Financial Stability Paper No. 10 – April 2011

Growing fragilities? Balance sheets in *The Great Moderation*

Richard Barwell and Oliver Burrows

BANK OF ENGLAND

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The years leading up to the financial crisis are widely acclaimed as a period of remarkable, if not unprecedented, stability in the global economy. From a perspective that focuses on the value and volume of gross domestic product, that assessment is valid. The world's major economies enjoyed a sustained period of growth. Inflation was low and stable. But from a perspective that focuses on the value of financial assets and on the volume of market activity, this period was anything but stable. The past decade has borne witness to sharp swings in asset prices and a large expansion in credit and balance sheets. This paper considers a flow-of-funds approach that stresses the role of asset prices, credit and balance sheets. This framework is used to shine a different light on the Great Moderation in the United Kingdom. It suggests that there were linkages between many of the macroeconomic puzzles of the day and the balance sheet developments that led to financial instability. It further argues that approaches to macroeconomics that stress the importance of balance sheet linkages might be helpful in spotting building financial fragility.

1 Introduction

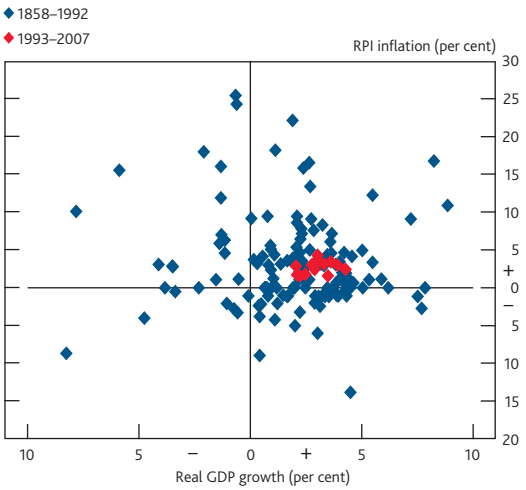
In the years leading up to the financial crisis the global economy enjoyed a period of remarkable, if not unprecedented, stability, at least as far as conventional macroeconomic indicators were concerned — so much so that this period earned its own label: *The Great Moderation*.(1) The UK economy enjoyed an extended period of uninterrupted economic growth and low and stable inflation, and our major trading partners had similar experiences. According to Benati's (2006) authoritative study for the United Kingdom:

> 'The post-1992 inflation targeting regime appears to have been characterised, to date, by the most stable macroeconomic environment in recorded UK history, with the volatilities of the business-cycle components of real GDP, national aggregates, and inflation measures having been, post-1992, systematically lower than for any of the pre-1992 monetary regimes/historical periods, often markedly so, as in the case of inflation and real GDP.'

Charts 1 and **2** illustrate these developments. A scatter plot of growth and inflation outcomes over a century and a half of data (**Chart 1**) clearly reveals how stable the period between 1993 and 2007 (red diamonds) was by historical standards. **Chart 2** focuses on more recent history, illustrating how both the level and distribution of quarterly nominal GDP growth declined over the 1990s and the beginning of the current decade.

It is difficult to overstate exactly how much of a break with past macroeconomic performance this represented. Speaking in 2002 to the Association of Corporate Treasurers, the former Governor of the Bank, Eddie George, reminded his audience

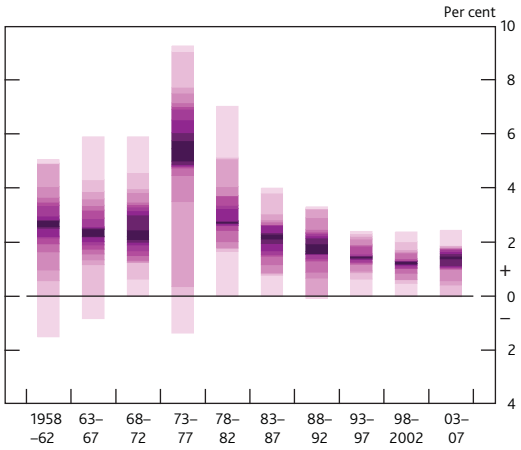
Chart 1 UK annual growth and inflation outcomes over the past 150 years



Source: Bank of England.

(1) This term was coined by James Stock and Mark Watson in a paper in 2002.

Chart 2 The distribution of quarterly growth in UK nominal GDP



Sources: ONS and Bank calculations.

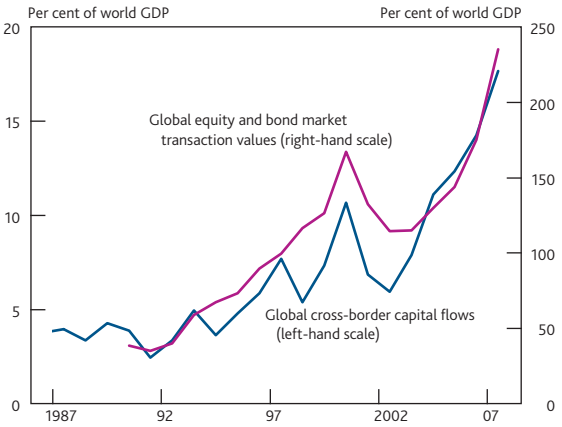
how they had reacted to a speech he had given to them eight years earlier:

> 'At that time we'd had just 2½ years of growth with low inflation — after the 1990/91 recession. I told you that we were determined to maintain price stability as a necessary condition for sustainable growth of output and employment. You all hooted with laughter! Your President said it had been the best joke of the evening — even though you'd heard it many times before.'

Developments in financial markets proceeded at an altogether less sedate pace during the Great Moderation. The process of global financial deepening gathered momentum, with ever larger amounts of money flowing through the world's major financial markets (**Chart 3**), coupled with rapid financial innovation through the emergence of new and ever more complex products. Emerging Asian economies and oil exporters ran large and persistent current account surpluses, which were recycled to developed economies, reducing the cost of debt. Credit flows and balance sheets in the United Kingdom ballooned (**Chart 4**). And boom and bust were certainly not banished from financial markets: the period was characterised by huge swings in equity prices and a long rise in property prices (**Chart 5**).

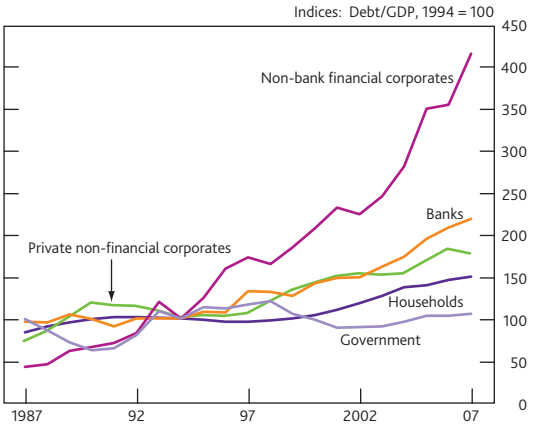
For a decade or more these developments appeared divorced from what was happening in the real economy. In the past, rapid growth in the quantity of money has typically presaged a transitory burst in economic activity and an inevitable increase in inflation. More generally, movements in asset prices can influence demand, both through direct wealth effects and indirectly, by influencing the terms on which agents can borrow(1) (and therefore spend). However, the gyrations in financial markets appeared to have little material impact on the real economy during the Great Moderation; it remained a period of unprecedented stability in output and inflation. And while some economists identified building vulnerabilities in the

Chart 3 Global financial markets



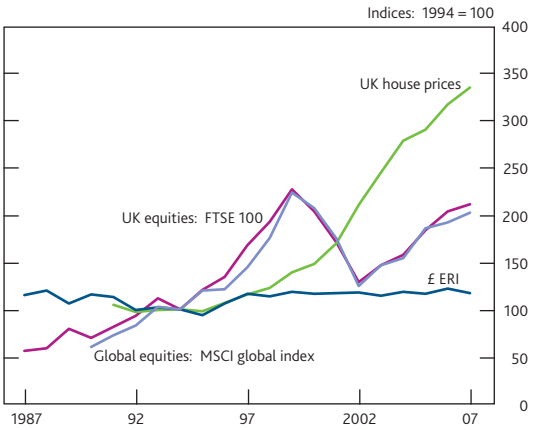
Sources: BIS, World Federation of Exchanges and Bank calculations.

Chart 4 UK sectoral debt/GDP



Sources: ONS and Bank calculations.

Chart 5 Asset prices



Sources: ONS, Thomson Reuters Datastream and Bank calculations.

(1) Two channels are at play here. First, rising asset prices reduce the costs of capital for agents raising new funds in the market (investors are willing to pay more for a security which offers a given claim on future resources). Second, rising asset prices generate an increase in net worth for those agents holding the assets, which reduces their external finance premium.

financial system, few, if any, anticipated they would result in the scale and breadth of financial instability of recent years.

The recent crisis has led many economists to question the way they think about the relationship between developments in the real economy and in financing flows, balance sheets and asset prices, particularly when looking for financial vulnerabilities.(1) This interest is brought into sharp relief by the development of macroprudential policy. While much interesting theoretical work remains to be done, this paper contends that a simplified flow-of-funds framework offers a useful prism on these relationships in the United Kingdom, by outlining a broad set of stylised facts that link together real economy developments with the evolution of balance sheets and asset prices.

Analysing flow-of-funds data to examine the relationship between the real economy and financial variables is by no means new. Recent work by Godley and Lavoie (2007), in which they build a macroeconomic model based on a complete accounting framework for real economy and financing flows, traces the history of such approaches back through Tobin in the 1970s and 80s to the French circuitistes of the early 20th century.(2) Indeed, the Bank of England used to publish flow-of-funds matrices back in the 1960s and used to forecast flow-of-funds data alongside standard macroeconomic variables, with staff noting that 'The merit of this system [a closed accounting framework that encompassed both national income flows and flow of funds data] is that each element can be tested by the plausibility of its counterparts... The whole is reasonable only if the parts are.'(3) More recently, work at the Bank of England in the past decade attempted to project household and corporate balance sheets using the Bank's macroeconomic projections and taking account of disaggregate information on the distribution of debt within each sector.(4)

The objectives of this paper are relatively modest: first, to construct a simple flow-of-funds framework for the United Kingdom; and second, to use this to look back over the period 1994–2007 to see whether it could have been useful in spotting the building financial fragilities. The motivation lies in the old observation that money is ubiquitous in a 'modern' economy, tying agents together at any point in time as a method of transaction and over time as the unit of denomination of almost all contracts, whether it is for the labour supplied by employees to firms, or for the repayment of loans by borrowers to lenders. By building an accounting framework that follows the circulation of money through the economy, we can therefore ensure that we account for all the critical flows of financing that lead to the stocks of assets and liabilities in which financial fragility can build. Moreover, we can trace the linkages between these financial fragilities and the flows of income and expenditure that are the more usual focus of mainstream models.

While much good analysis of sectoral balance sheets is already done in the Bank and elsewhere, particularly for the household and corporate sectors, the intended contribution of the framework described in this paper stems from its completeness. Looking ahead, we hope that using a framework that draws out the linkages between activity and balance sheets in the non-financial sectors and asset prices and the balance sheets of the financial sectors can make a contribution towards the detection of growing financial fragilities. Looking back over the period 1994–2007, our framework provides us with a set of stylised facts that link together the macroeconomic flows of the Great Moderation and the more dramatic balance sheet developments — for example, linking households' low savings to banks' increased reliance on wholesale funding. We then attempt to explain those stylised facts, for each sector in turn, with partial analysis of their behaviour.

The rest of this paper is organised as follows. Section 2 presents the balance sheet framework used in this paper; Section 3 applies this framework to the United Kingdom over the period of the Great Moderation, focusing in particular on two distinct phases: the boom and bust of the dotcom bubble around the turn of the millennium, and then the rapid expansion of credit towards the end of the Great Moderation. Section 4 concludes.

2 The balance sheet framework

2.1 A stylised accounting framework

Godley and Lavoie build a series of closed accounting frameworks based on the system of National Accounts, which encompass: the standard national income flows, such as wages and consumption; the counterpart financing flows, such as bank loans and deposits; and stocks of physical and financial assets and liabilities. This framework lends itself to representation in a set of matrices. The first matrix captures flow variables (**Table A.1**). The columns represent the sectors of the economy and the rows represent the markets in which they interact. The matrix has two important properties. Each sector's resources and uses columns provide their budget constraint — the sums must equal to ensure that all funds they receive are accounted for. And each row must also sum to zero, to ensure that each market clears — that is, the supply of a particular asset must be matched by purchases of that asset, to ensure that no funds go astray.

The table can usefully be split in two, with the top half covering the standard income and expenditure flows and the bottom half covering financing flows. The two halves of the table are linked together by each sector's 'net lending balance',

(1) See, for example, Caballero (2010) and Greenspan (2008).
(2) See Godley and Lavoie (2007), Chapter 1.
(3) Bank of England (1972).
(4) See, for example, Benito, Whitley and Young (2001).

Table A.1 Stylised flow matrix

		Households		Firms		Banks		...	RoW		Σ
		Resources	Uses	Resources	Uses	Resources	Uses		Resources	Uses	
Income flows	Wages	+ wages			– wages						0
	Consumption		– goods	+ goods							0
	Interest payments/ receipts	+ interest			– interest	– interest	+ interest				0
	...										
	Net lending	$Resources_{hh} + Uses_{hh} = NL_{hh}$		$Uses_{firm} + Uses_{firm} = NL_{firm}$		$resources_{bank} + Uses_{bank} = NL_{bank}$					0
		Resources (= NAFL)	Uses (= NAFA)	Resources (NAFL)	Uses (= NAFA)	Resources (NAFL)	Uses (= NAFA)				
Financing flows	Δ Loans			+ loans			– loans				
	Δ Deposits		– deposits			+ deposits					
	...										
	Σ	$NAFA_{hh} = NL_{hh} + NAFL_{hh}$		$NAFA_{firm} = NL_{firm} + NAFL_{firm}$		$NAFA_{bank} = NL_{bank} + NAFL_{bank}$					

Table A.2 Stylised balance sheet matrix

	Households		Firms		Banks		...	RoW		Σ
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities		Assets	Liabilities	
Loans				– loans	+ loans					0
Deposits	+ deposits					– deposits				0
Domestic equity	+ equity			– equity				+ equity		0
Physical capital			+ capital							Capital
...										
Net worth		$(= L_{hh} - A_{hh})$		$(= L_{firm} - A_{firm})$		$(= L_{bank} - A_{bank})$			$(= L_{RoW} - A_{RoW})$	– capital
Σ		0		0		0			0	0

or 'financial surplus'. The net lending balance can be used to summarise each sector's income and expenditure flows as the difference between the amount the sector spends on consumption and physical investment and the amount that it receives in income. This difference must be met by financing flows — either borrowing or the sale of financial assets. In national accounts terminology, a sector's net lending balance (NL) must equal its net acquisition of financial assets (NAFA) less its net acquisition of liabilities (NAFL). Across sectors, the net lending balances have to sum to zero, as all funds borrowed by one sector must ultimately come from another.

While it is useful to split the table for accounting purposes into income and expenditure flows and financing flows, it is important to note that the acquisition of financial assets and liabilities is not necessarily determined purely by imbalances between income and desired expenditure. Sectoral balance sheets can adjust for other reasons. Agents may want to borrow money to purchase assets, simultaneously acquiring financial assets and liabilities. And on occasion agents may want to shrink the size of their balance sheets, selling off financial assets to pay off financial liabilities. Finally, some agents may default on their debt obligations, which will involve a revision in the financial assets and liabilities of both debtor and creditor. At an aggregate level, simultaneous expansion of a sector's assets and liabilities invariably represents one set of underlying agents taking on assets whilst the other takes on liabilities. The household sector provides an important example. If a young household takes a mortgage to buy a house from an old household, the sector in aggregate simultaneously acquires a liability (the young household's mortgage) and an asset (the deposit created for the young household to pay to the old household).

All of these activities — leveraging up, deleveraging and default — involve NAFA and NAFL moving in lockstep. The net lending identity still holds: the gap between income and expenditure determines the difference between NAFA and NAFL. But the absolute size of the NAFA and NAFL flows is determined by agents' actions in financial markets.

The second table captures the balance sheet positions of each sector. The balance sheet matrix is updated over time using data on the acquisition of assets and liabilities from the transaction flows matrix, and revaluation effects to asset

positions. Proceeding in this manner, balance sheets always balance across sectors, flows of funds are always accounted for over time and the impact of flows of funds on balance sheets is always recorded.

The design of such a framework entails interesting questions about the degree of granularity to introduce. Financial fragility tends to lurk in the tails of weak institutions within any particular sector, rather than being uniformly distributed, which argues in favour of more granularity. Similarly, the degree of disaggregation of instruments is of interest: should we aggregate up all fixed income instruments and call them debt, or do we want to break them down along maturity lines to try to identify maturity mismatch? In practise, the answers to these questions are usually pragmatic, determined by the availability of data.

2.2 Assembling an accounting framework for the United Kingdom

In this paper, we focus on financing flows and balance sheets and so our accounting framework starts half way down **Table A.1**, at the point at which real economy flows have been summarised in each sector's net lending position. Because the accountancy framework described above follows the same principals as the system of National Accounts upon which the Office for National Statistics' (ONS) National Accounts are based, the ONS publish most of the data we need to calculate our closed system of accounts. Financial flows are published in the sectoral *financial accounts*, while stocks are published in the sectoral *balance sheets* (see Appendix 1 for a presentation of the raw ONS data in matrix form). This constrains our breakdown of the sectors into the usual System of National Accounts high-level sectors: households, non-financial corporates (NFCs), monetary financial institutions (MFIs), insurance companies and pension funds (ICPFs), other financial institutions (OFIs) and the rest of the world (RoW). We occasionally consolidate ICPFs and OFIs into a non-bank financial (NBF) sector.

We face three problems in using this data to construct the sort of stylised matrix shown above. First, data quality: the ONS do not have hard data for all the entries in the matrix. Second, 'non-uniqueness': for some assets, principally equity and debt securities, each sector's asset and liability position is calculated, but it is not possible to uniquely map the assets of one sector to the liabilities of the others. As an example, we know households' holding of domestic firms' equity, but we do not know the breakdown between bank equity, non-financial firm equity and other financial companies' equity. Third, there is an excess of granularity on the asset side, making the data unwieldy. These problems are addressed in turn below.

2.2.1 Data quality

Appendix 1 shows the ONS' own categorisation of the financial accounts data, by quality of datum. A few points are worth drawing out. First, while much of the table is judged to contain poor quality data (where the figures involve 'a substantial amount of estimation, or where the coverage is known to be significantly incomplete'), these red cells tend not to account for much of the flows by size. For example, although data quality is poor for most household asset purchases, households' fianancial asset holdings are completely dominated by bank deposits and pension and insurance fund claims, which are well measured. Second, data quality varies substantially by sector. Quality is good for the MFI and ICPF sectors, reflecting the fact that MFIs' balance sheets are covered monthly by Bank of England surveys and ICPF balance sheets are covered quarterly by ONS surveys. Quality is poor for the NFC and household sectors, where the ONS do not have comparable surveys for HHs and PNFCs. It is worth noting that coverage of PNFC liabilities improves significantly if their debt and equity issuance is reclassified to good. Public issuance data comes from the London Stock Exchange, via the Bank, and is judged poor by the ONS because it may be incomplete.

2.2.2 'Non-uniqueness'

There are six significant asset classes for which we do not have unique data on sectoral holdings, of which quoted and unquoted equity and short and long-term debt are the most important (Appendix 1). In all four cases, it is not possible to distinguish between a sector's transactions in NFC, OFI, ICPF, and to a lesser extent MFI, liabilities. In practice, this reduces to an inability to distinguish between the liabilities of NFCs and OFIs, as ICPFs issue little debt or equity. We have dealt with this by attempting to allocate non-unique claims uniquely across sectors using weights derived in one of four ways: by imposing restrictions that arise naturally from the data used to construct the accounts (ie, the ONS note that ICPFs 'other accounts receivable' comprise only claims on households); by imposing restrictions that seem economically sensible (ie, we only allow NFCs to hold unquoted equity in other NFCs, as there are few reasons for them to hold unquoted equity in MFIs or OFCs); by estimation, where we regress NAFL on NAFA; and by residual, where one sector's share is a time-varying residual. The use of residuals follows the ONS' use of residuals — they allocate at least one sector's share of flows by residual for most categories. In practice, the breakdown of assets across sectors is not material to the analysis in this paper, but further details are available from the authors on request.

2.2.3 Unwieldy amounts of data

Finally, to simplify the flow-of-funds matrix for analytical purposes, we aggregate across asset classes to produce a higher-level breakdown, as shown in **Table B**. The properties of the ideal flow-of-funds matrix are preserved: the rows sum to zero and the columns sum to sectoral budget constraints, with the inclusion of a small residual which arises by ignoring some sector's transactions in some instruments, where they appear

Box 1
Extending the accounting framework into a model

An obvious extension of this approach is to formalise the explanations posited for behaviour, and to develop a fully fledged macroeconomic model. In principle, one could build a model of boundedly rational heterogeneous agents which allowed a rich treatment of asset prices, credit flows and balance sheet positions. In practice, this solution looks far beyond the current frontier. A tractable alternative, as pursued by Godley and Lavoie (2007), is to instead use empirically plausible behavioural rules. A similar approach would be to split the model into sectoral blocks, and to allow for a disaggregation of agents within each block, as shown in **Diagram A**.

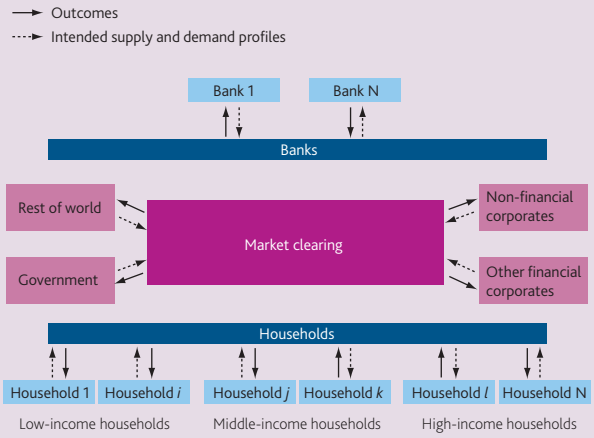
Godley and Lavoie start with an accounting framework similar to that described above, and add behavioural rules of thumb for each sector of the economy. This in itself is sufficient to construct a macro model, and is akin to the old macroeconometric models constructed before the rational expectations revolution of the 70s. The rules can be calibrated to match established multipliers in the academic literature (such as on the marginal propensity to consume out of wealth) or to conduct scenario analysis: for example, *what if UK corporates behave as Japanese corporates did during the Lost Decade?*

To adapt the approach to financial stability ends, models of disaggregate behaviour can be embedded within sectors of interest. For example, the corporate sector could be broken down into heterogeneous groups of firms, whose behavioural choices — say, over leverage — can lead to a tail of fragile firms. Aggregate sectoral behavioural rules can then be built from the agent level behaviour, which can then be used in the macro model. Given behavioural rules for each sector of the economy, some constructed bottom-up from behavioural models, a market clearing mechanism would be needed in the centre of the model to ensure all accounting constraints hold. Quantities and prices would then be allocated to sectors and where sectors had been disaggregated, aggregate quantities would need to be spread across individual agents in a manner that ensured their individual balance sheet constraints were not violated. In Godley and Lavoie, the market clearing mechanism involves at least one sector operating a buffer stock in each market — a concept which has clear parallels in the real world.

A key choice in the design of such a model would be the appropriate level of disaggregation. As with the approach taken to modelling behaviour, this will depend very much on the question posed and the preferences of the user. The balance sheets and behaviour of agents in some sectors may be aggregated together to form a simple representative agent if they are not key to the question at hand, while others may have to be modelled at a much more granular level. The one constant across all these models is the accounting identities: stock and flow identities must hold.

While such an approach would depart from the orthodoxy of optimising agents, it would make it much easier to conduct scenario analysis in which financial fragilities arise on balance sheets, as such fragilities are generally ruled out by construction in optimising models of rational agents. It also has interesting implications for asset prices. Because the balance sheet framework forces an explicit and consistent accounting of the supply and demand for assets, these factors have to determine asset prices in the model. This departs from the conventional assumption that assets can be priced simply using a no-arbitrage condition and a representative agent's preferences and expectations of the future returns on that asset. However, the idea that demand and supply imbalances influence asset prices is perfectly consistent with the conventional wisdom that the behaviour of institutional investors can and do influence asset prices.(1)

Diagram A A schematic of a balance sheet model



(1) One example is the UK government bond market. There are very few genuine substitutes for long-dated index-linked government bonds in the market, so institutional investors who value these features (for whom the long end of the gilt market is their preferred habitat) might have a pretty inelastic demand for these assets. A further example is the common claim, referenced in Section 3, that Asian central banks' accumulation of FX reserves during the Great Moderation, which they held mainly in the form of AAA-rated developed world debt, shifted the global balance between the demand and supply of these assets, bidding down risk-free interest rates.

to be very small.

2.2.4 Building a balance sheet matrix

The ONS' sectoral balance sheets can be aggregated up to provide a balance sheet matrix corresponding to the flow-of-funds matrix outlined above. But to complete the accounting framework, we need to account for the revaluation of asset prices. This is done by residual, using the following formula:

$$\text{revaluation}^{i,s,t} = \text{stock}^{i,s,t} - (\text{stock}^{i,s,t-1} + \text{flow}^{i,s,t})$$

where i denotes the asset class, s the sector and t the time period.

2.3 Making the link to financial stability

The remainder of this paper applies the above framework to the UK between 1994 and 2007, laying out a broad set of stylised facts that covers the main financing flows and balance sheet developments during the period of the Great Moderation. In further work, we intend to model the growth of financial fragility, by building behavioural models based on the accounting framework laid out here. Box 1 offers more details. For the purposes of this paper, we attempt a narrower task: to explain the developments in financing flows and balance sheets with qualitative stories and partial analysis, drawing wherever possible on disaggregate data to supplement the macroeconomic data.

The novelty of this paper is therefore simply to apply a flow-of-funds framework to UK data over the period 1994–2007, to catalogue some stylised facts, and to see how the observations made at the time about the Great Moderation stack up against those facts. Where facts are left unexplained, we consider some plausible alternative explanations. The underlying motivation is to illustrate that, by combining financing flows and balance sheets with the standard set of real economy income and expenditure variables, we may help identify the growing financial fragilities that characterised the run-up to the recent financial crises.

3 The Great Moderation in retrospect

Introduction

The accounting framework described in Section 2 is applied to UK data from 1994 to 2007 in **Table B.1–4** and **Charts 6.a–f**. The Great Moderation is split into four periods: 1994–96, 1997–2000, 2001–03 and 2004–07. The first and third are periods of generally modest balance sheet growth, while the second and fourth see rapid balance sheet growth across almost all sectors. For each period, and for each sector of the economy, we show the initial balance sheet positions at each of the key dates outlined; the NAFA, NAFL and NL accounts; and the effects of revaluation.

Two events loom large in the financial markets between the early 1990s, when the global economy emerged from recession, and the eve of the financial crisis in mid-2007: the tech boom and bust, in the late 90s and early 2000s, and the great credit expansion, which took off in earnest following the collapse of the tech bubble, but had been an underlying feature of the whole period. The banks were on the periphery of the tech boom. Companies primarily raised funds in capital markets, primarily through equity issuance, reflecting the decline in the cost of equity through this period. And because that flow of funds from end-investors was not intermediated across banks' balance sheets, the provision of bank credit to the real economy was not seriously impaired by the collapse of the tech boom, which in turn helped to explain the muted spillover effects. By contrast, banks played a much more central role in financing the expansion in balance sheets and inflation of asset prices during the credit expansion period, creating far greater systemic fragilities.

Sections 3.1 and 3.2 consider these two periods of rapid balance sheet expansion in turn, focusing primarily on developments in UK balance sheets. For each, we present the main stock and flow developments over the period, and how they were connected; we then try to explain them with descriptions of behaviour within and across sectors, before presenting disaggregated evidence to support these explanations. We conclude each section with a consideration of the financial fragilities to which they led. Finally, Section 3.3 discusses developments in the rest of the world over the whole period, which provides part of the explanation for the extraordinary growth in UK banks' balance sheets.

3.1 Expansion 1: tech boom — 1997–2000

Before the tech boom came a period of relative calm. In the mid-90s, as the effects of the early 1990s recession abated, growth was a touch above trend, as the margin of spare capacity that had built up during the recession was slowly worked off (**Chart 7**). In terms of the balance of savings and investment — net lending — at the sectoral level, the household sector was running a surplus, offsetting a fiscal deficit (**Chart 8**).

Technological advances in the technology, media and telecommunications sector (TMT) and expectations that they would in time deliver large returns appeared to lead to a wave of investment in the United States, and a more modest increase on this side of the Atlantic. Those expectations led to increases in equity prices around the globe, particularly in those sectors expected to benefit most from improved technology.

3.1.1 Main balance sheet developments

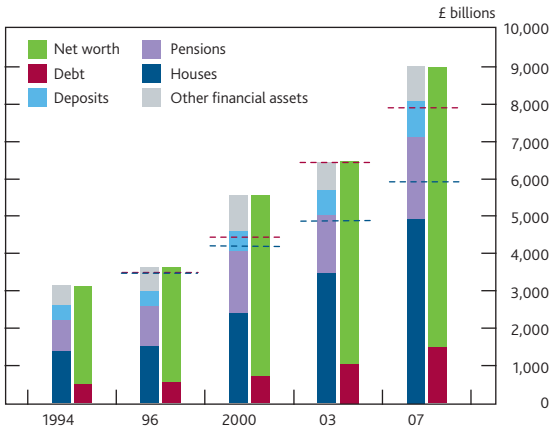
In the United Kingdom, there was a modest increase in investment and overall activity. But there was a more notable increase in the corporate sector balance sheet, and to a lesser

Charts 6.a–f Balance sheet growth and financing flows in the Great Moderation

Households

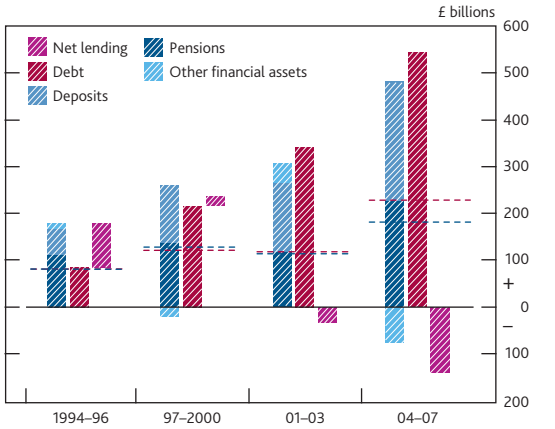
Balance sheets

Chart 6.a



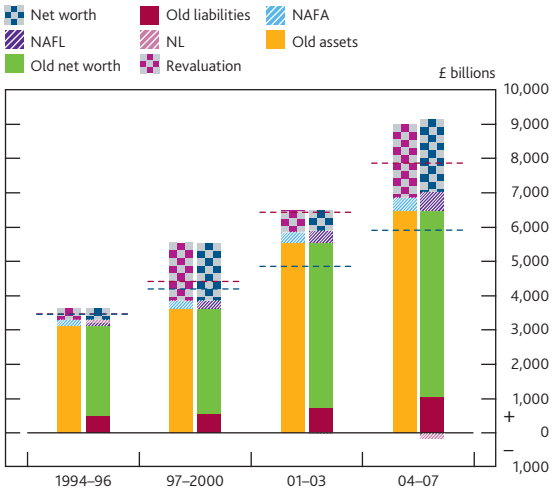
NAFA = NAFL + NL

Chart 6.b



Revaluation of balance sheets

Chart 6.c



Corporates

Chart 6.d

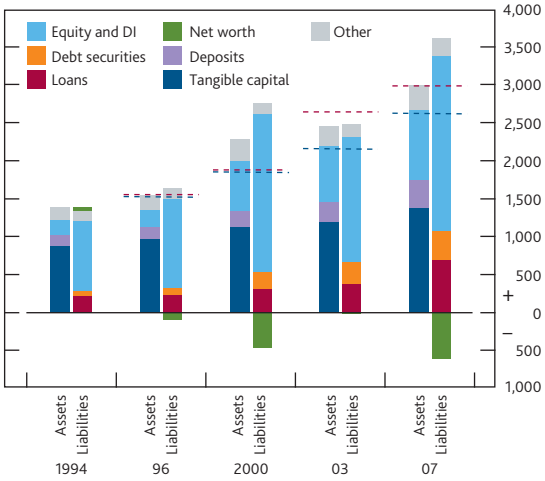


Chart 6.e

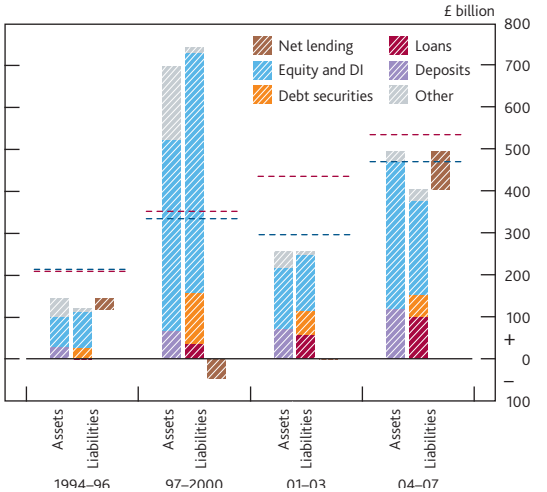
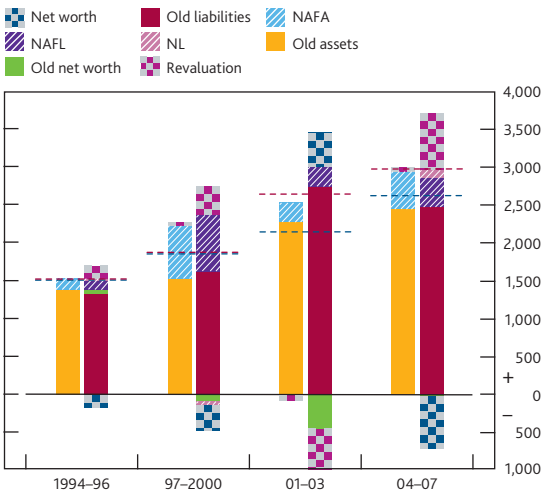


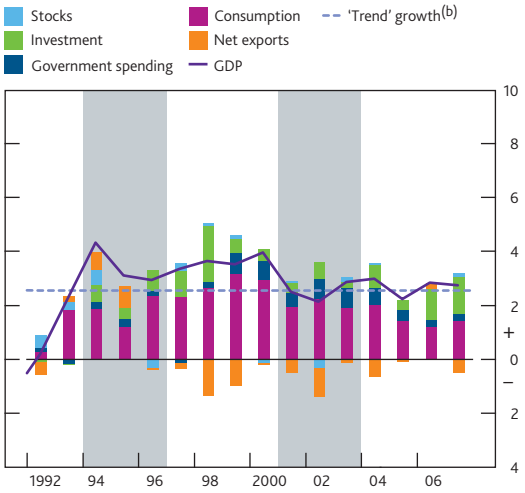
Chart 6.f



Sources: ONS and Bank calculations.

Dashed lines give benchmarks for the growth in stocks that would occur if they grew in line with trend nominal GDP (5%) in each period considered (red line), and cumulatively from 1994 (blue line). Solid bars represent stocks, dashed bars show flows and hatched bars show revaluation effects and changes in net worth.

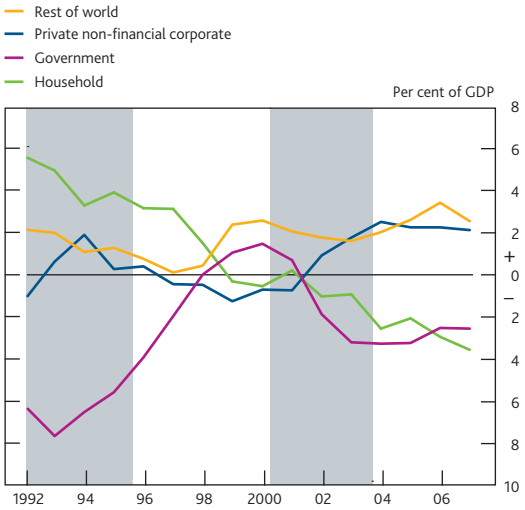
Chart 7 Macro flow variables[a]



Sources: ONS, Thomson Reuters Datastream and Bank calculations.

(a) Grey shaded areas cover periods of slower balance sheet expansion; 1994–96 and 2001–03.
(b) UK real growth averaged 2.6% between 1948 and 2007.

Chart 8 Sectoral net lending balances[a]



Sources: ONS, Thomson Reuters Datastream and Bank calculations.

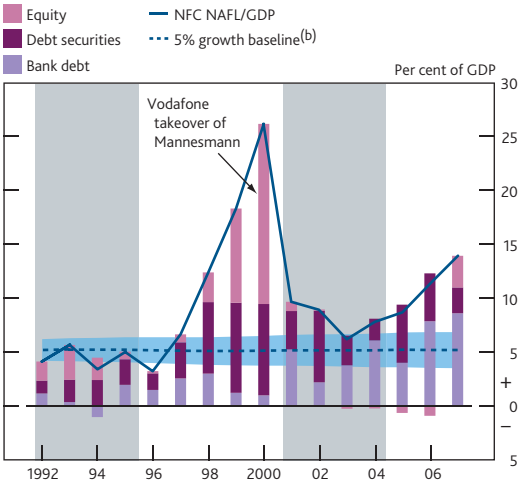
(a) Grey shaded areas cover periods of slower balance sheet expansion; 1994–96 and 2001–03.

extent the household sector balance sheet (**Charts 6.b**, **6.e**, **9**, **10 and Table B.2**). A quick glance at the financial account shows that the expansion in the household and corporate sector balance sheets far exceeded that required by their savings and investment positions; indeed, the corporate sector ran a surplus.

The household sector took on bank loans, predominantly to finance house purchases. House prices began a long march upwards (**Chart 5**), boosting net worth for existing homeowners through revaluation effects (**Chart 6.c**) and providing a large pool of liquid assets for those households trading down or out of the housing market, which accumulated as bank deposits and other financial assets.

What is notable about the expansion in corporate balance sheets during this period is that the banking system played a peripheral role, at least in a relative sense. As we will go on to describe, the growth in bank credit during the 2000s was central to the expansion in corporate balance sheets, whether that was to underpin the commercial property boom or to finance balance-sheet restructuring. In contrast, in the late nineties, companies borrowed only a modest amount from banks, choosing to raise money directly in capital markets instead (**Chart 9**). But the key developments in this period were in equity markets. The UK corporate sector bought a lot of foreign equity during this period, dominated by a number of high-profile deals, and revaluation effects were very large, as equity prices rose around 70% between 1996 and 1999.

Chart 9 Corporate NAFL/GDP[a]



(a) Grey shaded areas cover periods of slower balance sheet expansion; 1994–96 and 2001–03.
(b) '5% growth baseline' shows the rate of accumulation of financial liabilities consistent with debt growing 5% per year. If nominal income growth is close to trend (ie 5%), this is the rate of accumulation that would keep debt/income constant. The blue band marks a two standard deviation error band around this growth rate, calculated using annual nominal growth between 1992 and 2007.

3.1.2 Underlying behaviour

We leave aside for now the growth in household balance sheets, as by far the most notable development in the period is the sharp rise in equity prices and the rapid expansion of the corporate sector balance sheet.

The mainstream view at the time was that the 'productivity miracle' underway in the United States, and anticipated elsewhere, justified somewhat higher equity prices, although there was scepticism about whether this could explain all of the rise in equity prices, or whether some of it looked like a bubble.[1] Some economists had less compunction in calling it a bubble, with Shiller (2000) describing a positive feedback loop, in which impressive past increases in technology stock prices fuelled expectations of strong future gains among investors, which proved self-fulfilling when investors acted

(1) See, for example, Greenspan's testimony of July 1999, in which he says, 'At the root of this impressive expansion of economic activity has been a marked acceleration in the productivity of our nation's workforce. This productivity growth has allowed further healthy advances in real wages and has permitted activity to expand at a robust clip while helping to foster price stability'. He later cautions, 'By itself, the interpretation that we are currently enjoying productivity acceleration does not ensure that equity prices are not overextended'.

Table B.1 Balance sheet developments: 1994–96(1)

	HHs		NFCs		MFIs		OFIs		ICPFs		Govt		RoW	
Initial balance sheets, Dec 1993														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	1,757	486	495	1,514	1,687	1,685	491	524	888	968	258	371	1,369	1,392
Non-financial assets	1,431		836											
Net worth		2,703		-182		2		-33		-80		-113		-23
Flow of funds - NAFA, NAFL and net lending[1], end-Dec 93 to end-Dec 96														
Asset category	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**
Deposits, liabilities of														
MFIs	57		26			297	44		25		-2		147	
UK interbank deposits					56	56								
RoW banks	3		4		87		59		2		2			157
Loans, assets of														
MFIs		73		29	236			75		2		10		47
Non-banks, secured on dwellings		-3	-0				-1		-1		-0			
RoW MFIs		-2		-16				64		-1		-0	44	
FDI loans into the UK				10		-1		1		1			10	
FDI loans out of the UK			15		0		2		1					18
Debt securities, liabilities of														
Govt	0		-0		6		3		57		0	78	11	
RoW	-2		5		50		-1		7		-2			56
Domestic private sector	1	1	4	26	40	95	7	24	13	1	-3		84	
Of which (NAFA estimated):[2]														
NFCs				26			1		2				23	
OFIs			0		9			24					14	
MFIs	1		2		31	95	6		10		-0		44	
Debt residual	1	1	1		-0		0		0	1	-3		3	
Equity, liabilities of														
RoW	5		55		11		11		8		1			91
Domestic mutual funds (OFIs)	4		0		0		1	16	11				0	
Domestic private sector, other	-23		50	74	9	3	13	17	2	2	-12		57	
Of which (NAFA estimated):[2]														
NFCs	-17		36	74	0	-0	10		2		-1		44	
OFIs (excluding mutual funds)	-6				9		2	17	0				11	
Equity residual	-1		15		0	3	1		-1	2	-11		3	
Pensions	110		4				0		0	124	0		8	
Other (not specific to a sector)														
Finance leasing			0	3	1	0	2	0				0		
Financial Derivatives			0		-5	0		-0						-5
Other known	24	15	3	5	1	4	11	-3	11	5	1	20	1	5
Of which:														
Gold and SDRs											1		-1	
Currency	3		1		0	3	0					0	0	0
Other deposits	15		2		-0							17	1	
Other loans by UK residents	1	8	-2	-2	1		9	-3	1	0	-4	2		1
Other accounts payable	5	8	2	7	0	0	2	0	10	5	4	1	1	4
Total NAFA/NAFL and Net lending														
Total NAFA/NAFL	179	84	166	130	491	453	151	193	137	134	-16	108	363	369
Net lending (financial account)		95		36		38		-42		3		-124		-6
Net lending (capital account)		74		25		27		-9		-14		-123		20
Revaluation effects, end-Dec 93 to end-Dec 96														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Equity and debt	106		-66	119	14	-5	25	72	46			-22	84	-35
Derivatives					5	-0								
Pensions	63									61				
Physical capital	100		137											
Other	-6	-18	-15	-9	-67	-41	-13	11	-11	3	-3	0	-63	-37
Final balance sheets, Dec 1996														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	2,099	552	580	1,754	2,130	2,092	654	799	1,059	1,166	239	457	1,753	1,689
Non-financial assets	1,531		973		0		0		0		0		0	
Net worth		3,078		-200		38		-145		-107		-218		63
Δ Net worth		375		-18		36		-112		-27		-105		87

Sources: ONS and Bank calculations.

(1) Colour coding highlights notable annualised growth rates over the period, when compared to a benchmark 5% growth rate and the standard deviations of historical annual growth (over 1988 to 2007 Q2). Red indicates significantly low growth (more than two standard deviations below 5%); orange indicates mildly low growth (more than one standard deviation below); uncoloured indicates broadly normal growth (within one standard deviation of 5%); light green indicates mildly high growth (more than one standard deviation above); and dark green indicates significantly high growth (more than two standard deviations above).
(2) While sector *issuance/NAFL* can be identified in the ONS data, breakdowns of debt and equity *purchases/NAFA* by sector are based on Bank estimations since the ONS does not provide sector-specific line items.

Table B.2 Balance sheet developments: 1997–2000(1)

	HHs		NFCs		MFIs		OFIs		ICPFs		Govt		RoW	
Initial balance sheets, Dec 1996														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	2,099	552	580	1,754	2,130	2,092	654	799	1,059	1,166	239	457	1,753	1,689
Non-financial assets	1,531		973											
Net worth		3,078		-200		38		-145		-107		-218		63
'Flow of funds' - NAFA, NAFL and net lending[1], end-Dec 96 to end-Dec 00														
Asset category	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**
Deposits, liabilities of														
MFIs	120		40			675	80		13		17		406	
UK interbank deposits					87	87								
RoW banks	9		30		233		95		6		1			373
Loans, assets of														
MFIs		155		68	452			115		7		3		105
Non-banks, secured on dwellings		23	-0				25		-0		-1			
RoW MFIs		-0		-8				156		-2		-1	144	
FDI loans into the UK				115		0		3		2			120	
FDI loans out of the UK			82		-1		3		1					85
Debt securities, liabilities of														
Govt	4		1		-22		33		-15		0	-7	-9	
RoW	0		1		132		-39		43		-1			136
Domestic private sector	2	0	-6	120	43	120	58	52	85	2	2		109	
Of which (NAFA estimated):[2]														
NFCs				120			27		51				42	
OFIs			-5		20			52					37	
MFIs	2		-1		22	120	28		32		3		34	
Debt residual	0	0	0		1		2		2	2	-1		-3	
Equity, liabilities of														
RoW	1		356		15		65		-8		1			429
Domestic mutual funds (OFIs)	29		0		0		0	49	19				0	
Domestic private sector, other	-96		183	451	25	14	42	56	-12	14	-9		402	
Of which (NAFA estimated):[2]														
NFCs	-17		153	451	6		24		-7		-7		299	
OFIs (excluding mutual funds)	-53				19		16	56	-2				76	
Equity residual	-25		30		0	14	1		-3	14	-2		27	
Pensions	137		0				0		0	138	-0		1	
Other (not specific to a sector)														
Finance leasing			2	2	0	0	1	0				2		
Financial Derivatives			-0	-0	-3	0		0			0			-2
Other known	30	37	39	17	2	13	14	17	38	31	23	34	0	-3
Of which:														
Gold and SDRs											1		-1	
Currency	7		1		3	10						1	0	0
Other deposits	1		-3		-0		3	3			3	2	1	
Other loans by UK residents	3	32	15	6	-1		8	14	35	14	10	5		-2
Other accounts payable	19	5	26	12	0	3	3	-0	4	17	9	26	-0	-1
Total NAFA/NAFL and Net lending														
Total NAFA/NAFL	237	216	728	764	963	909	376	448	170	190	32	30	1,173	1,123
Net lending (financial account)		21		-36		54		-72		-20		2		50
Net lending (capital account)		26		-20		31		-37		-51		3		48
Revaluation effects, end-Dec 96 to end-Dec 00														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Equity and debt	309		-100	352	78	17	0	324	447			39	254	210
Derivatives					3	-0								
Pensions	428									424				
Physical capital	900		159											
Other	45	-33	-40	4	83	149	4	-65	-19	7	-0	6	-12	46
Final balance sheets, Dec 2000														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	3,117	734	1,169	2,873	3,256	3,167	1,034	1,506	1,657	1,788	271	532	3,167	3,068
Non-financial assets	2,431		1,132		0		0		0		0		0	
Net worth		4,814		-573		89		-472		-131		-261		99
Δ Net worth		1,737		-372		51		-327		-24		-43		36

Sources: ONS and Bank calculations.

(1) Colour coding highlights notable annualised growth rates over the period, when compared to a benchmark 5% growth rate and the standard deviations of historical annual growth (over 1988 to 2007 Q2). Red indicates significantly low growth (more than two standard deviations below 5%); orange indicates mildly low growth (more than one standard deviation below); uncoloured indicates broadly normal growth (within one standard deviation of 5%); light green indicates mildly high growth (more than one standard deviation above); and dark green indicates significantly high growth (more than two standard deviations above).
(2) While sector *issuance/NAFL* can be identified in the ONS data, breakdowns of debt and equity *purchases/NAFA* by sector are based on Bank estimations since the ONS does not provide sector-specific line items.

Table B.3 Balance sheet developments: 2001–03(1)

	HHs		NFCs		MFIs		OFIs		ICPFs		Govt		RoW	
Initial balance sheets, Dec 2000														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	3,117	734	1,169	2,873	3,256	3,167	1,034	1,506	1,657	1,788	271	532	3,167	3,068
Non-financial assets	2,431		1,132											
Net worth		4,814		-573		89		-472		-131		-261		99
'Flow of funds' - NAFA, NAFL and net lending[1], end-Dec 00 to end-Dec 03														
Asset category	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**
Deposits, liabilities of														
MFIs	139		35			617	75		-4		-10		382	
UK interbank deposits					287	287								
RoW banks	13		69		177		97		12		-1			366
Loans, assets of														
MFIs		220		46	520			122		-2		-4		137
Non-banks, secured on dwellings		76					75		0		0			
RoW MFIs		9		68				73		10		0	161	
FDI loans into the UK				72		0		20		3			95	
FDI loans out of the UK			41		-0		2		4					47
Debt securities, liabilities of														
Govt	7		-1		1		1		20		-0	37	9	
RoW	0		10		39		-4		15		-2			59
Domestic private sector	2	0	1	57	10	115	29	97	81	5	-2		152	
Of which (NAFA estimated):[2]														
NFCs				57			22		43				-8	
OFIs			-1		12			97					86	
MFIs	1		1		-4	115	9		37		-2		72	
Debt residual	1	0	2		1		-1		1	5	-0		2	
Equity, liabilities of														
RoW	6		105		16		39		40		1			206
Domestic mutual funds (OFIs)	18		0		0		0	24	6				0	
Domestic private sector, other	-19		56	51	2	16	90	52	-78	6	-12		85	
Of which (NAFA estimated):[2]														
NFCs	-38		26	51	-3	0	69		-57		-11		65	
OFIs (excluding mutual funds)	30				5		17	52	-16				16	
Equity residual	-11		30		-0	16	4		-4	6	-1		4	
Pensions	118		0				0		0	117	0		-1	
Other (not specific to a sector)														
Finance leasing			1	1	-0	1	2	0				1		
Financial Derivatives			0	-1	-5	0		0			-0			-4
Other known	23	36	2	18	-1	3	12	-1	38	28	1	-6	1	-1
Of which:														
Gold and SDRs											-1		1	
Currency	5		1		-0	5						1	0	0
Other deposits	3		0		-0		-1	-3			-3	2	0	
Other loans by UK residents	11	11	-0	9	-1		12	2	6	17	2	-6		-2
Other accounts payable	4	25	2	9	-0	-3	2	-0	32	12	2	-3	-0	0
Total NAFA/NAFL and Net lending														
Total NAFA/NAFL	307	341	320	311	1,047	1,038	418	387	135	167	-26	29	883	809
Net lending (financial account)		-34		8		8		31		-32		-55		74
Net lending (capital account)		-24		27		47		-34		-17		-54		54
Revaluation effects, end-Dec 00 to end-Dec 03														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Equity and debt	-245		-92	-529	-7	-1	-76	-84	-213			-13	-139	-148
Derivatives					5	0								
Pensions	-208									-206				
Physical capital	1,060		65											
Other	3	-25	-72	17	16	-7	17	-3	-15	-57	37	6	-143	-80
Final balance sheets, Dec 2003														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	2,975	1,050	1,324	2,672	4,317	4,198	1,393	1,806	1,564	1,692	282	553	3,768	3,649
Non-financial assets	3,491		1,197		0		0		0		0		0	
Net worth		5,416		-151		119		-413		-128		-272		120
Δ Net worth		602		421		30		59		3		-11		20

Sources: ONS and Bank calculations.

(1) Colour coding highlights notable annualised growth rates over the period, when compared to a benchmark 5% growth rate and the standard deviations of historical annual growth (over 1988 to 2007 Q2). Red indicates significantly low growth (more than two standard deviations below 5%); orange indicates mildly low growth (more than one standard deviation below); uncoloured indicates broadly normal growth (within one standard deviation of 5%); light green indicates mildly high growth (more than one standard deviation above); and dark green indicates significantly high growth (more than two standard deviations above).
(2) While sector *issuance/NAFL* can be identified in the ONS data, breakdowns of debt and equity *purchases/NAFA* by sector are based on Bank estimations since the ONS does not provide sector-specific line items.

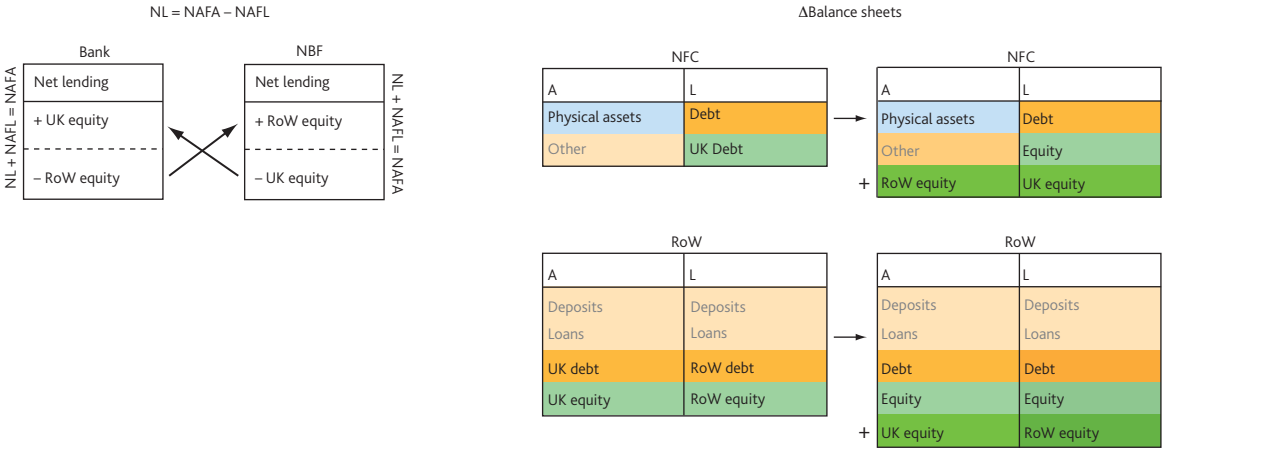
Table B.4 Balance sheet developments: 2004–07(1)

	HHs		NFCs		MFIs		OFIs		ICPFs		Govt		RoW	
Initial balance sheets, Dec 2003														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	2,975	1,050	1,324	2,672	4,317	4,198	1,393	1,806	1,564	1,692	282	553	3,768	3,649
Non-financial assets	3,491		1,197											
Net worth		5,416		-151		119		-413		-128		-272		120
'Flow of funds' - NAFA, NAFL and net lending[1], end-Dec 03 to end-Dec 07														
Asset category	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**	**NAFA**	**NAFL**
Deposits, liabilities of														
MFIs	249		82			2,327	369		27		16		1,583	
UK interbank deposits					589	589								
RoW banks	32		207		817		291		32		-4			1,374
Loans, assets of														
MFIs		237		214	1,483			427		4		9		593
Non-banks, secured on dwellings		231					230		-1		1			
RoW MFIs		12		79				316		16		1	424	
FDI loans into the UK				102		0		2		4			109	
FDI loans out of the UK			99				9		1					109
Debt securities, liabilities of														
Govt	-43		-2		-12		48		57		-0	148	101	
RoW	0		-1		277		7		70		8			361
Domestic private sector	2	2	5	54	115	243	28	411	68	4	0		495	
Of which (NAFA estimated):[2]														
NFCs				54			7		13				34	
OFIs			0		88			411					323	
MFIs	2		6		29	243	19		52		-2		136	
Debt residual	0	2	-1		-2		1		2	4	2		2	
Equity, liabilities of														
RoW	22		193		148		41		70		2			477
Domestic mutual funds (OFIs)	-7		0		0		0	24	31				0	
Domestic private sector, other	-126		100	103	63	10	70	148	-133	18	-21		324	
Of which (NAFA estimated):[2]														
NFCs	-153		54	103	15	-0	52		-98		-13		246	
OFIs (excluding mutual funds)	49				48		16	148	-27				62	
Equity residual	-23		46		1	10	3		-8	18	-7		16	
Pensions	225		-4				-0		-0	225	0		4	
Other (not specific to a sector)														
Finance leasing			2	2	-0	0	3	0				2		
Financial Derivatives	0		-2	-0	21	-0	-12	-0	-2		-1		-6	-2
Other known	49	62	61	83	-0	14	81	48	48	38	31	29	-0	-4
Of which:														
Gold and SDRs											-0		0	
Currency	9		1		0	9						1	0	0
Other deposits	18		2		-0		3	5			4	21	-1	
Other loans by UK residents	-11	24	50	66	-1		76	44	8	4	17	7		-5
Other accounts payable	34	38	9	18	-0	4	3	-1	40	34	10	0	0	1
Total NAFA/NAFL and Net lending														
Total NAFA/NAFL	403	544	741	638	3,501	3,182	1,166	1,376	269	309	33	189	3,034	2,909
Net lending (financial account)		-141		103		319		-211		-40		-156		125
Net lending (capital account)		-151		123		108		-6		-50		-156		132
Revaluation effects, end-Dec 03 to end-Dec 07														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Equity and debt	241		-120	557	-30	-6	180	235	493			7	369	112
Derivatives					2,348	2,357	187	206	21	1			615	609
Pensions	441									443				
Physical capital	1,430		174											
Other	15	-70	-35	3	-566	-536	132	231	6	2	40	5	537	718
Final balance sheets, Dec 2007														
	A	L	A	L	A	L	A	L	A	L	A	L	A	L
Total financial assets	4,075	1,523	1,910	3,870	9,570	9,195	3,058	3,854	2,354	2,447	354	754	8,323	7,996
Non-financial assets	4,921		1,371		0		0		0		0		0	
Net worth		7,473		-590		375		-796		-93		-400		328
Δ Net worth		2,057		-438		256		-383		35		-129		208

Sources: ONS and Bank calculations.

(1) Colour coding highlights notable annualised growth rates over the period, when compared to a benchmark 5% growth rate and the standard deviations of historical annual growth (over 1988 to 2007 Q2). Red indicates significantly low growth (more than two standard deviations below 5%); orange indicates mildly low growth (more than one standard deviation below); uncoloured indicates broadly normal growth (within one standard deviation of 5%); light green indicates mildly high growth (more than one standard deviation above); and dark green indicates significantly high growth (more than two standard deviations above).
(2) While sector *issuance/NAFL* can be identified in the ONS data, breakdowns of debt and equity *purchases/NAFA* by sector are based on Bank estimations since the ONS does not provide sector-specific line items.

Diagram 1 The national accounts treatment of an equity financed cross-border takeover



In this example, a UK company issues equity to the shareholders of a foreign company in exchange for their shareholdings, gaining control of the foreign company. The financial account transactions recorded are a net acquisition of equity liabilities (the newly issued shares) and a net acquisition of RoW equity and/or FDI (the control of the new company). The balance sheets change by same amounts, plus any revaluation effects that occur

upon those expectations. One of the most graphic illustrations of the role of expectations in supporting the rise in equities can be found in the IPO of Palm (Shiller (2003)):

> 'In March 2000, 3Com a profitable provider of network systems and services, sold to the general public via an initial public offering five per cent of its subsidiary Palm, a maker of handheld computers. 3Com announced at the same time that the rest of Palm would follow later. The price that these first Palm shares obtained in the market was so high, when compared with the price of the 3Com shares, that if one subtracts the implied value of the remaining 95 per cent of Palm from the 3Com market value, one finds that the non-Palm part of 3Com had negative value'.

It seems reasonably clear that the rapid expansion in corporate balance sheets was due largely to a sharp rise in mergers and acquisitions (M&A) activity, particularly in the TMT sector, but also in the utilities and oil sectors. Again in the case of the tech sector, exuberant expectations of future earnings was almost certainly a causal factor in driving acquisitions.

Equity-financed M&A transactions between two UK-resident companies lead to zero net expansion of the UK corporate sector balance sheet, as one company issues equity to buy the equity of another (ie X issues equity in the new venture to shareholder's of Y, replacing their existing equity). But if a UK company acquires a foreign company by issuing equity in the new entity to shareholders of the foreign company, both sides of the UK corporate sector's balance sheet expand; on the asset side, by the amount of foreign equity purchased and on the liability side, by the amount of the new equity issued to fund the purchase. Vodafone's record takeover of Mannesmann in 2000 was a particularly notable example, involving the issuance and acquisition of around £100 billion of equity for the UK corporate sector (**Chart 9**).(1) In a sense, the 'equity issuance' of the period was a mirage — UK corporates are recorded as having issued equity to purchase foreign companies, and *vice versa*, but for the most part new funds were not being raised in this process, equity in a new entity was just being swapped for equity in the acquisition (**Diagram 1**). Thus the NFC sector purchased £356 billion of RoW equity and 'issued' £451 billion. The RoW sector acquired £402 billion in UK private sector non-bank equity. Although the NFC component cannot be perfectly isolated, issuance by the MFI, OFI and ICPF sectors over the period only amounts to £84 billion, suggesting that much of the NFC issuance was acquired by RoW. A considerable part of it was likely acquired directly in M&A transactions in which UK companies bought overseas companies and *vice versa*.

3.1.3 Corporate balance sheets and financial fragility

There does not appear to have been a significant increase in financial system fragility over this period. While the scale and global exposure of UK corporates like Vodafone increased, the structure of their balance sheets only changed to the extent that they were now a weighted average of the two entities' previous balance sheets. The only obvious sign of increasing fragility was the reasonably sharp rise in debt issuance (**Chart 9**), again with a sizable proportion accounted for by the telecom industry.(2) This did increase the proportion of debt on the aggregate corporate balance sheet slightly, as equity was replaced with debt (in the case of a takeover of a UK company) or the balance sheet was merely expanded by the amount of debt issued (in the case of the takeover of a foreign company). Importantly, banks played a peripheral role in the expansion of corporate sector balance sheets, with an unusual proportion of funds provided in capital markets (**Table B.2** and **Chart 9**).

(1) Over the period 1997–2000, the ONS record UK companies purchases of foreign companies, net of disposals, at £304 billion and foreign companies' purchases of UK companies at £158 billion.
(2) Telecommunications companies account for around 40% of the debt issued by UK non-financial corporates between 1997 and 2000.

Expectations of the returns from investment in the tech sector eventually reversed in the early 2000s, and stock markets fell dramatically. The expansion of corporate sector balance sheets slowed sharply, as the cost of equity soared (**Chart 9**). Some of the debt issued by telecoms did lead to financial distress for the firms, with, for example, BT forced into a rights issue and asset sales in 2001 to restructure its balance sheet. But there was no contagion from financial distress at individual firms to broader financial system distress.

This is probably due to the manner in which the prior expansion of balance sheets had been financed. The losses from the bursting of the tech bubble were borne primarily by equity, and to a lesser extent, bond-holders — ie pension funds and insurance companies and wealthy individual investors. Because banks had played a peripheral role in financing the expansion, their balance sheets were left largely unscathed by the fallout, which meant credit supply was largely unaffected.(1) And because the impact of mark-to-market fluctuations in wealth on high-wealth individuals, and holders of pensions, appears to be small, at least in the short run, the impact on aggregate demand appears to have been modest compared to the crash of 2008.(2) As monetary and fiscal policy were eased significantly in the United Kingdom and around the globe, the fallout from the tech bubble seemed quite containable, with UK growth in particular barely falling below the post-war trend. The 'mop up afterwards' strategy described by Blinder and Reis (2005) and largely endorsed by policymakers around the world, in which central banks do not attempt to intervene pre-emptively in asset price bubbles but instead let events run their course and 'mop up afterwards' if necessary, appeared to have worked:

> 'This 'mop up after' strategy received a severe real-world stress test in 2000–2001, when the biggest bubble in history imploded, vaporizing some $8 trillion in wealth in the process. It is noteworthy but insufficiently noted, that the ensuing recession was tiny and that not a single sizable bank failed. In fact, and even more amazingly, not a single sizable stock brokerage or investment bank failed, either. Thus the fears that the 'mop up after' strategy might be overwhelmed by the speed and magnitude of the bursting bubble proved to be unfounded... If the mopping up strategy worked this well after the mega-bubble burst in 2000, shouldn't we assume that it will also work well after other, presumably smaller, bubbles burst in the future?'

The world had witnessed gyrations in balance sheets and asset prices, but the eventual impact on output and inflation appeared to have been modest.

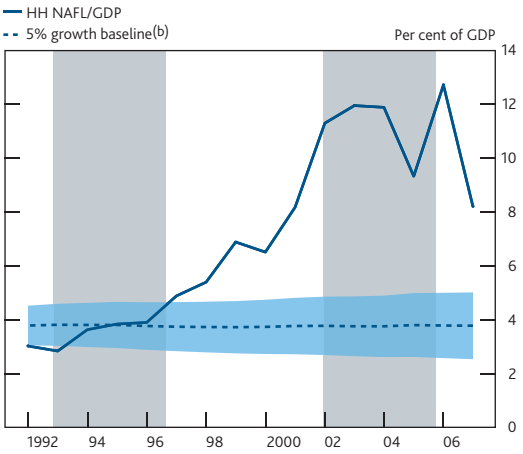
3.2 Expansion 2: credit — 1996/2003–07

The second expansion affected both the corporate and household sector balance sheets. We consider each in turn. For the household sector, it makes sense to trace developments back to 1996, whereas for the corporate sector a notable change in behaviour appears to have occurred in the aftermath of the tech bust, around 2003.

3.2.1 The household sector: main flow and stock developments

The rapid expansion of the household sector balance sheet can be traced back to the period of stability in the mid-90s, when growth was a touch above trend and well balanced across the sectors of the economy. The household sector's liabilities began to expand faster than aggregate income in the second half of the 1990s (**Tables B.2–4**; summarised in **Chart 10**). This accelerated through the global slowdown of 2001–03 and continued into the credit boom years of 2004–07. The household savings rate declined over the period, as did household net lending (**Chart 8**). The household sector balance sheet expanded rapidly, comprising both an increase in borrowing from banks and a counterpart increase in the acquisition of deposits and pension fund assets, and an upward revaluation of asset prices, particularly house prices (**Chart 6.c**). We focus here on secured debt, but credit card debt was also growing rapidly, as discussed in Box 2.

Chart 10 Household NAFL/GDP(a)



(a) See footnote (a) to **Chart 9**.
(b) See footnote (b) to **Chart 9**.

3.2.2 Underlying behaviour

Developments in house prices and household debt attracted plenty of attention over this period. The view generally taken by policymakers was that a substantial part of the rise in house prices was to be expected given the macro developments of the day: long-term real interest rates had fallen over the

(1) Indeed, Tudela and Young (2005) suggest that the relatively small increase in corporate liquidations in the early 2000s can be partly explained by the availability of bank lending to restructure the debt of overextended corporates. They claim this is consistent with the sharp rise in public bond defaults by UK NFCs in 2001 and 2002.
(2) Equity investors, and to a far lesser extent, bondholders would have borne the brunt of the losses that followed from mass defaults. Equity ownership is highly skewed, so the first round impact on spending would have been concentrated on a small number of wealthy households. While changes in financial wealth must eventually be reflected in spending, it appears that the pass-through is gradual (and may span generations via changes in bequests); for more evidence see Poterba (2000) and Starr-McCluer (1998).

course of the nineties; the availability of credit had eased significantly; inflation had fallen to low and stable levels not seen in a generation, significantly reducing households' income gearing in the early years of their mortgages; and the rate of household formation appeared to have outstripped the rate of housing supply for some time, for a variety of structural reasons.(1) Because various attempts to quantify the impact of these factors suggested they may fall short of fully explaining the rise in prices, policymakers remained open to the possibility that the rise in house prices contained a bubble-like element.(2) Given the rise in house prices, the rise in secured debt was easily explained and the impact of the debt in itself on macrodynamics was generally thought to be modest.(3) Most attention instead focused on the impact of house prices on consumption. Although some causal channels were noted, particularly the availability of collateral against which to borrow, the impact of higher house prices on consumption was generally argued to be muted, largely because the positive wealth effect on households that owned sufficient housing for their lifetime needs was offset by the negative wealth effect on those that did not. Lower real rates and some exogenous structural factors, like credit availability and the rate of household formation were thought to have led to a one-off increase in house prices, but the impact on macro flows, such as consumption, was expected by many to be muted.

A more puzzling development for policymakers, in the United Kingdom and elsewhere, was the growth of global trade imbalances. Most developed Western countries ran pronounced current account deficits, most developing Asian economies and commodity exporters ran counterpart surpluses and global interest rates fell to historically low levels. This development was awkward for mainstream macro models, which for the most part predicted that the rapid opening up of Asian markets and attendant increase in labour supply should increase global interest rates and cause Asia to run trade deficits with the West, as capital poured from West to East to fuel the investment boom in the East.(4) Quite the opposite seemed to be happening. A variety of explanations arose to explain the apparent anomaly, with the hypothesis of a 'savings glut' in Asia and a lack of credible financial assets in Asia among the most popular. Policymakers internationally ascribed some weight to these views, and often voiced concern about the possibility of a fall in asset prices should the global imbalances unwind in a disorderly manner.(5)

3.2.3 Linking together the stocks and flows

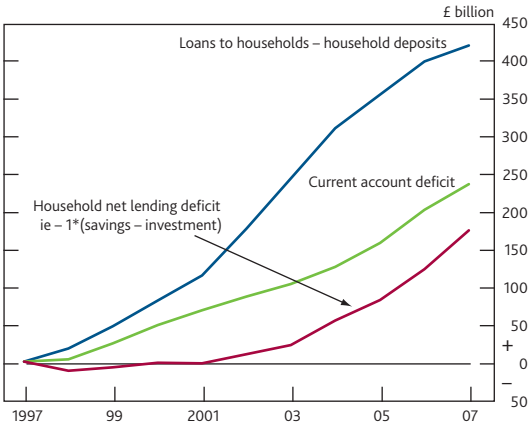
A balance sheet accounting framework offers an interesting perspective on the period. Over the period 2001–07, the household sector ran a net lending deficit of £175 billion, which roughly coincided with a RoW net lending surplus (ie a UK trade deficit) or £186 billion. But households did not borrow directly from foreigners; instead, they borrowed from banks. Indeed, their borrowing from banks, £782 billion,(6) vastly exceeded their deposits with banks, £370 billion, causing banks to run a 'customer funding gap' (CFG) of £412 billion, ie a growing gap between their deposits from customers and their loans to customers. This growing gap was met by wholesale funding, particularly securitisation. A substantial proportion of this funding appears to have been supplied by foreigners: over the period, RoW is estimated to have purchased £647 billion of UK private sector debt, while the bank and OFI sector issued £866 billion in combination and the NFC sector only £111 billion. The bank and ICPF sectors appear to have bought the rest of the issuance. The increasing reliance of banks on particular wholesale funding markets was noted with growing concern in the Bank of England's *Financial Stability Reports* of the time. While an accounting framework cannot offer evidence of cause and effect, it can establish some stylised facts — the most important of which can be summarised as:

- The household net lending deficit roughly coincided with the current account deficit from 2001 onwards and was of roughly the same magnitude (**Chart 11** and **Tables B.3–4**) — £175 billion and £186 billion.

- The customer funding gap also grew over a period of persistent household deficits, so there could be a causal link.

- But the numbers do not add up — households borrowed far more than was required to fund their net lending position and ran a funding deficit with the banking sector of around

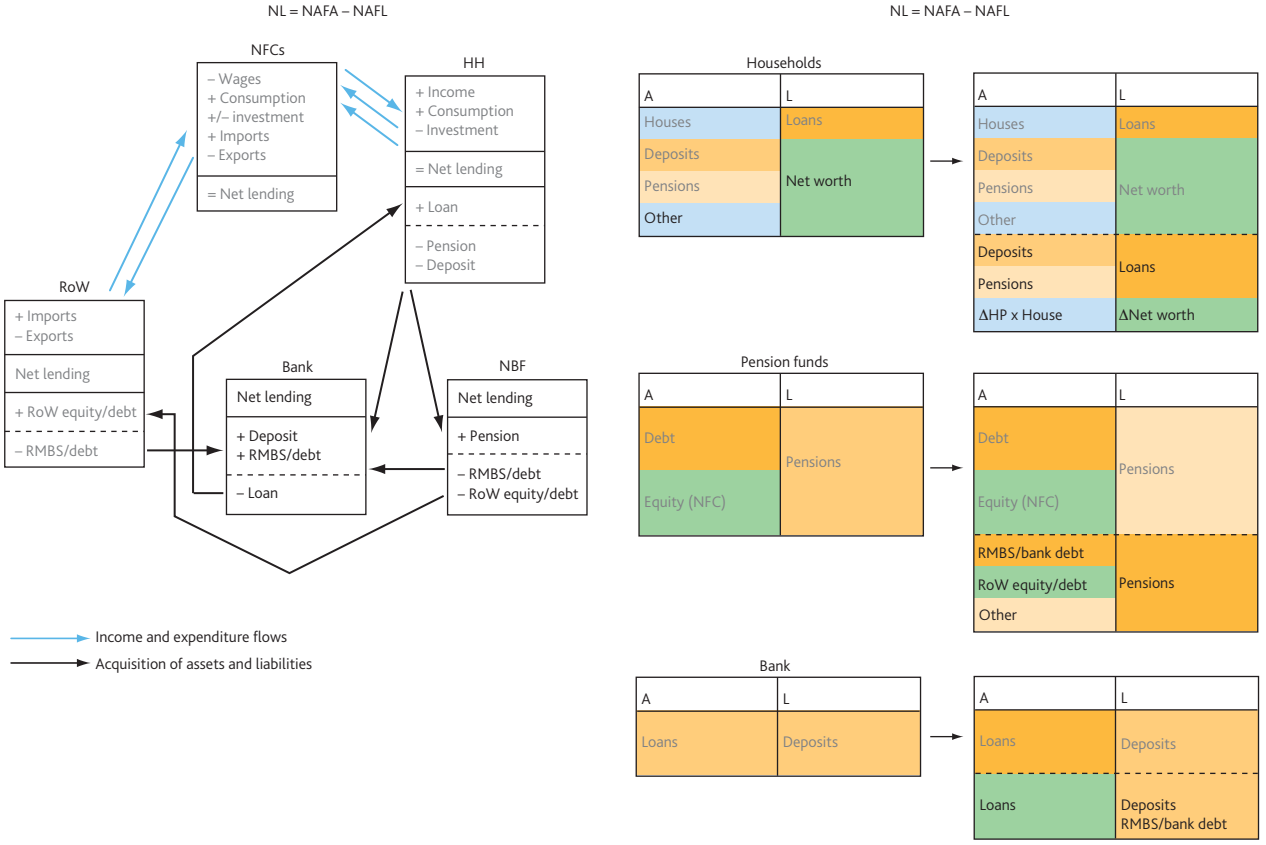
Chart 11 Savings, the current account deficit and the CFG: cumulated flows from 1998–2007



Sources: ONS, banks' published accounts and Bank calculations.

(1) See, for example, the May 2004 MPC minutes, Bean (2004) and Nickell (2004).
(2) See Weeken (2004) for an attempt to quantify the impact of lower real rates on house prices.
(3) See Benito, Waldron, Young and Zampolli (2007).
(4) See, for example, Spange (2007) for a central bank take on the theory and evidence.
(5) See, for example, King (2006), *Bank of England Inflation Report*, February 2006 and Trichet, 4 May 2006 ECB press conference.
(6) This sums loans of banks and 'non-bank loans secured on dwellings', as the latter is dominated by banks' securitisation vehicles. We treat the securitisation vehicles as part of the banking sector because the banks used the securitisation vehicles as a source of medium-term funding, rather than risk transfer. The vehicles are consolidated into banks' balance sheets for regulatory reporting purposes, but are left unconsolidated in the national accounts treatment.

Diagram 2 The housing market and balance sheet growth



In this example, the HH sector runs a net lending deficit by spending more on consumption and investment than it earns. This causes it to run a deficit with the NFC sector, which in turn runs a deficit with the RoW by importing more than it exports — assuming flat government and financial sector net lending balances, this leads to a trade deficit at a national level. To fund its financial deficit, the HH sector's NAFL must exceed its NAFA; thus its loans from the banking sector exceed its purchases of pension assets and deposits. The excess of loans over deposits leads to a CFG for two reasons: first, because the net lending deficit requires that NAFL exceeds NAFA; and second, because the HH sector splits its NAFA between deposits and other financial assets — in this case pension assets. In the first case, the funds have flowed from the banking sector to the RoW and will very likely return as wholesale funding (unless the RoW buys an asset from the HH or NFC sector and that sector deposits the proceeds with the banking sector) — in the example, they return directly as a purchase of bank RMBS/debt. In the second case, the funds have flowed to the NBF sector and will also likely return as wholesale funds — in the example, they again return directly as RMBS/debt.

twice what was required to fund their net lending position. Weak household savings alone cannot explain the growth of the CFG and the counterpart growth of banks' reliance on wholesale funding.

While a more formal model is required to identify what was going, a story about the dynamics of a period of rapid house price rises seems to fit these stylised facts. When young households borrow from banks to buy housing from old households, old households receive funds to consume or invest (**Diagram 2**). They saved most of the funds, some in the form of bank deposits, some in pensions and some in other financial assets. Note that at an aggregate level, the household balance sheet expands: liabilities increase by the amount of the loan, and assets increase by the same amount, comprising the financial assets the older household chooses to buy (deposits, pension assets, mutual funds shares, etc). If older households choose to hold some of the funds in assets other than deposits, then less funds are deposited with banks in the form of deposits than are lent out as loans, which causes a CFG to arise. The banking sector finances this through increasing its wholesale liabilities (interbank loans from foreign banks, bonds, securitisations, etc). Between 2001 and 2007, the issuance of residential mortgage-backed securities (RMBS) played a large role in closing the CFG, with the bonds sold to domestic and foreign bank and non-bank financial institutions (see Box 3 for further discussion of the role of securitisation). Direct funding from foreign banks also appears to have been important.

It seems quite plausible that at some point a feedback loop formed between borrowing and house prices. As households anticipated house price gains, they were willing to borrow more and pay more for housing, further bidding up house prices. As house prices rose, the loan to value (LTV) ratios on existing lending declined, making banks increasingly willing to lend, particularly against housing collateral, and leading to a relaxation in credit standards (**Chart 14**). Meanwhile, the saving rate fell, perhaps in response to a perception of higher real wealth, and the current account deficit widened.(1) The flow of funds from foreigners to banks, or securitisation

(1) See Davey (2001) for evidence that falls in the savings ratio in the late 1990s and early 2000s were driven by rising wealth.

vehicles, provides more than sufficient financing for this deficit, with the excess being part of the large cross-border flows of capital between non-bank financials, corporates and governments in the United Kingdom and abroad.

This story receives some support from disaggregate data. **Charts 12.a–c** set the scene by documenting the marked increase in the number of households holding significant amounts of housing equity and financial assets as credit expanded. **Chart 12.d** reveals the marked cross-cohort variation in the change in the size and structure of balance sheets across this period. Young households' net financial wealth fell as they took on more debt to buy housing, and older households' net financial wealth rose as they sold housing to younger generations in order to buy financial assets. Housing wealth rose most for middle-aged households, who hold most of the stock of housing.

And there is some evidence from aggregate data that at least some households expected house prices to keep rising. The profit an investor expects to make from a buy-to-let (BTL) investment, where a household buys a property for the purpose of letting it out to tenants, is roughly equal to the expected price appreciation, plus the rental yield less the mortgage cost.(1) **Chart 13** shows aggregate data on rental yields and mortgage costs.(2) It suggests that as house prices rose, BTL investors became increasingly willing to rely on expected increases in house prices to make their investment profitable.

For highly leveraged BTL investors, this appears to be reminiscent of the three stages of the financing of a bubble in Minsky's Financial Instability Hypothesis.(3) In the initial stages of a credit expansion, investors borrow only what they can repay with their expected income from the project (which seems plausible in the late 1990s). In the second stage, as the expansion rolls on and expectations become more bullish and lending standards relax, borrowers borrow as much as they expect they can service with their expected income (allowing for some operating costs, this seems to be roughly the case for the early 2000s). In the final stage, borrowers borrow more than they expect to be able to service with future income, relying instead on capital gains to cover their borrowing (this is true by the end of the period, when rental yields are negative, and probably true of much of the second half of the 2000s, if operating costs are non-negligible). The same principal of overborrowing and relying on price appreciation appears to have been true of some elements of the owner-occupier market, with FSA data suggesting that repossessions have been concentrated in households with very high initial loan to value ratios and self-certified mortgages.

3.2.4 Household balance sheets and financial fragility

Viewed as unconnected phenomena, the rise of house prices and household debt, the current account deficit and the growing reliance of banks on short-term wholesale markets and foreign funding each seemed like small risks. Importantly, while each seemed unable to go on forever, they also seemed unlikely to come to an abrupt halt of their own cause, in what appeared to be a very benign macro environment. But viewed as interconnected phenomena, it should have been much clearer that their eventual correction was inevitable. Household debt cannot grow faster than income forever — households simply run out of income to service the debt. While it may have taken many years for households' appetite for housing to have declined of its own volition, a steady supply of lending from the banking sector was required for the level of house prices not to fall. And for the banking sector to supply that lending, they in turn needed a steady supply of funding from the wholesale markets, and particularly foreign investors in those markets, upon which they had become increasingly reliant. The nature of banks' balance sheets — a highly leveraged collection of loans, financed with significant amounts of wholesale funding — meant that the supply of credit could be cut off very quickly if wholesale investors became worried about households' ability to service their debt and thus about the solvency of banks.

Viewed with the benefit of hindsight as interconnected phenomena, the rapid expansion of household debt, with its counterpart in increasingly stretched bank balance sheets, looks much like many of the great credit bubbles of the past. As Kindleberger concludes in *Manias, panics and crashes*, a pattern of increased investor optimism, declining risk-aversion on the part of lenders and the resultant wave of leveraged investment for short-term capital gains rather than for the returns associated with the productivity of the asset ran through many of the crises of the past 400 years. And while some of the shocks that brought an end to these booms were unpredictable, others were highly probable: 'At some stage it was inevitable that the lenders would reduce the rate of growth of their loans to these increasingly indebted borrowers, although the details and the timing of these moves could not have been predicted.'

3.2.5 The corporate sector: main balance sheet developments

At an aggregate level, investment was not particularly strong coming out of the global slowdown of 2001–03 in relation to previous cycles and was more than covered by corporate savings. Moreover, business investment looked relatively weak outside of investment in structures, much of which is likely to

(1) In reality, investors must also allow for operating costs, primarily the risk that the house may lie empty for some periods. Taxes also play an important role, as interest cost is tax-deductible. This means that any deficit of rent below interest cost can be offset against profit elsewhere to reduce the investor's tax burden, complicating the calculation.

(2) Rental yield data are only available back to 2002, and mortgage cost data to 2001. Prior to that, RPI rents data and house prices are used to calculate a rental yield, and a spread of 100 basis points over the observed 95% LTV, two-year mortgage rate is used for mortgage cost. For all periods, the mortgage cost is calculated as a spread over two-year swaps and then added to a 20-year swap rate, to give a better measure of expected interest cost over the life of the investment.

(3) See Minsky 1986 or 1992.

Chart 12 Distribution of housing equity and financial assets (net of unsecured debt and excluding pension assets) across the household population

Chart 12.a 1995

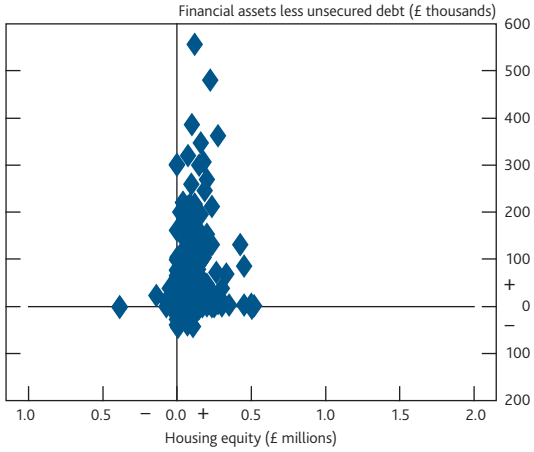
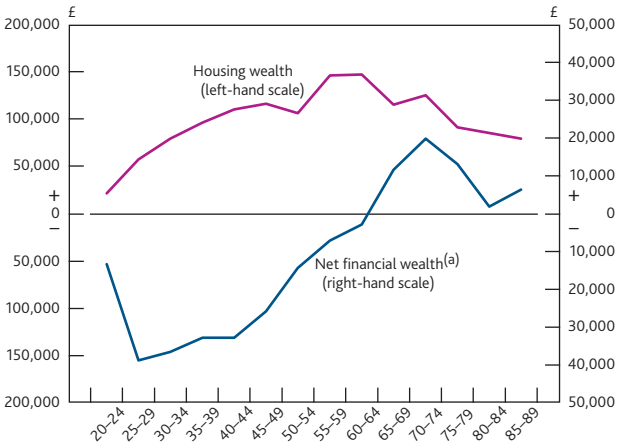


Chart 12.b 2000

Chart 12.c 2005

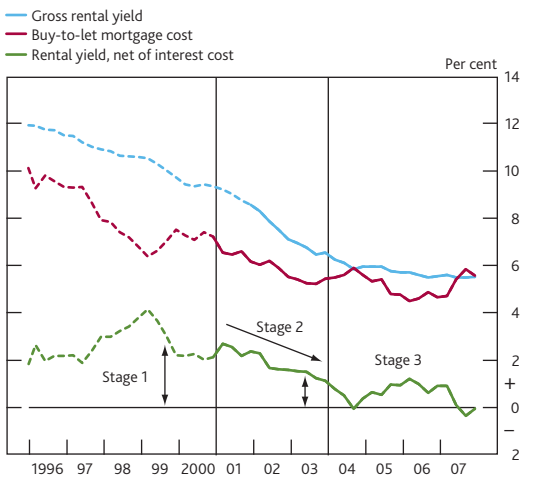
Source: British Household Panel Survey and Bank calculations.

Chart 12.d Change between 1995 and 2005 by age



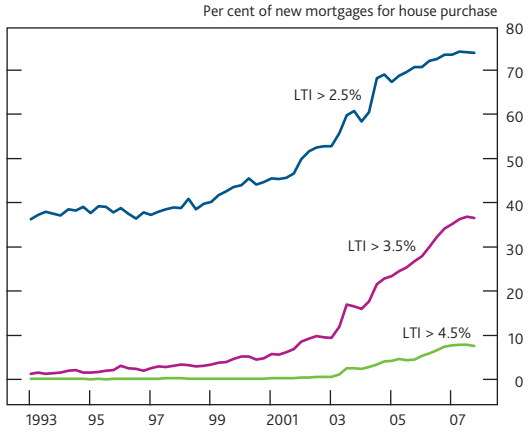
(a) Excludes pension assets.

Chart 13 Buy-to-let rental yield



Sources: Bank of England, ONS and Bank calculations.

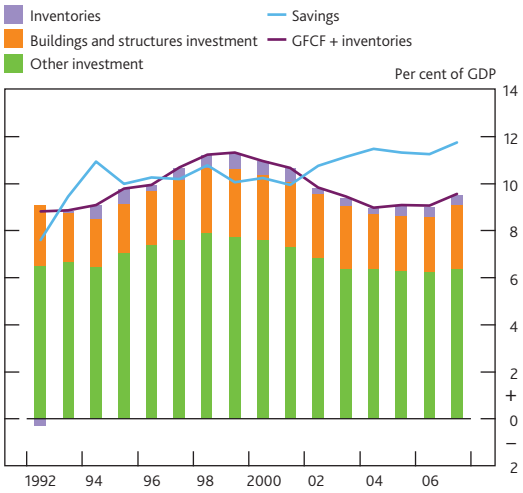
Chart 14 Loan to income ratios



Source: Council of Mortgage Lenders.

have been by the commercial property sector (**Chart 15**). Nonetheless, the corporate sector balance sheet grew considerably faster than income, driven by borrowing from banks (**Table B.4**, where loans from UK banks picked up rapidly from **Table B.3**; summarised in **Chart 9**). Furthermore, there was a distinct shift in the type of financing undertaken, relative to the expansion of the late 1990s, with net equity issuance actually negative for much of the period and borrowing from banks expanding rapidly.

Chart 15 Corporate investment and savings



Sources: ONS and Bank calculations.

While activity in the corporate sector was considerably more diverse than in the household sector, two stories seem to help explain much of the balance sheet growth: a debt-fuelled overextension of the commercial property sector, and an increase in balance sheet restructuring, in which debt was taken on to increase the return to equity, in particular via private equity firms.

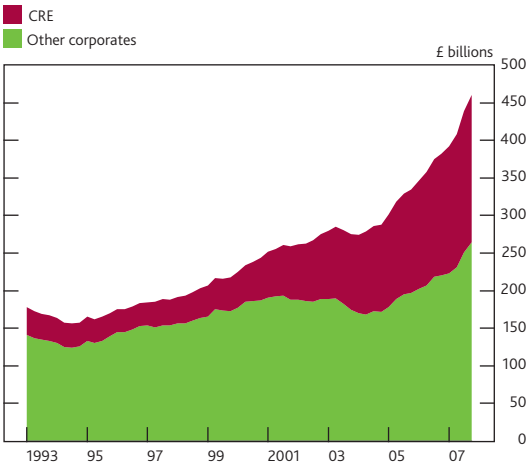
3.2.6 Underlying behaviour

Corporate sector balance sheets received less attention over this period than those of the household sector. Although corporate debt was growing faster than income, balance sheet growth looked modest relative to the late nineties and a surplus of savings over investment, at the aggregate sectoral level, suggested that companies might be deleveraging after the exuberance of the dotcom years.(1) At a sub-sectoral level, the Bank's *Financial Stability Reports* repeatedly warned of the rapid expansion of lending to the commercial real estate (CRE) sector and the coincident rise in commercial property prices.(2) And media commentators debated the impact of private equity activity on the UK corporate sector.(3) This section considers the balance sheet impacts of each phenomenon in turn and argues that they can help explain the changes in the aggregate corporate sector balance sheet over the period 2004–07.

3.2.6.1 Underlying behaviour: commercial property

Commercial real estate (CRE) debt accounted for about half of the rise in UK-resident banks' corporate loans (**Chart 16**). Much of the underlying behaviour here was likely similar to that in the household sector. CRE firms borrowed money to buy property, predominantly in secondary markets rather than through development, and became engaged in a process of bidding up prices, which again led to positive feedback: rising prices increased their net wealth and eased their borrowing constraints. Credit conditions eased, with LTV ratios and interest-cover ratios falling from 2003–06, partly driven by financial innovation opening up the market to a broader spectrum of investors.(4) Finally, note that debt was not only raised to facilitate purchases in secondary markets; firms could borrow against the rising value of their existing property portfolios to extract equity for shareholders.

Chart 16 Bank lending to corporates

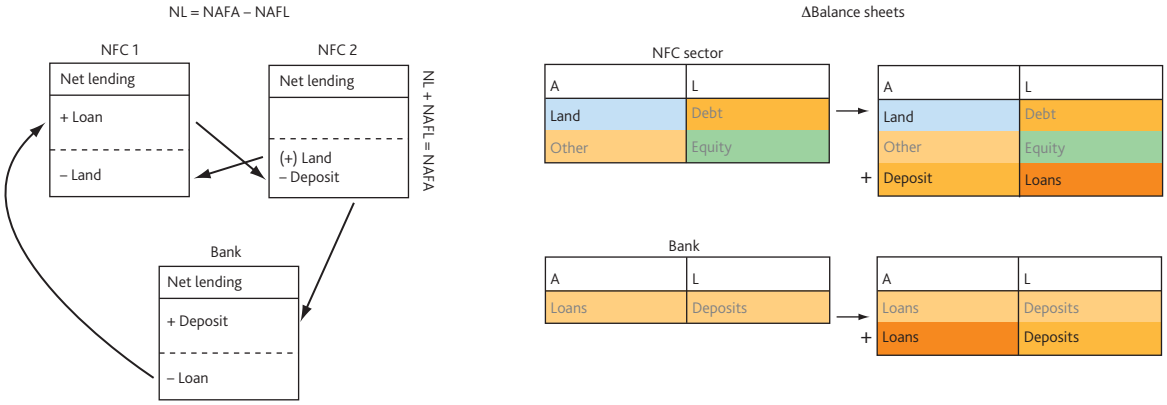


Source: Bank of England.

As commercial property prices rose, the increased debt required to finance purchases raised the debt service burden to a point where the solvency of many CRE firms became heavily dependent on both stable land prices and a steady flow of rent. It seems likely that some firms pushed this further, relying upon both further rises in land prices and a liquid market for commercial property to realise capital gains in order to repay both debt and interest — again as suggested by Minsky's Financial Instability Hypothesis.(5) The impact on balance sheets was relatively straightforward: CRE firms borrowed from banks either to buy property or against property they already owned, expanding both sectors' balance

(1) See, for example, Bunn and Young (2003).
(2) See, for example, the Bank of England's 2006 *Financial Stability Report*.
(3) See, for example, http://business.timesonline.co.uk/tol/business/economics/article1917848.ece.
(4) See, for example, the Bank of England's December 2005 *Financial Stability Review*.
(5) Market contacts suggest some investors 'walked away' from speculative commercial property development deals after failing to find tenants. This seems consistent with the type of credit upswing described by Minsky, where a period of financial stability encourages borrowing, as *ex-ante* returns look appealing. As more money is borrowed to buy assets, asset prices rise, and the type of borrower progresses from one who expects to repay capital and interest out of the returns from the portfolio, to one that needs capital appreciation in the asset even to meet the interest payments on the debt. This inevitably leads to an increase in financial fragility.

Diagram 3 A commercial real estate bubble?



In this example, one corporate borrows funds from the banking sector to buy land from another corporate. The second corporate temporarily deposits the funds back with the banking sector. The net effect is to increase the balance sheet of the corporate sector by the amount of loans taken on, with a counterpart increase in deposits. The banking sector balance sheet also increases by the amount of the loan extended. In reality, the seller of land would likely find an alternative use of funds, which may then return to the banking sector as wholesale funding.

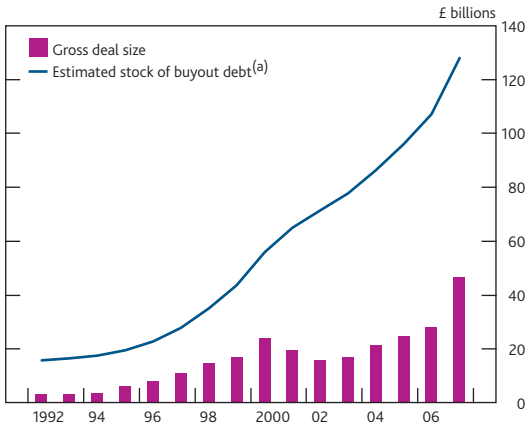
sheets (**Diagram 3**). The increase in CRE firms' funds was distributed to shareholders, who most likely recycled them into other financial assets. To the extent that these assets were not bank deposits, this may have contributed to a rising funding gap at domestic banks.

There is little reason to expect much of an impact on macroeconomic flows from this activity if the buyers and sellers of commercial property are either high-wealth individuals or pension funds, as changes in the assets of either appear to have very little short-run impact on consumption.(1) This meant that the risks to the economy from commercial property, while acknowledged in isolation, were not easily tied to the broader developments in the economy, many of which had a common theme of posing direct risks to bank balance sheets.

3.2.6.2 Underlying behaviour: balance sheet restructuring

Balance sheet restructuring is harder to pin down. It is clearest in the rapid growth of the buyout industry, and particularly in private-equity sponsored buyouts (**Chart 17**). Leveraged buyouts again had counterparts in the balance sheets of banks, high-wealth individuals and institutional investors like pension funds (**Diagram 4**). High-wealth households and pension funds invested in private equity firms, which used the funds as an equity stake in a leveraged purchase of the equity of an NFC, with the debt provided by banks — and generally sold on to other banks through syndication. Because the existing equity of the target firm was being purchased with a mixture of equity and debt, the target firm ended up more leveraged. The transactions brought into sharp relief the option-like pay-off of equity investments: if the firm proved profitable, the private equity investors earned dividends on their investment and were compensated for their risk or floated the firm at a profit; if it did not, the equity stake was wiped out and the company was turned over to the debt-holders.

Chart 17 Buyout deals



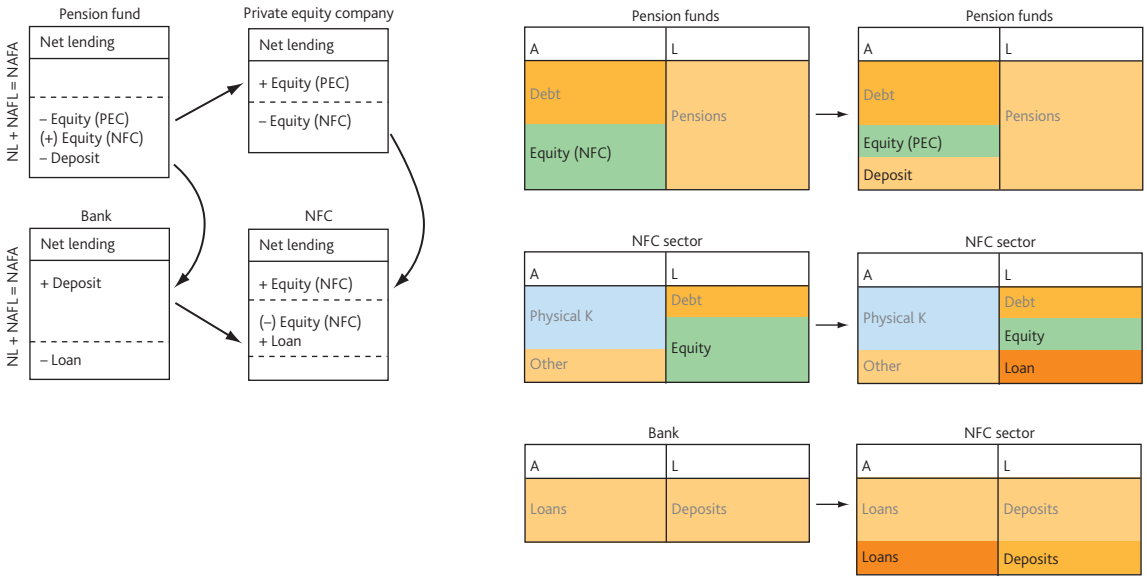
Sources: CMBOR and Bank calculations

(a) We have no data on repayment of buyout debt, but research by Gilligan and Wright suggests deals were typically around 60% debt financed, that the debt was typically split between a seven-year amortising loan, an eight-year bullet and a smaller payment-in-kind note and that the financing of many deals was rolled. Assuming half of the debt was a seven-year amortising note and that the other half was an eight-year bullet, ignoring defaults and equating 'many' to 50% gives a crude estimate of the debt stock.

While buyouts received lots of press coverage, balance sheet restructuring also occurred through equity buy-backs (**Chart 18**) and appears to have been a common cause of borrowing in the syndicated lending market (**Chart 19**).(2) It is not clear from the data whether the buy-backs were financed out of savings or debt, but either would have contributed to an increase in leverage, at least at book cost.

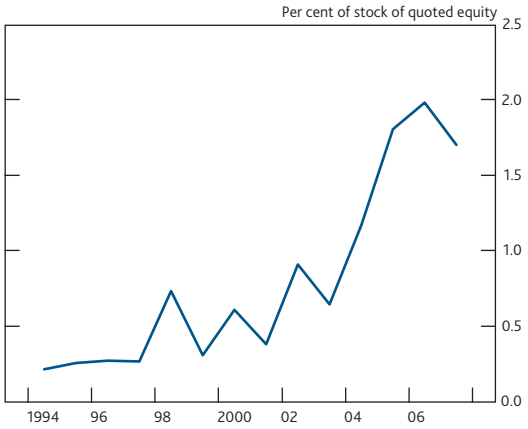
(1) See footnote 2 on page 17.
(2) Data on the syndicated loan market, provided by Dealogic, differs from the net lending data collected by the Bank of England, making it difficult to compare the two. First, it records facilities granted to corporates, not loans drawn, and so will overestimate the amount of gross lending done over the period to the extent that not all facilities were drawn. Market contacts indicate that this is a significant factor. Second, without data on repayment or restructuring of loans, it is not possible to construct net lending data, and thus to compare the syndicated lending data to the lending data collected by the Bank of England. Third, the data on syndicated loans is not collected on the basis of the lending bank's location, and so is not directly comparable to the loan data collected by the Bank of England.

Diagram 4 The implications of corporate balance sheet restructuring



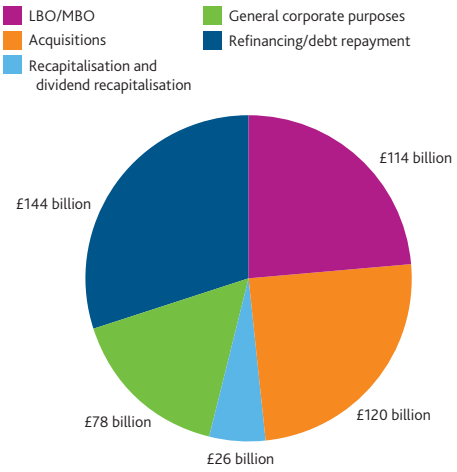
In this example, the ICPF sector invests in a private equity company (PEC). The PEC buys the equity of a NFC, financed with the funds from the pension fund and a loan from a bank, secured against the target NFC. The NFC's previous shareholders receive cash for their equity. For simplicity, assume the NFC was entirely owned by the ICPF sector. The implication for the NFC sector's balance sheet is that equity has been replaced with a combination of equity and a bank loan, making it more leveraged. The ICPF sector has sold NFC equity and received a combination of equity in a PEC and cash, which in this example it deposits with the banking sector, but in reality would likely invest in other assets. The banking sector has expanded its balance sheet by the amount of the loan to the PEC and received a matching deposit from the ICPF sector.

Chart 18 Equity buy-backs



Sources: ONS and Bank of England.

Chart 19 Syndicated lending by purpose of borrowing 2004–07



Sources: Dealogic and Bank calculations.

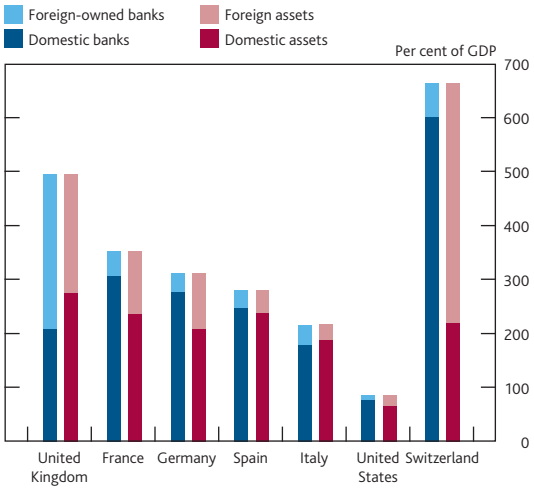
There is again little reason to expect an impact on macroeconomic flows from leveraged buyouts (LBOs) or share buy-backs, as the beneficiaries were again high-wealth households and pension funds — neither of which have strong channels to aggregate consumption. The funds likely ended up in other financial assets, once again pushing up asset prices and possibly contributing to a rising funding gap at banks.

3.2.7 Corporate balance sheets and financial fragility

There is thus a common theme running through the main stories behind corporate sector balance sheet expansions — a period of corporate debt expansion outpacing income, but with the debt financing the acquisition of commercial property (inflating property values in the process) or financial assets (equity). While this appears to have had little effect on macroeconomic flows, it had a significant effect on balance sheets. Not only did aggregate balance sheets grow across sectors, but the distribution of assets and liabilities within those balance sheets, particularly the corporate and banking sectors, made for a more fragile system. A tail of highly indebted corporates arose, particularly in the real estate and LBO sectors. Their fragility was a credit risk to the banks, who financed their leveraging and became highly exposed to the value of their assets and income streams. While the equity investors in both types of transaction tended to enjoy increases in net wealth, at least in the short-term, this wealth was not available to support future financing problems of the indebted corporates.

Chart 20 The UK banking sector in the Great Moderation

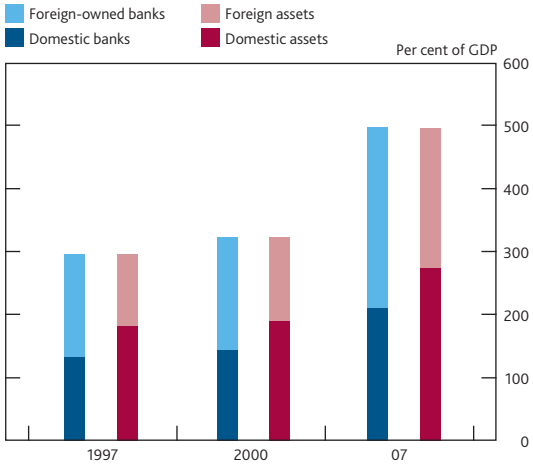
Chart 20.a Resident banking sector assets[a]



Sources: Bank of England, ECB, Federal Reserve and Swiss National Bank.

(a) US data only cover commercial banks; rest of sample also includes investment banks.

Chart 20.b UK banking sector assets



Source: Bank of England.

3.3 UK financial system and rest of world balance sheets

The primary objective of this paper is to shed light on the evolution of credit flows, balance sheet stocks and financial fragilities in the real economy during the Great Moderation. Sections 3.1 and 3.2 have documented the expansion in the balance sheets of these over the period. However, the balance sheets of the other private-sector agents in our framework — the banking sector, the non-bank financial sector and the RoW sector — experienced even more pronounced growth during this period (**Table B.1–4**). In this sub-section, we briefly review developments elsewhere in the system.

In part, rapid balance sheet expansion in the UK financial sector and the rest of the world were simply the counterpart (or mirror image) of what was going on in the UK real economy. The domestic housing bubble was reflected in the balance sheets of the UK banks just as much as in those of UK households. And as Section 3.2.2 discussed, a line can be drawn between the flow imbalances in the United Kingdom — low households savings and a current account deficit — and changes in balance sheet stock positions both here (accumulation of debts) and overseas (accumulation of assets).

But to better understand the scale of the growth in these other sectors, it is important to take into account the international nature of the UK banking system and the global growth of credit and leverage within the financial system.

The UK banking sector is large

The national accounts are constructed on a 'locational' basis, meaning that they count as UK activity all economic activity occurring within UK borders, rather than activity conducted by UK nationals. For the banking sector, this means counting all the activity conducted by foreign-owned banks resident in the United Kingdom. As shown by the blue bars in **Chart 20.a**, foreign-owned banks have a much larger presence in the United Kingdom than in many developed economies, reflecting London's importance in global capital markets. The red bars in **Chart 20.a** further show that around half of UK-resident banks' assets are actually foreign assets, a considerably higher proportion than for most other developed countries.

Half of the banking system's growth from 2000–07 was growth in foreign assets

While some of the remarkable growth in the banking sector's balance sheet is explained as a counterpart to the expansion of the domestic household and corporate balance sheets (Sections 3.2.1 and 3.2.4), much of it is left unexplained. This can be cleared up, in an accounting sense, by **Chart 20.b**, which shows that around half of the expansion in the UK banking sector's balance sheet related to its non-UK activities.

A surge in intrafinancial system positions

Table C shows that the banking and NBF sectors' assets and liabilities expanded more rapidly with respect to each other and the rest of world sector than with the domestic real

Table C Growth in cross-sectoral claims, 2000–07

Per cent

		Asset			
		Bank	NBF	RoW	HH + NFC + Government
Liability	Bank	142	171	147	74
	NBF	189	121	140	33
	RoW	165	104	n.a.	87
	HH + NFC + Government	73	83	59	-9

Sources: ONS and Bank calculations.

economy (the household, NFC and government sectors). Indeed, some of the most rapid growth was of intrasector claims in the banking and NBF sectors; combining the two into the 'financial' sector, intrafinancial sector claims grew around 166% between 2000–07, compared to growth in claims on the domestic real economy of around 80%. It is important to note here that while the RoW cannot easily be broken down into RoW financial institutions and non-financial institutions, the majority of the growth in RoW positions appears to comprise RoW financial corporations.(1) This is consistent with the growing scale and interconnectedness of the global financial system documented elsewhere.(2)

A discussion of the reasons for this intrafinancial sector growth is beyond this paper, which focuses on the linkages between the UK financial and non-financial sectors and the rest of the world, but we can note that most accounts draw heavily upon: low savings in many of the developed economies; a growing demand among developing economies for developed economy assets as a repository for their growing trade surpluses; a proliferation of innovative financial products to create sufficient supply of AAA assets to satisfy this demand; and feedback loops from rising asset prices, to financial sector leverage, as asset prices were bid up by the increased demand for developed world assets.(3) Box 4 sketches out such a story, illustrating the balance sheet implications at each stage of the narrative.

4 Conclusion

This paper has presented a balance sheet perspective on the Great Moderation. While real activity and consumer prices were stable, asset prices, financing flows and balance sheets were manifestly not. There were two distinct episodes in financial markets over this period — the tech boom of the nineties and the credit expansion of the 2000s. The question always was: did these developments in financial markets matter? Did policymakers have to respond proactively to prick these bubbles, or could they rely on mopping up after the event? As Blinder and Reis noted, the global macrofinancial system proved pretty resilient to the implosion of the 'biggest bubble in history' when 'some $8 trillion in wealth' was vaporized at the turn of the millennium. When the credit boom collapsed it completely overwhelmed the system.

Our approach considers insights from a framework which accounts for developments in balance sheets and asset prices and which might prove useful in spotting building fragilities in the future. It comes at a time when the Bank is preparing for the introduction of macroprudential policy and is keen to further develop the suite of models it uses to assess risks to the financial system. The accounting framework set out in this paper aims to make a contribution to that suite, by providing a quarterly update on the evolution of financing flows and balance sheets, which can be used to cross-check the stories we tell about the economy and financial system.

A common criticism of this type of approach is that it was already in place to some extent. The hope for the framework advocated here has at least two strands: first, that it would force attention onto financing flows, stocks and asset prices and make sure that these were accounted for in the stories told to help us understand the economy — because a story that cannot explain large financing flows or asset price movements is likely missing something important; and second, that there would be a better understanding of the interlinkages; for example, if the household balance sheet is expanding rapidly through borrowing growing faster than income, there must be counterparties, and those counterparties are taking on new risks.

Finally, if further work to extend the accounting framework to a modelling framework with behavioural rules proved feasible, it could be used to extrapolate forward concerning trends in behaviour to see what balance sheets would look like if they were to continue, and to explore what might happen if behaviour in one part of the system were to change — say, if an important source of funding to a key sector were to dry up. As Kindleberger concludes in his famous study of financial crises, 'Manias, Panics and Crashes':

> Several of the[se] shocks [that brought about panics] were true surprises but several were 'predictable'; a 'predictable shock' seems like an oxymoron since by definition a shock is not predictable. However the increasing reliance on cash from new foreign investments to pay the interest on the outstanding foreign indebtedness that developed in the mania phase of the expansions in Mexico in the 1970s and again in the 1990s and in Thailand, Malaysia, and Indonesia in the 1990s could not be sustained for an indefinite period... Similarly at some stage it was inevitable that Japanese real estate prices would stop increasing; when that happened, many of the investors that recently had purchased real estate with large amounts of borrowed money would be likely to be in a cash bind because the interest payments on their loans would be larger than their rental income.

Looking ahead, the operation of macroprudential policy will require an eclectic approach towards the assessment of risks to our financial system, drawing on a range of approaches to come to a judgement about risks to financial stability. We think that approaches that emphasise the relationship between standard macroeconomic income and output flows and the financing flows and stocks behind those flows have a useful role to play in this work.

(1) For example, of the £2.8 trillion increase in UK bank and non-bank financial holdings of rest of world liabilities, £1.5 trillion comprises deposits and a further £0.9 trillion comprises bank loans, many of which are likely to non-bank financials.
(2) See, for example, Haldane, 2009b.
(3) See, for example, Caballero *et al* (2008) for the link between trade imbalances and the demand for developed world assets, and McGuire and Von Peter (2008) for the growth of global financial sector balance sheets.

Box 2
Credit card debt and financial fragility — a taste of things to come

The story of lax lending standards feeding rapid growth in household debt that is ultimately curtailed by a sharp correction played out during the Great Moderation in the credit card market, albeit on a much smaller scale — given the size of the debt stock and hence the systemic implications of the credit crunch —– than would later come to pass in the mortgage market.

The first half of the noughties was characterised by heightened competition in the credit card market. By the middle of the decade, 'zero interest deals' on credit cards were widespread, having been virtually non-existent on the eve of the millennium.(1) These deals usually expired after a year, but most lenders did not charge fees for balance transfers so it appeared as though households could achieve interest-free unsecured debt for so long as they were willing and able to constantly transfer their outstanding balance from one lender to the next. The lenders also relaxed limits on debt and reduced the spread between the interest rate that was charged on credit card debt, relative to Bank Rate. As a result of these developments on the supply side, credit card lending continued to expand rapidly.

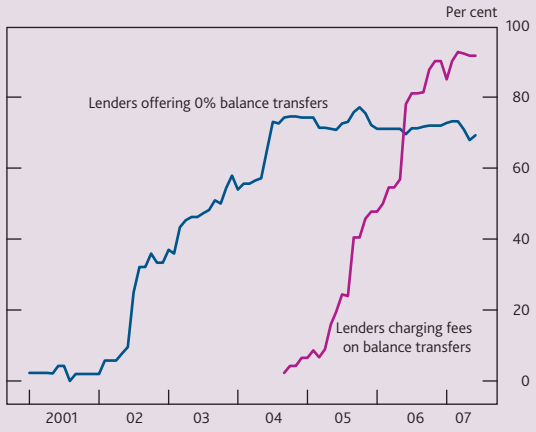
In 2005 the credit cycle turned, prompted by a pickup in arrears and write-offs (**Chart A.4**).(2) The lenders introduced fees for balance transfers, reduced credit limits and the spread on credit card debt started to widen. Unsurprisingly, growth in the stock of credit card debt slowed, but the macroeconomic fall-out from the rise in defaults and tightening in credit conditions was relatively contained.

Unsecured debt accounts for the largest share of debt and income for those on the lowest incomes (**Chart A.5**). Likewise, Tudela and Young (2003) report that those who describe their unsecured debt as a heavy burden are disproportionately at the bottom end of the income distribution, and typically hold few assets.(3) Given their relatively low incomes, the individuals that found their supply of credit tightened in the mid 90s accounted for a disproportionately small share of consumption, and therefore the shock to their financial circumstances had a muted impact on aggregate consumption. Similarly, the impact on banks' profits was sufficiently small that the broader implications for credit supply were modest, and the incident passed by without a significant impact on the course of the broader economy.

(1) See May, Tudela and Young (2004) for more details.
(2) See Section 3 of the April 2009 edition of *Trends in Lending* and evidence from the Bank's *Credit Conditions Survey*.
(3) Tudela and Young (2003) report that over half of those who describe that their debt as a heavy burden are in social class DE (semi-skilled and unskilled manual workers, shop assistants, cleaners, unemployed or retired on only the state pension).

Chart A The mid-decade credit card lending cycle

Chart A.1 Access to 'interest-free credit card debt'

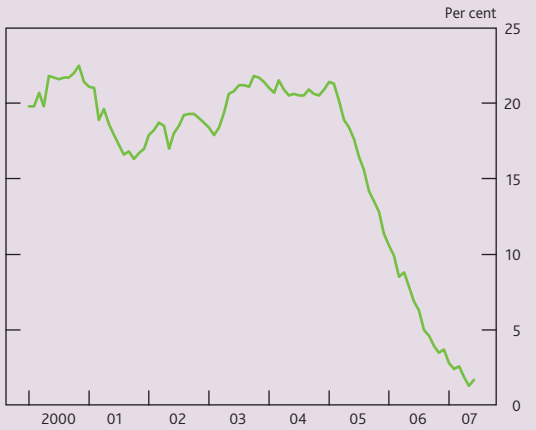


Source: Moneyfacts Group.

Chart A.2 Interest rates on credit card debt (spread over Bank Rate)

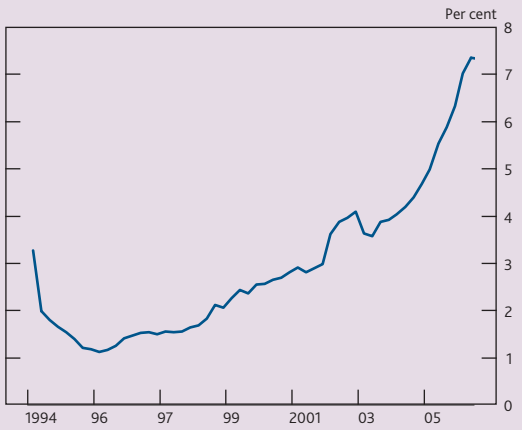
Source: Bank of England.

Chart A.3 Annual growth in credit card debt



Source: Bank of England.

Chart A.4 Write-off rates on credit cards



Source: Bank of England.

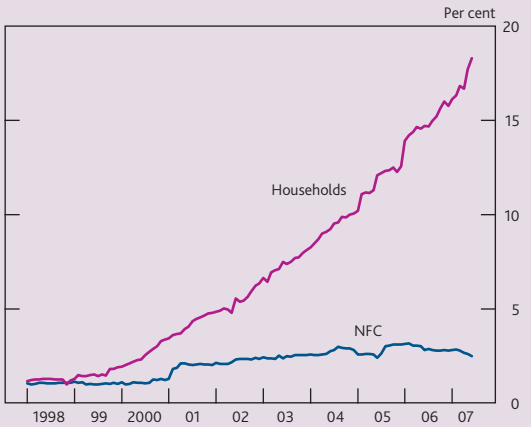
Chart A.5 The importance of unsecured debt for those who hold it, by income decile

Sources: BHPS and Bank calculations.

Box 3
Securitisation

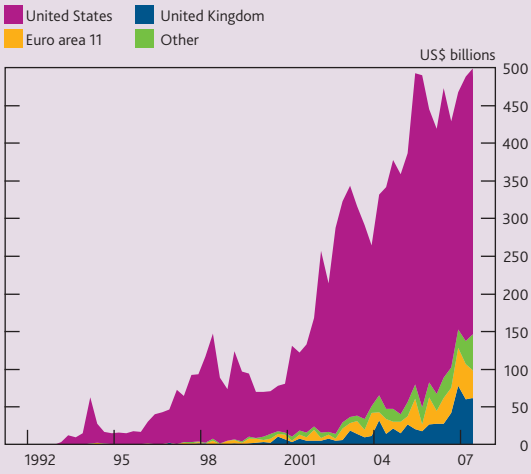
Securitisation played a major role in the rapid expansion of balance sheets during the tail end of the Great Moderation, particularly in the United States and in financial institutions around the globe which bought securitised US assets, but also in funding UK lending (**Chart A**). Securitisation is the process through which a cluster of illiquid assets are packaged together to produce a tradable asset-backed security (ABS). Banks transfer a pool of assets ('receivables') to a bankruptcy remote special purpose vehicle (SPV) which issues securities backed by the cash flow generated by that pool. **Diagram A** presents a stylised securitisation programme from a balance sheet perspective — that is, stressing the 'monetary circuits': the flow of deposits and assets around the system. In principle, the underlying pool of assets could be almost anything;[1] in practice, they were almost always bank loans, often mortgages (**Chart B**).

Chart A Securitised lending as a share of bank lending to UK households and companies



Source: Bank of England.

Chart B Quarterly global issuance of RMBS by nationality of risk



Source: Dealogic and Bank calculations.

SPVs varied in the type of asset-backed security they issued. In some cases, so-called conduits issued short-term asset-backed commercial paper (ABCP); in others, longer-term debt securities were issued, which were typically split into tranches. Tranching creates a cash-flow waterfall where the holders of subordinated tranches are not entitled to any claim on the debt servicing payments on the underlying loan until the senior tranches have been paid in full.[2] Credit risk is now concentrated: senior tranches can be sufficiently subordinated to earn AAA credit ratings. In contrast, the returns on the junior (mezzanine and equity) tranches are extremely sensitive to a small increase in defaults.

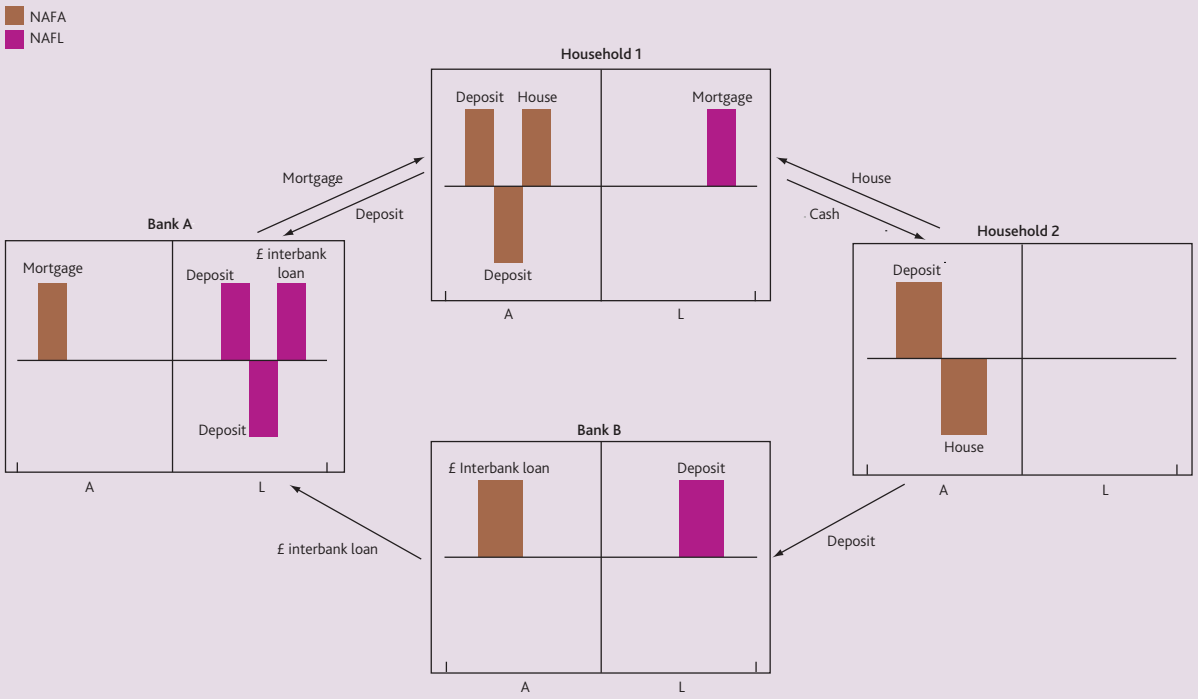
The process did not stop there. Junior tranches of ABS were pooled, repackaged and tranched into new assets, Collateralised Debt Obligations (CDO). A belief that diversification reduces exposure allowed the senior tranches of these CDOs to obtain AAA ratings, despite the fact that none of the underlying assets were AAA. In some cases, the process was repeated again, with CDO tranches pooled together to create 'CDO-squareds'. Credit risk was re-packaged into ever more complex securities, which became practically impenetrable to the investor and therefore ever more reliant on high ratings from ratings agencies to assure their quality.[3]

There were two key drivers of the explosion in securitisation. Demand for AAA fixed income products appeared to rise significantly, partly buoyed by global trade imbalances, which left states and savings institutions in surplus countries with funds which they wanted to store in safe assets. The AAA tranches of ABS appeared to offer a virtually risk free excess return, expanding the available pool of AAA assets and providing cheap funding to banks that could create them. For investors that were mandated to hold highly liquid securities, such as money market mutual funds, banks were willing to provide maturity transformation via ABCP programmes, where they set up SPVs to buy medium-term ABS and issue short-term, highly rated ABCP. Housing provided the perfect collateral against which to lend to create loans for securitisation, which likely contributed to the rapid growth of mortgage lending. Once created, these AAA assets had a further expansionary impact on lending, as the assets themselves provided good collateral for financial firms to repo, allowing them to leverage their holdings of financial assets.

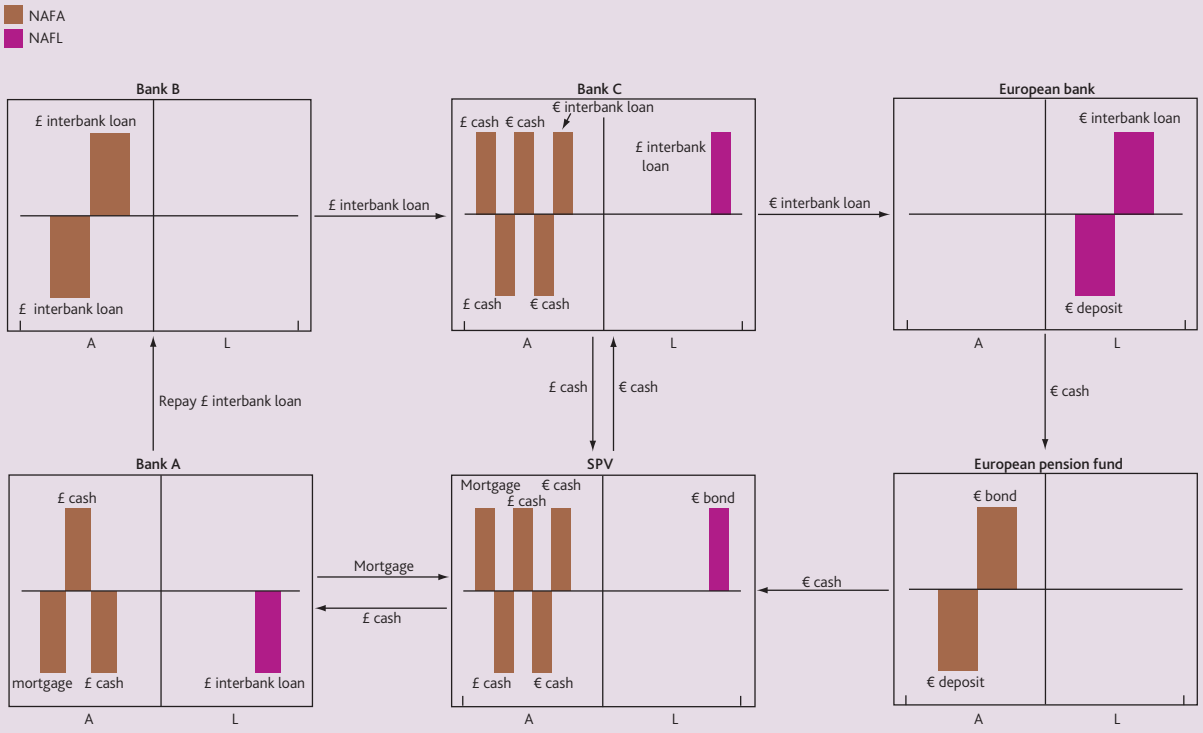
The second driver of securitisation was regulatory arbitrage. Differences in the regulatory treatment of loans and securities allowed banks to reduce their capital requirement for a given loan by securitising it (and retaining the securitisation). Further securitisations of tranches of loans, such as CDOs, could further reduce the capital held against loans. As a result, bank lending could expand faster than bank capital.

Diagram A Stylised illustration of an off-balance sheet securitisation programme

Stage 1: Bank A originates a mortgage loan to Household 1, simultaneously crediting Household 1 with a deposit of the same value. Household 1 draws on this deposit to buy a house from Household 2. Household 2 deposits the funds with Bank B. Bank B then lends Bank A the funds in the interbank market. In aggregate, the banking (household) sector has increased assets by the amount of the mortgage (deposit) and liabilities by the amount of the deposit (mortgage).



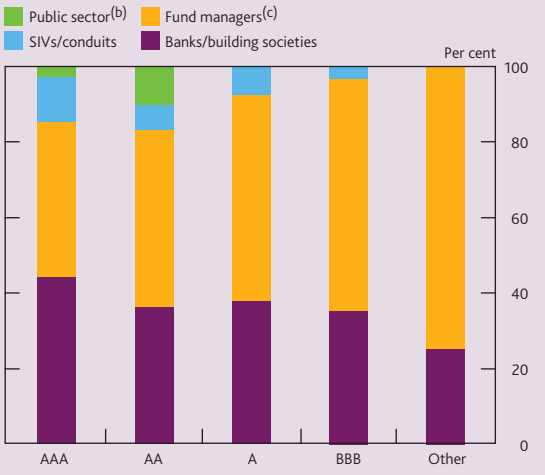
Stage 2: Bank A's SPV issues a €-denominated bond, which is purchased by a European pension fund. The SPV swaps the proceeds into sterling with Bank C and uses these to pay bank A for the mortgage it originated. Bank A uses the funds to repay the interbank loan it took from Bank B in Stage 1. To provide the FX swap, Bank C borrows sterling funds in the interbank market (to keep things simple, from Bank B), and gives the proceeds to the SPV. In return, it receives euros from the SPV and lends them in the interbank market. To fund the purchase of the RMBS bond, the European pension fund redeems a deposit with a European bank. The European bank replaces the funds in the interbank market; in this example, by borrowing from Bank C.



Securitisation led to increased system fragility in three other key ways. First, securitisation likely led to a relaxation in lending standards and an incipient increase in credit risk in the system. In the traditional 'originate and hold' model of intermediation, the bank that creates a loan retains it on balance sheet and therefore had a vested interest in screening and monitoring debtors. With the transition to originate and distribute, banks had much less incentive to discriminate between good and bad credit risks when they created loans, or to monitor credit worthiness thereafter. Clearly, there was a particular problem with regard to the securitisation of sub-prime lending in the United States.(4) Demanyanyk and Van Hemert (2010) note the monotonic decline in the quality of loans and compensation for default risk as the sub-prime mortgage market expanded. Mian and Sufi (2009) document the abnormal inverse correlation between income growth and credit growth over this period, and a disproportionate relaxation in credit constraints in regions with a high proportion of sub-prime borrowers. Dell'Ariccia, Igan and Laeven (2008) report that lending standards decline more in regions with higher securitisation rates.

Second, many of these securitised assets were never truly distributed off the banking system's balance sheet. Although the notional maturity of the RMBS that banks issued matched the maturity of the loans, these bonds were callable. That is, the banks had the option to redeem the bonds within five years — an option which the market expected banks to 'honour'. Moreover, banks were one of the key investors in ABS (**Chart C**) and they often provided the funds which allowed other investors to purchases these assets. While issuing banks were contractually able to not call RMBS, doing so may have led to a withdrawal of funds in other key funding markets.

Chart C Investor base in UK prime RMBS by rating, as of 2004–06(a)



Sources: Citi, European Securitisation Forum, JPMorgan Chase & Co. and Bank calculations.

(a) Estimated from a number of investment bank surveys.
(b) Includes supranational, sovereign wealth funds and agencies.
(c) Includes money market funds.

Third, the very nature of these ABS suggested that the demand for these assets might be fragile in certain states of the world. The demand for these assets were heavily reliant on market participants' absolute faith in their gold plated rating, given the complex nature of these securities. If investor demand for ABS dried up banks would not only have to bring assets held off balance sheet back on, but they would also be subject to 'warehousing risk': they would find themselves saddled with assets which they had planned to distribute off balance sheet.

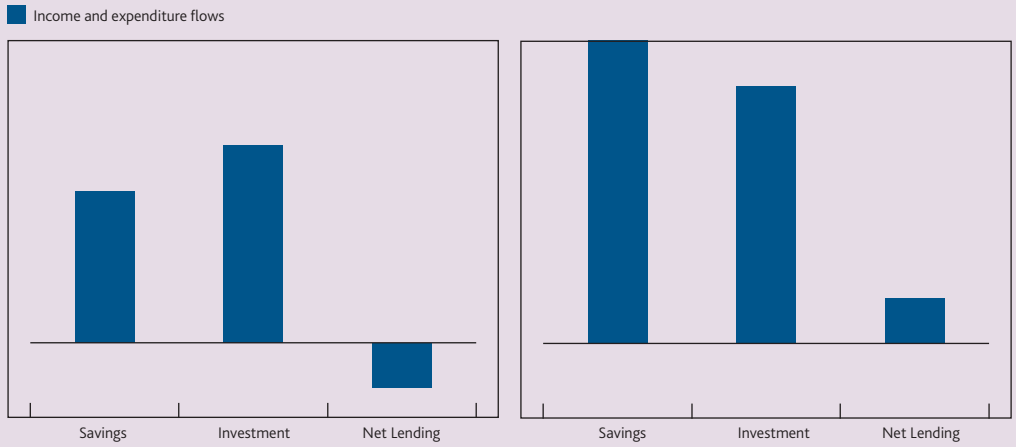
(1) For example, so-called Bowie Bonds were issued in the late 1990s which were backed by the royalties on David Bowie's back catalogue.
(2) Investors are also protected from credit risk through a number of internal and external credit enhancements, such as overcollateralisation (where the value of the underlying asset pool exceeds the value of the ABS that it supports) and credit wrapping (where typically monoline insurers guaranteed the security).
(3) The typical CDO-squared contained 125 CDO tranches, each of which might comprise 150 RMBS, each of which in turn would reflect a claim on 5,000 mortgages, which if the RMBS were independent of each other implies that the CDO-squared packaged together the cash flow on almost 100 million mortgages (Haldane (2009b)).
(4) See Ashcraft and Schuerman (2008) for details on the problems inherent in the securitisation of sub-prime mortgage credit.

Box 4

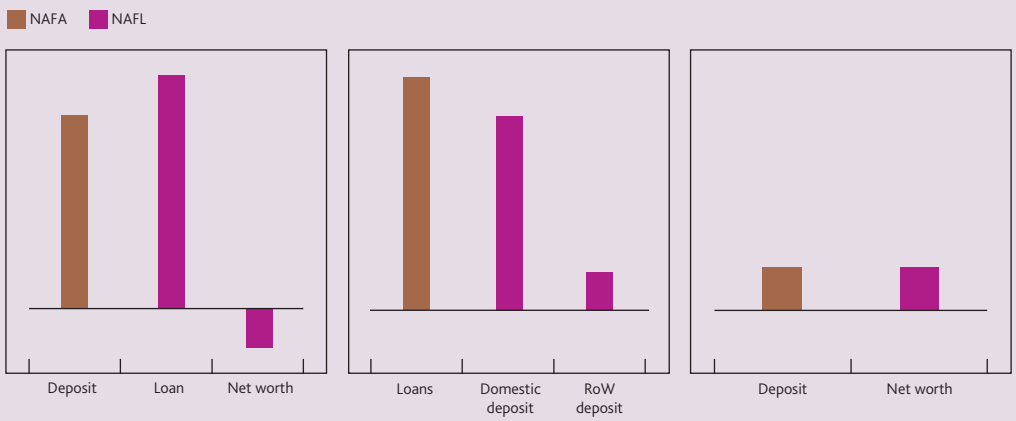
The link between low households savings, recycled trade imbalances, rising asset prices and increased leverage

Stage 1: The private non-financial sector in a developed economy runs a financial deficit, perhaps as part of the equity generated in a local housing boom is spent on imports. Assuming no increase in savings from other domestic sectors, the sectoral counterpart is a trade deficit, which in turn is a trade surplus in a developing economy and a financial surplus for that economy's private non-financial sector. Let the domestic private sector's borrowing be intermediated by the domestic economy's banking system. In this case, the domestic private sector borrows more from domestic banks than it deposits in those banks, paying the difference to the developing economy to finance the trade deficit. This transaction results in the domestic banking sector crediting the developing economy exporter with a local deposit.

Income and expenditure flows

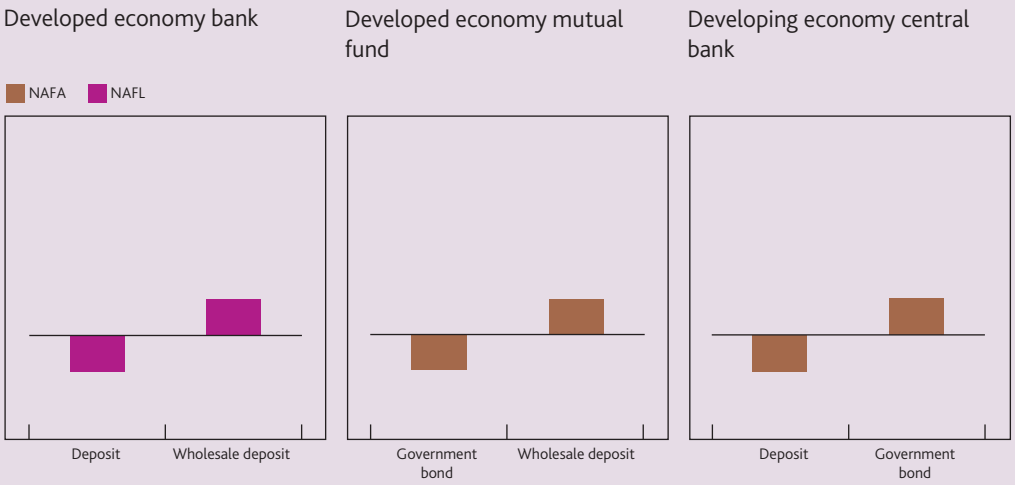


Financial flows



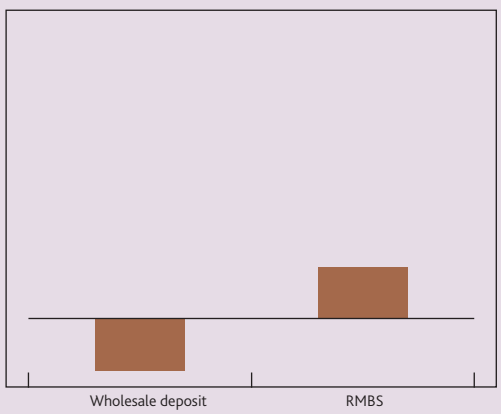
Stage 2: Assume the developing economy exporter draws the deposit and sells it to its central bank to buy its own local currency. As part of its exchange rate management, the central bank does not sell the developed economy currency in the market, but rather uses the proceeds to buy developed economy government bonds, avoiding placing upward pressure on its own currency from the trade surplus it is running. The developed economy bank replaces the deposit with wholesale funding. For simplicity, assume the foreign central bank buys a developed economy bond from a developed economy mutual fund, which puts the proceeds on deposit with the developed economy bank, closing the circle.

Financial flows



Stage 3: The former holder of the government bond (in this case a mutual fund) needs to rebalance his portfolio away from cash. He does this by buying substitute assets. Depending on a whole range of factors, this could push up the price of the substitute assets, such as other bonds that are perceived to have low credit risk. Looked at from the perspective of the borrower, this reduces the cost of funding a range of activities with debt, both by directly reducing the cost of funds and increasing their equity, through higher asset values. This cheap debt could have been used to finance any of the activities described in Section 3: funding banks' mortgage lending via securitisation, funding corporate balance sheet restructuring through leveraged buyouts or funding CRE lending. If the returns to the funded activity were perceived to be strong, this could encourage a further flow of funds through the same channels. Taking the housing market as an example, if the mutual fund buys RMBS and pushes up the price of RMBS, this reduces the cost for banks of funding mortgages, which could encourage further mortgage lending, which could push house prices up further and lead to some households saving less, in turn leading to a trade deficit — and returning to Stage 1.

Financial flows



Appendix 1
Data quality in the ONS sectoral accounts

Sector	HHs		NFCs		MFIs		OFIs		ICPFs		Govt		RoW	
Asset type	NAFA	NAFL	NAFA	NAFL	NAFA	NAFL	NAFA	NAFL	NAFA	NAFL	NAFA	NAFL	NAFA	NAFL
Monetary gold and SDRs											-2		2	
Currency and deposits														
Currency	17		2		5	23	0					2	1	0
Transferable deposits														
Deposits with UK monetary financial institutions	436		149		936	3,909	444		14		22		1,907	
Deposits with RoW MFIs	46		276		966		466		44		-4			1,794
Other deposits	18		-2		0		3	1	0		0	19	0	
Securities other than shares														
Short term: money market instruments														
Issued by UK general government	0		0		5		3		0		0	13	5	
UK local authority bills	0		0		0		0				0	0		
Issued by UK monetary financial institutions	2		6		-8	169	7		12		5		145	
Issued by other UK residents	0	1	-3	8	2		2	2	4		2		4	
Issued by the rest of the world			14		37		8		1		2			62
Long term: bonds														
Issued by UK central government	-20		-3		-31		52		56		0	140	86	
Issued by UK local authorities	0		0		0		0		0			0	0	
Issued by UK monetary financial institutions			1		18	199	16		45				120	
Issued by other UK residents	2	1	2	194	134	56	71	488	143	10	0		397	
Issued by the rest of the world	1		6		394		-56		97		3			445
Financial derivatives	0	0		-1	0	0	-11		-2		-1		3	-7
Loans														
Short term loans														
Loans by UK MFIs, excluding secured on dwellings & financial leasing		156		252	1,656			536		0		5		708
Loans by RoW MFIs		23		160				532		27		0	742	
Long term loans														
Direct investment			165	265	0	1	11	18	8	8			292	184
Loans secured on dwellings		686	0	8	408		286		-1		1			
Finance leasing			3	2	0	1	4	0				3		0
Other long-term loans by UK residents	5	55	57	72	-3		86	58	52	40	23	4		-9
Other long-term loans by the rest of the world				0				0				0	1	
Shares and other equity														
Shares and other equity, excluding mutual funds' shares														
Quoted UK shares	-134		197	368	24	8	161	67	-191	25	-5		415	
Unquoted UK shares	-64	0	97	186	59	25	8	156	-6	11	-3		288	
Other UK equity (including direct investment in property)	0			-21		0					-29		8	
Shares and other equity issued by the rest of the world	24		589		171		114		92		4			995
Mutual funds' shares														
UK mutual funds' shares	43		0		0		1	88	44				0	
Rest of the world mutual funds' shares	3													3
Insurance technical reserves														
Net equity of households in life assurance and pension funds' reserves	394									393			0	
Prepayments of insurance premiums and reserves for outstanding claims	7		-2				0		0	9	0		5	
Other accounts receivable	59	74	32	34	0	2	6	-1	84	68	18	21	0	1
Percentage poor data quality (red shading)	0	15	80	65	1	1	0	8	0	0	0	12	23	0

Green: Accounting-type figures, relating to individual institutions mainly in central government.
Blue: Reliable figures, obtained by aggregating statistical returns (thus prone to coverage or reporting errors).
Orange: Figures based on returns but with some degree of estimation, eg sampling.
Figures involving a substantial amount of estimation, or where the coverage is known to be significantly incomplete.

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