Personal and corporate sector debt

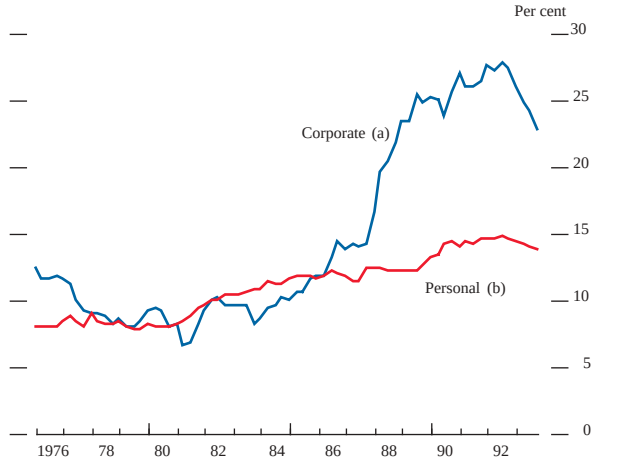
By Jennifer Smith and Gabriel Sterne of the Bank's Economics Division, and Michael Devereux.[1]

This article examines the influence of debt on the behaviour of households and firms in the recent recession. It compares the levels of debt in the two sectors in recent years, and the sectors' reactions to indebtedness. It then considers each sector in turn. Debt was more unevenly spread across both households and firms in the recent recession than in its predecessors. Partly as a result, disaggregated data can in both cases help in reaching a more accurate picture of the influence of debt on behaviour, and in deciding between competing explanations of recent developments in the two sectors.

Overview

Debt had an important influence on corporate and personal sector behaviour in the 1990–92 recession and in the subsequent recovery. By comparing this recent experience with the recession of the early 1980s, this article examines the extent to which the historically high indebtedness played a part in the recent recession, and how continuing high levels of debt may affect the shape of the recovery.

Chart 1
Capital gearing in the personal and corporate sectors



(a) Ratio of outstanding borrowing (debt at nominal value) to capital stock at replacement cost.
(b) Borrowing from banks and building societies as a proportion of personal sector financial and physical assets.

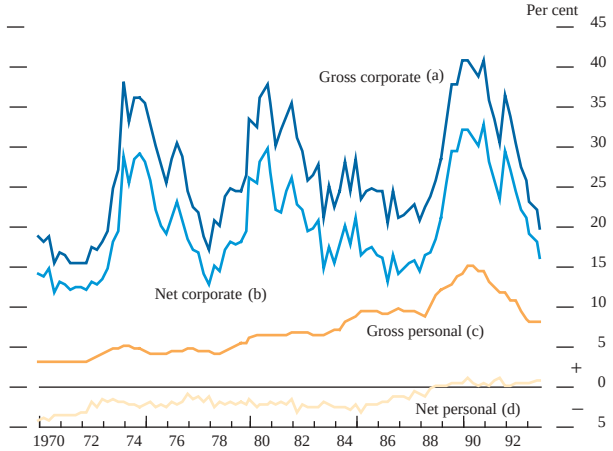
Some progress can be made towards answers using aggregate data; and the article starts by using these to identify a number of elements common to the two sectors. But there has been a wide dispersion of debt levels within both the personal and corporate sectors; so it then uses disaggregated data to gain a more detailed understanding and to help decide between competing explanations suggested by the aggregate statistics. For the personal sector, the disaggregated data allow in particular an analysis of the incidence of negative equity,[2] and of the extent to which overoptimistic income expectations played a part in the pattern of consumption. For the corporate sector, a cross-sectional analysis can help determine to what extent debt was a cause of firms' problems and how it interacted in this with poor profitability.

Some common threads and points of comparison

There are various measures of the extent of corporate and household debt levels; the box on page 145 outlines the main ones.

Both personal and corporate sector capital gearing increased significantly from the mid-1980s, as Chart 1 shows. The increase coincided with a period of financial liberalisation,

Chart 2
Income gearing in the personal and corporate sectors



(a) Ratio of gross interest payments to post-tax income.
(b) Ratio of net interest payments to post-tax income.
(c) Ratio of gross interest payments to disposable income.
(d) Ratio of net interest payments to disposable income.

relatively low interest rates and tax cuts. Income gearing increased even more sharply in the late 1980s, as interest rates rose (see Chart 2). Strong consumer spending and an

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(2) The authors acknowledge the contribution of Rob Thomas of the Bank's Economics Division in his work on negative equity.

Measures of gearing

Gearing ratios measure the significance of levels of debt. Two main ratios are widely used: capital gearing, which can be thought of as a 'stock' measure; and income gearing, which is a 'flow' measure. Both are useful indicators of the importance of a given level of debt, and so its potential influence on behaviour.

Capital gearing is a ratio of debt to assets. It can be thought of as a measure of financial exposure, since it indicates the proportion of wealth that would have to be sold in order to pay off debt. It is sometimes used as an index of vulnerability to changes in asset prices.

The various measures of capital gearing differ in their use of net or gross debt as the numerator of the ratio, and financial or physical assets as the denominator. In this article, corporate sector net capital gearing is defined as net debt at book value (gross debt including bonds less liquid assets) as a percentage of the physical capital stock at replacement cost. (Other measures focus on debt at market value in relation to the market value of equity, which indicates financial markets' assessment of the net worth of a firm; series based on these measures, however, tend to be more volatile.) Personal sector capital gearing is defined as the stock of personal borrowing from monetary sector institutions divided by the sum of tangible and financial wealth less non-monetary sector financial liabilities.

Income gearing is a ratio of interest payments to income. It indicates how costly debt is to service, and provides a measure of vulnerability to changes in interest rates, since it shows the proportion of income that is needed to service debt. Like capital gearing, there are both net and gross versions: the interest payments can be included either gross or net of interest receipts. It is usually defined in net terms for the corporate sector and in gross terms for the personal sector and, unless otherwise stated, this article follows that practice.

Analysis of both gross and net gearing measures is often useful when the debtors and creditors within a sector are distinct, and their behaviour is different. Net gearing will, in most cases, provide a more useful summary of the financial position of individual agents.

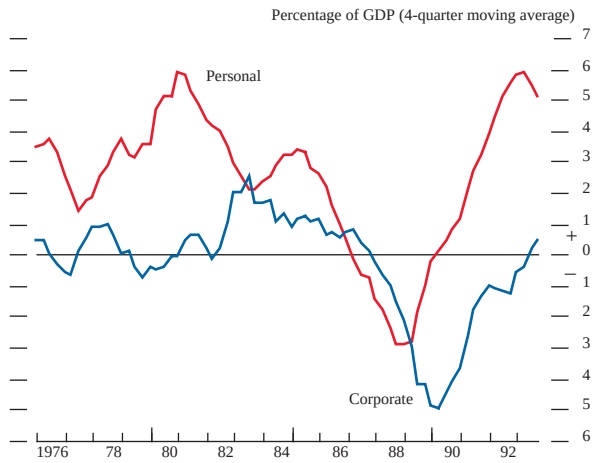
The *financial surplus (deficit)* of a sector is the balance of its saving and net receipts of capital transfers, less its expenditure on fixed assets and the increase in the book value of its stocks. In principle, any deficit is met by borrowing from, and any surplus is lent to, other sectors.

investment boom led the personal and corporate sectors to run financial deficits peaking at around 3% and 5% of GDP respectively during this period (Chart 3). The merger boom added to companies' net borrowing requirement.

The increase in capital gearing was much more marked in the corporate sector than the personal sector for two main reasons. Companies ran significantly larger financial deficits and continued running deficits longer. And house price rises boosted the value of personal sector assets and so dampened the rise in personal capital gearing until 1989.

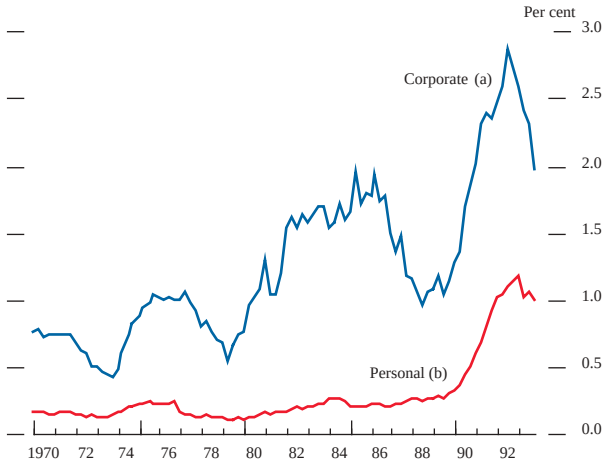
Nevertheless, house price volatility markedly increased the diversity of net asset positions across the personal sector. People who had bought houses earlier benefited from the house price boom; but many who bought in the late 1980s and early 1990s suffered from negative equity, as price falls took the value of their houses below the level of their

Chart 3
Financial surplus/deficit in the personal and corporate sectors(a)



(a) Financial deficit as a proportion of GDP (- means deficit/+ means surplus).

Chart 4
Insolvencies in the personal and corporate sectors

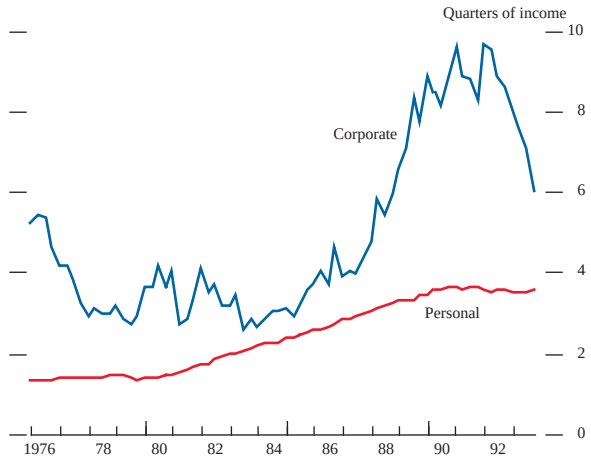


(a) Percentage of active companies (annualised rate).
(b) Percentage of working population (annualised rate).

mortgages. In the corporate sector, diversity stemmed more from differences in financing choices than from asset-price inflation; many firms borrowed heavily in the late 1980s, but others increased their bank deposits. As Chart 4 shows, insolvency rates in both sectors began to rise sharply between 1990 and 1992.

In the same way that corporate sector borrowing increased more rapidly than that of the personal sector during the second half of the 1980s, firms reduced their spending more rapidly as interest rates rose and growth slowed. Since 1992, the corporate sector as a whole has reduced its level of debt, partly by net repayments of bank debt. Despite large falls in the real and nominal value of housing assets, the personal sector in aggregate has not repaid debt to the same extent.

Chart 5
Ratio of debt to income: corporate[a] and personal[b] sectors



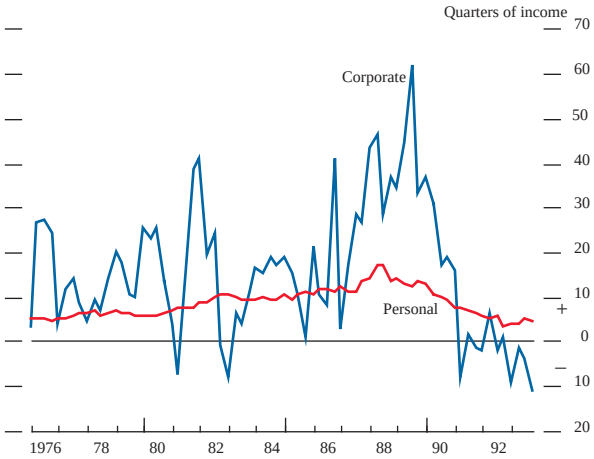
Debt is measured by the stock of sterling lending by banks and building societies. This excludes trade credit, company bonds and miscellaneous instruments, and for persons also excludes loans for house purchase from miscellaneous financial institutions.
(a) ICCs' stock of sterling borrowing from banks and building societies as a proportion of their post-tax income.
(b) Persons' stock of sterling borrowing from banks and building societies as a proportion of their disposable income.

As Chart 5 shows, since the beginning of 1992 the decline in the corporate sector's debt-income ratio has contrasted with the stability of the personal sector ratio. The difference can, however, partly be explained by the different movements of income in the two sectors: while nominal personal disposable income has risen by just over 9% during the period, the nominal post-tax income of the corporate sector has increased by 38%.

Since 1990, interest rate reductions have led to lower income gearing for both sectors; income gearing is no longer high compared with the mid-1980s and is around half its 1990 peak (as shown in Chart 2). Meanwhile, both sectors have increased the proportion of borrowing they undertake at fixed, rather than variable, interest rates, which has reduced the short-run sensitivity of their interest payments—and therefore retained income—to changes in interest rates.(1)

Although it is sometimes difficult to distinguish the acceptance of a given level of debt from the inability to

Chart 6
Ratio of the flow of debt to income: corporate[a] and personal[b] sectors



Debt is measured by the stock of sterling lending by banks and building societies. This excludes trade credit, company bonds and miscellaneous instruments, and for persons also excludes loans for house purchase from miscellaneous financial institutions.
(a) ICCs' sterling borrowing from banks and building societies as a proportion of their post-tax income.
(b) Persons' sterling borrowing from banks and building societies as a proportion of their personal disposable income.

reduce it, several factors suggest that households have been more comfortable than firms with their recent debt levels. Falls in personal sector non-mortgage borrowing have been more than offset by increases in borrowing for house purchase. During 1993, the rate of increase in household borrowing—although low—exceeded income growth (see Charts 5 and 6). Chart 6 also suggests that the corporate sector may have reacted more to past high debt levels: in aggregate, firms began repaying debt in 1991, before any marked rise in their income. And consumer spending has been the driving force of the recovery, even though real disposable income growth has been very subdued; by contrast, despite higher income growth firms' investment has so far contributed little to the recovery.

The personal sector

Consumption in the recession and the recovery

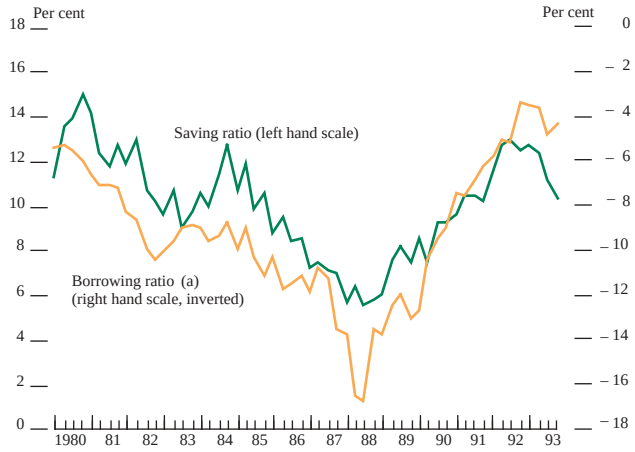
Relative to GDP, consumption fell faster and for longer during the 1990–92 recession than is usual in downturns in major industrialised countries. As noted above, its recovery since then has contributed more to GDP growth than any other category of expenditure. The variation in consumption has been associated with large changes in the saving ratio (see Chart 7): the proportion of income consumed increased substantially during the mid-1980s, but fell again between 1989 and 1992.

These movements have confounded many forecasts, which underpredicted consumption during the boom and overpredicted it during the recession. A wide variety of explanations have been put forward for the errors.

First, it has been suggested that expectations of permanent income increased during the mid-1980s, encouraging

(1) See the article on fixed and floating-rate finance in the United Kingdom and abroad in the February 1994 *Quarterly Bulletin*.

Chart 7
Personal sector saving and borrowing



(a) Bank and building society borrowing by the personal sector as a proportion of personal disposable income.

relatively high borrowing by consumers.[1] When the expected increase failed to materialise, consumers were left with excess debt, leading them to reduce consumption, increase net saving and reduce borrowing in order to restore their desired debt-to-income ratios.

Second, financial liberalisation—particularly taken together with a change in permanent income expectations—has been offered as a factor contributing to the growth of consumption. Previously, capital market imperfections—liquidity constraints—may have prevented consumers from increasing their borrowing as they wished to finance higher spending.

Third, the sharp rise in consumption during the mid-1980s and its fall between 1990 and 1991 could have been caused in part by owner-occupiers responding to changes in their housing wealth, particularly in regions where house prices changed most. This explanation emphasises the importance of wealth and asset prices in determining consumers' behaviour.[2] If net debt is the main determinant of consumption behaviour, then the fall in consumption should have been greatest among those owner-occupiers with outstanding mortgages.

Finally, some economists have focused on the influence of demographic factors and changes in the distribution of income. A redistribution of income towards those with higher propensities to consume (notably the young) might account for the increase in consumption during the late 1980s. King has presented both theory and evidence to show how distributional shocks that alter the allocation of net wealth between debtors and creditors can lead to large changes in demand and output.[3]

Some of these explanations are based on a suggestion that different types of consumer reacted differently to the shocks affecting the whole economy. To decide between them, it is therefore necessary to look at disaggregated data. Before assessing what these data show, however, the next section investigates the importance of debt levels as an influence on consumers' behaviour. Sectoral data can throw light on how far the changes in capital gearing were the result of changes in asset values and how far of changes in the volume of debt, and on what the effect of interest rate changes was on debtors and creditors.

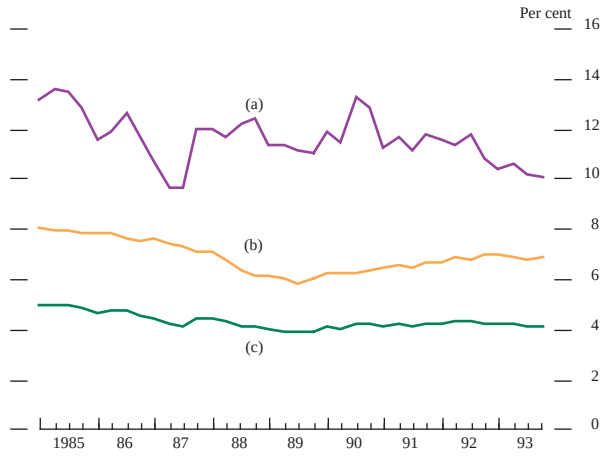
Aggregate measures of personal sector debt

Capital gearing

Movements in personal sector capital gearing result from changes in either borrowing or the value of assets held. The steady rise in capital gearing during the 1980s reflected increased borrowing; it increased more sharply in late 1989 as house prices began to fall. The ratio levelled off after 1990, as the rate of increase in personal sector borrowing slowed. And since 1992 Q3, it has declined as personal sector wealth has increased; a 27% increase in net financial wealth and a 7% growth in tangible wealth (including consumer durables) have both exceeded the 5% rise in the stock of borrowing.

In general, falling asset prices may be an important element in the explanation of movements in consumption. Asset values are often included, along with income, as an explanatory variable in consumption functions. Chart 8 shows that the relationships between consumption and a variety of wealth measures have been broadly maintained, despite quite large swings in asset values.

Chart 8
Consumption/wealth ratios



(a) Personal sector quarterly consumption as a proportion of net financial wealth.
(b) Personal sector quarterly consumption as a proportion of tangible wealth.
(c) Personal sector quarterly consumption as a proportion of total net wealth.

By the end of the fourth quarter of 1993, the personal sector held about £2,600 billion worth of net assets. Of this, 60% was accounted for by tangible assets, primarily housing. Although this is a higher proportion than in some European countries, it is similar to that seen in the United States and Japan. But the volume and structure of personal sector debt suggest that the United Kingdom might be particularly

(1) Permanent income is the steady rate of consumption that could be sustained over an individual's life, given his/her current wealth and present and future earned income.
(2) See Muellbauer, J and Murphy, A, 'Is the UK balance of payments sustainable?', *Economic Policy*, Vol 11, pages 345–83, 1990.
(3) King, M A, 1993 EEA Presidential Address, 'Debt deflation: theory and evidence', forthcoming *European Economic Review*.

prone to difficulties related to debt deflation resulting from falls in tangible asset prices; in particular, UK mortgage lending is characterised by relatively high loan-to-value ratios.(1)

Income gearing

A high proportion of the stock of UK mortgages have variable—rather than fixed—interest rates, compared with around 25% in the United States; this makes the personal sector particularly sensitive to changes in short-term interest rates.(2)

Although household capital gearing has remained high, household income gearing has fallen substantially over the last three years, as interest rates have fallen. Since 1990 Q3, average mortgage rates have declined by roughly seven percentage points; the current level of income gearing—8%—is close to that seen in the mid-1980s. The decline contrasts with recent experience in other major economies, where income gearing has either continued to rise or fallen only slightly.

Total personal sector interest payments, which form the numerator of income-gearing measures, have fallen from a peak of £14.5 billion a quarter in 1990 Q3 to £9.3 billion in 1993 Q4—a reduction equivalent to about 5% of personal disposable income. But the net effect of interest rate reductions depends in addition on their effects on consumers' investment incomes; average bank and building society deposit rates fell by about eight percentage points in the same period.

The personal sector has been a *net floating-rate debtor* since 1988; in 1993 Q4, its total bank and building society borrowing of £410 billion compared with total deposits of £384 billion. So in aggregate, consumers' net income *benefits* in the short run from cuts in short-term interest rates, although the net interest receipts are very small in relation to income (see Chart 2). The effect on aggregate consumption depends on debtors' and creditors' relative propensity to consume, and on whether the interest rate changes are viewed as permanent or temporary. If, as is generally thought, borrowers have a higher propensity to consume, this will tend to magnify the negative relationship between consumption and interest rates.

The disaggregated picture

To what extent can the fall in consumption during the recession be explained by falling asset prices, and to what extent by disappointed income expectations? One way of addressing this is to analyse the behaviour of consumers with different asset-holding, debt and income profiles.

Income and expectations

The pattern of changes in income over time across the distribution of household income suggests that unfulfilled income expectations may have had an important bearing on household behaviour. Households in the top half of the income distribution enjoyed substantial real rises in their income between 1980 and 1988; since then, they have suffered significant real declines—see Table A. The potential for unfulfilled income expectations is clear, if expected permanent income is affected by actual income. Furthermore, changing permanent income expectations affect the behaviour of younger consumers more than older. So any effect as a result of unfulfilled income expectations probably reinforced that from negative equity, which has been concentrated among the young: two thirds of those suffering from negative equity are first-time house-buyers.

Table A
Real pre-tax household income: by decile

£ per week, January 1987 prices

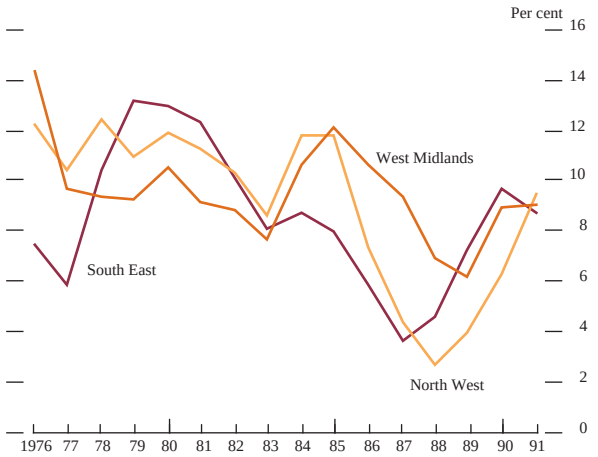
	1980	1988(a)		1992(b)	
10th decile	57.50	56.00	*-3.1*	52.00	*-6.5*
20th decile	83.50	83.50	*0.4*	79.50	*-5.2*
median	198.00	220.50	*11.4*	204.50	*-7.2*
80th decile	319.00	397.50	*24.5*	377.50	*-5.0*
90th decile	400.50	511.50	*27.7*	500.00	*-2.2*

Figures for the 10th decile refer to a household whose income is exceeded by 10% of households. The deflator used is the retail prices index excluding mortgage interest payments. Income is rounded to nearest £0.50.
Source: Family Expenditure Survey.
(a) Figures in italics give percentage change based on unrounded real income, 1980 to 1988.
(b) Figures in italics give percentage change based on unrounded real income, 1988 to 1992.

The distribution of income and spending patterns across different income groups can have important effects on aggregate behaviour. Because high-income households account for a disproportionate amount of consumption—it has been estimated that the top 4% of income-earners account for almost 15% of all consumer spending—the expectations and behaviour of high-income groups may be particularly influential.

Regional differences also suggest some role for income expectations in the explanation of the movements in consumption, but the evidence is not conclusive. Regional saving ratios show that the consumption boom of the mid to late-1980s was associated with a sharp fall in the saving ratio of households in the South East (Chart 9). Consumers in

Chart 9
Saving ratios by region



(1) See Table G in the article on fixed and floating-rate finance cited in footnote (1) on page 146.
(2) See the box on personal sector gearing in the major economies in the August 1993 *Quarterly Bulletin*, pages 336–37.

northern regions also spent more of their income, but the falls in their saving ratios were generally smaller. Between its peak in 1986 and its trough in 1990, unemployment fell faster in the South East than in the rest of the economy which, other things being equal, would cause the expected income of those in the region to increase relative to other regions; this could in part explain their spending behaviour. Since 1990, however, despite a larger rise in unemployment in the South East than in other regions, the recovery in consumption has been led by a decline in the saving ratio in the South East. This suggests that factors other than income expectations have been more important in determining consumers' behaviour.

Debt levels and asset prices

Since 1980, the proportion of households with mortgage debt has increased sharply, leaving the personal sector more vulnerable to changes in interest rates and to falls in house prices. According to the Family Expenditure Survey (FES), the proportion of households with mortgages rose from 33% in 1980 to 42% in 1992.

There is no doubt that homeowners in the southern regions suffered most from the recent falls in house prices. House prices in those regions started to fall earlier, from the fourth quarter of 1988; prices in northern regions rose until at least mid-1990. And the largest falls were seen in southern regions.(1) To a great extent, these falls reversed previous very rapid rises—for example, prices rose by almost a third in East Anglia during 1988, but then fell by over a third between the end of that year and the beginning of 1993. The spending decisions of homeowners who did not move during this period were probably relatively unaffected by these price movements: it is unlikely that asset-price changes associated with so obvious a boom had an immediate and full impact on their spending decisions. But the price falls and debt deflation left many recent house-buyers—a substantial minority of all homeowners, and often young, first-time buyers—with negative net wealth.

Table B
Regional profile of negative equity, 1994 Q1

	Number of households with negative equity ('000s)	Total value of negative equity (£ billions)	Average amount of negative equity per household (£)
Greater London	220	1.7	8,000
Rest of South East	510	3.8	7,500
South West	180	1.0	5,700
East Anglia	80	0.6	6,700
East Midlands	100	0.3	2,600
West Midlands	90	0.1	1,400
Other regions	120	0.1	900
Total	**1,290**	**7.6**	**5,900**

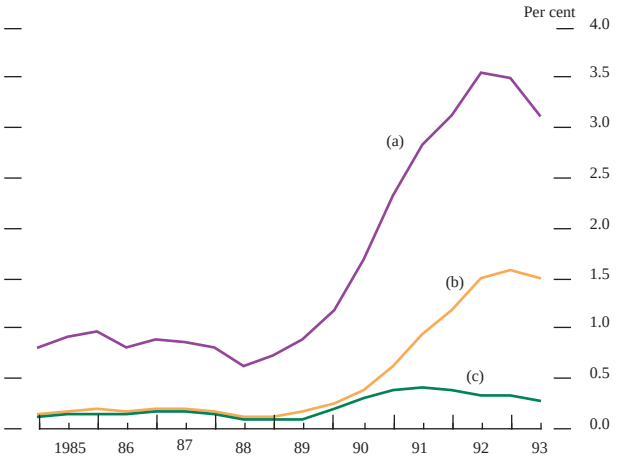
Components may not sum to totals because of rounding.

For the country as a whole, negative equity is estimated to have risen from £8 million at the beginning of 1989 to a peak of almost £12 billion in the first quarter of 1993. At its peak, about 1.8 million households were affected, with an average negative equity of £6,600 (the average had fallen to £5,900 by 1994 Q1—see Table B). Since house prices fell furthest in the South East, the problem was worst there, with about 900,000 households (including in Greater London) having negative equity in 1993 Q1—over 50% of all affected households. Their average negative equity—at £9,000—was also substantially higher.

There is some evidence that the increase in negative equity has altered the behaviour of households and affected the economy as a whole. Lump-sum repayments to mortgage lenders, other than on loan redemptions, have risen by 140% since 1989, to reach £2.5 billion in 1993—nearly 5% of personal sector saving. This increase cannot readily be explained by changes in mortgage rates; rates fell sharply between 1989 and 1993, reducing the incentive to repay debt. A more likely cause was concern about the level of debt, particularly among households with negative equity. But debt repayment of £2.5 billion is not large compared with the benefit that consumers have enjoyed from lower interest payments; in gross terms these have increased annual personal income net of interest payments by £18 billion a year between 1990 and 1993.

The severe income-gearing problems faced by some indebted households provides another example of the range of experience within the personal sector; it is illustrated by the large increase in the proportion of mortgages going into arrears and leading to possessions (Chart 10). But falling asset values do not by themselves explain these increases, unless households are simply unwilling to continue paying interest and capital on a secured debt that exceeds the value of the underlying asset. The increase in arrears is more likely to have resulted from lower-than-expected personal income growth or larger-than-expected increases in interest rates. Falling nominal house prices exacerbated the difficulties, however, because negative equity prevented households from trading down and so reducing their mortgage payments to more sustainable levels.

Chart 10
Mortgage arrears and possessions



(a) Mortgages over six months in arrears as a proportion of the outstanding stock of mortgages.
(b) Mortgages over 12 months in arrears as a proportion of the outstanding stock of mortgages.
(c) Possessions as a proportion of the outstanding stock of mortgages.

(1) In Greater London, prices declined by 29% between 1988 Q4 and 1993 Q1. Prices fell by only 5.3% in the North as a whole (the fall occurred between 1990 Q3 and 1993 Q1), 8.4% in the North East (1990 Q2 to 1993 Q1) and 10.3% in the North West (1991 Q2 to 1993 Q1).

Homeowning consumers with no outstanding mortgage debt seem to have reacted to lower interest rates, and lower investment income, by reducing their spending: according to the FES, between 1991 and 1992 real consumption by such homeowners fell by about 11%, whereas spending by households with a mortgage rose by 5%.

Summary

The disaggregated data support the view that consumption behaviour over the recent cycle was the combined result of income-expectation, asset-price and debt factors. The influence of demographic factors makes it difficult to determine the relative importance of income expectations and net debt. Specifically, young households both had a key role in unfulfilled permanent income expectations and were the group that suffered most from high net debt and negative equity following the house-price falls. Again, regions that saw the fastest income and asset-price growth in the mid-1980s subsequently faced the largest rises in unemployment, the greatest house-price falls and the most substantial negative equity.

The following main points can be suggested:

- the comparatively modest increase in personal sector capital gearing masks a financial position that was significantly worse for a number of households. At its peak, 1.8 million households were affected by negative equity;
- consumer behaviour seems to have reflected both debt levels and income shocks; and
- there is some evidence of increased lump-sum repayments and of mortgagors switching to fixed-rate mortgages. Consumer borrowing has remained subdued, but households have been willing recently to let their saving ratios fall.

The corporate sector

Levels of corporate gearing such as those seen in the second half of the 1980s—and shown in Charts 1 and 2—do not inevitably mean difficulties for companies. Chart 4 shows that the corporate insolvency rate did rise sharply from 1989, but firms do not necessarily experience financial distress when their net debt reaches 27% of physical assets [the average for industrial and commercial companies (ICCs) in 1992] or because net interest payments reach 31% of income (the average in 1990).

Such average gearing levels provide cause for concern because of the likelihood that they mask much higher gearing levels for a significant minority of firms. It is only by looking at data for individual firms that it is possible to gain a real indication of how many directly faced financial difficulties. Furthermore, there is substantial interdependence between firms (eg through trade credit and customer-supplier links); so the greater the number of such highly-geared firms, the more likely there are to be implications for the rest of the sector, ie the greater is overall fragility.

The company data used

Data were taken from the accounts of UK-quoted companies compiled by Datastream International. On average, around 1,200 companies were included in the sample for each year; its composition changed over time, as companies entered and left the quoted sector.

The year shown is that in which an accounting year ended, so data for a particular year usually reflected activity of the company in both the cited and the previous calendar year. At the time of compilation, only half of the accounts for 1993 were available, predominantly of companies that had reported in the first half of the year.

As all firms were quoted, they represented a wide—but not full—spectrum of the UK corporate sector. In particular, small firms are not usually quoted and are therefore underrepresented in this sample. Subsidiaries are excluded.

To calculate capital gearing, the replacement cost of capital was calculated for each firm using the perpetual inventory method.

This part of the article examines the diversity of corporate gearing over the last two decades. It focuses on how this diversity has changed since 1980; and it analyses the characteristics of those firms that experienced the most acute financial distress. From the data used (see the box above), it is possible to analyse: whether gearing varied according to firm size; whether the same firms were consistently more highly geared; and whether firms with high debt levels also experienced poor profitability. It begins by suggesting why levels of debt might affect a company's performance, and by offering a number of reasons for the expansion of debt in the late 1980s.

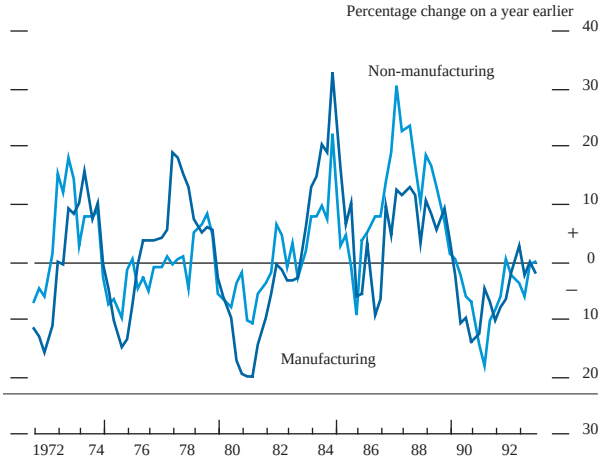
Do debt levels matter?

The results presented here focus on the importance of debt for corporate performance. But debt is just one source of finance: companies may choose instead to use equity issues or may generate sufficient funds internally. There are several reasons why a firm's choice of method of finance may affect its market value. The most important are: differences in tax rates affecting the different methods; costs associated with bankruptcy; and the impact of different sources on the incentive both to commit effort and take risks. The incentive for highly geared firms to take risks may lead potential financiers to be more cautious; opportunities for productive investment may as a result be missed.

Although debt levels are in practice likely to influence behaviour, it is difficult to determine an equilibrium level of gearing. That will depend on all the factors that affect the expected stream of future income and the cost of financing debt. These are not easily measurable at either the aggregate

level or the level of the firm. But the disaggregated analysis presented here can offer information beyond that contained in aggregate data about which firms face financial pressures.

Chart 11
Business investment in manufacturing and non-manufacturing(a)(b)



(a) Non-oil business investment.
(b) Figures include public corporations and are therefore not affected by privatisations.

Why did debt levels rise so rapidly in the 1980s?

There are a number of reasons why a shift in gearing levels might have been observable in the 1980s. Financial liberalisation (including the abolition of exchange controls) increased financial choice and allowed some firms to increase levels of gearing to desired levels. Financial innovations enabled firms to substitute debt for equity— in part because they increased the opportunities for leveraged buy-outs—while also increasing competition among suppliers of finance.

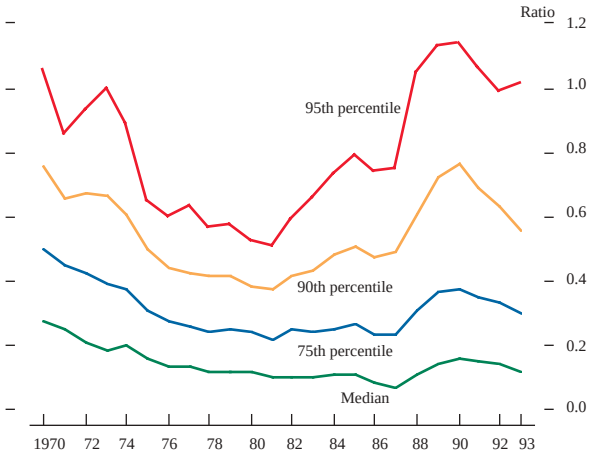
In addition, the liberalisation occurred at a time when expectations of both future income and real interest rates were probably too optimistic. A number of pieces of evidence support this view. Most medium-term forecasts published in the late 1980s overpredicted output. And the buoyancy of business investment during the period—illustrated in Chart 11—may suggest that firms' assessments of medium-term income net of interest payments were also overoptimistic.

Gearing levels

Using disaggregated data taken from the accounts of UK-quoted companies, it is possible to focus on the diversity in companies' behaviour that is not observable from average measures.

Chart 12 shows the changing distribution of firms' capital gearing over time: for each year, it plots the gearing of the median firm in the distribution, along with that of representative firms at various points in the upper tail of the distribution. The 95th percentile line, for example, shows the gearing of the firm whose gearing level was exceeded by only 5% of firms in the sample. This upper tail therefore

Chart 12
Corporate sector capital gearing:(a) **cross-sectional distribution**



(a) Gross debt less cash, as a proportion of replacement cost of physical assets.

contains those firms likely to be facing financial difficulties in any specified year, and the evolution of the line suggests whether these difficulties are becoming more or less acute over time.(1) A number of points emerge:

- in every year shown, there was a wide disparity between the gearing of median firms and firms in the upper tail. The gearing of the 95th-percentile firms never fell below 50%, whereas after 1980 over half of the firms consistently had gearing of less than 15%;

- diversity of gearing increased sharply over the 1980s. In the late 1980s, gearing increased across all parts of the distribution. For firms in the upper tail, it rose to very high levels. By 1990, 5% of the firms had borrowing over 1.2 times the value of their physical capital stock. Such firms were likely to be vulnerable to falls in their income and increases in their debt-servicing costs; and

- there is little evidence of persistent cyclicality of capital gearing, either for median firms or for firms in the upper tail. Rather, the lines are U-shaped up to 1990: it is plausible to suggest that firms ended the 1960s with high levels of debt; then allowed the real value of this to be eroded by inflation during the 1970s; and in the 1980s—helped by financial liberalisation—increased their debt, encouraged by increasing confidence in the economic recovery and the merger boom. After 1990, firms across all parts of the distribution made efforts to reduce their borrowings. This is also evident from recent data on net bank lending to ICCs (see Charts 5 and 6).

It is also clear from the data underlying Chart 12 that smaller firms (in terms of turnover) were over-represented in the upper tail of the distribution. If the relatively heavily indebted firms were mainly larger ones, then a severe economic shock would be likely to lead to defaults on higher absolute levels of debt.(2) But the predominance of smaller

(1) This approach follows that in Bernanke, B S and Campbell, J Y, 'Is there a corporate debt crisis?', *Brookings Papers on Economic Activity*, 1988.
(2) In 1990, the average net indebtedness of the largest 25% of firms in the sample was around 14 times the average level of debt of the smallest 25% of firms in the sample, where size of firm is determined by turnover.

firms in the upper tail is a feature which appears fairly consistently throughout the period analysed; it became particularly marked from the late 1980s. The capital gearing of the smallest 25% of the firms increased from 0.9 in 1987 to 1.6 in 1990; in contrast, the capital gearing of the largest 25% rose more modestly, from 0.6 in 1987 to 0.9 in 1990. This illustrates the particular difficulties faced by smaller firms during the 1990–92 recession.

Some care is needed, however, in drawing conclusions from these data. The estimated value of the physical capital stock will understate the total value of the firm if it owns intangible assets such as brand names, patents and copyrights. But this will not affect the conclusions here, unless there has been a substantial shift in business activity between sectors which are heavily reliant on physical capital and those heavily reliant on intangible assets.

Persistence of indebtedness

The analysis can also be used to see whether the same firms were consistently more highly geared, or whether firms that survived a period of high indebtedness tended not to repeat the experience. If the same firms were consistently found in the upper tail of the distribution, it might suggest that they were content with such high levels of debt. The question is addressed in Table C, which analyses the persistence of capital gearing over the sample period, using Spearman rank correlations. The technique uses a ranking of the firms from highest to lowest-geared for each year; a coefficient close to one indicates that there is a close correspondence between firms' ranks in the two years in question; a coefficient close to zero indicates little correspondence. A negative coefficient shows an inverse correlation between the ranking of firms in the two years.

Table C
Spearman[a] rank correlation coefficients for capital gearing in different years in the sample

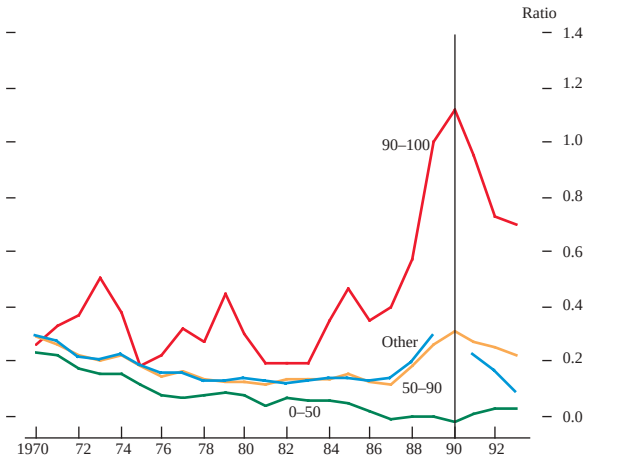
	1970	72	74	76	78	80	82	84	86	88	90	92
1970	1											
72	0.72	1										
74	0.58	0.71	1									
76	0.48	0.61	0.74	1								
78	0.42	0.49	0.62	0.78	1							
80	0.35	0.42	0.55	0.65	0.74	1						
82	0.29	0.39	0.46	0.58	0.64	0.73	1					
84	0.23	0.33	0.37	0.46	0.51	0.56	0.67	1				
86	0.12	0.30	0.31	0.36	0.38	0.42	0.52	0.63	1			
88	0.09	0.22	0.22	0.26	0.29	0.31	0.36	0.41	0.54	1		
90	0.06	0.16	0.20	0.26	0.28	0.28	0.30	0.32	0.44	0.59	1	
92	0.07	0.14	0.18	0.23	0.25	0.24	0.28	0.33	0.40	0.46	0.68	1
	1970	72	74	76	78	80	82	84	86	88	90	92

(a) See Spearman, C, 'The proof and measurement of association between two things', *American Journal of Psychology*, 1904.

A number of points can be drawn from the table. First, the coefficients are all positive, indicating that there was some correspondence between the ranking of companies' gearing over time. This may in part have been the result of sectoral effects—some sectors use physical assets less intensively and so consistently have a lower level of gearing. Second, over the long term the coefficients are very small. Even over a two-year time horizon, the correlation may be as low as 0.5, suggesting that firms did not keep their position in the gearing distribution for very long. And finally, the correlations are lower in the 1980s than in the 1970s. This is consistent with the picture of a rapidly-changing structure of corporate sector finances in the 1980s.

Another way of gaining information about changes in the gearing of highly indebted firms is by selecting firms in various parts of the distribution in a particular year, and investigating how their gearing changed over several years. This is done in Chart 13, where the sample is divided into four 'cohorts' of firms, based on firms' gearing relative to the overall distribution in 1990; the median gearing of each cohort is then plotted over several years. Details of the cohorts used are shown on the chart. The cohort of firms that did not exist in 1990 (labelled 'other') contains very different types of firms before and after that date; up to 1989, its members are firms that left the sample before 1990, and after 1990 its members are newly quoted companies.[1]

Chart 13
Capital gearing[a] of firms grouped according to ranking in overall distribution in 1990



The lines show the median gearing of the following groups of firms:
0–50: Low-geared firms, whose gearing was in the lower half of the gearing distribution in 1990.
50–90: Firms whose gearing was between the 50th and 90th percentile in 1990.
90–100: Highly geared firms, whose gearing was higher than the 90th percentile in 1990.
Other: Firms that did not exist in 1990 (hence the break in the line).
(a) Gross debt less cash, as a proportion of the replacement cost of physical assets.

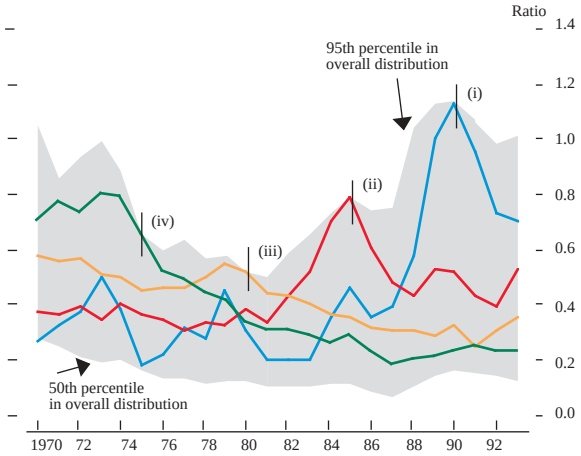
Chart 13 suggests that firms that were highly geared in 1990 had seen their gearing levels increase extremely rapidly to reach that point. The median gearing of the cohort of highly geared firms was just over 0.4 in 1987, but nearly trebled over the following three years. These highly geared firms subsequently reduced their gearing almost as quickly. This feature is consistent with the low Spearman rank correlations seen even for short periods. The line showing 'other' firms indicates that the firms that left the quoted sector in 1989 had a median gearing level well above that of the overall distribution. It would appear that debt may have been a factor in firms leaving the sector.

The tendency for firms that were highly geared in a particular year to have increased their gearing levels rapidly

(1) Firms may have ceased to exist because of either insolvency or merger. New firms may have been the result of merger or may have been newly quoted in the year in question.

in the preceding years and to have reduced them rapidly afterwards is a feature of the 1980s but not the 1970s. Chart 14 plots the gearing of four cohorts of highly geared firms in four benchmark years. The boundaries of the shaded areas represent the median gearing of the entire sample and the gearing of the 95th percentile firm in the sample.(1)

Chart 14
Capital-gearing ratios of highly geared firms(a)



Lines (i) to (iv) reflect the median gearing of the following cohorts of highly geared firms:
(i) Firms whose gearing was higher than the 90th percentile in 1990.
(ii) Firms whose gearing was higher than the 90th percentile in 1985.
(iii) Firms whose gearing was higher than the 90th percentile in 1980.
(iv) Firms whose gearing was higher than the 90th percentile in 1975.
(a) Gross debt less cash, as a proportion of the replacement cost of physical assets.

The sharper spikes for the gearing of highly indebted survivors in the 1980s indicate that in that decade highly geared firms may have acted earlier—and more actively—to reduce their levels of gearing. Although the gearing of firms that were highly indebted in 1975 also fell rapidly, this was a feature across the whole distribution at the time, as high inflation eroded the value of debt.

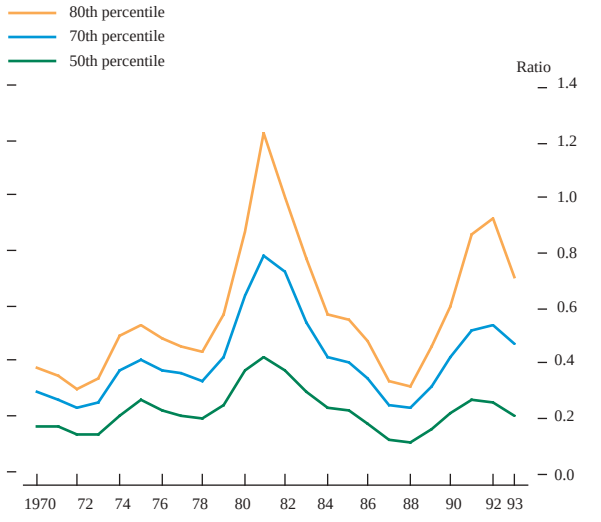
Income gearing

There was a wide diversity in the income gearing of sample firms, particularly during the last two recessions (see Chart 15). In both 1981 and 1992, net interest payments exceeded 90% of post-tax income for 20% of firms. High levels of interest rates in 1980 meant that the income gearing of firms in the upper tail of the distribution was higher then than in the 1990–92 recesssion, even though capital-gearing levels were much lower in the earlier recession(2) and a smaller proportion of firms were making low profits or losses (see below).

Profitability

Profitability (defined here as pre-tax operating profits as a proportion of turnover) also showed considerable dispersion in all the years examined. Chart 16 plots median profitability in each year, together with the profitability of representative firms in the upper and lower tails of the distribution. Diversity of performance increased over the course of the 1980s; once again this is consistent with the greater access to finance (provided by financial liberalisation) leading to a wider range of project outcomes.

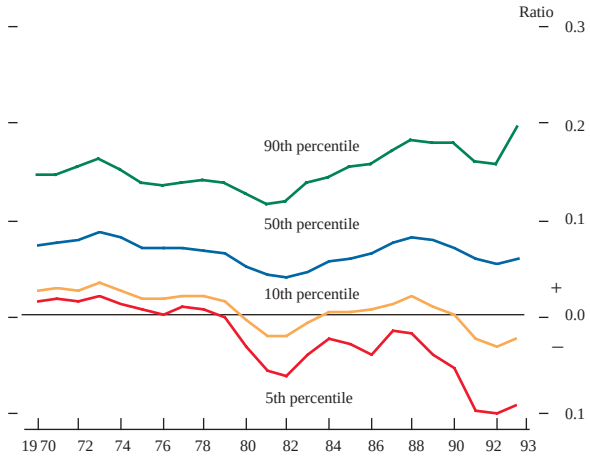
Chart 15
Corporate sector net income gearing:(a) **cross-sectional distribution**



(a) Net interest payments as a proportion of post-tax income net of interest receipts.

In contrast to capital gearing, profitability was pro-cyclical across the distribution—and particularly pro-cyclical for less profitable firms. Not only did profitability fall in the last two recessions, but firms in the lower tail of this distribution were more affected relatively by the fall. And although well over 10% of firms made losses during the recessions, Chart 16 also shows that the most profitable 10% of firms earned profits in excess of 15% of turnover even in the 1990–92 period.

Chart 16
Profits/turnover:(a) **cross-sectional distribution**



(a) Pre-tax operating profits as a proportion of turnover.

Links between indebtedness and profitability

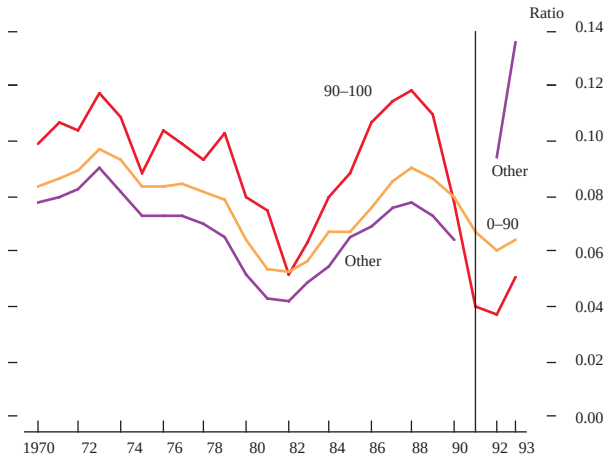
Debt levels may have an important influence on the performance of firms. Geroski and Gregg(3) have described

(1) The median gearing of the 90%–100% percentile firms in the four benchmark years by definition equals the gearing of the 95th percentile firm in the overall distribution in that benchmark year.
(2) Percentiles above the 80th have not been plotted because in the most recent two recessions over 15% of firms made operating losses. This implies negative income gearing for some of the most financially distressed firms.
(3) Geroski, P A and Gregg, P, 'Coping with recession', *National Institute Economic Review*, November 1993.

some of the key features, using company accounts data and the results of a detailed questionnaire on how firms responded to recession. They found that many firms became vulnerable to recession through overexpansion in the 1980s, and that 'firms that are extremely hard hit by recession seem to be much more likely to make major changes in their workforce organisation and operation than other firms. These firms are very likely to have abandoned or postponed investments in all forms of capital.' The results of a cross-sectional analysis focusing on the link between profitability and debt support the view that many firms faced financial pressures in the 1990–92 recession because they overcommitted themselves in the 1980s when profitability was buoyant. They suggest, in contrast, that the difficulties in the recession of the early 1980s were primarily the result of low profitability.

Charts 17 and 18 show the profit-to-turnover ratio for different cohorts of firms ranked by their capital gearing in, respectively, 1991 and 1981—two years in which the economy was in recession. They show a different profitability profile for highly geared firms. The firms that were highly indebted in 1991 had been among the most profitable in the mid-1980s; their median profitability grew rapidly until 1987, when it was nearly three percentage points higher than the remainder of firms. It then fell rapidly to a trough in 1992. The profile is consistent with the proposition that those firms that took on high levels of debt in the late 1980s had income expectations that were not fulfilled, and that this was the reason why so many of them faced problems when the economy moved into recession. A symptom of their problems was that they increased their already-high levels of gearing in the two years to 1991, a period of rapidly-falling cash flow.

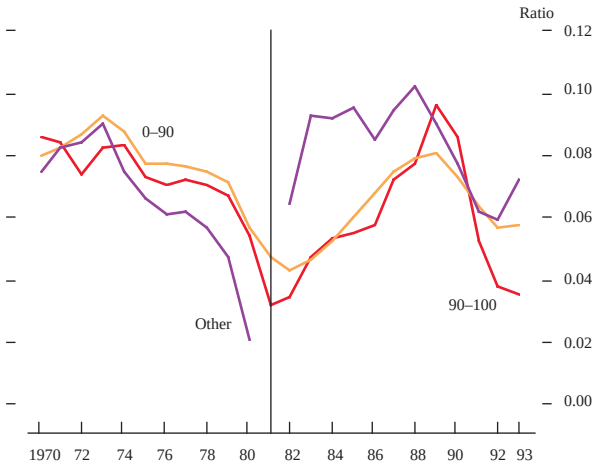
Chart 17
Profitability[a] of firms grouped according to capital-gearing ranking in 1991



The line reflects the median profitability of the following groups of firms:
0–90: Firms whose gearing was below the 90th percentile of the gearing distribution in 1991.
90–100: Firms whose gearing was higher than the 90th percentile in 1991.
Other: Firms that did not exist in 1991 (hence the break in the line).
(a) Pre-tax operating profits as a proportion of turnover.

In contrast, the 1981 cohort of highly geared firms had a median profit-to-turnover ratio that broadly tracked that of other firms present in 1981. There is much less to suggest that firms took on debt in the late 1970s on the basis of

Chart 18
Profitability[a] of firms grouped according to capital-gearing ranking in 1981



The line reflects the median profitability of the following groups of firms:
0–90: Firms whose gearing was below the 90th percentile of the gearing distribution in 1981.
90–100: Firms whose gearing was higher than the 90th percentile in 1981.
Other: Firms that did not exist in 1981 (hence the break in the line).
(a) Pre-tax operating profits as a proportion of turnover.

expectations of strong profits. Chart 18 also suggests that poor profitability may have been a more important factor in firms leaving the quoted sector in 1981. As the line for 'other' firms shows, the difference in the profitability of the firms leaving the sector in 1981 and those replacing them was very marked; and the profitability of the incoming firms was the highest of all the 1981 cohorts for most of the period until 1993.

This suggests that profitability had a very important influence on the incidence of financial distress in the early 1980s recession, but that it was the combination of debt and profitability levels that led many firms to experience difficulties in the 1990–92 recession.

A picture suggested by the disaggregated data

Following a decade of high inflation that eroded the nominal value of debt, by 1980 even the most indebted firms had relatively low levels of capital gearing. The recession that followed caused financial distress for many firms, but this was more a product of low profitability than of high indebtedness. As the economy emerged from the 1979–81 recession, firms became increasingly optimistic about the likely returns on investment, while financial liberalisation allowed some of them increased access to finance. Capital gearing was increased, first and fastest by relatively highly geared firms, but later by firms across the whole of the distribution. As the economy entered the 1990–92 recession, three factors left many firms in a precarious position. First, capital gearing was at historically high levels, particularly for the most indebted firms. Second, although average profitability was robust, it was very weak for the firms at the lower tail of the profitability distribution, and tended to fall most sharply in the case of highly indebted firms. And third, high nominal interest rates meant that income gearing rose sharply; since 1990, those firms in the top 20% of the income-gearing distribution have faced net interest payments of at least 59% of income.

The following summary can be given:

- levels of debt increased significantly in the late 1980s, but the full extent of this is not revealed by the aggregate data. Firms that became highly indebted in a recession did not tend to repeat the experience;

- poor profitability affected a significant minority of firms in both the two most recent recessions. But debt was more important as a cause of problems in 1990 than a decade earlier. Furthermore, highly indebted firms in the recent recession were among those with the sharpest decline in profitability; and

- following their most recent experience, highly geared firms have taken more active steps than in earlier years to reduce their burden of debt. But even last year, many firms remained vulnerable to a sharp rise in interest rates.

Conclusions and prospects

Corporate and personal sector indebtedness increased markedly during the 1980s and the high levels persisted into the early 1990s. In the recent recession, debt had a much greater impact on both sectors' behaviour than in the recession of the early 1980s. It was more unevenly distributed across households and firms; and as a result, aggregate measures mask the force of financial pressures on a significant minority. In the corporate sector, the difficulties were reflected in a greater dispersion of capital-gearing levels, and the combination of debt and poor profitability (particularly among highly geared firms) led to major changes in workforce organisation, cuts in investment and widespread insolvency. A substantial minority of households were affected by negative equity, mortgage arrears and possessions. The combination of debt levels and income shocks seems to have been an important influence on consumers' behaviour.

Consumers' willingness to borrow in the coming months will depend, among other things, on changes in the value of their assets. Conditions in the housing market appear more favourable than in the recent past, and any further rise in house prices could have quite large effects on the levels of negative equity and on aggregate capital gearing. The rise in house prices in the year to the first quarter of 1994 reduced the number of households with negative equity by over a quarter.

In the short term, many firms are likely to concentrate to a greater extent than in previous recoveries on reducing capital gearing. This may dampen investment and employment expansion. As the economy continues to recover, however, firms' desire to issue debt will ultimately depend on the existence of profitable investment opportunities. ICCs' average profitability is much higher now than when the economy emerged from the 1980–82 recession, and the earlier experience suggests that the profitability of firms at the lower tail of the distribution may increase relatively quickly as the economy recovers. It is therefore unlikely that the scars of the recent financial difficulties will lead ICCs to be reluctant in the longer run to take on debt.

In the near future, the gradual nature of the recovery and the severe financial constraints facing a minority of firms and households may lead to cautious borrowing behaviour and further balance sheet adjustment. But in the longer term, both the corporate and personal sectors are likely to use a wide range of sources of finance, including debt.