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Editors

Ageing, Financial Markets and Monetary Policy

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With 32 Figures and 38 Tables

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Ageing, financial markets and monetary policy – a summary

Alan Auerbach and Heinz Herrmann

On May 4 and 5, 2001 the Bundesbank and the Burch Center of the University of California, Berkeley held a joint conference on "Ageing, financial markets, and monetary policy". Economic problems generated by an ageing society have already been discussed extensively in the past. Such issues concern, for example, the effects on labour markets, capital formation and growth. Another issue focuses on whether existing pension systems (and public transfer systems in general) can be maintained in the long run in the event of a shift in the population's age profile. In this regard, a consensus has evolved that an ageing population will make a reform of old-age pension systems indispensable in most countries. This applies, in particular, to those countries in which generous public pay-as-you-go pension schemes still exist. One approach to reform aims at strengthening the funded elements of old-age pension provision. This kind of transformation of pension systems is expected to lead to a number of changes in financial systems. The emerging changes in both underlying macroeconomic conditions and financial systems will have an impact on central bank policy in the future. This was the reason for holding such a conference. This volume reproduces the conference papers and discussions as well as the introductory statements to two panel discussions.

One key question that is the starting point for a number of further considerations in this field is how the expected shift in the age profile will affect the saving decisions of private households. To provide for old age is an important reason for people to save. How easy it will be to effectively handle the problem of ageing will depend on people's willingness to build up such savings. Particularly in Europe, however, little is known about the relationship between saving and old-age pension provision. In the opening chapter, "*Ageing and Saving in Europe*", *Agar Brugiavini* first provides an overview of how saving patterns have developed in important European countries and then attempts to link those developments to demographic trends and a number of other relevant features. These include, for instance, the current conditions of statutory pension schemes and the present state of development of financial markets in the different countries. In the second part, she presents an empirical approach that is intended to shed light on how statutory changes in claims against the state pension scheme influence private saving behaviour. This question arises naturally when examining the relationship between saving and ageing. The empirical analysis is based on a life-cycle model and regresses individual saving rates on the ratio of future pension wealth to current net income. It draws on the experience gained when the social security system in Italy was reformed in the early 1990s, which led to drastic reductions in the number of claims against the statutory pension scheme. The various sectors of the population (elderly people, young people, public employees as opposed to private-sector employees, etc.) were affected to differing degrees. From Brugiavini's estimates, it becomes clear that a reduction in claims against the statutory pension system has led to a markedly increased willingness to save, particularly in the sectors of the population which were most affected.

Reinhold Schnabel starts by discussing possible consequences of a pension cut from a German perspective. He discusses possible effects on saving and labour supply. In the second part of his comments he questions whether all of Brugiavini's interpretations of the "Italian experiment" are convincing. He doubts in particular, whether the reform was unexpected.

The problem of ageing populations affects most industrial countries. However, this problem is more acute in some economies than in others. Germany belongs to that group of countries, with considerable implications for social security systems in the future. (Corresponding) scenarios based on closed economy models have often been played through in the past. In the case of free movement of capital, however, the foreseeable ageing process - due to differences in intensity and the staggered phasing of developments across countries - can be expected to lead to a pattern of capital exports and imports. According to this pattern, households in the initially or more strongly affected countries invest some of their savings intended to provide an old-age pension abroad, with a view to transferring those funds back in the later "consumption phase". In the second chapter, "*Ageing and international capital flows*", *Axel Börsch-Supan*, *Alexander Ludwig* and *Joachim Winter* use a multi-country overlapping generations model to display the significance of this kind of international movement of capital. The simulations focus on the implications for Germany, although the model also allows the same calculations to be made for other countries, some of which are also referred to. According to these model calculations, substantial international capital flows can be expected over the coming decades as a result of the shifts in the age profile. Even taking a rather conservative model variant, an annual capital export of more than 7 % of GDP can be expected. Those exports are even higher if the reform of the current social security system entails moving towards a more extensively funded system. The assumptions with regard to capital mobility are another important element. Even though capital mobility is assumed to be high in Europe only - with a large proportion of the exported capital being invested here - the movement of capital is considerable. Hence Börsch-Supan and his co-authors have high hopes that the opportunity for international diversification of capital used to provide old-age pensions will alleviate the problem of an ageing society, particularly in the case of a more extensively funded system.

In his remarks, *Gary Hufbauer* points out that the assumption of ultra-rational households in the model leads to saving for retirement being overestimated if reforms fail to materialise. In his opinion, the authors are therefore exaggerating the advantages of capital mobility should the status quo be maintained. The differences between the reform scenario and the status quo scenario for capital movements are, however, understated. In his observations, *Ulrich Grosch* claims that the Börsch-Supan et al. model neglects a number of aspects, with the result that the paper overstates the importance of capital flows. These aspects include, for example, the deterministic structure of the model, which leaves no room for risk aversion.

Chapters 3 to 5 deal with possible implications for the financial markets. In particular, risks resulting from the problem of population ageing are highlighted from different perspectives, and proposals are made as to how these risks should be managed. For the individual who has to make provision for his old age and who can no longer rely (completely) on the statutory pension scheme, it is important to find ways of safeguarding himself against uncertainty during his lifetime. Annuities are an appropriate instrument in this respect; they can guarantee either a nominal or a price-indexed life-long pension. Such instruments have played an important role in some countries for quite some time, and in others, they are becoming increasingly important. Against this backdrop, *Olivia Mitchell*, in the chapter entitled *"Developments in decumulation: The role of annuity products in financing retirement"*, begins by describing how life annuities work. She analyses a number of pitfalls which have to be taken into account when determining a fair price for such products. These include problems relating to investors' risk aversion (and which are particularly relevant, for example, in terms of the extent to which investors are able to obtain a safe pension from other sources) and difficulties in calculating life expectancies. In this connection, Mitchell highlights a special adverse selection problem that arises if investors with especially long life expectancies purchase annuities. Overall, she concludes that annuities should play an important role in pensioners' portfolios. The chapter then goes on to analyse the extent to which government regulations and supervisory provisions can hamper or foster this market.

In his commentary, *David Blake* mainly describes the British experience with annuities. In the United Kingdom, this market has reached the highest level of development by international standards. Blake compares different saving schemes for old-age pension provision in the United Kingdom and confirms the benefits of annuities, particularly for risk-averse pensioners. *Friedrich Breyer* points out in his observations that problems relating to asymmetric information also exist outside the voluntary annuity systems described. He refers to moral hazard problems in (public) compulsory annuity systems. A combination of public and private pension systems might help to overcome such problems.

While, in the third chapter, a risk is considered against which the individual can take out insurance, in the fourth chapter *Henning Bohn* deals with the macroeconomic question of how aggregate risk arising in connection with old-age pension provision might best be distributed among the generations. In his paper

"Retirement savings in an ageing society. A case for innovative government debt management", Bohn applies different variants of an overlapping generations model. In the first period, households work, consume, pay pension contributions and save for their old age. The second generation consumes and receives public transfers. The government arranges a public pension scheme and can levy a tax on capital and incur debt by issuing bonds. There are four types of risk in the economy: uncertain productivity, uncertainty about the development of the younger generation and about the longevity of the older generation and, finally, uncertainty about the profitability of the existing capital stock. On the basis of this model, Bohn examines different intergenerational transfer schemes to determine how those risks are distributed among the generations and which schemes result in optimal risk sharing, i.e. as even a distribution of risks as possible. This chapter contains a number of interesting conclusions. For example, it shows how important it is for governments to have an overall pension scheme concept, since, in the final analysis, the distribution of risks results from taking all the instruments together - including the distributable taxes. In Bohn's model, for example, a tax on capital may fulfil an important function, leading to an increase in potential welfare. On the other hand, Bohn points out that different innovative elements in debt management may help to achieve better results in terms of the question posed. Those elements include wage-indexed and longevity-indexed bonds.

Alan Auerbach stresses that he considers Bohn's general approach to be very useful. He doubts, however, whether all his conclusions could be upheld if the model were modified so as to make it more realistic. In particular, he is sceptical about the possibility of achieving more favourable risk distributions by levying high taxes on capital and labour (compulsory contributions to the pension scheme). In his opinion, Bohn underestimates the distorting effects of such taxes in real life. *Philipp Rother* is critical of the fact that Bohn places too much emphasis on the relevance of the asset risk to the generation of pensioners. Temporary fluctuations in the market value of the capital stock are of little relevance to pensioners, who are concerned with financing their retirement income through the real return on their capital stock. He also considers that Bohn overestimates the risk of unforeseen developments within the younger generation (population risk), because, in reality, society is able to adapt to such developments in good time.

In the fifth chapter, *"Ageing and Financial Stability"*, *Philip Davis* deals with the question of why the process of population ageing may lead to increased risks to the stability of the financial system. Davis distinguishes between two cases. In the first case he assumes that there will be no timely reforms aimed at putting old-age pension provision on a sounder footing. This would lead to the risk of increased uncertainty and unsatisfactory ad hoc solutions attempted by the government, which might ultimately also undermine the functioning of the financial system. An example of the former would arise from suboptimal forms of saving in an environment where households no longer trust the social security system but on their own encounter an inadequately developed financial structure. In the end this may endanger the stability of the system. An example of the latter is attempts by the government to finance the statutory pension scheme by incurring ever more debt. The second part of the paper focuses on problems that may arise if funding elements are increasingly introduced into old-age pension provision, with institutional investors gaining in importance. Although Davis considers the basic problems to be less significant in this case, he does not rule out systemic risks. Their magnitude also depends on the government's and/or the central banks' regulatory policies.

Franklin Allen categorises the different types of financial crises discussed in the literature and identifies those with links to the ageing problem. The types of crises that are most likely to be triggered by the ageing problem are those due to the business cycle where fixed promises are made but there are insufficient resources to meet them, those due to inconsistent government macro policies and those due to bubble collapse. The first type is more relevant for a bank-base system and the third one for a system with significant market funding of pensions and institutional investors. Considerations of political economy lead *Martin Hellwig* to a rather sceptical view about the possibilities of solving the future problems of ageing with a pay-as-you-go system or by stimulating saving and investment. Furthermore he stresses that it is probably neither optimal nor feasible to immunize old-age provisions from shocks. Finally he explains why and how regulatory interventions in ageing-provision should play a role.

The sixth chapter deals directly with possible implications of population ageing for monetary policy. In *"Should monetary policy be different in a greyer world"*, *David Miles* focuses on a number of aspects that may become relevant for the monetary transmission process. He bases his analysis on three versions of an OLG model. First, this type of model is used to examine how population ageing changes the optimal capital stock and, thus, the real equilibrium interest rate. Miles regards the equilibrium interest rate as an important reference variable for a central bank which, for example, is adhering to a Taylor rule. In this model, the equilibrium interest rate in an elderly population (with a small labour supply) is far lower than in a young population. This is true, in particular, if the current pension system promotes saving. In a second version of the model, Miles turns to the question of the different impact of a (permanent) exogenous change in interest rates on the consumption decisions of young households with a long life expectancy and on those of elderly, wealthy households. In this case, too, the results depend, *inter alia*, on the generosity of the pension system. In a third version of the model, different types of uncertainty are taken into account (e.g. about labour income or mortality rates). At the same time, there are two assets – a risky one and one without risk. Depending on the type of asset, households are affected to a differing degree by different uncertainties and therefore prefer different types of portfolios. As in the first two cases discussed, Miles again emphasises that the existing pension system is of crucial significance. It determines both how much precautionary saving is made and to what extent risky forms of investment are preferred. This means that monetary policy effects in an older population cannot be discussed without giving consideration to future changes in pension systems.

Hiroshi Fujiki discusses the findings of Miles against the background of the experience gained in Japan. He points to the fact that a falling equilibrium interest rate may aggravate the problem of the zero bound on interest rates. *Benoit Mojon* points out that the empirical relations between interest rate changes and saving behaviour and between increased ageing and the interest rate sensitivity of saving have not yet been clarified. A number of model calculations, presented as examples, show that it does not generally hold true that the interest rate sensitivity rises in line with an increasingly ageing society, as Miles suggests. Finally, he is doubtful whether the shift in the equilibrium interest rate postulated by Miles is of major relevance to monetary policy, since it materialises only very gradually.

During the conference, two panel discussions supplemented the presentations of the papers. The introductory statements to these discussions are reproduced in this volume.

The first discussion was on *"Ageing as a challenge for economic policy"*. *David Wise* opened the debate by presenting his view of the major challenges arising from the ageing process in industrial countries. Financing of social security programs will require substantial reforms in the future. In this connection he emphasised that it is important to encourage private saving and work at older age. Another, related challenge will be health care. *Martin Werding* described the need to reform the social security systems in Europe and the possible ways of doing so. He warned against hoping that the current problems in the labour markets, which have led to high unemployment rates, will be resolved automatically when the labour supply shrinks in the future. Rather he pleaded for reforms in this field, too. *Claus Hofmann* described past reforms in Germany in the area of pension insurance and plans for the future. A role will be played here by modified pension adjustments and supplementary funded systems. In addition, he stressed the importance of the higher participation of certain groups in the labour market. *Platon Tinios* explained the specific problems in some southern European countries and in Greece, in particular. He emphasised the role of the European Monetary Union in fostering reforms in the pension system.

The topic of the second panel discussion was *"How pension reforms are changing financial systems"*. *Hans Blommestein* described how pension systems with greater funding will lead to a modernisation of the capital market infrastructure in OECD countries, including greater globalisation of the financial markets. He highlighted the advantages and possible risks of these developments. *Olivier Davanne* gave an overview of the current state of the French pension reform, which also gives more prominence to the funded component. In this connection, he expressed some concern about the way pension money is managed today. *Jürgen Pfister* explained the plans to encourage saving for retirement in

Germany. He saw a certain amount of over-regulation in this reform. Subsequently, he gave his view on how these reforms may change saving, financial markets and the financial system in Germany in general. He stressed that the structure of the system, and the role of banks in particular, will not be fundamentally changed. *Joseph Bisignano* emphasised that it is not easy to forecast exactly how pension reforms will affect the financial landscape of a country. He assumed that in the end it will lead to a sizeable demand for longer term finance and to major changes in the structure in European finance. The experience of the past teaches us that this will bring new challenges for European central bankers.

Ageing and Saving in Europe

Agar Brugiavini*

1 Introduction

Saving is the result of intertemporal decisions taken by individuals. Despite the recent research effort, economists find it hard to provide a satisfactory explanation for the cross-country variation in the level of private saving and for the observed trends. Even more demanding is the task of attributing precise amounts of savings to specific types of future conditional consumption and to specific risks. Most economists would agree, however, that providing for resources in old age is one major motive for household saving. In countries where the state provides for old age via a public pay-as-you-go (PAYG) pension system[1] the need to save for consumption during retirement should be mitigated. Alternatively, old-age insurance can be obtained through the capital market via institutional investors in group insurance (second pillar) or through individual contracts (third pillar), in these cases provision for retirement is normally part of private accumulation. Whether, from an accounting point of view, saving for retirement is part of private saving or not, it is clear that one of the most - if not *the* most - important interaction between savings and ageing is centred around pensions. In Europe, ongoing or impending pension-reform attempts have made even more apparent that ageing has an impact on saving, and have made it even more compelling to analyse the link between pensions and savings.

The mixture between PAYG and funded old-age provision varies quite remarkably across countries. In most Continental European countries, notably in the three largest countries France, Germany and Italy, the PAYG mechanism is the most important instrument. A move towards private funded schemes, whether participation in the scheme is made compulsory or voluntary, requires some

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1 Normally referred to as a "first pillar". In this paper I use, rather loosely, the terms "first pillar", "public pensions" or "social security" to indicate public pension provision.

knowledge of the degree of substitutability between "saving for retirement" and "other saving". Two kinds of substitution may be relevant: (1) substitution between bequeathable wealth and wealth that is annuitized for retirement, and (2) substitution within "retirement wealth".[2] Both substitution mechanisms are important: while all forms of private saving (whether annuitized or not) constitute private wealth accumulation, and are usually recorded that way in national accounts, the difference between bequeathable (fungible) wealth and retirement wealth rests on the basic motives for saving. Hence, in theoretical models or in simulation exercises, one is usually concerned with describing changes in total capital accumulation (i.e. total private wealth, even if annuitized), but in the empirical work the extent of substitutability is usually assessed by comparing bequeathable wealth on the one hand, and retirement wealth (or just public retirement wealth), on the other.

This paper briefly reviews the reasons for relating saving to ageing. It presents some facts on ageing and saving in Europe, and it mainly focuses attention on the empirical work on substitutability between pension wealth and private wealth for European households.

2 Ageing and saving: facts and theory

2.1 Saving in Europe

European countries, and particularly countries in continental Europe, have traditionally been described as "high-saving-rate" economies, when compared to the US. Although the saving rates have declined in many European countries, the "high-saving-rate" paradigm still seems confirmed by the data for the late 1990s (Table 1).[3] Both the high level of the personal saving rates and the recent

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2 Bernheim (1987a and 1987b) first addressed this issue.

3 OECD Economic Outlook (2000b) provides a long-time series of saving rates on a consistent basis for a number of countries used in Table 1. However one should be careful in carrying out cross-country comparisons, and should rather focus the attention on the time variation for each individual country, as the definitions adopted are not fully consistent. In fact, some countries have provided data on gross saving rates (gross of capital depreciation) and some have provided the net figure. However, the gross and net figures do not seem to correspond to the labels indicated by the OECD. The difference could be marked: for example, according to calculations based on National Accounts Data, the German gross saving rate in the year 1999 is 15.5%, while the net saving rate is 9.9%. Despite these caveats, there is no doubt that the European saving rate (particularly continental Europe) and the North-American are two extreme cases.

declining trends pose a puzzle. Why do households save in countries where the welfare state is relatively generous and it strongly conforms to the *Bismarckian* tradition?[4] This is a hard question, which I do not try to develop fully here.

The debate in the US is posed in terms of "is the saving rate too low?" The microeconomic reasons are related to the basic task of saving: provision for future consumption. If people are myopic or underestimate future risks, saving will be too low. Paternalistic arguments then generate the provision of "forced saving" through public pension systems. These arguments rest on the assumption that individuals are myopic (and eventually free riders); a milder version of this argument tends to favour some tax-relief for retirement-saving, worrying about a lack of capital accumulation and growth. There is a growing literature that tries to assess the existence and the extent of myopia, based on survey data and through "experiments". However, this is still an area of research in its infancy: see Kotlikoff, Spivak and Summers (1982) and Hamermesh (1982) for early contributions, and the recent work on "mental accounts" and "hyperbolic discounting" for structural models (Laibson, Repetto and Tobacman, 1998 provide a useful example, a survey of this literature can be found in Bernheim, 1999). From a European perspective, we may be tempted to ask whether saving is too high: this may be a ill-posed question, but it has significance over and above the problem of capital accumulation and growth. The question of the adequacy of saving to provide for retirement, or the extent of over-annuitization, remains in fact an important argument to justify the concern of economists, precisely because European countries are ageing considerably and are ageing fast.

Looking at the dynamics: what has determined the declining trends? The household-saving rate fell in Italy, particularly during the late 1970s and 1980s: some authors (Rossi and Visco, 1995) argue that this decline is almost completely explained by the increasing generosity of the social security system (see Börsch-Supan and Brugiavini, 2001). However, it is hard to find a one-dimensional explanation for these trends in each country. In fact, the development of formal credit and mortgage markets, the generalized access to financial markets where a larger range of products is available, surely affected personal saving throughout Europe, possibly changing also the national saving rate. In addition, the decline in the share of composite households observed in many Southern-European Countries may have contributed to the decline in household saving: change in household head-ship can also partly explain the patterns observed in the data, so that what appears as a decline in the saving rate is partly an artefact of the data (see section 2.3 below). Obviously, the tax system and its evolution over time also play a major role (see Poterba, 1994 and Browing and Lusardi, 1996). Finally,

4 So that the standard of living for most workers is preserved under most negative contingencies. In these countries, social security provides old-age protection, insurance against disability and to survivors. Quite often, health care and unemployment insurance are also provided to workers through a National Programme.