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Microeconomics of Saving

Barbara Kauffmann*
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Summary

SUMMARY

In the past decade, saving in the industrial countries has been relatively low. The decline in funds available for financing investment needed to support growth and welfare improvement has raised much concern. One important source of low national saving has been the dissaving in the government sector in various countries. Private saving has also generally been lower in the 1980's than in the preceding decades. The contribution of business saving to this decline has been comparatively minor, whereas the fall in household saving has played an important role.

The paper analyzes the households' decision-making processes to accumulate wealth, discussing the role of various factors in determining the observed personal saving patterns in the largest industrial countries. It addresses the dependence of the households' saving rate on age and retirement conditions in the context of the life cycle model and the implication of demographic changes for the aggregate saving rate. The role of the return on savings is analyzed and how tax policy interferes with the saving decision. Finally, the impact of inflation, changes in wealth, and corporate saving is examined. In this context, the important role of uncertainty and liquidity constraints is pointed out.

A major conclusion of the paper is that households in a particular country or period should not be considered relatively impatient or less thrifty just because their observed overall saving rate is relatively low.

Microeconomic Aspects of Saving

1. Introduction

The past decade has been marked by relatively low national saving in the industrial countries. The net national saving rate in the OECD countries declined from an average of around 14 p.c. of GNP in the preceding two decades to roughly 9 p.c.; in the 1980's, the corresponding figures were 13.5 p.c. and 10 p.c. for the major seven industrial countries (Table 1). This relative decline in funds available for financing investment needed to support growth and welfare improvement has raised much concern. On the one hand, the declining supply of global funds is faced with a large demand for global savings - enhanced recently by the transition process in Central and Eastern Europe and in the Soviet Union. On the other hand, despite higher capital mobility there is still a link, even though it may be declining, between a country's saving and investment performance.[1]

One important cause of low national saving has been the dissaving of the government sector in various countries (Figure 1). Certainly most of the attention has been attracted by the US federal budget deficit which relative to GNP is lower than that of Canada and Italy but stands out in absolute terms and with respect to its impact on the world's capital market. This has led to the call for a reduction in budget deficits by many economists followed by declarations at the political level, e.g., at the latest Economic Summits of the G7. So far the consolidation process has been successful only in some countries. However, this seems more a problem of political feasibility than a lack of clarity about the necessary steps to be taken since they are, at least as far as the expenditure side is concerned, unambiguous.

Private saving has also generally been lower in the 1980's than in the preceding decades with the exception of Canada where it has been noticeably higher. The role of business saving in the general decline of private saving and hence national saving has been relatively minor compared to that of household saving. Not only do businesses provide a much smaller share (about one third) of net private saving than households, they also have increased their saving propensity in the course of the 1980's (despite a lower period average) as opposed to the downward movement of overall private saving until the late 1980's. Perhaps decisive is that households are the ultimate owners of businesses and hence do,

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[1] See Feldstein and Horioka (1980) and Feldstein and Bacchetta (1989) for empirical evidence and Santillán (1991) for a survey of the general discussion.

at least to a considerable extent, take into account the savings of businesses (of which they own shares) when deciding how much to save out of their disposable income.[2]

Thus, the other important cause of low national saving in the 1980's has been the decline in the saving rate of the household sector in many countries, after an increase during the 1960's and early 1970's (Figures 1 and 2)[3]. In particular, the US household saving rate has attracted considerable attention since it has declined from an already relatively low level. However, it has been shown that the difference in the household saving ratios between the US and other countries is reduced considerably if the data are corrected for statistical differences.[4] The causes and possible remedies for the generally low level of household saving in the past decade are far less clear than those for government saving. The saving rate of the household sector is the result of the behavior of a large number of individual household units which are influenced in their decision to accumulate capital by various factors. In order to understand the level and movement of a country's overall saving rate it is necessary to study the saving behavior of the household units.

Broadly speaking there are two main reasons why households save. The first, the long run, reason is the provision for the period after lifetime employment. People save in order to be able to maintain their consumption after they stop working and possibly to leave behind a bequest. The second reason for saving arises from uncertainty either due to exceptionally low income or high necessary expenditures (precautionary saving). The common element is the maximization of the (extended) household's expected life-time utility. When making their saving plans households are affected by various variables such as the age of household members, household wealth, and corporate saving, as well as by interest and inflation rates, tax and financial regulations.

The purpose of this paper is to analyze the households' decision-making processes to accumulate wealth and in particular, how they are influenced by these variables. Furthermore, it will be shown, drawing on the existing theoretical and empirical literature, which role such variables may have played in determining observed saving patterns of the household sector of various countries. Section 2 addresses

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[2]This issue is discussed further in Section 4.

[3] It should be noted that the saving rates are not corrected for the inflation effect that usually entails an overestimation of the actual saving of households and an underestimation of that of government and business sectors as discussed in Section 4.1.

[4] See Blades and Sturm (1982). Hayashi (1987) found that most of the difference between the US and the Japanese personal saving rates is a statistical illusion. Similarly, the US-German household savings gap can be reduced if statistical differences are taken into account (Kauffmann, 1990).

the dependence of the household's saving rate on age and on retirement conditions in the context of the life cycle model and the implication of demographic changes for the aggregate saving rate. The role of the return on savings and how tax policy interferes with the saving decision are discussed in Section 3. Finally, the impact of changes in wealth, corporate saving, inflation and income is analyzed in Section 4, as well as the role of uncertainty and liquidity constraints in this process.

2. Saving for Old Age

2.1. The life cycle hypothesis of saving

Saving is the household's decision to forego consumption at a particular moment in time to be able to consume at a future date. It is the result of the fact that households prefer a smooth consumption path, but are faced with an income stream which is not smooth - be it due to the sharp drop in income with retirement or to short-run fluctuations. The simple life cycle hypothesis of saving (assuming no bequest, no social security and no uncertainty) is a useful point of departure for analyzing this process with emphasis on the long run.[5] It starts from a typical household's income stream of low income at the beginning of the employment period, rising thereafter to drop sharply when retirement starts (in the simplest case, income is constant over the full employment span, zero thereafter). The decision of how much to save or to consume in each period is furthermore affected by the household's initial wealth, rate of time preference[6], and the prevailing market interest rate. According to the life cycle hypothesis, the saving pattern resulting from the household's attempt to maximize lifetime utility subject to its income stream is hump-shaped, rising from low levels in early years of economic life to high levels in later years and then falling to negative levels after retirement.

Positive **aggregate** personal saving rates (which are observed in most countries) are explained in the simplest case of no productivity growth and constant income by positive population growth that gives younger households with relatively high saving rates a higher weight than older households. If productivity growth is taken into account, one argument put forward has been that the combination of positive popula-

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[5] See Ando and Modigliani (1963). The closely related Permanent Income Hypothesis introduced by Friedman (1957) has been used more often to study short run fluctuations of income and consumption. For a brief discussion of the differences between the two models see Modigliani (1990).

[6] The rate of time preference is generally assumed to be positive. This is, e.g., confirmed by Lawrance (1991) who derived from a sample of 1513 US households a rate of time preference of 13 p.c. for the sample mean, with lower values for higher income and educational levels, and vice versa.

tion growth and income growth from one age cohort to the next explains positive aggregate household saving.[7] However, if intra-generation income growth is taken into account in addition to income growth from one generation to the next, the effect is no longer unambiguous; as the young household which takes this future income stream as given saves less in early years or even dissaves, the overall rate can easily be negative given positive population growth. Hence the additional assumption is needed that income profiles of a given generation are relatively flat which is not always true.

Another possible explanation for a positive overall saving rate is that people save not only for consumption at old age but also to leave a bequest.[8] In a growing economy the bequest left behind would be greater than that received and hence at any moment the overall saving for the bequest would be positive. Such a bequest term can quite easily be incorporated into the life cycle model.[9] It would at the same time help to explain why generally observed saving rates of retired people are, although lower than average, not negative as implied by the simple LCM.[10] Furthermore, it would provide one possible but barely sufficient explanation for the observation that young households save in a growing economy (even though less than average) despite an (expected) steep rise in future income.[11] Household surveys generally do not only confirm that saving rates are lower than average for old-age households and for very young households. They also reveal that the presence of children does tend to dampen the household's measured saving performance.[12]

2.2. Population structure

The primary usefulness of the simple life cycle model of saving, with or without bequest, is to explain how demographic factors affect the aggregate household saving rate. As the individual saving rates vary with age, the overall saving rate depends on the population structure. If, for example, the share of the older population is relatively low, this should have, ceteris paribus, a positive effect on the overall personal saving rate. If, and this is slightly more complicated, life expectancy increases such that retirement at a given age leads to a longer expected retirement period, the young household's effort to accumulate wealth

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[7] See Ando et al. (1991) for an extensive discussion of this point and Shibuya (1987).

[8] Cf. Kotlikoff (1988).

[9] See, for example, Evans (1983).

[10] Another explanation for the positive saving ratio of the old is that the time of death is uncertain. Cf. Mirer (1979).

[11] Other more powerful explanations are uncertainty about future income and liquidity constraints (see Section 4) and the desire to maintain flexibility for future decisions (Ando et al., 1991b).

[12] This is confirmed by Ando et al. (1991a) based on microdata on Japanese households .

is expected to increase the aggregate saving rate; once the generation with increased life expectancy reaches retirement age, there will be a higher share of people above a given age, and consequently a lower aggregate saving ratio. Widely used indicators for the population structure are dependency ratios. Table 2 shows the old age dependency ratios (ratio between population aged 65 years and older and that from 15 to 64 years) in the G7 countries for selected years between 1960 and 1989. All countries have experienced considerable aging of their populations which certainly had a dampening effect on saving. This development is expected to continue.[13]

Regarding the period average, it is possible to broadly group the data into those with relatively high dependency ratios (the four European countries) and those with relatively low ratios (Japan, Canada, and the United States), with Italy and the United States at less extreme positions. The dependency ratios in the four European countries increased strongly in the period from 1960 and 1975 and stabilized thereafter at high levels (only Italy's ratio kept increasing by the same amount); their 1989 ratios range from 21.1 p.c. in France to 23.9 p.c. in the United Kingdom. On the other hand, for the United States, Japan, and Canada, the first half of the period under consideration saw stable rates and strong increases in the second half. Particularly Japan's ratio, which started from a relatively low level, has increased by 5 percentage points since 1975 to 16.7 p.c. in 1989. Presently, Canada's old age dependency ratio is the lowest with 15.3 p.c.; the US ratio has reached 19.3 p.c.

Hence, as far as the share of the older population is concerned, the population structure of the three non-European countries, especially Japan and Canada, seems to have been more conducive to higher saving rates than that of the European countries considered here. However, after widening prior to 1975, the gap has diminished since then. That the share of the older population plays a role in explaining intercountry differences has been confirmed by Feldstein (1980) and Koskela and Virén (1983) among others.

A quite different picture is presented by the young age dependency ratios (the ratio between the population aged under 15 and that between 15 and 64) as shown in Table 3. They play a role because households with dependent children tend to save less. As a general trend all dependency ratios have declined considerably. The US and Canada, and also Japan for the average of the period considered, have the highest dependency ratios with strong declines by around 20 percentage points over time, whereas the European countries, especially Germany and Italy, are at the lower range with more

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[13] Shibuya (1987) found a dampening effect of aging, raising the share of the retired people, on Japan's saving rate. Using simulations he predicted a further decline of the Japanese household saving rate. Similarly, Auerbach et al. (1990), Auerbach and Kotlikoff (1991), and Cutler et al. (1990) project declines in US aggregate saving rates during the first decades of the 21st century.

moderate declines ranging from 6 percentage points (United Kingdom) to 12 percentage points (France and Italy).

It is likely that this dependency structure and its change has at least partly offset the effect of old age dependency and its increase over time. Furthermore, the international comparison indicates that the lower young age dependency ratios in the European countries are conducive to higher saving ratios there; but the gap has recently diminished, and for Japan it has almost disappeared. A confirmation of the importance of young age dependency ratios in explaining international household saving differences can, e.g., be found in Graham (1987).

2.3. Social security

A very important and at the same time complicated issue in this context is the effect of a social security system on household saving. Social security replaces at least partially individual retirement saving. It takes away a part of of the household's income, lowering its disposable income, and transfers a regular sum to the retired household, increasing its disposable income. With population and productivity growth the impact on the overall saving rate depends on how the social security system is funded.[14]

In a fully funded system where the government invests the contribution of taxing a generation to pay that generation's old-age benefits at a later date, the decline in personal saving of the younger (growing) generation caused by the social security tax is not fully matched by the lower dissaving (higher saving) of the older generation if people behave rationally. Hence with such a system we would expect a lower overall household saving rate than without it, but no change in the national saving rate since government saving should increase by the same amount. Furthermore, there would be no change in the consumption profile.

With the so-called pay-as-you-go system, the social security contributions raised from the working population are immediately redistributed to the older population. Its effect on aggregate saving depends crucially on the way people form their expectations about future benefits. If the young anticipate the same benefits which they would receive under the funded system, the fall in their saving will exactly match the lower dissaving of the old with no change in the overall rate of household saving. When the system is

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[14] In an economy without productivity and population growth, the life cycle hypothesis would predict no overall change of aggregate household saving. Saving ratios for younger households would be lower (both saving and income decline by the same amount, but the ratio declines), and the older households' saving ratios would rise (even if benefits are fully spent, the dissaving relative to a higher income becomes smaller).

introduced, aggregate consumption increases due to the positive wealth effect incurred by the old who benefit from the system without having contributed.

If, however, the young generation expects to gain from the social security system, anticipating the same relative benefits to lifetime income which the old generation currently receives,[15]
then it would - according to the life cycle hypothesis - reduce its saving by more than the amount deducted by social security taxes from its income. Hence, with a given retirement age, the introduction or expansion of the pay-as-you-go system would be expected to lower the aggregate household saving in a growing economy. This decline in aggregate household saving would not be compensated by a change in government saving, and the proportion of income devoted to consumption would increase permanently through the increase in lifetime wealth.[16] On the other hand, if households fully understand that this intergenerational redistribution will ultimately have to be financed and lead to higher taxes and if they altruistically take future generations' wellbeing into account as assumed for the Ricardian Equivalence Theorem, then neither the young nor the old may perceive a positive wealth effect. Instead, they will be induced to leave larger bequests such that aggregate saving remains unchanged.[17]

If, on the other hand the young generation perceives that it will not benefit from the social security system the way the currently old are benefiting since there will only be a relatively small number of people working to support an increasing number of old, they may start saving more than under a funded system.[18] In this context Tabellini (1991) and Auerbach and Kotlikoff (1991) have argued that a growing share of the old will be able to influence through the democratic process the level of benefits they will receive. However, as national economies become more and more interwoven and multinational corporations play a larger role, mobility is also likely to increase. It can therefore be argued that the generation who would then be forced to pay the extremely high taxes might decide to emigrate. Under these considerations it would not be optimal for the social security receivers who compete globally for the

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[15] I.e., there is a higher benefit than under the funded system made possible by the payments of future generations (with higher income).

[16] See Kotlikoff (1979) for a discussion on this subject.

[17] See Barro (1974), Carroll and Summers (1987), and Wilcox (1989) whose findings of consumption increases in the US in response to the rise in social security benefit payments cast doubt not only on the validity of the Ricardian Equivalence Theorem, but also on that of the Life Cycle Hypothesis.

[18] In view of the aging problem, several countries have started to run surpluses (transforming the former pay-as-you-go systems into partly funded systems). But despite these efforts there may still be a negative wealth effect embedded in the social security system for those currently young. On the other hand, there is the possibility of a major inflow of potential social security contributors, particularly from Eastern European countries and Soviet republics in the coming decade(s) which may partially compensate this effect.

young contributors to vote for a very high level without taking into account this possible emigration effect.

What has been omitted from the previous discussion is the effect that the social security system can have on retirement age. It is important for the determination of the overall effect of the system on household saving. The social security system may induce people to retire earlier than otherwise for two reasons. First, if social security benefits are not or only partly paid to older persons that continue working, this is an implicit tax on labor supply that will discourage many people from working after they become eligible for retirement. Second, the positive wealth effect inherent in the social security system causes people not only to want more consumption goods but also more leisure.[19] But the expansion of the retirement (leisure) requires a larger saving effort during this shortened period of employment. Since this retirement effect works in an opposite direction to the wealth effect discussed above, the overall impact of the social security system on saving is unclear from a theoretical point of view.

Social security payments have increased considerably relative to GDP since 1960 which cannot simply be explained by the fact that the share of the older population has increased (Table 4). This is particularly true for Japan, whose ratio of social security benefits to GDP, starting from a low 13.5 p.c. has doubled since then. Overall, with a given retirement age, the past improvement of relative retirement benefits would suggest, according to the life cycle hypothesis, a dampening of the saving ratio since it can be assumed that households have in the past expected a similar positive wealth effect as that observed for older people. However, Table 5 reveals that the improvement in social security benefits has moved in line with a decline in the labor force participation of the old,[20] making the overall effect difficult to determine.

The empirical evidence has been contradictory.[21] Numerous studies have found evidence that the social security system has depressed savings in the past (see, e.g., Feldstein (1974) for the US[22], Shibuya (1987) for Japan) and Feldstein (1980) for international data). On the other hand, there has been a considerable number of studies which found no such effect (e.g., Kotlikoff (1979) who did, however, find that social security tax contributions in the US have reduced private savings of the younger group in his

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[19] Assuming both are normal goods. In addition, the social security tax distorts the household's choice in favor of leisure.

[20] It probably has been partly caused by the increase in relative income of the old, but may also have been affected by increases in other forms of wealth which will be discussed later.

[21] See Dean et al. (1990).

[22] In his 1982 paper Feldstein obtains broadly similar results, but does point to the limitations of using time series data to study this "inherently dynamic process."

sample and Koskela and Virén (1983) who found indications that the induced retirement effect may have been at work).

To summarize, a household's savings propensity varies considerably with age as the household tries to accumulate assets to provide for retirement and therefore saves most when income is high. Forced retirement saving through the social security system alters the flow of income; in particular, it raises old-,age income. Therefore the perceived need to save personally in the pre-retirement period and to dissave during retirement is decreased since social security replaces part of the deliberate saving. It is likely that these two effects may have been at work in the industrial countries, where the population has aged and the social security system has expanded. However, their impact has been counterbalanced by the decline in young-age dependency ratios and a decrease in retirement age. Whereas the on-going aging of the population structure is expected to have a dampening effect on overall household saving rates, individual households will probably save more for a retirement period which may bring only relatively low benefits. The increase in the retirement age that should have a dampening effect on savings will probably be compensated by an increase in life expectancy which would increase savings.

3. The Return on Saving

3.1. The real interest rate

A crucial element in the household's intertemporal decision-making process is the real interest rate. It signals the extra consumption that can be afforded in the future per unit consumption given up at the present. How and in what direction the interest rate affects household saving has been a heavily debated issue.[23] Probably the main reason for this ongoing debate is that the answer to the question whether or not households respond to increases in interest rates by saving more (positive interest elasticity) has major implications for the impact of tax policies on the households' saving behavior and ultimately on the question whether changes in the tax policy could increase welfare.

The problem of determining the sign and size of the interest elasticity of saving arises from the fact that an interest rate change affects the household's saving process through different channels which, taken separately, lead to opposite reactions. An increase in the interest rate makes current consumption relatively more expensive inducing the household to postpone consumption ("substitution effect"). In addition, due to the higher interest rate the household's future labor income now is worth less in present terms, which should increase the household's saving effort ("human wealth effect," which is one particular

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[23] See, e.g., Boskin (1978), Summers (1981), and Evans (1983).

type of income effect).[24] On the other hand, the household now receives more interest income for the same amount of saving, allowing it to consume more in all future periods if it is a net creditor.[25] This direct "income effect" would induce higher consumption in the present as well as in all future periods, lowering current saving. Hence, in order for the household's overall saving reaction to an interest rate increase to be positive, it is necessary that the substitution and human wealth effects dominate the income effect. Clearly, the household's reaction to an interest rate rise depends on which stage of economic life the household is moving through.[26] For example, if the household had just reached retirement and was expecting no or only very negligible social security payments, intuitively it can be expected that the possibility of buying more in future periods due to the income effect may induce him to consume more today in response to an interest rate increase. There would be no or only a very small human wealth effect, and the substitution effect would most likely be dominated by the income effect. On the other hand, in the case of a young household, the human wealth effect is more important; given the long economic life ahead the gain to be made from saving to broaden the range of consumption paths may seem more worthwile.[27]

It should be kept in mind that the discussion of these effects is based on the assumption that the interest rate change observed is expected to be permanent. If uncertainty is taken into account, it is less likely that a risk-averse household would be induced by an interest rate increase to save less on the basis of increased future consumption possibilities which he may in fact never reach if the interest rate declines again because of the irreversibility of his choice for more current consumption today. The issue of uncertainty will be addressed below but it seems worth mentioning it here because it has an effect on the interest elasticity of saving that we expect to observe in reality.

Real interest rates have been considerably higher in the 1980's than in the previous two decades.[28] However, it would be wrong to jump to the conclusion that this observation, together with an unusually low

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[24] It should also increase the incentive to work.

[25] If it is a net debtor, saving should be increased. The household sector generally is a net creditor of the business and public sectors. In a closed economy the aggregate income effect may be unimportant if the households' ownership of businesses and their future tax payments are fully considered in the saving decision. However, as countries generally either are net debtors or creditors (see, e.g. Sinn, 1990), the income effect cannot be ignored.

[26] See also Evans on this point (1983).

[27] Summers (1981) pointed out in a footnote that the terminology of the "human wealth effect" might be somewhat misleading since it has this positive effect ("broadening the set of feasible consumption paths") in addition to the effect of "reducing the value of consumers' endowment in terms of first-period consumption.

[28] It is problematic to calculate the real interest rate correctly since it depends on expectations about future inflation rates and not actual values.

saving performance of households, does signify a negative interest elasticity. On the contrary, the evidence is quite mixed and more often indicates that the interest elasticity of saving is positive (cf. Smith, 1989). But there are considerable differences with respect to the estimated size of the interest elasticity of saving. While some, e.g., Boskin (1978), Summers (1981), and Tullio and Contesso (1986) find large positive effects, others as, e.g., Evans (1983) do not find any significant effect of interest rate changes on aggregate household saving.

3.2. Taxes[29]

Of the three types of taxation, consumption tax, wage tax, and capital income tax, only consumption tax - if it is linear - is completely neutral with respect to the savings rate; i.e., it does not distort the household's intertemporal decision. This indirect tax is raised when consumption takes place, but it does not burden future consumption any differently from current consumption. On the other hand, both wage and capital income taxes do influence the household's intertemporal saving decision. The wage tax extracts income only during the pre-retirement period and therefore shifts the household's saving activity backwards, leading to lower saving rates in earlier years. The tax on interest income drives a wedge between the household's intertemporal substitution in consumption and the firm's intertemporal substitution in production.[30] With positive interest elasticity, a tax on interest income induces the household to save less than without the tax. The firms then have to pay higher (before tax) interest rates in order to induce households to increase their saving, ultimately leading to a situation where less is saved and invested and consequently per capita income is lower than without the tax (or with the consumption tax).[31]

The different implications for saving and welfare of income-based as compared to expenditure-based taxes have been pointed out by Summers (1981), Kotlikoff (1984), Smith (1989), and many others and have led to a call for a move in the direction of expenditure-based taxation.[32]

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[29] For a more detailed discussion of this subject see Owen's contribution in this book.

[30] See Bovenberg et al. (1989); this paper also addresses the effects of different treatment of income earned by residents and non-residents in the US and Japan.

[31] Apart from the direct effect of taxation on household saving, there is also the indirect effect via business saving. Higher corporate tax rates dampen after-tax business profits and hence the dividend payments received by households. Furthermore, as Poterba (1987) shows, higher dividend tax rates tend to lower the payout to households and to increase corporate saving (from which households ultimately benefit as well).

[32] Of course, it is recognized that the consumption tax is more regressive than a progressive income tax and may therefore be rejected on equity grounds. Furthermore, it does distort the decision between leisure and consumption, taxing the latter heavily, but not the former.

In considering how the households' saving process is distorted in different countries one first measure one might look at is the marginal income tax rate. This could lead to the conclusion that savings is much less discouraged in the United States and Canada, with maximum marginal tax rates around 30 p.c. than in most European countries, where rates range from a "low" 40 p.c. in the United Kingdom to 60 p.c. in Italy. However, there are reasons to believe that this does not characterize the situation correctly. If the ratio of direct to indirect taxes is compared, the United States and Canada have, together with Japan and Italy, relatively high ratios (Table 6).[33] This ratio has been very similar in the United States and Japan in the eighties, with relatively high 1.7 and 1.6, respectively, followed by Italy which has seen a continuous rise in direct taxes as a share of GNP, with Canada as well as Germany, the United Kingdom, and France at the lower end. It is likely that the Canadian ratio will drop in response to the introduction of the value-added tax at the beginning of 1991; similarly, the increases in consumption tax in 1990 in Japan and in various excise taxes in the United States may have contributed to a lower ratio.[34]

Important in this context is the interaction between taxation and inflation. The reduction in real wealth caused by inflation is compensated for, as far as it is expected, by higher nominal interest rates. Since these interest payments generally are counted fully as income, the effective taxation of the amount actually saved is increased. First, the part that compensates only for income losses is taxed as well as the real return on saving. Secondly, the progressiveness of the tax system may imply a higher marginal and average tax rate if the tax system is not fully indexed as is usually the case. Thus, in combination with a tax system, especially if it is progressive, inflation causes the effective real rate of interest to decline (which is usually only partially compensated for by an increase in the rate paid by the investor). These effects may discourage savings (in inflation-adjusted terms) in countries with relatively high inflation such as Italy and the United States.[35]

If we focus on the capital income tax which is the type of income tax that, given a positive interest elasticity of saving, discourages saving most, the picture changes even more. Besides the official income tax rates, the issue of how tax collection is actually insured and whether there are exemptions or deductions play an important role. In Germany, for instance, where this has been the subject of a recent ruling of the German Constitutional Court,[36] presently there is neither a source tax[37] nor reporting of

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[33] Certainly it is not possible to decide on this basis alone as to whether one tax system is more distorting than another since it does not take into account the tax incidence as can be seen from the shares in GDP.

[34] For a list of such increases in the United States, see, e.g. the SII Report (1991).

[35] There are other effects of inflation on saving which will be discussed later.

[36] Urteil des Zweiten Senats des Bundesverfassungsgerichts vom 27. Juni 1991.

banks to the revenue offices.[38] In most of the other countries including the other six of the G7 countries there are measures that ensure tax collection (Table 7). Japan, the United Kingdom, and Italy have source taxes varying from 20 p.c. (Japan) to 30 p.c. (Italy) for deposits, whereas in the United States, Canada, and France, banks are obliged to report on capital income to ensure tax compliance. For dividends the conditions are about the same, but in this case there is also a source tax of 25 p.c. in Germany.

Of course, it is not suggested here that the measures taken in the countries are able to prevent tax evasion altogether. It is well known that banking accounts in countries where capital income is neither taxed nor reported, e.g., Luxembourg, are quite common. So the explanatory power of the difference in effective rates of taxation and possibilities for evasion among countries should not be overestimated. But it is quite possible that the lack of tight control on capital income taxation in some countries such as Germany may have distorted less against the saving process than in other countries.

3.3. Tax exemptions and saving incentives

Governments have created a variety of tax exemptions with the goal of promoting domestic savings. The understanding that this will have the desired effect rests, of course, on the presumption that the interest elasticity of saving is indeed positive. Interest income from certain government bonds are very commonly exempted.[39] In addition, there has been a tradition in some countries, including Japan and France to exempt income earned on personal saving accounts. This has been particularly important in Japan where about 70 p.c. of interest income earned on personal saving was exempt until the tax reform of 1988.[40] It had the effect that the average tax rate paid on this type of income was below 10 p.c. in the 1980's (Bovenberg et al., 1989). The comparable average ratios for the same years were much higher in the United States, ranging from 28.5 p.c. in 1980 to 22.4 p.c. in 1987.

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[37] A 10 p.c. source tax was introduced in 1990 and abolished only six months later due to massive capital flight.

[38] On the contrary, the banking law of 1979 does specifically ask local tax authorities to respect the "relation of trust" between banks and customers. As a result of the legal situation which has to be changed by January 1, 1993 practically only those who declare their capital income have to pay taxes since those cases where nothing is delared are extremely unlikely to be investigated. According to the Court, no more than half of the taxable capital income is declared in Germany which is based on estimates of the German authorities. The Bundesrechnungshof (General Accounting Office) even found during its examinations (of a very limited number of households) that the quota of declaration varied between 3.7 p.c. and 47.7 p.c. from one revenue office to the other. In reaction to the ruling there is now a proposal to introduce a 25 p.c. source tax for residents and to revise upwards substantially the exemption levels.

[39] Byrne's (1979) list of countries with such a custom included all countries currently belonging to the G7.

[40] Since 1988, most income in Japanese savings accounts is subjected to a 20 p.c. source tax (cf. Hayashi et al., 1988).

Two forms of saving are often treated very generously. One is saving explicitly tied to the provision for retirement (private pension plans or special accounts), the other is saving for and in the form of private housing. Such preferential treatment may merely cause the households to shift assets into those forms that benefit from such measures without increasing the households' overall saving propensity. Undoubtedly there will be such a shift. But there is also evidence that these incentives may well have a positive overall impact on the households' saving activity, as, e.g., in Carroll and Summers (1987) who examined the difference in saving rates between the United States and Canada.[41] The US and Canadian saving rates were very similar until the early seventies when they started to diverge. One of the factors Carroll and Summers identified as contributing to these divergences is the treatment of retirement saving which became increasingly more generous in Canada, as compared to the United States, through various increases in the ceilings of tax-sheltered contributions to pension plans (employer-sponsored Registered Pension Plans and individual Registered Retirement Savings Plans).[42] In the United States, there have also been sheltered saving opportunities (Individual Retirement Accounts (IRA's) and Keogh plans), but they were much more limited.[43] In his FY 1992 budget proposal, the President proposed enhancing IRA's again as well as creating so-called Family Savings Accounts.[44]

In the context of housing it is again not the United States that has the most generous treatment of saving. In some countries, e.g., Germany and France, there are bonus and deduction schemes for saving that is tied to housing construction or purchase, thus prior to the acquisition of a house; in Germany, where various programs were started after WWII to cultivate household wealth and home ownership, they have been slowly cut back.[45] Once a house has been purchased, this asset generally receives preferential treatment relative to other forms of wealth because neither the implicit rental income nor the capital gains from an increase in the value are taxed.[46]

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[41] This is a particularly good case for comparison since the two countries have much in common not only geographically and institutionally but also demographically.

[42] In addition, a $1000 deduction of investment income was introduced in 1974.

[43] For example, the IRA's were first restricted to a small number of people, then extended to all taxpayers in 1981, and subsequently capped in 1986.

[44] See Annual Report on the U.S.-Japan Working Group on the Structural Impediments Initiative (1991).

[45] In 1975, government bonuses were restricted to medium and low-income earners; cf. Kauffmann (1990).

[46] In addition , it is common that the real estate property is largely undervalued when an inheritance asset is estimated.

Another measure that certainly does induce the shift of assets into housing is the deductibility of mortgage interest payments which is possible in all G7 countries except for Canada.[47] This is an especially beneficial scheme for households in those countries where tax rates and/or inflation and hence nominal interest rates are high. It may, however, dampen the household's overall savings propensity mainly in cases where it is possible to use some of the mortgage credits for consumption purchases. The extreme case of explicitly deducting interest payments for consumption goods which was until recently the practice in the United States certainly had a dampening effect on the consumer's saving propensity.

To conclude, apart from social security, various other government policies influence the households's saving process. How important this impact is depends to a large extent on the interest elasticity of saving. If it is, as suggested by some studies, significantly positive, then taxes discourage the households from saving the amount that would be optimal for the economy as a whole. Although the marginal tax rates are relatively low in the United States as compared to other countries, a closer examination of generous exemption schemes, e.g., in Japan and Canada, and looser enforcement of tax collection, e.g., in Germany, indicate that the effective taxation of capital income in the United States may have been higher than in other countries, particularly if the interaction between taxation and inflation is taken into account.

It may be a coincidence that countries with relatively high saving rates such as Japan and Germany either have little control of tax collection or generous tax exemption rules. For instance, it has been argued that those countries which have a "tradition of saving," are those which are most likely to use saving incentives; this would lead to the conclusion that the observed coincidence of generous tax treatment and a high saving ratio would not prove any positive effect from those measures. But the experience in the United States and Canada seems to indicate that tax deductions and saving incentives can make a difference.

4. Changes in Wealth and Income

4.1. Inflation

The impact of inflation on household saving is ambiguous since the process involves various short-run as well as the long-run channels which have opposite effects. One effect which has already been mentioned is more of a measurement problem than a real impact on the households' behavior of

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[47] As pointed out by Dean et al. (1990), in terms of efficiency it would make sense if interest payments were tax deductible as long as the income on housing investment were taxed. But as they are not it is likely that the various measures lead to a distortion of investment in favor of housing and at the expense of business.

accumulating assets: If inflation is anticipated, the erosion of wealth that it causes is compensated for by a corresponding inflation premium on the real interest rate. The household who accumulates wealth will consider this part of interest payments as a necessary contribution to keeping his real wealth constant and will only count the remaining part to his actual saving.[48] Measured saving, on the other hand, does include these inflation-premium payments. Therefore it generally (for years with positive inflation) overstates the real saving activity of the household sector which is a net creditor. It understates at the same time the actual saving of the business and government sectors that tend to be net debtors.[49] The difference between actual and measured saving is, of course, particularly high in periods and countries of high inflation.

During the 1970's when the two oil shocks drove up inflation rates (Figure 3), the measured saving rates overstated the actual saving activity of households markedly while understating actual business saving. Consequently, the actual fall in household saving during the early 1980's when inflation declined was less pronounced than indicated by measured saving rates. However, Dean et al. (1990) who compared the original to adjusted saving rates found that the inflation adjustment does not generally change the fact that saving was higher in the 1970's and neither does it affect the position of saving rates in the 1980's as compared to the 1960's.

A related and already mentioned channel through which expected inflation affects saving is the interaction between the tax system and inflation. It leads to a lower effective rate of return because the "compensation payments" discussed above are counted as taxable income; assuming a positive interest elasticity of saving, the household's saving rate declines.

As for unanticipated inflation, there are several channels that may play a role in the shorter run. When inflation is unexpected, compensation for the erosion of wealth does not take place and the real return on wealth declines (at first). This has the various effects (substitution, human wealth, income) discussed above in connection with real interest rate changes. In addition, the household may be induced to shift from financial wealth into real assets which are now relatively more attractive. Since these real assets include consumer durables which are part of the consumption measure despite the fact that they are not

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[48] Von Ungern-Sternberg (1981) showed in an empirical study for Germany and the United Kingdom that households do indeed behave as if they would not consider the compensation for wealth erosion through inflation as part of their income.

[49] Modigliani (1990) found an underestimation of government saving (corresponding broadly to the same overestimation of private saving) in the order of half a percentage point in the 1960's and 2 percentage points in the 1970's and 1980's for the average of the 21 OECD countries. See also Elmeskov et al. (1991) and Barro (1974) on this issue.

fully consumed during the current period, the saving rate declines.[50] Furthermore, two opposite effects of money illusion are conceivable: First, if households mistakenly perceive income growth at least partly as real income growth (although it is not), then they may decide to increase real consumption which will lower their saving rate (Branson and Klevorick, 1968). Second, if households mistakenly take observed price increases for increases in relative prices, they may buy less consumption goods than under perfect information (Deaton, 1977).

The empirical evidence on the saving-inflation link is mixed.[51] When the "compensation effect" is captured by a "real wealth variable", the estimated sign and significance of the remaining effect of inflation on saving varies considerably from study to study. Whereas a negative sign is generally taken as a reasonable result, those authors who find a positive sign most often attribute it to the fact that inflation is positively correlated with uncertainty and that higher uncertainty causes higher saving (see discussion below). In that case the lower inflation of the 1980's (if it is separated from the related decline in uncertainty) may well have been a factor encouraging households to save more than in the previous decade.

4.2. Increases in current wealth

The life cycle and permanent income hypotheses predict that with given expected income an increase in current real wealth decreases the share of current disposable income saved since it renders possible a higher lifetime consumption level. Conventional income and saving measures do not include revaluations of real wealth. Therefore measured saving rates decline when households incur a positive wealth effect and raise current consumption accordingly. For example, an increase in the real value of housing, which is an important form of household wealth, may decrease the saving propensity of those, mostly older, households who own a house. Clearly, the households can now afford a higher level of lifetime consumption despite the fact that their labor income streams are unchanged. Those households who neither own nor want to buy a house may save more to finance the rent payment or they may opt for a smaller apartment or house and maintain their saving rate.

The impact on the savings behavior of a young household which does not yet own a house but has purchasing plans is less straight forward. If we assume that it expects to derive some utility from living in its own house, the household may increase savings in order to still be able to purchase it. This is the so-

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[50] The former effect depends on a positive elasticity of saving.

[51] Cf. Sturm (1983) and Koskela and Virén (1985).

called target saving argument. However, this argument fails to consider that the choice for owner-occupied housing is price elastic, with higher prices likely to discourage the choice for housing purchase.[52]

Although the implication for the young households' saving behavior is not clear a priori, it is likely that the overall effect of the increase in the real value of housing is negative.[53] However, the reaction of savings to an increase in housing wealth should be less pronounced than that caused by increases in most other sources of wealth since it is related to higher rent payments (consumption expenditures) and may also not be sold as easily at the end of life as other forms of wealth.[54]

Household wealth and particularly housing wealth increased considerably in the 1980's. Wealth increases were exceptionally high in Japan where housing and land prices have skyrocketted; increases in housing wealth were also considerable in the United Kingdom and Canada.[55] It seems therefore likely that this increase in housing wealth dampened household savings, particularly in Japan, and possibly also in other countries. Similarly, during the 1980's, stock prices rose rapidly until 1987, and especially so in Japan. This long-run movement certainly stimulated consumption during the 1980's. In the short run, on the other hand, consumption generally reacts only partially to stock price increases since they will - given their high variance - at first be considered mostly temporary. This is probably the reason why the stock market crash in 1987 did not dampen private consumption as much as was generally expected.

4.3. Corporate saving

The ownership of business assets is a particular form of household wealth. It gives rise to current and future income streams from the business to the household sector. This link between both sectors of the economy makes it impossible to explain corporate and household saving independently of each other.

A part of the relation between the two savings ratios is more of a measurent problem mentioned earlier than a structural link: Since the household is a net creditor of the business sector (including the financial

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[52] Yoshikawa and Ohtake (1989) found in a study of Japanese households that the decision not to buy property induced by an increase in land prices was strong enough to turn a positive (land-) price elasticity of saving into a negative one.

[53] If there is a bequest motive, one might expect that the savings rate declines less given the expectation that children will be affected negatively by higher housing prices either through higher rents or through higher purchasing prices. But it is not likely that this will fully compensate for the drop in savings induced by the wealth effect.

[54] See Thaler (1990) for a discussion of the fungibility of wealth.

[55] In Japan, the ratio of net wealth (including housing and land) to income rose from 5.0 in 1975 to 7.8 in 1987. The corresponding figures for the United States, Canada, and the United Kindom stayed roughly between 4 and 5 (Dean et al., 1990).

sector), it is compensated for the erosion of its net wealth position if inflation is positive and expected. This inflation premium is counted in the statistics as income and saving (if it is reinvested to keep real net wealth constant) and leads to an overprediction of actual household saving and an underprediction of actual business saving. The effect is that with changing inflation both sectors' saving rates move in opposite directions.[56]

Much more interesting is the structural relation between the two sectors' saving rates. The discussion has mainly centered around the question: "To what extent do households pierce through the corporate veil?" Shareholders receive a part of their current income in form of dividends from the firms that are left with "retained after-tax profits" to invest. As these investments produce future income flows, a household who completely "pierces the veil" takes business saving fully into account in its lifetime consumption strategy. In particular, with perfect capital markets it displays the same consumption behavior whether or not business profits are distributed. This can also cause corporate and household saving rates to move in opposite directions. With given profits, higher dividend payments would lower business saving, causing the household's measured income to decline. Since the household would perceive the compensating increase in future income (indicated by capital gains which are not included in the measured current income), its consumption should remain unchanged even though its measured saving rate would decline.

That household and business sector saving rates move in opposite directions resulting in a relatively stable private saving rate was first observed by Denison (1958) and since then confirmed by many others.[57] However, some studies such as Poterba (1987) found that household saving offsets movements in the corporate saving rate only partially; this implies that tax policy affecting the firm's payout decision has an impact on the private saving rate.

Corporate saving has been relatively low in the 1970's which resulted from several factors including lower profit shares and higher inflation and interest rates as a result of the oil price shocks. During the 1980's, measured corporate saving has picked up again as profit shares increased and inflation declined. However, the households have had more liquid financial means available for consumption during the past decade than the dividend payments included in measured disposable personal income may suggest. Share repurchases spurred by takeover threats and tax considerations as well as leveraged buyouts (both affecting neither measured personal income nor saving) have played an important role. For instance,

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[56] For a detailed study of this relationship in the United States see Poterba (1987).

[57] For example, David and Scadding (1974).

Summers and Carroll (1987) found that corporate repurchases and takeovers may have lowered the US private saving rate by 1 to 2 percentage points.

4.4. Uncertainty and short-run movements in income

Most life cycle/permanent income models of saving are based on the assumption that the present value of lifetime wealth is given since it is assumed that either future income flows are certain or that the individual behaves as if the expected value of future income were indeed a certain income (certainty equivalence). In reality, uncertainty is one of the major problems the household faces. Uncertainty about the time of death which causes the individual to save more and to leave a higher bequest than under certainty is only one aspect. There are other, mostly shorter run, aspects of uncertainty which can have a major impact on the household's saving strategy, changing the long-run profile of wealth accumulation and the reactions to fluctuations in income.

Looking first at the individual's lifetime saving profile, uncertainty causes a typical risk-averse household[58] to save more at young age and less at old age than under certainty equivalence (Caballero, 1990). The household derives a higher disutility from the risk of having to decrease future consumption in response to a lower-than-expected income than the utility associated with the (same) probability of being able to increase future consumption in response to a corresponding lower-than-expected income. To diminish the potential impact of such a low income on future consumption, the household is willing to forego some of its current consumtion (which it would not do if future income were certain). If income is realized as expected, the household will stick to its original saving plan, which will allow it after a lower consumption level in earlier periods to consume more in later periods than under certainty equivalence. Otherwise, the household can readjust its savings strategy every time when income (or necessary consumption) is different from what it had been previously expected. Overall, this "prudent" behavior of a typical household faced with income uncertainty is one explanation why very young households do have positive saving ratios despite their high expected income and consequently helps also to explain a positive aggregate household saving rate in a growing population.

A consequence of this relation between uncertainty and the household's intertemporal choice is that an increase in uncertainty will induce a prudent household to accumulate more wealth, whereas a decrease will lower his saving rate. For example, it is likely that such forces were at work during the 1970's when the world economy was hit by major up- and downswings following expansive economic policies and the

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[58] Assuming a time-separable utility function with non-increasing absolute risk aversion.

two oil crises. The households perceived the higher possibility of being unemployed or suffering a cut in real income through high inflation and may have tried to form a buffer against possible income losses.

As the 1980's brought a long expansion which was only recently interrupted by recessions in the Anglo-Saxon countries, the perceived income risk declined and consequently the perceived need for precautionary savings did too. This may be one important explanation for the decline in household saving during the greater part of the 1980's (and the recent pickup). As pointed out earlier, the movement in inflation rates coincided with the change in uncertainty and may therefore mistakenly have been identified as a factor with a positive impact on household saving (besides the real wealth effect). Other longer-run factors that may have contributed to a decline in uncertainty are the expansion of the social security net, which has made the loss of income through unemployment less dramatic, and the evolution of various insurance schemes. Finally, it is also conceivable that the entrance of women into working life which can be seen from Table 8 may have dampened the households' perceived uncertainty.[59]

Uncertainty may also help to shed some light onto observed responses to short-run income changes. For example, the life cycle/permanent income theories predict that the household's consumption pattern will be smooth at the moment of a sudden and previously announced increase in income; i.e., the household's savings rate would increase in response to such a change but consumption would not since the increase in consumption is predicted to take place at the moment of the announcement. However, as shown by Flavin (1981) and Wilcox (1989), consumers do react quite strongly to announced increases in current income with increases in consumption ("excess sensitivity of consumption"). Furthermore, consumers respond less to unannounced changes in labor income than under the certainty equivalence ("excess smoothness of consumption"). Caballero (1990) has shown that if specific assumptions are made about the form of the utility function, uncertainty and prudent behavior can explain both these interrelated phenomena. In the longer run saving is not affected by these phenomena.

4.5. Liquidity constraints

Another possible explanation for the excess smoothness and sensitivity of consumption as well as positive overall savings is the presence of liquidity constraints. The typical model of the consumer's utility maximization subject to a lifetime budget constraint is based on the assumption that capital markets are perfect. This implies that a household cannot only borrow against currently held assets such as housing

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[59] Whether or not this effect induces a decrease in saving depends on whether it offsets effects such as the generally observed increasing propensity to save at a higher income or a possible motive for joining the labor force which may have been to earn income for a housing purchase. It may be strenghened by higher purchases of durable goods or services, e.g. in connection with child care. Graham (1987) found evidence that increased labor force participation of women lowers the saving rate.

or stocks, but that it is also able to borrow against expected future lifetime income. This leads to the model prediction that a household with no current assets and a low current income but with high expected future labor income will be a net borrower in early years. In reality, however, capital markets are far from perfect and there are borrowing constraints that prevent the household from borrowing as much as would be optimal. As a result, current wealth plays a much more important role for the young household's consumption level than would be implied by the standard models without a liquidity constraint. Evidence for such an effect for a considerable number of households has generally been found by Zeldes (1989), Koskela and Virén (1984), and Ogawa (1990).

Whereas borrowing constraints may have played an important role in the past by preventing very young households from being net borrowers and inducing them consequently to expand consumption in response to income increases more than would be warranted without such a constraint, developments in financial markets are likely to have led to a decrease in the importance of this factor. New financial instruments have been created and constraints have been reduced. An important development in this area is the reduction of the percentage downpayment that is needed for the purchase of a house. Similarly, car makers, e.g., have developed their own credit instruments. This, together with the rapid expansion of credit card use may have contributed to lowering the credit constraint in recent years. This factor may have also dampened household saving during the last decade. However, it certainly also had the beneficial effect of enabling households to choose a consumption and savings path which is closer to their optimum and at a lower cost of financial intermediation.

5. Conclusion

Saving remains a complicated and only partly understood issue even after decades of intensive and excellent research. A major difficulty is that saving is a forward-looking activity and that it involves the households' formation of expectations about future developments in an uncertain future. It is not only future income from labor and capital that has to be anticipated or the expected lifetime of the household members. Other important parameters include the population growth, the implied social security benefits, and the future taxes.

The saving rate and especially that of households in each country is the result of a multitude of factors ranging from demographic characteristics to those influencing individual households in different ways. The simple life cycle model is useful for explaining the long-run impact of changes in the population structure on the saving propensity of the household sector as a whole. In the past, the population has aged in industrial countries and this has, taken separately, dampened saving behavior. As this aging process continues, saving of the overall household sector can be expected to be depressed further. The individual household is influenced by expectations about future income, including retirement benefits and corporate profits, and their uncertainty, as well as by inflation, taxation, and incentive schemes which change the expected flow of income and therefore affect his saving decisions. This paper discussed some of these channels that affect a household's saving behavior and may have been relevant for the determination of the overall housing rates observed. It should be clear from the above discussion that it would be wrong to jump to the conclusion that households in a particular country or period are relatively impatient or less thrifty just because their observed overall saving rate is relatively low.

Tables and Graphs

Table 1 National saving ratios (1)

1960-69	USA	Japan	Germany	France	Italy	UK	Canada
Gross	19.7	34.8	27.3	25.6	28.3	18.8	21.9
Net	10.7	25.5	19.8	18.0	19.9	11.3	11.5

1970-79	USA	Japan	Germany	France	Italy	UK	Canada
Gross	19.6	35.6	24.4	25.9	26.0	18.8	22.6
Net	9.2	25.6	15.2	17.1	16.3	9.2	13.0

1980-89	USA	Japan	Germany	France	Italy	UK	Canada
Gross	16.2	32.4	22.9	20.3	21.6	16.6	20.2
Net	3.8	21.6	12.0	8.9	10.8	5.6	9.6

(1) As percent of GDP and NDP, respectively
Source: EUROSTAT

Table 2 Old age dependency ratios (1)

	USA	Japan	Germany	France	Italy	UK	Canada
1960	15.5	9.5	16.0	18.8	13.3	17.9	12.9
1965	15.8	9.2	18.3	19.4	14.7	18.9	13.0
1970	15.8	10.2	20.7	20.7	15.8	20.7	12.9
1975	16.3	11.6	22.6	21.5	17.6	22.4	13.1
1980	17.1	13.4	23.4	21.9	19.3	23.3	14.1
1985	18.0	15.0	21.2	19.7	18.6	23.0	15.3
1989	18.9	16.6	22.0	21.1	21.4	23.9	16.7
2005(2)	18.0	26.0	29.0	24.0	25.0	22.0	19.0
2025(2)	29.0	32.0	37.0	33.0	32.0	28.0	34.0

(1) Population aged 65 and over, divided by population aged between 15 and 64.
(2) OECD projections.
Source: OECD, Labour force statistics, EUROSTAT
                IMF, World Economic Outlook, May 1991.

Table 3 Young age dependency ratios(1)

	USA	Japan	Germany	France	Italy	UK	Canada
1960	52.0	47.1	31.5	42.5	34.6	35.8	57.5
1965	50.8	37.8	34.5	41.1	34.4	36.3	56.6
1970	45.6	34.7	36.4	39.9	34.5	38.3	49.1
1975	39.1	35.8	33.5	38.2	34.6	37.3	40.7
1980	34.0	35.0	27.4	35.1	30.7	32.8	34.0
1985	32.7	31.7	21.6	32.2	25.3	29.3	31.8
1989	32.9	27.4	21.5	30.4	22.1	28.9	31.0
2005(2)	29.0	28.0	22.0	28.0	25.0	31.0	27.0
2025(2)	30.0	27.0	23.0	28.0	24.0	31.0	28.0

(1) Population aged 65 and over, divided by population aged between 15 and 64.
(2) OECD projections.
Source: OECD, Labour force statistics, EUROSTAT
        IMF, World Economic Outlook, May 1991.

Table 4 Social security transfers
(as percentage of GDP)

	USA	Japan	Germany	France	Italy	UK	Canada
1960	5.0	3.8	12.0	13.5	9.8	6.8	7.9
1965	5.2	4.7	12.4	16.4	12.5	7.5	6.0
1970	7.5	4.6	12.7	14.8	12.4	8.7	7.9
1975	11.1	7.7	17.6	17.4	15.6	10.2	10.0
1980	10.9	10.1	16.5	19.2	14.1	11.7	9.9
1985	11.0	11.0	16.2	22.1	17.1	14.0	12.2
1989	10.3	11.1	15.6	21.4	17.7	11.9	11.8

Source: OECD, Historical statistics.

Table 5 Old age participation ratios (1)

	USA	Japan	Germany	France	Italy	UK	Canada
1965	16.9	36.8	14.1	17.8	10.7	13.0	15.5
1970	16.0	31.7	11.1	12.8	7.1	11.6	12.9
1975	13.1	27.9	6.9	9.0	5.7	10.0	10.9
1980	11.9	26.3	4.5	4.9	7.5	6.2	8.9
1985	10.2	24.3	3.3	3.4	4.8	5.0	7.7
1989	10.9	23.8	2.7	2.4	4.3	5.7	6.9

(1) Working population aged 65 and over, divided by total population aged 65 and over.
Source: OECD, Labour force statistics, EUROSTAT

Table 6 Taxes as percent of GNP

A. Dir. tax

	USA	Japan	Germany	France	Italy	UK	Canada
1970-79	13.3	9.3	12.3	7.3	6.5	14.0	14.9
1980-89	13.3	12.8	12.2	9.0	12.6	13.9	15.6

B. Indir. tax

	USA	Japan	Germany	France	Italy	UK	Canada
1970-79	8.4	6.9	13.0	14.3	9.1	14.1	13.1
1980-89	7.7	7.8	12.6	14.6	9.6	16.2	12.7

C. (A)/(B)

	USA	Japan	Germany	France	Italy	UK	Canada
1970-79	1.6	1.3	0.9	0.5	0.7	1.0	1.1
1980-89	1.7	1.6	1.0	0.6	1.3	0.9	1.2

Source: EC-Commission, internal publication;
                  Bank of Canada.

Table 7 Measures to ensure tax collection on capital income:
Source taxes (in percent) and control messages (R)

Interest income on savings accounts

USA	Japan	Germany	France	Italy	UK	Canada
R	20	-	R	30	23.25	R

Interest income on bonds

USA	Japan	Germany	France	Italy	UK	Canada
R	20	-	R	12.5	25	R

Dividend income

USA	Japan	Germany	France	Italy	UK	Canada
R	20	25	R	10	-	R

Source:　　　Drucksache Nr. 11/2599 des Deutschen Bundestags.

Table 8 Participation of women (1)

	USA	Japan	Germany	France	Italy	UK	Canada
1965	45.7	55.8	48.8	45.7	31.0	50.0	35.3
1970	50.4	55.4	48.1	49.8	29.1	53.5	41.1
1975	54.9	51.7	49.7	52.9	29.9	58.6	50.5
1980	61.3	54.9	50.0	55.6	39.2	61.7	57.9
1985	65.5	57.2	50.3	56.4	40.6	62.6	63.5
1989	69.4	59.3	54.7	57.6	44.0	66.0	68.2

(1) Share of women at work.
Source:　　　OECD, Labour force statistics.

Fig. 1 - Net saving in the G-7 countries
(as a percentage of national income)

Public sector [1]

Households

Business sector [2]

USA   Japan   Germany France   UK   Italy   Canada
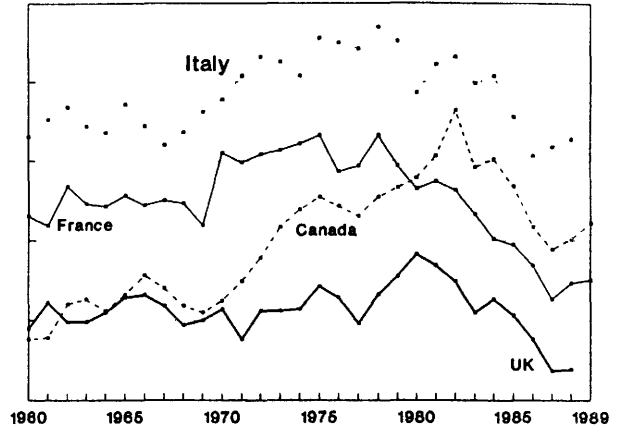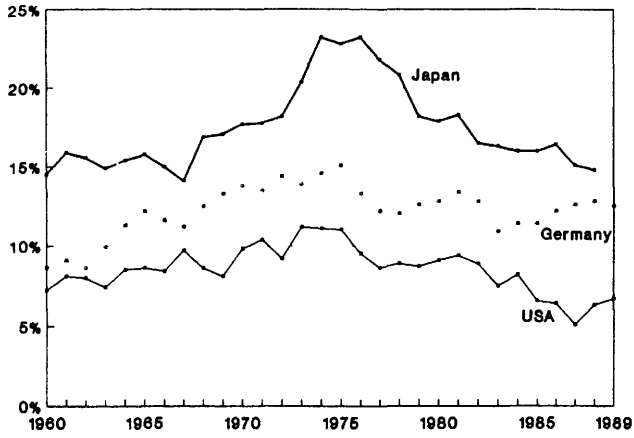
■ 60-69   ▨ 70-79   ☐ 80-89
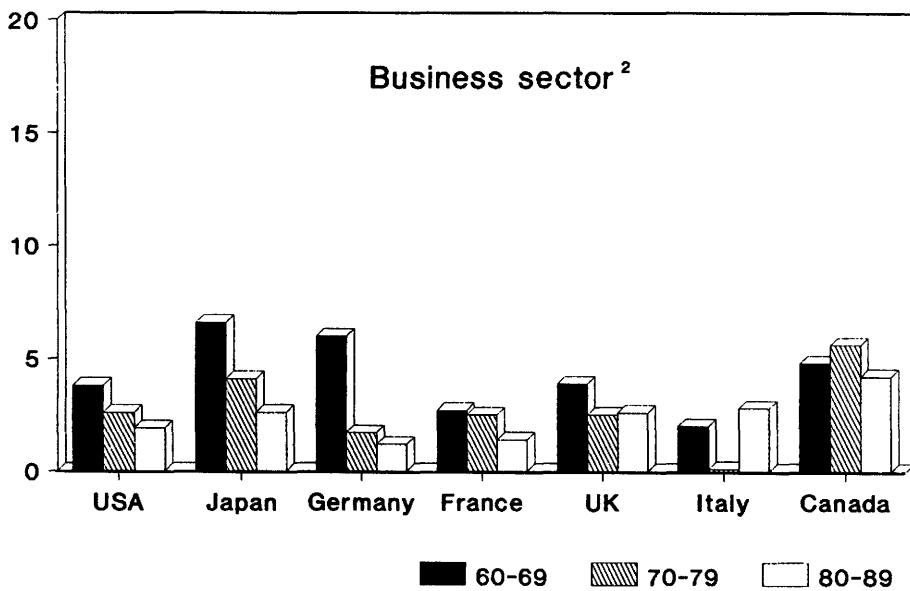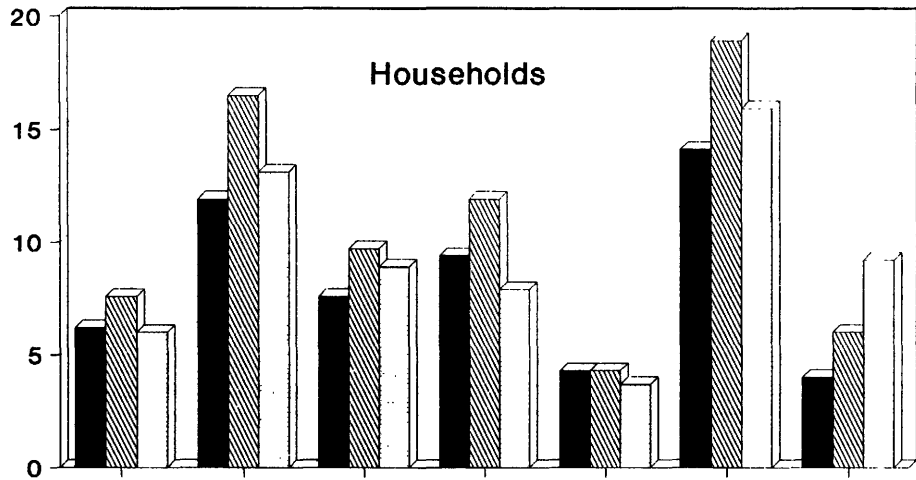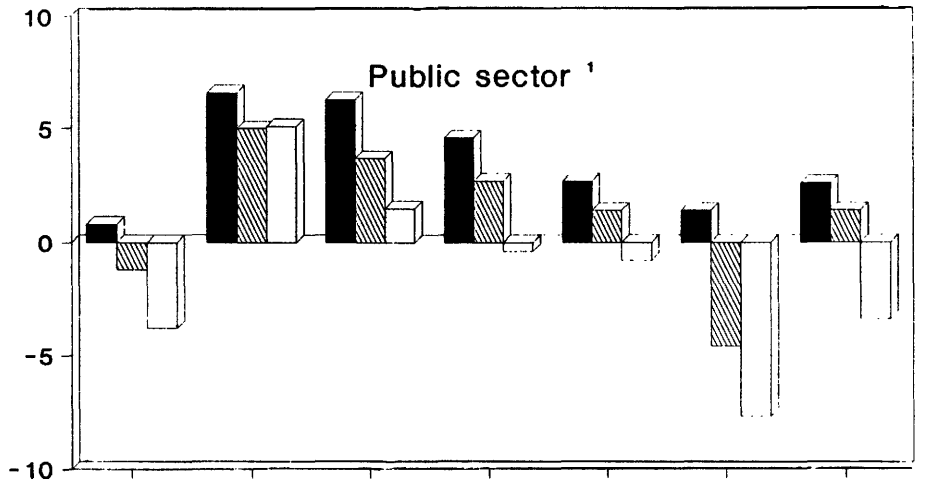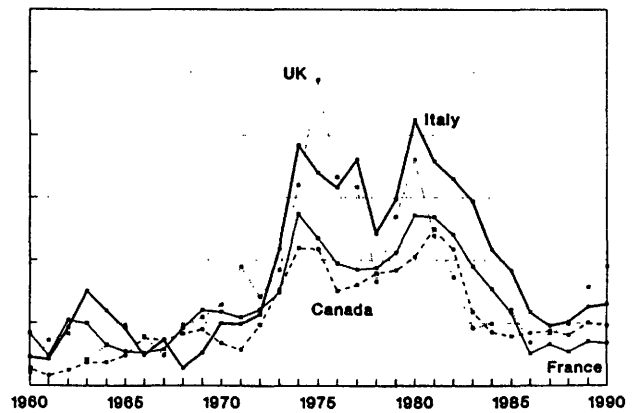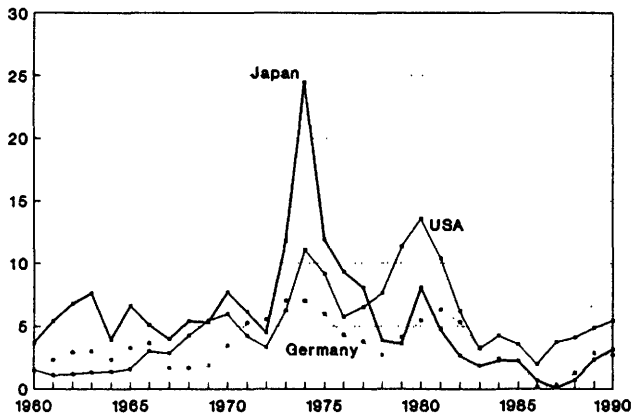
1 General government.
2 Including public enterprises.

Source: BIS Report (June 1991); based on OECD data.

Figure 2 - Net household saving
(as a percentage of disposable personal income)

Source: OECD - Historical Statistics.

Figure 3 - Consumer price indices
(annual change in percent)

Source: Eurostat - CRONOS-ICG.

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