

# The interest rate transmission mechanism in the United Kingdom and overseas

*Financial deregulation and innovation have been features of many industrialised economies since the late 1970s; the completion of the EC single market and the prospect of an agreement in the Uruguay round of GATT negotiations to liberalise trade in financial services mean that the process of global deregulation is likely to continue. Concern has been expressed that this process of deregulation and innovation may have weakened the mechanisms through which changes in monetary policy—meaning here interest rates (usually short-term) controlled by national monetary authorities—affect aggregate demand and inflation. Any such changes would have important implications for policy since the governments of the major economies including the United Kingdom are committed to the use of monetary policy in pursuing price stability as a condition for stable and sustained growth.*

*After a brief general consideration of how interest rates might be expected to affect an economy, the first half of this article<sup>(1)</sup> summarises current understanding of the ways in which interest rates affect the UK economy. It suggests that, contrary to the concerns noted above, the impact of interest rates on expenditure in the United Kingdom is now more powerful than in the past, and the channels of influence are more clearly discernible. The second half of the article<sup>(2)</sup> examines some relevant features of the major overseas economies.<sup>(3)</sup> The broad conclusion which emerges is that although there is some evidence of change in the early 1980s, data on asset and liability stocks and flows suggest little firm evidence of any radical change in the way that monetary policy influences the components of aggregate demand in these economies.*

## The effects of interest rates—an overview

In the 1987 Mais Lecture,<sup>(4)</sup> the Governor suggested three broad mechanisms through which an increase in interest rates might operate. These concerned the cost of borrowing, the effects on incomes and wealth and the influence on the exchange rate; this section sets out briefly how each of these might be expected to work.

The cost of borrowing affects the relative attractions of spending today and spending later. The direction of its effect is unambiguous: by raising the implicit price of present expenditure in terms of future expenditure, saving will be made more attractive and this will tend to reduce present expenditure, either on consumption or on investment goods.

The effect of a change in interest rates on income depends on several factors, such as the balance between an agent's holding of interest-bearing assets and liabilities, and also on the sensitivity of the relevant interest rates to market conditions. If the overall effect of these factors is such that interest payments are more sensitive to a rise in interest

rates than are interest receipts, the net effect on disposable income will be negative.<sup>(5)</sup> In this case, the income effect will reinforce the substitution effect and act to reduce expenditure by the agent concerned. As these direct effects alter the overall level of activity, there will additionally be second-round effects working through employment, wages and profits.

A further direct effect comes from the influence of interest rates on the value of certain assets. Although not associated with an explicit stream of income which varies as interest rates alter, the value of assets such as housing, equities or government stocks tends to fall as interest rates rise; such a reduction in wealth would also tend to reduce expenditure. This effect would occur even if the purchase of the asset were not being financed by borrowing.

Distributional and demographic effects may also be important in this area, particularly in the personal sector. If borrowers are more cash constrained than those who hold positive net financial assets (which is at least

(1) Written by W W Easton in the Bank's Economics Division. P G Brierley was also involved with an earlier version of the work.

(2) Written by M J Stephenson in the Bank's International Divisions. N H Jenkinson also contributed to earlier drafts of the article.

(3) The United States, Japan, Germany, France, Italy and Canada.

(4) Reproduced in the August 1987 *Bulletin*, pages 365–70.

(5) It is neither necessary nor sufficient for a negative income effect that an agent has net interest-bearing liabilities. For example, if the rate paid on deposits rises by less than the rate charged on borrowing, the income effect could be negative even if the agent held net interest-bearing assets.

plausible), then a rise in interest rates which redistributes income from borrowers to lenders might have a particularly marked effect on expenditure. Demographic factors such as a rise in the proportion of households in the net debtor phase of their life cycle could reinforce such an effect. Changes in the structure of taxation may also influence savings and borrowing decisions.

For any individual economy, the third transmission mechanism operates through the exchange rate. As the major economies have become increasingly integrated, and domestic financial markets increasingly responsive to international developments, the importance of the exchange rate as a transmission mechanism has grown, as has the influence of overseas monetary policy.<sup>(1)</sup> A rise in domestic interest rates relative to those overseas will tend to lead to an exchange rate appreciation. Assuming that overseas exporters do not take all of this rise into their profit margins, the appreciation will reduce import prices in the country which raised interest rates. The fall in import prices will reinforce the downward pressure on inflation arising from the domestic effects noted above.

### The impact of interest rates on the UK economy

#### Background

During the period since 1970 there have been six distinct periods of sustained interest rate increases including the current tightening which began in May 1988. Previous episodes of policy tightening give only limited guidance on the impact of interest rates because it is difficult to separate out interest rate influences from other factors such as world events or other policy changes. For example, between the first quarter of 1978 and the first quarter of 1980, base rates rose from 6½% to 17%. But although there was a slowdown in consumers' expenditure which may partly have been a consequence of the tightening, it was also a result of the reduction in real earnings growth as inflation accelerated, and of the widespread strikes during the winter of 1978/79. Equally, the rise in interest rates was accompanied by a substantial slowdown in the world economy and a marked real appreciation of sterling, both of which owed much to the huge rise in oil prices in 1979. In order to separate out interest rate influences from other factors, it is necessary to adopt a more structured approach.

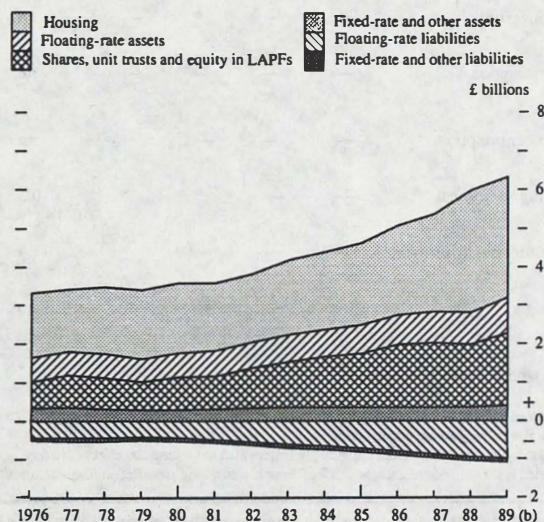
The results of one such approach are outlined in the note on page 200, which describes the evolution of interest rate effects in the Bank's macroeconomic model of the UK economy. There is clear evidence that interest rate effects have become more powerful, with the latest version incorporating effects where previously they were absent. The next section considers economic developments in the United Kingdom during the 1980s which might explain the apparent increase in the power of such effects.

### Developments in the 1980s

#### The personal sector

One important influence on personal sector behaviour has been the liberalisation of the financial system in the 1980s, which resulted in considerably greater competition in credit markets, making credit much more readily available. Rationing in credit markets had been a prominent feature of the 1960s and 1970s and on occasion made it necessary for households to run down liquid assets, rather than increase borrowing, to support any desired increases in expenditure. But following the increase in competition and the associated fall in the cost of intermediation and the greater availability of credit, and assisted also by sustained growth in real incomes and increased consumer confidence as inflation fell, the personal sector increased both its assets and its liabilities extremely rapidly from 1981 onwards. The most rapid growth has been on the liabilities side of the balance sheet; as a proportion of annual disposable income, the stock of personal sector debt rose from just over one-half in 1981 to over one by 1988. Despite the more rapid growth (in percentage terms) of liabilities than assets, the stock of financial assets remains nearly three times as large as the stock of liabilities; when non-financial assets such as housing are included, the stock of assets is almost six times as large as the stock of liabilities (Chart 1). Such an

Chart 1  
The personal sector's balance sheet<sup>(a)</sup>



(a) Assets and liabilities measured relative to personal disposable income. Floating-rate assets consist mainly of sterling deposits with banks and building societies. Floating-rate liabilities are largely loans from banks and building societies, of which over three quarters are loans for house purchase.  
(b) 1989 data are end third quarter figures.

increase in the value of the personal sector's assets increases the potential for changes in the value of assets such as housing or equities to influence personal sector expenditure.

Despite the rapid growth of total net assets, when only floating-rate assets and liabilities are considered (ie those interest-bearing assets and liabilities on which interest rates are not contractually fixed), the personal sector has

(1) Such spillover effects are discussed on pages 206-207.

## Econometric evidence on changes in the impact of interest rates over time

The evolution of the Bank's macroeconomic model of the UK economy shows how perceptions on the power of interest rates to affect key economic aggregates have changed. The table below shows how interest rates have gradually been incorporated into all of the various model equations explaining the main components of aggregate demand.<sup>(1)</sup> It has been found that short-term real interest rates provide the best explanation, with the exception of non-residential investment where the effect operates mainly via long-term interest rates.

As the table indicates, some of the effects have been found to be quite powerful, notably for residential investment and durable consumption. In common with the other large UK models, the latest version of the Bank model also recognises a direct effect of interest rates on consumers' expenditure on non-durables—although it should be noted that the effect is subject to some uncertainty and has not always been supported by research on consumption

elsewhere. The latest Bank model also identifies an important influence running from housing wealth to consumers' expenditure. Direct interest rate effects have long been recognised on residential investment, but it is recent evidence on the spillover from the housing market onto consumers' expenditure which underpins much of the increased ability of interest rates to have an impact on personal spending.

There is also evidence that interest rate effects in the corporate sector have become more substantial in recent years. The latest version of the Bank model identifies important influences of long-run interest rates on investment in both manufacturing and distribution and services. For stockbuilding, a small effect for the short-run interest rate in conjunction with the level of output has long been a feature of the Bank model; the present model, however, identifies a more powerful influence via the cost of stockholding.

### Interest rate effects in Bank model expenditure equations

	Long rates					Short rates				
	1979	1984	1987	1989	Long-run effect (a)	1979	1984	1987	1989	Long-run effect (a)
Residential investment	—	—	*	—	no	*	*	—	*	-3.0(b)
Durable consumption	—	—	—	—	no	—	*	*	*	-0.9
Non-durable consumption	—	—	—	—	no	—	—	—	*	-0.6
Manufacturing investment	—	—	*	*	-0.5	—	—	*	*	no
Distribution/services investment	—	—	—	*	-1.4	—	—	—	—	no
Stockbuilding	—	—	—	—	no	*	*	*	*	-0.3(c)

\* Denotes where direct effect present.

(a) Figures quoted are for the 1989 model and are the overall percentage change in the expenditure component as a direct result of a 1% point rise in the relevant interest rates.

(b) There is also a direct influence from the mortgage rate which has a long-run effect of -0.5.

(c) Effect quoted is for non-manufacturers' stocks. There is also a long-run effect on manufacturers' stocks of -3.0.

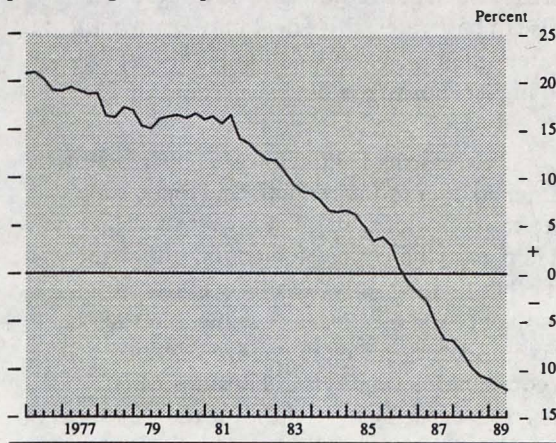
(1) For a detailed description of the various models see A Laffer, 'Bank of England model of the UK economy', Bank of England *Discussion paper* No 5, 1979; G P Dunn, N H Jenkinson and G Midgley, 'Some Properties of The Bank Model', Bank of England *Discussion paper* (technical series) No 9, 1984; K D Patterson, I Harnett, G Robinson and J Ryding, 'The Bank of England Quarterly Model of The UK Economy', *Economic Modelling* Vol 4 No 4, 1987; and F J Breedon, A J Murfin and S H Wright, 'The Bank of England Model 1989', Bank of England *Discussion paper* (technical series) to be published shortly.

moved from being a net creditor to a net debtor (primarily as a result of the growth in borrowing to finance house purchases). Accordingly, and in contrast to historic experience, the rise in base rates and deposit rates since May 1988 will have raised the personal sector's interest payments more than its interest receipts.

Chart 2 shows the stock of personal sector net floating-rate assets as a proportion of annual disposable income and shows clearly the marked fall since 1981. By the third quarter of 1989, the stock of net floating-rate liabilities was equivalent to around 12% of annual disposable income,

compared with net floating-rate assets equal to some 16% of disposable income in 1981. It might appear that after allowing for the cushioning effect of mortgage interest tax-relief, the effect of this change on aggregate income is unlikely to be very significant—although it should be noted that much of the personal sector's interest receipts are subject to taxation. However, the *distribution* of personal sector assets and liabilities is also highly relevant. Studies based on Family Expenditure Surveys (FES) indicate that it is mainly younger households that hold substantial net debts and older households that hold net assets. According to the 1985 FES, the ratio of liabilities

**Chart 2**  
Personal sector net floating-rate assets as a percentage of disposable income

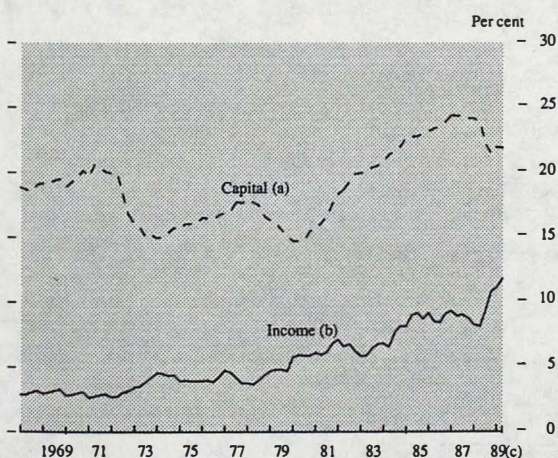


to assets was highest in 1984 among the 25–30 age-group (at around 5), while positive net financial wealth was not reached until age 50; pensioners held on average financial assets five times greater than mortgage liabilities.<sup>(1)</sup> The FES also suggests that the younger households facing the highest debt-service ratios also have greater marginal propensities to consume than the older households, and so the effect of a rise in interest rates in restraining expenditure will tend to be greater than is implied by aggregate estimates.

The main aggregate debt indicators confirm that households now devote a considerably greater proportion of their disposable incomes to servicing debt than at any time in the past 20 years. Both the personal sector's debt-income ratio and its income gearing (the proportion of disposable income taken up by interest payments) have risen especially rapidly in recent years (see Chart 3).

Developments in personal sector behaviour have been strongly influenced by the profound changes that have

**Chart 3**  
Personal sector income and capital gearing ratios

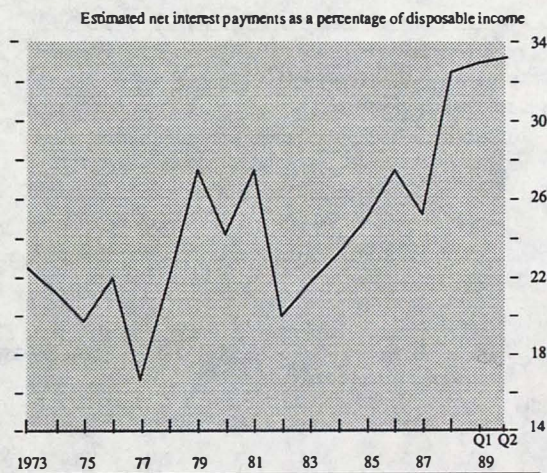


- (a) Outstanding stock of mortgages as a percentage of the value of the owner-occupied housing stock.
- (b) Households' gross interest payments as a percentage of disposable income.
- (c) Data are for second quarter 1989.

taken place in the housing and mortgage markets. The recent rise in income gearing, for example, reflects not only higher interest rates but also the increasing numbers taking on mortgage debt (especially those on low incomes buying council houses) and the rise in both loan-to-income multiples and loan-to-value ratios since 1980. Prior to the 1980s, mortgage borrowing was periodically restricted as building societies operated rationing schemes, which to some extent acted to protect existing borrowers from the effects of increases in mortgage rates. This system ceased to be feasible following the liberalisation of financial markets in the early 1980s, which led to the banks' re-entry into the mortgage market and the break-up of the building society cartel. With this development superimposed on the longer-term trend towards increasing owner-occupation, and given also generally rising house prices in the 1980s, the result has been that housing has assumed increasing importance in the personal sector balance sheet. Mortgage debt grew extremely rapidly in the 1980s, rising from 30% to 70% of annual disposable income; there was a sharp rise in capital gearing in the housing market (the stock of outstanding mortgages as a proportion of the value of the owner-occupied housing stock), although it fell back somewhat as a result of the rapid increase in house prices during 1988 (Chart 3).

These developments have greatly increased the number of households likely to be affected by an increase in mortgage interest rates. The recent rise in interest rates has indeed already had especially large effects on the debt-servicing burden of first-time buyers. Evidence suggests that first-time buyers now have to devote around a third of their disposable incomes to servicing mortgage

**Chart 4**  
Debt servicing burden for first-time buyers



debt, compared with a quarter at the end of 1987 (Chart 4); in London the debt service burden is over 40%. The increase in mortgage rates may also be having a more powerful effect in restraining the willingness of existing owner-occupiers to take on additional debt, either by

(1) A broadly similar conclusion on the distribution of assets and liabilities is reached by J Costello, 'The effect of a 1% increase in building society mortgage and investment rates', *Housing Finance*, No 5, February 1990.

gearing-up when moving house or by additional borrowing secured on the value of existing property.

Overall, therefore, it is likely that interest rate effects will be more powerful than in the past given the much greater proportion of households which are affected by changes in mortgage interest rates, and the much larger proportion of their incomes devoted to servicing mortgage debt. This also makes it more likely that lenders' own prudential limits such as loan-to-value ratios or loan-to-income multiples will limit access to additional credit. Certain factors which might nevertheless act to attenuate these effects should, however, be borne in mind.

Annual adjustment schemes for mortgages (which fix repayments for a twelve-month period even if interest rates subsequently alter) account for over one-quarter of the total mortgage stock but seem likely to have delayed, rather than substantially reduced, the impact of interest rate policy acting via higher mortgage rates.

More generally, supply-side innovation on the part of lenders (such as low-start schemes, fixed-interest loans and reduced rates for first-time buyers) may attenuate the effects of higher base rates; greater competition makes such innovation more likely than in the past. The increased competition both in mortgage lending and for retail deposits (and the increasing use of wholesale funds) has also tended to reduce the margins available to lenders in the mortgage market. As a result, a greater proportion of profits come from items such as commissions on life-insurance policies, which are more directly related to the level of turnover. Hence, in addition to the general competitive pressure, there is greater incentive for lenders as a whole to maintain turnover by avoiding increases in the mortgage rate where possible. Something of this behaviour can be seen in the rates set by mortgage lenders over the last year. Ultimately, however, the need to secure

adequate funding and maintain adequate reserves to satisfy prudential capital ratios will tend to force lending rates upwards in such a situation, and so if there is a sustained rise in base rates, this effect may again act to postpone rather than reduce substantially the response of spending to higher mortgage rates.

A further possible limiting factor concerns the reaction of wage bargainers, either to the reduction in disposable income or to the short-term effect of higher mortgage rates on the RPI (since, in the United Kingdom, unlike the vast majority of other major countries, mortgage interest payments influence the RPI). It is possible that the rise in personal sector income gearing may have strengthened these links compared with previous episodes when interest rates rose, especially given the current tightness of the labour market. This is clearly also relevant to the effects of a policy tightening on inflation considered below.

Notwithstanding such offsetting factors, it still seems probable that the potential for higher interest rates to affect personal sector expenditure has been enhanced by these structural developments in the financial and mortgage markets. Certainly the effects now identified in the Bank's model of the UK economy (see the note on the present transmission mechanism on page 203) suggest a quite powerful impact on consumption, with the role of the housing market prominent.

#### The corporate sector

As with the personal sector, financial deregulation and increased competition in the 1980s have been associated with a rapid build-up of both sides of the company sector balance sheet (Table A). But, unlike with the personal sector, until 1987 ICCs' net liquidity and net floating-rate financial wealth were relatively stable. Since then,

**Table A**  
**Financial assets and liabilities of ICCs**

Figures refer to end year stocks, £ billions

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 Q3
<b>Financial assets</b>											
Floating-rate	16.9	18.3	22.3	22.7	27.8	32.1	36.0	45.3	56.1	63.6	74.5
Fixed-rate	45.8	49.9	53.0	59.0	69.9	78.1	84.0	86.7	94.3	98.3	102.6
Overseas	37.0	42.1	56.7	65.5	67.7	91.6	88.9	101.6	108.1	124.7	155.4
Equities	10.2	11.9	13.0	15.6	19.6	24.6	28.4	36.6	42.6	46.4	58.1
<b>Total</b>	<b>109.9</b>	<b>122.1</b>	<b>145.0</b>	<b>162.8</b>	<b>185.0</b>	<b>226.4</b>	<b>237.3</b>	<b>270.2</b>	<b>301.1</b>	<b>333.0</b>	<b>390.8</b>
<b>Financial liabilities</b>											
Floating-rate	33.1	37.3	43.3	41.8	45.2	50.7	55.6	64.1	76.9	100.6	128.1
Fixed-rate	49.2	54.7	60.4	68.0	80.9	93.9	100.3	104.4	110.1	118.5	124.9
Overseas	33.4	37.9	43.9	48.4	50.8	55.9	64.9	81.4	89.9	106.5	116.5
Equities	66.3	79.3	86.8	115.0	142.7	182.9	213.9	282.3	323.0	347.1	434.9
<b>Total</b>	<b>182.0</b>	<b>209.2</b>	<b>234.4</b>	<b>273.2</b>	<b>319.6</b>	<b>383.4</b>	<b>434.7</b>	<b>532.2</b>	<b>599.9</b>	<b>672.7</b>	<b>804.4</b>
<b>Net financial wealth</b>	<b>-72.1</b>	<b>-87.0</b>	<b>-89.4</b>	<b>-110.4</b>	<b>-134.6</b>	<b>-157.0</b>	<b>-197.4</b>	<b>-262.0</b>	<b>-298.8</b>	<b>-339.7</b>	<b>-413.6</b>
<b>Net 'floating-rate' position</b>	<b>-16.2</b>	<b>-19.0</b>	<b>-21.0</b>	<b>-19.1</b>	<b>-17.4</b>	<b>-18.6</b>	<b>-19.6</b>	<b>-18.8</b>	<b>-20.8</b>	<b>-37.0</b>	<b>-53.4</b>

## The present day transmission mechanism

The note on page 200 summarised the direct interest rate effects on the main components of aggregate demand in the bank model. But such effects do not take account of the interactions between key variables, and even given the relative importance of the direct effects, the indirect effects of interest rates on spending are likely to be at least as important, if not more so. Particularly in current circumstances, the most important are likely to be those operating through the housing market. In addition to the direct effects on private residential investment, research indicates indirect effects on personal sector expenditure via the impact on house prices, mortgage lending and housing wealth.<sup>(1)</sup> More general second-round effects on expenditure come about through changes in activity, employment, real incomes and financial wealth. The slowdown in activity affects both investment and stockbuilding while the reduction in employment and the associated reduction in the total wage bill are probably a more important influence on personal sector disposable income than the initial effect on net interest payments. (The effect of this on real incomes is, however, to some extent offset by the tendency of a rise in interest rates to reduce prices.) Finally, the value of many financial assets will tend to fall as interest rates rise (eg government bonds and equities) and such induced changes in financial wealth will also tend to have an adverse impact on real expenditures, although again the effect will take some considerable time to feed through.

The influence on prices works through two broad channels—the pressure of demand and the exchange rate. The increased potency of interest rates in reducing aggregate demand means that for a given pressure of demand effect on inflation, a tightening of policy will now be better placed to bear down on inflation. The

current version of the Bank model identifies both a capacity utilisation effect and a pressure of demand effect in important price equations. However, neither of the effects is particularly large and, in addition, one further possible channel of influence between pressure of demand and wages—the ‘Phillips Curve’—is also weak.

The table summarises the overall impact of a 1 percentage point rise in interest rates on the economy as a whole. Clearly all the effects and interactions are subject to considerable uncertainty, especially given the important role of expectations. Nevertheless, the results provide at least some quantification of the various interactions and show that, leaving aside the response of the exchange rate, each 1 percentage point rise in interest rates reduces the level of GDP by just under 1% after three years. The fall in domestic demand is larger than that of GDP, giving an improvement on the current account of some £2 billion in the third year. The perverse short-run impact on the RPI is evident, but by the end of the third year, prices as measured by the GDP deflator have fallen by 0.5%, although the effect in the first two years is rather more muted.

The table also shows the effects after three years when the exchange rate is free to respond to the increase in UK interest rates. Research in the Bank suggests that changes in the exchange rate, in the same way as changes in world prices, affect sterling import prices quite powerfully. When the interaction between wages and prices is taken into account, the evidence suggests that a 1% rise in the level of the exchange rate will reduce the level of domestic prices by around 0.6% after three years. The link from the exchange rate to inflation appears to be fairly well-determined and can be quite powerful (although the model suggests little change in the response of GDP to the rise in interest rates when the exchange rate is allowed to respond).

What is less clear, however, is the influence of short-run interest rates on the exchange rate at any particular moment. In the current version of the Bank model, the real exchange rate depends on, *inter alia*, the real long interest rate differential between the United Kingdom and the United States. The equation implies that a 1 percentage point increase in this differential would, *ceteris paribus*, raise the effective exchange rate by 0.6% in the long run (with a degree of overshooting in the short run). However, an important additional complication which the equation does not capture is that the relationship is clearly dependent upon the circumstances and policy regime in which interest rates alter. In practice, it is also unclear whether the exchange rate is mainly linked to short-term or long-term interest rates.

### Bank model simulation : all interest rates +1% point (exchange rate fixed)

Percentage differences from base, except where stated, after specified quarter.

	1	4	8	12	Exchange rate free 12
GDP (output measure)	—	-0.4	-0.7	-0.9	-1.0
Domestic demand	-0.1	-0.7	-1.1	-1.4	-1.4
Consumers' expenditure <i>o/w durables</i>	-0.1	-0.6	-0.9	-1.2	-1.1
	-0.1	-3.5	-4.5	-3.6	-3.7
Investment <i>o/w private residential</i>	-0.1	-1.3	-2.2	-2.8	-3.2
	-0.9	-3.2	-3.1	-4.1	-4.1
GDP deflator	—	-0.1	-0.2	-0.5	-1.0
Retail price index	0.4	0.3	0.2	—	-0.7
Average earnings	—	—	-0.1	-0.4	-1.1
Current account (£bn) (a)	—	0.6	1.5	2.0	1.9
Unemployment (000's)	—	12	35	58	76
Effective exchange rate	—	—	—	—	1.5

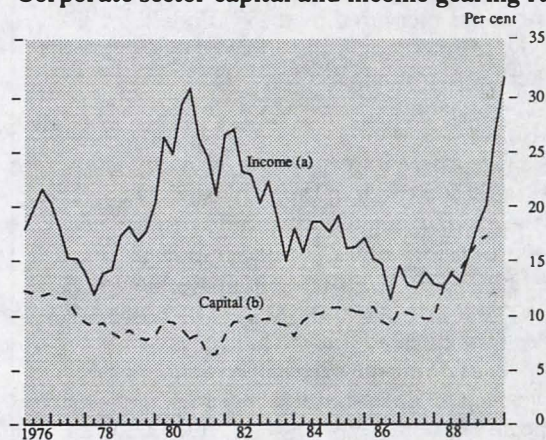
(a) Quoted effects are over the year to the specified quarter.

(1) For example, the present equations suggest that each 1 percentage point rise in short-term interest rates would, via its impact on income gearing, reduce house prices by around 3% after one year, and ultimately by perhaps 5% overall. Such a fall in house prices would ultimately lead to a fall of around 2% in non-durable consumption, although the full effect would take a number of years to feed through.

however, ICCs' bank borrowing has grown much more rapidly than their gross liquidity, so their net interest-bearing liabilities have increased substantially. This partly reflects the lingering effects of the 1987 stock market crash, which induced companies to switch away from equity finance (primarily to bank borrowing), but is predominantly a consequence of the rapid growth in investment expenditure and dividend payments, and higher levels of merger and takeover activity.

It follows that companies' exposure to changes in short-term interest rates has risen substantially, and the aggregate debt indicators suggest a substantial deterioration in the company sector position over the past 18 months. By the middle of 1989, the capital gearing ratio (net debt as a proportion of replacement cost capital stock) stood at 17%, having been at or below 10% for most of the 1980s. Income gearing has also risen particularly sharply since the end of 1988, and by the end of 1989 is likely to have been around its previous (1980) peak (Chart 5).

**Chart 5**  
Corporate sector capital and income gearing ratios



(a) Net interest payments, ie gross interest payments less non-trading income, as a percentage of non-interest income net of stock appreciation and tax payments.  
(b) Capital gearing at nominal cost - ratio of outstanding net borrowing to replacement value of assets (adjusted for tax). 1989 Q2 figure is a Bank estimate.

As mentioned above, much of the recent increase in borrowing has been to finance the rapid rise in capital expenditure during 1987-88 and high levels of merger and takeover activity. With dividend payments also increasing sharply, ICCs moved into significant financial deficit towards the end of 1987. After a small deficit in 1987 (the first annual deficit recorded since 1979), their overall financial deficit in 1988 and 1989 amounted to, respectively, 1.7% and 4.6% of nominal GDP. In the past, a corporate sector deficit has usually been followed fairly quickly (in the next year) by de-stocking and/or investment cutbacks. This happened in each of the three previous relevant periods, viz 1969-70, 1974-75, 1979-80. The present episode is already unusual in that the deficit has persisted for three years. Although the rise in net interest payments made a relatively small contribution to the move into deficit compared with dividend payments or high levels of investment, given the

possibility that the overall deficit will lead to a retrenchment of corporate expenditure, the marginal impact of additional interest payments may be heightened.

A number of factors suggest, however, that the response may be less than in these previous episodes. First, the corporate sector as a whole is much more profitable than in either the middle or late 1970s; the pre-tax real rate of return on capital employed in 1988 and 1989 was 9½%, compared with 4½% in 1975 and only 2½% in 1981. Second, the rate of inflation remains well below those earlier periods: high inflation tends to worsen companies' financial positions in various ways, eg by boosting payments of corporation tax. Third, the available evidence on the current transmission mechanism (see the note on page 203) suggests that, with the important exception of housebuilding, companies are more influenced by changes in longer-term borrowing costs, rather than short-term interest rates (at least in the first instance), and the rise in long interest rates over the past two years has been rather less than that in short-term rates, although the gap has narrowed recently.

Although these factors suggest that the direct effects on corporate expenditure may not be greater than in previous episodes, as noted above the effects on the personal sector are likely to be greater than was previously the case. Personal sector retrenchment will also tend to reduce corporate profit margins and adversely affect companies' expectations of future demand and output growth. There is some evidence that the impact of adverse effects on investment expenditure through second-round reductions in activity could be quite significant (see page 200), although less evidence to indicate that such effects are any more or less powerful than before.

On balance, therefore, the evidence suggests that conjunctural developments and the improvement in profitability may have made the corporate sector more prepared to run financial deficits for longer periods than in the past. A similar conclusion arises from a consideration of stockbuilding. The fall in stock-output ratios in the 1980s and the associated move towards a 'just-in-time' system based on improved distribution and inventory control will tend to make any substantial destocking more difficult than previously.

#### Wages and prices

The preceding sections suggest that, overall, the net effect on aggregate demand is likely to be stronger than before given the relative sizes of personal and corporate spending in relation to GDP. For a given pressure of demand effect on inflation, this development on its own will have increased the ability of a tightening of policy to put downward pressure on inflation. What is less clear, however, is whether the impact of a given change in aggregate demand on costs and prices has changed in recent years. Econometric evidence suggests that direct pressure of demand effects on wage settlements have never been especially strong in the United Kingdom. A

further factor is that the rise in personal sector income gearing may lead to a greater response of wage settlements to the rise in mortgage rates than in previous episodes. In the longer term, however, wage settlements should respond appropriately to the slower growth in output and productivity and the consequential fall in corporate profitability.

Direct pressure of demand effects on prices will depend on the degree to which profit margins are reduced as a consequence of the policy tightening. The recent experience of falling unemployment, strong growth in employment (outside manufacturing) and relatively stable world inflation may mean that pressure of demand effects on inflation will be relatively modest and slow-working. On the other hand, the very fact that profit margins have risen rapidly in recent years may make companies more prepared to trim margins when activity slows, especially if they wish to maintain share in world markets at a time of slowing demand at home and deteriorating underlying competitiveness. Recent econometric evidence does suggest that direct effects of demand on prices have become more important than in earlier years, when most studies suggested that price-setting behaviour was linked solely to movements in costs.

In addition to these direct pressure of demand effects, the rise in interest rates may also have an important influence on inflation via the possibility of an induced rise in the exchange rate. The evidence on the current transmission mechanism from the Bank model certainly supports such a view. Unfortunately, it is extremely difficult to assess the likely impact of a rise in interest rates on the exchange rate at any given time, let alone whether this linkage has increased in importance. Much will depend on the circumstances which have prompted the policy tightening and its likely effect on market expectations, which is particularly difficult to gauge.

It is also unclear whether the impact of a given change in the exchange rate on domestic inflation has increased over time. The increased penetration of imports into the United Kingdom might be thought likely to increase the responsiveness of domestic prices to a given change in import prices. But exporters to the United Kingdom may allow their margins to rise rather than seek to expand market share, thereby limiting the response of import prices. Another relevant linkage here is via the labour market and the possibility of stronger competitive pressure on the corporate sector to resist excessive wage claims. It becomes more likely that industrialists will resist such wage claims if they are aware that competitiveness will not be maintained by allowing an exchange rate depreciation. But this linkage is much more important to manufacturing and rather less relevant to the largely non-trading services sector (both public and private) where much of the current cost pressure on inflation is concentrated—although, since there will be no direct benefit from buoyant export demand, this may also be the sector in which the weakening of demand will be most marked.

## Summary and conclusion

There is clear econometric evidence that the various effects of a rise in interest rates on demand have become more powerful in recent years. The consideration of longer-term developments which might explain such a change places considerable emphasis on deregulation and structural change in the financial markets during the 1980s. A particular consequence of these has been an end to rationing in various credit markets, especially the mortgage market. The initial impact of such changes would probably have been to reduce the impact of interest rates as it would have become easier to borrow in order to maintain expenditure. However, the availability of credit and the reduction in the cost of intermediation associated with the greater competition in financial markets encouraged a large expansion of both sides of the personal sector's balance sheet. The expansion of personal sector gross debt has shifted the sector from being a net creditor to a net debtor on floating-rate terms. The consequent higher levels of income and capital gearing have made households more sensitive to interest rates, particularly mortgage rates, than in the past. Such effects may be mitigated by supply-side innovations on the part of lenders. Nevertheless, overall, it seems likely that once distributional effects are taken into consideration, the personal sector will be less able to maintain expenditure in the face of an increase in debt service costs. The increase in gearing will also make it more likely that lenders' prudential limits will bite, limiting access to further lines of credit.

There is also evidence that the corporate sector's exposure to interest rates has risen substantially, but that this is a much more recent development. Moreover, unlike the personal sector, the corporate sector's income and capital gearing are not yet much above historic levels, and there is evidence that large companies have limited their exposure by matching assets and liabilities or by various forms of hedging. Although previous corporate sector financial deficits were followed by rapid cutbacks in stockbuilding or investment, the sector's much higher overall levels of profitability than in the 1970s and early 1980s suggest a rather more limited response on this occasion. This is reinforced by the lower levels of inflation now prevailing.

The evidence on the present day transmission mechanism identifies quite powerful direct substitution and income effects on real expenditures. In addition, indirect effects result from the implications of interest rates for the housing market, wealth and liquidity in particular, and overall activity and employment in general. Price effects come about either as a result of the exchange rate response, or through the impact of changes in demand pressures on profit margins, capacity utilisation and the labour market. The direct effects seem likely to be quite powerful in reducing expenditure on durable goods and private residential investment, but less important for expenditure on non-durables or industrial investment unless (in the latter case) there is an accompanying increase in long rates. The evidence also suggests that



indirect effects on expenditures are likely to be powerful, particularly those via the housing market.

The overall conclusion is that a rise in interest rates should currently have a greater effect in reducing aggregate demand than previously. This in itself would entail a greater effect in lowering inflationary pressures through demand-side influences. In the current conjuncture, however, a number of factors may limit this effect, notably the continued tightness of the labour market and the upward pressure on wages from the influence of mortgage interest rates on the RPI. In these circumstances, a fall in profit margins may be relatively more important. The evidence also supports the hypothesis of a powerful link between a stronger exchange rate and lower domestic inflation than would otherwise have occurred. Other things being equal, higher interest rates tend to lead to a stronger exchange rate, although, especially in the short term, interest rates are only one of a number of factors which influence the level of sterling.

## Monetary transmission in the major overseas economies

### Background

A large number of measures have been taken in the past decade to remove regulation from borrowing and lending markets.<sup>(1)</sup> In many countries, for example, exchange controls have been reduced or eliminated. In Japan, interest rates on large-scale deposits have been liberalised, and a new market-related system introduced to determine the Short Term Prime Rate, the base rate for short-term corporate borrowing. The United States has also removed regulatory ceilings on deposit rates, while Canada has seen a large increase in the number of current accounts paying interest. The completion of the single market in the European Community will also have the effect of liberalising trade in financial services.

The change to a situation where many markets which were rationed by quantity are now rationed by price has affected financial markets in a number of ways. Administrative controls had affected sectoral balance sheets: the removal of these controls has been an important factor behind the changes in balance sheets seen in the 1980s, which in turn have been reflected in the rapid growth of credit and broad monetary aggregates in several countries, adding to the difficulty of setting and interpreting monetary indicators. Deregulation has in general led to increased competition in the financial services sector, narrowing spreads between borrowing and lending rates (the price of financial intermediation).

A further development has been the introduction of new financial instruments, which have the general effect of increasing the number of agents having access to any particular financial market and the number of markets

that any particular agent might have recourse to. Swaps, options and futures, which have seen a rapid expansion in the 1980s, can be used as hedging instruments for interest rate, and other, risks. In addition, swaps allow agents to maximise their comparative advantage in terms of access to credit markets. These new instruments allow redistribution of interest rate risk between agents, and increase the overall liquidity of the economy, reducing the impact of liquidity constraints on agents. It should be noted that some of the new instruments, such as swaps, are 'off balance sheet', and so will not be captured by an examination of balance sheet data: this makes assessing the effect of the changes rather more difficult. Such innovations have so far been of importance chiefly to corporations, with the use of cash management systems to reduce the level of idle balances and manage exposure to interest rate and other risks becoming increasingly common, although households in several countries now have access to shorter-term variable-rate mortgages, and to an array of new financial assets.

Alongside greater domestic intermediation, one particularly noteworthy feature of the innovation process has been the rapid growth in international capital markets in the late 1970s and the 1980s, as the relaxation of exchange controls and similar restrictions gave domestic borrowers and lenders increasing access to international markets.<sup>(2)</sup>

These changes have several consequences for the conduct of monetary policy. The reduction and removal of administrative controls means that interest rate changes now carry a greater burden of the transmission mechanism: in order to maintain a given monetary policy stance, the authorities now employ movements in interest rates as the primary policy tool.

The rates which the authorities act on directly are typically short-term rates, while many transactions are effected at long-term rates: thus the link between short and long-term rates is central to the transmission mechanism, and since long rates depend, *inter alia*, on expectations of future short rates and inflation, the credibility of the authorities' policy actions will be important. If participants in the financial markets believe that counter-inflationary policy will prove effective then nominal long-term rates may not rise by as much as nominal short-term rates, with possible implications for the distribution of the burden of the policy.

### Spillover effects of monetary policy

In addition to the impact of domestic monetary policy on the domestic economy, policy effects can spill over between economies, even in the absence of exchange rate movements. For example, a rise in domestic interest rates will reduce domestic demand and imports. This produces a reduction in the growth of overseas economies' export

(1) For further information, see Appendix One to S A Cooper, 'Internationally mobile savings', Bank of England *Discussion paper* (forthcoming) and J-C Chouraqui, M Driscoll and M-D Strauss-Kahn, 'The effects of monetary policy on the real sector: an overview of empirical evidence for selected OECD economies', OECD Working Paper No 51, April 1988.

(2) For more detail on the growth of internationally mobile savings, see S A Cooper 'Internationally mobile savings', and the *Annual Reports of the Bank for International Settlements*.

markets and leads to downward pressure on world output and prices. These deflationary effects may be reinforced by financing constraints affecting indebted developing countries as higher interest payments, slower growth in export markets and lower commodity prices lead to additional import compression<sup>(1)</sup> if external finance is unchanged. The deflationary effects in the world economy will feed back in turn onto the economy undertaking the monetary tightening.

Although this effect and the exchange rate effect work in a deflationary direction for the country undertaking the monetary tightening, forces in the overseas economies push in opposite directions, and the overall impact on output growth and inflation is unclear. The answer is essentially an empirical one, but unfortunately econometric models do not yield clear conclusions: in a recent exercise to analyse macroeconomic interdependence, the Brookings Institution ran a standardised experiment on eleven leading international models to assess the size and direction of spillover effects on overseas economies from monetary tightening. In summarising the results of this exercise OECD staff drew the following not very illuminating conclusion:

'The main conclusion of the Brookings experiment and of other work in this area would, however, seem to be that domestic output and prices are dependent on the stance of monetary policies in other countries, though the direction and extent of this dependence remain uncertain.'<sup>(2)</sup>

One obvious point to emphasise is that the exchange rate transmission mechanism only operates in cases of differential tightening. If all the major countries tighten together by a similar amount, then external influences on each country are limited to the (second round) impact of lower world demand and lower world prices—there is no scope to 'import' or 'export' inflation through exchange rate changes. It is thus possible that a tightening of monetary policy overseas would add to the difficulty of reducing domestic inflation by limiting the opportunity for the domestic economy to 'export' some of the problem, although counteracting this will be spillovers resulting from the direct effect of tightening overseas on export markets and trade prices.

External influences on domestic monetary policy, and implicitly the role of the exchange rate as a transmission mechanism, continue to grow in importance. The major economies are becoming increasingly open, as greater specialisation and rising income and wealth lead to faster growth in world trade than in output. As economies become increasingly integrated, foreign demand and prices grow in importance. Imports of manufactured goods are growing more rapidly than imports of raw materials, as changes in technology lead to more efficient use of energy and raw materials. As a result, each

industrialised economy becomes increasingly dependent on price developments in other industrialised countries and less vulnerable to shocks in oil and commodity prices. Removal of capital controls and greater emphasis on stability of exchange rates as a policy goal has increased the importance of monetary policy developments overseas, while rapid growth of international capital flows, associated in large part with deregulation of financial markets and greater competition in the provision of financial services, may have led to more rapid transmission of effects from one market to another.

### Evidence on changes in the transmission mechanism

The preceding discussion suggests that if financial liberalisation has had an impact on the transmission mechanism, this may be shown by a change in the net asset position of various sectors of the economy, or in their net interest receipts. This section attempts to evaluate the available data on interest payments and

### Interest rate effects in GEM

In preparing its biannual forecasts of the world economic outlook,<sup>(1)</sup> the Bank uses the Global Econometric Model (GEM), supplied by the National Institute for Economic and Social Research. For the major overseas economies, this contains equations for consumption and investment, usually broken down into housing and business investment. In almost all of these equations, an interest rate term appears (GEM uses short-term rates throughout). The table below shows the long run effects on these categories of aggregate demand (in percentage terms) of a one percentage point rise in the interest rate.

	Consumption	Business Investment	Housing investment
United States	-0.57	(a)	-7.40
Japan	-1.79	(a)	(a)
Germany	(b)	-1.09	-6.76
France	-0.08	—	(a)
Italy	-2.65		-1.72
Canada	-0.58	-0.50	-8.85

(a) No solution possible due to equation structure.  
(b) No interest rate term in equation.

In all these equations, there is a negative effect of interest rates on the dependent variable. These are typically largest on housing investment—though it should be noted that the lag structure of the equations means that these long-run responses take some time to occur, while the response in the consumption equations typically occurs rather more quickly. The equations also differ in the size and complexity of their dynamic responses.

(1) See pages 178–80 for a summary of the most recent forecast.

(1) As import spending is constrained by the availability of foreign exchange, lower export revenues and higher interest charges lead to a compression of imports.

(2) J-C Chouraqui, M Driscoll and M-D Strauss-Kahn, 'The effects of monetary policy on the real sector'.

receipts and asset positions on a country-by-country basis for evidence of changes in these positions. Data in this area are inevitably limited and imprecise: in many countries, the process of liberalisation has not been in train for sufficiently long for the effects to show in the data, while consistent sectoral balance sheets are not available for all major overseas economies, and even for those where data are available international comparisons are difficult. The OECD is a useful source of data on interest payments and receipts<sup>(1)</sup> and on the financial asset and liability position of various sectors in some of the major economies.<sup>(2)</sup>

### United States

Data from US national sources and the OECD show that the personal sector is a substantial net creditor, with net worth at the end of 1988 of some \$13,000 billion, of which approximately 70% are net financial assets, while the non-financial corporate sector is a net debtor, with some \$1,800 billion in net financial liabilities at the end of 1987.

**Chart 6**  
Net financial assets of the US personal and non-financial corporate sectors

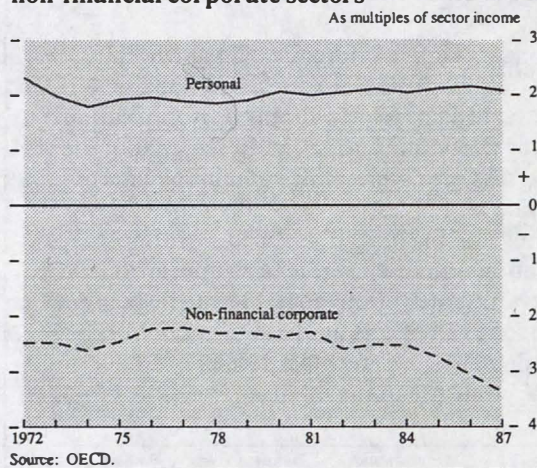
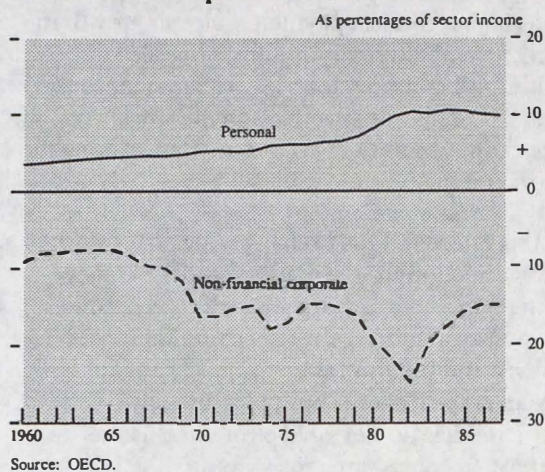


Chart 6 indicates that, while the personal sector's net financial asset position, scaled by income, has changed very little over the 1970s and 1980s, there is evidence that the non-financial corporate sector has increased its net indebtedness over the 1980s.

OECD National Accounts data shown in Chart 7 indicate that the pattern of net asset holding is mirrored in terms of interest receipts, with the US personal sector being a substantial net receiver of interest, while the non-financial corporate sector paid net some 35% of its income in interest. Thus the income effect might be expected to be positive for households but negative for non-financial corporations.

The US personal sector's interest receipts and payments are worth examining in some detail. Chart 8 shows that both gross and net interest receipts increased rapidly as a proportion of total receipts in the late 1970s and early

**Chart 7**  
Net interest receipts of the US personal and non-financial corporate sectors

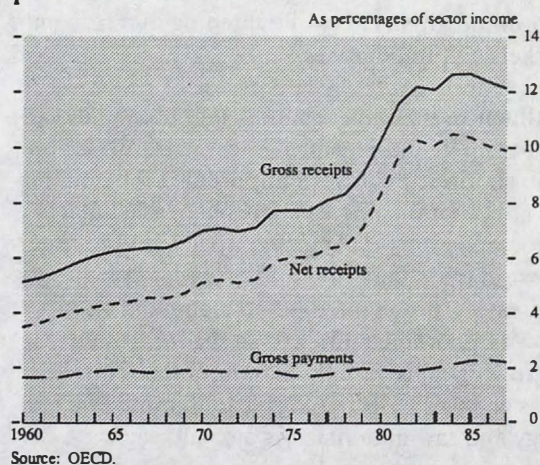


1980s, but gross payments of interest remained virtually constant as a proportion of income, suggesting that a higher proportion of liabilities were at fixed rates.

Taken together, the evidence presented here does suggest that a change has occurred in the financial environment in the United States in the last decade or so. In the personal sector, the surge in interest receipts between 1978 and 1982 was not matched by any increase in asset stocks, suggesting that an increase in the rate of return on assets may have been responsible. Interest rates were indeed at a historic high during this period, but subsequently fell back with no significant fall in interest receipts. It may be that the abolition of the Regulation Q ceiling on deposit rates, which occurred after the surge, was a factor in maintaining the rate of return on the personal sector's net assets.

Data for the non-financial corporate sector, on the other hand, show that while net indebtedness increased during the 1980s as a multiple of income, the servicing cost, in terms of net interest payments, fell as a proportion of

**Chart 8**  
Interest receipts and payments in the US personal sector



(1) See, for example, OECD National Accounts 1975-87.

(2) See OECD Financial Statistics: Financial Accounts of OECD countries.

income, suggesting that the sector was able to increase its net indebtedness while gaining access to finer terms than in the 1970s. There is also evidence of a surge, this time in gross interest payments, in the late 1970s and early 1980s, before the decline began: as in the personal sector, the net asset position was little changed in that period.

In addition to these aggregate shifts, there have been changes in the structure of assets and liabilities affecting both sectors. One of the main developments in household borrowing in the United States has been the growth in adjustable rate mortgages (ARMs) which in 1988 accounted for almost 60% of new advances, although the \$500 billion of ARM debt still represents only about 25% of outstanding mortgage debt (from about 5% at the start of the 1980s). An assessment of the impact of ARMs is subject to important qualifications: there are often limits on the amount by which the rates charged on ARMs may vary—a 200 basis point limit on the increase allowable in one year and a 500 basis point limit on that allowable over the life of the mortgage are typical figures. A 200 basis point increase in ARM mortgage rates will reduce post-tax disposable income by only 0.2% or \$9 billion.

Distributional considerations suggest that the impact on consumption might differ from that implied by the data on aggregate interest receipts. Survey evidence indicates that while many liability holders are also holders of assets, many ARM borrowers have comparatively few interest-bearing assets: the median borrower in 1986 had a mortgage of \$39,600, but only \$2,000 of assets. Thus interest rate increases within the limits imposed by the ARM may have a disproportionately large effect on these borrowers.

A recent study by Federal Reserve Board staff<sup>(1)</sup> suggests that household interest income is both larger than and more sensitive to changes in market rates than interest expenditure. However, they suggest that the difference has become less marked in recent years, largely as a result of the growth of ARMs. Moreover, the study stresses the relative importance of wealth and substitution effects, and suggests that 'consumer spending is likely to decline as higher rates reduce the value of assets and damp aggregate economic activity by raising financing costs'.

One important qualification to the aggregate data arises from the maturity structure of corporate debt. A rising proportion of corporate debt is long term: thus if long rates do not match increases in short rates (perhaps because the policy of the authorities is believed in the markets) then the implications of the increase in corporate debt for the evolution of the transmission mechanism will be offset to some extent.

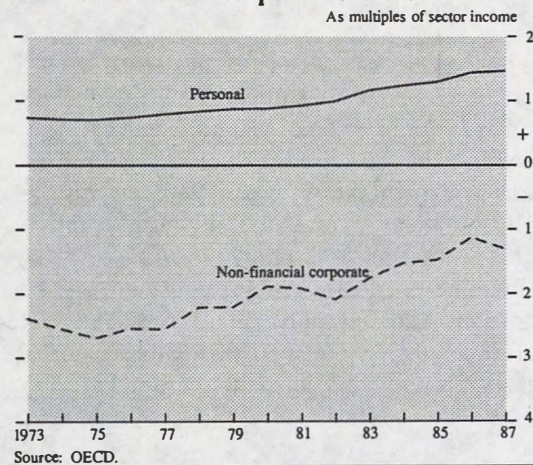
Both the personal and non-financial corporate sectors in the United States have seen changes in the pattern of interest receipts and payments rather more dramatic than those in the pattern of asset stocks, reflecting in part

movements in interest rates, but also changes in spreads and the maturity of assets and liabilities. Particularly noteworthy were a surge in personal sector net interest receipts and non-financial corporations' net payments between 1978 and 1982, and a subsequent decline in the latter. There is some evidence to confirm the view of Goodman, Lockett and Wilcox that the income effect in the personal sector may be declining, as following the increase in the 1978–82 period interest receipts have shown a slight downward trend (see Chart 8). However, the decline is modest compared with the earlier increase, so that the income gearing of the personal sector may have increased, and that of the corporate sector decreased, since the 1970s.

### Japan

The personal sector in Japan has consistently been a net creditor: national sources suggest that assets were between 7 and 8½ times liabilities over the 1970s and 1980s. During this period financial assets were between 30% and 40% of total assets, a low proportion compared with the United States with the relative importance of the value of land being a noteworthy difference. Again, the OECD assets stocks data match the national sources, showing a rise in gross asset stocks with gross liabilities growing only a little.

**Chart 9**  
Net financial assets of the Japanese personal and non-financial corporate sectors

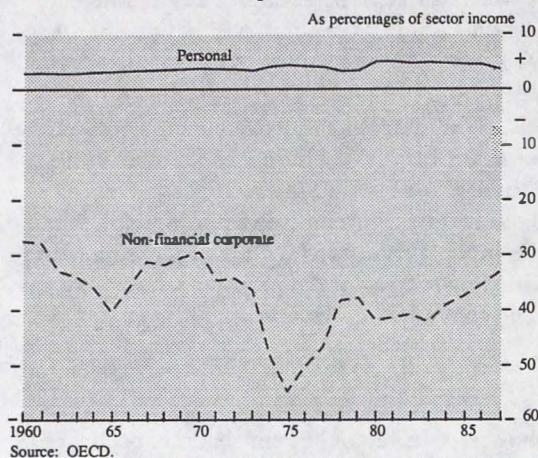


National data suggest that the corporate sector as a whole is a net creditor, with assets over the period 1970–87 consistently exceeding liabilities by a factor of approximately 1½. However, OECD figures for non-financial enterprises show a rather different situation, with net liabilities falling steadily over the sample period as gross assets grew more rapidly than gross liabilities. The difference between the two reflects the strong asset position of financial companies.

The Japanese personal sector's gross interest receipts have risen steadily, with the exception of some erratic behaviour in the late 1970s, to reach a peak of 8.8% of personal sector income by 1983. Receipts have been

(1) J L Goodman, C A Lockett and D W Wilcox, 'Interest Rates and Household Cash Flow', Federal Reserve Board mimeo, 1988.

**Chart 10**  
**Net interest receipts of the Japanese personal and non-financial corporate sectors**



declining as a multiple of payments over the period, so that net receipts have not risen as much as gross receipts.

OECD data show that in Japan the non-financial corporate sector is a net payer of interest, with payments being some four times receipts. With the exception of a rise in the early 1970s, net payments as a proportion of total receipts have remained within a 25%–40% band, with no clearly discernible trend. The data show a much greater spread between interest payments and receipts than between liabilities and assets, suggesting that the rate of return on assets may be artificially low.

Interest rates on deposits have been steadily deregulated since 1985: rates on loans to consumers remain subject to high ceilings, but the proportion of loans affected by the ceilings (always low) has been falling since the 1970s. Housing loans have grown rapidly since 1985, following rising asset prices, increased residential investment and measures by the authorities to promote housing investment. Floating-rate loans were introduced in 1983, and the proportion of floating-rate debt is rising. The proportion of personal sector interest payments accounted for by mortgages has remained constant at around 85%–90%.

One potentially important factor in Japan is the ageing population, which is more marked than in other industrial countries. This suggests that a greater proportion of households will come to depend more heavily on investment income, and one consequence of this may be that the marginal propensity to consume out of interest income may increase over the medium term.

One important change in corporate fund raising has been a greater use of internally instead of externally generated funds such as bank lending. In addition, detailed data on the breakdown of corporate fund-raising by small, medium-sized and large companies show that large companies have been able to take most advantage of the liberalised financial regime to diversify sources of external funds, while smaller companies remain dependent on bank borrowing for about 80% of their externally

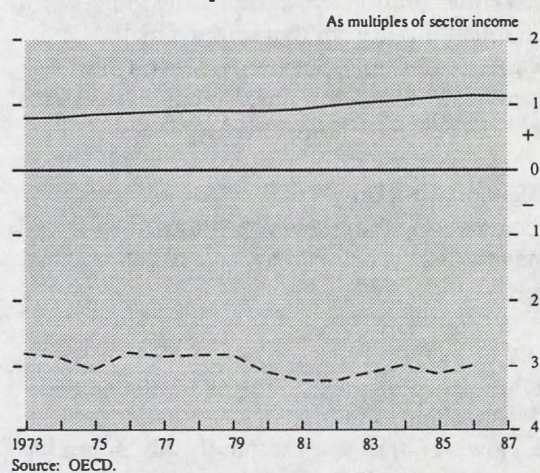
generated funds. Larger companies also use external finance less than medium-sized or smaller companies. Thus, it might be expected that an interest rate increase will adversely affect smaller, rather than larger, companies.

#### Germany

Financial liberalisation has been much less extensive in Germany than in other major economies. There is relatively little competition for deposits between banks, and growth in the provision of new borrowing instruments for persons or companies has been limited.

Balance sheet data show that German households are significant net creditors. Mortgage debt is still largely at fixed rates, while around 50% of savings are held at broadly fixed rates. This suggests that income effects in the household sector may be positive, though the yield on net assets is low, and the lack of competition among the major banks may limit the response of lending rates to officially induced changes in rates.

**Chart 11**  
**Net financial assets of the German personal and non-financial corporate sectors**

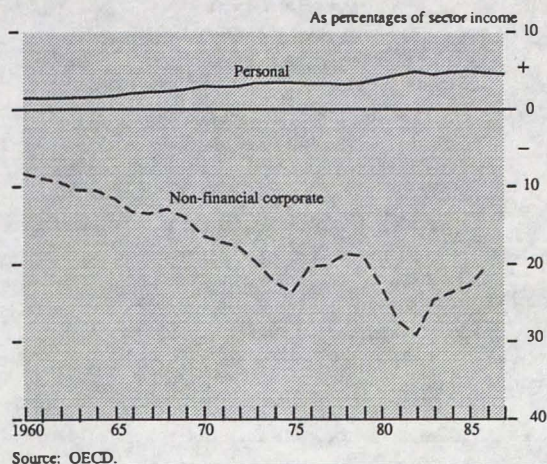


OECD data on assets stocks in the personal sector show a picture of steady growth in net assets, driven by gross assets: gross liabilities have remained almost constant as a proportion of income. The corporate sector in Germany has consistently been a net debtor, with both gross assets and gross liabilities growing slowly through the period, so that non-financial enterprises' net liabilities have remained virtually constant.

According to OECD National Accounts data the German personal sector has a lower proportion of interest payments to total receipts, on a gross or a net basis, than any other major economy for which data are available except France. Asset and liability stocks are not out of line with other countries, suggesting that the implicit rate of return on assets is rather lower in Germany than elsewhere.

Net interest payments in the non-financial corporate sector grew to a peak of 30% of total receipts in 1982, and

**Chart 12**  
Net interest receipts of the German personal and non-financial corporate sectors



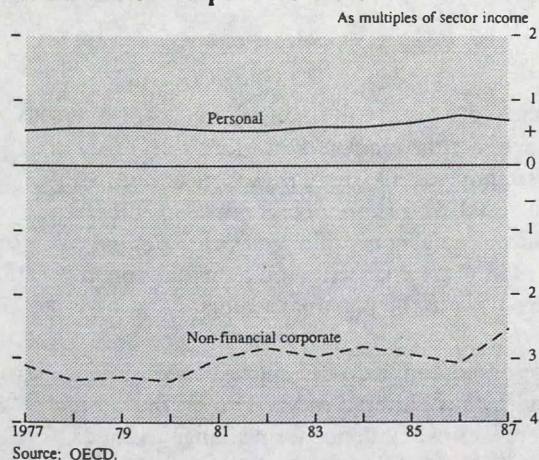
have since fallen back to around 20% in 1986 as interest rates were reduced.<sup>(1)</sup> There has been a general upward trend, led by gross payments, over the sample period as a whole.

Internal generation of funds has grown in importance in the 1980s as a source of investment finance, while the majority of bank loans are long term in nature: rates on these loans and other long-term rates have until recently changed much less than short rates over the past two years despite the doubling of short-term rates, so that the channel of monetary policy transmission to investment spending essentially works primarily through the cost of short-term loans: these have, however, been important recently as short-term finance has grown rapidly to accommodate strong growth in output.

### France

OECD data on financial assets stocks in the French personal sector show a lower proportion of net assets to income than for any other major country for which data are available, possibly because there are few pension

**Chart 13**  
Net financial assets of the French personal and non-financial corporate sectors



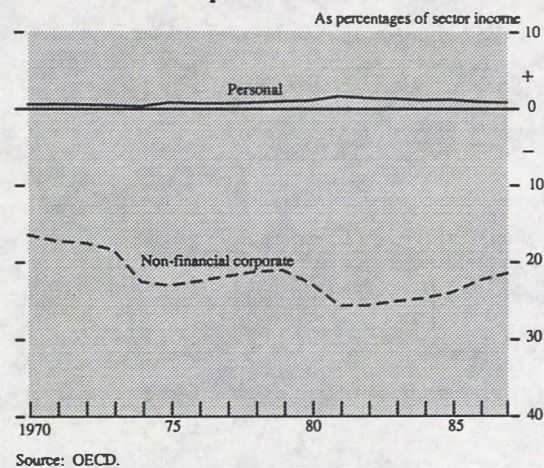
(1) More recently, net payments may have increased as rates have risen, although no more recent data are available.

funds. There is some sign of an upward trend in net assets, driven mainly by a rise in gross assets.

Consumer credit has grown rapidly in recent years, though the stock remains small in relation to total household assets. Most housing finance is on a fixed-rate basis. In the corporate sector, gross assets and gross liabilities have grown steadily over the 1980s according to OECD data—net liabilities have remained virtually flat.

OECD data on interest receipts in the personal sector show net receipts accounting for about 1%–2% of total receipts, the smallest proportion of any country

**Chart 14**  
Net interest receipts of the French personal and non-financial corporate sectors



considered here. The non-financial corporate sector receives virtually no interest, and pays out around 20% of current receipts, a proportion which has shown a slight upward trend over the 1970s and 1980s.

Around 50% of investment is financed by debt, of which about 60% is at fixed rates. Since the late 1970s, bank loans have declined in importance relative to corporate bond issues. As long rates have moved by much less than short rates these factors suggest that the effects of monetary tightening may be relatively weak.

### Italy

Households in Italy are substantial net creditors, holding a large volume of short-term government securities: the large public sector debt is seen as a constraint on the use of monetary policy because of the implications for debt servicing. Income effects are consequently substantially positive, though wealth and substitution effects may offset the effect on consumption. No OECD data on asset stocks or interest payments or receipts are available for Italy.

The corporate sector finances investment mainly through retentions. The sector is a net debtor, with bank finance accounting for some 30% of financing requirements:

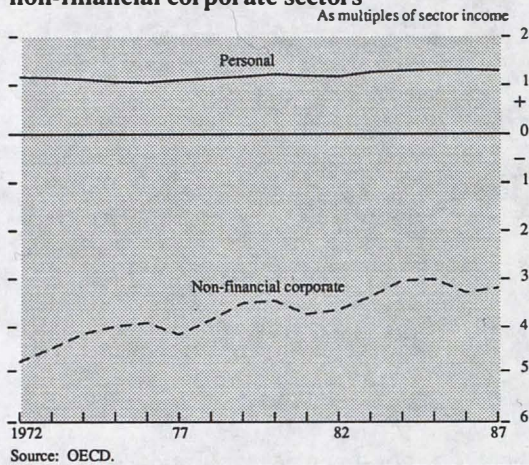
short-term debt is important, though its significance does not appear to have increased in recent years.

### Canada

OECD data indicate that personal sector net financial assets are around 1 to 1½ times sector income, with evidence of a slight upward trend from at least the mid 1970s—gross assets appear to be the important factor here.

National data indicate that the corporate sector is a net debtor, in terms of both total financial and interest-bearing assets and liabilities. There is some evidence to suggest that short-term debt has fallen as a proportion of the total over the 1980s, after rising in the early years of the decade.

**Chart 15**  
Net assets of the Canadian personal and non-financial corporate sectors

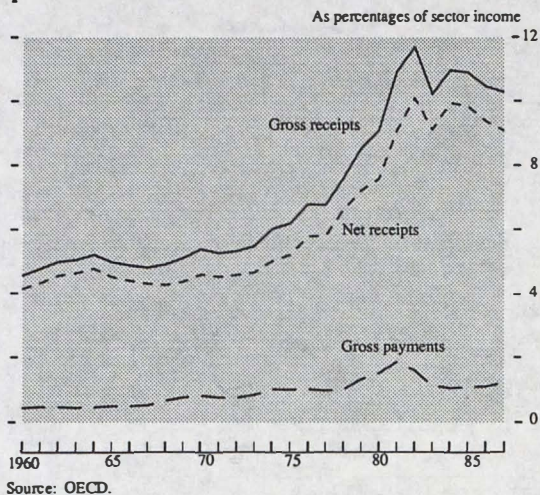


Interest receipts by the personal sector as a proportion of total income, both gross and net, have been close to those for the United States, and higher than for any other major country. They have also followed the path of the US experience. No OECD data are available for the corporate sector, though other sources suggest that, after a surge in the early 1980s, interest payments in the corporate sector have stabilised as a proportion of pre-tax profits, at a level rather above that shown in the late 1970s.

The surge in interest receipts in the late 1970s and early 1980s is even more marked than in the United States, with net receipts almost doubling as a proportion of total receipts between the early 1970s and early 1980s. From this point, some downward trend is evident. Once again, gross receipts appear to be the main factor—apart from a slight increase centred around 1981, gross payments are essentially flat.

Interest income accounts for a large proportion of households' investment income, and for a large part of variation in it. Thus, substantially positive income effects might be expected to occur. The wealth effects of interest rate changes are important in determining the effects of an interest rate rise. Since around 60% of Canadian households own their homes, there is a tendency for

**Chart 16**  
Interest receipts and payments in the Canadian personal sector



households to borrow against this security: such borrowing is sensitive to changes in house prices. This tendency has been coupled with a shift to mortgages with more frequent interest rate adjustments.

An important trend in Canada been the increasing tendency of corporations to issue bonds in overseas markets and to hold foreign currency loans. The nature of Canada's financial markets means that the proportion of long-term borrowing overseas is very high. Given this free movement of capital, companies have a mechanism by which high domestic interest rates can be avoided, though at the cost of greater exchange rate risk.

### Conclusions

The 1980s have seen a trend towards financial innovation and deregulation in all the major overseas economies, though the extent of the changes varies across countries. Deregulation has removed quantitative controls on borrowing and lending and assigned a greater role to the short-term interest rate as a policy instrument. At the same time, and partly related to this trend, the patterns of borrowing, lending, interest payments and interest receipts by sectors of these economies have also changed. Table B summarises the data discussed in more detail above.

In terms of financial assets, OECD data show that personal sectors are net creditors in all the major overseas economies, while non-financial corporate sectors are net debtors. In support of this, there is evidence that in all countries personal sectors are net receivers of interest, while all non-financial corporate sectors are net payers. Thus a rise in interest rates will tend to switch income from the corporate to the personal sectors.

The data presented above do not suggest that asset holding patterns have altered radically over the last decade—there is most evidence for a change in Japan, where there appears to have been a slight increase in the rate of growth of gross assets as a multiple of sector

**Table B**  
**Sectoral assets and interest receipts**

**Personal sector**

Net assets as a multiple of sector income

	1970s(a)	1980s	Latest data
United States	2.0	2.1	2.1 (1987)
Japan	0.8	1.2	1.5 (1988)
Germany	0.9	1.0	1.1 (1988)
France	0.6	0.6	0.7 (1988)
Canada	1.1	1.3	1.3 (1987)

Net interest receipts as a percentage of sector income

	1970s	1980s	Latest data
United States	6.0	9.9	9.9 (1987)
Japan	3.8	4.6	3.6 (1987)
Germany	3.2	4.5	4.5 (1987)
France	0.7	1.2	0.9 (1987)
Canada	5.4	9.3	9.1 (1987)

**Non-financial corporate sector**

Net assets as a multiple of sector income

	1970s(a)	1980s	Latest data
United States	-2.4	-2.7	-3.4 (1987)
Japan	-2.4	-1.6	-1.3 (1988)
Germany	-2.9	-3.1	-3.0 (1986)
France	-3.2	-2.9	-2.5 (1988)
Canada(b)	-4.1	-3.3	-3.2 (1987)

Net interest receipts as a percentage of sector income

	1970s	1980s	Latest data
United States	-15.8	-18.6	-14.8 (1987)
Japan	-41.1	-39.0	-33.2 (1987)
Germany	-19.5	-24.4	-20.3 (1987)
France	-20.1	-23.9	-21.4 (1987)

(a) 1972-79 for US and Canada, 1973-79 for Japan and Germany, 1977-79 for France.  
(b) As a multiple of total corporate sector income.

income for both the personal and the non-financial corporate sector, but it is very difficult to discern any change in asset holding patterns in other countries.

There is more evidence of changes in the pattern of interest payments and receipts. This is particularly marked in the case of the United States and Canada, where a surge in net interest receipts as a proportion of total income by the personal sector occurred in the late 1970s and early 1980s, following which there was a slight decline to the end of the sample. Data on US non-financial corporations' net payments show a somewhat similar pattern. Evidence for an analogous change, at about the same time, can be found for Germany and Japan. This increase does not appear to be totally due to a surge in interest rates: the subsequent decline was not as great as the fall in interest rates, and the surge in net receipts by the personal sector (payments by corporations) seems to have been driven by gross receipts and payments respectively, whereas in the case of a surge driven by interest rates alone payments and receipts by both sectors might be expected to increase. This may also indicate that assets are denominated more in floating rates and liabilities more in fixed rates.

There has been a tendency recently in all sectors to move from fixed-rate to variable-rate instruments, both for assets and liabilities. This is particularly so in the case of housing finance, but is also true for corporate borrowing in several countries. However, available evidence suggests that in terms of stocks of assets and liabilities fixed-rate instruments still predominate: furthermore, variable rates may change only after a lag. This move towards variable-rate instruments will tend to raise the immediate income effect of any change in interest rates (as it will affect payments on stocks of interest-bearing assets and liabilities). This is essentially a timing effect: if all instruments are variable rate, then the income effect could have an immediate impact, whereas if instruments are

fixed rate then the income effect can only come into play as the instruments are rolled over. Liberalisation might be expected to have an additional effect here as it may have become easier to restructure portfolios to minimise the adverse impact of changes in rates. Conversely it might perhaps reduce the substitution effect, if borrowers expect any rise in short-term rates to be temporary and consequently are less worried about locking into higher fixed rates (this effect would not operate in a perfect capital market, where long rates would contain all relevant information on expected short rates).

Clearly, a crucial factor in determining the impact of a change in short-term interest rates is the view that is taken by financial market participants on the efficacy of the policy change, and thus how the change is reflected in long-term interest rates. In practice, as long-term interest rates have moved much less than short rates over the last two years, despite the recent steepening of yield curves, the net effect of the movement towards variable-rate finance is likely to be an increase in the responsiveness of agents to a monetary tightening.

Evidence from several countries suggests that distributional effects within the household sector are important. Though for the sector as a whole the income effect of an interest rate rise may well be positive, the gains are likely to be concentrated in particular household groups. Although it is hard to draw firm conclusions, it is probable that 'net savings' households gaining from an increase in interest rates may have a lower marginal propensity to consume than 'net borrowing' households, who in addition may have absolute gearing or cash flow constraints. Consequently distributional factors probably dampen the positive income effect.

Wealth effects, most notably on the value of the housing sector but also on financial assets, are important. For countries where evidence is available, wealth effects



(along with substitution effects) appear to outweigh positive income effects. A rise in interest rates is likely to induce a fall in consumption and residential investment.

In the corporate sector, there appears to have been a move from long-term to short-term finance, though, in stock terms, long-term debt predominates in most countries. Movements in long rates relative to short rates depend on the credibility of the authorities' monetary stance. If long rates move by much less than short rates as yield curves flatten or become inverted the net result may be to shift some of the impact of a monetary tightening from companies to households.

The increased openness of major economies in terms of both trade and capital movements means that the exchange rate and policy developments overseas have increased in importance. Unfortunately, there is no consensus among models or economists as to the direction, let alone the magnitude, of the spillover effects of a tightening overseas on domestic inflation and output.

In terms of the three transmission mechanisms examined in the Governor's Mais Lecture, the evidence set out above would suggest that income effects may have

become more powerful over the last decade or so in several countries. Since the personal sector is a net creditor, this implies that *ceteris paribus* a rise in interest rates will have less of a deflationary impact on the personal sector, and more of an effect on the corporate sector. Evidence on the substitution effect is more difficult to determine, though increased access to markets and a switch from fixed to variable-rate finance may weaken the substitution effect as borrowers are less concerned about locking in to higher fixed rates. Changes in the final transmission mechanism, via the exchange rate, will clearly have become more important as the major economies become more interdependent, though the magnitude and direction of spillover effects are very difficult to determine, partly because the increasing importance of the effects distorts the historical evidence. In conclusion, although the changes have obscured the already somewhat murky picture, there seems to be little convincing evidence that these changes have led to any radical shifts in the way that the transmission mechanism operates. Such changes as have occurred in the transmission mechanism are probably confined to shifts in the extent to which the burden of policy is shared between sectors and the timing of any changes.