller trade deficit, itself a refection of the comparative depth of Britain's recession.

83 Survey measures of capacity utilisation were close to average levels at the end of 2007. HM Treasury assumes that trend output will fall by 5¼% between mid-2007 and mid-2010, but the evidence for this strong assumption is debateable. The question of capacity growth is discussed further in section 4.

Chart 16: Private, household and company financial surpluses

Private, household & company financial surplus, % of GDP
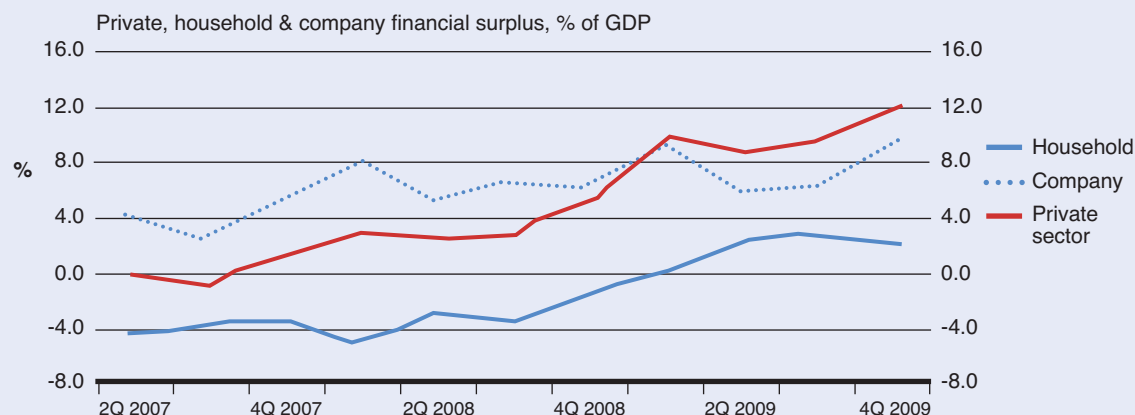
Source: ONS *UK Economic Accounts;* author's calculations. See notes to Chart 4.

Chart 17: GDP, private disposable income & spending growth

Growth, year on year, of GDP and private disposable income and spending
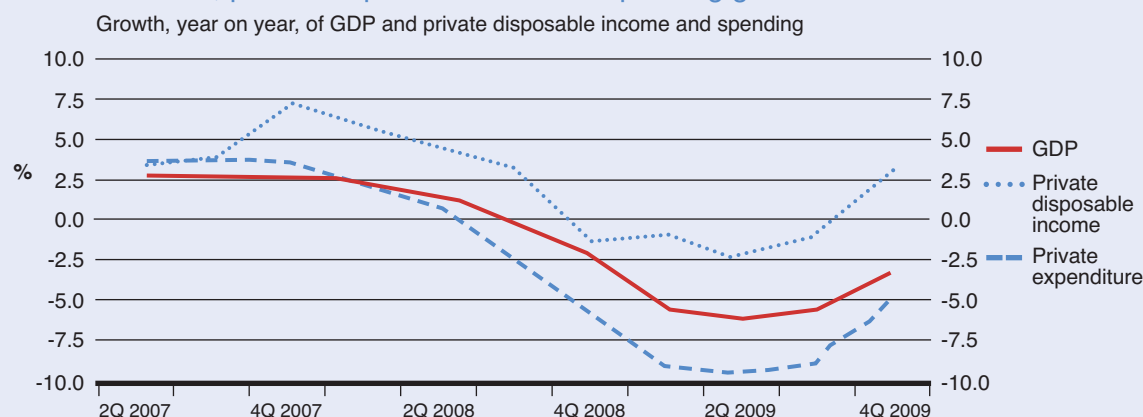
Source: ONS *UK Economic Accounts*; author's calculations.

Table 11: Private disposable income, spending and financial surpluses

annual volume growth, %, unless stated	2007	2008	2009
GDP	2.6	0.5	-4.9
Private sector			
Disposable income	4.6	3.1	-0.2
Expenditure	3.6	-1.2	-7.9
Private financial surplus, % of GDP			
Total	0.1	3.6	10.2
of which:			
Household sector	-4.1	-3.2	2.0
Company sector	4.2	6.8	8.1
Current account of balance of payments, % of GDP			
Total	-2.7	-1.5	-1.3
Goods and services balance	-3.2	-2.6	-2.3

Source: ONS *UK Economic Accounts*; author's calculations. See notes to Chart 4.

Five recessionary drivers

Attention is now turned to the drivers that shaped the recession. Five are identified:

1. An external inflationary shock
2. A delayed policy response
3. A collapse in world trade
4. A collapse in wealth
5. A domestic credit crunch

In the following, it is argued that (1) had little lasting significance; the impact of (2) was offset by automatic stabilisers; (4) is more important and explains the 2008 downturn; drivers (3) and (5) drove the economy into deep recession in 2009.

Driver (1) – An external inflationary shock

Between the summers of 2007 and 2008, the dollar price of crude oil doubled, peaking at $144 a barrel in early July.[84] World food prices rose by over 40% in dollar terms.[85] Consumer price inflation rose quickly, from a level close to the 2% target at the end of 2007 to a peak of over 5% in September 2008. Excluding energy and food, the rise in inflation was far more modest: from 1½% to a little over 2%. Employees' average earnings failed to keep pace with the acceleration in the cost of living. Real wages were therefore depressed and acted to curb consumers' spending.

The impact on the economy was limited, however, for three reasons. Automatic fiscal stabilisers – the tendency for tax-take to fall and welfare receipts to rise in downturns – uplifted household disposable income, which grew, after allowing for inflation, more quickly in 2008 than in 2007. Second, the economy's overall terms of trade improved in 2008, thanks to a surge in export prices. The loss of real income incurred by households as a result of the jump in import prices was more than offset at the national level. Third, the commodity price shock rapidly unwound. By the close of 2008, the oil price had fallen to $40; the subsequent recovery took it back to its autumn 2007 level by end-2009. World food prices followed a similar pattern.

Driver (2) – A delayed policy response

Neither the Treasury nor the Bank appreciated the risks to activity posed by the housing bubble and the over-geared banking system. Although the authorities were active in supporting the banks, other substantive counter-cyclical policy measures to aid the economy were not implemented until the final months of 2008. What caused this delay and what was it impact?

Fiscal policy was predicated on a fundamental misreading of the economy's natural resilience. The October 2007 Pre-Budget Report, that came after the run on Northern Rock, projected economic growth of 2¼% and 2¾% in each of 2008 and 2009. The following Budget was only mildly less optimistic. In March 2008, the Treasury took the view that a decade of "*improved resilience*" meant that the UK economy possessed "*a solid platform from which to cope with the economic shocks from the ongoing disruption in global financial markets and increased global commodity prices.*"[86] Fiscal policy was intended to be mildly restrictive, with the cycle-adjusted budget deficit projected to fall after 2008, a modest retreat from the tightening planned in the 2007 Budget.

84 Europe Brent crude spot price.
85 Source: IMF International Financial Statistics.
86 2008 Budget, annex B.

It is not clear whether the Bank fully shared the Treasury's belief in the natural resilience of the UK economy. But the Bank seriously misread the threats to activity. The weight placed on combating inflation may have been one reason. The upsurge in inflation in 2008 triggered a sequence of high-visibility explanatory letters from the Governor to the Chancellor. In addition, the Bank was arguably far too sanguine about the implications for private spending of the fall in house prices, which began in the final months of 2007. It is of interest that the US Federal Reserve took almost the polar opposite viewpoint.[87] This difference of opinion may help to explain the initially much more vigorous relaxation of monetary policy undertaken in the US from autumn 2007, despite an upsurge in inflation every bit as marked as that faced by the Bank.[88]

The most important factor contributing to delay was the Bank's misdiagnosis of the banking system's weaknesses. Under the UK's tripartite system of regulation, the Bank was responsible for promoting financial stability and monitoring the vulnerabilities of the system as a whole.[89] But the stability wing of the Bank lacked influence,[90] and greatly underestimated the systemic dangers. In the spring of 2008, it was comparatively sanguine. The Bank had introduced new and extended measures to provide liquidity[91] and banks were actively raising new capital. While noting some downside risks, the Bank's April 2008 Financial Stability Report concluded, "*The most likely path ahead is that confidence and risk appetite turn gradually as market participants recognise that some assets look cheap on a fundamentals basis.*"

During the summer, the global banking crisis deepened: investment banks reported increased losses and the US Treasury was obliged to support the giant mortgage finance agencies, Fannie May and Freddie Mac. Despite these omens, the central forecast in the Bank's August 2008 Inflation Report envisaged no more than a temporary period of weakness: UK GDP would remain "*broadly flat for over the next year or so*" before recovering. The "fan chart" of possible outcomes indicated a low (less than one in ten) possibility of a greater-than-1% contraction in 2009.

The misjudgements of the Treasury and the Bank delayed the introduction of discretionary counter-cyclical demand management policies, but it seems unlikely that the delay accounts for more than a small part of the fall in output. The most important reason is that automatic stabilisers were already acting powerfully to support activity.

Table 12 provides a guide to the impact of fiscal policy, recording the increase in the budget deficit and its components between calendar years 2007 and 2009. As a share of GDP, the budget deficit rose by 7¾ percentage points, of which 1¾ percentage points came from a fall in tax receipts and 6 percentage points came from an increase in public expenditure. Discretionary measures undertaken in the November 2008 Pre-Budget Report and in the March 2009 Budget account for about a quarter of the increased deficit: the stimulus packages, focussed on a temporary cut in the rate of Value Added Tax and, at less exchequer cost, the bringing forward of government capital spending, were worth together about 2% of GDP. [92]

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87 Compare, for example, Bean (2008) and Mishkin (2007).

88 In July 2008, the federal funds rate and bank rate were 2% and 5% respectively. Compared with July 2006, the former was 3¼ percentage points lower while bank rate was a ½ percentage point higher.

89 Responsibility for financial stability was shared between the tripartite authorities - HM Treasury, the Bank of England and the Financial Services Authority - as set out in a "Memorandum of Understanding" amended in March 2006.

90 See former Deputy Governor Sir John Gieve's description of the "one-and-a-half purpose Bank", The Sunday Times, 1 March 2009.

91 In addition to extending enhanced repurchase and other arrangements introduced after August 2007, the Bank established in April 2008 a Special Liquidity Scheme, allowing banks to swap mortgage-backed and other securities for UK Treasury bills.

92 Estimate based on a simple interpolation of HM Treasury fiscal year figures for discretionary policy changes (Table C3, 2009 Budget). Most of the impact of the packages occurred in calendar 2009.

Of the remaining increase in the budget deficit, equivalent to about 5¾% of GDP, automatic stabilisers account for perhaps 5 percentage points, assuming trend GDP continued to grow at 2½% a year. Most of the cyclical impact comes from the automatic uplift in the GDP share of government spending when GDP falls. Structural factors, such as the contraction of high tax-generating activities, help explain the rest of the increase in the budget deficit, worth about ¾% of GDP.

Table 12: Public sector receipts and spending

% of GDP unless stated	2007	2009	Change % points
Budget deficit	2.4	10.2	7.8
Current receipts	38.4	36.6	-1.8
of which:			
Taxes & National insurance contributions	23.5	22.5	-0.9
Indirect taxes including VAT	12.5	11.6	-0.9
Other receipts	2.4	2.4	0.0
Total managed expenditure	40.8	46.8	6.0
of which:			
Current spending on goods & services	21.1	23.4	2.3
Capital spending	2.1	3.2	1.1
Transfers & subsidies including debt interest	17.7	20.2	2.6

Source: ONS *UK Economic Accounts*, Public Sector Finances; author's calculations. Note: taxes include income tax, corporation tax, capital gains tax and council tax. Totals and changes subject to rounding error. Calendar year data.

On this reckoning, about two-thirds of the increase in the budget deficit over this period can be attributed to the effect of automatic stabilisers. These estimates are naturally subject to considerable uncertainty; the Treasury's estimates, for example, point to a rather smaller cyclical component.[93] But regardless of the precise breakdown between structural and cyclical elements, it is clear that most of the increase in the budget deficit, which helped support activity through the recession, did not result from discretionary counter-cyclical policy decisions.

As with fiscal policy, the about-turn in monetary policy followed the near-collapse of the global banking system beginning with the failure of the US investment bank Lehman Brothers in mid-September 2008.[94] In a move coordinated with other central banks, the Bank announced a ½ percentage point reduction in bank rate in early October and took part in the first of many government plans further to bolster UK banks. The main interest rate response began a month later as the Bank radically re-assessed the outlook. The central projection in the Bank's November 2008 Inflation Report portrayed a fall in UK GDP that went below the extreme lower bound of unpleasant possibilities envisaged in the August report.

93 Assuming a fall in trend output, the 2010 Budget Report attributes two-fifths of the increase in the budget deficit between fiscal years 2007 and 2009 to the impact of the cycle.

94 Other key events were the failure of the insurer American International Group, which had sold under-priced credit protection; widespread redemptions across the US money market fund sector following losses by the Reserve Primary fund; the resulting shortage of regular dollar funding to non-US banks (about an eighth of their $8 trillion dollar needs according to Baba et al. (2009)); and, as perceived counterparty risk surged, the seizure of global wholesale money markets.

By March 2009, bank rate had been cut to an unprecedented ½%, 4½ percentage points below the level six months earlier. The Bank regarded this as a lower bound. The ultra-low bank rate also had an undesirable side effect: it squeezed the margins of under-capitalised banks and building societies whose retail lending rates were often contractually linked to bank rate. With further cuts in bank rate ruled out, the Bank switched to a programme of "quantitative easing" under which the Bank purchased largely UK government bonds ("gilts") in the secondary market with electronically manufactured central bank reserve money.[95] By December 2009, securities worth £190 billion had been purchased under this scheme, equivalent to about 14% of annual GDP. Preliminary assessments suggest that UK gilt yields may have fallen as a result by between ½ and 1 percentage points, resulting in some decline in yields on substitute private sector securities, including corporate debt.[96]

To what extent did the Bank's delayed response deepen the recession? This question cannot be answered definitively, but it is not unreasonable to use the more vigorous US response to the crisis as a guide to opportunities missed in the UK. Had the Bank emulated the cuts in the US federal funds rate that occurred after August 2007, bank rate would have been about 2 percentage points lower on average during 2008. Under this scenario, a variety of models suggest that UK GDP during the recession would have been uplifted by between ½% and 1%.[97]

It is fortunate, then, that a substantial fall in sterling provided a powerful offset to the Bank's delayed interest rate response. Since sterling is not a formal policy instrument, nor easily controlled if it were, its movement should not be regarded simply as the monetary equivalent of automatic fiscal stabilisers. But in this instance, sterling provided a timely, unexpected, support for activity. The nominal effective exchange rate fell by over 10% during the first year of the banking crisis, collapsed during its worst moments in the winter of 2008, and subsequently staged a partial recovery.

These movements are not explained by changes in interest rates. During the first year of sterling's fall, the excess of UK short-term interest rate over the overseas average at first increased and did not materially decline until after September 2008.[98] Were interest rate differentials the only consideration, sterling would have risen, uplifted by the carry trade. On the other hand, sterling staged a recovery after March 2009 when it might have been expected to fall: the UK interest rate differential was close to zero and the Bank was engaged in large-scale quantitative easing. Sterling's behaviour is more plausibly explained in terms of changes in investors' perceptions of the comparative risks, including counterparty risks, of holding sterling assets, a conclusion broadly echoed by the Bank's comprehensive analysis.[99]

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95 This programme grew out of the Asset Purchase Facility, introduced in January 2009, under which the Bank purchased high-quality private sector assets financed by the issuance of Treasury Bills.

96 See, for example, Meier (2009); Miles (2009 and 2010); Dale (2010).

97 See, for example, Bean (1998), Harrison et. al. (2005). The author's model suggests a figure of ½%, abstracting from any indirect impact operating through property and equity prices.

98 Because the European Central Bank raised its key policy rate in July 2008, the increase in the UK interest rate excess was less marked gauged against the overseas average than against US rates alone.

99 See Astley and Smith (2009). Official currency swaps also gradually eased distortions in foreign exchange markets arising from banks' acute dollar shortage (see Allen and Moessner (2010)).

The impact on international price and cost competitiveness was significant. By late-2009, the nominal exchange rate was over 20% below its immediate pre-crisis level and international unit labour cost competitiveness in manufacturing was back to within 10% of its 1995 high, therefore unwinding much the competitiveness loss sustained between 1995 and 2007. The improvement in cost competitiveness between 2007 and 2009 exceeded 30%. Model estimates vary widely but nevertheless suggest that the stimulus arising from sterling's depreciation was sufficient at least partly to offset the impact of the Bank's delayed interest rate response.[100]

Driver (3) – A collapse in world trade

World trade fell precipitously during the worst moments of the global banking crisis. By the second quarter of 2009, world trade in goods and services was 15% below the level of the previous year.[101] The decline in world trade in goods alone was even greater. The world trade shock was exceptional in scale, exceeding the pace (although not the full extent) of the decline seen during the Great Depression,[102] and unusually synchronous across all major trading nations.[103]

The scale and speed of the decline in world trade, its synchronicity and the proportionately much larger impact on trade in goods might be plausibly attributed to the fragility of cross-border production chains, the impact of the credit crunch on manufacturing production, and a reduction in the provision of trade credit.[104] Both the Bank and the International Monetary Fund incline to the view that the downturn in trade largely reflected falling demand, notably the postponement of expenditure on consumer durables and investment goods which comprise a larger proportion of trade than of GDP, an impact amplified through cross-border production chains, rather than trade credit shortages, although these also probably played a role.[105] Belief in the existence of a highly elastic response and recent data, which indicate a resumption of trade growth, lead the IMF to entertain the possibility of a pronounced rebound in world trade as world GDP recovers. Baldwin (2009) reaches a similar conclusion.

How much of the UK recession can be attributed to the world trade shock, itself partly a consequence of the global banking crisis? The calculations shown in Table 10 suggest that the shortfall in exports was a major contributor, accounting for about half the negative GDP output gap. This simple calculation needs qualification, however: it does not allow for any offsetting fall in imports induced by the decline in exports. Allowing for this offset, a simulation using the author's model suggests that the below-trend level of UK exports in 2009 may have contributed about 3 percentage points to the 9% below-trend level of GDP. Since exports were supported to some extent by the fall in sterling, the impact of the fall in world trade alone would have been greater still.

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100 Compare, for example, Richardson (1987) and Dalsgaard et al. (2001), who present materially different estimates of the impact of currency depreciation based on different vintages of the OECD Interlink model. A simple regression relating the UK's non-oil trade balance to world trade, domestic spending and competitiveness suggests the competitiveness gain added about 1% to GDP in 2009.

101 Source: OECD Main Economic Indicators, world imports of goods and services.

102 See Eichengreen and O'Rourke (2009).

103 See Araújo and Martins (2009)

104 See Freund (2009); Chor and Manova (2010).

105 See Bank of England Inflation Report, May 2009 p22; IMF World Economic Outlook, October 2009, Box 1.1.

Driver (4) – A collapse in wealth

The remaining shortfall in GDP came from a slump in private spending, partly the result of the reaction of households and companies to balance sheet damage inflicted by the fall in house and stock market prices. House prices peaked in late 2007 and fell by about 15% during 2008.[106] The rout continued until the late spring after which a partial recovery set in for the remainder of 2009. A similar profile was traced by the UK stock market. A summer 2007 peak was followed by a 30% fall in the FTSE All-Share index during 2008, and by another 20% fall until early March 2009. Stock prices then recovered sharply. By end-2009, the FTSE was 20% below its 2007 peak. World stock markets followed a similar pattern.

Chart 18: Housing and stock market wealth, ratio to private disposable income
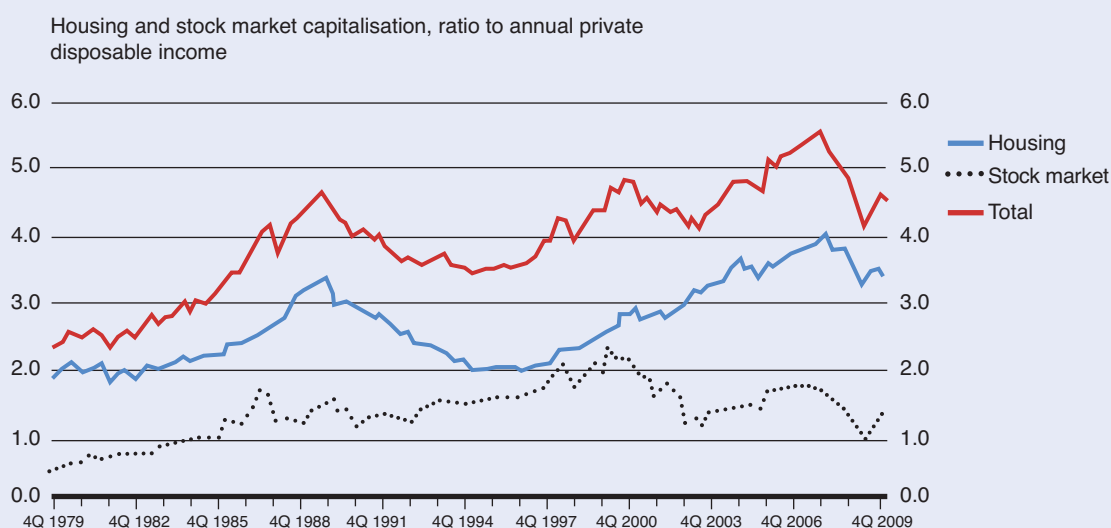
Source: ONS *Financial Statistics, UK Economic Accounts*; Land Registry; Halifax; Nationwide; author's calculations. Stock market capitalisation includes private sector holdings of overseas equities and excludes UK equities held by overseas investors.

The initial impact on private wealth was dramatic, as Chart 18 shows. In the two years to spring 2009, the market value of housing and equities owned by the private sector fell from 5½ times annual private disposable income to 4 times: probably the largest drop over any comparable post-war period. The resulting balance sheet distress of households and companies was evident from a number of indicators.

Households who had borrowed in the belief that house prices could only rise were left with too much debt. By the spring of 2009, between 7% and 11% of owner-occupiers had mortgage debts that exceeded the value of their homes, not far from the level of negative equity seen in the mid-1990s housing trough.[107] Mortgage arrears and repossessions rose

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106 The fall in the twelve months to December 2008 registered by the Halifax, Nationwide, Land Registry and Department of Communities and Local Government house price indices, the latter not seasonally adjusted, were respectively: 18.4%, 16.0%, 13.8% and 10.2%. The figure cited in the text is a simple average.

107 See Hellebrandt et al. (2009)

markedly, especially for the highly indebted with inadequate collateral, although in 2009 payments problems remained less acute than those in the recession of the early-1990s when nominal interest rates were much higher.[108]

Conventional measures of income gearing and capital gearing of non-financial corporations also rose sharply, peaking in the winter of 2008. Capital gearing then stood at levels last seen in the mid-1970s. In addition, companies were faced with the prospect of making good larger pension fund deficits. Even on the restricted basis used by the UK Pension Protection Fund, estimated company pension fund deficits rose to in excess of £240 million by spring 2009, equivalent to about ½% of companies' profit retentions.[109] By late-2009, however, capital gearing and companies' pension fund deficits had fallen back, aided by the stock market rally.

Households and companies seeking to repair their balance sheets would have cut spending relative to their disposable income, contributing to the upward movement in private financial surplus shown in Chart 16. This increase in planned saving would have depressed demand. The important question is to what extent such broadly defined "wealth effects" can account for the fall in private spending and GDP.

Rough estimates suggest that there was a shortfall in the combined value of private sector housing and stock market wealth by end-2008 approaching £1½ trillion. The partial recovery of the housing market and stock market rally may have reduced the scale of the shock to £1¼ trillion by end-2009.[110] The impact on private spending will have depended, in part, on the propensity to spend out of wealth; that is, by how much marginal changes in private wealth impinge on the annual flow of spending. The author's estimates suggest an impact of about 4 pence in the pound, with similar impacts from changes in housing and stock market wealth. This figure lies close to the mid-point given in many other studies recently surveyed by the IMF. [111]

The combination of, say, a £1¼ trillion wealth shortfall and a propensity to spend out of wealth of 4 pence in the pound would be sufficient to depress annual private spending by £50 billion, or by over 4½%. This is a rough estimate: allowances also need to be made for time lags and for wider "multiplier" effects arising from the interplay between private expenditure, income and imports. With such allowances, calculations based on the author's model suggest that the housing and stock market wealth shocks may have reduced the level of private spending by nearly 3½% and 5% in each of 2008 and 2009, sufficient to cut GDP by 1½% and 2½% respectively.

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108 See Bank of England, Inflation Report, November (2009).
109 PPF 7800 Index Update, January 2010.
110 The calculation assumes that nominal house prices and stock market prices would otherwise have risen in line with private sector prices of goods and services.
111 See Brooks (2009). The author's estimate accords most closely with the properties of the US Federal Reserve model, but not with the Bank's model, which rules out any long-run consumer spending impact arising from changes in the value of housing

Table 13: Explaining the GDP output gap

Percentage points unless stated	2008	2009
Output gap, %	-1.8	-8.9
Identified factors:	-2.0	-5.2
of which:		
Export shortfall	-0.4	-3.1
Housing & stock market wealth loss	-1.6	-2.4
Confidence loss & other wealth effects	0.0	-0.7
Discretionary counter-cyclical fiscal policy	0.0	1.1
Unexplained residual	0.2	-3.7

Source: author's model simulations. The GDP output gap is derived from a mechanical extrapolation of 2001 to 2007 expenditure trends, implying annual growth in trend GDP of about 2½%. The impact of identified factors is calculated in each case from a comparison of simulated output gaps with and without each shock. These shocks are defined as follows: shortfall in exports relative to extrapolated 2001 to 2007 trend; shortfall in housing and stock market wealth relative to "trend" levels implied by zero real increase in house prices or the FTSE from end-2007; fall from end-2007 in consumer confidence and in the ratio to private disposable income of non-housing tangible and intangible wealth; the discretionary fiscal policy packages in the 2008 Pre-Budget Report and 2009 Budget with allowance for changes in debt interest payments. Due to interactions, the total impact of all the shocks is not exactly equal to their simple sum.

The implications of these estimates and those for the impact of the shortfall in exports, of discretionary counter-cyclical fiscal policies and of other confidence effects are brought together in Table 13. It shows that the wealth and exports shocks depressed the level of GDP in 2008 by 2%, sufficient to reduce growth to a mere ½% in an economy otherwise expanding at a trend rate of 2½%. These shocks, notably those arising from the fall in wealth, therefore accurately account for the weakness of the economy in the first year of recession.

In 2009, however, the explanation is incomplete. The much higher impact of the export shortfall and the somewhat larger impact of wealth and confidence shocks reduce the level of GDP by an estimated 6¼%. Discretionary counter-cyclical monetary policy would have mitigated the fall in asset prices, and thus would have attenuated the wealth shocks, but the effect is not separately identified. Estimates are shown for the impact of discretionary counter-cyclical fiscal policy, which might have added about 1% to GDP. Together, these identified shocks and policy responses account for a 5¼% decrement to the level of GDP. Although substantial, the identified shortfall is materially less than the negative GDP output gap, which runs to 9%.

The key conclusion is that a large part – perhaps over 3½% - of the shortfall in the level of GDP remains to be explained. This is the "recession puzzle of 2009". It is a sizeable puzzle: the unexplained output gap is nearly ten times the typical error generated by the author's model. An understatement of GDP in the official figures might be partly to blame, but normal statistical bias would account for perhaps no more than 1 percentage point of the

unexplained gap. The puzzle is unlikely to be purely a statistical one or one due to normal model error. Nor is the puzzle confined to the UK. Referring to the experience of advanced countries as a whole, the Bank's Deputy Governor has argued, "*we cannot come near to explaining the 'Great Contraction' purely in terms of wealth effects.*"[112]

What can account for the unusual weakness of spending and activity in 2009? A plausible explanation is that there was a very large balance sheet deficiency in 2009 and that the private sector attempted to repair it with unusual rapidity.

According to the author's estimates, a £1¼ trillion housing and stock market wealth shortfall would induce the private sector over a period of years to cut spending *cumulatively* by around £300 billion relative to income. This is a measure of the outstanding balance sheet deficiency. In normal circumstances, only a proportion of this deficiency – initially less than 20% - would be corrected during a year, giving rise to the reduction in private expenditure, mentioned previously, of the order of £50 billion.[113] In 2009, however, the corrective reduction in spending relative to trend may have been as much as £135bn, 45% of the outstanding balance sheet gap.

It is not difficult to think of reasons that may have produced an unusually rapid balance sheet adjustment. The near collapse of the banking system and the shortfall in the supply of bank credit may have induced, or forced, the private sector to save. The corollary is that the balance sheet gap may have been substantially reduced in 2009, and therefore pose less of a threat to private spending during recovery.

Driver (5) – A domestic credit crunch

One measure of the impact of the banking crisis is provided by the figures for the flow of bank "net" lending (new bank loans less any repayments). In the post-2000 years prior to the crash, net lending had run at over 10% of GDP, as Chart 19 shows. In 2008, the flow of bank lending halved to less than 6% of GDP, and collapsed again in 2009, partly as a result of a substitution by large companies of bond and equity finance for bank debt.

There were few signs through the course of 2009 of any material increase in lending either to households or to small and medium-sized enterprises.[114] SMEs, it should be noted, account for a large part of the economy's output and are far more dependent than large companies on bank finance.[115] Surveys suggest that the availability of credit to SMEs stabilised at a low level.[116] Mortgage lending to households rose slightly in the second half of 2009, but consumer credit contracted.

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112 Bean (2009).
113 The proportion of the deficiency corrected is therefore 50 divided by 300 or about 17%. According to the estimated relationship in the appendix, this proportion rises eventually to 22% a year.
114 See Bank of England Trends in Lending, March 2010.
115 The Department of Business Innovation and Skills (BIS) defines SMEs as private sector enterprises with up to 250 employees. At the start of 2008, SMEs accounted for about 50% of national employment. Companies and partnerships account for around 70% of those employed by SMEs. (Source: BIS, SME Statistics for the UK and Regions 2008, October 2009.)
116 See Cosh et al. (2009); BIS SME Business Barometer, September 2009

An important question concerns the demand for credit and its availability. Was the diminished flow of bank credit due to a fall in credit demand, the result of a recession caused by other factors, or due to an adverse shift in credit supply, the result of banks' balance sheet weaknesses and increased risk aversion? In the early-1990s, high interest rates and inflation both acted to curtail credit demand. Neither was a consideration in 2009, however. Banks reported low demand for credit but they also acted to discourage borrowers by raising lending margins and imposing tighter conditions. The fact that lending margins rose rather than fell suggests that at least part of the decline in credit flow was supply determined. The global nature of the crisis compounded the problem: foreign-owned banks cut back on foreign currency lending, particularly through their UK branches, and reduced their interbank lending to UK-owned banks.[117]

Chart 19: Bank credit flows

Bank lending to non-financial business & households, % of GDP

Source: Bank of England; ONS *UK Economic Accounts*. Lending figures refer to lending in sterling (new lending net of repayments) by banks and building societies, adjusted for the impact of securitisation. The figures are seasonally adjusted.

Chart 20 provides rough estimates of the extent to which the flow of bank lending may have fallen as a result of an adverse shift in credit supply. A simple regression[118] suggests that bank credit flow in 2008 was around £80 billion (over 5% of GDP) below what might have been expected given the level of private spending and incomes. In 2009, there is an additional consideration: private spending and output may well have been curtailed as a result of banks' unwillingness to lend, artificially suppressing the demand for bank credit. Allowing for this suppressed demand, the Chart suggests that the shortfall in bank lending in 2009 may have risen to 8% of GDP. Although rough and ready, these estimates are of such magnitude that there can be little doubt that bank lending was abnormally low during the recession. This conclusion is in accordance with recent evidence that finds a strong link between external shocks to banks' capital reserves and their willingness to lend.[119]

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117 See Bank of England, Financial Stability Report, December 2009, Box 2.
118 Details available on request.
119 See, for example, Francis and Osborne (2009); Mora and Logan (2010).

The slump in bank lending provides some support for the idea that the banking collapse intensified normal recessionary forces. But, if so, an important puzzle remains about the timing of the impact on activity. There was a substantial fall in bank lending in 2008 as well as in 2009 but it is only in 2009 that activity fell by more than can be reasonably explained by reference to the slump in exports and the shocks to wealth. Why should the shortfall in bank credit have had little noticeable impact on activity in 2008 and a much greater impact on activity in 2009?

Chart 20: Banks' net lending shortfall

Banks' lending to households and non-bank business, % of GDP
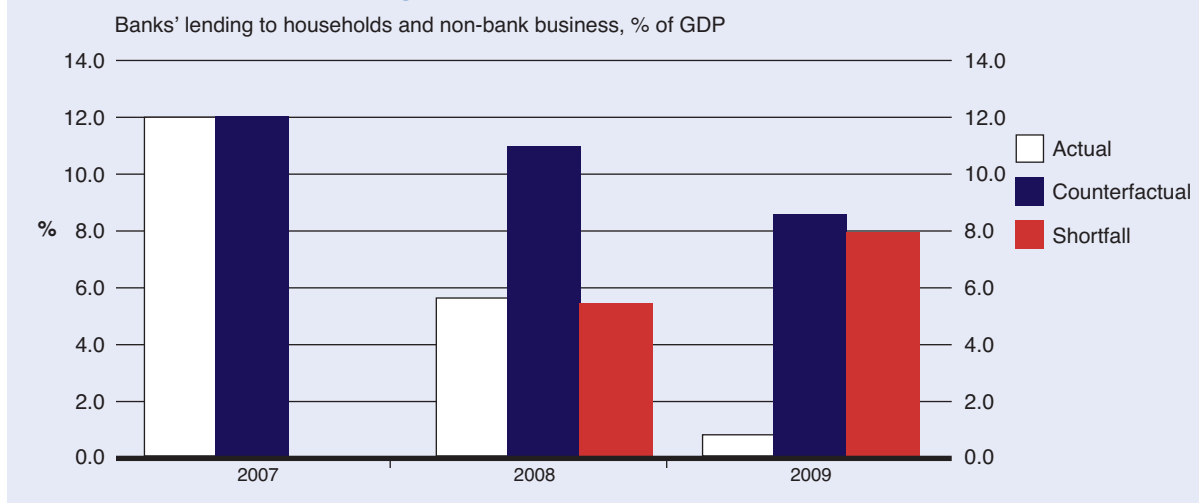
Source: Bank of England; author's calculations. Net lending is modelled as a function of the level of private spending and disposable income, of real capital gains in housing, and various measures of wealth, including housing and stock market wealth. The shortfall in net lending in 2008 is measured by a dummy variable. In 2009, the shortfall reflects in addition the impact of the unexplained fall in private spending.

Chart 21: Confidence measures

Confidence measures (survey balance of ups & downs,%)
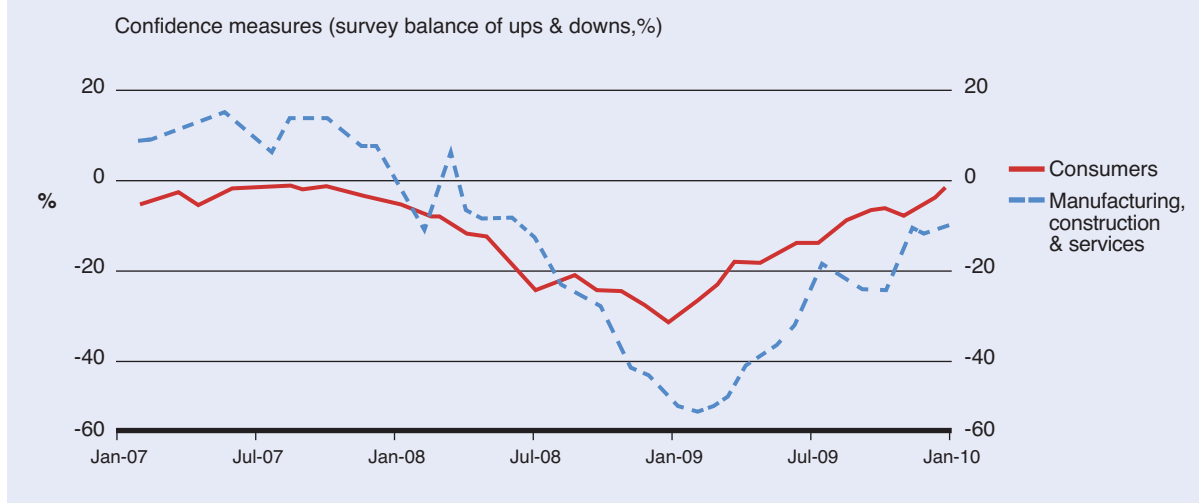
Source: OECD Main *Economic Indicators*; author's calculations. The confidence measure for manufacturing, construction and services is a value added weighted average of the sectors' confidence measures.

Deputy Bank Governor Charles Bean suggests two possible answers: expectations of future credit availability may have worsened after Lehman's collapse in September 2008; second, the fear of another Great Depression may have intensified, leading to a general fall in confidence and increased precautionary saving.[120] Both suggestions provide a plausible explanation of the sharp fall in activity in the final quarter of 2008 and in the first quarter of 2009. But they do not explain why activity in the UK did not rebound subsequently: as Chart 21 shows, measures of consumer and business confidence generally rose after spring 2009. Consumers were apparently as confident by winter 2009 as they were two years earlier. Retailers were more confident. Sentiment in other industries was generally more muted, but each measure of confidence records a significant improvement since the worse moments of the crisis.

The depletion of liquidity cushions may provide the missing part of the explanation. It may be conjectured that during 2008, households and companies were better able to compensate for the shortage of bank credit by drawing down on precautionary saving balances. Households and companies were each seeking to repair balance sheets – a process that might normally be expected to lead to increased holdings of financial assets as well as lower indebtedness. But instead the rate of household saving in liquid assets fell in 2008, while non-financial companies drew down their bank balances. These defensive actions may well have delayed the full impact of the credit crunch on private spending. Once liquidity cushions were depleted, the private sector had no option but to cut spending in line with the reduced flow of bank credit.

In summary, the recession of 2008 and 2009 appears to have been primarily driven by a collapse in world trade, by losses of private wealth as house prices and stock market prices fell, and by a severe domestic credit crunch. Once private sector liquidity cushions had been depleted, a large shortfall in the supply of bank credit effectively forced an accelerated repair of households' and non-bank businesses' balance sheets, causing in 2009 an abnormally large rise in the private sector's financial surplus. The credit crunch, plus a statistical bias in official estimates, might account for over 3½% of the measured shortfall in GDP in 2009. The export collapse, private wealth shocks and consumers' loss of confidence might have depressed GDP by a further 6¼%.

Other depressive factors that have attracted much attention – the 2008 commodity price shock and the delayed official policy response - appear to be of much less consequence. The UK's terms of trade did not deteriorate in 2008, as commodity prices surged, and the commodity price shock subsequently dissipated. Discretionary counter-cyclical fiscal policy delivered a stimulus worth 2% of GDP in 2009, possibly uplifting GDP by half that amount. Most of the fiscal support for the economy in 2008 and 2009 came from automatic fiscal stabilisers. The Bank's delayed interest rate response may have deprived the economy of an uplift worth between ½% and 1% of GDP, but the fall in sterling provided an offsetting boost.

120 Bean (2009).

4 Britain's Recovery

The economy emerges from the worst recession since the 1930s with a high level of unemployment, above-target inflation and exceptional financial imbalances. An abnormal private sector financial surplus, running in relation to GDP at perhaps nine times the post-war norm, is matched by an equally unprecedented budget deficit. Policy makers seek a recovery that will deliver economic balance both internally - full employment with inflation on target and the budget back to normal – and externally – a tolerable international balance of payments position. But policy makers operate under conditions of uncertainty with a limited number of policy instruments.

Attention here is focussed on three key considerations: the causes and scale of the uncertainties surrounding the pace of Britain's recovery; second, the implications for fiscal policy and, third, the UK's latent balance of payments problem. The policy paradigm that emerges stresses the need for a cheap exchange rate, stimulatory monetary policy and credible budgetary restraint. Aggregate demand needs to be supported, with due regard to the economy's ability to respond without pushing up inflation, and orientated towards a material improvement in Britain's trade performance. A hair-shirt alternative would risk a permanent loss of output and taxable capacity, exposing the economy to a low growth debt trap.

Rumsfeld uncertainty
Macroeconomic policy makers have always to assess risks to the outlook but their problem in 2010 is of a different order, thanks to the banking crisis. Neither the rate of recovery of the banking system nor its wider impact can be reliably forecast. These matters are not quite the "unknown unknowns" made famous by the former American Defence Secretary Donald Rumsfeld, but policy makers have little to guide them. The Bank attempts regularly to convey forecasting risks in its "fan charts", but this technique relies on an assessment of probabilities drawn from past experience. Post-war British experience contains little relevant information on which to base such probabilities.[121] Added to the usual problems of prediction, the banking crisis means that forecasters can have little clue about the speed and scale of Britain's recovery.

Since standard models are incomplete, forecasters have sought illumination instead from studies of business cycle patterns and the role played by banking crises in past recessions, pre-war and post-war, in a range of countries. The relevance of these events is questionable, however, so it is perhaps inevitable that opinion amongst forecasters remains sharply divided. Two camps are separated by a gulf that illustrates the depth of forecasting uncertainty.

A pessimistic majority expects a weak recovery. The forecasting consensus in early-2010 envisages 1¼% UK growth in 2010 and average growth of around 2½% a year subsequently: insufficient to make good the loss of output relative to the level implied by previous trend growth.[122]

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121 The "secondary" banking crisis in the mid-1970s is the closest comparator, but this was a localised shock. Other bank collapses in the post-war era (Johnson Matthey (1984); Bank of Credit & Commerce International (1991); Barings (1995)) did not cause system-wide failures.
122 Source: HM Treasury, Forecasts for the UK Economy, February and March 2010.

This pessimism fits with the message of a number of banking crisis "event" studies, of which Reinhart and Rogoff's (2009) is probably the most influential.[123] In their analysis of major banking crises in developed and developing countries, the authors calculate that post-crisis per capita GDP typically fell from peak to trough by 9% over two years and that the rate of unemployment typically rose by 7 percentage points over five years.[124] They further calculate that real house prices (relative to consumer prices) fell on average by 36% over six years; real equity prices fell 56% over three years; and real government debt rose 86% over three years, mainly as the result of lower tax receipts and counter-cyclical policies rather than bank bailout costs.

The pessimists are as much concerned by the prospect of weak supply potential as they are by the prospects of weak demand. Several studies ranging across a variety of countries have shown that output remains depressed for years after banking-crisis led recessions, a persistent loss attributed to a fall in economic potential.[125] An OECD study puts the loss in potential output at between 1½% and 2½% on average, rising to nearly 4% after deep crises.[126] A study by the European Commission paints a similar picture, while an IMF study is more pessimistic.[127] It concludes that per capita GDP remains nearly 10% below potential even seven years after the typical crisis, with the shortfall attributed in roughly equal measure to higher unemployment, cumulatively lower investment and worse productivity.

For similar reasons, many hold that the UK's potential output has been adversely affected. The National Institute of Economic and Social Research believes UK potential might fall by between 3% and 5%,[128] a figure cited by HM Treasury in support of its assumption of a decline in potential GDP of about 5% between mid-2007 and mid-2010. The Bank similarly forecasts a prolonged fall in UK output relative to trend, reflecting "*in large part the substantial impact of the downturn on the supply capacity of the economy*"[129]. The Bank notes the role that tight credit conditions may play in reducing firms' ability to finance inventories and so meet customers' orders.[130] More generally, the Bank believes "*an impaired financial system will be less effective at allocating capital to its most productive uses* ".

In contrast, a small minority foresees a rapid recovery. The basic proposition is straightforward: the deeper the recession, the sharper the recovery - a profile sometimes referred to as the "Zarnowitz rule".[131] Ormerod (2009a; 2009b) finds that most recessions in advanced economies end after a year – in the sense that output growth resumes – irrespective of the size of the initial shock. He paints an upbeat picture for recovery on the grounds of irrepressible animal spirits. Mussa (2009) draws a similar conclusion. His key observation is that the recovery itself will typically help restore the financial system to better health; the banks need not act as an independent brake on recovery once the financial system has been stabilised.[132]

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123 See, also, Balakrishnan et al. (2009); Bordo and Haubrich (2009); Claessens et al. (2008), McKinsey (2010).
124 Cited figures are rounded to the nearest integer.
125 Brittan (2009) stresses the earlier contribution of Dow (1998).
126 Furceri and Mourougane (2009).
127 European Commission (2009); Balakrishnan et al. (2009).
128 Barrell (2009).
129 November 2009 Inflation Report.
130 Blinder (1987) gives a neglected, non-mainstream theoretical account of this process. He considers firms who pay for their purchases of materials and labour before receiving revenue from sales and rely on bank finance to maintain cash flow. With bank finance constrained, the firms may be forced to curtail production even if demand for their products holds up. See, also, Posen (2009).
131 Named after the late, veteran business cycle scholar Victor Zarnowitz.
132 Mussa also criticises pessimists for what he regards as their misinterpretation of the widely–cited Scandinavian bank crises in the early-1990s. He attributes the slow pace of recovery of Sweden and Finland not to the lingering impact of bank failures but to new shocks, including the collapse of the Soviet Union and the impact of their membership of the European exchange rate mechanism.

A more general criticism of the pessimists' case concerns the heterogeneity of the event studies on which they rely. The putative "typical" bank crisis-led recession covers a very wide range of disparate circumstances. For example, the average 9% fall in per capita GDP noted by Reinhart and Rogoff comes from the experiences of 14 economies that include the near 30% fall in US output after 1929 and the negligible increase in output in Spain after 1977. The typical 10% shortfall in medium-term output calculated in the IMF study includes a middle group of cases in which the deviations from trend range from minus 26% to plus 6%. Partly because of this heterogeneity, a study by Cecchetti and others[133] contends "*it is not possible to learn about the likely path of the current crisis by averaging outcomes across past crises.*" They argue instead that the current crisis is "unique" and that major economies may "*regain their pre-crisis levels of output by the second half of 2010*".

A robust recovery of demand would also alleviate concerns about supply potential. The Bank acknowledged this possibility for the first time in its February 2010 Inflation Report: "*The outlook for supply will depend, in part, on the strength of recovery in demand. Some of the falls in supply capacity are likely to prove temporary ..*". Shortfalls in potential arising, for example, from the damaging impact of demand deficiency on labour market participation and capital investment could be gradually reversed. A revival of animal spirits would additionally counter the depressing impact on capital investment of the greater risk aversion and higher financing costs emphasised by the National Institute. There could also be an important impact on bank credit supply. A recovery of demand that itself aided the repair of banks' balance sheets should ease the credit rationing that may have led to the mothballing of capacity, especially amongst SMEs. Recovery should reduce the scale of banks' asset impairment and raise profitability, enabling banks to meet more comfortably regulators' more demanding capital requirements. In such circumstances, normal wholesale funding could resume. The revival of the banks and bank lending and of the supply potential of the economy would all follow the revival of demand.

Recovery Scenarios

Unable to make reliable forecasts, policy makers are in the unenviable position of having to plot a course of action that would be tolerable under a range of contrasting future economic conditions of seemingly equal prior plausibility. To gauge the broad magnitude of the policy problem, consideration is given to two scenarios depicting a "fast" and "slow" pace of medium-term recovery to 2014.

Each scenario is grounded on the latest HM Treasury economic forecast and fiscal policy settings with amendments to reflect alternative possibilities for export prospects, the efficacy of devaluation, the outlook for property and stock market prices, and the pace of banking system repair.[134] These alternatives cover many, although by no means all, of the sources of future shocks and surprises. For the same reason, the scenarios are not exhaustive: better or worse outcomes are imaginable. But compared to "fan charts", the scenarios have the advantage of transparency. They are derived from a model that "adds up" and the driving assumptions are explicit.

133 Cecchetti et al. (2009).
134 A baseline model projection is aligned with the main features of the Treasury's central economic forecast from 2010 to 2012 and with the public expenditure and tax projections to 2014. The official public finance projections assume a potential rate of growth that is ¼ percentage point below that used in the central economic projections. In the baseline projections, the level of GDP and the public finances closely approximate the official public finance projections in 2014.

In summary, the fast and slow recovery scenarios, built around official economic and public finance projections, envisage two very different sets of underlying behaviours:

- Under the fast recovery scenario, the economy enjoys a significant export revival; exports and imports respond substantially to the large gains in international competitiveness of 2008 and 2009; house and stock market prices rise at a moderate pace and the impact of the banking crisis gradually fades.

- Under the slow recovery scenario, the export revival and competitiveness benefits are more limited, consistent with supply-side impediments. Asset prices fall in real terms, in line with the findings of banking crisis studies. The fall in asset prices exacerbates balance sheet problems, including the banks'. As a result, the credit crunch persists and has a lasting detrimental impact.

The details for each scenario are described in the following paragraphs.

As regards fiscal policy, projected government spending, excluding debt interest, and discretionary tax changes follow the course described in the 2010 Budget Report. The scenarios' budget deficit projections allow, in addition, for the operation of automatic fiscal stabilisers and for the impact of accumulated debt on government debt interest payments. Discretionary tax increases, including the reversal of the temporary VAT reduction and the higher rates of national insurance planned from April 2011, raise tax receipts by about 1¾% of GDP between 2009 and 2014, and account for about a third of the projected fiscal policy tightening. Public expenditure restraint accounts for the rest, but with the burden falling on government spending on goods and services rather than on transfer payments and debt interest. Total managed government spending in real terms is officially projected to rise in 2010 and to stagnate thereafter, but the volume of government spending on goods and services, which adds directly to GDP, falls by an average 1¼% a year from 2010 to 2014.[135]

The official public finance projections assume a level of unemployment that is, by 2014, around 750 thousand above the Treasury's preferred unemployment forecast upon which the scenarios' projections of unemployment are based.[136] This procedure gives rise to an inconsistency, since the lower level of unemployment would also lead to a lower level of government welfare spending. But the inconsistency is a small one: according to the Treasury's ready reckoner, the lower level of unemployment could reduce the budget deficit directly by about £3¾bn a year, just ¼% of GDP.

The Treasury's forecast shows unemployment measured by the number of claimants falling by over 500 thousand to around 1 million by end-2014, significantly below the consensus medium-term forecast.[137] The official forecast is not implausible, however. Flexibility over hours of work and falls in real wages explain much of the smaller-than-expected loss of jobs and rise in unemployment that occurred during 2009, notwithstanding the outsized

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135   The real increase in 2010 is the product of a lower than expected price level and the unchanged cash level of government departmental spending plans set out in the 2007 Comprehensive Spending Review (which extends to 2010). This higher real level of public spending is carried forward under the Treasury's "no policy change" forecasting assumption. See IFS (2010). The author's estimate of the implied reduction in the volume of government spending on goods and services is based on the published cash plans available until 2010, extrapolated thereafter in line with published plans for total public current and capital spending, excluding debt interest. Interpolated from financial years to calendar years, the cash plans are expressed in volume terms by dividing by an inferred price deflator. The resulting volume figures for general government consumption and investment are comparable to the Treasury's economic forecasts to 2012, which show a rate of decline after 2009 of 1¾ a year.

136   The official forecasts, published for the first time in the 2009 Pre-Budget Report, are expressed in terms of the claimant count. An International Labour Organisation Labour Force Survey equivalent measure is inferred assuming an excess over the claimant count equal to the 2009 average excess.

137   The February 2010 consensus forecast for the average level of claimant count unemployment in 2014 is 1.55 million. Source: *HM Treasury, Forecasts for the UK* Economy.

loss of output.[138] Such flexibility may assist a significant fall in unemployment in line with the Treasury view. However, workers' willingness to accept lower real wages may prove to be temporary and a resumption of real wage demands may inhibit the creation of jobs during recovery.[139] This latter possibility is given some weight: the scenarios assume a level of unemployment a little above the Treasury view after taking into account differences in the projected level of activity.

As regards the *international balance of payments*, alternative assumptions are made regarding the ability of the economy to return to a trend level of exports and the efficacy of the competitiveness gain resulting from sterling's decline. Under the fast recovery scenario, exports are assumed, as a first step, to return by 2014 to a level consistent with the continuation from 2007 of the rate of growth observed in the preceding period from 2001; this assumption implies a substantial recovery from the depressed levels of exports seen in 2009. Exports under the slow recovery scenario fall short of this trend by 5%, reflecting, for example, diminished supply capacity.

Under both scenarios, exports and imports also respond to the increase in unit labour cost competitiveness of over 30% that occurred between 2007 and 2009. Under the fast recovery scenario, the long-term impact on the trade balance in volume terms is put at nearly 2½% of GDP by 2014.[140] Under the slow recovery scenario, the assumed impact is half this amount. Most of the competitiveness impact is felt by imports, which aligned to the Treasury forecast fall below a level that would be expected simply on the basis of projected levels of activity and expenditure.

Export volumes grow on average by 7½% a year in the fast recovery scenario, a rate of advance rarely observed in the post-war era. Quinquennial rates of annual export growth touched 7% on the back of the synchronous world boom in the early-1970s and exceeded 7% in the late-1990s, aided by America's boom and stock market bubble. The plausibility of the fast recovery scenario export projection rests on the likelihood of a return to a moderately growing trend level but from a very depressed base. Export volume growth averages 6% a year in the slow recovery scenario.

Other components of the balance of payments follow the Treasury forecast until 2012 and are extrapolated on neutral assumptions thereafter. Two factors act as a drag on the *trade account*. Falling North Sea production leads to a larger trade deficit in oil. Second, the terms of trade – the ratio of export to import prices – deteriorate in line with the Treasury projection until 2012 and are held steady thereafter. The terms of trade deterioration means that the trade balance improvement after 2009 is less in nominal terms than in real terms. The arithmetic impact in the Treasury forecast is to enlarge the trade deficit in 2012 by about 1¼% of GDP.

The deficit on balance of payments transfers, which include payments to the European Union, is projected at 1¼% of GDP in 2014, unchanged from the Treasury's 2012 forecast.

138 The Bank's August 2009 Inflation Report gives a detailed analysis.

139 This possibility is consistent with a labour market in which "insiders" – the employed – are able to secure higher wages notwithstanding the willingness of "outsiders" – the unemployed – to work for less. Insiders may seek to make good real wages sacrificed during the recession, raising the involuntary rate of unemployment amongst outsiders. See, for example, Lindbeck and Snower (2002).

140 This impact, calculated before any resulting change in domestic demand, is consistent with optimistic published model properties and with a simple regression for the non-oil trade balance. The regression relates the volume of the non-oil trade balance as a share of GDP to world trade, domestic demand and unit labour cost competitiveness. The long-run competitiveness semi-elasticity is 0.08.

The surplus on *overseas investment income* in 2014 is projected at 1% of GDP in the fast recovery scenario and at ¾% of GDP in the slow recover scenario, consistent with the modest year-to-year decline in the surplus projected by the Treasury up to 2012. The scenarios' projections are lower than the 2007 outturn, the last year for which fairly reliable figures exist that are not distorted by the banking crisis.[141] This decrement is due solely to increased government debt interest payments on that part of its rising debt held by overseas investors. The government debt interest outflow reaches 1% of GDP by 2014 in the fast recovery scenario and 1½% of GDP in the slow recovery scenario. In the same year, the private surplus on overseas investment income is a little over 2% of GDP in each scenario, unchanged from 2007.

As regards *house and stock market prices*, the fast recovery scenario adopts Treasury-style assumptions. Nominal house prices are assumed gradually to return to a rate of advance of about 5% a year by 2014, equivalent to about 2½% growth in real terms.[142] The average annual real increase during the five years to 2014 is 1½%. Equity prices rise roughly in line with nominal GDP from spring 2010, producing an average real increase over the period to 2014 of nearly 3½% a year.

Under the slow recovery scenario, asset prices are assumed broadly to follow the "typical" post-banking crisis pattern described by Reinhart and Rogoff. Over the five-year projection period, this pattern is interpreted to imply falls in real house prices and real equity prices of about 5% a year and 8½% a year respectively. Interest rates are the same in each scenario. An alternative would be to assume lower interest rates in the slow recovery scenario, but without any change in asset prices the simulated impact would be small.[143] Supply impediments and inflation could also limit the scope for interest rate reductions in the slow recovery scenario.

As regards banking system repair, the fast recovery scenario assumes that credit constraints gradually diminish so that they cease to have any further influence on activity by 2014. Under the slow recovery scenario, credit constraints are assumed to continue, depressing GDP in 2014 by around 4%.

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141 During the banking crisis, a reduction in the profits of foreign banks operating in the UK flattered the investment income account by more than it was disfigured by UK banks' overseas losses.

142 See 2010 Budget Report, paragraph B.68. "Real terms" refers here to asset prices in relation to the price deflator for private expenditure on goods and services
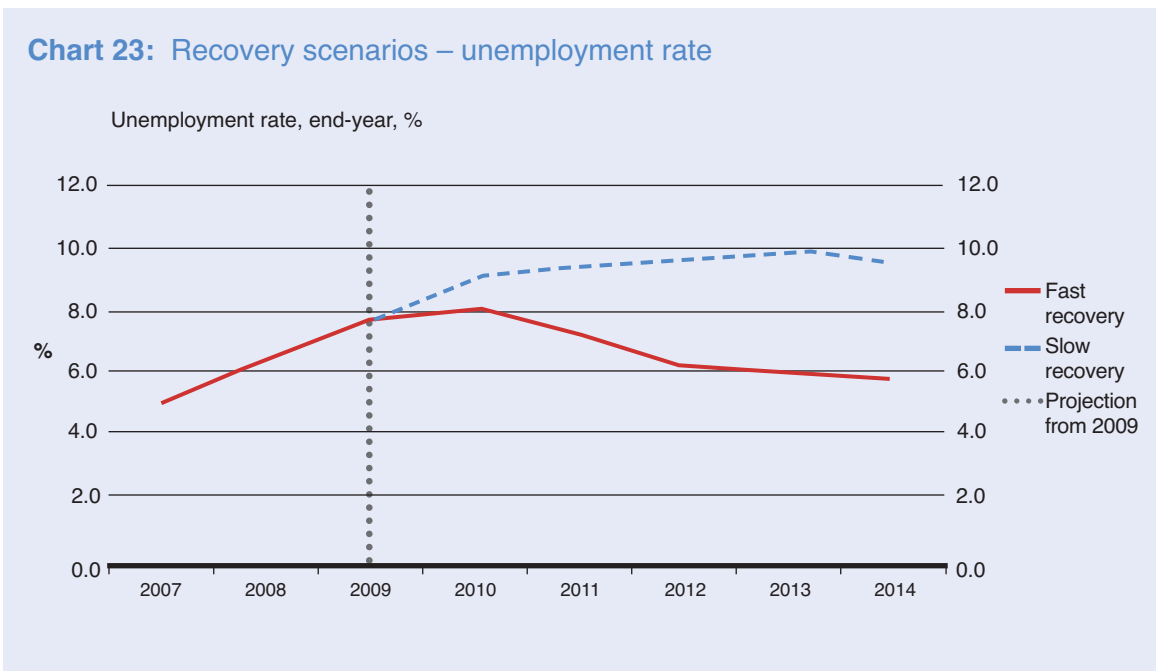
143 Were short-term interest rates to remain low, simulated GDP would be ¾% higher by 2014.

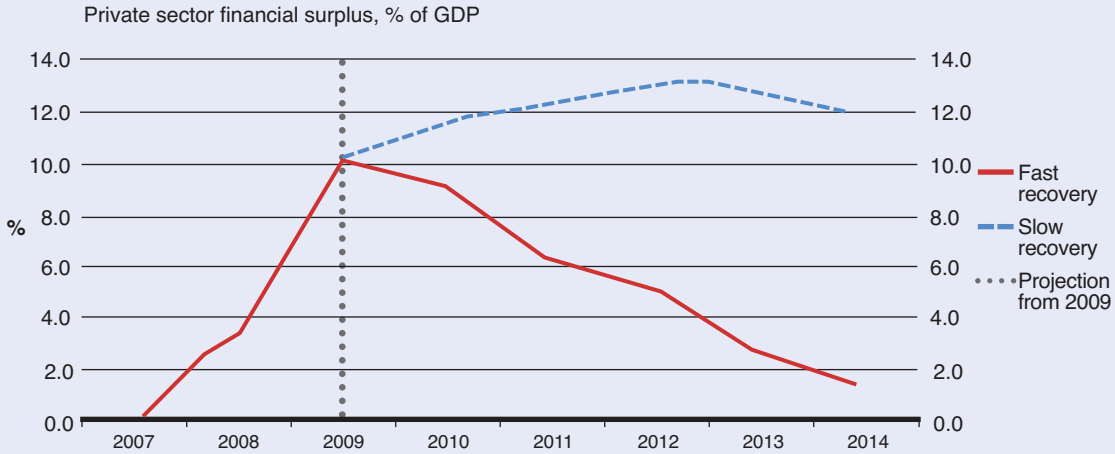**Chart 22:** Recovery scenarios – GDP growth

GDP growth projections
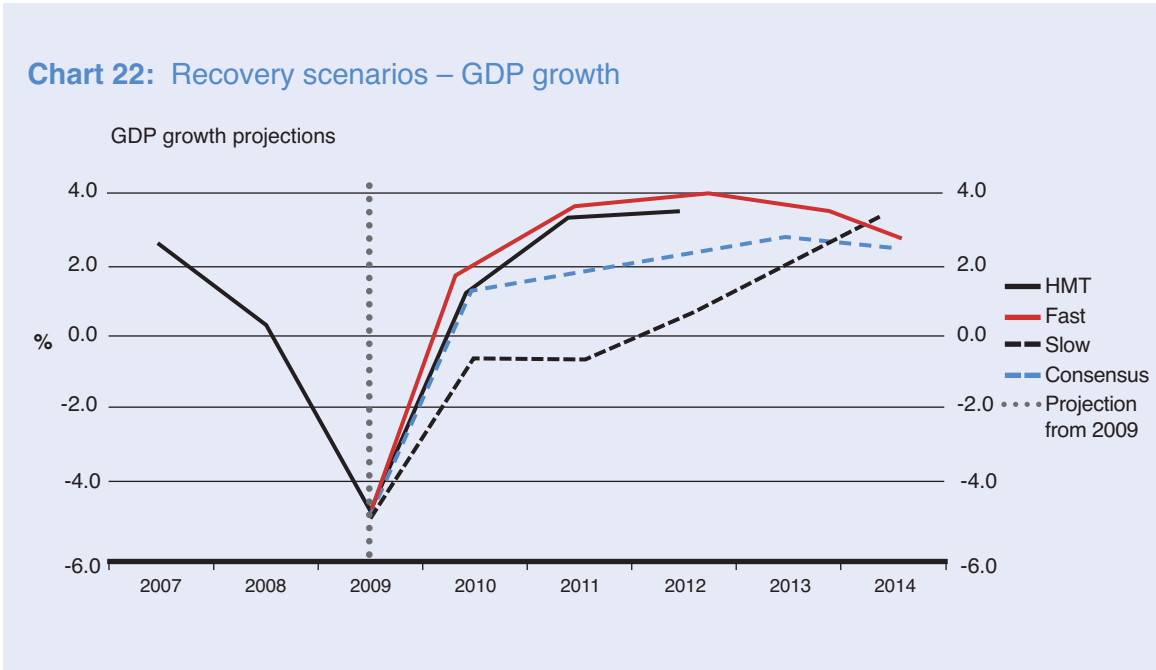
Source: ONS; HM Treasury 2010 Budget Report and *Forecasts for the UK Economy*, February and March 2010; author's calculations.

Chart 23: Recovery scenarios – unemployment rate

Unemployment rate, end-year, %

Source: ONS; author's calculations. Labour Force Survey measure.

Chart 24: Recovery scenarios – private financial surplus

Private sector financial surplus, % of GDP

Source: ONS; author's calculations.

Chart 25: Recovery scenarios – government financial deficit

Government financial deficit, % of GDP

Source: ONS; author's calculations. Calendar year general government data.

Chart 26: Recovery scenarios – balance of payments

Current account of balance of payments deficit,% of GDP

Source: ONS; author's calculations.

Chart 27: Recovery scenarios – unemployment and financial balances in 2014

Unemployment rate and financial balances, % of GDP in 2014 projections
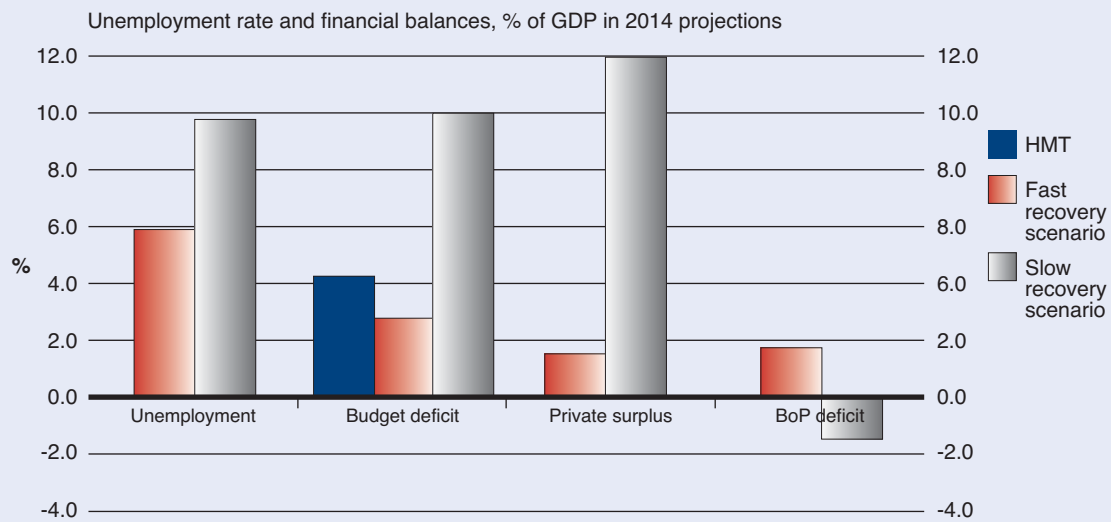
Source: HM Treasury 2010 Budget Report; author's calculations.

Table 14: Recovery scenarios – GDP growth

Growth, % p.a. 2010 to 2014	Scenario	
	Fast recovery	Slow recovery
GDP	3.2	0.9
of which:		
Exports of goods & services	7.5	6.0
Government consumption & investment	-1.3	-1.3
Private consumption & investment	4.0	0.2
Imports of goods & services	5.9	2.1
memo:		
Real private disposable income	1.8	0.7

Source: author's calculations.

Table 15: Recovery scenarios – unemployment and financial balances in 2014

Rate or share of GDP, % 2014	Scenario	
	Fast recovery	Slow recovery
Unemployment rate*	5.9	9.8
"Output gap"**	-5.9	-15.7
Private sector financial surplus	1.4	12.0
Budget deficit***	2.9	10.1
Current account of balance of payments	-1.8	1.6
of which:		
Goods & services balance	-1.5	2.2
memo:		
Public sector net debt ratio end-2014***	72	103

Source: author's calculations. * Labour Force Survey measure. ** GDP in 2014 relative to a level implied by 2½% growth maintained from 2007. *** public sector measure that excludes the temporary effect of bank bailouts.

The results of these assumptions are presented in Charts 22 to 27 and Tables 14 and 15. No weight is attached to the year-to-year developments shown in the two scenarios; only the broad trends matter. Several features stand out:

- Projected rates of growth differ substantially: between 2010 and 2014 average GDP growth of 3¼% a year under the fast recovery scenario contrasts with 1% a year under the slow recovery scenario. Growth in the former case is slightly above that envisaged in the Treasury's central forecast. Before 2014, the consensus forecast lies between the two scenarios.

- There are sharply contrasting impacts on the level of activity. Under the fast recovery scenario, the projected level of GDP by 2014 lies 6% below a level consistent with a continuation of the past trend growth rate of 2½% a year. Under the slow recovery scenario, the output shortfall is 15½%. It is open to question whether these shortfalls should be interpreted as output gaps, in the sense of demand falling short of supply. In the slow recovery case in particular, part of the shortfall represents a fall in potential GDP.

- The cumulative impact of these differences is seen in the projections for unemployment. An unemployment rate of 6% under the fast recovery scenario contrasts with a near 10% rate under the slow recovery scenario.

- Export performance is stronger, by assumption, in the fast recovery scenario compared with the slow recovery scenario, but the main difference between them arises from the projections for private spending. Private spending grows at 4% a year in fast recovery scenario but by only ¼% a year in the slow recovery scenario. This difference results from the contrasting assumptions made regarding the behaviour of property and equity prices and the associated longevity of the credit crunch's impact on activity.

- Under the fast recovery scenario, private spending outpaces private disposable income, itself constrained by the tightening of fiscal policy. The result is a substantial fall in the private financial surplus to 1½% of GDP by 2014. Under the slow recovery scenario, private spending falls short of the growth in disposable income, which is protected by the fiscal stabilisers. The result in 2014 is an abnormal private sector financial surplus running at 12% of GDP.

- The current account of the balance of payments stays in modest deficit in the fast recovery scenario, close to Treasury projections. The maximum benefit from sterling's devaluation is felt in 2012. In the slow recovery scenario, the balance of payments moves into surplus, thanks to depressed private spending.

- The budget deficit falls to 3% of GDP by 2014 under the fast growth scenario, about 1 percentage point less than the Treasury's public finance projection, which is based on a more cautious assessment of GDP growth. Under the slow recovery scenario, the budget deficit, inflated by the impact of automatic fiscal stabilisers, runs at 10% of GDP in 2014.

- The different budget deficit projections affect the outlook for government debt. Under the fast recovery scenario, the ratio of the end-year stock of debt to annual GDP in 2014 is 72%, a little below the 77% Treasury forecast figure.[114] Under the slow recovery scenario, the 2014 debt ratio exceeds 100%.

The common thread underlying these details is one of prolonged private sector balance sheet adjustment. Seeking to reduce its excess debt, the private sector, banks included, maintains an unnaturally high rate of "saving", registered by falling but still high private financial surpluses in the fast recovery scenario and the persistence of abnormally high financial surpluses in the slow recovery scenario. These financial surpluses are the means by which individual private sector players collectively reduce their excess indebtedness and increase their financial worth.

The consequence of balance sheet repair is a persistent shortfall in activity. This happens even in the fast recovery scenario, in which exports return to an above-trend level thanks to the competitiveness boost. But government spending on goods and services falls well below its previous trend and private spending fails to make up the difference, massively so in the slow recovery scenario, which in some respects apes Japan's "lost decade". The private spending shortfall leads to under-employment.

This behaviour can be usefully contrasted with UK experience in the latter half of the 1990s. The combination then of robust growth and fiscal rectitude is sometimes prayed in aid of the view that a tightening of fiscal policy would not impede recovery, but this conclusion is based on a misreading of history. After 1995 rising property and stock market prices, the latter an echo of the super bubble developing in America, boosted private sector balance sheets, encouraging both households and companies to raise their expenditure relative to their disposable income. As described in Section 2, the result was a record downswing in the private sector financial surplus, which turned into a near 4% of GDP deficit in 2000. Balance sheet developments were therefore conducive to an upsurge in private spending that more than compensated for the depressing impact on activity of tight fiscal policy. A materially different picture emerges from the recovery scenarios over the next five years: private sector expansion does not compensate for public sector restraint thanks to ongoing balance sheet repair.

144 The Treasury presents the ratio in terms of centred end-March values of GDP: 75% in 2014.

In principle, the repair of private sector balance sheets could lead to a large surplus on the current account of the balance of payments. In this case, the reduction in private debt would take the form of an increase in private holdings of overseas assets. This route to lower indebtedness faces a hurdle, however - the economy's underlying international trade performance. Even with exports back to an above-trend level, the fast recovery scenario depicts an economy in balance of payments deficit, partly as a result of declining North Sea oil and gas production. In the slow recovery scenario, on the other hand, a modest balance of payment surplus is achieved.

In both scenarios, however, the main counterpart to high private sector "saving" is a large budget deficit or public sector "dissaving". In an economy closed to overseas trade, it could not be otherwise: one sector's surplus necessarily equals the other sector's deficit. The key question is not the identity of the sector balances but the level of activity that results from the private sector's desire to reduce its indebtedness.

The process at work is straightforward in principle. A decision by the private sector to reduce its debt depresses private demand, which in turn depresses output. The fall in output strains the government's finances: tax revenues fall relative to government spending, even in the absence of discretionary counter-cyclical fiscal policy measures. Government spending, in particular, will rise in relation to the depressed level of GDP, and the larger budget deficit will add to debt interest payments. Tax revenues will also fall relative to GDP. As a consequence of these automatic fiscal stabilisers, the private sector's desire for less debt and higher saving forces the government into deficit, that is into a position of dissaving, although it is open to the government to resist by subsequently raising taxes or cutting public spending. The result would be a further reduction in activity.

The implication of the adjustment process is that the improvement in the private sector's balance sheet comes at the expense of the public sector's balance sheet. As Chart 28 illustrates in the case of the fast recovery scenario, the rise in government debt and the increase in private financial wealth are two sides of the same coin.

This adjustment process further implies a transfer of default risk. The acquisition of over-priced assets, financed by increasing levels of debt, eventually brought into question the solvency of banks and some non-financial companies and households. The result was a tightening of the terms on which banks and non-banks could raise new finance and, in some cases, an inability to raise finance at any price: a "capital stop". Default risks are now being transferred to the public sector, which has access to the deep, but not infinitely deep, pockets of the taxpayer. The risk of default on government debt – "sovereign risk" - threatens the sustainability of the fiscal policy stimulus and underlies the consensus view that the budget deficit needs to be reduced.

Chart 28: Fast recovery scenario - private financial wealth and government debt

Private financial wealth & government debt, % of GDP
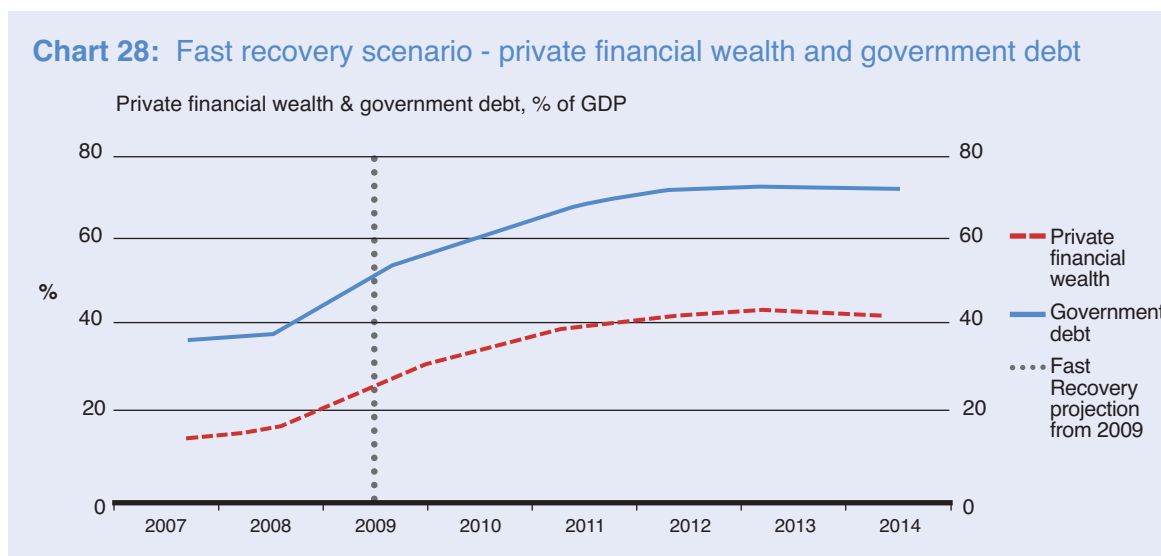
Source: author's calculations. Private financial wealth (financial assets less debt) comprises the private sector's outstanding net financial claims on government and the rest of the world. The data traced in the chart are calculated by adding accumulated private financial surpluses to a benchmark level. These data closely follow trends in the market value of private financial wealth measured directly (see Martin (2009a)).

Fiscal policy lessons

The different recovery scenarios vividly illustrate the dilemma confronting policy makers. The fast recovery scenario comes with a sharper-than-planned fall in the budget deficit, albeit with a level of unemployment still high judged by pre-recession standards. Economic rebalancing would be incomplete, but the policy challenges pale against those posed by the slow recovery scenario. In this case, the economy experiences a combination of mass unemployment and exceptional budget deficits. No one can confidently predict which of these scenarios is the most plausible, an uncertainty that confounds strategic policy decisions. The same fiscal policy position that might seem sensible under one scenario could be very damaging under the alternative. How should policy makers respond to these uncertainties?

The official fiscal plans do not provide a fully satisfactory answer. There is a commitment to a substantial fiscal policy tightening predicated on a reasonably fast recovery. The plans allow scope for a faster fall in the budget deficit should the recovery surprise but mandate a response that would amplify the impact of unpleasant demand shocks. The implications of a persistently slow recovery are not addressed.

The details of the March 2010 Budget strategy can be briefly summarised. Although without the benefit of detailed public expenditure plans, which end in financial year 2010, the projections envisage a decline of nearly 8 percentage points in the budget deficit in relation to GDP between 2009 and 2014. Consistent with the Treasury's assessment of economic potential and the rate of recovery, 6 percentage points of this deficit reduction is regarded as "structural", a fast pace of retrenchment previously only exceeded according to currently-available estimates during the inauspicious period ending in 1981.[145] The reversal of counter-cyclical measures means that 1 percentage point of the tightening comes in 2010. The Treasury's illustrative projections beyond 2014 depict a structural budget deficit that eventually finances government investment alone; the structural "current" budget deficit in 2016 is zero.

145 Published Treasury estimates of the cycle-adjusted budget deficit begin in 1973.

Various aspects of these projections are encoded in the Government's February 2010 Fiscal Responsibility Act, which is designed to increase parliamentary scrutiny of the fiscal plans.[146] The Act includes a requirement that the budget deficit should fall in each year until 2015 with no allowance for the impact of the business cycle. In this important respect, the Act departs from the temporary operating rule put in place in the November 2008 Pre-Budget Report. The temporary rule prescribed, once recovery had commenced, a reduction each year in the cycle-adjusted current budget deficit. The focus in the Act on the cycle-unadjusted budget deficit reflects another objective - to secure a decline in the level of government debt relative to GDP after 2014.

The Fiscal Responsibility Act facilitates what might be called "opportunistic fiscal policy tightening." Should, for example, the pace of recovery exceed Treasury expectations, the headline deficit is likely, other things equal, to undershoot. It is improbable that an undershoot would be clawed back; more likely, if sufficiently large, it would lower the projected trajectory for deficit reduction. This conclusion follows for two reasons: each year the deficit as a share of GDP has to be lower than the year before and, under secondary legislation, the deficit is required by 2013 to be 5.5% of GDP – very close to the current projection of 5.2% - or *less*. The downward revision in the 2010 Budget to the forecast 2009 deficit outturn, courtesy of higher-than-expected tax receipts, had precisely this opportunistic tightening impact on the deficit reduction plans.

The Act mandates a substantial tightening of fiscal policy over the medium term and encourages opportunistic tightening in better-than-expected circumstances. What it does not allow is room for easement in worse-than-expected circumstances. Should the pace of recovery fall short of Treasury expectations, the budget deficit is likely, other things equal, to overshoot. Should the overshoot be sufficient to breach the requirement for successive yearly falls in the deficit as a share of GDP or put at risk the ceiling objective for 2013, the Act, taken literally, would oblige the authorities to raise taxes or cut spending, thereby amplifying the depressive impact of the shock. The effect would be to remove some if not all of the support that would normally be offered by automatic fiscal stabilisers. Table 16 suggests the amplification of unpleasant shocks could be material, perhaps more than doubling their impact on GDP if resort is made to public spending cuts, less if the offset is higher taxation.[147]

Table 16: Shocks to GDP with and without automatic fiscal stabilisers

Fall in GDP % of level in absence of shock	Impact with stabilisers	Impact without stabilisers *	
		Public spending cut	Tax increase
Export shock	0.2	0.5	0.3
Private demand shock	0.6	1.3	0.8

Source: author's calculations. Each shock comprises an ex ante reduction of 1% of the relevant level (exports or private spending). * calculated to restore the budget deficit to its level in the absence of the shock. The simulations take as given the level of prices, the exchange rate and interest rates.

Taken to a logical extreme, the Government's strategy would require a further large tightening of fiscal policy under the kind of depressed conditions depicted by the slow recovery scenario. On this logic, the slow recovery could be transformed into a slump. An

146 IFS (2010) discusses this and other institutional arrangements that might help limit fiscal policy mistakes and improve credibility. None of the options would be likely to cope well with the challenges posed by a slow growth scenario.
147 The differences arise because the short-run impact of tax increases on activity is softened by reductions in private saving and in imports. In the long run, the impacts of government spending cuts and tax increases are similar.

often-cited example of the problem comes from Japan's lost decade, when there was mounting concern about government debt and scepticism about the efficacy of fiscal policy. In 1997, Japan hiked taxes by nearly 2% of GDP. Output contracted.[148]

The contrary view is that large budget deficits, even those that simply accommodate depressed private sector conditions, do not support activity, and can be positively harmful. The argument concerns default risk and crowding out. It is contended that an escalation of budget deficits and debt would raise financial market concerns about the possibility of default, leading to a tightening in the terms on which the government could borrow, or worse, an inability to raise finance at any price. On this view, the stimulus offered by fiscal policy would be crowded out, if not reversed, by an adverse market reaction. This objection requires careful consideration.

In principle, crowding out should not pose a severe threat in the circumstances of underemployment envisaged in the scenarios. The higher private sector saving, which causes the fall in activity, has to be held in a financial form, which will include the extra Treasury bills and bonds issued by the government to finance its rising deficit. This private demand for government debt is a counterpart of the higher private saving, a mechanism that partly explains the continued low level of bond yields in Japan. In addition, tougher liquidity requirements imposed by regulators could *force* the banks to hold more government bonds, including those disgorged by the Bank when its quantitative easing programme is finally reversed.[149] Historically, the UK has coped with much higher debt levels than envisaged even in the slow growth scenario.

Although these arguments are persuasive, there are grounds for caution. Heightened perceptions of sovereign risk that drive up long-term interest rates may come when they are least welcome. A long period of slow growth and high unemployment could weaken the authority of the government and the economy's "taxable capacity". Taxpayers may come to see the payment of interest on government debt as a burden, limiting the scope for tax cuts or the provision of public services. In the slow growth scenario, government debt interest payments (net of receipts) rise to about 4½% of GDP, with a third paid to foreign investors. Matters could escalate. An adverse market reaction could drive the long-term interest rate in real terms well above the depressed rate of growth. Government debt in relation to GDP would be on an explosive path. Depression could combine with hyperinflation if the currency is then debased.[150]

There is evidence to support these concerns. A recent IMF study suggests that higher budget deficits lead to higher borrowing costs, but emphasises that the impact increases if government debt is already high and the government weak.[151] These findings square with the history of defaults, which typically occur after banking crises and severe output contractions.[152] It is not without relevance that the last time the British government came closest to a *de jure* default on its largely domestically-held debt was in 1932.[153] In another historical study of advanced and emerging countries, Reinhart and Rogoff find evidence of a threshold level of government debt beyond which economic growth becomes seriously impaired, the result the authors suggest of financial markets' escalating debt intolerance. This threshold would be exceeded in the slow growth scenario, suggesting the possibility of even worse outcomes.[154]

148 See, for example, Kuttner and Posen (2001 and 2002).
149 See, for example, Miles (2009).
150 The seminal study is by Cagan (1956).
151 International Monetary Fund (2009).
152 Reinhart and Rogoff (2008 and 2010b).
153 Investors were enticed using means that would be frowned upon by today's regulators to convert their holdings of War Loan stock – about a quarter of the national debt – into a near-perpetuity with a lower coupon. The conversion reduced the annual flow of debt interest paid, as intended by the authorities, and may have slightly reduced long-term interest rates. See Capie et al. (1986).
154 According to Reinhart and Rogoff (2010a), the threshold is reached when gross central government debt reaches 90% of GDP. By 2014, UK gross central government debt could be over 10% higher than the public sector net debt figures, excluding bank bailouts, shown in Table 15.

In summary, current fiscal plans envisage a severe tightening of policy with scope for further opportunistic tightening should the pace of recovery surprise. Even in an optimistic case, private sector balance sheet repair may mean that private spending fails to make good the loss of demand as fiscal support is withdrawn and reversed, leaving the economy with a level of unemployment still high judged by pre-recession standards. Worse than this, previous banking crisis episodes point to the possibility of a protracted period of modest expansion, mass unemployment and potentially high budget deficits and rising debt, the counterpart of high private sector saving. High private saving may readily finance the high budget deficits, but a prolonged period of slow growth could permanently weaken the economy's productive potential and its taxable capacity, thereby raising financial market fears of default. In the worst case, the government may be unable to raise funds at any price.

The conclusion to be drawn is that the slow growth scenario is a trap, in which all policy choices would be grim. The best thing is to avoid the trap. Since fiscal policy is circumscribed, the onus is placed on monetary policy to keep the recovery going.

Towards a balanced recovery

Capacity constraints and international developments limit the ability of any form of stimulus to revive the economy without a rise in inflation. Through the recession, inflation has exceeded forecasts and, at the time of writing, exceeds the Government's 2% target. This is a policy concern but not, as yet, a binding constraint. There is no evidence of a return of a wage-price spiral; wages remain quiescent. The unexpected rate of inflation can be attributed to a series of one-off shocks to the price level, notably as a result of sterling's fall and the revival of world commodity prices, and perhaps to temporary supply weakness caused by the credit crunch. The Bank's policy is to look through the inflation-target breach and to support the revival of demand, subject to speed limits, in the belief that demand will help create its own supply.[155]

Policy also needs to support a balanced recovery: one that takes the economy back to full-employment with low inflation without an outsized balance of payments deficit. Supply side policies that encourage an efficient allocation of resources, and support investment and innovation relative to consumption, are required, although the details are not the subject of this study. Here the focus is on the balance of payment aspect of policy. This topic has received comparatively little attention partly because the comparative depth of Britain's recession has helped to curtail imports more than exports. The external balance sheet is also untroubling, thanks in part to the revaluation into weaker sterling terms of foreign-currency denominated assets.

However, there are good reasons to suppose that the balance of payments exists as a *latent* constraint on expansion. Were full employment restored simply on the basis of resurgent private spending, the resulting inflow of imports could push the balance of payments into material deficit. In turn, the economy could become vulnerable to a sudden reversal of capital flows. International studies find that economies that begin to run large and persistent current account deficits become vulnerable to "capital stops" that can force the economy concerned into painful readjustment. One estimate suggests the UK's threshold is reached once the current account deficit is close to 2% of GDP; others suggest a somewhat higher figure.[156] As important as the scale of the deficit is the underlying cause. Current account deficits that result from a surge in a country's rate of technical advance are likely to be sustainable in a way that those stemming from domestic asset price bubbles or consumptions booms are not.

155 This is an interpretation of the remarks by Deputy Governor Paul Tucker (2010)
156 See Clarida et al. (2007) and references therein.

Chart 29 show the results of two simulations in which private spending is strong enough to return the economy to "full-employment" by 2014. Full-employment is interpreted as an unemployment rate of 5% - close to the level observed in the 2001 to 2007 period – although this is likely to imply a continuing high level of under-employment.[157] Each simulation takes as given the March Budget fiscal policy settings and envisages a revival of asset prices and bank lending sufficient to boost private spending and the level of GDP to a full-employment level. GDP growth from 2009 averages 3¾% a year. The simulations differ in their assumptions about trade performance, taking as optimistic and pessimistic cases those assumptions regarding exports and the impact of competitiveness gains that underpin the fast and slow recovery scenarios previously described. Each simulation embodies a conventional estimate of the response of imports to the change in private spending.[158]

The chart records disturbingly large "full-employment" current account deficits in 2014, ranging from 3½% of GDP in the optimistic trade performance case to 6½% of GDP in the pessimistic trade performance case. The main counterparts to the current account deficits are abnormal private sector *deficits* of about 2% of GDP and 5% of GDP respectively. These come on the back of large increases in property and equity prices. In short, full employment pursued through the expansion of private spending alone may risk the re-appearance of domestic asset price bubbles and an insupportable balance of payments deficit. This would not constitute balanced recovery.

Chart 29: "Full-employment" financial balances, % of GDP, in 2014
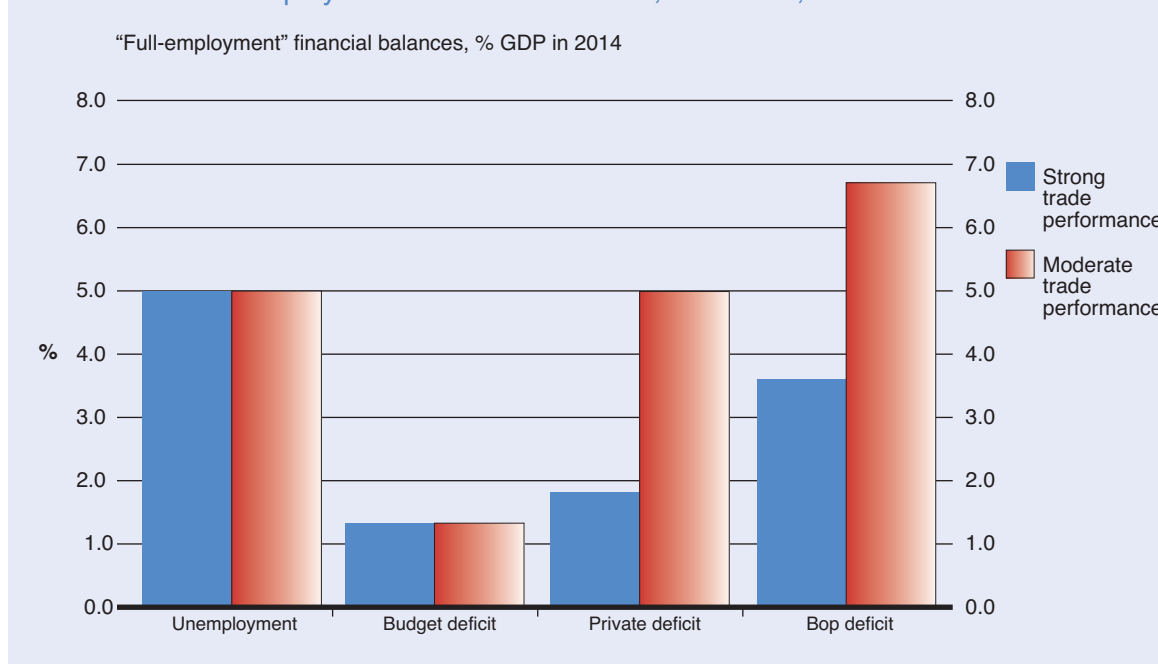
Source: author's calculations.

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157 Beatty et al. (2007) estimate that the discouraged unemployed receiving incapacity benefit accounted for around 3% of the workforce in January 2007. Moreover, the projected 5% "full-employment" unemployment rate coincides with an output gap, as defined in Table 15, of about -3½%.

158 The private spending import elasticity is about 1, implying a GDP import elasticity of about 2, close to estimates surveyed and presented in Tsionas and Christopoulos (2004).

Such simulations should be set in a wider context. It is well known that Britain's faces a period in which the oil and gas resources of the North Sea will be steadily depleted. Coutts and Rowthorn (2010) carefully quantify the large balance of payments impact. The gap left by oil's retreat needs to be filled by an expansion of the internationally-trading parts of the non-oil economy. Banks may no longer be able to fulfil that role.

The end of the booms in oil and finance leaves the UK exposed to longer-run structural changes that are reflected in a tendency for the economy to pull in more imports than it generates in exports. The tendency is captured by a long-established disparity in the economy's income trade elasticities: the growth in imports induced by an increase in UK income is higher that the growth in exports induced by a comparable increase in overseas income.[159] The precise cause and interpretation of this disparity is open to debate. But taken at face value, it implies that the UK has to grow less quickly than its trading partners to secure a non-deteriorating trade account with unchanged levels of competitiveness. Should the UK grow more quickly, there would be a tendency for the balance of payments to deteriorate.

Currency devaluation provides a partial solution to this problem, enabling a faster recovery that would be less likely to meet a balance of payments constraint. Chart 30 takes the case of the fast recovery scenario previously described and adds the impact of a further 25% fall in sterling, raising the level of competitiveness by about 25%.[160] The simulation depicts an economy that grows in a balanced fashion at 3¾% a year over the period to 2014, an expansion sufficient to reduce the unemployment rate to 5%. A small private sector surplus in 2014 roughly matches a small budget deficit while the current account of the balance of payments is close to balance. A larger fall in the pound would be required to achieve the same result in the slow recovery scenario or under either scenario if world trade remained depressed.

Chart 30: Fast recovery scenario with 25% sterling devaluation*

Unemployment rate & financial balances, % GDP, 2014; GDP growth, % p.a. 2010-2014
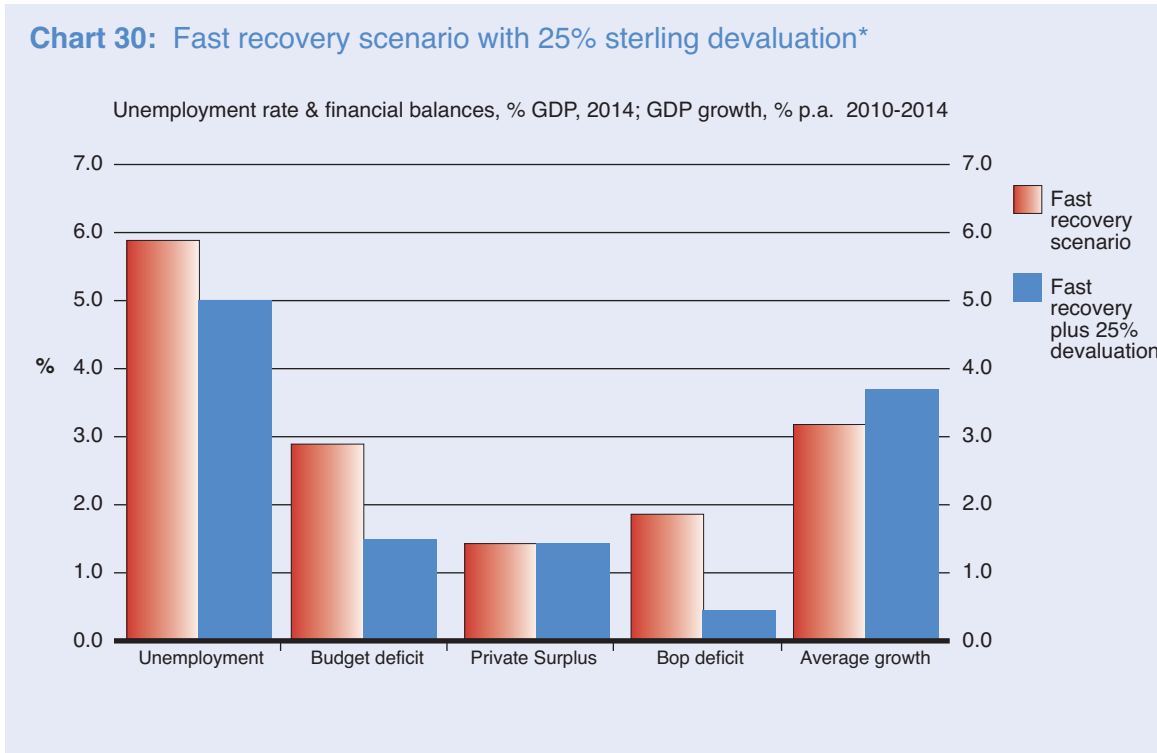
Source: author's calculations. * relative to the 2009 level of the sterling index.

159 The seminal study was by Houthakker and Magee (1969).
160 It is assumed that UK wages rise partly to offset the competitiveness impact of the devaluation in line with the assessment of the 1992 sterling depreciation given in Burstein et al. (2007). The simulation takes no account of the uplift to the sterling value of foreign-currency denominated net investment income or of the offsetting impact of any terms of trade deterioration

A currency decline on top of that already seen would raise a number of policy challenges, not least the speed of decline and the acceptability to overseas trading partners. The ability of the economy to respond to competitiveness gains is partly dependent on the size of its internationally trading sector, which declined as a share of GDP during Britain's New Golden Age. This resource shift may have impaired the economy's short-term capacity to respond to an international competitiveness gain. A sudden large fall in sterling might then prove to be more inflationary than helpful, and stoke financial market fears of *de facto* government debt default. In addition, overseas governments faced with high levels of unemployment might retaliate, viewing a fall in sterling as an aggressive act of competitive devaluation. These considerations suggest that gradual depreciation of sterling would be preferable to a sudden fall, an ideal that might require the Bank to engage in more active currency management.

There is, in addition, no guarantee that sterling would depreciate left to market forces; circumstances – such as a strengthening of speculative carry trade activity - could conspire to push sterling up. But the Bank is not powerless: granted the authority, it can sell sterling and acquire foreign currency reserves. Like quantitative easing, the intervention could aid monetary expansion. Some advocate such currency intervention as the best means to maintain a monetary stimulus when official interest rates are at their lower limit.[161] The conclusion here is based on a simpler observation: currency appreciation would stand in the way of Britain's balanced recovery.

This study uses official data available at the end of March 2010. The text was completed in mid-April 2010.

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161 See, for example, Svensson (2009).

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Appendix: Private Sector Expenditure Function

This appendix provides a brief outline of an estimated private sector expenditure function, which is fully described in Martin (2009a). The methodology of Hendry (1995) is used to nest a long-run relationship between financial wealth (measured by cumulative financial surpluses) and various indicators of the relative return on non-financial wealth within an error correction model for total expenditure of the private sector (strictly the private sector plus public corporations).

The general form is:

$$\Delta E = A(L)\Delta X + \tau_0 \{E_{-1} - \tau_1 Y^a_{-1} - \tau_2 (V_{-1} + \tau_3 k_{-1} + \tau_4)\} \qquad \text{(A1)}$$

where X is a vector of regressors, $A(L)$ is a vector polynomial in the lag operator L such that, $L^1(\Delta X) \equiv \Delta X_{-i}$, Δ denoting a one-period change. $A(L)\Delta X$ comprises (typically differenced) variables that over long time periods are integrated of order zero (denoted $I(0)$). The main variables in levels are $I(1)$. It is expected that: $-1 < \tau_0 < 0$.

The dependent variable is the change in total private expenditure (including public corporations' capital spending) in constant prices, E. Private sector disposable income (including public corporations' retentions and the national accounts residual error) is adjusted by deducting an "inflation tax", approximately equal to the product of inflation (measured by the private sector expenditure deflator), π, and the stock of financial wealth in constant prices, V. This adjustment preserves the key accounting identity: $E \equiv Y^a - \Delta V$, where Y^a is inflation-tax adjusted private disposable income in constant prices.

In a departure from Martin (2009a), the ratio, k, of non-financial wealth to private (inflation-tax adjusted) disposable income is represented by three separate ratios for housing wealth, k^h; non-financial, non-housing wealth, k^{nh} ; and stock market capitalisation, k^s . The ratios k^{nh} and k^s are regarded as alternative measures of the non-housing tangible and intangible wealth ratio. Each of the three ratios, with varying degrees of measurement error, is conceptually akin to a price-earnings ratio (PE) that reflects expectations of future utility or rental streams suitably discounted. These proxy PEs are assumed to drive the private sector's willingness to hold financial wealth.

The differenced variables in ΔX comprise changes in inflation-tax adjusted disposable income; the ratio to income of real capital gains on the housing stock, $\dot{q}^h k^h_{-1}$ (where q^h denotes the level of house prices in relation to the private expenditure deflator and the diacritical dot denotes rates of change); the change in the ratio to disposable income of stock market capitalisation, Δk^s ; and the change in the inflation rate squared, $\Delta \pi^2$, a transformation that makes expenditure more sensitive to changes in inflation when it is high rather than low. Also included in ΔX is an index of the level of consumer confidence (C), which is $I(0)$ (the augmented Dickey-Fuller (ADF) statistic is –4.9).

Data limitations and the likelihood of structural change, notably in the housing market and in the nature of corporate objectives, guide the choice of sample period, which runs from 1979 to 2008. Estimation is by ordinary least squares supplemented by a test for the weak exogeneity of contemporaneous variables, a null that is not rejected.

The preferred results for a linear transformation of equation (A1) are shown in Table A1. As expected, the change in expenditure is related positively to the change in income, housing capital gains, changes in the stock market income ratio, consumer confidence, past levels of financial wealth and the non-financial wealth ratios and related negatively to inflation shocks and to past differences between the level of expenditure and income. The fit is tight ($\bar{R}^2$ of 96%) and residuals appear to be normally distributed, free of serial correlation, first and higher order (not reported), and of heteroscedasticity. There is no evidence of functional misspecification.

With the last ten years of the estimation sample period set aside, the equation passes a standard Chow test for the adequacy of out-of-sample predictions. The stability of the relationship is also assessed from the CUSUM test (not reported) based on the cumulative sum of one-step-ahead residuals resulting from recursive estimation and from the CUSUM of squares test (not reported) based on the cumulative sum of the same residuals squared. Both tests stay well within the 5% confidence limits.

In principle, a test for cointegration can be based on residuals calculated by deducting from the level of expenditure the algebraic long-run static-state solution, E^s , derived by setting to zero the I(0) variables in equation (A1):

$$E^s = \tau_1 Y^a + \tau_2 (V + \tau_3 k + \tau_4) \qquad \text{(A2)}$$

In static stock-flow equilibrium, the financial surplus is also zero ($E^s = Y^a$). In this case, the estimated level of financial wealth, V^s, is given by:

$$V^s = \frac{(1 - \tau_1)Y^a}{\tau_2} - \tau_3 k - \tau_4 \qquad \text{(A3)}$$

The residuals formed by deducting V^s from V can be similarly used to test for cointegration.

In practice, the short sample period (30 annual observations) makes this procedure highly vulnerable to the low power of standard unit root tests: too frequently the null of nonstationarity will not be rejected. This is probably the case here. The ADF statistics for the residuals formed from equations (A2) and (A3) are –3.4 (compared with a critical value at the 5% level of significance of –5.3) and –3.1 (critical value of –4.9) respectively. Inspection of these residuals reveals large oscillations associated with $\dot{q}^h k^h_{-1}$, the flow of real capital gains on housing. The null of nonstationarity for this variable is rejected over the post-war period but not over the period used for equation estimation. The conclusion drawn is that the estimation period is too short properly to test for the presence of cointegration. Further work is required to allow for structural change using a long historical dataset (as noted in Martin (2009a)).

Table A1: Private sector expenditure estimation results, sample period 1979 to 2008

	Regressors											Regression statistics						
	ΔY^a	$\dot{q}^h k^h_{-1}$	Δk^s	$\Delta \tau^2_{-1}$	C_{-1}	E_{-1}	Y^a_{-1}	V_{-1}	k^h_{-1}	k^{nh}_{-1}	k^s_{-1}	$\bar{R}^2$	Z1	Z2	Z3	Z4	Z5	Z6
α	0.48	400.2	169.4	-75.6	426.1	-0.74	0.66	0.15	366.1	515.0	418.0	0.96	0.58	1.22	0.02	0.72	1.21	0.11
t	7.6	11.4	4.1	-4.5	3.4	-9.3	8.4	6.2	9.5	4.9	8.2	p	0.46	0.28	0.99	0.71	0.41	0.89

See text for definition of variables. Ordinary least squares regression for the dependent variable ΔE using annual data including an intercept (not reported). α - coefficient value; t – t-statistic; p – p-value. Regression statistics: $\bar{R}^2$ - coefficient of determination adjusted for degrees of freedom; Z1 – F version of Breusch-Godfrey Lagrange Multiplier (LM) test for first order serial correlation; Z2 – F version of Ramsey's RESET test for functional form; Z3 – LM version of Jarque-Bera's normality test; Z4 – F version of White's heteroscedasticity test; Z5 – F version of Chow's predictive failure test (Chow's second test) for the adequacy of the predictions using the last 10 years of the sample period; Z6 – F version of Wu-Hausman statistic for the weak exogeneity of ΔY^a, $\dot{q}^h k^h_{-1}$ and Δk^s. Coefficient values for $\dot{q}^h k^h_{-1}$, Δk^s, k^h_{-1}, k^{nh}_{-1}, k^s_{-1} are divided by 100.

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