SAVING TRENDS AND BEHAVIOUR IN OECD COUNTRIES

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This paper was prepared in the General Economics Division; Martine Durand is now working in Country Studies I Division while John Fallon, who was in Economic Prospects Division, is now working at the Industries Commission in Australia. The authors would like to acknowledge the comments and suggestions of Derek Blades, Robert Hagemann, Kenichi Kawasaki, Kenneth Messere and other colleagues in the Economics and Statistics Department. They are also grateful to Valérie Barca, Marie-Christine Bonnefous, Anick Lotrous and Chantal Nicq for statistical assistance.

INTRODUCTION AND SUMMARY

National saving and investment rates in most OECD economies have declined in the last two decades. This has led to concern in some countries about the adequacy of national saving and investment. Furthermore, current-account imbalances associated with disparities between national saving and investment rates in individual economies became a major concern for policy-makers during the 1980s. There was an especially rapid decline in household saving rates in some countries during the 1980s. The paper, while it raises issues about saving and investment at a national and even global level, thus focuses on the saving behaviour and net worth and debt positions of the household sector.

The paper begins with a summary of the main facts about saving and investment, which provides a more detailed "signposting" of the structure of the paper. A brief description of trends in national saving and investment rates and a discussion of whether saving/investment gaps should be of concern in a world of increasingly integrated financial markets is presented in Section I. The role of government saving and dissaving is then assessed in Section II. The rest of the paper then looks at trends in private sector saving rates concentrating in particular on household savings.

Summary of the main facts

National saving and investment rates in OECD countries were in general lower in the 1980s than in the 1960s or 1970s and inter-country differences have remained large. Measures of gross saving and investment have fallen by less than net measures, depreciation having become more important (Section I.A).

Saving and investment decisions by the private sector are considered in a framework of intertemporal optimisation. Although there is no necessary reason to believe that the small trend declines in national saving and investment rates indicate inadequate saving or investment, recent pressures on capacity may suggest the need for continuing high investment while various distortions, especially on the tax side, may be leading to a sub-optimal allocation of resources (Section I.B).

The strong ***covariation between national saving and investment rates*** which was found by Feldstein and Horioka (1980) and others has been reduced substantially, the influence of international financial liberalisation in the 1980s facilitating the large capital flows necessary to sustain recent saving/investment gaps in many countries (Section I.B).

Reductions in ***government saving*** since the 1960s have been an important factor contributing to the decline in national saving and investment. While there are a number of ways in which changes in government saving may induce offsetting changes in private saving, a complete offset seems to have been far from the norm. Only in countries with very high government debt/GNP ratios is there evidence for something close to "Ricardian equivalence". Changes in government expenditure programmes may also affect private saving, even when they are financed by current taxation, and may therefore influence overall national saving. This is especially important for the areas of pension, health and education policies, where the design of programmes may have significant effects on the private sector's incentives to save (Section II).

Private sector saving rates have exhibited greater stability over time than have the component household and business rates. One implication is that households do see through the "corporate veil", although empirical work usually indicates offsets that are far from complete (Section III.A).

Business saving is strongly related to profit developments. The sharp recovery in profits since the early 1980s has boosted business saving and considerably increased the self-financing of business investment (Section III.B).

Household saving ratios rose almost everywhere in the 1970s. In the 1980s, they declined markedly in almost all countries to levels mostly similar to those in the 1960s but in some cases even lower. The 1970s "bulge" in saving ratios is a common feature in all OECD countries; it is less significant if adjustment is made for inflation. Other adjustments, such as treating consumer durables as investment, affect the levels of saving ratios but not in general the trends. Demographic factors are important in explaining inter-country disparities in saving ratios (Section III.C).

Household net worth has increased strongly since the 1970s in several OECD countries and has allowed saving rates to decline without any deterioration in wealth/income positions (Section III.C.*v*)). The rise in net worth can largely be attributed to the rise in the value of housing and equities (notwithstanding the stockmarket crash). Meanwhile ***debt/income ratios*** have risen sharply, and in many cases this has been associated with financial market liberalisation. The interaction of more readily-available finance, favourable tax treatment of housing and rising property values has encouraged borrowing and may have led to a rnisallocation of resources. There has also been more concern about the sustainability of personal sector debt build-up (Section III.C.*vi*)).

Tax structures are an important influence on household saving decisions and seem likely in many cases to lead to important distortions (Section III.C.*vii)*). Although there have been tax reforms in many countries in recent years which have reduced such distortions, those which remain may have interacted with financial market liberalisation in unfortunate ways, raising the important issue of unfinished business in the area of structural reform (Section III.C.*viii)*).

I. TRENDS IN NATIONAL SAVING AND INVESTMENT

A. Declining saving and investment rates

National saving and investment rates have differed considerably across OECD countries throughout the period considered (Chart A). A common feature, however, is that in almost all countries the shares of saving and investment in GNP have declined since the **1960s.**

For the OECD area as a whole, the average ratio of ***gross national saving*** to GNP fell by 3 percentage points between **1960-70** and **1981-88** while the decline of ***gross national investment*** relative to GNP was about 2 percentage points. The largest falls occurred in continental European countries and Australia, the smallest declines (or even rises) in the United Kingdom, Canada, Finland, Ireland, New Zealand, Norway, Portugal and Switzerland. While gross national saving rates in the United States and Japan have both fallen by 3 to 4 percentage points (Table 1), the investment rate in Japan has fallen by about **6** percentage points and in the United States, albeit from a much lower level, hardly at all. Hence a net surplus of saving has emerged in Japan and the reverse has occurred in the United States.

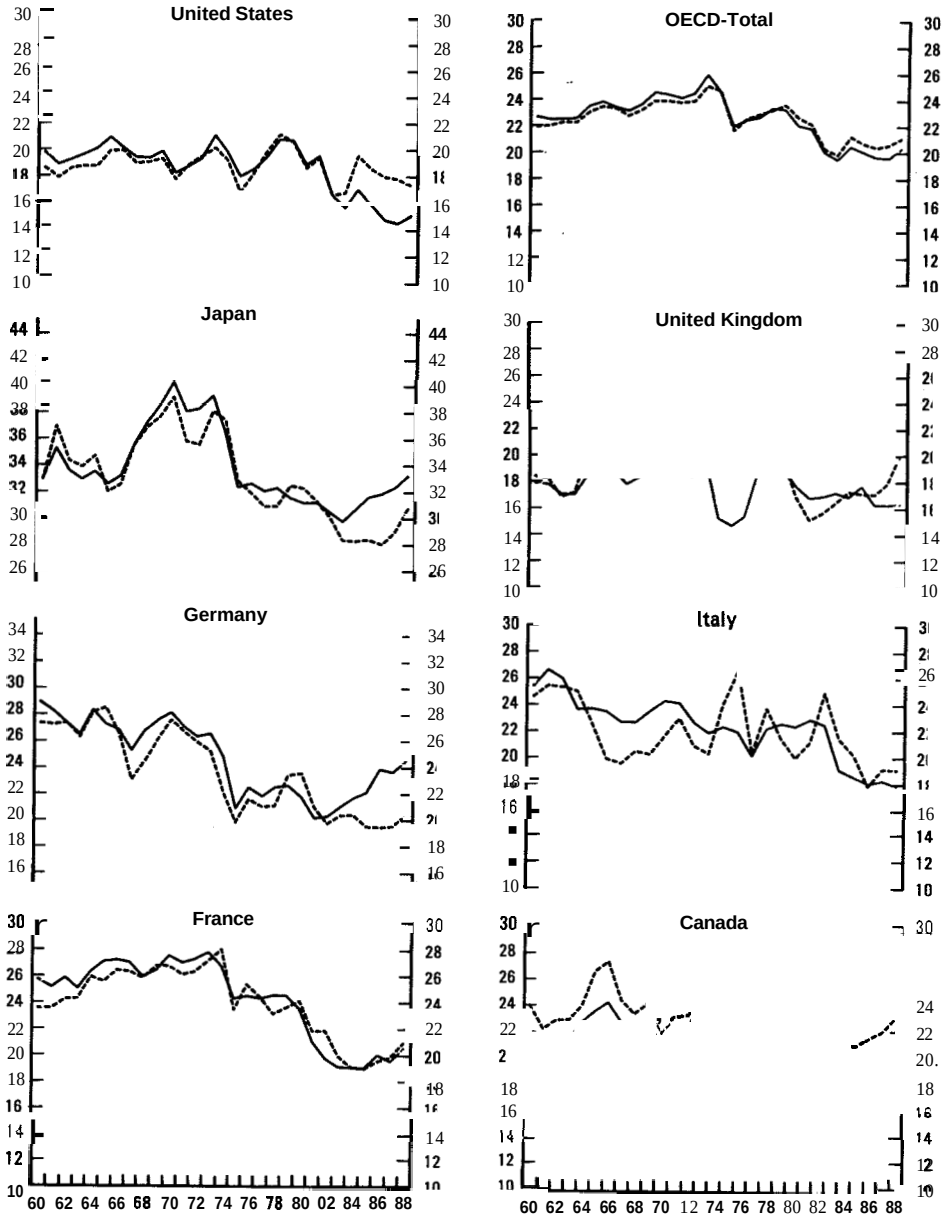
The fall in ***net saving and investment*** in relation to net national product has generally been more pronounced, reflecting a rise in the depreciation of fixed capital'. For the OECD area this amounted on average to **60** per cent of gross national investment in the **1980s** compared with **40** per cent in the **1960s.** Between the **1960s** and **1980s** ***net*** rates of national saving and investment for the OECD area have thus fallen by more than gross rates – by **6** and 5 percentage points respectively, compared with 3 and 2 percentage points respectively for ***gross*** saving and investment rates. Although the net figures would seem to indicate a more serious decline, with a smaller addition to the capital stock, the data on capital consumption are notoriously unreliable so that it is often felt more prudent to focus on the gross measures[2]. Irrespective of the precise measure used, however, there does seem to have been a decline in national saving and investment rates in most OECD countries since the **1960s.**

CHART A

TRENDS IN NATIONAL SAVING AND INVESTMENT RATES

—— Grosssaving (per cent of GNP)

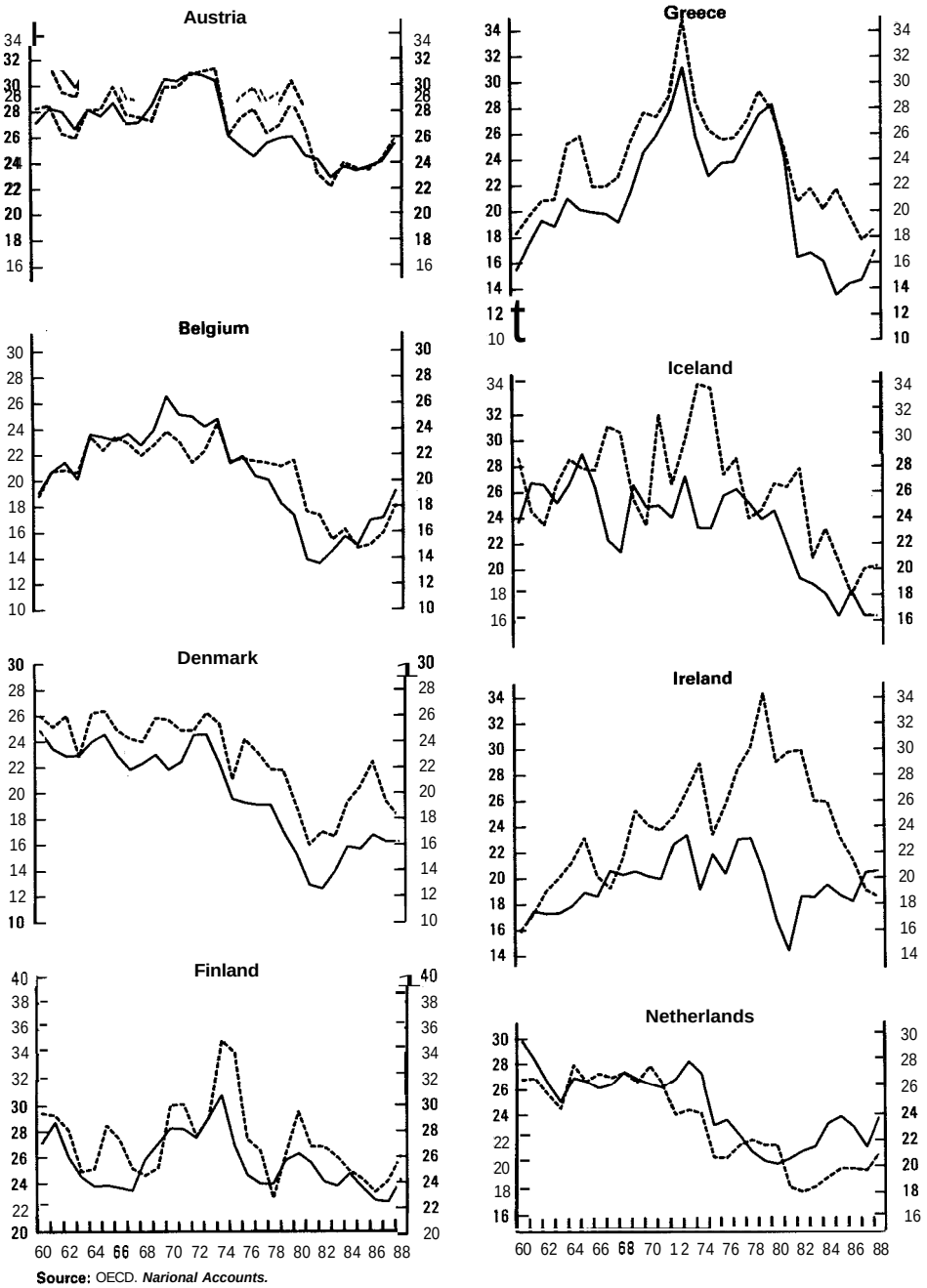
– – Gross investment (per cent of GNP)



Source: OECD. *National Accounts.*

CHART A **(cont.)**

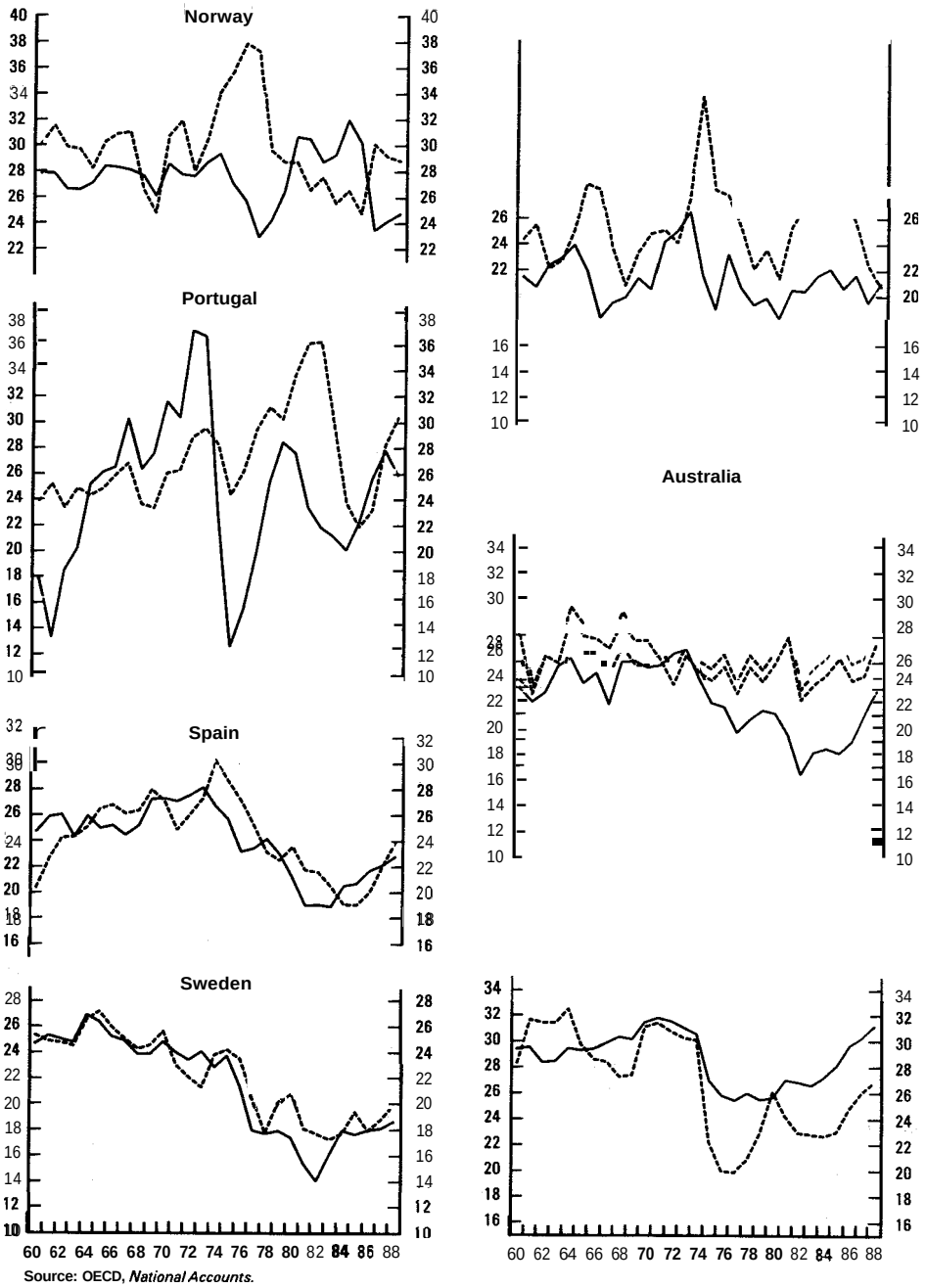
TRENDS IN NATIONAL SAVING AND INVESTMENT RATES



Source: OECD. ***Narional Accounts.***

CHART A (cont.)

TRENDS IN NATIONAL SAVING AND INVESTMENT RATES



Source: OECD, *National Accounts.*

Table 1. Net and gross national saving ratios

As per cent of net and gross national product

		Averages			1986	1987	1988
		1960.70	197140	1981-88[a]			
United States	Net	10.6	8.9	3.7	2.5	2.4	3.3
	Gross	19.6	19.5	16.1	14.7	14.5	15.1
Japan	Net	25.6	24.6	20.4	20.8	21.2	22.0
	Gross	35.0	34.4	31.4	31.9	32.3	33.2
Germany	Net	19.9	14.3	11.1	13.1	12.9	13.9
	Gross	27.3	23.7	22.2	23.9	23.6	24.5
France	Net	19.3	16.3	8.2	8.6	7.9	9.2
	Gross	26.3	25.4	19.8	20.0	19.6	20.5
Italy	Net	15.0	12.1	7.5	..	..	..
	Gross	21.0	19.2	15.6	..	..	..
United Kingdom	Net	11.1	7.7	5.6	5.1	5.3	5.2
	Gross	18.6	17.7	16.8	16.3	16.3	16.4
Canada	Net	11.3	13.3	9.4	7.0	8.5	10.5
	Gross	21.8	23.1	20.3	18.5	19.6	21.1
Austria	Net	18.2	18.0	13.1	12.7	13.1	14.8
	Gross	28.0	27.6	24.0	23.7	24.0	25.4
Belgium	Net	14.4	13.9	7.0	8.3	8.8	11.1
	Gross	22.6	21.8	15.7	16.9	17.1	19.1
Denmark	Net	17.4	13.3	6.6	8.3	7.5	7.3
	Gross	23.2	20.3	15.0	16.7	16.2	16.2
Finland	Net	15.7	14.2	10.3	8.7	8.6	10.8
	Gross	25.6	26.7	23.8	22.6	22.4	24.2
Greece	Net	15.3	20.7	8.5	5.4	5.8	8.7
	Gross	19.7	26.2	16.5	14.3	14.6	16.8
Ireland	Net	12.0	13.1	8.6	8.1	10.8	10.9
	Gross	18.6	21.0	18.5	18.1	20.3	20.4
Netherlands	Net	19.9	16.4	13.3	14.2	12.2	14.6
	Gross	26.9	23.9	22.3	23.0	21.4	23.6
Norway	Net	16.1	14.0	15.2	10.6	10.8	10.4
	Gross	27.5	27.0	27.8	23.4	24.1	24.7
Portugal	Net	19.8	22.0	19.9	22.2	24.5	22.5
	Gross	23.9	25.6	23.5	25.6	27.8	25.9
Spain	Net	16.7	16.7	10.1	11.5	12.4	13.0
	Gross	25.5	25.0	20.6	21.7	22.1	22.8
Sweden	Net	16.6	11.7	5.8	7.2	7.3	7.8
	Gross	25.0	21.0	16.9	17.9	18.1	18.6
Switzerland	Net	21.2	19.4	20.6	22.3	22.9	23.7
	Gross	29.6	28.0	28.4	29.7	30.3	31.2
Australia	Net	13.6	10.9	4.8	3.8	6.8	9.9
	Gross	24.7	23.6	20.1	19.9	21.9	23.8
New Zealand	Net	14.2	15.0	14.0	14.8	12.5	13.8
	Gross	21.2	21.8	20.9	21.6	19.5	21.0
Average of above countries[b]	Net	14.6	13.5	8.7	8.2	8.2	9.3
	Gross	23.3	23.5	20.2	19.7	19.6	20.3

a) Revised National Accounts data are available for Italy only for the 1980s. In ordar to consider a longer run of data and a sectoral breakdown (as in later tables) the earlier National Accounts estimates. which are available only up to 1985, have therefore been used with data for 1981.85 appearing in the third column.

b) Excludes Italy.

Note: Recent developments and forecast values are shown in Chart B.

Source: OECD. *Annual National Accounts.*

B. Should lower rates of saving and investment be a concern?

i) Saving and investment choices over time

Saving and investment decisions reflect intertemporal choices about consumption and production. Hence low saving rates, for instance, which are a current matter of concern in some countries, are in part a reflection of individuals' rates of time preference – in this case a preference for current consumption. If low saving rates in a country mean that there is not sufficient national saving to finance the desired national investment, then should this cause concern, especially if other countries seem willing to cover any gap?

The rate of saving by consumers and companies reflects private sector decisions which are a normal feature of the operation of markets. However, private sector decisions are made against a background of government policy, past and present, which may give rise to distortions and sub-optimality of one sort or another. The private sector may be deciding how much to save in the light of individual rates of time preference, taking into account the government's own saving position (Section II), but distortions introduced by policies may mean that those decisions are not the optimal ones from the national viewpoint. On these arguments, the role of government should not be to worry about the level of saving and investment, ***per se,*** but to worry about whether its own activities – its own claims on resources but more importantly the structure of tax and expenditure – are unduly distorting the private sector's saving and investment decisions. Pertinent questions about the role of government would include consideration of the level of government saving, the interaction of taxation changes with financial liberalisation, the impact of social security policy and the effect of tax structures on the saving decisions of firms and households, issues taken up in Sections II and III below.

In an open economy, the level of national investment may not be matched by the requisite amount of national saving. It is possible for foreign capital inflows to finance domestic investment, even for long periods of time, so long as the returns on the domestic investment generate the requisite income to pay the foreign capital exporter, i.e. the marginal productivity of domestic capital equals or exceeds the marginal cost of foreign borrowing. Differences between countries in national saving and investment rates will reflect different aptitudes, opportunities and preferences for consumption and production over time. If there were no major distortions to the free functioning of markets (such as capital controls or tax distortions), there would hardly be a problem if national saving and investment did not match. But, as later sections will discuss, there are important distortions influencing the decision to save or consume, as well as to invest in real assets at home or abroad. Such distortions may well mean that national saving and investment rates are sub-optimal and any gaps between them may be reflecting disequilibria.

The neo-classical closed-economy model, where the "steady-state" growth rate is determined by the growth of the labour force and improvements in technology, provides some insights to understanding investment, saving and growth in the 1950s and 1960s[3]. In that period there were ample investment opportunities to undertake post-war reconstruction and achieve technological "catch-up" with the United States (see Maddison, 1987). In this context, as argued by Boskin (1988), the much lower saving and growth rates of the United States relative to other countries were not unreasonable. However, as population growth slowed and the potential for catch-up was gradually exhausted, there was also a gradual lowering of investment and saving rates in other countries in the 1970s and 1980s. A slowing in the growth of potential output which reflected slower labour force growth or slowing in technological progress would entail a lowering in the investment rate. Whether lower rates of investment in the 1980s[4] should therefore be of no concern is nevertheless a complex, unresolved issue that is not pursued further in this paper.

ii) The international dimension

In a world of integrated financial markets, saving should flow across national borders to seek the highest expected risk-adjusted, after-tax rate of return. Capital flows tend to equalise the demand for and supply of loanable funds and establish a common global real rate of return (adjusted for tax and risk). Hence, an ex *ante* increase in saving in one country could increase investment everywhere. On the other hand, if restrictions on capital movements existed, national investment would be constrained to some extent by national saving and rates of return to capital would differ. For many years, the latter situation seemed to prevail and there was a strong covariation of saving and investment within countries. More recently, as financial markets have become more and more globally integrated, this relationship seems to have been waning.

During the 1960s and 1970s there was a broad balance between national saving and investment within OECD countries except for a few countries which remained habitual capital exporters (Switzerland and the Netherlands) or importers (Canada, Greece, Ireland and some Nordic countries). Even when, as in the early 1970s, there was an oil-price shock that effectively reduced the net saving of the industrialised countries and raised OPEC saving, saving/investment gaps were eradicated relatively quickly, at least in most industrialised countries – the developing countries borrowed more, sowing the first seeds of the debt crisis. But while the imbalances were soon eroded, the levels of national saving and investment were in general lower from the mid-1970s onwards.

Not only were national saving rates in the 1980s lower than in the 1960s and 1970s, but gaps have persisted in a few countries where investment and saving, taking several years together, had previously been relatively well-

balanced. The emergence of such gaps, which has been mirrored in persisting current-account imbalances, has coincided with a period of greater international financial market liberalisation and persistent exchange-rate misalignment.

While capital flows have permitted saving/investment gaps to develop and persist, the fundamental causes have been associated with the underlying behaviour of national saving and investment and exchange-rate developments related to differences in policy mix. In Japan, Germany and the Netherlands, where there has been an excess of national saving over investment, the excess has occurred because investment has declined by more than saving. In contrast, in the United States, the United Kingdom, Canada and Australia, where national saving has been inadequate to finance investment, the cause has been a substantial fall in saving. In the United States, gross total investment as a share of **GNP** has been relatively well maintained in the **1980s,** after a strong recovery following the sharp drop during the recession, while in Canada and Australia investment has declined but by far less than saving.

In a study covering the period of broad balance between national saving and investment, Feldstein and Horioka **(1980)** examined the degree of capital mobility between countries by regressing domestic saving on domestic investment ratios using cross-country data and average ratios over runs of several years. Results for the years **1960** to **1974,** both for the entire period and for sub-periods, showed that domestic saving passed into domestic investment nearly one to one. A more explicit structural model which allowed for inter-country differences in saving behaviour (e.g. differences in pension benefit/earnings replacement ratios or the age structure of the population) yielded the same results. These findings suggested that an increase in saving in one country added little to an internationally-mobile **pool** of saving and investment[5].

Nevertheless, the Feldstein-Horioka result gradually came to seem less relevant in the **1980s** as freer movement of capital and the development of imbalances seemed to contradict the basic thesis. Some new research showed different results (Obstfeld, **1986;** Turner, **1986).** A repetition of Feldstein and Horioka's work for this paper which extends the sample to **23 OECD** countries and the time period to **1987,** suggests a less important correlation of national saving and investment in recent years than previously. While the coefficients in the regressions for the **1960s** and early **1970s** are close to one, they drift down later to reach a low of only **0.58** for the last five-year period from **1983** to **1987** (Table 2). These lower "savings retention coefficients" have been confirmed by recent research on this issue by Feldstein and Bacchetta (1989)[6]. Foreign financing seems to have become more important and it has apparently become much "easier" to sustain saving/investment imbalances over longer periods[7]. The rapid increase in international financial interdependence is also evident from the growth **in** foreign assets and liabilities over the last ten years[8].

Table 2. Relation between gross national saving and investment ratios[a]

	Constant	S/Y	R^2
1963-67	0.033	0.91	0.90
	(0.016)	(0.064)	
1968-72	0.053	0.80	0.82
	(0.020)	(0.079)	
1973-77	0.077	0.77	0.44
	(0.044)	(0.181)	
1978-82	0.085	0.71	0.47
	(0.035)	(0.156)	
1983-87	0.094	0.58	0.61
	(0.021)	(0.098)	

a/ Pooled data for 23 OECD countries. The regression is: $I_i/Y_i = \alpha + \beta [S_i/Y_i]$, where I_i, S_i and Y, are domestic investment, saving and income in country i. For countries with a statistical discrepancy, it is split between saving and investment. Investment and saving ratios are averaged over the subperiods. Standard errors are shown below coefficients.

Source: OECD, *Annual National Accounts.*

The extent to which capital flows in recent years have conformed to the idealised model is a contentious issue. Moreover, as Williamson (1985) has pointed out, it is difficult to establish what the time preferences and marginal efficiencies of investment are which would allow one to judge whether welfare-maximising capital flows are taking place. Welfare maximisation in the context of liberalised capital markets would require equalisation of before-tax rates of return[9]. However, there are considerable differences in effective marginal rates of income taxation, *so* that decisions on where to locate physical and financial investment are thus distorted.

II. GOVERNMENT SAVING AND DISSAVING

The main change in the sectoral composition of national saving between the 1960s and 1980s in most countries is the reduction in general government saving (Table 3). In every case apart from Norway, there was a reduction in

Table 3. Gross national, government and private sector saving

Per cent of GNP

		Change in average ratios between 1960-70 and 1981-8	Averaoe ratios		
			1981-87[a]	1986	1987
United States	National	–3.3	16.2	14.7	14.5
	Government	–4.2	–2.4	–3.1	–2.1
	Private sector	1.0	18.7	18.1	16.7
Japan	National	–3.9	31.1	31.9	32.3
	Government	–2.0	4.3	4.8	6.5
	Private sector	–1.9	26.8	27.1	25.8
Germany	National	–5.5	21.8	23.9	23.6
	Government	–4.4	1.8	2.4	1.9
	Private sector	–1.1	20.0	21.5	21.7
Italy	National	–5.4	15.6	..	..
	Government	–7.3	**–6.0**	..	..
	Private sector	2.0	21.7	..	..
United Kingdom	National	–1.7	16.9	16.3	16.3
	Government	–4.3	**–0.3**	–0.1	0.6
	Private sector	4.6	17.7	16.8	16.3
Canada	National	–1.5	20.3	18.5	19.6
	Government	–5.9	–2.2	–2.3	–1.9
	Private sector	4.4	22.5	21.3	21.3
Austria	National	–4.2	23.8	23.7	24.0
	Government	–4.6	2.6	2.1	1.1
	Private sector	0.3	21.1	21.6	23.0
Belgium	National	–7.4	15.2	16.9	17.1
	Government	–7.9	**–6.6**	–6.4	–4.9
	Private sector	0.6	21.8	23.2	22.0
Finland	National	–1.8	23.8	22.6	22.4
	Government	–3.6	3.8	4.6	2.7
	Private sector	1.8	20.0	18.0	19.7
Norway	National	0.8	28.3	23.4	24.1
	Government	1.0	9.1	8.9	7.0
	Private sector	–0.2	19.2	14.5	17.1

a) 1981-85 for Italy: see note *a)* on Table 1.

Note: With the exception of Italy, only countries with data for gross saving ratios covering the entire period are included in this table. Sectoral savings data are available on the OECD's national accounts basis only up to 1987 though aggregate savings for 1988 are already available and are shown in Table 1. Recent developments and forecast values are shown in Chart B.

Source: OECO, *Annual National Accounts.*

government saving and in half of the cases shown in the table the government moved from being a saver to a dissaver.

During the *1960s* government saving contributed to aggregate saving in all the OECD countries shown in Table 3. In some cases the contribution was substantial. In Japan, Germany, Austria, Finland and Norway gross government saving was more than 5 per cent of gross national product or close to a quarter of gross national saving. In most countries government saving could cover capital outlays and for the area as a whole the financial position of governments was roughly in balance.

During the *1970s* government saving fell more than capital outlays and financial deficits became large in some cases. After the first oil-price shock, revenue growth slowed because of the slowdown in activity, while expenditure growth continued to outstrip GDP growth due to the spending momentum built into social programmes put in place in a period of high growth expectations. In many cases discretionary policies also aimed at cushioning the adverse demand effects of the first oil-price shock. The build-up of government debt and rising interest rates at the turn of the **1980s** boosted expenditure further. Increased interest payments only partly compensated holders of government debt for the inflationary erosion of asset values, so that inflation-adjusted government saving was much higher, especially in countries with high inflation and a large amount of outstanding debt such as Italy and Belgium. The interaction between saving and inflation is discussed in more detail in Section III.C.*ii).*

During the period *1981-87,* government saving fell again and public sector borrowing on a large scale to finance government consumption and transfers became widespread. Among the major seven economies, only the Japanese, German and French governments covered current expenditure with current revenue. Dissaving as a per cent of GNP reached 2.4 per cent in the United States, 2.2 per cent in Canada, **6.0** per cent in Italy and **6.6** per cent in Belgium (Table 3).

In many countries reduced gross government saving more than accounts for the fall in gross national saving between the **1960s** and **1980s.** In the United States, for instance, the gross national saving rate fell by 3.3 percentage points, that of government alone by 4.2 percentage points, with the private sector saving rate being about **1** point higher (Table 3). Other countries where the government saving rate has fallen by more than the national saving rate are the United Kingdom, Italy, Canada, Austria, Belgium and Finland. In Japan and Germany the fall in the national saving rate has been due to a combination of declines in the government and the private sector rates. Of the ten countries covered in Table 3, Norway is the only one where the government saving rate has picked up between the **1960s** and **1980s,** presumably because of oil revenues.

The implications of persistently large government deficits and rapidly growing debt led governments to seek to correct financial balances. Significant consolidation results were achieved in Japan, Germany, Denmark, Ireland, Sweden, Australia and New Zealand. Government debt/GNP ratios began to fall in a number of countries as from the mid-1980s[10]. Other countries made much less progress and in some countries – the United States, Canada and Italy among the major seven economies – government dissaving was still significant by 1988, even though lower than at the cyclical peak in the early 1980s (Chart B). Public sector claims on private funds increased in most countries between the 1970s and early 1980s but have been reduced in recent years because of widespread consolidation efforts.

The effects of government deficits on private saving are manifold and interact importantly with policy measures which may be fiscally neutral on the budget but affect the intertemporal choice of individuals. One view, known as the "debt-neutrality hypothesis" or "Ricardian equivalence" argues that individuals "pierce the government veil"[11]. The private sector is assumed to anticipate the future tax burden associated with government debt service and adjust its saving accordingly. On this view, the way public outlays are financed does not affect the flow of funds available for investment nor interest rates and makes the choice between tax and debt finance irrelevant to macroeconomic outcomes. "Crowding out" of investment or consumption would only occur by the direct absorption of government goods and services.

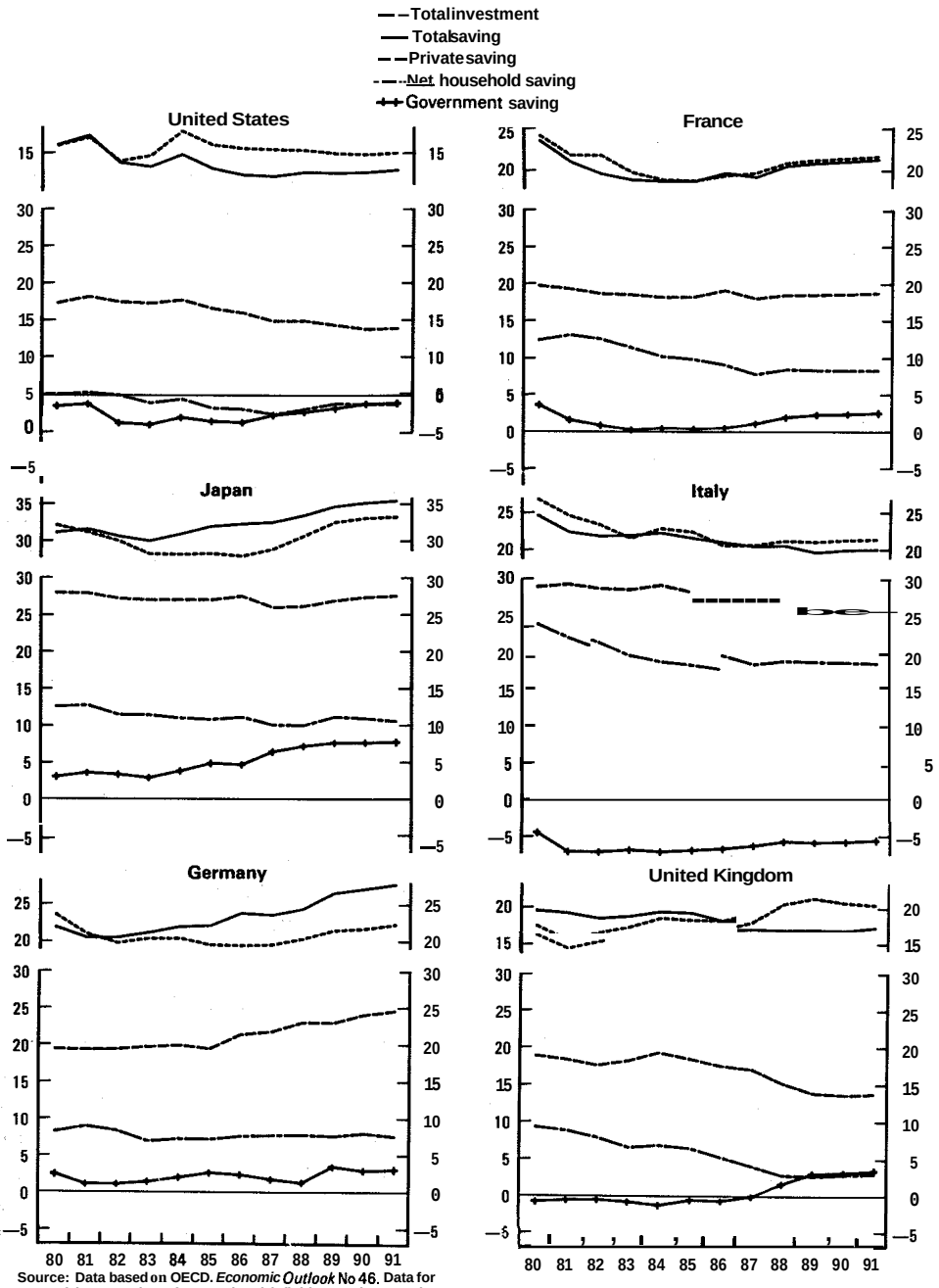
A recent OECD study by Nicoletti (1988), which also provides a summary of earlier work on this topic, found little empirical support for the strict "debt-neutrality hypothesis". For most countries the estimated offset of an increase of government deficits by an increase in private saving was much lower than one for one, but still significantly different from zero in the cases of the United States and Canada. Italy and Belgium, two countries where high debt/GNP ratios have threatened explosive debt dynamics, were exceptions in exhibiting something approximating debt-neutrality behaviour, suggesting that there may be some sort of threshold effect. Ireland, though not in the study, might also be included in this category.

The rejection of the strict debt-neutrality hypothesis in empirical work does not mean that fiscal action has little influence on private saving since partial offsetting is still likely. Furthermore, as reviewed in Section III, tax distortions are important and changes in tax rules, even if they are deficit-neutral, can have a strong impact on private saving. In addition, expenditure programmes can change saving patterns. The introduction of a pay-as-you-go system for financing pensions or extension of health care and public education programmes would be likely to reduce private saving previously committed to meeting future pension, health and education requirements.

CHART B

GROSS SAVING RATIOS: RECENT TRENDS AND OUTLOOK

Per cent of GNP/GDP

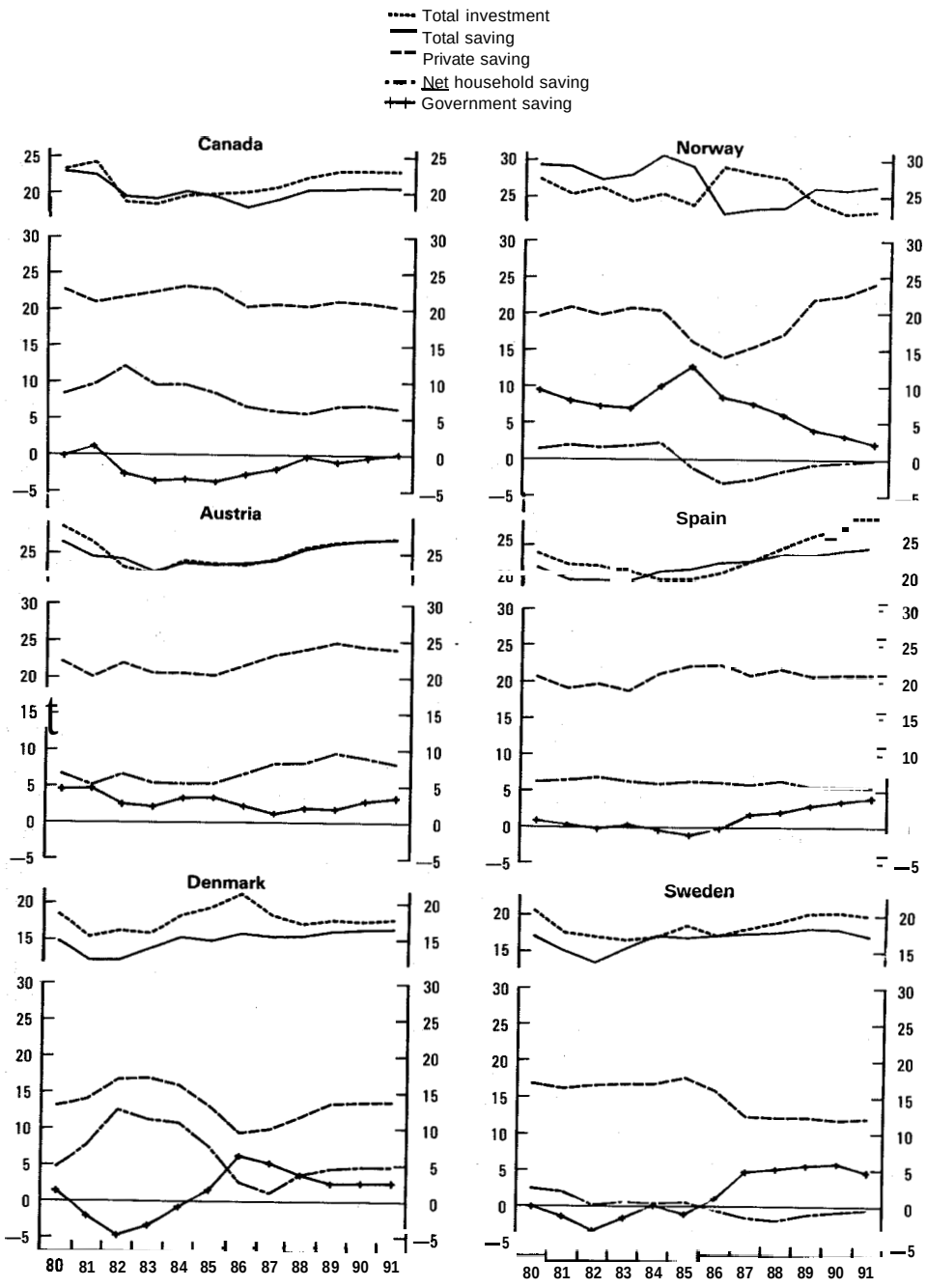


Source: Data based on OECD. *Economic Outlook* No 46. Data for some of the countries refer to national definitions and may not be Strictly comparable to those in the other tables and charts.

CHART B (cont.)

GROSS SAVING RATIOS: RECENT TRENDS AND OUTLOOK

Per cent of GNP/GDP



III. PRIVATE SECTOR SAVING

A. Overall trends

Private sector saving – that is, saving of the household and enterprise sectors combined – is by far the largest source of financing for national investment. Even though, as noted above, the contribution of government to national saving has been significant at certain times (notably the **1960s)** and in certain countries (Japan, Norway and Switzerland), in general it is the private sector that has been the main provider of investment finance. Some of this saving has been intermediated, originating in the household sector, but much of it has been from internally-generated funds of business. In addition, as noted above, the foreign sector has become increasingly important in closing national saving/investment gaps.

Developments in private sector ***gross*** and net saving rates are summarised in Table 4. Private sector ***gross*** saving rates have been fairly stable over time. Apart from fairly sharp increases in Canada and the United Kingdom, ***gross*** private saving rates in the first half of the **1980s** were little different from their levels in the **1960s.** Differences across countries are also relatively small: in the first half of the **1980s** gross private saving rates were in the range of **15** to 23 per cent apart from Japan where the rate was **27** per cent.

Gross private saving rates generally have been less volatile in the past than either their component household and business rates or national saving rates. Households can be regarded as the ultimate owners of businesses, so that they may view retained business earnings as a close substitute for their own saving. More specifically, in periods of strong corporate sector profit expectations, market valuation rises; since this will raise household wealth and probably influence consumption, some offsetting of business and household saving is likely. Earlier studies of the United States found evidence that changes in household saving were nearly completely offset by changes in business saving. Denison **(1958)** and David and Scadding **(1974)** found greater stability in private sector saving behaviour than in either personal or corporate saving. More recent studies such as Poterba **(1987),** Kotlikoff **(1988)** and Schultze **(1988)** have indicated a less than complete offset. Poterba estimated that a fall in U.S. corporate saving of **$1** increases household saving by roughly **50** to **75** cents and Schuttze estimated a change of 55 cents. The situation might be rather different for small open economies where domestic firms' assets are not all held by domestic households while the latter possess a lot of foreign assets, as for instance in the case of Belgium.

Table 4. Net and gross private sector saving ratios

Per cent of net and gross national product

		Averages			1986	1987
		1960-70	1971-80	1981-87[a]		
United States	Net	9.9	10.2	8.1	7.9	6.5
	Gross	17.7	19.2	18.7	18.1	16.7
Japan	Net	18.9	20.1	15.9	16.0	14.4
	Gross	28.7	29.9	26.8	27.1	25.8
Germany	Net	13.5	11.0	9.4	11.1	11.7
	Gross	21.1	20.2	20.0	21.5	21.7
France	Net	..	13.8	9.1	9.9	8.6
	Gross	..	22.0	18.8	19.3	18.5
Italy	Net	13.9	16.3	14.4	..	..
	Gross	19.7	22.9	21.7	..	..
United Kingdom	Net	6.3	7.8	7.9	6.9	6.6
	Gross	13.1	16.4	17.7	16.8	16.3
Canada	Net	8.6	12.3	13.6	12.1	12.4
	Gross	18.1	20.7	22.5	21.3	21.3
Austria	Net	10.9	12.2	10.8	11.3	12.8
	Gross	20.8	21.7	21.1	21.6	23.0
Belgium	Net	13.1	14.9	14.0	15.6	14.5
	Gross	21.2	22.5	21.8	23.2	22.0
Denmark	Net	..	8.1	7.3	2.8	3.2
	Gross	..	14.8	15.2	10.9	11.4
Finland	Net	8.1	6.7	7.2	4.8	6.9
	Gross	18.2	19.3	20.0	18.0	19.7
Greece	Net	11.2	18.7	15.6	13.7	14.4
Netherlands	Net	..	13.8	14.7	15.7	13.9
	Gross	..	20.8	22.8	23.1	22.3
Norway	Net	7.4	5.4	6.2	1.2	3.6
	Gross	19.4	18.8	19.2	14.5	17.1
Sweden	Net	..	5.3	5.7	5.4	2.8
	Gross	..	14.2	15.5	15.0	12.7
Switzerland	Net	16.1	15.2	16.3	17.5	18.2
Australia	Net	..	10.5	5.3	4.2	5.5
	Gross	..	21.1	18.4	18.1	18.9
Average of above countries[b]	Net	..	12.0	10.0	10.0	9.3
	Gross	..	21.0	20.4	20.3	19.7

a/ 1981-85 for Italy; see note *a/* on Table 1.

b/ Excludes Italy.

Note: Recent developments and forecast values for grass private saving ratios are shown in Chart B.

Source: OECD, ***Annual National Accounts.***

Despite the record of stability of private saving ratios, such ratios have recently dropped considerably in a number of countries. The downward movement has been especially sharp in Denmark, Sweden and Norway but still appreciable in the United States, the United Kingdom and Italy (Chart B). In the short term, lower private saving can be expected to lead to higher expenditure and, through higher tax revenues, to greater government saving, i.e. the reverse causality to the Ricardian equivalence discussed above. In the longer run, as income and other variables change, the links between private and government saving will be less clear.

B. Business saving

Business saving accounts for a considerable part of funds to finance investment. Including depreciation, business saving provides about half of private saving in most countries.

Developments in business saving track profit developments very closely, differing from profits by the amount of dividends paid out to shareholders. While profits were rather stable in North America during the 1960s and early 1970s, a considerable squeeze occurred in most European countries and Japan. Profit shares and rates of return reached low levels between the mid-1970s and early 1980s but have rebounded sharply since then. Ratios of corporate saving to GNP closely mirror these developments (Table 5).

During the profits squeeze of the 1970s business investment was sustained by considerable borrowing. The ratio of corporate interest payments to GDP increased considerably and continued rising into the 1980s. This reduced cash-flow further in the early 1980s. Interest payments of corporations as a proportion of GDP had, for instance, trebled since the 1960s in the United States and doubled in Finland. In addition to the low capacity utilisation rates reached in the early 1980s, a desire to restructure balance sheets may help to explain the slow recovery of business investment in many countries during the initial phase of the current upswing. But a sharp recovery in profits in recent years, associated with wage moderation, has played a vital role in increasing business saving to levels closer to those of the 1960s. These developments have contributed to: *i)* stronger corporate cash-flow, and *ii)* reduced interest payments following balance-sheet restructuring.

Concern has been expressed in certain countries, particularly the United States, the United Kingdom and Australia, about the build-up of corporate debt in relation to equity in recent years. Higher leverage can be traced to new financing arrangements, associated with financial liberalisation, which have interacted with incentives to incur debt that were often already inherent in tax systems[12]. The higher level of gearing in the business sector has not been tested in a recession; if

Table 5. Business saving[a]

Per cent of GNP

	1960.70	1971-80	1981-87[b]	1985	1986	1987
United States						
Beforetax revenue[c]	11.9	11.9	13.2	13.7	13.3	13.0
Direct taxes	3.6	2.8	1.9	1.7	1.8	2.2
Other current payments	0.3	0.4	0.5	0.5	0.5	0.6
Interest	2.1	3.8	6.0	5.9	5.6	5.7
Dividends	3.3	3.2	3.2	3.1	3.1	3.0
Net saving	2.6	1.8	1.7	2.5	2.2	1.6
Net lending	−0.9	−1.7	−0.5	0.1	0.3	−0.4
Japan						
Beforetax revenue[c]	20.1	18.3	17.9	18.1	18.1	18.0
Direct taxes	3.4	3.6	4.1	4.4	4.1	4.6
Other current payments	0.9	1.2	1.2	1.2	1.1	1.1
Interest	8.3	9.9	9.0	8.8	8.5	7.9
Dividends	2.3	1.6	1.2	1.2	1.2	1.2
Net saving	5.2	2.0	2.4	2.6	3.2	3.2
Net lending	−9.2	−8.0	−4.9	−5.5	−4.1	−4.5
France						
Before-tax revenue[c]	..	18.1	19.3	19.8	20.7	21.1
Direct taxes	..	1.8	1.8	1.8	1.9	1.9
Other current payments	..	2.8	3.1	3.1	3.0	3.0
Interest	..	4.2	5.5	5.7	5.5	5.3
Dividends	..	2.0	2.4	2.4	2.5	2.7
Net saving	..	7.2	6.5	6.7	7.8	8.1
Net lending	..	−4.3	−2.5	−1.8	−1.0	−1.3
Italy						
Before-tax revenue[c]	..	6.9	8.1	8.4	..	..
Direct taxes	..	1.0	1.5	1.6	..	..
Other current payments	..	3.1	2.5	2.4	..	..
Interest	..	3.9	5.8	5.6	..	..
Dividends	..	0.4	0.5	0.6	..	..
Net saving	..	−1.3	−2.2	−1.8	..	..
Net lending	..	−5.6	−3.6	−2.1	..	..
Finland						
Before-tax revenue[c]	10.3	8.2	10.1	10.4	10.0	11.1
Direct taxes	2.1	1.4	1.3	1.2	1.3	0.9
Other current payments	1.0	1.4	1.6	1.7	1.7	1.8
Interest	3.4	5.3	6.5	6.7	6.4	6.2
Dividends	0.7	0.5	0.7	0.9	0.9	1.0
Net saving	3.2	−0.4	−0.1	−0.1	−0.4	1.1
Net lending	−3.8	−6.4	−3.5	−3.3	−3.1	−3.1
Sweden						
Beforetax revenue[c]	..	7.0	9.9	11.7	11.0	10.3
Direct taxes	..	1.0	1.4	1.5	1.2	2.4
Other current payments	..	1.7	1.8	2.0	2.0	2.0
Interest	..	3.6	4.8	4.6	5.1	4.8
Dividends	..	0.9	1.3	1.3	1.6	1.8
Net saving	..	−0.2	0.5	2.3	1.0	−0.7
Net lending	..	−4.7	−2.5	−2.6	−2.7	−6.0

a) For the *non-financial* corporate sector.
b) 1981-85 for Italy; see note *a)* on Table 1.
c) Before-tax revenue is net operating surplus plus receipts of property income and current transfers.

economies slow substantially, difficulties could arise for some companies who have borrowed in the recent high growth period. However, new financial arrangements also give firms more flexibility to deal with cash-flow pressures. Changes in corporate control and management incentives associated with the replacement of equity by debt, are likely to have helped to improve company performance (Lichtenberg and Siegel, **1987).**

C. Household saving

i) The rise and fall of household saving

Gross household saving ratios increased substantially in the **1970s** and then decreased markedly in almost all OECD countries during the course of the **1980s**[13] (Chart C). The uncertain economic environment of the first oil-price shock and the inflation of the **1970s** seem to have contributed to the rise in saving ratios while the disinflation and sustained recovery of the **1980s** seem to have contributed to their fall. The separate impacts of uncertainty and inflation during these periods are however difficult to disentangle. The decline in household saving ratios in recent years has been particularly pronounced in some countries, often associated with financial market liberalisation.

Household saving ratios are now lower than in the **1960s** in the Scandinavian countries, in a few other European countries (the United Kingdom and France) and in the United States and Australia. They also followed a downward trend in Japan, Italy and Ireland in the **1980s** but remain higher than in the **1960s** and relatively high compared with the OECD average (Chart C).

Because capital depreciation is difficult to evaluate, both within and across countries[14], especially in periods of inflation, net saving ratios tend to be less reliable than gross ratios. Nevertheless, the pattern of trends in net ***household saving ratios*** is similar to that for the gross ratios (Chart C). In Finland, Norway and Sweden recent declines have even led to negative net household saving ratios. Current trends and prospects for most OECD countries up to **1990** do not point to a reversal of the downward trend, but rather to a stabilisation of net household saving ratios around current levels (see Chart B).

ii) Is household saving being measured "correctly"?

A number of measurement problems, besides those of measuring depreciation, may distort calculations of household income, consumption and saving in the national income accounts (Blades, **1983;** Boskin, **1988).** Apart from the exclusion of ***unincorporated enterprises*** from the household sector, these adjustments concern the inclusion of purchases of ***consumer durables*** in capital rather than current expenditure, the standardisation of the treatment of public and private ***pension***

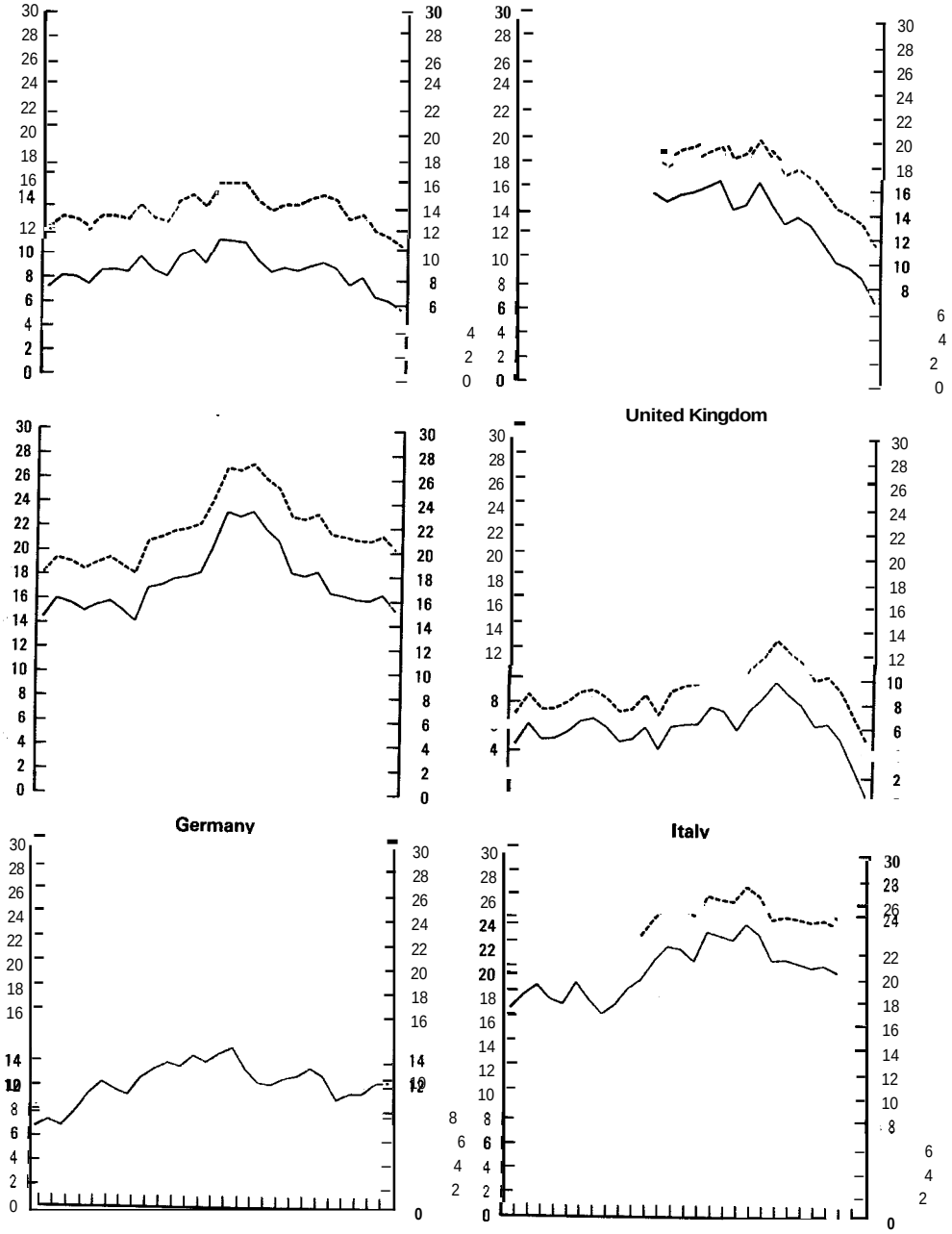

United Kingdom
Germany
Italy

CHART C (cont.)

GROSS AND NET HOUSEHOLD SAVING RATIOS

— Net saving ratio

------ Gross saving ratio

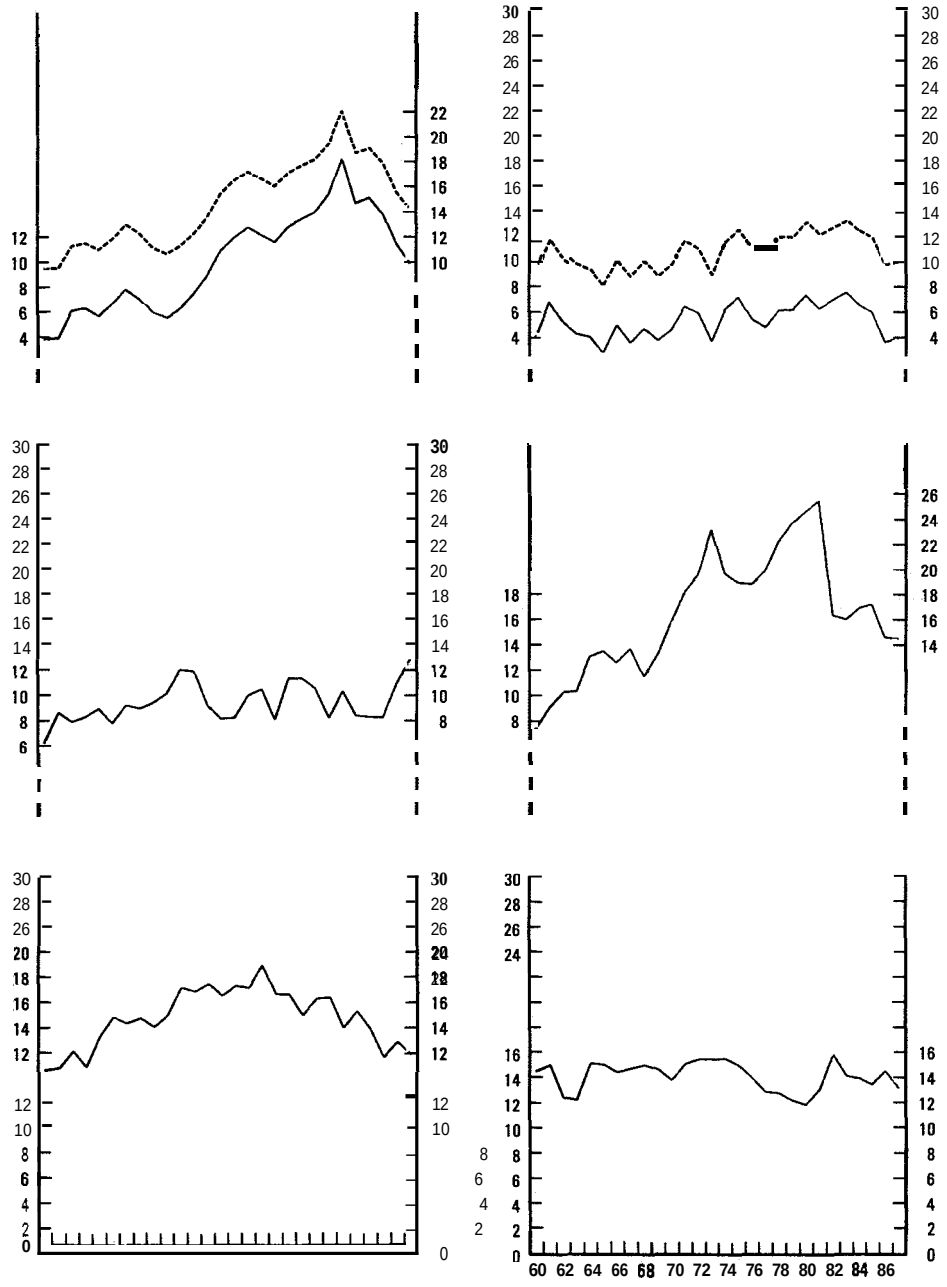
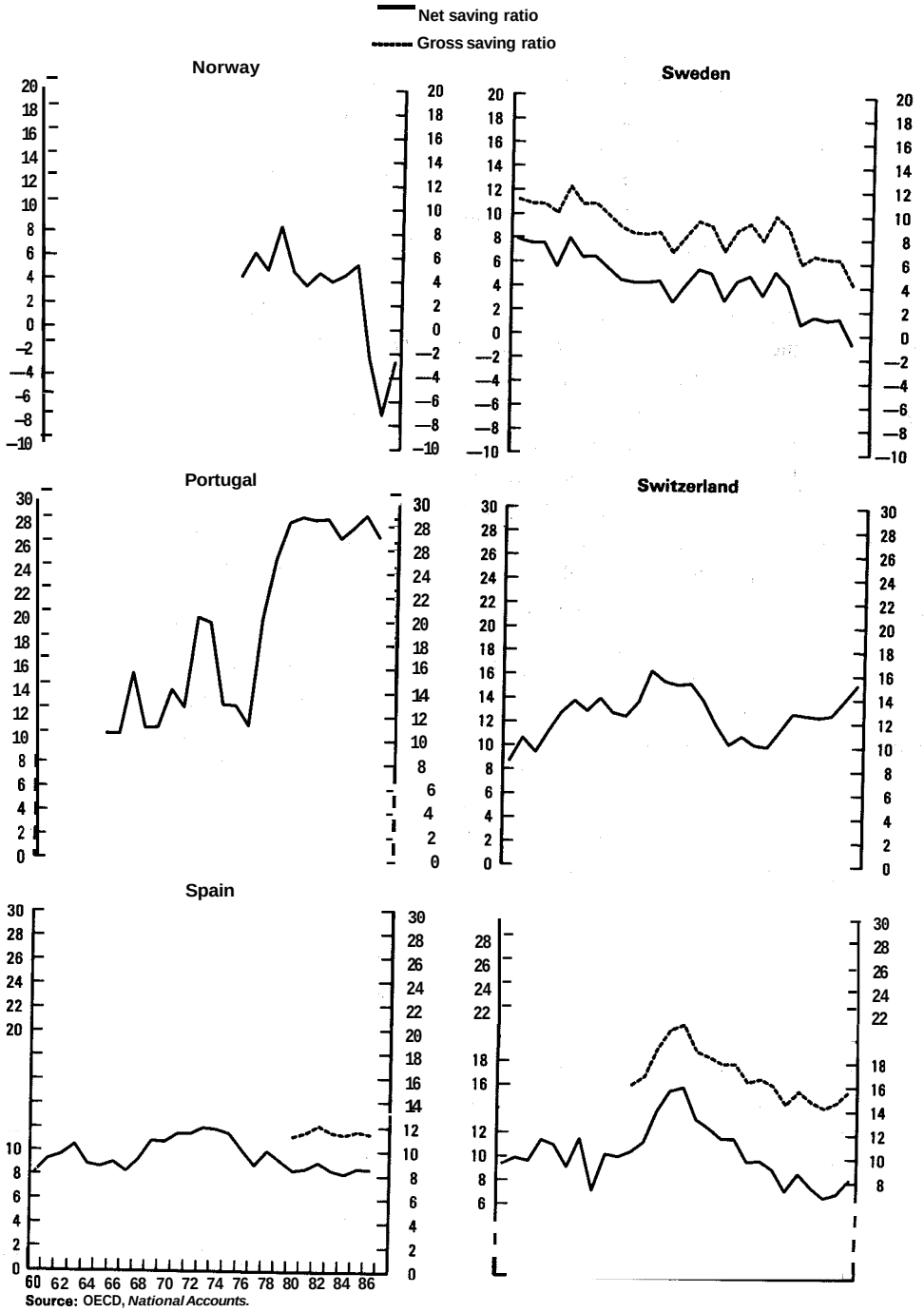


CHART C (cont)

GROSS AND NET HOUSEHOLD SAVING RATIOS



Source: OECD, *National Accounts.*

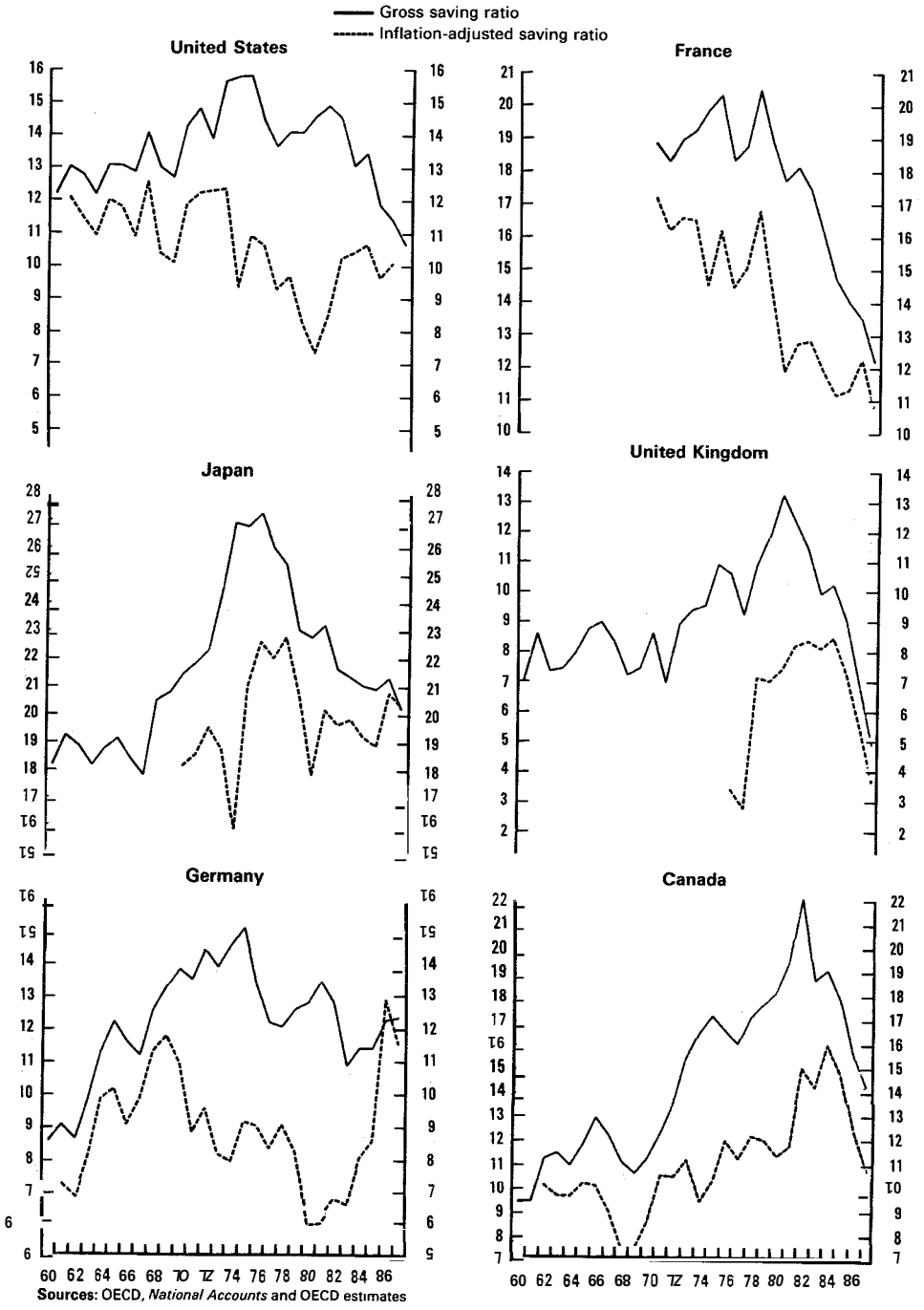
and life insurance schemes and the inclusion of saving by social security *funds*[15]. It should be noted that these adjustments either have a counterpart in the definition of saving of other sectors (adjustment for pensions and social security, exclusion of unincorporated enterprises) or in the definition of household investment (adjustment for consumer durables), and do not as a matter of definition affect the overall national investment/saving balance. Such adjustments do not in practice have much effect on the inter-country disparity in saving ratios. They affect the levels of the household gross saving ratio, sometimes substantially, (*e.g.* the exclusion of consumer durables from consumption expenditure in the case of the United States or the inclusion of pension fund saving in Sweden), but in general do not have a marked impact on the trends.

Measured trends in household saving ratios are significantly altered, however, if an adjustment is made for holding gains and losses arising from inflation. Because disinflation has been an important phenomenon in the **1980s,** it has been argued that part of the decline in household saving ratios could be attributable to the mismeasurement of inflation-induced changes in household income and saving. Although measured nominal income and outlays include interest receipts and payments which include inflation premia, holding gains and losses on financial assets and liabilities do not enter into the calculation of income or saving in the System of National Accounts. However, when there is persistent inflation, holding gains and losses on monetary assets and liabilities become regular and predictable so that it would seem appropriate to treat them as components of current incomes and outlays (Hill, **1984** and **1988).** Nominal interest payments should therefore be corrected by offsetting imputed transfers between creditors and debtors to avoid overstating the saving of the creditors and understating the saving of the debtors. inflation adjustment reduces the level of saving of the lending sectors and increases that of the borrowing sectors. The mirror image of the inflation adjustment of household saving can thus be found in the business and government sectors, at least for countries with a net external position close to zero.

Chart D shows inflation-adjusted saving ratios for the major seven countries in the **1970s,** a period **of** increasing inflation, and in the **1980s,** when the deceleration of inflation was **pronounced**[16]. The major feature is that the inflation adjustment substantially mitigates movements in unadjusted rates and in some cases reverses the trends. In the United States, for example, the gross saving ratio on an inflation-adjusted basis, would have increased by about 4 points between **1980** and **1986,** compared with a decline of 3½ points on an unadjusted basis. In Germany and Italy, where SNA gross saving ratios remained broadly stable in the **1980s,** the adjusted ratios show a marked increase. In general inflation adjustment changes the story about when household saving rates rose and fell but does not change the position of saving ratios in the **1980s** relative to the **1960s.**

CHART D

INFLATION-ADJUSTED GROSS HOUSEHOLD SAVING RATIOS



Sources: OECD, *National Accounts* and OECD estimates

Measurement problems due to ***exchange-rate movements*** are of the same nature as those arising from inflation and should in principle be taken into account, to the extent that a proportion of financial assets and liabilities held by households is denominated in foreign currency. A study covering Canada (Haydu, **1987)** shows that the household saving ratio adjusted for changes in real exchange rates would have been somewhat lower since **1976** because of the depreciation of the Canadian dollar ***vis-à-vis*** the U.S. dollar. This suggests that variations in exchange rates could have had some impact on the measured household saving ratios in other countries during the period of exchange-rate volatility in the **1980s.**

iii) Why do households save and can inter-country differences be explained?

There is a large body of theoretical as well as empirical work on the determinants of household saving behaviour. For individual households the main saving motives are: to allocate consumption over time given a pattern of expected income flows[17] and particularly the necessity to save for retirement, as embodied in the life-cycle hypothesis (Ando and Modigliani, **1963);** to allow for uncertainty about the future, which leads to a demand for precautionary assets; and the willingness to save for bequest. In the short to medium term, saving and dissaving by households also occur because of the planning of future acquisition of consumer durables and housing. For the household sector as a whole, saving thus depends on demographic factors, current and expected wealth, and institutional or structural characteristics, such as financial market opportunities, pension schemes and tax systems, which interact with individual household saving behaviour to determine aggregate saving ratios[18]. Variations in a number of these factors explain some of the differences in saving ratios across countries or within a country over time. Those most relevant for a comparative analysis of the household saving behaviour in the **1980s** are briefly discussed below. The important influence of changes in net worth and debt is addressed separately in Section III.C.*v).*

Demographic factors – that is, changes in the age distribution of the population – alter the aggregate household preferences if, as suggested by the life-cycle hypothesis, an individual's propensity to save varies with age (Musgrove, **1982;** Barnes and Gillingham, **1984;** Modigliani, **1986;** Graham, **1987). A** recent analysis by Heller **(1988)** of the effects of demographic changes on saving rates in the major seven OECD countries shows that the share of elderly in the population has reduced saving (and could continue to reduce it substantially into the first quarter of the next century) with the largest declines expected to occur in Japan. However, there is evidence that the bequest motive is particularly strong in Japan, which may be one reason for the high labour participation ratio of the elderly and may lead to some muting of the decline in the saving rate that might otherwise be

Table 6. Demographic and social factors influencing household saving

	Old age dependency ratio[a]	Young age dependency ratio[b]	Participation rate: > 65	Population growth	Participation rate: women
1962-1970					
United States	15.8	49.5	16.7	1.2	45.5
Japan	9.5	37.7	35.6	1.1	56.4
Germany	18.9	35.0	12.4	0.8	48.5
United Kingdom	19.3	36.8	12.6	0.5	49.2
Canada	13.0	54.6	14.3	1.7	..
Australia	13.6	47.4	12.1	1.9	..
Finland	12.7	41.2	8.8	0.3	61.9
1971-1980					
United States	16.4	38.8	13.2	1.0	54.1
Japan	11.8	35.4	28.0	1.2	53.5
Germany	22.6	32.5	6.8	0.0	49.4
France	21.5	37.7	8.6	0.6	**51.7**
United Kingdom	22.4	36.3	8.6	0.1	55.0
Canada	13.4	40.3	9.4	1.2	**50.5**
Australia	13.9	42.4	8.9	1.3	49.3
Finland	16.0	32.7	10.9	0.4	66.2
Netherlands	16.9	38.8	4.2	0.8	..
Norway	22.7	36.7	15.5	0.4	58.9
Sweden	23.6	31.8	7.5	0.3	67.5
1981-1986 '90					
United States	17.7	33.1	10.8	1.0	62.6
Japan	14.5	32.9	25.1	0.6	56.7
Germany	21.7	23.2	3.6	-0.2	50.2
France	20.2	33.0	3.6	0.4	54.7
Italy	19.1	27.3	5.8	0.3	40.4
United Kingdom	23.1	30.2	5.3	0.1	58.8
Canada	14.9	32.3	7.5	0.8	61.1
Australia	15.3	36.6	5.1	1.4	53.3
Finland	18.2	28.8	5.0	0.5	72.7
Netherlands	17.6	30.1	1.8	0.5	40.0
Norway	24.2	32.4	12.6	0.3	66.5
Spain	18.3	37.4	4.9	0.5	32.8
Sweden	26.3	28.7	4.4	0.1	76.7

a) Population 65 years and over as a per cent of the workingage population.
b) Population under 15 years as a per cent of the workingage population.
Source: OECD, ***Labour Force Statistics.***

90 - 2000
2000 - 2010
2010 - 2020
2020 - 2030

expected. As shown in Table 6, the old-age dependency ratio has indeed increased in most countries in the 1980s compared with the 1970s and the 1960s. Horioka (1986) also estimates that important forthcoming changes in the age structure of the population in Japan could lead to a decline in the household saving ratio after 1995. The ageing of the population could have a similar effect in Germany and in some other countries (Hagemann and Nicoletti, 1989). There is thus some economic rationale for Germany and Japan currently having relatively high private and national saving ratios, with savers seeking the highest real after-tax rate of return internationally.

Not only does the age structure of the population change, but there is evidence that individuals of a given age behave differently than earlier – a "vintage effect". Based on a decomposition of the U.S. population by cohorts, Boskin and Lau (1978) estimate that persons born since 1939 have, at the same age, a significantly lower propensity to save than those born prior to 1939. Similarly,

Table 7. Socio-economic influences on household saving, 1981-86

	Old age dependency	Young age dependency	Participation rate: > 65	Population growth	Participation rate: women	Expected ranking	Actual ranking
United States	3	6	6	1	7	6	6
Japan	1	4	7	3	4	3	2
Germany	6	1	1	7	2	2	5
France	5	5	1	4	3	4	3
Italy	4	2	4	5	1	1	1
United Kingdom	7	3	3	6	5	7	7
Canada	2	7	5	2	6	5	4

Kessler (1989) estimates that, in 1988, French households aged between 25 and 45 have a higher propensity to consume than their parents had at the same age and, as noted by Christine (1989), this effect may have been enhanced by the liberalisation of financial markets. Other social factors such as youth dependency ratios and labour force participation of the aged and of women may also help to explain differences in household saving ratios across countries[19]. Table 7 presents

a synthetic indicator of the demographic and social influences on household saving ratios for the major seven countries over the **1980s** which shows that, based on a simple composite ranking of these factors alone, the levels of saving rates should be comparatively high in Japan and Italy and low in the United States and the United Kingdom.

The increase in the ***share*** of ***the elderly in the population*** has been accompanied by an improvement in their economic situation, and this has also been advanced as an explanation of reduced aggregate saving. The way in which compulsory social security systems alter the time pattern of consumption, and hence saving, has been discussed by a number of authors. Feldstein and Pellochio **(1978),** for instance, found that social security significantly depressed private wealth accumulation in the United States in the **1960s,** and Boskin, Kotlikoff and Knetter **(1985)** and Summers and Carroll **(1987)** argued that the increase in the relative well-being of the elderly is an important cause of the drop in the U.S. household'saving ratio in the **1980s.** Although some doubt has been cast on such an effect by a number of other authors (Barro, **1978;** Leimer and Lesnoy, **1982;** Kaskela and Viren, **1983;** Auerbach and Kotlikoff, **1983)** empirical evidence of the depressing effect of social security on saving has been found more recently in a number of other countries. Bentzel and Berg **(1983)** argued that the introduction of the public social security systems in Sweden had a significant depressing impact on private saving (which would mitigate the pensions adjustment mentioned in Section III.C.*ii)*. Similarly, Shibuya **(1987)** and Brugiavini **(1987)** found empirical evidence of reduced saving due to public pension schemes in Japan and Italy respectively, although in the case of Japan it should be borne in mind that the public pension scheme there began only in **1965.** Mechanical adjustment of gross household saving ratios adjusted for this effect can be found in Annex III of Dean ***et al.*** **(1989).** It should be stressed that public pension expenditure rose substantially in most OECD countries in the **1980s,** representing an average of **9** per cent of GDP for the major seven countries compared with **7** per cent in the **1970s.** This evolution has been even more pronounced in some of the smaller economies, the most striking example being Sweden, where public pension expenditure represented **5** per cent of GDP at the end of the **1960s** and almost **11** per cent in **1985** (OECD, **1988).**

How ***interest rates*** affect saving is an important issue as it bears on questions regarding public indebtedness and the effects of fiscal policy. The liberalisation of financial markets which has occurred during the **1980s** has made this issue more relevant, as it has increased the role of interest-rate movements in balancing demand and supply in financial matters. A ***priori,*** the effect of interest rates on saving is ambiguous, since they have both an income (via net interest payments) and a substitution effect. Hall **(1985),** for instance, found strong evidence that a higher expected real interest rate makes U.S. consumers defer consumption and Boskin **(1978)** pointed to a "modest positive interest elasticity of U.S. private

saving". Dicks (1988) also emphasised the positive interest elasticity of saving in explaining U.K. household saving behaviour. This conclusion was confirmed for seven other industrial countries by Tullio and Contesso (1986)[20]. Beach *et al.* (1986) found that in Canada the age distribution of the population was important, the response of aggregate household saving to changes in real rates of return being positive for the young (the substitution effect dominating) and negative for those approaching retirement (income effects dominating). The effect of interest rates operating through wealth effects, as described below, is also likely to be important.

iv) Unanticipated inflation and uncertainty

Changes in inflation may lead to real changes in saving as well as distorted measures of it because, at least in the short term, nominal interest rates may not adjust to fully offset inflation. In response to such unanticipated inflation, individuals may save more in order to maintain their real wealth positions. Similarly, periods of decelerating inflation which result in an unexpected better real wealth position, could induce individuats to save less (Jump, 1980). This behavioural link between saving and inflation is different from the pure measurement problem discussed above which in any case also occurs when interest rates increase in line with inflation, i.e. when inflation is anticipated. Recent econometric studies suggest that inflation-induced wealth effects have had a positive impact on saving in most OECD countries[21].

Apart from the induced wealth effects, the relation between saving and inflation is also a reflection of uncertainty. As periods of high inflation are often periods of more general uncertainty, households may react by adding to their stock of precautionary assets. During the two oil-price shocks in the 1970s, when inflation surged, inflation-adjusted household saving ratios increased strongly in Japan and more moderately in Canada. In Japan, France and Canada inflation-adjusted saving ratios declined markedly in 1974 before rising sharply again in 1975 (Chart D). On the other hand, during the 1980s the long period of disinflation may have contributed to some reduction in uncertainty, thereby inducing some running-down in precautionary assets.

v) The broader picture; personal net worth and debt

Net worth. The life cycle and permanent income approaches to consumption stress the importance of net wealth positions in affecting consumption/saving behaviour. In the life-cycle approach, households have some target wealth position (changing systematically over the life cycle) to support consumption through their lifetimes while, in the permanent income approach, permanent consumption is defined as the amount that can be consumed that leaves net

wealth unchanged (including the discounted present value of expected labour income). In either case, from the household's point of view, improvements in net worth give rise to a lower need to save. Despite low saving in many countries, data depicting net worth or net financial wealth suggest a broadly healthy or strongly improving financial picture for the personal and total private sectors in recent years, even allowing for the October 1987 stockmarket decline (Table 8)[22].

During the 1980s personal saving ratios have fallen while the ratio of personal net worth or net financial wealth to personal disposable income has risen significantly in most of the major OECD countries. In Canada, however, there is no clear link between saving and net worth/income ratios over most of the past 25 years. Carroll and Summers (1987) explain the sudden decline in the net worth/income ratio in Canada in 1980 and in the household saving ratio in 1982 by a property boom and bust in the late 1970s followed by the most severe recession of all OECD countries in 1981-82.

Equities. Housing (including land) and equities generally account for much of the variation in household wealth. Until the October 1987 stockmarket decline, capital gains on equity were boosting wealth relative to household disposable income, encouraging a reduction in household saving. The loss in wealth after the October decline was expected to lead to slower growth of consumer spending and increase the saving ratio – and more *so* in those countries such as the United States where losses on equities were a more important component of changes in household net worth – but in most countries consumption growth hardly slowed or slowed by less than expected.

Several factors appear to be important in explaining the continued buoyancy in consumer spending after the October 1987 decline. In hindsight a large part of the build up in equity prices may have been regarded by many equity holders as temporary. In most countries the October decline merely wiped out most of the year's gains and in many countries equity prices have subsequently recovered substantially, in some cases to beyond pre-crash peaks. The recovery in equity prices and the strength of consumer spending after the October decline suggest that the underlying strength of OECD economies was under-estimated at the time, but can also be associated with the prompt availability of ample credit as central banks acted to avoid a financial crisis.

Housing. In Japan and the United Kingdom changes in the value of the housing and land stock have dominated changes in net worth over the past 20-25 years and in most years have been larger than the aggregate value of personal saving. Increases in the value of the housing stock have also been large in Canada, Australia, Sweden and Norway in recent years. In most of these countries the greater availability of credit through financial liberalisation, or general monetary ease as in the case of Japan, has been an important factor in explaining the rapid growth of mortgages and property prices.

Table 8. Personal sector wealth and debtlincome ratios[a]

	1970	1975	1980	1985	1986	1987	1988
United States							
Net wealth/income[b]	4.53	4.25	4.78	4.58	4.66	4.62	4.58
Net financial wealthlincome	2.86	2.46	2.71	2.70	2.74	2.65	2.64
Stock market shareslincome	1.04	0.57	0.62	0.69	0.75	0.68	0.66
Total liabilitieslincome	0.71	0.70	0.80	0.88	0.92	0.94	0.94
Saving ratio	8.3	9.4	7.3	4.5	4.3	3.3	4.3
Japan							
Net wealth/income[b]	3.98	4.14	5.04	5.74	6.48	7.80	n.a.
Net financial wealthlincome	0.97	0.99	1.24	1.66	1.85	2.17	n.a.
Stock market shareslincome	0.24	0.20	0.24	0.30	0.43	0.67	n.a.
Total liabilitieslincome	0.60	0.62	0.76	0.90	0.93	1.02	n.a.
Saving ratio	17.7	22.8	17.9	16.0	16.4	15.1	15.20
Germany							
Net financial wealthlincome	1.08	1.23	1.37	1.62	1.66	1.69	1.73
Stock market shareslincome	0.06	0.04	0.03	0.04	0.05	0.05	0.05
Total liabilitieslincome	0.08	0.09	0.15	0.16	0.17	0.17	0.17
Saving ratio	13.8	15.1	12.7	11.4	12.2	12.3	12.6
France							
Net financial wealthlincome	0.97	0.80	0.84	0.98	1.15	1.03	1.14
Stock market shareslincome	0.50	0.31	0.21	0.43	0.62	0.53	0.67
Total liabilitieslincome	0.58	0.59	0.62	0.63	0.67	0.74	0.76
Saving ratio	18.7	20.2	17.6	14.0	13.2	11.5	12.4
Italy							
Net financial wealthlincome	n.a.	0.98	0.97	1.29	1.45	1.48	1.56
Stock market shareslincome	n.a.	0.05	0.06	0.1 1	0.19	0.13	0.13
Total liabilitieslincome	n.a.	0.09	0.07	0.08	0.10	0.10	0.11
Saving ratio	38.2	35.1	29.1	23.6	23.1	22.1	22.7

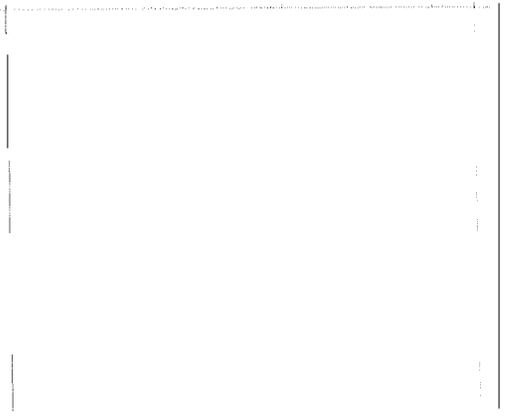
United Kingdom							
Net wealth/income[b]	4.07	4.07	3.91	4.48	4.88	5.10	n.a.
Net financial wealth/income	2.26	1.39	1.19	1.65	1.84	1.82	1.79
Stock market shares/income	n.a.	0.30	0.21	0.26	0.33	0.41	0.41
Total liabilities/income	0.57	0.64	0.51	0.80	0.87	0.93	0.99
Saving ratio	9.3	12.1	13.5	9.6	7.8	6.2	4.4
Canada							
Net wealth/income[b]	3.92	3.72	4.06	3.84	3.96	4.06	4.14
Net financial wealth/income	1.58	1.31	1.52	1.65	1.68	1.67	1.68
Stock market shares/income	0.64	0.47	0.58	0.55	0.57	0.57	0.56
Total liabilities/income	0.82	0.81	0.87	0.73	0.78	0.84	0.90
Saving ratio	5.6	12.7	13.6	13.3	10.6	9.7	9.4

n.a. = not available.

a) Income is nominal personal disposable income. Wealth and debt variables are year-end nominal values. Stock market shares exclude shares held by pension funds and are at market values.

b) Including housing and land.

Source: United States: Federal Reserve, ***Balance Sheet for the U.S. Economy 1949-89,*** 1989.
Japan: Economic Planning Agency, ***Annual Report on National Accounts,*** 1989.
Germany: Oeutsche Bundesbank, ***Zahlenübersichten und methodische Erläuterungen zur gesamtwirtschaftlichen Finanzierungsrechnung,*** 1989.
France: Banque de France, ***Tableau d'Equilibre des Relations Financières,*** 1989.
United Kingdom: Central Statistical Office, ***Financial Statistics,*** 1989, ***National Accounts,*** various years.
Italy: Banca d'Italia, ***Economic Bulletin,*** 1986 ***Annual Report,*** 1989.
Canada: Statistics Canada, ***National Balance Sheet,*** 1989.



Capital gains on housing often increase net worth substantially and hence stimulate consumption. In the United Kingdom there is evidence that the rapid growth of house prices in London has encouraged equity withdrawals as property is bought and sold with a substantial part of sales proceeds being consumed and not reinvested (Muellbauer and Murphy, 1988; and Calverley and Datta, 1988). In several other countries, financial liberalisation and competition have also made it easier to use home equity as collateral for other loans. In addition, the tax system often favours investment and saving in the form of housing, and this effect has become more important as other distortions have been removed and credit has become more available (see Sections III.C.*vii)* and *viii)*).

Personal debt. Increases in personal net worth have been accompanied by a rapid build up of gross personal debt in recent years, particularly in the United States, France, the United Kingdom, Australia, Sweden, Finland and Norway. The increase of personal debt can be closely related to an easing of borrowing constraints associated with significant financial market liberalisation and innovation. In the case of France, for instance, some credit liberalisation occurred in 1986 and the removal of credit controls for households at the beginning of 1987 has encouraged consumption and borrowing[23]. But the most important increases in debt have been directly related to housing or to consumer loans based on housing equity.

Borrowing for housing represents the largest liability of most households in most OECD countries. In some countries credit rationing of housing finance, which was previously extensive, has largely disappeared. Formal and informal saving and downpayment requirements have been substantially reduced through liberalisation and competition in financial markets. In the United States the average downpayment as a per cent of the sales price fell from 20.5 to 11.4 from 1980 to 1985 (Summers and Carroll, 1987). In the United Kingdom over half of those buying their first property in 1987 were given mortgages of 95 per cent or more of the purchase price (Shields, 1988). Similar developments have accompanied financial liberalisation in Australia, Sweden, Finland and Norway in recent years. Furthermore in many of these countries consumer loans based on the value of housing equity have become significant. In the United States home-equity financed credit has grown rapidly as a result of the Tax Reform Act of 1986, although there is evidence that it has largely substituted for other consumer debt with little effect on aggregate borrowing (Canner et al., 1988). In the United Kingdom and some of the Nordic countries, however, such loans seem to have contributed to the sharp rise in personal debt in recent years.

In linking the build-up in household borrowing for mortgages to the drop in the household saving ratio it is helpful to consider how the relevant transactions are treated in the national accounts. The saving ratio for a typical household falls considerably after the purchase of a house but then rises again as interest payments (a deduction from income) become less important relative to principal

repayments (saving)[24]. There would be no effect on the aggregate household saving ratio if the dissaving of some households were offset by the saving of others. However, in most OECD countries the "baby-boom" demographic bulge has in recent years led to an increase in the size of the age groups characterised by high rates of family formation and associated expenditure on housing and its accoutrements, thus providing a large base for the growth of debt through financial liberalisation to have an important effect. In the United States, for example, there was a rapid increase in the rate of household formation in the three years following the 1980-82 recession and this was accompanied by a rebound in housing investment in that period (Gabriel, 1987). It is also the case that households buy numerous durables when they purchase a house and fund such purchases with loans, further contributing to any decline in saving.

vi) Assessing the *sustainability* of personal sector debt

The rapid growth of personal sector debt has raised concerns about the ability to service that debt, in particular about widespread payments problems in the event of an economic downturn. For the personal sector as a whole, net worth/disposable income positions have improved or been maintained in the major OECD countries in the 1980s, but such aggregate measures provide little information about the distribution of assets and liabilities. A deterioration in economic conditions, whether a general downturn or higher interest rates, could put pressure on highly-leveraged households.

Household survey information in the United States suggests that upper income households, who should be better equipped to service debt, account for the bulk of debt and financial assets, and within specific income groups financial assets are on average about as large as debt, although the concentration of interest income is greater than for interest payments. Most consumer debt is covered by assets. In both the 1983 and 1986 Surveys of Consumer Finances about 80 per cent of families had financial and home equity assets of greater value than consumer loans outstanding, with just over 50 per cent having financial assets larger than their consumer debts. Even families with debt payments of 30 per cent or more of gross income had assets to offset 70 per cent of their consumer debts (Avery et al., 1987). Furthermore, only a few families appear to carry heavy debt burdens over long periods – most appear to reduce the ratio of payments to income rather quickly.

It would appear that the number of households with high debt payments (30 per cent or more of gross income) is generally small in OECD countries. In the United States less than 3 per cent of families had consumer debt repayments of 30 per cent or more of gross income in 1986 (Avery et al., 1987) and in the United Kingdom less than 7 per cent of households had debt service payments in excess of one third of disposable incomes in 1988 (Saunders, 1988). Although

default rates may be rising, they are still generally at low levels and likely to continue to involve only a small number of households – in the United States delinquency rates on personal loans are not high compared with averages of the past fifteen years; in the United Kingdom the rate of properties taken into possession increased through the **1980s** to a relatively high level in **1987,** but declined somewhat in **1988** and the first half of **1989,** while loan arrears have followed a similar pattern except for a rise in the first half of **1989.** The most likely general effect in response to cash-flow pressures is to cut back on general consumption rather than default on loans.

In judging the personal sector debt burden for the major OECD economies, further factors, relating particularly to financial liberalisation, need to be considered. Many new products have been marketed which increase the ability of borrowers to deal with cash-flow problems: e.g. loans with adjustable rates but fixed repayments over a variable period, options to vary the real burden of interest payments over the life of loans and greater accessibility of home equity finance. In some countries loan maturities have lengthened *so* that although debt/income ratios have increased, debt repayment/income ratios have not increased as much. As well, in several of the countries where debt has risen rapidly, substantial mortgage interest costs (and consumer interest for Nordic Countries) are tax deductible, alleviating the pressure on net debtors from rising interest rates.

In the past a crucial factor which contributed to abrupt pressures was the widespread use of credit rationing when monetary policy tightened. This factor does not operate in many larger OECD countries now – credit is typically available, albeit at a price and provided income and net worth evaluations demonstrate there is capacity to pay. Thus, in a world of greater financial liberalisation and floating rates (compared with one in which credit rationing is the norm), the impact of monetary tightening will be felt gradually in rising interest costs – rather than in the more abrupt manner characterising a situation in which new borrowing is prevented.

As noted, one of the main features of financial liberalisation has been the significant drop in deposits required when purchasing a home, with many households obtaining loans for **95** per cent or more of the purchase price. Thus those households who bought near the peak of recent booms, which have since faltered, face the prospect that their mortgage debt is greater than the value of their property. This need not be a problem if, as is likely, housing prices recover over the longer term: housing is a long-term asset. However, reductions in housing values would reduce the size of collateral for new loans and limit the effectiveness of the option to sell to reduce cash-flow pressures, as well as contributing to a disincentive to service debt. These considerations may be relevant in some countries with high personal sector debt levels – namely the United Kingdom, Australia, and several Nordic countries – where activity is expected to slow in **1990.**

vii) Tax structures and their influence on household saving

The potentially undesirable way in which tax structures operate adversely on the level and form of saving and investment is of increasing concern. Because after-tax rates of return tend to be lower than *before-tax* rates under an income tax, saving may be discouraged by discriminating against future relative to current consumption, though heavy reliance on consumption taxation may have the reverse effect. Whether such a distortion is, in fact, important depends on the size of the tax wedge (the difference between before and after-tax rates of return) and the elasticity of saving with respect to the after-tax rate of return. Because, for a net saver, the income and substitution effects are of opposing signs, the net effect of income taxation on saving is ambiguous. As noted earlier, recent studies suggest that saving is likely to be more positively responsive to the after-tax rate of return than previously thought.

A large number of different tax instruments influence saving. No current tax system tries to treat all forms of income in an equal manner, and no existing tax system provides a total exemption of saving and capital income from taxation as would be the case in a tax system with a pure expenditure tax. Research has increasingly indicated that current tax systems are in many cases likely to have a discouraging impact on saving, and that moves away from taxation of saving and capital income could provide substantial economic gains. For instance, simulations of dynamic general equilibrium models, such as those of Auerbach and Kotlikoff (1987), show that a shift away from capital taxation towards taxation of labour income, or a move towards a consumption tax, could increase capital formation and output substantially in the long run[25]. In the former case, greater neutrality with respect to saving would come at the expense of a larger distortion of incentives to accept employment.

Saving incentives. Many countries provide favourable treatment of some form of financial saving, especially that related to retirement pensions. A critical question arises as to whether such tax incentives increase aggregate household saving, or whether they only result in a transfer of saving into a preferentially-treated category. Carroll and Summers (1987) found strong evidence that the sharp divergence in Canadian and U.S. saving rates since the end of the 1960s can partly be explained by the generous tax treatment of pension contributions in Canada, and Venti and Wise (1987) found some evidence that introduction of IRAs in the United States increased financial saving of households somewhat.

Investment in owner-occupied housing receives a considerable amount of preferential tax treatment[26]. This preferential treatment arises via several channels such as tax relief on mortgage interest payments and exclusion of capital gains and non-taxation of implicit rental income. Among OECD countries, only Canada, New Zealand and Turkey allow no tax deductions or credits for mortgage interest payments. While tax relief is limited in a number of countries, many provide for full

deductibility of interest, and in some countries this extends to secondary residences as well. In terms of economic efficiency, tax deductibility of interest payments would be justified with respect to investment in housing if the accrued income on housing investment (including capital gains and implicit rental income) were taxed. However, capital gains and imputed income, if taxed at all, are only lightly taxed in most countries. Estimates of tax wedges for investment in owner-occupied housing for some OECD countries are shown in Table 9 (using tax parameters for 1985). Tax wedges (differences in pre- and after-tax rates of return in percentage points) are large for countries which allow generous or complete deductibility of interest payments. In this case, the tax wedge increases considerably with inflation (e.g. in Sweden, the United Kingdom and the United States). The extent to which the favourable tax treatment really benefits first-time buyers is not clear since such measures increase demand, with the result that the tax incentive may be capitalised in existing house and land prices. To the extent that tax breaks then lead to "overinvestment" in housing, the funds available for business investment are reduced.

Disincentives to saving. Deductibility of consumer credit interest payments clearly favours debt-financed consumption although this may be offset by heavy taxation of consumption. Such deductibility is provided in only a few OECD countries. However, where, as is sometimes the case, mortgage credit is not tied to actual construction activity or in practice can be used for other purposes, the bias against financial saving is exacerbated. If no restrictions apply, possibilities for arbitrage arise where consumer or mortgage credit can be used to buy tax-sheltered financial assets, *so* that lower tax payments finance part of the asset purchase. Generosity of tax systems with respect to consumer goods purchases are but one feature influencing household saving. Nevertheless, countries with low household saving ratios, like the United States and the Nordic countries, are among the most generous in this respect.

viii) The interaction of financial market liberalisation and tax distortions

Tax deductibility of interest payments is not generally a new feature of tax systems. But financial market liberalisation has eliminated or reduced credit rationing *so* that households have been able to take greater advantage of tax incentives related to purchases of housing or consumer goods by borrowing at an earlier stage of their lifetimes and making larger purchases than would otherwise be the case. The attractiveness of borrowing for housing and consumer goods has been further enhanced as other distortions have been removed in the personal income tax system in some of these countries. The net effect on housing may have been to encourage overinvestment. Although the initial effect of recent financial market liberalisation has apparently been largely reflected in rising values of existing properties, the volume of housing investment grew by 15 per cent or more in

Table 9. Tax wedges for housing investment

Percentage points, using 1985 tax parameters

	3				5			
	Inflation rate				inflation rate			
	0	5	10	15	0	5	10	15
	Borrowing case							
United States[a]	−0.79	−2.11	−3.43	−4.74	−1.32	−2.64	−3.95	−5.27
United States[b]	−0.45	−1.20	−1.95	−2.70	−0.75	−1.50	−2.25	−3.00
Japan	−0.23	−0.23	−0.23	−0.23	−0.35	−0.35	−0.35	−0.35
Germany	−0.06	−0.11	−0.11	−0.11	−0.15	−0.18	−0.18	−0.18
France	−0.03	−0.09	−0.15	−0.18	−0.10	−0.19	−0.29	−0.29
United Kingdom	−0.71	−1.90	−3.10	−4.29	−1.19	−2.38	−3.57	−4.76
Canada	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Australia	−0.13	−0.33	−0.54	−0.75	−0.33	−0.66	−1.00	−1.33
Sweden	−0.53	−1.86	−3.19	−4.52	−1.06	−2.39	−3.72	−5.05
	"Asset draw down" case							
United States"	−0.79	−2.11	−3.43	−4.74	−1.32	−2.64	−3.95	−5.27
United States[b]	−0.45	−1.20	−1.95	−2.70	−0.75	−1.50	−2.25	−3.00
Japan	−0.42	−1.12	−1.82	−2.52	−0.70	−1.40	−2.10	−2.80
Germany	−0.66	−1.76	−2.86	−3.96	−1.10	−2.20	−3.30	−4.40
France	−0.30	−0.80	−1.30	−1.80	−0.50	−1.00	−1.50	−2.00
United Kingdom	−0.90	−2.40	−3.90	−5.40	−1.50	−3.00	−4.50	−6.00
Canada	−0.88	−2.35	−3.82	−5.29	−1.47	−2.94	−4.41	−5.88
Australia	−0.90	−2.40	−3.90	−5.40	−1.50	−3.00	−4.50	−6.00
Sweden	−1.59	−4.25	−6.91	−9.57	−2.66	−5.32	−7.91	−10.63

a/ Old.
b/ New.

Note: The calculations take into account:

a/ the deductibility of interest payments and eventual limits,
b/ the availability of tax credits and subsidized loans,
c/ the taxation of imputed income from owner-occupied housing.

The "asset draw down" case refers to financing by the liquidation of financial assets. In this case the opportunity cost of housing investment depends on the marginal tax rate on interest income.

Source: Fukao and Hanazaki (1987).

1988 in the United Kingdom, Australia and Finland, three countries where these interactions are clearest. The increase in household borrowing and decline in the household saving ratio have in turn been reflected in a deteriorating external position. Thus financial liberalisation has worsened the effects of remaining distortions and has led to imbalances elsewhere in the economic system. This should not, however, be offered as an argument to re-introduce controls and regulations, but rather as an example of why it is important to continue to proceed with reforms on a broad front and in a co-ordinated way.

IV. CONCLUSIONS

The long-run trend in the levels of saving and investment

The paper has identified a reduction in national saving and investment rates in most OECD countries over the last two decades. Some reduction might have been expected given the slowing of population growth and as post-war reconstruction in certain countries was completed. The possibility of strong productivity growth arising from technological "catch-up" has been reduced. Moreover, the oil-price shocks in the 1970s and the disinflation and generally high level of real interest rates in the 1980s, have clearly impaired both growth and investment. Nevertheless, insofar as embodiment of technical progress is important, there may have been a link between the general reduction of national investment rates and the lower rates of growth generally experienced over this period.

National saving/investment gaps

National saving/investment gaps – current-account deficits – are sustainable only *so* long as the rate of return on the domestic investment is sufficient to service the external debt. National saving "shortages", on this view, are only a problem if the dynamics of external debt threaten sustainability. International financial market liberalisation and integration have *so* far facilitated the capital flows necessary to allow persisting national saving/investment gaps, but, because of the interest-rate and exchange-rate implications, concern has been expressed about the continued financing of such gaps.

Private saving

The decline in household saving rates during the 1980s has been particularly pronounced in North America, the United Kingdom, the Nordic countries (where

negative rates of net saving have occurred), Australia and New Zealand – mostly countries where there has been some domestic financial liberalisation. In a few countries – Germany, Austria, the Netherlands and Switzerland – there has been no decline or even a rise. For most countries the fall is also associated with disinflation and a strong rise in personal sector wealth since the early 1980s, in part reflecting the long bull market for equities (even taking account of the October 1987 crash) and in part reflecting the house price boom in certain countries.

Against the background of the strong rise in the value of personal sector assets and financial deregulation, there has been an increase in ***personal sector debt/income ratios.*** However, the distribution of assets and debt may differ substantially, so that rising debt and interest burdens for some households could precipitate general financial difficulties. In most of the economies where personal debt has grown rapidly, economic growth is currently strong, although there is a question about its sustainability given inflationary pressures and external account problems. In current circumstances, with monetary policy being directed towards dealing with inflationary pressures, there are clearly greater risks for those individuals and companies which are now highly leveraged.

Increases in household net worth are, ***inter alia,*** a reflection of improved profits and ***business saving.*** Private saving rates declined much less than household saving in the 1980s since business saving, reflecting the profits recovery, picked up strongly in recent years. It would seem that the "corporate veil" is indeed pierced although there has been a sharp fall in overall private saving rates in a few countries in the last few years.

Government saving and tax policy

One of the main features of the trend fall in national saving rates between the 1960s and 1980s was the reduction in the contribution of government saving to national saving. This decline in government saving, which has only recently been reversed in some countries, has not in general been offset to any great extent by private saving. Hence, strict "Ricardian equivalence" does not appear to have occurred, although there is much stronger evidence of important offsets where public sector deficits have been rather high, suggesting some sort of threshold effect.

Government decisions influence the level and allocation of national saving and investment in many ways. The public provision of social programmes is likely to reduce private saving that would otherwise be committed to future expenditure on pension, health or education requirements. Differential tax treatment of different forms of private saving or investment can lead to a misallocation of resources, a sub-optimal composition of the capital stock and considerable welfare losses.

The increased access to liquidity and reduced spreads on consumer or housing loans may have discouraged saving while distortions in the tax system may have meant that additional expenditure has been directed to areas where there is the greatest tax relief. Financial market liberalisation, in the context of tax structures which commonly encourage housing, may have encouraged overinvestment in housing at the expense of productive investment. The interaction of financial market liberalisation and tax distortions should not however be taken as an argument for slowing or reversing the deregulation of financial markets but rather as an argument for pushing ahead with further reforms of tax systems.

NOTES

1. The change in depreciation is due to changes in the ***composition*** of the capital stock which now contains more short-lived equipment and less long-lived structures; it is not due to changes in the service lives of assets of a given type.
2. Depreciation is only one of the areas where measurement issues arise. There are other important issues such as the effect of inflation on measured national income and saving which are explicitly raised in the case of household saving in Section III.C and Annex III of Dean ***et*** a/. (1988). Moreover, the way countries elaborate their national accounts sometimes differs conceptually. To alleviate some of these problems and to facilitate cross-country comparisons, this paper uses System of National Accounts (SNA) data which ensure better consistency. In some countries, however, SNA data are only available with some lag so that national data have occasionally been used to illustrate the most recent trends.
3. Neo-classical growth theory suggests that the capital stock should expand at a rate which equates the marginal productivity of capital with the economy's growth rate. But, in practice, measurement problems make it difficult to answer questions about dynamic efficiency (see Abel, Mankiw, Summers and Zeckhauser, 1989).
4. There are various ways of looking at trends in investment but most of the measures seem to indicate that investment rates in OECD countries have generally been lower during the 1980s than in the 1960s and 1970s. It is nevertheless important to note that conventional measures of investment do not include expenditures on research and development and investment in human capital (education and training) which may crucially affect economic growth. The proposed revision to the SNA will treat research and development expenditures as investment. See Blades (1989).
5. The result was generally confirmed by later studies, as indicated in Annex II of Dean ***et al.*** (1989).
6. The authors became aware of the Feldstein-Bacchetta results only when finalising this paper. The basic conclusion of their analysis is that "an increase in domestic saving has a substantial effect on the level of domestic investment although a smaller effect than would have been observed in the 1960s and 1970s".
7. While saving for the whole OECD was always greater than investment from 1960 to 1973 and the difference never larger than 1 to 2 per cent of total area capital formation, saving was usually lower afterwards. Large swings occurred at the time of the two oil-price shocks. Capital inflows from the rest of the world financed 3 per cent of total OECD capital formation in 1980. In the aftermath of the second oil-price shock and the developing country debt crisis, the aggregate saving/investment imbalance was not redressed. In 1987 rest of the world capital inflows still financed 4 per cent of the OECD's capital formation.

8. This is shown for the United States, Japan, Germany and the United Kingdom in Chart C of Dean et al. (1989).

9. Recent research has concluded that differences in risk-adjusted rates of return on assets denominated in the same currency but issued in different countries are arbitraged away quickly in the absence of strict capital controls. Bilateral correlations show that ex-ante real interest rates tend to move together and that there was a clear tendency towards convergence from the early to the mid-1980s. See Cumby and Mishkin (1985) and Obstfeld (1986).

10. In addition to consolidation efforts, privatisation generated a considerable amount of funds during the 1980s in a number of countries though it would not have altered public sector net worth.

11. For some recent discussion of Ricardian equivalence, see Leiderman and Blejer (1988) and Barro (1988).

12. See OECD Economic Outlook 45, pp. 18-20.

13. The household saving ratios used here and in the following paragraphs are those derived from the System of National Accounts (SNA). These sometimes differ from national definitions. For the United States, for instance, measured household saving in SNA adds estate and gift taxes and saving by government employers in state and local government pension funds to the national definition of personal saving.

14. For example, depreciation is valued at historical cost in Japan and at replacement cost in the United States. In Canada, depreciation is estimated on an historical-cost basis except for housing, agriculture and government which are estimated on a replacement-cost basis.

15. Annex III of Dean et al. (1989) reviews a number of these issues and identifies different kinds of possible adjustments that would be necessary to derive measures of household saving ratios which would be more consistent across countries. Adjusted ratios are provided for the major seven countries, Finland and Sweden.

16. The adjustment for inflation is obtained by multiplying the current rate of inflation by the preceding period's stock of net monetary assets held by the household sector. The definition of net monetary assets includes bonds. Hill (1984) indicates that "while the price of long-term bonds may change significantly during any individual accounting period, over the long term they share the characteristics of monetary assets whose real value is continually eroded by inflation." See also Hibbert (1983) and Cukierman and Mortensen (1983). Changes in the private consumption deflator have been used to measure inflation.

17. The income usually associated with the saving decision in economic theory is the "economic" or "Hicksian" income which is defined as "the maximum value which a person can consume during a given period and still expect to be as well-off at the end of the period as he was at the beginning" (Hicks, 1946). See also Hill (1984).

18. For a survey on the determinants of saving, see Sturm (1983).

19. See, for example, Hayashi (1986), Horioka (1986) and Kawasaki (1990) for a discussion of such social and demographic effects on Japanese household saving ratios, and Kaufmann (1988) for Germany and the United States.

20. Tullio and Contesso's study covered Belgium, France, Germany, Japan, Sweden, the United Kingdom, Italy and the United States.

21. In the OECD's INTERLINK model, the consumption function for the major seven countries, apart from the United States (see next note), includes the inflation rate as an explanatory

variable. The inflation term proxies both inflation-induced wealth effects and the effect of the inflation adjustment discussed previously. The semi-elasticity of household saving ratios with respect to a 1 point increase in the inflation rate varies from 0.1 1 in France to 0.45 in Japan and Germany. See Richardson (1987).

22. There is a large body of literature on the effects of wealth on household saving and consumption. See, for instance, Simes and Horn (1986) and Holtham and Kato (1986). Numerous empirical studies have been conducted which include household net worth as a determinant of saving and many national models now include wealth variables in their equations for private consumption. The OECD's INTERLINK model has a wealth term in the U.S. consumption function with an elasticity of 0.05.

23. A recent Bank of France study shows that the inclusion of a credit variable improves the tracking performance of a standard consumption function in recent years (Banque de France, 1988).

24. In the years prior to the purchase of a house, for example, savings are being accumulated to meet deposit requirements. But in the years immediately after the purchase, interest payments, which are treated as a deduction in calculating disposable income, are normally much larger than principal repayments (which are treated as saving) so that saving is likely to be low. Assessing the effect on the saving ratio is complicated, however, by noting that disposable income falls because of the interest charge but increases because imputed income from home ownership is included as income. The imputed income is also treated as consumption, replacing rental payments which were recognised as consumption before the house was purchased. In order for the saving ratio to rise consumption would have to ***fall*** proportionately more than saving which is unlikely given the treatment of interest expenses and imputed rental income.

25. See Table 4 in Hagemann ***et al.*** (1987) which summarises simulation results of tax changes and also Kotlikoff (1984) and Borges (1986).

26. The deductibility of mortgage interest is the single most costly expense-related taxation relief in most countries. The situation in the United States, the United Kingdom, Australia, Finland, Norway and Sweden – all countries where tax reliefs significantly distort the housing market – is spelt out in more detail in note 32 of Dean ***et*** al. (1989).

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