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AGEING AND COUNTER-AGEING

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Editorial

by Orio Giarini

Why do these EUROPEAN PAPERS ON THE NEW WELFARE exist?

Who is supporting them?

This time let us answer these questions first:

- this magazine exists because a number of people believe that the phenomenon of a longer life-cycle (extending little by little to the whole world) is a crucial factor in the present and future development of our society. This is a true revolution, concerning culture, economics, social justice, individuals, family life and political institutions. Fundamental issues are at stake: intergenerational solidarity, the capacity of the younger to better manage their future life cycle, the capacity and possibility of the older to integrate in an open society. In other words, to provide and manage hope, vision and results for everybody’s life. This ‘problematique’ (as The Club of Rome calls it) is so challenging that it should mobilize more and more all those who feel they should also look beyond their immediate interests.

- The only costs incurred and paid for this publication concern the pure printing costs, the distribution and the translation of the articles. They are covered in part by subscriptions, by the sponsors mentioned at the end of magazine and above all, personally, by those involved directly in this venture (including all the work which one can describe as secretariat). We are a typical case of the ‘Service Economy’, where a considerable amount of real value is produced by non o semi-monetarized activities. Of course we benefit essentially of a long experience and worldwide contacts with researchers, professionals, academics, economists, social scientists etc. who contribute, motivated by the importance and value of the issue we deal with. If, in some cases, the authors represent some specific institution, interest group or company, this is not a reason not to consider their arguments, which can always be criticized or contradicted.

And then let us insist on the following points:

- the better organization of welfare has to do essentially with enhancing what economists call ‘Human Value’, but which includes culture, creative capacity, being sensible to a civilized vision of man (and of course women), and not only productive capacity. Today a priority effort in this area concern those over 60 years of age. It is the advancing counter-ageing society, maybe equivalent to the discovery of a new continent.

- Welfare has to do with work — productive work — and the necessary improvements to achieve in this area. The abstracts at the end of this issue propose some ideas on the matter. In particular the issue of part-time work, as a basis and not as a marginal instrument for full employment.

- Within the perspective of the ‘four-pillar strategy’, in the future work, pensions, subventions and incentives will be more and more considered jointly (including the issue of a negative income tax). See on this the articles on pensions and partial work in Sweden. The contributions from Finland and the United States provide further useful insights.

- Modern technology and culture are bound to improve the quality of work further and further (see the descriptions in the textile industry no longer than one or two centuries ago). Work, good productive work is necessary to the human being to live a healthier and more satisfactory life (accompanied by lifelong education).

- All this has to do with the evolution and changes within society and in particularly in the economy. We have long insisted on the importance to understand the potentials of the modern economy, as a ‘Service Economy’. Practice is well advanced in most areas in this direction:
a little effort is still required by macro-economists, where some fundamentals demand revision. In particular concerning the notions of risk and uncertainty and their management. It is here that economics reveals deep philosophical roots, embedded in the wider general cultural ground. An adequate consideration and promotion of 'productive work' needs to start from here.

- Dealing with such issues in the European context, we can only insist — as we have done on many occasions — that although each country has a long different economic history, the issues of the ageing and counter-ageing society are similar (even for the rest of the world). The European social policy will little by little move to a more similar pattern, and become a central issue for the whole integration process. Realistically this will probably take one or two decades, but the experiences in each country will be increasingly compared and the best solutions will little by little emerge.

We understand that 'political reality' (still too often national) is conditioning the debate and the policies in this area. But not following the best necessary solutions will indicate the losers of tomorrow, both on the economic and the social ground.

Let’s finally just recall some other fundamental questions, dealt in this issue, and which we have considered also in the previous European Papers:

- the management of health and health costs, on which the whole welfare policy largely depends, and where again feasibility has to be combined with social justice. Here again public and private systems have to find the best practical and possible compromise;
- the developments of scientific research and of technological applications which are the very central motor of all the changes we are dealing with. In this issue we establish a link between the studies on brain and longevity;
- longevity and the risk of the enterprise, integrating these problems into the analyses of vulnerability of a country (the vulnerability index), which we hope to deal with in greater detail in future issues.

In order to make our work more accessible, we are setting up an access to the internet system, where all the articles published can be downloaded (www.newwelfare.org). We aim thus to disseminate our work and make it available as far as possible also to attract contributions, discussions and counter-proposals. Maybe also from you.
Financial Sustainability of Social Protection Systems (with Particular Reference to Retirement Pensions)\(^1\)

by Maite Barea\(^1\)

1. Introduction

The fact that the serious problems facing the European social protection system are frequently overlooked, is not an outcome of the different political or cultural viewpoints. Instead, it has more to do with a complete shift away from any link with reality. This alteration is endangering the current welfare of society and, above all, the welfare of future generations. European governments are aware of this fact, however, they are, on the whole, reluctant to take on unpopular, albeit necessary, proposals that could put the relation between production and resource consumption back on track.

2. Evolution of Total Social Protection Expenditure

Figure 1 describes the current situation very clearly indeed. From the total of social protection expenditure of the ESA\(^1\) the EU-25 spends, on average, two thirds exclusively on the elderly and the sick: 23% on health, 6% on the disabled, 33% go to retirement pensions, 4% go to widows’ pensions; to which 5% can be added for unemployment benefits. Expenditure that does have a view to overhauling the population only accounts for 22% of the total amount: 16% is allocated to education and 6% to Family and Infant schemes.

Following the terrorist attacks in Madrid on the 11th of March, 2004, Il Foglio published the following editorial, from which the following extracts are reproduced, as they provide an insight into the situation referred to above:

“The profound phenomenon with which we must come to terms, is as follows: The Western world is tired. It has been tired for a long time and it is indeed difficult to keep up with the number of gurus prophesising its decadence or its twilight with sound reasoning. However, this tiredness is no longer a theoretical premonition or textbook account, nor a literary kind or even a philosophical hypothesis for the wise who question the meaning of life. The real truth is that we are in fact morally exhausted, we work little, we now find ourselves far removed from the earth’s products and industry because everything has become dependent on technology and services, we are a society of agents of culture and the tertiary sector; we are all part-students, part-teachers, part-base priests and ants of the neighbourhood, we are all real or potential retired persons; the words that really count in our world are volunteering, searching for higher reaching ideals, solidarity, equality, sheltering, holidays, 35 hours, protection, guarantees, insurance, welfare, the right to health, free assistance, defence in the face of the market and its risks (...) We are worn out (...) and we want to be left alone”. (G. Ferrara, Il Foglio, 16.3.2004).

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\(^1\) Professor of Applied Economics, Autonoma University of Madrid.

\(^1\) According to the ESA (European System of National Accounts), social protection expenditure includes: health, invalidity, old age and survivor’s pensions, unemployment, family and infants, education, housing and social exclusion.
Figure 1: Social protection expenditure by function, ESA, EU-25, 2002

Source: Eurostat and author's personal compilation.

Figure 2: Social protection expenditure, ESA, in million PPS, by country, UE-25

Source: Eurostat and author's personal compilation.
Figure 2 underlines the total value of social protection expenditure of the EU-25 countries expressed in millions of Euros of PPP in 2002, and Figure 3 includes these figures as a percentage of GDP. The EU-25 average is 32.6%, furthermore, countries with established welfare states — Sweden, Denmark, France, Austria, Germany and Holland — have a much higher average percentage. In Sweden and Denmark expenditure is between 38-40% of GDP.

Nevertheless, international comparisons based on social protection expenditure as a percentage of GDP are not short of ambiguity given that similar percentages can in fact hide the varying level of endeavour carried out by each country. Thus, it is of greater interest to take into account the percentage that social protection expenditure represents of Government spending: in almost all the countries, this percentage is between 60 and 70% of total expenditure, and in Great Britain it reaches almost 80%. If no strong corrective measures are adopted, in 2050 this figure could escalate to 80-82% of total Government spending. How then will the remainder leave enough margin for essential expenditure on research, innovation, infrastructure, environmental protection, interterritorial solidarity etc., within the EU?

3. The Ageing Process of the European Population

As a consequence of the ageing process, Europe, together with Japan, hosts some of the most ageing societies of the world. The baby-boom generation will reach retirement age in the near future and the low fertility rates in Europe fail to tackle its effects, nor do they manage to create an adequate population structure as far as age brackets are concerned. The latest demographic forecasts of the EU\(^2\) highlight the fact that at present, some EU-15 Member States have very low fertility rates — lower than 1.4 — in particular, Germany, Austria, Spain, Greece and Italy. Nonetheless, since 2000, fertility rate trends for EU-15 Member States have differed somewhat: in some countries, rates continue to fall, as is the case of Germany, Belgium, Greece and Luxembourg, whereas in other countries a slight upturn in fertility rates is starting to occur, namely in Spain, Finland, Great Britain, Holland, Ireland, Italy and Sweden. For some new Member States the drop in fertility rates started in the sixties. The fall of communist regimes caused a slowdown of fertility rates to below 1.4 in several countries and this trend has continued since then.

Not only do people live longer, but also nowadays a 60-year old European worker has the same life expectancy as a 35-year old citizen of 1900. Moreover, the European worker of today is in perfect health. In the Figures 4 and 5 we can see, as an example, life expectancy — of men and women — at the effective retirement age in some EU Member States. In France, for example, with one of the earliest effective retirement ages of Europe (around 58 years old), life expectancy stands at 22.2 years old for men and 27.5 years old for women.

The Council of Europe of Stockholm in March 2001 envisaged a three-fold strategy in order to come to terms with the effects of an ageing population on government economy and budget:

- Growth of employment rates, especially for women and older workers. In the same way, in the European Summit of Barcelona in March 2002, Heads of State set themselves the following objectives for 2010: employment levels of 60% for women and 50% for older workers (aged between 55 and 64).
- A quickening of the pace of the reduction in public sector borrowing.
- Health system and retirement pension reform.

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\(^2\)European Commission (2005).
4. Ageing Pension Expenditure and Necessary System Reform

It is estimated that the mere demographic factor could cause an increase in retirement expenditure, which, on average terms, would amount to the equivalent of 5 or more percentage points of GDP between now and 2050. The OECD calculates that longer working lives and an increased share of women in employment could reduce this expenditure by 1 point of GDP. Moreover, pension system reform (replacement rates, length of contribution periods, etc.) would lead to a further reduction of 1.25 GDP points (on average for OECD countries, as a whole)\(^3\). A deficit on this scale would increase borrowing, the burden of which would have to be upheld by future generations. It is plausible that this would entail a decline of intergenerational wealth — something that politicians are reluctant to deal with.

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Figure 4: Life expectancy at the effective retirement age in some EU Member States. Men, 2002

Source: Eurostat and author’s personal compilation.

Figure 5: Life expectancy at the effective retirement age in some EU Member States. Women, 2002

Source: Eurostat and author’s personal compilation.
On the other hand, experts talk about an extremely large amount of implicit public debt that Governments incur with pensioners and future pensioners amounting to several times a country’s GDP\(^4\), which responds to the inheritance that current generations are leaving to their heirs. The European System of National Accounts (SEC-95) records Government operations based on the principle of rights of entitlement; however, within the systems of distribution only recognised pensions and those which have been paid are earmarked annually as expenditure. The implicit debt of the Social Security proceeds from the entitlement rights as a result of the contributions paid but not yet recognised as the person in question has not yet reached the age of retirement. If the principle of rights of entitlement were to be applied to the retirement pension regime, the National Accounts of all the Governments of the EU Member States would incur enormous deficits.

It is unforeseeable that this situation could be tackled by increasing taxation or social contributions given that the competitiveness of each country would suffer enormously. Migration flows are by no means the panacea: young people arriving from other countries are indeed new contributors; however, as a result of family regrouping, this soon entails increases in health and education expenditure and family allowances etc., not to mention the cultural consequences. On the other hand, research carried out in EU member states such as France and Germany, with their long history of migration currents, highlights the fact that emigrants adopt the demographic pattern of the host country from the second generation onwards.

It is, therefore, of utmost importance to attain budget surplus, so that it is possible to reimburse and take off some of the burden of public debt and to enable the creation of reserve funds which will help to cope with the implicit debt of the Social Security systems. With this in mind, the adjustment of the conditions of the Stability Pact by the members of the Monetary Union only worsen the problem. From the 22nd to the 23rd of March, 2005, as a result of strong pressure from the French and German Governments, a watering down of Stability and Growth Pact conditions was approved. In fact, in 2004, both countries had budget deficits amounting to 3.7% of GDP respectively. With the new agreement, the formal aspect of the Pact continues to be maintained, with the criteria of the 3% limit of GDP for budget deficit and 60% of GDP for public borrowing. Nonetheless, from then onwards, the system makes room for ‘other appropriate factors’ when the 3% threshold is marginally surpassed. No specific reference is made to what the permanent factors are and the decision for each case is entirely left to Member States and the institutions. In this way, governments, for strictly political reasons, are postponing the onus of unpopular decisions which they do not wish to resolve at present, for the future- that is to say, leaving the burden for future generations.

As a result of the aforementioned scenario, it is clear that pension system reform and sustainability should be both a political priority and a matter of understanding of the current situation, taking into account the largest possible number of factors at stake.

In order to understand the question of financial sustainability, it is important to consider the distribution system in the following way:

\[
\text{Arp} \times N^p = \text{As} \times N^w \times Sc
\]

where \(\text{Arp}\) is the average retirement pension, \(N^p\) the number of pensioners, \(\text{As}\) the average salary for which contributions have been made, \(N^w\) the number of active workers, and \(Sc\) the rate of social contributions.

\(^4\)For example, Magnoni d’Intignano, B. (1997), citing sources from the INSEE, estimates that total debt of France is about 2.5-3.75 times its GDP in the mid-nineties; Barca, J. (1999 and 2004) estimates the total for Spain for 1996 of 217% of GDP, of this amount 109% is explicit — which corresponds to the commitment with current pensioners — and 108% implicit — as it refers to the commitment with current contributors. The latter only grows in time (estimates for Spain highlight the fact that they have nearly doubled between 1990 and 1996). The situation does not differ in the case of the new Member States. According to the Plenipotentiary Office of Poland, the implicit debt of pension could be around 200% of current annual GDP in the latter half of the nineties (OECD, 1998, p.83).
The causes of imbalance within the system respond to the demographic problem — which has been previously mentioned — and its lack of equity. That is to say:

1. The number of pensioners increases at a rate which is greater than the number of workers \(( \Delta N^p > \Delta N^w \) ). In the cases in which the system has a variable worker replacement rate \([Arp/As]\) variable, a reduction of the average retirement pension \((Arp)\) takes place. On the whole, the regime has a fixed worker replacement rate. Therefore, in order to balance the equation, either social contributions are increased — this measure entails the loss of competitiveness for domestic enterprise and lower employment levels. Alternatively, we can resort to public deficit. The Figure 6 shows how the imbalance between the number of retired persons and the number of active persons will grow between 2000 and 2050.

2. When the average retirement pension grows at a higher rate than that of the average salary contribution \((\Delta Arp > \Delta As)\) the same occurs: either the social contribution rate is increased or budget deficit is brought into play.

In order to assess the equity and proportionality of the system, a series of indicators are normally used: the pension returns rate and the replacement rate. The pension returns rate equals the final value of the contributions paid over a worker’s active life period with the current value of the retirement pensions that they will receive. The aforementioned rate refers to the ‘returns’ that a person receives from the pension system. Paradoxically, this rate tends to be higher for those who have contributed to Social Security pension regimes within the different countries for fewer years. During the sixties, a series of agreements made among social agents — as a result of a general buoyant economic situation, electoral promises or for various reasons — allowed workers with only a few years of contribution to have access to full pension returns; it was accepted that these people should be given a pension that was much greater than a pension which would correspond to the real contributions made. The outcome of this is the clear lack of proportionality within pension systems.

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**Figure 6: Dependency rates of retired persons (65+ years old) with regard to the number of active persons (20-65 years old)**

![Dependency rates of retired persons](image)

*Source: Eurostat and author’s personal compilation.*
The substitution rate indicates the relationship between the last salary for which contributions have been made during the active working life and the amount of the first retirement pension. In general, as can be seen from the Figure 7 the substitution rates in the different Member State countries have been increasing since the sixties. In a system based on distribution, the rate which guarantees the sustainability of the system should be around 60%. On the other hand, there is a tendency for the pensions of lower income groups to benefit from greater levels of replacement given that minimum threshold levels exist.

If countries wish to maintain a distribution system, what should they do to guarantee the system’s viability? Faced with the problem of a lack of equity, they should:

• Actively link up the level of benefits to that of contributions, increasing the reference period of incomes received and use this as a base for calculating ageing pensions (it is necessary to move away from a system which only accounts for the ‘best years’ or final years undertaken by the worker to a system in which the average income obtained over the entire working life is taken into account) and to reduce the replacement rate.

• To pursue an actuarial adjustment in the payment of benefits, so that the longest life expectancy and the different possible ages of retirement are taken into account in order to render the system of pension returns more proportional.

• To make sure that the different Social Security regimes have the benefit of an identical contribution preponderance.

In order to come to terms with the demographic challenge, it is important to put back the age of retirement, at the same time this should not give rise to new rights. This is a move which is currently being introduced in several Member States.
On the other hand, the Council of Europe in Göteborg expressed its concern for safeguarding an adequate standard of living for the elderly. In fact, with a distribution system there is intergenerational solidarity, given that offspring can satisfy the rights of their parents. Nonetheless, in the past, Governments have made use of this system for redistributing income and at the same time have included the minimum pensions of persons who have made small contributions to the system. By doing so, the true spirit of a system of distribution is overlooked, given that this system should redistribute the income of a person over his or her working lives, rather than a distribution between social classes or generations. The latter type of distribution should always be financed by public budget and not by way of social contributions; when the onus is put on social contributions, an element of indebtedness is introduced in the system. This approach might have been able to hide its troublesome effects whilst there were cohorts of contributors; however, it has become an additional burden on the system when the demographic trend has been reversed.

The OECD Secretariat has drawn up a model that helps to estimate the changes in a ‘standard’ country regarding the number of pension beneficiaries and the total of benefits between 2005 and 2025, in order to maintain the threshold of public debt as a percentage of GDP at the level of around 55% in 2050.

Table 1

<table>
<thead>
<tr>
<th>Date this measure comes into force</th>
<th>2005</th>
<th>2015</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of the number of old age pensions beneficiaries (as a %)</td>
<td>7.7</td>
<td>9.5</td>
<td>12.3</td>
</tr>
<tr>
<td>Reduction of the level of average pensions (as a %)</td>
<td>17.3</td>
<td>21.3</td>
<td>29.9</td>
</tr>
</tbody>
</table>

Although the data represent only a rough estimate, we can foresee that the longer it takes for countries to embrace old age pension measures, the greater the chance is of this adjustment being both critical and dramatic. Experience shows that, when reforms are made to retirement regimes, normally a long transitory period is needed for the population to come to terms with it and to modify their options concerning their savings. Since the nineties, the majority of EU Member States are trying to carry out reforms of their pension systems in order to make them fairer, more suitable and sustainable, financially speaking. The Commission and the Council of the EU support and strongly back this process.

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2 Within the model, country estimates are the U.S.A, Japan, and members of the OECD, whose public expenditure on old age pensions is lower than that of European countries. This means that the European average model would be higher than the data from the OECD. Moreover, the average does not provide indications as to difference between European countries themselves.

5. Conclusions

Ageing — and life itself — are far removed from what they were in the past, at least from a biological point of view. The former starts later and the latter has been prolonged. Nevertheless, over the past decades the trend in Europe has been to work less and often the effective age of retirement has been below sixty years old. This phenomenon runs the risk of undermining the welfare of the population, especially that of future generations. European Governments have incurred ‘hidden’, implicit debts which stand for several times the value of their annual GDP. Governments are indeed aware of this, however, they prove to be timid or pusillanimous when putting forward unpopular but vital measures in order to bring the relationship between production and resources consumption into line. It is important to accompany any attempt to soundly redress the level of resources, financial sustainability, intra- and intergenerational equity of pension systems with a clear nurturing of the meaning of work.

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Phased Retirement: Who Opt for It and Toward What End?

by Yung-Ping Chen* and John C. Scott**

1. Introduction

The workforce of the United States is ageing and will continue to age, a development that is contrary to historical trends. The labour force participation rate for those aged 65-plus declined steadily from the 1950s to the 1980s, reaching 10.8% in 1985. Then, however, it increased to 12.8% in 2000. By 2015, more than 16% of those aged 65 and older are expected to be in the labour force (Toossi, 2002; 2004). The median age of the labour force increased from aged 34.6 in 1982 to 40 in 2002.

This increase in the labour force participation rate by older Americans may reflect more than a general trend of population ageing. Reasons for the higher participation of older people in the labour force may include financial need, higher educational attainment, improvements in health, reduced disability, changes in pension plans, more accommodating legal and economic environments for older workers, and changes from an industrial to an information-based economy.

In addition, older workers may in fact desire to remain in the workforce, regardless of their particular economic circumstances. Work may provide social and psychological benefits that retirement cannot, and some individuals may not value leisure as highly as they do employment.

A desire to keep working, however, may not equate to a wish to work full time. Some employees are able to modify their work schedules in some fashion in order to ‘phase down’ their career employment as they approach full retirement. Workers who cannot engage in phased retirement with their current employer often ‘retire’ and then find part-time work with a different employer. Both types of arrangements are usually not formal or ‘part of’ broad-based programs, but studies have found some employer interest in implementing phased retirement arrangements in the future (Watson Wyatt Worldwide, 1999; Ehrenberg, 2001; Hutchens, 2003).

This study examines various aspects of phased retirement and extends the extant research on the work-retirement behavior of older employees in several ways. We consider several key issues of interest, including factors that are conducive to phased retirement for particular workers, the impact of phased retirement on the probability of becoming fully retired, and the financial effects of phased retirement on those who engage in it. We address these questions

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*This article is taken from a publication of the AARP Public Policy Institute, an organization formed in 1985 as part of the Policy and Strategy Group at AARP. One of the missions of the Institute is to foster research and analysis on public policy issues of importance to mid-life and older Americans. This publication represents part of that effort. The views expressed herein are for information, debate, and discussion, and do not necessarily represent official policies of AARP, http://www.aarp.org/ppi.

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Such arrangements have a variety of titles, including phased, partial, and gradual retirement. In some studies, ‘phased retirement’ refers to arrangements in which the employee gradually reduces work within a career job while ‘partial retirement’ has been used to refer to a reduction in work outside of a career job. We adopt these definitions in this report.
through the use of a large, longitudinal interview survey of older workers that takes into account employee attitudes towards work and leisure, as well as other variables such as demographic, family status, employment, and financial characteristics.

2. Background

A host of demographic and economic trends may be producing opportunities for new patterns of work and retirement as well as new attitudes towards work by older Americans. Specifically, Americans are living longer and seem to be experiencing better health into later life, thereby enabling them to remain in the world of work longer if they desire. Financial needs resulting from a lack of assets, not being covered under defined benefit pension plans, the increasing burden of health care costs, or the lack of retiree health insurance may be keeping older Americans in the labour force or pushing them back into it. At the same time, the passage of age discrimination laws and changes in the nature of work are providing more opportunities and incentives for increased labour force participation by older workers. As a result, expanded opportunities for phased retirement may be on the increase. This section provides a background discussion of these trends and influences, many of which will be represented in the methodology and analytical models discussed in subsequent sections.

2.1 The Demography of Ageing

Based on fertility, mortality, and health trends, the U.S. population is projected to continue ageing well into the first half of the twenty-first century. These forecasts are subject to change, of course, but one study suggests that current forecasts may be overly conservative and that society may be ageing faster than officially projected (Anderson, Tuljapurkar, and Li, 2002). However the future unfolds, it is likely to include continued work well into the older ages.

A major determinant of population ageing is declining fertility. The mean fertility rate (the average number of children born to a woman in her lifetime) has dropped from 3.61 in 1960 to 2.04 in 1998, and it is expected to decline to 1.90 by 2025 (U.S. Census Bureau, 2000). With smaller cohorts of babies being born, older people will assume a larger proportion of the overall population. With relatively fewer younger workers available, there may be more needs and opportunities for older persons to continue working.

As they are living longer, older Americans appear to be better able to participate in the workforce. Life expectancy at birth has increased from 70.6 years in 1970 to 76.9 years in 2000 with steady increases expected through the rest of this century. Currently, people who are aged 65 have a life expectancy of 18 years, compared to 13.9 years in 1950 (U.S. Census Bureau, 2000; 2004). Figure 1 illustrates the increase in life expectancy at age 65 for the United States from 1950 to 2000.
Older Americans are not just living longer but they are generally healthier. Physical impairments increase with age, and chronic health conditions have not declined much over time\(^3\). But, despite the overall tendency for people to lose functionality as they age, health measures tend to suggest that the old of today are really less ‘old’ (in terms of ability and functionality) than prior generations of older Americans (Riche, 2001). In 2001–2002, 73% of older Americans reported their health as good, very good, or excellent, with little difference by gender. The percentage of people aged 65 and over reporting fair or poor health declined from 29% in 1991 to 27% in 2001 (Federal Interagency Forum on Ageing Statistics, 2004)\(^4\).

Cohort size also affects the overall picture: the large cohort of baby boomers (some 76 million individuals born from 1946 to 1964) will accelerate the growth of the older population over the coming decades (Riche, 2001).

The changes in fertility, longevity, health, and cohort size are decreasing the proportion of younger workers and increasing the number of work-eligible older Americans, which should result in additional workers aged 65-plus available to take advantage of phased retirement. Also, formal constraints on later-life employment are lessening and thereby altering workforce patterns for the aged.

\(^3\)Chronic health conditions such as arthritis, diabetes, and heart disease are diseases that are rarely cured and that impose a significant health and financial burden. In 2001–2002, of those aged 65 and older, 40% reported having arthritis, 50% having hypertension, 31% having heart disease, and 21% indicated that they had contracted cancer at some point (Federal Interagency Forum on Aging Statistics, 2004). From 1982 to 1994, the percentage of Americans with chronic disabilities declined slightly from 24% to 21%, but the total number of persons with chronic disabilities increased from 6.4 million to 7 million (Manton et al., 1997).

\(^4\)Between 1984 and 1995, Americans aged 65 and older reported improvements in physical functioning as measured by the ability to walk a quarter mile; climb stairs; reach up over one’s head; and stoop, crouch, or kneel. However, there are significant differences among groups of Americans. For example, in 1995, 33% of older black Americans were unable to perform at least 1 of 9 physical activities versus 25% of older white persons. Among men and women in every age group, non-Hispanic blacks and Hispanics were less likely to report good health than non-Hispanic whites, and positive health evaluations tended to decline with age for all groups (Federal Interagency Forum on Aging Statistics, 2000).
2.2 Labour Force Participation by Older Workers

Although the labour force participation of older Americans declined over the latter half of the twentieth century, there are indications that this trend is reversing. For persons aged 55 to 64, civilian labour force participation rates fluctuated from 56.7% in 1950 to a high of 61.8% in 1970 to a low of 55.7 in 1980 before resuming an upward trend to 61.9% by 2002. This rate is projected to be 61.6% in 2015. Labour force participation rates for older workers (aged 65-plus) have steadily declined since the 1950s, reaching 10.8% in 1985. However, labour force participation in this age cohort increased to 12.8% in 2000 and is expected to increase to more than 16% by 2015 (Toossi, 2002; 2004).

The median age of the labour force has also changed over the last 40 years. As Toossi (2004) has noted, the median age of the labour force attained a peak level of 40.5 in 1962. The median age decreased as the baby-boom generation entered the labour force, reaching 34.6 in 1982. Starting then, the median age of workers increased to 40 years of age in 2002. Although this recent increase in the median age of the workforce undoubtedly reflects the ageing of the baby boomers, it may also reflect the increase in labour force participation of persons 65 and older.

The nature of employment is changing in a manner that may facilitate continued work. In a survey of human resource managers undertaken by AARP, older workers were rated lower relative to other employees on such skill-related attributes as trying new approaches, learning new technologies, and having up-to-date job skills (AARP, 2000). However, the less physically demanding nature of an information-based economy may work to the advantage of older workers if their skills are upgraded. The number of workers aged 50 to 59 using a computer at work increased from 43.9% in 1993 to 50.7% in 1997, and this percentage is not much lower than the 55% for those aged 40 to 49. A similar rise was recorded for those 60 and older whose computer use at work increased from 27.3% in 1993 to 32.6 in 1997 (U.S. Census Bureau, 1995: Table 671; 2000: Table 690). Although the Census Bureau has not updated these numbers since 1997, more recent numbers show a similar trend for home computer ownership. The percentage of people aged 65 or older owning a computer rose from 8.3% in 1993 to 24.3% in 2000 (U.S. Census Bureau, 1993; 2001).

Change is also occurring in the structure of retirement and health benefits. Most notable among these changes has been the shift in sponsorship by employers from defined benefit pension plans to defined contribution plans such as 401(k)s. In 1980, there were more than 148,000 defined benefit plans that covered 30 million active workers (38% of the workforce), but by 1999 the numbers had shrunk — just under 50,000 defined benefit plans covered fewer than 23 million American workers (21% of the workforce). Over the same period, the number of defined contribution plans increased from 340,850 to 683,100 with an increase in workers covered from 14 million (14% of the workforce in 1980) to more than 46 million (43% of the workforce in 1999) (U.S. Department of Labour, 2004: Table E4). Defined benefit plans generally provide an annuity payout for the life of the worker or beneficiary, but defined contribution plans typically do not provide such a payout. Instead, a worker retiring on a defined contribution plan may exhaust his or her retirement assets and thereby be compelled to return to work.

2.3 Job Flexibility

The growth of the older workforce, with the concomitant relative decline in workers of younger ages, improvements in health status, certain institutional changes, and for some older Americans, the need for income may be combining to extend working life. An apparent extension of working life in turn may be changing norms for the transition to retirement and
for the very idea of retirement. The idea of a set or standard retirement age has been replaced by a wide variety of workplace arrangements involving older persons (Wiatrowski, 2001). There are indications that the number of ‘bridge jobs’, that is, part-time or temporary jobs that bridge a career job and retirement, is increasing. Whether voluntarily or involuntarily, many older individuals continue working with an employer different from their career employer after they have ‘retired’ from the career job (Quinn and Kozy, 1996).

Moreover, flexibility in workplace schedules is increasingly common — 28% of full-time wage-and-salary workers aged 20 and older had flexible work schedules in 2004, an increase from 12% in 1985 (U.S. Department of Labour, 2004: Table A). 27% of workers between the ages of 55 and 64 had flexibility in setting work hours in 2004, and this percentage increased to 35% for the 65 and older age group (U.S. Department of Labour, 2004: Table 1). Increasing flexibility in workplace schedules may aid in adopting phased retirement programs.

2.4 The Role of Public Policy

A number of policy proposals could expand employment opportunities for older workers. These proposals include increasing the eligibility ages for early and/or normal retirement benefits under Social Security, indexing the Social Security eligibility ages to life expectancy, making Medicare the primary payer for health benefits for workers aged 65 and older, removing disincentives for benefit accruals in pension plans after attainment of the normal retirement age, encouraging more part time and flexible work arrangements, enhancing training for older workers, and improving enforcement of the Age Discrimination in Employment Act (Rix, 2004).

3. Research Literature Review

3.1. Determinants of Continued Labour Force Participation by Older Workers

Research on the determinants of continued labour force participation provides the basis for the methodology of this study. The literature identifies a host of factors that may affect continued work by older Americans including personal characteristics of the workers, household characteristics, and job-related characteristics.

3.1.1 Personal Characteristics

- Black, Hispanic, and female older persons — due to disadvantages in human capital, employment opportunities, and health characteristics — experience more involuntary job separation than white males, and the resulting periods of joblessness often result in a state of involuntary ‘retirement’ or labour force withdrawal (Flippen and Tienda, 2000).
- Highly educated individuals tend to continue working in old age (Haider and Loughran, 2001). The negative effect on labour force participation of low educational attainment is found to be stronger for women than for men and stronger for blacks than for non-blacks (Williamson and McNamara, 2001).
- Healthier individuals tend to continue working in old age (Haider and Loughran, 2001;
Conversely, negative health shocks may significantly change plans for continued work (Dwyer, 2001; Haider and Loughran, 2001), with poor health contributing to a decision to retire (Reitzes et al., 1998).

### 3.1.2 Household Characteristics

- Income and wealth are important factors when older people decide whether to continue working, but the effects are varied. Greater wealth is a major explanation for the historical decline in labour force participation of older male workers (Costa, 1998). The wealthier individuals, however, are most likely to be working in old age (Haider and Loughran, 2001). Such wealthy individuals may be able to cushion a drop in wage income by drawing on non-wage income from assets.
- Family size may influence continued employment at older ages. The propensity to retire has been found to be inversely related to the number of children present in the household, which may in turn reflect financial pressures caused by having dependents. The presence of children in the home is more likely to lead to continued work for women than for men (Reitzes et al., 1998).
- The employment and health status of a spouse appear to influence retirement and continued work decisions for married men and women. If a spouse is not employed and does not have health problems, the worker is more likely to retire, but the presence of health problems in a nonworking spouse reduces the retirement rates for men and women (Johnson and Favreault, 2001). For households in which both individuals work, evidence of spouses retiring at the same time suggests conscious efforts at coordination due to shared tastes for leisure (Reitzes et al., 1998; Gustman and Steinmeier, 1994).

### 3.1.3 Job-Related Characteristics

- Workers in physically demanding jobs are likely to retire earlier than other workers (Hayward, et al., 1989).
- Jobs that require more complexity and creativity and less repetition have been associated with delayed retirement (Reitzes et al., 1998; Hayward, et al., 1989).
- Job flexibility facilitates continued work, in part because it increases an employee’s job satisfaction (Reitzes et al., 1998; Hurd and McGarry, 1993). These occupational characteristics — physical demands, flexibility, and financial aspects — influence decisions concerning continued employment through a worker’s job satisfaction (Mueller, et al., 1994).
- Workers with defined contribution plans generally retire later than similar workers with defined benefit pension plans (Friedberg and Webb, 2000).
- Although employer-provided health insurance helps keep people in the labour force, the availability of health insurance in retirement is an important predictor of retirement (Gruber and Madrian, 2002). For example, one study found that the availability of employer-provided retiree health insurance increases the rate of exit through retirement by two percentage points per year if the employee shares the cost of insurance with the employer and by six percentage points per year if the cost of retiree health insurance is borne fully by the employer (Blau and Gilleskie, 2001). Retiree health benefits usually interact with the availability of private pensions in affecting retirement decisions (Wise, 1997).
- In a study of self-reported age discrimination, workers who experience age discrimination are much more likely to separate from their employers and are less likely to remain employed (Johnson and Neumark, 1997).
3.2 Defining and Measuring Partial Retirement

While phased retirement is the principal focus of this study, we discuss the literature on partial retirement first because of the similarities between partial retirement and phased retirement. For convenience, the study uses the term ‘partial retirement’ to mean part-time work for an employer different from one’s long-term employer. However, most research on alternatives to full retirement has used ‘partial retirement’ to apply to any gradual reduction of work, regardless of whether the employer remains the same.

Labour force participation rates are a widely used gauge of continued involvement by older individuals in the workplace (Quinn, 1999; Toossi, 2002; 2004). But the labour force participation rate is a poor indicator of the work-to-retirement transition. At any point in time, the observed labour force rate for an older age group is the product of older persons exiting and entering the workforce such that there is not a unidirectional flow of persons from work to retirement. Other measures are needed to assess changes in retirement outcomes (Hayward et al., 1994).

Another conceptual issue is the value of self-reporting versus an objective standard such as hours worked or earnings from a job. It is fairly clear that self-reports of retirement status can differ substantially from objective measures (Honig and Hanoch, 1985; Ruhm, 1990; Gustman and Steinmeier, 2000; but see note 7 of Gustman and Steinmeier, 1984). “Many who report themselves partially retired have earnings at or near previous levels, and many with substantially reduced earnings consider themselves either fully employed or fully retired.” (Honig and Hanoch, 1985: 23). Thus, defining retirement status only through self-reports may not be particularly helpful in pinpointing older workers in a particular transition to retirement.

Purely objective measures can also be problematic. For example, a decline in wages, whether due to job demotion or job displacement, may falsely signal phased retirement when in fact the worker has not reduced their hours or embarked on a transition to full retirement. The usefulness of self-reported status, then, is that it provides a signal of the individual’s intention. Some of the studies described below use a definition of partial retirement that combines self-reported status with an objective measure (Ruhm, 1990). The approach of this report, as discussed in the Methodology section, combines both self-reported retirement status and changes in the number of hours worked.

Gustman and Steinmeier conducted one of the first empirical investigations into what they termed ‘partial retirement’. Using the first four waves of the Social Security Administration’s Retirement History Study (RHS), a longitudinal survey of men aged 58 to 63 when initially surveyed in 1969, they showed that a dichotomous outcome (retired, not retired) was not appropriate for predicting retirement behavior. The sample was limited to white males who were not self-employed in their main jobs, and for data purposes, ‘main job’ was the full-time job held at age 55. The study showed that about 3% of workers not facing mandatory retirement were partially retired in their main jobs while 11% were partially retired outside of their main jobs. Moreover, partial retirement increased with age. For example, in the 1975 wave, the percentage of the sample reporting partial retirement increased monotonically from 23.5 for those aged 64 to 38 at age 69 (Gustman and Steinmeier, 1984).

In 2000, Gustman and Steinmeier reexamined partial retirement using the self-reported definition of partial retirement, but this time using a different dataset, the Health and Retirement Study (HRS). In 1992, 6.3% of respondents reported themselves as partially retired, but that number rose to 12.7% by 1998.

Examining earnings is another method of defining partial retirement. Honig and Hanoch (1985), using the first three waves of the RHS, based ‘partial retirement’ on the ratio of an individual’s current earnings to maximum earnings over the entire career. If the ratio was 0.5
or less, the person was partially retired. Under this definition, nearly 20% of the sample was partially retired. Of those classified by the authors as partially retired, 39% considered themselves to be fully retired, 43% reported their status as partially retired, and the remaining 18% did not consider themselves retired at all.

Some studies have defined partial retirement by the number of hours worked. For example, Haider and Loughran (2001), using data from the Current Population Survey, found that 22% of those aged 50 to 58 and 31% of those aged 59 to 61 worked part time (less than 1,750 hours annually) from 1996 through 1998. Gustman and Steinmeier (2000) used two hours-based measures of partial retirement: usual hours worked per week (1-24 hours per week indicating partial retirement) and usual hours worked per year (1-1,199 hours per year indicating partial retirement). The usual hours per week measure found that 7% of respondents were partially retired in 1992 with an increase to 9.3% by 1998, and the use of an annual hours measure resulted in slightly higher percentages, ranging from 8.1% in 1992 to 10.6% in 1998.

Gustman and Steinmeier’s 2000 study also used job tenure to measure partial retirement. Partial retirement was defined as leaving a long-term job (long term meaning at least 10 years of tenure) for a new job. The measure of leaving a job of 10+ years resulted in 24% being classified as partially retired over the four waves of the HRS, and the definition of leaving a job of 20+ years found an average of 21% partially retired.

Combining earnings and self-reported retirement status in his study of the RHS, Ruhm (1990) was concerned that involuntary reductions in hours or wages might cause an erroneous classification of partial or full retirement. Approximately half of all workers under this definition were partially retired at some point in their lifetimes, but only about 6.2% partially retired from their career job. Ruhm also focused on the duration of partial retirement, finding that the average duration (from onset of partial retirement to full retirement) exceeded five years.

<table>
<thead>
<tr>
<th>Author(s) (Year)</th>
<th>Definition of Partial Retirement</th>
<th>% Found to be Partially Retired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gustman and Steinmeier (1984)</td>
<td>Self-Reported Status</td>
<td>33% (&quot;at some point&quot;)</td>
</tr>
<tr>
<td>Honig and Hanoch (1985)</td>
<td>Earnings &lt; 50% of Maximum Career Earnings</td>
<td>19.7%</td>
</tr>
<tr>
<td>Ruhm (1990)</td>
<td>Earnings and Self-Reported Status</td>
<td>More than 50% (&quot;at some point&quot;)</td>
</tr>
<tr>
<td>Gustman and Steinmeier (2000)</td>
<td>Self-Reported Status</td>
<td>6.6% to 12.9%</td>
</tr>
<tr>
<td></td>
<td>Usual hours worked per week</td>
<td>7.6% to 10.2%</td>
</tr>
<tr>
<td></td>
<td>Usual hours worked per year</td>
<td>8.6% to 10.9%</td>
</tr>
<tr>
<td></td>
<td>By leaving 10+ year job</td>
<td>22.7% to 26.0%</td>
</tr>
<tr>
<td></td>
<td>By leaving 20+ year job</td>
<td>19.1% to 23.8%</td>
</tr>
<tr>
<td></td>
<td>By change in hourly wage</td>
<td>10.1% to 12.6%</td>
</tr>
<tr>
<td></td>
<td>By change in weekly earnings</td>
<td>11.7% to 15.6%</td>
</tr>
<tr>
<td>Haider and Loughran (2001)</td>
<td>Less than 1,750 Hours Annually</td>
<td>From 22% for 50- to 58-year-olds to 72% for those over age 80 who still worked</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation, 2005.
3.3 Research on Phased Retirement

For this report, phased retirement means the gradual reduction of work with a long-term employer as an older employee approaches full retirement. To date, there has been relatively little research on the number of people taking part in phased retirement in the United States. Gustman and Steinmeier (1984) made one of the first distinctions between phased and partial retirement by finding that 3% of their sample were phased retirees. Subsequently, Ruhm noted that 6.2% of his sample of workers ‘were partially retired and working for their career employer’ (Ruhm, 1990: 492). More recently, Even and Macpherson (2004) found that phased retirement varies from 2.7% to 14.3% depending on the age group.

According to the ERISA Advisory Council (2000), employees who are contemplating retirement generally respond favorably to the option of phased retirement. An AARP study (2005) found that, although only 19% of surveyed older workers had heard of the term ‘phased retirement’, nearly 40% expressed interest after reading a description of it.

Similarly, Abraham and Houseman (2004) analyzed workers’ plans for the future and found significant interest by employees in reducing their hours of work. Analyzing the HRS over the first five waves, they found that 18% of respondents desired a reduction in work hours while another 5% wanted to change the kind of work they did, 25% wanted to stop work altogether, nearly 8% never wanted to stop, and more than 45% did not know or gave a different response. Of those planning to stop work, almost two-thirds did so, and 86% of those who planned to keep working continued working. However, only one-third of those desiring to reduce hours were able to do so, and only 22% of respondents who wanted to change the kind of work actually did so.

Employee responses to phased retirement can vary depending on how the program operates (see, e.g., Bertelsen, 1983; Berry, 1998). The same AARP study in which 40% of workers expressed an interest in phased retirement showed that 48% of workers said that, if being a phased retiree meant that they would have to hold a different job with the same employer, this would make phased retirement less attractive to them. In the same study, 63% of all workers indicated that phased retirement would be less attractive to them if it reduced the amount of pension benefits. Likewise, Even and Macpherson (2004) reported that workers covered by pension plans are less likely to transition to part-time work than those not covered by pension programs, and of those that do make the switch to part-time work, those with pension coverage are more likely to make a switch of employers in the process. For those workers who desire a reduction in hours or a different kind of job, some job duties may not be amenable to division or other changes (Abraham and Houseman, 2004).

On attitudes of phased retirees, Watson Wyatt Worldwide (2004) found that 57% of those workers currently in phased retirement entered into an arrangement voluntarily to have more leisure time. Of these voluntary phased retirees, 42% indicated that they chose phased retirement because they enjoyed their work while 28% stated that they needed the income from continued work. However, 32% of the phased retirees retired completely from their jobs but then returned to work part-time, and of this group 40% indicated that they entered into phased retirement for financial reasons. Almost 10% of phased retirees surveyed were forced into phased retirement through job restructuring. Almost 60% of these phased retirees said they continued to work because they needed the income.

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4 Even and Macpherson (2004) found phased retirement at 3.9% for those aged 50-54; 2.7% for those aged 55-59; 3.5% for those aged 60-61; 8.3% for those aged 62-64; and 14.3% for those aged 65 and older.

5 In a study of university faculties, the overall rate of workers leaving full-time employment increased significantly, but the increase in full retirement was small. Based on observable characteristics such as age, salary, years of service, and job characteristics, employees entering a formal phased retirement program offered by an employer more closely resembled those remaining in full-time jobs than those entering full retirement. The probability of entering into phased retirement was also related to job performance, workload, and maximization of personal income (Allen, Clark, and Ghent, 2001). One study of a large state university system found that a phased retirement program raised the odds that low-performing faculty would start the retirement process earlier (Allen, 2004).
The Watson Wyatt Worldwide survey also indicated that phased retirement might influence the timing of retirement: nearly 25% of phased retirees expected to work past age 65 and another 20% did not plan to retire at all. This comports with surveys of older workers not in phased retirement programs who answered that they would continue working longer than otherwise planned if their employer offered a phased retirement program (Watson Wyatt Worldwide, 2004; AARP, 2005). In the AARP survey (2005), 78% of older workers who expressed an interest in phased retirement anticipated that the availability of phased retirement would encourage them to work past their expected retirement age. In a different survey of employees in a state public school system, 44% of respondents indicated that they would consider delaying full retirement if a phased retirement option were made available (Bartle, 1989).

Employers also view phased retirement programs positively, but most phased retirement programs are neither broad based nor part of a formal written policy (Watson Wyatt Worldwide, 1999; Hutchens, 2003). One survey of 600 large private firms found that 16% of employers provide a formal phased retirement program, with an additional 40% interested in initiating a program (Watson Wyatt, 1999). In a study of 950 public and private organizations that employ 20 or more workers, Hutchens (2003) found that although 73% of surveyed employers permitted an employee to reduce hours before official retirement, only 14% of those employers had a formal, written phased retirement policy that applied broadly to employees. Phased retirement programs appear to be more prevalent among organizations that are smaller in size, non-unionized, and in the service sector — although larger organizations were more likely than smaller organizations to have formal programs. Colleges and universities, with their unique tenure rules, seem to be leaders in providing phased retirement programs for faculty. A survey of universities found that 27% have formal programs through which tenured faculty may make a gradual transition to retirement by working part time for a number of years before complete retirement (Ehrenberg, 2001).

Phased retirement was also likely to be offered with other types of human resource policies such as job sharing, flexible starting times, and health insurance for part-time workers (Hutchens, 2003). Nearly three-quarters of employers would alter health insurance benefits for workers who entered into phased retirement, and 34% of employers would drop health insurance coverage for phased retirees.

Significant legal, cultural, and institutional barriers stand in the way of the implementation of broad-based phased retirement programs. Complicated tax rules on distributions from, and benefit accruals under, pension plans may be preventing employers from coordinating pension benefits with a phased retirement program, although recently proposed rules from the Internal Revenue Service may alleviate some of these complexities. Moreover, it is unclear how the age discrimination laws would apply to phased retirement programs, if at all. Employers may also be concerned about employees drawing down benefits, particularly in defined contribution plans. Employers are unlikely to institute phased retirement programs, particularly broad-based programs, without greater clarity in the law and without the flexibility to adapt such programs to their own needs (Chen and Scott, 2003).

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8 U.S. Treasury Department Proposed Regulation 114726-04, Federal Register, vol. 69, no. 217, Nov. 10, 2004. The proposed Internal Revenue Service regulations generally provide for defined benefit plan distributions that are made as part of a 'bona fide' phased retirement program. A phased retiree would be able to receive a pro rata share of his or her accrued benefits based on the reduction in hours worked in phased retirement. The employee would be able to continue accruing benefits under the pension plan. The proposed regulations focus only on defined benefit pension distributions and not on other issues such as age discrimination or health insurance coverage.
REFERENCES


and May 1, Philadelphia, PA.


Part-Time Pensions and Part-Time Work in Sweden

by Eskil Wadensjö

1. Introduction

Sweden had a special partial pension scheme between 1976 and 2001. It was one of three part-time pension schemes in the social security system. The other two were a partial early old-age pension, and a partial disability pension.

The special partial pension scheme became very popular with a high take-up rate and was criticized for being too expensive. As a part of the decision on the old age pension scheme in 1994, the partial pension scheme was made less generous, and the scheme was totally abolished from the year 2001. The other two options for combining work and receiving a pension continue.

In this paper the effect on the total number of hours worked of the subsidized part-time pension system is analysed. The analysis indicates that the effect that people continue to work part-time instead of taking an early exit route is larger than the effect that people who would have continued to work full-time until ordinary retirement age instead work part-time.

2. Part-Time Pensions and Part-Time Work in Sweden

2.1 Why a policy for increasing the labour supply?

The forecasts of the demand for labour in Sweden have varied with the business cycle during most of the post-war period. This can easily be seen by studying the five-year forecasts made by the Ministry of Finance. The analysis and the recommendations vary with the year of publication. In years of prosperity the conclusion has been that the labour supply is too small and that measures have to be taken to increase the supply. In recession years the lack of demand has been in focus and that measures should be implemented to decrease labour supply. Since the of the 1980s, irrespective of the business cycle, worry that the declining share of the population who are of active age and the resultant decline in labour supply would lead to problems in financing the welfare state has dominated the debate. Many measures were also implemented in the 1990s in an attempt to increase the labour supply, but in the same decade measures were also introduced which (intentionally or not) contributed to diminishing the labour supply. Although these measures have not solved the problem, they have served to make it more visible.

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1 I am grateful to Per Gunnar Edebalk, Gabriella Sjögren Lindquist, Ann-Charlotte Ståhlberg for their comments and to Annika Sundén for her comments on an earlier version and also for comments on the ESPE conference in Bergen June 2004 and the conference on Changing Social Policies for Low-Income Families and Less Skilled Workers in the EU and the US at National Poverty Center and European Union Center University of Michigan April 2005.

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3 The term 'active age' is usually defined as the age from completion of the compulsory school to the normal (ordinary) retirement age according to the social security pension system, which is presently from 16 to 65 in Sweden. This means that what we mean by active age may vary over time (by changes in the school system and the pension system) and differs between countries. Many people who are of active age are not employed and there are those who are either below or above active age who are employed.

4 For a survey see Wadensjö & Sjögren (2000).
The reason for the changed focus of the debate is the increasing awareness that the share of older people in the population is increasing all the time and the increase is not compensated for by the decline of the share being below active age. The share of the population who are of active age is declining. This is not a new phenomenon but people have become more aware of it in recent years, perhaps as a result of that other countries, not least other EU countries, are also experiencing the same development as Sweden and we are influenced by the debate in those countries. See Table 1 for the development in some countries.

Tabella 1: The share of the population in some countries who are 65 years old and over and 80 years old and over (%)

<table>
<thead>
<tr>
<th>Country</th>
<th>1975</th>
<th>2000</th>
<th>2015</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>65+</td>
<td>80+</td>
<td>65+</td>
<td>80+</td>
</tr>
<tr>
<td>Denmark</td>
<td>13.4</td>
<td>2.4</td>
<td>14.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Norway</td>
<td>13.7</td>
<td>2.5</td>
<td>15.2</td>
<td>4.4</td>
</tr>
<tr>
<td>Sweden</td>
<td>15.1</td>
<td>2.7</td>
<td>17.3</td>
<td>5.0</td>
</tr>
<tr>
<td>France</td>
<td>13.5</td>
<td>2.5</td>
<td>16.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Germany</td>
<td>14.8</td>
<td>2.2</td>
<td>16.2</td>
<td>3.5</td>
</tr>
<tr>
<td>Italy</td>
<td>12.0</td>
<td>1.9</td>
<td>18.1</td>
<td>4.0</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>14.0</td>
<td>2.4</td>
<td>15.7</td>
<td>4.0</td>
</tr>
<tr>
<td>Japan</td>
<td>7.9</td>
<td>1.1</td>
<td>17.0</td>
<td>3.7</td>
</tr>
<tr>
<td>United States</td>
<td>10.5</td>
<td>2.1</td>
<td>12.6</td>
<td>3.3</td>
</tr>
</tbody>
</table>


There are two factors behind the development towards an ageing population. The first factor is that fertility is low, below the level leading to a non-declining population. New cohorts are smaller than earlier cohorts and the population pyramid is not a pyramid anymore. The other factor is that people are living longer. In the early decades of the 20th century, life expectancy increased primarily because child mortality and mortality among those of active age declined. Mortality in epidemic diseases was drastically reduced. During the most recent decades life expectancy has mainly increased due to the fact that those who reach retirement age live more years after reaching that age. This form of increase in life expectancy has a greater effect on the share of the population who are of old age than the earlier dominating forms of increase in life expectancy. The effect will be magnified when the baby boom cohorts from the 1940s reach retirement age. This is another reason for the present intense discussion on the effects of the ageing of the population.

As seen in Table 1, the share of those who are 80 years old and over is increasing strongly. This means that not only the pension costs but also the costs for old age care and health services will increase considerably.

The main factors behind the ageing of the population are the increase in life expectancy and low fertility. That we live longer is a very positive development. Fertility may be influenced to some extent by the family and education policy. But we should not expect any large effects and a rise in fertility will only have an effect on labour supply with a lag of about 20 years. In the first decades after an increase in the fertility rate the share of the population who are of active age will decline. The measures which may increase the number of hours worked in the economy do not influence the two main factors behind the increase of the old age share, but are targeted towards increased labour force participation among different demographic groups. This will be discussed in the next section of the paper.
3. Policies Aimed at Increasing the Number of Working Hours in the Economy

When the old age share of the population increases and the number of hours worked declines, the most obvious measures are those that counteract the decline in employment among older workers. It is not evident, however, that this is the most efficient method of increasing the number of hours worked. And even if it is, it is not the only possible way to go for increasing the number of hours worked. Following are some different methods for increasing labour supply and employment, including measures that are focused on increasing labour supply among older workers.

- On average, entry into the labour market occurs later now than some decades ago. This is partly due to the fact that the period in school has been lengthened. The nine-year period in the compulsory primary school has been prolonged by three years in secondary school for almost everyone. A gradually increasing share of the cohort also continues on to higher education. But this is only part of the explanation. Entry into the labour market is delayed by more years on average than the lengthening of the period in education. It takes a longer time to go from completed secondary school or university to employment. And many people wait a few years after secondary school before continuing on to higher education. Measures that make it easier for young people to find work after education, and easier access to university education for those who have completed secondary school may be of value.

- Labour force participation is considerably lower among some groups of active age than among other groups. Recently arrived refugees especially, have very low labour force participation and a high unemployment rate. A better policy for integrating immigrants in the labour market and society in general may be a way to increase employment. One measure that has been proposed is to encourage labour force immigration. Labour migrants are young and have a high employment rate — they are actively recruited to jobs in most cases.

- The number of hours worked is not only influenced by the labour force participation rate and the employment rate but also by to what extent people who are employed are actually working. The most common reason for absence from the work place is illness\(^4\). Measures to decrease sickness absence would, if they are efficient, be a way of counteracting the decline in the number of hours worked due to increase in the old age share of the population.

Most of the proposals, however, are focused on increasing labour supply and the number of hours worked among people of older active age (55-64) or above active age (65+). The goals regarding labour force participation among older people may be divided in three sub-goals.

- To decrease early exit from the labour force and in that way increase the number of hours worked in the economy. Early exit has tended to increase during the last decades in Sweden and even more so in many other countries. The exit follows many routes, in Sweden for example through disability pensioning\(^5\) and by pensions paid by the employer, but there are many other routes out of the labour market.

- To increase the formal retirement age. Such a change may relate either to the normal retirement age and/or to the minimum age for getting an early old age pension\(^6\). During the last two decades many countries have raised the retirement age in at least one of these two respects. In several countries the previous lower retirement age for women has been raised to the same age as for men. Some countries with a retirement age lower than 65 have raised it to 65. In the U.S. a decision was made to raise the retirement age gradually from 65 to 67. This was decided already in 1983 and the first enhancement to 65 years took place in 2002 for those born in 1937. The first cohort who will retire at age 67 will be those who were born in 1955 for which the ‘normal’ retirement year will be 2022.

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\(^4\)See the different papers in Swedenborg (2003).
\(^5\)The disability pension system and also the names of the different forms of disability pensions were changed from January 2003.
\(^6\)See Turner (2003) for a survey of recent increases of the lowest possible age for an old age pension which have been made in various countries.
• To facilitate work after the formal retirement age. In some countries many people continue to work after retirement age. In the U.S., mandatory retirement for those up 70 years of age was prohibited in 1978. In 1987 mandatory retirement was prohibited also for those 70 years and older with only a few exceptions. Income testing for those who are 65 years and older was discontinued from the year 2000. Income testing remains for those whose age ranges from 62 to 65. In Sweden the law on employment security has been changed to hinder the earlier common mandatory retirement at age 65. The new age limit has been set to 67 years. However, it will not be possible to get unemployment benefits after the age of 65 and sickness benefits only to a limited extent after the age of 657.

How does a part-time pension system fit into that system of reforms? In a formal sense a part-time pension means that instead of continuing full-time work, a person changes to part-time work some years before full-time retirement, i.e. a reduction in the number of hours worked. Might such a working-time reduction lead to that more hours are worked in the economy in practice? We will now proceed to this question.

4. Effects of a Part-Time Pension System on Labour Supply, Employment, and Number of Hours Worked

If everyone had continued to work until 65 years of age, the introduction of a part-time pension system would have reduced the labour supply if measured by the number of hours worked. However, it is more complicated than that. Many people leave the labour force before the normal retirement age. Some do so early but many do so when they are 60-65 years old. In the same age span it was possible to get a part-time pension (in 1994 the lower age limit was raised to 61 years). It is not unlikely that the part-time pension leads to people continuing to work more years than if they had not had that option. In that case we will get two effects going in the opposite directions.

The discussion on the partial effects of the part-time pension system has had both a medical and an economic basis. It is possible to combine the two types of analysis.

The starting point for the medical analysis is that there is a change in the work capacity with age. Research in this field indicates that the maximum capacity in many cases is the same well above the age of 60, but that the ability to work at maximum capacity for an extended period of the day or week may be lower for older people than for younger ones. If the work is organized in a way that it requires use of the maximum capacity during a large part of the workday it may lead to problems for older workers. A negative solution, at least from the point of view of increasing labour supply, is that older workers leave the labour force with a disability pension or with other forms of economic support. A more positive solution is to adjust work tasks, work speed and working hours according to age. One example is a change from full-time to part-time work. An indication that people could continue to work if the working conditions were adjusted is given by the results of Statistics Sweden’s survey of work environment. See Table 2. The answers in the table indicate that a shorter work-week is only one of several possible ways of changing the working conditions8.

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7 For those who have reached the age of 65 but not yet 70 and who have received sickness benefits for 180 days, the insurance society may decide that they should no longer be eligible for sickness benefits. Those who are 70 years and older and still work may only get sickness benefits for 180 days.

8 A comparison of the work environment studies of 2001 and 2003 shows that the share of those who believe that it will not be possible to work until ordinary retirement age in the present occupation declined to a great extent between 2001 and 2003.
Tabella 2: Possibilities of being able to work until the ordinary retirement age among people aged 50-64 years

<table>
<thead>
<tr>
<th>Currently have difficulties in fulfilling the work tasks due to age</th>
<th>Uomini (%)</th>
<th>Donne (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.7</td>
<td>8.4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Believe that it will not be possible to work until ordinary retirement age in the present occupation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.7</td>
<td>14.7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes that have to be made to make it possible to continue in the present occupation until ordinary retirement age among those who do not believe it will possible to work until ordinary retirement age</th>
<th>Blue collar</th>
<th>White collar</th>
<th>Blue collar</th>
<th>White collar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorter working hours</td>
<td>53.3</td>
<td>49.8</td>
<td>48.9</td>
<td>66.9</td>
</tr>
<tr>
<td>Change in the lay-out of the working hours</td>
<td>18.6</td>
<td>21.5</td>
<td>21.4</td>
<td>24.0</td>
</tr>
<tr>
<td>Changes in the physical working requirements</td>
<td>45.6</td>
<td>15.5</td>
<td>49.6</td>
<td>22.3</td>
</tr>
<tr>
<td>Changes in psycho-social working environment</td>
<td>25.3</td>
<td>36.8</td>
<td>35.7</td>
<td>54.9</td>
</tr>
<tr>
<td>Changes in the work intensity</td>
<td>50.2</td>
<td>51.6</td>
<td>51.1</td>
<td>65.2</td>
</tr>
</tbody>
</table>


There are arguments in favour of adjusting the working conditions for older workers, but why are these adjustments not taking place? Employees and employers could agree on reduced working hours for example. One explanation may be that there are economic arguments on the local level favouring other types of solutions.

A reduction in working hours which is combined with a part-time old age pension from the social security pension scheme means a reduction in the pension paid out both before and after the take up of the pension. More important is probably that the collectively bargained occupational pensions boost the effects to a high extent. The explanation is that the compensation in the social security pension scheme for income parts over the ceiling is based on the earnings in the years immediately before retirement\(^9\). For example, a change to half-time work means that the basis for that pension is drastically reduced and the pension will be much lower\(^10\). A disability pension is economically a much better alternative. The take-up of a disability pension means that the old age pension from the social security and occupational pension systems will not be reduced, and also in most cases to a higher compensation before 65. Other forms of early exit from the labour market that build on different forms of compensation may also be economically attractive. An alternative would be if the employer could offer half-time pensions instead of full-time pensions when reducing personnel and maybe also in other instances. There may be some complications for the employer. More people have to leave to get the same reduction in hours worked and it could lead to problems with organizing work. To make solutions attractive the collectively bargained occupation pension schemes have to be adjusted.

A problem is that unsubsidized part-time work is an economically unattractive alternative for many people compared to full-time exit with compensation from social and occupational

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\(^9\)The pension for earnings over the ceiling in the social insurance system depends in the occupational pension system for those in the state sector on the earnings in the five years before the retirement age, for those employed in the counties and municipalities on the best five of the last seven years before retirement, and for white-collar workers in the private sector on the earnings in the year before retirement.\(^9\)

\(^10\)For another example of the possibility that pension schemes may hinder part-time work see Even and Macpherson (2004).
insurance schemes. Subsidized part-time pension, which was introduced in 1976, was economically very attractive. For many a part-time pension from the special part-time system was combined with compensation from complementing occupational insurances, giving replacement for income parts over the ceiling in the social insurance part-time pension scheme. The occupational old age pension schemes were also adjusted to compensate for the reduction in occupational pensions due to the working-time reduction. Before continuing with a discussion on how to study the effects of the part-time system we will say something about the kind of effects we may expect.

- The first effect is the effect we started with. Some people who would have continued to work up to the ordinary retirement age will accept the offer of a part-time pension. The income loss for the individual is compensated by more leisure time. The importance of the replacement rate may be seen by the large changes in new pensions following changes in the replacement rate.

- The other effect is also mentioned earlier in the paper: If the opportunity arises to get a part-time pension, some people will take that pension instead of leaving the labour market with a disability pension or another form of early exit compensation. The alternative part-time pension and early exit with compensation in one or another form may not be exactly coordinated in time. For example, a person may abstain from applying for a disability pension at age 60, if he knows that he may be able to get a part-time pension at age 61 (may be encouraged to continue to work full-time when the part-time pension option is close in time). A person may also abstain from applying for a disability pension at the age of 62 if he has been part-time pensioned at the age of 61 (the part-time pension may make it attractive to continue to work).

- A third effect of the part-time pension system is that it can influence labour force participation both directly and indirectly (through the labour supply decision). Part-time work may lead to a better health condition for example (compared to full-time work and maybe also compared to full-time leisure). Absence due to sickness (with sickness benefits) may therefore be lower and perhaps also the number of people who later apply for a disability pension. It may lead to a positive effect for the number of hours worked in the economy.

The conclusion of this discussion is that the total effect of the introduction of a part-time pension on labour supply is uncertain. There are different effects that work in different directions. Empirical studies are necessary to say if the total effect is positive or negative. They are not easy to carry out as the labour supply and changes in labour supply are influenced by many other things than the introduction of a part-time pension system. We shall try to answer the question in several different ways. First we will discuss in general terms how part-time work and labour force participation are related to each other. After that we will discuss some experiences from countries other than Sweden. In the next step we try to estimate the effects by making use of existing studies and data from the National Insurance Board.

5. Part-Time Work and Labour Force Participation

The critical question is if a part-time pension system leads to a higher or lower number of hours worked in the economy. To answer that, certain questions have to be posed. The first question is if the part-time pension system leads to more people being employed. The second question is how the number of hours worked per person is influenced. The combined answer to those two questions tells us how the total number of hours in the economy is influenced by the introduction of the scheme.

Part-time work is common in our economies not only among older people. We can learn something from the experiences of part-time work among other demographic groups. I will
give some examples on experiences from part-time work below.

Women often work part-time in many countries, more so than men in the same age groups. Is part-time work among women combined with high or low labour force participation? This question has been dealt with by Jelle Visser (2002), who studies the pattern in the EU countries, and especially the development in the Netherlands. He finds a strong positive correlation between the share of women who work part-time and the number of women who are employed. In countries like Greece, Italy and Spain few women are employed and a low share of them are working part-time, while in countries like Denmark, Sweden and the United Kingdom many women are working part-time and the female employment rate is high. In the Netherlands a rapid expansion of part-time work has been accompanied by a rapid rise in the female employment rate. One interpretation of the development is that in countries in which women previously had a low employment rate, they now enter the labour market by part-time work, and that the possibilities of getting part-time work facilitate that process. Sweden had such a development in the 1970s and the 1980s, when the female employment rate rose at the same time as the part-time rate among employed women increased. During the last two decades more women have started to work full-time (or long part-time) in Sweden, and the female employment rate has continued to be high. According to Visser it is not self-evident that the development will go the same way in the Netherlands as in Sweden. The Netherlands may continue to be a part-time country on a permanent basis.

Young people are another group who often work part-time. In many cases part-time work is combined with (full-time) studies in high school or university. As mentioned earlier the transition from education to permanent jobs is taking place at a gradually higher age. However, there are large differences in labour force participation between different countries. Countries that have early entry into the labour force are mainly those who have an apprenticeship system (not only during the years the apprenticeship lasts) and those where it is common to work alongside studying. Both cases indicate that an early introduction of part-time work with part-time (or full-time) studies may be a way of increasing labour supply.

A third group of part-time workers are those who combine part-time work with a part-time disability pension. In Sweden it is rather common to combine work and a disability pension (granted on medical indications) and the share of the disability pensions which are part-time pensions has increased. An important question is how the existence of this option influences the labour supply. Cross-country comparisons indicate that labour force participation is relatively high among disabled people in Sweden.

The experiences accounted for here do not show that a high rate of part-time work necessarily implies that the rate of full-time work is reduced to the same extent. The total share of employed people may be higher. If this means that the total number of working hours is higher in countries with a high incidence of part-time work is another question. There are good arguments for carrying out a study of the same type as Visser’s (2002), and this time compare the share of part-time employment and the employment rate among people of older active age. Is it so that countries that have a high part-time employment rate among older people also have a high employment rate in the same age group?

We have done such a study based on observations for the EU countries for the period 1990-2003. The results are given in Tables 3 and 4 below. In both tables the part-time share is the independent variable and the employment rate the dependent variable. Table 3 shows OLS estimates with controls for country and year of observation. In Table 4 fixed effect models are estimated (fixed effects for countries). The main results are that the sign of the coefficient for

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11 See also Rasmussen et al. (2004) for the development of part-time work among different groups in New Zealand, the Netherlands and Denmark.
12 See for example Ryan et al. (1991).
the part-time share is positive, as expected, in all estimations and that the estimates are significantly different from zero. The value of the coefficient for the part-time share is higher for those aged 55-59, especially for men, than for those aged 60-64.

6. The Swedish Part-Time Pension System

As mentioned earlier there are only a few studies of the Swedish part-time system other than those that are based on aggregated data\(^{13}\). One exception is Sundén (1994) whose study is based on the Level of Living Investigations (LNU) from 1974 and 1981. In the next section I will use results from Sundén’s study together with calculations based on data from the National Social Insurance Board to estimate the effects of the part-time pension system. In this section information on the part-time pension system and part-time work in Sweden will be presented.

The part-time pension system was introduced in 1976. The part-time pension system was complemented with additional occupational part-time pensions for the main part of the employees (the main exception was blue-collar workers in the private sector). The part-time

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pension system became very popular in a short time. Many applied for and received a part-time pension. The most important steps in the development of the part-time pension system are presented in Table 5. The replacement rate changed on three occasions. It was first lowered and later restored to its original level. In 1994 it was lowered again at the same time as other changes were made, changes which were the first steps towards the abolishment of the system. This was a part of the agreement on the new system for old age pensions. In accordance with that agreement, no new part-time pensions have been granted since year 2000.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1, 1976</td>
<td>The part-time pension system started</td>
</tr>
<tr>
<td></td>
<td>• it was possible to get a part-time pension from 60 years of age</td>
</tr>
<tr>
<td></td>
<td>• the replacement rate was 65% of the loss in earnings</td>
</tr>
<tr>
<td></td>
<td>• the minimum reduction was 5 hours</td>
</tr>
<tr>
<td></td>
<td>• remaining working time had to be at least 17 hours and not more than 35 hours</td>
</tr>
<tr>
<td></td>
<td>• it was financed by a special payroll fee</td>
</tr>
<tr>
<td>January 1, 1980</td>
<td>It was possible for self-employed people to get a part-time pension; working hours had to be reduced by at least half</td>
</tr>
<tr>
<td>January 1, 1981</td>
<td>The replacement rate decreased to 50%</td>
</tr>
<tr>
<td>July 1, 1987</td>
<td>The replacement rate increased to 65%</td>
</tr>
<tr>
<td>July 1, 1994</td>
<td>Several types of restrictions</td>
</tr>
<tr>
<td></td>
<td>• the minimum age increased to 61 years</td>
</tr>
<tr>
<td></td>
<td>• the replacement rate decreased to 55%</td>
</tr>
<tr>
<td></td>
<td>• the maximum reduction of working hours was set to 10 hours</td>
</tr>
<tr>
<td></td>
<td>(the requirement that the self-employed with a part-time pension could not work more than half-time was abolished)</td>
</tr>
<tr>
<td>January 1, 1999</td>
<td>The special payroll fee was discontinued</td>
</tr>
<tr>
<td>December 31, 2000</td>
<td>Last day for the start of a new part-time pension</td>
</tr>
</tbody>
</table>
Table 6: New and all part-time pensions 1990-2000

<table>
<thead>
<tr>
<th>Year</th>
<th>new part-time pension men*</th>
<th>new part-time pension women*</th>
<th>total number part-time pensions men (in December)</th>
<th>total number part-time pensions women (in December)</th>
<th>total number part-time pensions (in December)</th>
<th>part-time pensions per 100 persons aged 60-64 with sickness benefits entitled earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>14792</td>
<td></td>
<td>10124</td>
<td>4436</td>
<td>14560</td>
<td>7</td>
</tr>
<tr>
<td>1977</td>
<td>20337</td>
<td></td>
<td>22131</td>
<td>9378</td>
<td>31509</td>
<td>12</td>
</tr>
<tr>
<td>1978</td>
<td>18494</td>
<td></td>
<td>29149</td>
<td>12764</td>
<td>41913</td>
<td>16</td>
</tr>
<tr>
<td>1979</td>
<td>18243</td>
<td></td>
<td>33415</td>
<td>15239</td>
<td>48654</td>
<td>22</td>
</tr>
<tr>
<td>1980</td>
<td>32882</td>
<td></td>
<td>46504</td>
<td>21333</td>
<td>67837</td>
<td>27</td>
</tr>
<tr>
<td>1981</td>
<td>12521</td>
<td></td>
<td>43331</td>
<td>21310</td>
<td>64641</td>
<td>24</td>
</tr>
<tr>
<td>1982</td>
<td>14641</td>
<td></td>
<td>40415</td>
<td>21317</td>
<td>61732</td>
<td>22</td>
</tr>
<tr>
<td>1983</td>
<td>10497</td>
<td></td>
<td>34458</td>
<td>20179</td>
<td>54637</td>
<td>20</td>
</tr>
<tr>
<td>1984</td>
<td>9794</td>
<td></td>
<td>28488</td>
<td>18716</td>
<td>47204</td>
<td>17</td>
</tr>
<tr>
<td>1985</td>
<td>9233</td>
<td></td>
<td>21912</td>
<td>15726</td>
<td>37638</td>
<td>13</td>
</tr>
<tr>
<td>1986</td>
<td>8184</td>
<td></td>
<td>18560</td>
<td>13620</td>
<td>32180</td>
<td>12</td>
</tr>
<tr>
<td>1987</td>
<td>14712</td>
<td></td>
<td>21404</td>
<td>14332</td>
<td>35736</td>
<td>13</td>
</tr>
<tr>
<td>1988</td>
<td>13964</td>
<td></td>
<td>23471</td>
<td>15001</td>
<td>38472</td>
<td>15</td>
</tr>
<tr>
<td>1989</td>
<td>12383</td>
<td></td>
<td>23856</td>
<td>15355</td>
<td>39211</td>
<td>15</td>
</tr>
<tr>
<td>1990</td>
<td>7077**</td>
<td>4228</td>
<td>23200</td>
<td>14868</td>
<td>38068</td>
<td>15</td>
</tr>
<tr>
<td>1991</td>
<td>7469</td>
<td>4623</td>
<td>22390</td>
<td>14462</td>
<td>36852</td>
<td>15</td>
</tr>
<tr>
<td>1992</td>
<td>15374</td>
<td>10082</td>
<td>29268</td>
<td>18683</td>
<td>47951</td>
<td>19</td>
</tr>
<tr>
<td>1993</td>
<td>9575</td>
<td>6484</td>
<td>29907</td>
<td>18701</td>
<td>48608</td>
<td>19</td>
</tr>
<tr>
<td>1994</td>
<td>9261</td>
<td>6584</td>
<td>30959</td>
<td>19614</td>
<td>50373</td>
<td>22</td>
</tr>
<tr>
<td>1995</td>
<td>499</td>
<td>373</td>
<td>23525</td>
<td>14608</td>
<td>38133</td>
<td>17</td>
</tr>
<tr>
<td>1996</td>
<td>449</td>
<td>377</td>
<td>15874</td>
<td>9518</td>
<td>25932</td>
<td>11</td>
</tr>
<tr>
<td>1997</td>
<td>821</td>
<td></td>
<td>8768</td>
<td>4834</td>
<td>13602</td>
<td>6</td>
</tr>
<tr>
<td>1998</td>
<td>1258</td>
<td></td>
<td>3685</td>
<td>1995</td>
<td>5680</td>
<td>3</td>
</tr>
<tr>
<td>1999</td>
<td>No information for 1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>7699**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Sources: Riksförsäkringsverket, Delpensioneringen t o m 1996, Statistikinformation Is-I 1997:2, and information from The National Insurance Board.


Table 6 shows the development over time of the number of people with compensation from the special part-time pension system. The variations are large, especially in the number of new pensions. The large increase in 1980 is explained by the decision to lower the replacement rate for newly granted pensions from 1981, a decision which was made already in 1980. Many of those who would have applied for a pension later hurried to apply already in 1980 to be able to get a pension with the old, higher replacement rate.

The increase in 1987 is explained by the increase in the replacement rate back to the original 65% level. The large increase in new pensions in 1992 is explained by the Government’s proposition of an abolishment of the part-time pension system (no new part-time pensions would be granted for those who had applied after a certain date. Many hurried to apply for a part-time pension. The Parliament, however, did not accept the proposal from the Government. After the drastic changes in the rules in 1994 the number of new part-time pensions declined dramatically and the number of part-time pensioners gradually fell to a very low level. The part-time pension system more or less disappeared before it was formally abolished.

A part-time pension combined with part-time work does not entail a fixed number of working hours. The minimum was set to 17 hours and the maximum to 35. Table 7 shows the
number of working hours for those who had a part-time pension on December 31, 1993. The
information is from the period before the maximum reduction in working hours was changed
to ten hours for those with a new part-time pension.

Table 7: The number of people according to (weekly) working hours after getting
a part-time pension among those who had a part-time pension December 31, 1993

<table>
<thead>
<tr>
<th>Numbers of hours worked</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>586</td>
<td>698</td>
</tr>
<tr>
<td>18</td>
<td>424</td>
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<td>19</td>
<td>873</td>
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</tr>
<tr>
<td>20</td>
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<td>5467</td>
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<td>330</td>
<td>251</td>
</tr>
<tr>
<td>22</td>
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<td>23</td>
<td>511</td>
<td>531</td>
</tr>
<tr>
<td>24</td>
<td>3749</td>
<td>1678</td>
</tr>
<tr>
<td>25</td>
<td>387</td>
<td>459</td>
</tr>
<tr>
<td>26</td>
<td>193</td>
<td>245</td>
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<td>27</td>
<td>204</td>
<td>202</td>
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<tr>
<td>28</td>
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<td>523</td>
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<tr>
<td>29</td>
<td>141</td>
<td>323</td>
</tr>
<tr>
<td>30</td>
<td>1048</td>
<td>1347</td>
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<tr>
<td>31</td>
<td>462</td>
<td>647</td>
</tr>
<tr>
<td>32</td>
<td>5693</td>
<td>3301</td>
</tr>
<tr>
<td>33</td>
<td>299</td>
<td>182</td>
</tr>
<tr>
<td>34</td>
<td>323</td>
<td>260</td>
</tr>
<tr>
<td>35</td>
<td>266</td>
<td>233</td>
</tr>
<tr>
<td>Total</td>
<td>26701</td>
<td>18003</td>
</tr>
</tbody>
</table>

Source: Calculations made at the National Insurance Board14.

Table 8: People aged 60 (61)-64 years in different partial pension systems

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Disability pension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/3</td>
<td>1400</td>
<td>2512</td>
<td>1110</td>
<td>2246</td>
</tr>
<tr>
<td></td>
<td>4219</td>
<td>2854</td>
<td>7214</td>
<td>6030</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>144</td>
<td>953</td>
<td>1156</td>
</tr>
<tr>
<td></td>
<td>9460</td>
<td>13594</td>
<td>1481</td>
<td>4156</td>
</tr>
<tr>
<td>Early old age pension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>416</td>
<td>79</td>
<td>2927</td>
<td>310</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>1985</td>
<td>2</td>
<td>291</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>35</td>
<td>654</td>
<td>777</td>
</tr>
<tr>
<td>Part-time pension</td>
<td>46504</td>
<td>21333</td>
<td>18506</td>
<td>13620</td>
</tr>
<tr>
<td>Total</td>
<td>52123</td>
<td>23929</td>
<td>29811</td>
<td>22206</td>
</tr>
</tbody>
</table>


14 The calculations were made in connection with the study which was published as Wadensjö (1996).
7. An Estimation of the Effects of the Part-time Pension System on the Number of Hours Worked

It is difficult to estimate the effects of the part-time pension system on the number of hours worked. It is necessary to ascertain what the part-time pensioners would have done had they not had the part-time pension option, and we also need information on the number of hours worked before and after taking a part-time pension. I will attempt to make an estimation of the total effects but must underline that the calculations are based on data which is not perfect for the task. Figures have been used on the number of hours worked before and after receiving a part-time pension which the National Insurance Board has calculated in connection with an earlier study of the part-time pension scheme, and also estimations from Sundén (1994) on what the part-time pensioners would have done had they not had the option of a part-time pension.

First we will look at the number of hours worked before and after taking up a part-time pension. Values for the years 1991 and 1994 are shown in Table 9\textsuperscript{15}. The people worked on average slightly less than 40 hours a week before taking up a part-time pension — women somewhat fewer hours than men. According to the data from the National Insurance Board, a not insignificant number of people were working more than 40 hours before taking a part-time pension, in some cases many hours more. As it is not clear how these high numbers of working hours should be interpreted, the calculation has been made using the figures received and by assuming that those with a work-week of more than 40 hours worked 40 hours. As seen in the table, the differences between the results given by the two methods are not large.

After taking a part-time pension people worked on average 24-25 hours — women somewhat more hours than men. Therefore, the reduction in working hours is less for women than for men (women work fewer hours before taking a part-time pension and more hours afterwards). The next step, also shown in the table, is to calculate the maximum share of those who could have continued to work as much as before if they had not taken a pension, without leading to a reduction in the total number of hours worked. We see that this share is slightly more than 60% for men and around 65% for women. (The share would have been 50% if part-time pensioning on average had meant a change from full-time to half-time work, but that is not the case according to the information available). If the share of those who otherwise would have continued to work as much as before is higher than those percentages, the total number of hours worked will decline; conversely, if the shares are lower, the total number of hours will increase.

\textsuperscript{15}I have also had access to the corresponding information from 1992 and 1993 but as the variations are small between the years I have chosen to only present the results for two of the four years).
Table 9: Average number of working hours before and after being granted a part-time pension, and the share of the part-time pensioners who at most may have chosen part-time pension instead of continuing to work the same number of hours as before the pension if the total number of working hours did not decline

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>1991</th>
<th>Women</th>
<th>All</th>
<th>Men</th>
<th>1994</th>
<th>Women</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of working hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>before getting a part-time pension</td>
<td>39.95</td>
<td>37.82</td>
<td>39.09</td>
<td></td>
<td>39.88</td>
<td>37.89</td>
<td>39.08</td>
<td></td>
</tr>
<tr>
<td>Number of working hours on average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>before getting a part-time pension under the assumption that those who have a reported working week of more than 40 hours have a work-week of 40 hours</td>
<td>39.66</td>
<td>37.72</td>
<td>38.88</td>
<td></td>
<td>39.64</td>
<td>37.78</td>
<td>38.89</td>
<td></td>
</tr>
<tr>
<td>Average number of working hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for those with a part-time pension</td>
<td>24.00</td>
<td>24.18</td>
<td>24.07</td>
<td></td>
<td>24.75</td>
<td>25.06</td>
<td>24.87</td>
<td></td>
</tr>
<tr>
<td>Share of the part-time pensioners who at most may have chosen a part-time pension instead of continuing working the same number of hours as before getting a pension if the total number of working hours did not decline (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60.1</td>
<td>63.9</td>
<td>61.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of the part-time pensioners who at most may have chosen a part-time pension instead of continuing working the same number of hours as before getting a pension if the total number of working hours did not decline (%)</td>
<td>62.1</td>
<td>66.1</td>
<td>63.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same share calculated under the assumption that those who have a reported working week of more than 40 hours have a work-week of 40 hours (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60.5</td>
<td>64.1</td>
<td>61.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62.4</td>
<td>66.3</td>
<td>63.9</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

It is possible to illustrate the method with an example. Assume that before taking up a part-time pension everyone works 39 hours a week and they all work 24 hours after pensioning. This means that the person who works part-time instead of ‘full-time’ as a result of the offer of a part-time pension diminishes his labour supply by 15 hours (39 minus 24), and that the person who — without the option of a part-time pension — would have left the labour market, increases his labour supply by 24 hours (24 minus 0). In this example which is close to the information we have, the second effect is larger than the first one per person. It means that less than a 50% change from leaving the labour force to working part-time is needed to get a net addition to the labour supply.

How large is the share of those who would have continued to work to the same extent in the absence of the part-time system? Sundén (1994) analyzed the choice the individual would have made in the absence of the part-time pension system using data from the Level of Living Surveys (LNU) from 1974 and 1981 supplemented with register data. Her results indicate that the part-time pension system has reduced both the number of people who work full-time and the number of those who leave the labour market before reaching the ordinary retirement age (mainly by the disability pension system). The change from full-time work (until ordinary retirement age) to part-time work is the most frequent change for men (56.59% of the men taking up part-time pension) but not for women (42.39% of the women taking up a part-time pension). In both cases the values are below the percentages calculated above. It indicates that the number of hours worked increases as a result of the part-time pension system. However, note that the calculations build on information from the different decades and the pattern may have changed from the 1980s to the 1990s. As Sundén stresses, it would also be very interesting to use the later waves of the Level of Living Surveys (from 1991 and 2000).
The analysis is further developed in Table 10. We estimate the change in the average number of hours worked by using the information on the hours worked before and after being part-time pensioned, and the values from Sundén (1994) about the alternative employment status if the part-time pension system had not existed. Both the positive effect (working part-time instead of being full-time retired) and the negative one (a reduction of the working time) are in that way included. The table shows that the average number of working hours per part-time pensioned increases by 4-5 hours. The number is considerably higher for women (8.2-9.0 hours) than for men (1.4 -2.3 hours). The total effect also depends on the number of people who take up a part-time pension, and the number of part-time pensioners was considerably higher in 1994 than in 1991. The effect in 1991 was close to 6.7 million working hours and in 1994 almost 10.6 working hours.

Table 10: Estimated effect on the number of hours worked per person with part-time pension given that 56.59% of the male and 42.39% of the female part-time pensioners would have continued to work the same number of hours (in most times full-time work) before getting the pension and otherwise would not have worked.

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th></th>
<th>1994</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>All</td>
<td>Men</td>
</tr>
<tr>
<td>Estimated working hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>effect per week per</td>
<td>1.39</td>
<td>8.15</td>
<td>4.12</td>
<td>2.22</td>
</tr>
<tr>
<td>part-time pensioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total effect in thousands</td>
<td>1310</td>
<td>5198</td>
<td>6507</td>
<td>2758</td>
</tr>
<tr>
<td>of hours during the year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated working hours</td>
<td>1.56</td>
<td>8.19</td>
<td>4.23</td>
<td>2.32</td>
</tr>
<tr>
<td>effect per week per</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>part-time pensioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>under the assumption that</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>those who have a reported</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>working week of more than</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40 hours have a work-week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of 40 hours (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total effect in thousands</td>
<td>1472</td>
<td>5220</td>
<td>6691</td>
<td>2884</td>
</tr>
<tr>
<td>of hours during the year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>under the assumption that</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>those who have a reported</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>working week of more than</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 hours have a work-week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of 40 hours (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Calculated by using information from Sundén (1994) regarding the shares who would have continued to work to the same extent if not getting a part-time pension and from Table 9 regarding the number of hours worked before and after getting a part-time pension. Note. The number of work-weeks is assumed to be 45 in a year (52 weeks minus vacation and public holidays).

To conclude: the effect of the part-time pension system is an increase in the number of hours worked in the economy, especially among women. It should be underlined that it is important to continue studies in the field by using databases that contain more individuals and cover a longer time period.

8. Summary and Conclusion

Sweden had a subsidized social security part-time pension system from 1976 up to the turn of the century. It was a part of the social security system and was financed by a pay-roll fee. A take up of a part-time pension did not influence the old age pension (from the age of 65). There were additions to the part-time pensions from the social security part-time pension system in three of the four main collective bargaining areas (state employees, for those employed by the counties and municipalities, and for white-collar workers in the private sector).

From the start of the new scheme the part-time pension was an option for employees who were 60 years or older (up to the age of 65). The minimum reduction of working hours was 5 hours, the minimum remaining working hours 17 and the replacement rate 65% of the earnings.
lost due to the reduction hours. With a progressive income tax system the actual replacement rate was in fact higher. To be able to get a part-time pension the employer had to give his consent. The system became very popular in a short time. Many people applied and the employers were generally positive. The employers saw it as a possibility to restructure and rejuvenate the work force without being forced to pay a severance pay or to go through complicated negotiations with the unions.

The part-time pension was a sensitive political issue leading to a row of conflicts. The Social Democratic Party, who introduced it, was in favour of it and the Liberal and Conservative parties were against it. The system changed in 1981 after a proposal to the Parliament by the then Liberal-Conservative government. The replacement rate was lowered to 50%. The number of new pensions declined substantially. A Social Democratic government took office after the election in 1982 and after some years, in 1987, the replacement rate was enhanced back to 65%. The number of new pensions increased again. A lesson from these election outcome-initiated changes in the part-time pension system is that the replacement rate is very important for the share of those entitled who are applying.

After the election of 1991 a new Liberal-Conservative government was formed. It tried both to lower the replacement rate and to abolish the system totally. The government’s proposal in both cases lost in Parliament due to a small right-wing party which had some seats in the parliament in the period 1991-1994 and in almost all issues supported the Liberal-Conservative government in this case supported the Social Democratic opposition.

The part-time pension did however change in the 1990s. As a part of the reform of the old age pension system and as part of a compromise between the Liberal-Conservative government and the Social Democratic opposition, the part-time pension plan came to an end in two steps. The formal motivation was that a subsidized part-time pension was not in accordance with the general principles of the new old age pension system — that the pensions should be based on life-time earnings.

As mentioned, the dismantling of the part-time pension took place in two steps. In 1994 the scheme was made less favourable in several respects. The maximum reduction of hours was set to 10, the replacement rate was lowered to 55%, and the lowest eligible age was increased from 60 to 61. The number of applications became very low. For the first year it could be explained by the fact that in that year no new people became eligible due to the increase in the lowest retirement age by one year and that most of those who took a part-time pension started to do so upon reaching the age of 60. But the number of people applying for a part-time pension continued to be few. Then in the second step (already decided on in 1994) no new part-time pensions were granted from January 1, 2001.

A part-time pension system may induce some people to work part-time instead of full-time and others to work part-time instead of leaving the labour market. The effect in hours worked in the economy also depends on the number of hours worked before starting to work part-time (or leave the labour market) and the number of hours worked when taking a part-time pension. The study shows that the total effect is an increase in the number of hours worked and that this effect is larger for women than for men. There may be other effects: the financing of the system (payroll fees) may have effects on labour supply, and the take-up of a part-time pension (instead of working full-time) may influence the health status and by that the incidence of future take-ups of a disability pension.

To summarize, there are some findings from the large-scale and long Swedish experiment with a part-time pension scheme:

1. The number of people who apply varies considerably with the replacement rate but is also sensitive to other rules, for example rules regarding how many hours of working-time reduction it is possible to get compensation for.
2. There are effects going in different directions: some people make a choice of working part-time instead of full-time and some people work part-time instead of leaving the labour market.

3. The estimated effect is that the part-time pension system increased the number of hours worked.

A part-time pension system has now been re-introduced for one important group in the labour market – the state employees. It is closely modelled after the former part-time pension system. Some private employers have also introduced part-time pension systems of their own. It should also be added that there is a part-time pension option in the new old age pension system as well as in the former old age pension system. But part-time pensions according to this option are not subsidized, and lead to an actuarially reduced old age pension. There also exist part-time pensions in the disability pension system. The number of partial pensions has tended to increase in those two systems.

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Is the Fertility Decline a Consequence of the Growth of the Welfare State? Evidence from Historical Data

by Mikko Puhakka* and Matti Viren**

1. Foreword

The demographic structures of many European and Western economies are changing substantially. Low fertility and longer expected lifetimes are behind this fundamental transformation. Both are presumed to have a substantial effect e.g. on fiscal policy. In fact, ageing and fertility decline are currently considered to be the main problems in Europe and other industrialised economies. A report by the European Commission (see Oksanen 2003, p. 11) goes even so far as stating that “the increase in public expenditure is mostly caused by declined fertility and increasing longevity…”

Both ageing and fertility decline are taken as ‘facts of life’, which cannot be affected by any policies. In other words, they are exogenous. Moreover, these changes are usually considered to be ‘problems’, which sounds somewhat surprising. At least an increase in the life-span is usually thought to increase individual’s lifetime utility and well-being. Why is it now a problem?

The exogeneity assumption might be true more with ageing, but definitely not with fertility as we argue below. But how does fertility change? Obviously, any change requires non-marginal change in institutions and relevant variables, but we cannot simply rule out all possibilities of affecting fertility behaviour even in the medium run. Both historical data and cross-country comparisons show that there are (have been) huge differences in fertility behaviour.

In this paper we try to summarize some key relationships which seem to exist between fertility and the key background variables. In particular, we pay attention to the size of the welfare state (and within the welfare state, the pension system). We present some empirical evidence that the fertility decline is related to the expansion of the government and its activities. Our evidence might help in designing policies, which will have less harmful effects on labour supply (retirement age) and fertility. If our thesis is correct, it would be dangerous for governments to try and solve the fiscal problems due to ageing with higher taxes and larger transfers, since fertility decline might still accelerate further, and make matters actually worse.

We proceed as follows. In section 2 we scrutinize the relationship between key determinants of fertility. In section 3, we delve deeper into the determinants of fertility by discussing how the relationships may change when we, instead of pair wise correlations, look at conditional correlations. Finally, some conclusions are drawn mainly for policy purposes in section 4.
2. What Determines Fertility?

Our thesis is not a new one. Rosati (1996), Ehrlich, and Lui (1998), and Boldrin, De Nardi and Jones (2005) show that fertility should be negatively correlated with e.g. social security. The intuition for these results is quite clear. In less developed old societies without the welfare state and relatively undeveloped capital markets people had few means for supporting themselves in the old age. They could try to work until the very last day, or they could invest in children who had an obligation to support their parents in the old age. Because all generations mainly lived close to each other and depended on one another, it was not so easy to default from the obligation one had for their parents. Of course, bequests generated another motive for supporting one’s parents.

We make use of reasonably extensive data sets which cover both the European and the whole World data. Above all, we focus on historical data which basically start at 1750 and end at 2000. These data are compiled for five-year intervals (before 1850, ten-year intervals) and they come from the following seven European countries: Denmark, Finland, France, Italy, Norway, Sweden and the UK. In addition, we use data from the following four Non-European countries: Australia, Canada, Japan and the US. Most comparative analyses can be made for a somewhat shorter period —1860-2000 only.

For control purposes, we use more extensive World Development Indicator data from the World Bank which come from 185 countries for the (maximum) period being 1960-2003. Finally, we use MZES (Mannheimer Zentrum fur Europäische Sozialforschung) data for 1949-1993. These data only cover pension expenditures and total social security expenditures (in relation to GDP) which — in a similar fashion as with the other data sets — are related to total fertility rates. Ideally, one might use the pension/social security expenditures for the long time period, but there is no way of compiling cross-country data for pre-WWII period. Therefore, we simply use various variables describing the size of government as an indicator of the welfare state and control the results for the post-WWII period with proper indicators.

The main purpose of our comparisons is to see how fertility is related to the growth of the welfare state (for a general exposition of this issue, see papers in European Papers on the New Welfare, 2006). Our main question is: Is it indeed true that the growth of the welfare state crowds out private investment in children?

The 19th century opened up new possibilities for the old age survival. The development of capital markets made it possible to save for the old age, and thus investment in (the quantity of) children was not necessarily needed to such a large extent. On the other hand, growth of educational opportunities made it possible to invest in the quality of children instead of the number of them. Furthermore, the growth of manufacturing and services and the decline of agriculture diminished the need for child labour. Because child labour was not so much needed — or the use was completely abolished — investment in children (quantity of children) was no longer an appealing opportunity.

But the most obvious reason for the decline of fertility comes from the welfare state. The government in a sense intervened in the market and provided a pension system (and also a system for health care, old people’s homes and so on). It is quite obvious that government intervention crowded out private investment, and this showed up in a smaller incentive to invest in children. Put simply, the growth of the welfare state is the reason for the decline in fertility.

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2 Galor and Weil (2000) emphasize the investment in the quality (education) of children in a transition to modern growth.

3 Doepke (2004) argues that child labor regulation has been an important factor in the decline of fertility.
But how do we know whether this is an important reason? The decline in fertility could equally well be explained by the growth of income, change of the structure of economy (say, agriculture versus manufacturing), fall in mortality or growth of education. It is not easy to answer this question, because we are really dealing with the behaviour of different generations and not only the current generations, but also the expectations of current generations on the behaviour of the future generations. Thus, annual observations on the size of the government and some other relevant variables cannot help to solve this problem.

Still we can do something to settle this issue. We can compare over countries and over reasonably long time-horizons the relationship between fertility and the background variables, and see whether any of the relationship is dominant. We have also constructed a model where we estimate the particular effect conditional on other variables.

It should be emphasized that it is not meaningless to ask what the reason for fertility decline is. If the main reason were just the growth of welfare state, we would face a difficult dilemma. Almost all attempts to boost fertility would then ultimately require more government resources, i.e. in a way an expansion of the welfare state. We could face a delicate situation, where government actions could only worsen the overall demographic situation.

3. Some Empirical Observations

The decline of fertility over the very long time horizon is illustrated in Figure 1. The selected graphs (Figure 2 and Figure 3) and the computed pair-wise correlations (Table 1) may in turn help providing some flavour of the nature of the basic results. Thus we can observe that fertility is in every case strongly and negatively related to the level of income, education and the size of the government. The ‘only significant’ positive correlation is between infant mortality and fertility; higher infant mortality rate may force parents to have more children and thereby guarantee the availability of the old-age support4.

One can also see that the longer life expectancy (at least seemingly) diminishes fertility. But one has to be careful with this type of an influence. If this relationship is scrutinized so that the effect is made conditional on income, income growth, economic structure, education, mortality and so on, it turns out that the conditional relationship becomes quite weak and the sign turns out to be positive5. The reason is obvious. Life expectancy mainly reflects technical change and the growth of income and welfare. Thus, when these variables are controlled, it may well be that increased life expectancy works in an ‘expected way’. The longer the period for which support is needed, the more investment in children takes place, and thus fertility increases along with an increase in longevity.

The negative relationship between the (various indicators of) welfare state and fertility seems to be robust for all variable combinations. The bigger the role of government in securing old-age income and support, the smaller is the private incentive to invest in children or physical or financial assets. The result is particularly clear in the case of income tax rate as an indicator of the size of government. But as one can see from Figure 3, the result is basically the same when pension expenditures or social security expenditures are used as indicators of the welfare state. Obviously, as pointed out by Ehrlich and Lui (1998), this has powerful implications for the private saving behaviour and thereby for the aggregate investment (in a global context or with Horioka-Feldstein puzzle in a single country setting). The relationship between pension/social security, wealth and saving has been analysed empirically since the 1970s with

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4 See e.g. Atella and Rosati (2000) for further elaboration of this effect and supporting empirical evidence from India.
5 We have elaborated this conditional effect in Puhakka and Viren (2006).
somewhat mixed results. The fertility behaviour has been considered much less and the combined effects on saving and fertility even less. Clearly, there is a lot of room and obvious reasons for further analysis.

Table 1: Correlations with the fertility variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>(panel) correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>historical data</strong></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>.816</td>
</tr>
<tr>
<td>Participation to education</td>
<td>-.659</td>
</tr>
<tr>
<td>Share of old people</td>
<td>-.845</td>
</tr>
<tr>
<td>Government expenditures/GDP</td>
<td>-.635</td>
</tr>
<tr>
<td>GDP growth</td>
<td>-.035*</td>
</tr>
<tr>
<td>GDP per capita at fixed US prices</td>
<td>-.286</td>
</tr>
<tr>
<td><strong>WDI (World bank) data</strong></td>
<td></td>
</tr>
<tr>
<td>Infant mortality</td>
<td>-.851</td>
</tr>
<tr>
<td>Literacy rate</td>
<td>-.817</td>
</tr>
<tr>
<td>School enrolment rate</td>
<td>-.759</td>
</tr>
<tr>
<td>University enrolment rate</td>
<td>-.617</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>-.853</td>
</tr>
<tr>
<td>Public consumption/GDP</td>
<td>-.167</td>
</tr>
<tr>
<td>Gross tax rate</td>
<td>-.486</td>
</tr>
<tr>
<td>Public expenditures/GDP</td>
<td>-.271</td>
</tr>
<tr>
<td>GDP growth</td>
<td>.055</td>
</tr>
<tr>
<td>GDP per capita at fixed US prices</td>
<td>-.226</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-.018*</td>
</tr>
<tr>
<td>Share of agriculture/GDP</td>
<td>.660</td>
</tr>
<tr>
<td>Military expenditure</td>
<td>.218</td>
</tr>
<tr>
<td>Urban population/total</td>
<td>-.661</td>
</tr>
<tr>
<td><strong>MZES data</strong></td>
<td></td>
</tr>
<tr>
<td>Pension expenditure/GDP</td>
<td>-.624</td>
</tr>
<tr>
<td>Social expenditure/GDP</td>
<td>-.619</td>
</tr>
</tbody>
</table>

Notes: in the historical data, the number of data points is 194, in the WDI data 2533, and in the MZES data 825. Due to very large number of observations, almost all coefficients are statistically significant at the 5% level of significance (Insignificant coefficients are marked with an asterix *).

*See, however, Cigno and Rosati (2003) for German evidence and Gabos, Gal and Kezdi (2005) for Hungarian evidence.
Notes: Fertility is here defined as number of births to relative to the number of women at the age of 15-49. Main data source is Mitchell (2003).

Figure 1: Median value of fertility in 11 countries

Notes: Numbers are median values of countries for 1860-2000. Note that in the last graph we compare government size with education, on the one hand, and GDP per capita, on the other hand. Definition of fertility is the same as in Figure 1.
4. Conclusions

Put succinctly, our main point here has been that fertility should be modelled endogenously especially in the models, which purport to do serious policy analyses for the long term. Recently at least in Europe a considerable effort has been made to analyze the fiscal implications of ageing. In many of these analyses and scenario creations (see e.g. Oksanen 2003, and also 2004) it has, however, been assumed that possible changes in taxes and social security expenditures do not affect individual behaviour neither in terms of labour supply nor in terms of fertility. Although the labour supply effects are perhaps more important in the medium run, it is quite clear that in the long run the implications of fertility are dominant. Obviously, all the long-run analyses should be executed in such a fashion that labour supply and fertility are allowed to adjust to changes in fiscal variables. One should also keep in mind, that (all) government policies which try to increase fertility with various fiscal packages, might not be effective at all, but indeed could lead to results quite opposite to what was expected.

REFERENCES


The Biology of Aging

by S. Gustincich, M. Biagioli, R. Calligaris, Z. Scotto Lavina and S. Zucchelli

1. Introduction

Gerontology and biology consider the process of aging a continuous, universal, progressive, intrinsic and deleterious phenomenon that can progressively reduce the capability of a certain organism to maintain its homeostasis within a given environment, increasing the risk of illness or death.

In this article, we will examine the most recent theories on the biological mechanisms of aging. We will analyze the biochemical and physiological characteristics of aged organisms and senescent cells cultured in vitro. Furthermore, we will focus on the implications of data obtained from genetic experiments, in which modified longevity is achieved in animal model systems. We will then describe some examples of human genetic disorders, in which patients show signs of premature aging. In the end, we will discuss the possible implications of these most recent discoveries for the development of anti-aging drugs.

2. Various Theories of Aging

A question a biologist might ask is whether the aging process might lead to a clear advantage during natural selection and evolution. The progressive loss of cerebral and physiological functions, the increased vulnerability to environmental toxins, the higher rate of pathologies and the decline of fertility are specific features of the aging process that are difficult to reconcile with a specific advantage during evolution. Why isn’t aging completely blocked by natural selection? A reasonable answer to this question suggests that aging and death prevent the accumulation of a great number of living organisms that would be incompatible with existing resources. Nonetheless, this model is based on a risky anthropomorphistic view of the problem: wild animals rarely survive till aging. Most usually, wild organisms succumb at a rather young age due to extrinsic causes, such as accidents or incidents with not exactly ‘friendly’ predators. Therefore, aging is not essential for survival, and thus is not subjected to selective pressure. In this context, the noble prize Medawar hypothesized, in his Mutation Accumulation Theory, that only those organisms that survive ‘extrinsic’ causes of death can display the effects of genetic mutations accumulated in their germlines. Thus, only germlines are subjected to a very limited natural selection.

As a consequence, the longevity within a certain species is probably optimized as a function of its ecological niche and its ‘extrinsic’ mortality. Evolutionary adaptations, such as the ability to fly or the development of an enlarged and more complex brain, can reduce ‘extrinsic’ mortality and therefore are associated with an increased longevity.

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Biologists wonder whether a genetic program for aging exists. The presence of such genetic program should not come as a surprise. In nature there are fundamental and well characterized metabolic pathways that, under specific signals from the outside (external environment) or from the inside (surrounding cellular tissues), can cause programmed and physiological cell death (apoptosis) of million of cells. Nevertheless, no combination of known genetic mutations has been able, so far, to generate an immortal animal or human being, even though some genetic alterations can modify longevity in laboratory animal models.

An intriguing theory, the Disposable Soma Theory, starts from the observation that complex living organisms need to optimize the consumption and usage of available metabolic sources. The amount of metabolic energy is, in fact, limited and requires a specific program of disposal and usage. In a very simplified classification of the possible types of energy disposal, we can identify two categories of energy-dependent activities:

1. maintenance of cellular physiological conditions, through continuous repair of macromolecular components within cells and tissues;
2. survival in a given environment and reproduction.

The molecular and metabolic mechanisms for cellular homeostasis require a large amount of energy. Nevertheless, 90% of wild animals succumb during the first year of life both for the inability to preserve a proper body temperature and for the encounter with predators. Thus, every organism needs a compromise: during the first phases of life it is mandatory to fight against external hostile conditions and to reproduce. Consequently, this choice implies the use of a minimal amount of energy for the maintenance of the cellular systems in order to keep them compatible with life. The small quantity of energy consumed inevitably causes an accumulation of cellular damages that has no consequences on the initial survival but participates in the aging process.

Based on this theory, it is possible to predict some biological mechanisms of aging:

1. aging results from an accumulation of cellular and molecular damages of various sources that cannot be repaired;
2. longevity is mainly controlled by regulatory genes of cellular and molecular repair;
3. the expression of those genes and, thus, the usage of metabolic energy can be regulated;
4. the germline, which is immortal, displays the highest level of repair and survival;
5. the mechanisms of aging are stochastic.

3. Cellular Mechanisms of Aging

Fifty years ago, Harman postulated a theory in which he considered free radicals formation the main cause of aging. His hypothesis is based on the observation that oxygen molecules, that are essential for life, can be modified to produce extremely toxic derivatives, almost incompatible with life itself. In fact, molecular oxygen can generate reactive metabolites, causing profound oxidative damages to biological macromolecules. Mitochondrial and genomic DNA can be altered in their chemical composition, they can be subjected to breaks in the double helix structure and recruit cellular proteins in an abnormal and uncontrolled way. Membrane lipids become modified by reactive oxygen metabolites (peroxidation) and cellular proteins are inactivated and/or rapidly degraded.
There are several experimental evidences to support this theory:

1. the number of oxidized molecules increases with age;
2. the artificial introduction of additional anti-oxidant enzymes in experimental animals prolongs life;
3. differences in longevity among various organisms within a given species can be correlated with the amount of oxidative stress.

To eliminate toxic reactive oxygen species, cells can synthesize protective proteins like Super-Oxide-Dismutases (SOD) and Peroxidases.

Furthermore, the decrease of the assumption of calories in the diet causes a diminished oxidative stress with a delay in the formation of pathogenic cellular modifications associated with aging and a progressive elongation of life span (see later)\(^6\).

In vitro cultures of senescent cells proved to be a very useful model system to study the aging process at the cellular level\(^7\). Following a number of cell divisions, senescent cells permanently exit the cell cycle. This phenomenon is highlighted by profound morphological and biochemical changes that underline the existence of a specific genetic program. The life span of primary cells in culture in considerably increased by adding anti-oxidant molecules or by decreasing oxygen concentration in the external environment.

Several cellular organelles show a prominent role in this phenomenon, as demonstrated both in vitro and in vivo (Fig. 1):

1. **Mitochondria**: the vast majority of reactive oxygen species is generated within the mitochondria, where cellular energy is produced. The integrity of mitochondria diminishes with age. In senescent cells, mitochondria display an altered morphology, produce elevated levels of toxic oxygen metabolites and reduced levels of energy. Mitochondrial DNA accumulates mutations and aberrant chemical modifications\(^6\).

2. **Telomeres**: they represent the terminal portion of a chromosome and are formed by six-bases long repeats. During each cell division, telomere length decreases substantially (in the range of 50-200 bases/division). The enzyme Telomerase can synthesize new repeats, counterbalancing those lost during cell division. When the loss of telomeres reaches a certain threshold, cells become senescent and enter apoptosis. Oxidative stress increases the rate of telomeres loss\(^7\).

3. **Protein Degradation**: with aging, cells tend to accumulate damaged proteins. Senescent cells have a reduced proteasome activity (a multi-protein complex responsible for protein degradation).

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During the aging process, organisms exhibit increased damages and decreased defense mechanisms, with an overall diminished threshold for activation of programmed cell death. Nonetheless, the level of cell death that is required to have an altered and non-functional tissue still needs to be established.

The most reasonable model postulates that mutations and damages accumulate during aging until the threshold level is reached and cellular homeostatic balance collapses. Different cell types have diverse combinations of somatic mutations, accumulation of toxic metabolites and mitochondrial damages. In this context, an organism needs to make a choice on how to use its metabolic energy, how much to invest in damage repair and how to dispose of vulnerable and damaged cells. Recently, it has been demonstrated that organisms with a prolonged life span employ a higher level of energy in DNA repair.

4. Physiology of Aging

Various animal model systems have been employed to dissect metabolic pathways involved in aging, among them the fruit fly *Drosophila melanogaster*, the worm *Caenorhabditis elegans* and the laboratory mouse *Mus musculus*. These organisms present several advantages: they are easy to grow and manipulate, their genetic background can be modified as needed and their DNA has been completely sequenced. Therefore, biologists have studied the effects of environmental stimuli and genetic mutations on the longevity of these model animals.

In worm and insects there is a direct correlation between metabolism and aging. Experimental manipulations of general metabolic levels and of oxidative stress (such as changes in temperature, nutrients and oxygen availability) have a profound effect on longevity.
The isolation of mutant animals with a prolonged life span has allowed the identification of specific genes involved in longevity. Most of these mutations alter the functions of the endocrine system. In mammals, insects and worms, the aging process can be modified by altering the Insulin/Insulin Growth Factor (Insulin/IGF-1) metabolic pathway. It has been observed that the inactivation of the Daf-2 gene (the receptor for Insulin/IGF-1) causes a prolonged life in animal models (about twice as long). This phenotype can be recapitulated also when regulatory genes within the Insulin/IGF-1 pathway are mutated. Such genes are mainly involved in general mechanisms of energy control and DNA repair. Therefore, one hypothesis is that the molecular functions of Insulin/IGF-1 have evolved initially to control survival. Indeed, Insulin/IGF-1 has the beneficial effect of promoting body growth and energy accumulation. When levels of insulin are reduced, life span is increased: the organism induces genes involved in stress responses and cellular energy is saved for maintenance of cellular integrity rather than growth.

Similarly, in yeast, a reduction of nutrients in culture medium causes an extension of life. This in vitro system can be considered a model of Caloric Restriction (CR) diet. The effects of CR are mainly mediated by the activity of the SIR2 gene: SIR2 inactivation induces reduction of life span, while SIR2 over-expression increases longevity. In the worm Caenorhabditis elegans, the homolog of SIR2 displays the same features of the yeast gene. Therefore, SIR2 can be considered a master regulator of cellular longevity and aging. Its biochemical properties suggest that SIR2 might act as a ‘sensor’ of cellular metabolic state and might control life span according to cellular energy state.

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A regimen of CR prolongs life of 50% also in laboratory mice. Genomic experiments have highlighted a multitude of genes induced in aged animals that are conserved in evolutionary distant species such as *Caenorhabditis elegans* and *Drosophila melanogaster*. Some of these genes encode for proteins involved in energy synthesis, mitochondrial functions and DNA repair. With similar techniques, biologists have discovered that aged mice under CR regimen displayed a gene expression profile similar to young mice.

Additional evidence can be added to the puzzle. A study conducted on members of the British aristocracy revealed that centenary women had fewer and later pregnancies as compared to women that die at a younger age. This observation is confirmed in nature in wild mammals and birds, where longevity and fecundity are inversely correlated. When the germline is removed from the worm *Caenorhabditis elegans*, life span is prolonged of about 60%. In experimental mice, ovary transplant from young to old females extends average life expectancy of about 40-60%. Thus, biological mechanisms may regulate life span according to fertility. In fact, CR regimen can increase longevity and reduce fertility, as demonstrated in insects, worms and rodents. It is then reasonable to hypothesize that, under conditions not favorable for reproduction, it is of major advantage to dislocate energy consumption from reproduction to survival.

### 5. Human Pathologies of Aging

Some mutations found in rare human diseases seem to accelerate the appearance and the progression of tissue degeneration as in aging\(^\text{11}\).

In *Werner Syndrome*, patients suffer a multitude of phenotypes of aging, with various tissues being affected. Adult patients show a reduced height, hypogonadism, binocular cataracts, osteoporosis, arteriosclerosis, peripheral neuropathy, benign and malign neoplasies. Patients usually die of heart attack or cancer. Patients’ cells cultured in the laboratory display a senescent phenotype, with a complex pattern of genomic aberrations (mainly translocations and deletions). Recently, biologists have found that in *Werner Syndrome* the pathology is caused by mutations in a gene encoding for a protein involved in DNA repair, replication, recombination and transcription. This discovery highlighted the relevance of genomic instability in many pathologies of premature aging.

*Ataxia Telangiectasia* (ATM) is another human disease in which patients show premature aging. ATM is a genetic disorder that causes a progressive loss of Purkinje cells in the cerebellum and a vast array of neoplasies. Patients are hypersensitive to ionizing radiations. The genetic basis for ATM is a mutation in a gene encoding for a protein involved in DNA double strand break repair. ATM protein is usually active during cellular responses to oxidative stress.

In *Juvenile Progeria*, children have severe mental retardation, loss of subcutaneous fat deposits and abnormal cartilaginous tissue and they usually die at a young age of heart attack. Recent studies have identified in patients with *Juvenile Progeria* mutations in the genes for Lamin A and C. Such mutations cause an altered structure of the nuclear membrane, with consequences on cellular metabolism and a phenotype of premature aging.

Other diseases associated with premature aging show a clear link to genomic instability. *Bloom Syndrome, Xeroderma Pigmentosa, Nijmegen Breakage Syndrome* and *Fanconi Anemia* all display a defect in the ability to maintain genome integrity.

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6. Anti-Aging Therapy

Pharmaceutical companies are currently developing a new class of drugs aimed to modify the aging process per se\textsuperscript{12}. This novel approach requires the identification of the metabolic pathways of aging and of the potential molecular targets. Efforts have mainly focused on the following aspects:

1. metabolic pathway of Insulin/IGF-1 signaling,
2. reduction of reactive oxygen species in the mitochondria,
3. reduction of food intake,
4. increase of anti-oxidant molecules,
5. maintenance of telomere length.

The discovery of molecules and molecular mechanisms in invertebrates with a short life span points to new exciting options for higher vertebrates. Since the number of drug treatments that can be followed in clinical trials is unfortunately quite small, it is of vital importance to screen conserved metabolic pathways to connect multiple strategies apparently distant. Only when data obtained in animal models will be comprehensive, potential drugs will be tested in clinical trials. In the past, eight-years long clinical trials have succeeded in proving the principles: it is feasible to test drugs as modifiers of the aging process and of the side effects of aging (mainly the development of pathologies connected with increased longevity). On the contrary, if the aim is the validation of a candidate drug to slow the aging process, the clinical trial should start at much earlier stages, creating complex logistics. It becomes therefore mandatory to identify biological markers of aging for validating the pharmacological effects of a candidate drug in relatively short times.

REFERENCES


Health Care System in the Industrialised Countries and the Role of Private Insurance

by Alfeo Zanette and Monica Ricatti

1. Introduction

In the industrialised economies, health plays a central role in the individual scale of values. As a result of the advances in medicine that have generated new expectations in the fight against disease, the demand for quality of life has become part of our daily experience. Citizens no longer accept the inevitability of illness and absolutely reject sickness and pain.

Governments are faced with a new scenario: on the one hand, citizens are prioritizing the quality of health care services, on the other health costs are constantly on the rise, as a result of scientific and technological developments in medicine and an aging population. These are the main forces behind the demand for additional health care services, the increased cost of which is to be borne by the State.

Health is the most crucial issue when it comes to building political consensus. Policy-makers must strike a balance between the increasing expectations of people vis-à-vis health care and the constraints imposed by public expenditure, particularly in countries like Italy where, in spite of the improvement of the quality of service, people are rather dissatisfied with the national health care system.

The solutions applied so far share the aim of rationalizing the costs of both the supply of and demand for health services and of costs’ financing. The measures adopted have produced similar results in all countries: hospitalization time has been reduced, cost-control has improved, market mechanisms have been implemented to manage resources, citizens have become conscientious consumers, and the number of sources of financing has increased.

In spite of their impact on efficiency, reforms implemented thus far have not succeeded in stabilizing health care expenditure as a share of GDP; thus, health care remains one of the causes of public budget deficits and is likely to remain so in the future, as a continued increase in spending is anticipated.

Using sources of financing in addition or as an alternative to public sources is a prerequisite to solving the health issue. In a public system burdened by slowness and rigidity, and faced with the need to rationalize costs, private insurance becomes a key tool to give citizens freedom of choice and provide flexible and customized solutions. In addition, insurance can be used to meet the funding needs resulting from the increasing number of people who are not self-sufficient and whose health care costs can hardly be borne by individuals alone.

This study gives an outline of health care systems in the industrialised countries and aims at exploring future opportunities for private health insurance. The first part focuses on the health care systems of the main industrialised countries and their reforms aimed at improving efficiency. The second part deals with health care demand and spending trends. Finally, the role

* Ufficio Studi of the Assicurazioni Generali.
of private insurance in financing health care systems, the supply of services and the potential of private insurance to improve overall efficiency are examined.

2. Health Care Models

In the industrialised world, health care models have much in common but also feature a number of differences. In Europe, one of the most common characteristics is the universal concept of the right to health, and the State is the main player in meeting health care needs. Health is considered one of the fundamental rights of each individual, the system is based on solidarity, and financing depends on the income capacity of each person, regardless of his/her needs.

Since the Seventies, the number of citizens covered by state-run health care schemes has been gradually rising, as national States have tended to broaden social security to improve the quality of life of their citizens. Across Western Europe, state coverage has reached 100% of the population, except for two important countries, notably Germany and the Netherlands, where a significant share is covered by private insurance programs.

In Germany, however, all citizens benefit from health care coverage, because everyone must be provided with coverage against the risk of disease, with the option — for citizens with a monthly income exceeding a given limit (EUR 3,862 in 2005) — to turn to private insurance (opting out).

Solidarity schemes also exist in the United States, where the poor and the elderly are covered by state-run schemes. However, the coverage offered is so limited that there are insurance plans available on the market, called Medigap, designed to cover all the costs that are not reimbursed by such schemes. Citizens who do not benefit from government-run schemes must provide for their own health care coverage. For those who are insured, health costs are based upon the principles of mutuality of risks or solidarity; however, a rather significant number of citizens has no health care coverage.

A common feature in industrialised countries is the decentralization of decisions to manage and allocate resources locally (regions or states), aimed at bringing the supply and demand of health services closer together in order to meet the population’s needs better, increasing system flexibility by avoiding slowness and rigidity and cutting costs through specific and targeted health care programs.

The Swiss health care system is a perfect example as it is organised according to a federal system. The Swiss confederation and cantons cooperate in developing national health care policies. However, though cantons still enjoy autonomy in health care planning, over the past few years the Confederation has taken on more responsibilities due to the extent and the importance of the issues to be tackled.

However, decentralization has a weak point. Indeed, coordination between national health care plans and local health care policies is difficult and may lead to inefficient allocation of resources.

In addition, some experts note that although decentralization is one of the components of more complex and structured political choices aimed at making the system more efficient, it is not a prerequisite to increasing the efficiency of the system (Bankauskait, et al. 2004). Innovative solutions — e.g. integration of public and private schemes — for the management of health care can be tested locally and then extended to the whole country.

1 In 1999, a law enacted in France extended the benefits of the state-run system to over a million people, thereby reaching an almost universal coverage of the population.
In the various systems, health care is pursued through a whole set of funding sources, ranging from general taxation to the payment of contributions or premiums to sickness funds and insurance companies, while part of the health costs are borne by citizens who must share in costs directly.

Historical reasons are mainly at the root of the financing schemes in force in Europe, based on the one hand on social insurance schemes and on the other on national health care systems, where the State is responsible for meeting its citizens’ needs. The economic implications of these two taxation principles are clear: with the first, health care financing affects the cost of labour, with adverse effects on the competitiveness of companies; with the second, costs are charged to the general taxation.

The social insurance scheme dates back to the first social security system for industrial workers conceived by Bismark in the late 19th century. Used throughout Central Europe — France, Germany, Switzerland, Austria and Benelux — it was almost the only social security system in place in Europe until the second world war. Later, in some countries these system were abandoned following the requests of the population for a health care system with no discrimination among groups of citizens. The national health system was established in the UK in 1946, in the Nordic countries in around 1970, in Italy in 1976 and in Spain in 1986.

The boundaries between social insurance and national health systems, however, are not clear. In France, for instance, the State plays a key role in the system, because it sets the health spending ceiling, it defines benefits and sets regulations. In addition, the State ‘supplements’ the system funding by resorting to general taxation.

In the Netherlands, the Health Insurance Act came into force on 1st January 2006. This reform requires all residents to join a private insurance scheme to cover basic health care expenses. This new system is strictly monitored by the State to safeguard the social nature of insurance. Insurers have to provide all residents with an insurance coverage regardless of their age, gender or physical conditions; indeed, these variables do not contribute to premium setting. Furthermore, the Healthcare Allowance programme gives a contribution to all the citizens who cannot afford to pay insurance premiums, thus ensuring general access to health care. Finally, the coverage may be extended beyond basic services by taking out supplementary insurance.

Like the Netherlands, Switzerland also has its peculiarities in integrating public and private sources of financing. Swiss citizens have legally been obliged to purchase a private health insurance coverage since 1996. In compliance with the law, policies cover diagnostic and therapeutic services, hospitalization costs, hospitalization in nursing homes, domiciliary care and other minor services. The basic coverage has been extended since 1999 and has included alternative or complementary treatments with respect to traditional medicine.

In terms of supply of health services, State and not-for-profit health care providers play a key role in all countries. The number of private, for-profit health care facilities is very low: it ranges from zero in France and 0.8% in Germany to a more significant 15% in the UK, the US and Spain. Private facilities generally offer treatment for non serious pathologies and do not require expensive equipment that only public facilities can afford to buy. Besides, private hospitals are mostly non-profit and have fewer beds as compared to public hospitals.

Generally, there is a clear distinction between healthcare service providers and fundholders. However, in the UK and in Spain, to control costs better and improve the quality of service, there are insurance companies that have their own health facility networks. In the United States, agencies have been created within the framework of the so-called Managed Care Organisations, specializing in the management of health care services, a form of vertical integration between service providers and sponsors (HMOs can own and operate their own hospitals and pay salaries to their own physicians).
The different approach adopted by the health care systems affects the health care costs of industrialised countries who allocate a different share of their wealth to the health care system. In the United States and Switzerland, the overall health care expenditure is very high: in 2003, it accounted for 15% and 11.5% of the GDP respectively (OECD Health Data 2005, Table 1). In the UE, in the same year the incidence of health expenditure accounted for 9.3%\(^2\). Countries with social insurance schemes have high costs (in France and in Germany, the health care sector absorbs over 10% of resources), whereas these costs have a lower incidence in countries with a national health system (Italy 8.4%; UK 7.7%).

There are also considerable differences in terms of per capita health care expenditure. In 2003, a US citizen spent USD 5,635 annually for health as against USD 2,968 spent by a European citizen. The yearly per capita health care expenditure accounted for USD 2,258 in Italy, USD 2,996 in Germany and USD 2,903 in France.

\textit{Figure 1: OECD health data 2005}

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3. General Features of the Health Reforms in the most Important Countries

The rise in health service costs and in health needs urged policy makers of the industrialised countries to make a more selective and effective use of the existing resources, but the strategies adopted to reach this goal have been different and ranged across private and public mechanisms. Common features (differentiating Europe from the United States) are universal coverage to all citizens and the strong role of the central government in regulating the provision of health care services.

The United Kingdom has been a very important testing ground for ‘quasi-market’ mechanisms. In the late 1980s, Thatcher’s government decided that the budget allocated by the State to local health authorities should be used to purchase services from providers (hospitals,

\(^2\) Estimates Assicurazioni Generali Research Department on OECD data.
physicians), which were set in competition with each other. In addition, hospitals owned by the district health authorities were encouraged to become private enterprises. The most efficient ones managed to widen their service pipeline, while others were forced to close when their resources were reduced. The Netherlands is trying to encourage market elements in the exchange between health service providers, sickness funds and insurance companies. Even in more centralized economies, techniques to enable and evaluate services based upon free market principles — have been adopted or are under scrutiny.

The results showed that quasi-market systems are not the best solution to improve the cost/service ratio of medical treatments. After a decade of testing of private mechanisms, the United Kingdom reversed itself and decided to find a fair balance between competition, dirigisme and cooperation, in the light of the problems affecting the quality of services and of the enormous transaction costs linked to the quasi-market system.

Information asymmetry is the main cause of failure of the free market mechanism in health services. To be perfect, a market must be transparent, which means that service users must be informed about the quality and prices of the services they want to have access to. In the health sector, information is lacking on the demand side, and this hampers the market functioning. Moreover, demand induction should also be considered, as health care providers use their knowledge to influence demand with a view to fulfilling personal objectives. However, experts in the field accept the SDI (supplier-induced demand) concept, which they deem to be a minor problem (Folland, et al. 1997).

Blair’s reforms introduced cooperation mechanisms to avoid the excessive competitiveness that might lead to non optimal results from a social policy viewpoint. Curbing competitiveness put a lid on the enormous costs generated by the high number of transactions and of subjects involved in the exchange, and with the introduction of long-term contracts, long-term planning in a framework of stability was possible, thus avoiding the problem of overlapping and duplications.

In all the most important countries, co-payments have been adopted to make citizens more responsible, so that they resort to health services only when they really need to; co-payments curb demand and supplement other forms of cost control.

Medications are the category of expenditure where cost sharing by citizens is at its highest. Drug spending is significantly on the rise because of the latest technological advances and the trend of replacing surgery with pharmacological treatment. In particular, the ticket system (a minimal flat contribution by the citizen) based on the average price of any kind of drugs (thus raising the price of the medication within the relevant bracket) can push demand towards equivalent but less expensive products, like generic drugs.

In some countries, health authorities set reference prices for some groups of drugs, above which the mechanism of co-payment by the patient becomes effective. In Germany, reference prices are set by a federal committee, while in the Netherlands they are the same as the European average. In order to control medication spending, in some countries – notably Germany, Spain, United Kingdom and Sweden – drug prices have been negotiated at a national level by governments and pharmaceutical companies.

The role of the primary care physician in cost containment focuses on monitoring access to secondary treatments and drug consumption. To be referred to specialist care or to be hospitalized, Dutch, British, Spanish and French citizens as of 2006, must first visit their primary care physician. However, although the use of primary care physicians as gatekeepers is considered effective to reduce healthcare consumption, not all countries grant the physician an authorization power.

\[\text{1} \text{ Since the study by Arrow (1963), the problem of asymmetric information has been acknowledged as the main cause of the malfunctioning of the health market.}\]
In countries where the physician is a state employee, cost control is carried out through a collective wage bargaining (in Germany, for instance, medical services are reimbursed according to the fees negotiated yearly with the sickness funds) or through incentives based on remuneration, which can vary according to efficiency or at least to the quality of services provided. In Spain, general practitioners get paid by health centres according to the services provided and not to the number of patients treated.

The choice of employee physicians to move on to self employment grants ‘customised’ negotiations and a better link to the quantity and quality of the treatment provided (in the Netherlands, for instance, 90% of physicians are self employed).

In terms of hospital expenses, that account for 37% of the overall spending of the OECD countries, many approaches to cost containment have been adopted: monitoring of the service quantity through gatekeeping mechanisms (typically, the primary care physician), focus on efficiency through the management of hospitals by the private system, competitive negotiations for the services provided and budgeting policies. Cost-control mechanisms have not always produced the expected results. The setting of a maximum limit for the reimbursement of individual services, for instance, has led to an excessive number of prescriptions, aimed at offsetting the decrease of costs per unit with an increase in volumes.

In some countries, hospital costs are covered by a fixed daily allowance, not related to the treatment cost, but negotiated between the local government and the hospital authorities; in others, hospitals are paid according to a budget that is proportional to the daily hospitalization cost. The idea to relate reimbursement to the diagnosis (e.g. through Diagnosis Related Groups) has contributed to reduce the length of hospitalization, thereby avoiding costs not related to the medical treatment and considered unproductive from the viewpoint of therapeutic effectiveness.

In Sweden, where public hospitals are funded according to a budget based on historical costs, monitoring of the results obtained has recently been implemented to reduce the cost of the system. At the same time, competition options to purchase services are being tested, without prejudice to the quality of treatment and the equity of the service.

In the Netherlands, state funding depends on productivity, while Germany has introduced a private system to manage hospitals; in Spain, the idea of accountability is slowly getting off the ground and hospitals are becoming increasingly independent. In the Anglo-Saxon world (UK and USA) there has been a trend towards a (vertical) integration between health facilities, which across the Channel are managed directly by insurance companies; this is a typical feature also of the Spanish market, where the chief insurers can rely on their own hospitals and clinics, managed by physicians.

In the last few years, more and more focus has been placed on increasing efficiency through de-hospitalization, fewer beds and more home health care. From 1990 to 2003, France passed from 11.1 beds per one thousand inhabitants to 7.7, Spain from 5.4 to 3.8, the United States from 6.0 to 3.3, whereas from 1980 to 2002 Italy passed from 9.6 to 4.4 beds. De-hospitalization offers opportunities to insurance companies that can provide home health care services. This approach calls for the cooperation of public institutions, that should play different but integrated roles.

4. Health Care Demand and Health Care Spending Trends

In the industrialised countries, economic welfare and the increase in education level have changed the attitude of citizens toward their own health. A culture of prevention has boomed, as shown by positive lifestyles focusing on healthy diets, the control of smoke and drug abuse
and the desire for better hygiene. As a result, new rules were issued by the legislative bodies to urge citizens to adopt a more responsible behavior to protect their health.

In addition, the advances in medicine have generated new expectations in the fight against disease. Citizens no longer accept the inevitability of illness and consider medicine as the tool they can resort to not to surrender to sickness.

Nevertheless, since our culture forces us to live in the fast lane, it gets increasingly difficult to put up with long waiting times; many citizens turn to private health facilities, in lieu of the public, generally free ones, to speed up diagnosis and treatment.

The changed attitude of citizens towards health has lead to a demand of quality health services, to frequent medical examinations, to an increased use of medicaments, alongside with a proliferation and an overlapping of therapeutic paths. This has been followed by an increase in the health care services required by not-self sufficient elderly people who cannot rely on an informal care, because of the break up of the family.

The major breakthroughs made in medicine, the use of cutting-edge technologies and of complex equipment for both diagnosis and treatment purposes have contributed to lengthen our lives. The discovery of new medicines and vaccines has reduced the chance to contract certain diseases. New equipment like ecography, magnetic resonance, endoscopies and biological tests have upgraded the diagnostic capability and favoured the early treatment of diseases. As a result of technological developments, it is now possible to cure diseases that only a few years ago were deemed incurable.

In the OECD countries, from 1990 to 2002 the number of CT scans rose from 6.9 systems per million of inhabitants to 13.2 (OECD Health Data 2005). The increase in number of magnetic resonance equipment was even more significant: from 1.2 to 5.2 per million of inhabitants. In this case, the percentage in Switzerland (14.1), Italy (10.6) and the United States was above average.

New scenarios have emerged as a result of genetic research and the subsequent development of diagnostic (through genetic tests) and therapeutic skills, due to pharmacogenetic tests (development of customized therapies) and gene therapy (the use of genetic material to prevent or cure diseases). Although it is too early to predict or fully understand the impact in terms of diagnosis costs, the prevention and cure of diseases, and of a longer lifespan, we cannot neglect the important implications that these studies will have for medicine (Taylor and Marocco, 2005).

Positive lifestyles have contributed to the improvement of health standards. In fact, according to Eurostat projections, in the 15 EU Member States, the average lifespan for men has increased from 70.5 years in 1980 to 76 years in 2003. Over the same period, life expectancy of 60-year-old men rose from 16.8 to 20.3 years. The Eastern European countries that joined the EU on May 1st, 2004, show striking differences in terms of average life: 70.2 years. This is probably due to lower prevention and to lifestyles that are less healthy as compared to the rest of Europe. In addition, during the transition from communism to a market economy, life span declined but it has started rising again over the last decade.

Population ageing has contributed to the upward trend of health costs. If we analyze the distribution of per capita health care expenditure and the changes in population within the same age group, we can conclude that the increase in health care spending is attributable solely to demographic trends. Such a phenomenon would only account for less than one fourth of the increase in health care costs, while other dynamics, linked to technological advances and to income, prevail. State-of-the-art technology contributes to cost containment, because it improves productivity of the resources employed, or the effectiveness of therapies and of prevention treatments, but generally it is more expensive than traditional therapy. This is why
the use of technology is considered one of the chief causes of health care inflation.

In the literature, a debate has developed on the consequences of increased longevity on the morbidity rate of the population. According to Gruenberg (1977), since we live longer, we need more treatments because we are more exposed to the chronicization of diseases. Manton (1995) argues instead that alongside longevity, we witness a parallel deferral of disease and disablement, and the total number of years spent in bad health remains the same. Fries (1980) starts from the assumption that health improvement, which postpones disease to an older age, results in the compression of the population’s morbidity rate. Empirical evidence shows that health care costs concentrate in the last months of life of an individual (death-related costs). In a scenario characterized by a longer life, mortality has been postponed to the oldest age brackets, with a reduction in health care service consumption for middle age classes which offsets higher costs for the most elderly (Roos, et al. 1987; Batljan and Lagergren, 2004).

The economic literature has also investigated the connection between the demand for health care services and income. In particular, the question as to whether health should be considered as a luxury or rather as a necessity (elasticity of the demand as compared to an income higher or lower than one respectively) has been tested empirically. In the first case, the basic idea is that once primary needs have been met, the remaining income should be used to satisfy special needs, whereby heath protection would acquire importance.

These studies have produced different conclusions, depending on how the issue has been approached. Someone affiliated with an insured group might have little incentive to reduce his/her consumption of health care services, in particular if the group he/she belongs to is a large one; his/her impact on the group is irrelevant; in this case, the demand for health services is independent of the income of the individual.

Generally, the empirical test on aggregated data at the national level showed that the income elasticity of demand for health care was greater than 1. As a matter of fact, studies on national expenditure indicate that 90% of changes in expenditure is attributable to variations in per capita income, whereas differences in the health status have a negligible impact. According to other studies, the rise of the share of health care costs associated with the income growth is the result of a spurious correlation, and is due to factors like technological progress that is more advanced in industrialised countries. Finally, others argue that since health treatments are ‘labour-intensive’, expenditure increases alongside with the rise in income.

Additional studies on individual spending show that most of the changes in expenditure (from 50% to 90%) are due to differences in health status, thus the elasticity of income is low or negative. Yet, data analyses carried out before the Sixties, when insurance was less common and most of the payments were made out of the citizen’s own pocket, showed a greater income elasticity.

To conclude, there are studies investigating the relationships between specific expenditure and income typologies. The out-of-pocket expenses for dental treatments, plastic surgery, the use of eyeglasses or for other kind of treatments show a greater-than-one elasticity as compared to income. This is probably due to the fact that these treatments can partly be considered unnecessary. In particular, the decision to undergo plastic surgery to look better or to receive special dental treatments (e.g. veneers) cannot be considered a necessity, all the more so since people who resort to them generally have higher incomes.

Regardless of the abovementioned theories, health care expenditure has always increased more rapidly than income. In the United States, from 1980 to 2003 the increase accounted for 4.4% in real terms - twice as high as economic growth (2%). The situation was more or less

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*This correlation might also conceal supply elements. For instance, industrialised countries may allocate more resources to health care with fewer budget constraints as compared to countries that have implemented cost-rationalization measures.*
the same in Europe, even though there were differences across countries, especially in Germany, where over the same period of time health care expenditure rose by 3.2%, as against a 1.6% increase in GDP.

In the last few years, the spread has widened: from 1997 to 2003, in the United States expenditure grew by 4.3% as compared to a 1.9% rise in GDP; in the United Kingdom the increase accounted for 5.2% and 2.7% respectively; in Germany the increase accounted for 1.7% and 1.2% respectively. Remarkable is also the growth spread in the Eastern European countries: in Hungary, expenditure grew by 7.7% as compared to 4.4%.

Table 1: Trends in health expenditure

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As to the future trend in expenditure, population ageing will continue to affect its growth. Eurostat projections (Europop 2004 baseline) indicate that between 2004 and 2050, in the EU the population over the age of 65 will rise from 16.5% to 29.4%; in the same period of time, the number of persons aged 80 and over is expected to increase from 4% to 11%. In Italy, where there is a remarkable population ageing process, the same percentages will rise from 19.2% to 33.8% (people aged 65) and from 4.8% to 13.4% (people aged 80+).

Compared with the past, in the future population ageing is expected to accelerate, mainly because of the progressive ageing of the post-war generation (the so-called baby boomers), a period characterized by high birth rates. Therefore, problems due to demographic development are likely to worsen.

The shift of population toward older age groups will imply more treatments, as evidenced by the fact that health care spending grows as people get older. The morbidity rate trends illustrated above, as well as medical technology costs and the income elasticity of demand for health services will have an impact on health care expenditure. Since these phenomena seem to be interconnected, expenditure trends are hard to project.
The Economic Policy Committee established a Working Group on Ageing Population (AWG) to examine the long-term consequences of population ageing on social security costs. This group has formulated new projections concerning health expenditure until 2050 in the above-mentioned scenarios.

The rather prudent AWG reference scenario takes into account the combined effects of the health care status of the population, demographics and the income elasticity of demand for health care. The projections show an intermediate scenario, half-way between the ‘pure ageing’ and the ‘constant health’ scenario.

In most of the expenditure projections submitted by the different countries, a distinction is made between health and long-term care expenditure. Public health expenditure has increased from 4.9% to 6.2% for EU-10. In general, all countries have witnessed a rise in growth, with France recording the highest growth (9.5% in 2050). In Eastern countries expenditure is lower though significantly increasing. Long-term care increases more in countries like Denmark, the Netherlands, Sweden and Finland, where coverage is state-run. Indeed, Sweden has the highest costs going from 3.8% in 2004 to 5.5% in 2050. Presumably, the same occurs in Germany, but no projections have been made for welfare costs. The increase in health care and long-term care ranges from 1.7% to 3.9% of GDP in the different countries, and in 2050 is expected to range from 7.3% to 13.2% for Italy and Sweden respectively.

Furthermore, total health expenditure of EU-10 is 2% lower than expenditure in EU-15, although it is on the rise. In 2050, the Czech Republic is expected to have a 2.4% increase in total expenditure and Slovenia almost 3%. Overall, the assistance expenditure will increase from 7.3% to 9.4% of GDP.

Table 2: Projections of gross public health expenditure as a share of GDP (AWG Scenario)

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Fonte: OECD.
The OECD (2006) has formulated its own projections on health care spending, but its conceptual approach differs from that of the AWG working group. Projections are based on the split of the expenditure increasing factors (demography, increase in income, technology, etc.) Alternative scenarios are simulated, notably a ‘cost pressures’ scenario — when policies are not effective in controlling expenditure growth — and a cost-containment scenario. Results referring to the most important European countries for the period between 2005 and 2050 show the same increase in spending (thus confirming the results obtained by AWG).

To conclude, although differing, the projections on health care spending represent an important contribution to the development of a health care policy by the National Governments. In a scenario characterized by ongoing improvements in medical technology, population ageing and by the increase of citizens’ expectations vis-à-vis health, health care spending as a share of produced wealth. Governments will try to cope with such an increase by adopting policies focusing on prevention, efficient provision of health services and monitoring of the demand.

5. Private Health Expenditure

As we have seen, in Europe health care is mainly state-run, while in the United States the public programs Medicare and Medicaid in 2003 financed only 44% of the overall health care expenditure of the country. In Europe, however, in the dynamics of private spending there is no rule of thumb. In some countries, because of the wide scope of state-run programs, private spending had no chance to grow, while other countries experienced just the opposite.

Up to the Eighties private spending tended to decline, because of the gradual increase in the number of people covered by state-run programs, with the subsequent rise in costs borne by the State. Afterwards, expenditure has shown different trends, mainly because health care policies have been dishomogeneous and reforms have been carried out at different times and in different ways. Notably, in Italy the pressing need to restore public finance soundness led, in the early 1990s, to an increase in the cost sharing by citizens.

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Source: OECD: Health data 2005; (1) 2002 figures; (2) Estimated on current public expenditure.
‘Out-of-pocket’ spending accounts for a significant share of private expenditure but its incidence varies in the most advanced countries and has a quite wide dispersion, averaging 20%. In Western Europe, contributions by citizens are rather high, for example, in Spain (23.7%) and in Italy (20.7%), whereas US citizens finance 14.1% of the total expenditure directly.

It is interesting to note that in the last few years out-of-pocket spending has remained mostly unchanged. This indicates that it has not been used as leverage by policy makers to reduce the financial burden on the State. Notably, tickets on medications have basically been the same since 1980, with fluctuations only in the short-term due to changes in the health care policy of governments, but they have not shown any upward trend.

**Table 4: Out-of-pocket expenditure on total expenditure**

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Source: OECD.
Note: Data for Belgium, Norway, Portugal and Sweden are not available.

### 6. Private Health Insurance

Private health insurance (PHI) is an alternate and additional source of financing for health care expenditure and in some cases it is the primary source of coverage for particular groups in the population. The experiences of advanced economies have been markedly mixed. The role of PHI, its economic relevance and the services it can provide are closely linked with the health care guaranteed by the public health care system.

The importance of the insurance industry as a financial instrument has grown, as evident from the table below. As previously mentioned, development in some countries has been limited by government decisions to extend state intervention to ever larger groups of the population in their pursuit to provide a universal health-care model.
PHI plays a vital role for top earners and for the well educated, and is offered to employees under company plans as an incentive to employee loyalty and/or to draw new recruits, factors which explain its great success in American companies.

The part PHI plays depends on the particular structure of the health care system. Insurance can be supplementary, complementary or act as a replacement:

- it is replacement where alternative state-run care is not provided;
- complementary where expenses or services not covered by the state are financed, for example, by co-payments adopted to make people more responsible in their use of health services;
- supplementary where it aims to broaden choice in health care services and/or speed access to such services.

In the first instance, demand for insurance is linked to the fact that some population groups do not make use of public health care (or do not intend to make use of it, for example those who opt out in Germany). Complementary coverage is for people who want to cover their own expenses through co-payment mechanisms. Supplementary coverage is for people who intend to use additional or alternative services to those offered by the public system where he/she does not consider them sufficient for his/her needs.

The contribution of insurance to health care expenditure is obviously greater in countries where private health care replaces state-run care. Certainly in the United States it contributes 36.7% of overall health care expenditure, in the Netherlands 17.2%, in Germany 8.8% and Switzerland 9%.

The subject of insurance in Switzerland is worth expanding. As previously mentioned, Swiss citizens are legally obliged to purchase a private insurance coverage. However, companies cannot make profits out of this activity and are monitored by the Federal Bureau. Insurers cannot deny private health care coverage to citizens requiring it. In order to facilitate the purchase of private insurance, the Federal Government puts pressure on companies to lower the prices of policies before they come out on the market, but if the price set is too high the Government may decide to subsidize the difference. All cantons enjoy some autonomy in setting the rules to subsidize premiums. For example, some cantons refund a part of the premium exceeding 10% of the income to citizens. Finally, it should be highlighted that compulsory insurance is based upon the solidarity principle: premiums paid are uniform and

Table 5: Ratio of private health care insurance to total health care expenditure

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Source: OECD: Health data 2005. Data for Belgium, Norway and Sweden are not available.
only vary according to regions and age (children/adults).

In Switzerland, public expenditure subsidizes nearly one third of insurance premiums paid by the citizens. Subsidies, their relevant amounts and beneficiaries are regulated by cantonal laws. Moreover, all cantons are legally obliged to cover 50% of hospital costs, as hospitals’ bed capacity must be higher than their economically viable bed capacity in order to ensure hospitalisation in the event of emergencies. This is considered to be one of the main causes for the strong increase in expenditure.

In France, it accounts for 12.7%, two thirds of which is covered by non-profit making health insurance funds and a third by insurance companies. In France it is common practice to refund out of pocket expenses directly. This type of coverage may be beneficial to the public system because by absorbing the expenses not covered by the state, it makes the implementation of reforms capping public expenditure easier.

7. Taxation on Private Health Insurance

The state regulates recourse to alternate sources of financing and in particular to private insurance through its fiscal policy. Several types of solutions have been adopted and have been changed over time by the health policies implemented by individual governments.

As a rule, tax incentives encourage people to acquire a health insurance policy because private insurance coverage lifts the burden on the system to some extent, thereby making up for the shortfalls in public resources. Moreover, private insurance provides appropriate solutions in an industry where the public sector struggles increasingly to satisfy such articulate and complex demand.

Tax allowances vary tremendously among advanced countries according to whether the buyer is an individual or a company. The majority of countries, including Italy, offer tax concessions to the individual but not to companies, while in Denmark and Spain they are only applicable to companies. The only countries where both types of concessions co-exist are Austria, Belgium and Ireland (Colombo and Tapay, 2004).

This very variegated context also includes cases where the limits on tax allowances are reduced. For example, in 1999, the Spanish government reduced tax allowances on all medical expenses, including insurance premiums, and at the same time it introduced tax allowances for companies which purchase insurance policies for their employees. In the United Kingdom in 1990, a tax allowance was introduced for people over sixty, but it was later repealed because fewer than 50,000 people applied for it in seven years.

Tax incentives are being driven down by the need for greater restraint in state finances, but also in some cases by the belief that private care must not be stimulated as this would shape the pricing process, generating additional transaction expenses, it would be a regressive tax, as the greater tax allowance would be for top earners in a higher tax bracket. Lastly, it has implications in terms of equity (Mosialos and Thomson 2002).

8. Relations with Service Providers

In providing financing for the system, PHI can select its health care providers and make them compete with each other, improving overall efficiency. Driven by the need to attract customers, insurance companies use a virtuous mechanism which offers the public better services and competitive prices; this makes them more dynamic, innovatory and sensitive to the needs of consumers compared to the public health care system which is rigidly bound to
providing uniform services for the public.

The constraints on containing costs have, on the other hand, imposed limitations on the freedom to choose a care provider in countries where a range of health care services are privately-run. In some countries, it has been restricted to a network of pre-selected service providers and in some cases authorisation is required from the family doctor in order to access secondary care. In the United Kingdom and Spain, the insurance companies provide medical services directly through participating health care providers. In the UK, private policy holders are required to make a co-pay deductible when they use services outside these networks, which varies according to the gravity of the provision.

While recognising the positive effects generated by competition, some observers claim that the private health care system is overburdened by considerable administrative costs, thereby averting funds from the public health care system. In the United States, in fact, the sophisticated control instruments in place to monitor the suitability and quality of services provided have given rise to significant additional administration costs, one explanation for the high cost of the American health system (Jones, 2004).

Moreover, despite the number of visits and days of hospitalization being lower in the United States than in other countries, the use of expensive technology has driven expenditure up, clearly with negative consequences. Fee for service systems appear to prompt doctors to write avoidable prescriptions, while the great sensitiveness within the American judicial system to civil responsibility promote so-called ‘defensive medicine’, where care and prescriptions are overstated to minimise the risk of being accused of negligence (it is estimated that this accounts for about 3% of the total expenditure).

One of the reasons why health care is so expensive in America may be the lack of competitiveness of the health service and an imbalance in the provision of medical care. In fact, historically, such imbalances between the public and private health care systems have given rise to speculation and gainful expenses imposed by both hospitals and doctors who can charge much higher fees than their counterparts in other countries.

To stem the concern, Managed Care Organisations began to appear in the United States in the 1970s and 1980s. Their main objective was to contain the costs of health care services, by merging the role of the financer with that of the service provider. In this case, the members of the managed care network are guided to make use of services in the health care facilities that are part of such organisations, but the member is still entitled to choose, and can utilize services outside the network on payment of a deductible.

On the other hand, if the sizeable proportion of the population with no access to health care is taken out of the equation, the quality of care offered by the American system is the best in the world (Docteur, et al. 2003). In this respect, the availability of new and costly technology helps provide a rapid diagnosis and improves the quality of care.

The insurance industry has made significant steps forward around the globe on the subject of costs. Practical evidence drawn from international comparative studies shows that market operators are in the process of concentrating their resources in the strive for economies of scale, premiums have fallen considerably, while distribution methods have been streamlined to provide simpler, more direct sales for even greater savings in expenditure.

In line with their free market economy guiding principles, most advanced nations tend not to regulate services provided through private health care insurance. Notwithstanding, some supervisory bodies are very active in overseeing that policy prospectuses are explicit and provide comprehensive information to enable the insured party to properly evaluate the different policies available on the market. A series of EU directives have been issued in this regard to uphold disclosure and scope for comparing insurance products.
Insurance is often considered grounds for concerns regarding equity implications because its availability depends fundamentally on the financial capacity of the single individual. In addition, policies impose limiting conditions, dictating the level and type of guarantees provided and, in some cases, risks may be uninsurable. In this regard, in-depth studies on the income redistribution effect resulting from refunds of medical expenses show that inequalities have been recorded in France and Ireland, a very limited impact has been recorded in Germany and the Netherlands and no impact has been recorded in Denmark.

Moreover, the provision of health care services has the potential to favour the insured and deflect resources from other patients. This risk is present above all in systems where the line between the public and private sectors is not well defined, where services require payment under both systems and the public health care system is limited in its ability to satisfy all demands.

However, it should be noted that two types of risks are responsible for limitations being imposed on the provision of care to policy holders, as they are so significant that they can pose a threat to financial stability in extreme cases. These risks are moral hazard and adverse selection.

The first risk is generally addressed by the inclusion in the policy of deductibles and maximum amounts. Depending on the type of coverage, maximum amounts and deductibles are applied to claims for accidents and/or per year of contract, to the degree of disability or the duration of professional incapacity or hospital stay. The aim in this case is to make the insured party responsible and discourage him/her from misusing the third payer, as well as containing policy costs.

Limitations on hospital and medical expense insurance are normally applied to more common expenses, while there tends to be fewer limitations where hospital stays or serious pathologies are concerned. Regular health care — such as dental care or medications — is generally excluded because it does not involve any risk and is consequently unavailable under health insurance funds, which is why the sector becomes accessible by insurance companies.

The risk of adverse selection is present in individual policies and voluntary collective ones, and is addressed by requiring a physical exam on the signing of the policy or by filling out an anamnestic questionnaire to determine whether the insured party misuses the insurance to cover medical expenses for pre-existing pathologies.

The type of policy determines the type of care provided and level of coverage offered by the insurance. In individual contracts where the risk of adverse selection exists, it is essential that the state of health of the insured party is assessed at the time the policy is signed to prevent fraudulent behaviour. Where collective policies are concerned, the risk of adverse selection is, on the other hand, non-existent.

9. Service Offered by the Private Health Insurance

Generally, insurance companies offer a broad range of services. In a number of insurance forms, benefit is negotiated as a (complete or partial) reimbursement for the costs borne to use health care services. Reimbursement of medical costs is the most important indemnity cover. Depending on the policy, reimbursed costs can be for diagnostic examinations, medical fees, hospitalization costs, purchase of medications, dental expenses, physiotherapeutic treatments, etc.

In addition, benefit can be provided just for specific diseases, like dread diseases that occur only in case of serious illnesses.
At any rate, when insurance covers those who are excluded from state-run services, the range of services it provides is quite diversified, but in some countries the provision of these services is subject to special regulations. As a matter of fact, in Germany and in the Netherlands standard policies are sold according to the terms set by Law to avoid the risk that part of the population remain without medical coverage.

In case of additional medical coverage, demand should meet the needs of those citizens who cannot find an adequate response within the state-run health care system. Regardless of the organizational structure of the public health system, the emphasis on ‘quality’ has been gradually increasing all over the world. In this respect, statistics about Italy are merciless. In terms of quality of service provided, Italy ranks 11th among the thirteen most industrialised countries in Europe, followed only by Portugal and Greece (EuoroHealth Consumer Index, 2005).

Despite inefficiencies and poor services, it should be highlighted that the Italian system and those of the other European countries can cover the entire population. This is not the case in the United States, where many people are in fact excluded from highly technological health care services because of their low income.

However, long waiting times for medical services, uncomfortable hospital accommodation, and limited freedom in choosing service providers can encourage people to buy private insurance. In Italy, Denmark, Australia, Ireland, New Zealand and the United Kingdom citizens must endure long waiting times for specialist examinations, surgeries or simple diagnoses given the lack of flexibility in the public system due to cost rationalization policies.

Insurance directs citizens to health care facilities that can provide the required services promptly, and in some countries it gives people the option of having more comfortable accommodation in private rooms in public facilities. In Austria, Ireland, Portugal and in the United Kingdom, hospitals offer private beds; in Australia, public facilities can accommodate and treat private patients. In so doing, insurance becomes an additional source of financing.

Under some insurance schemes, private insurance is used to replace earned income (e.g. daily allowance for temporary disability) and turns into a benefit paid when the insured is fully or partially unable to work because of his/her illness; under other schemes, the amount of money agreed upon is independent of financial loss resulting from the changes in the health status (for instance, a lump sum the event of permanent disability).

Among the innovative policies launched by insurance companies, Second Opinion Best Doctors and Long Term Care are worth mentioning. The first policy offers access to a network of specialists, mostly active in university centres, who check the correctness of prior diagnoses, suggest the most suitable therapy, excel in medical research, and in case of special needs provide information on the most advanced health facilities at the international level.

10. Long Term Care

Long Term Care deserves a separate discussion. In the future, we will be increasingly confronted with the problem of the care of people who become non-self sufficient, not only because of injury or sickness, but mostly because of population ageing. This problem is aggravated by the restriction of household groups, with the presence of single parent families, which make the traditional model of home care less feasible (Assicurazioni Generali, 1999).

The cost of non self-sufficiency might become hard to sustain, both for an individual who might be forced to use his/her own assets to pay for the necessary health care expenses, and for the State budget, due to the scarcity of resources. For this reason, some governments are creating new financial channels and implementing a better integration between public and
private mechanisms, with solutions that generally follow the approach of their respective health care systems.

In the United States, health care is guaranteed only to part of the population, through the previously mentioned public programs Medicare and Medicaid, conceived for the elderly and poor respectively. In this country, the absence of a welfare state based upon the concept of universality, creates substantial room for the growth of private health care schemes, notably long term care insurance policies.

In Europe, one of the best example is Germany. This country has established a mandatory state fund targeted to the care of not self-sufficient people. High income earners can opt out of this fund by following the same rules foreseen for the health care service. Long Term Care coverage is based on a capitalization system and, from a solidarity point of view, must comply with the rule of non selection of risk; moreover it has forced the companies to create a pool of businesses to share the aggravated risks.

The highly complex nature of the problem of care for the elderly — both from an economic and a human viewpoints — paves the way for a whole range of integration options, even at the level of a third pillar. If public service has to meet the primary care needs of the population and funds must provide collective integration, it is important to leave room for private social security aimed at meeting more specific needs.

The idea is that the need for long term care is considered a standard risk in human life; following this rationale, the insurance services offered to senior citizens can fall within a ‘package’ of coverages, encompassing disability due to injury or illness as well as social security services, which provide lifelong coverage to the individual and interact with each other synergistically.

Insurance providers have developed solutions in the various countries to reduce the technical-insurance problems related to these kinds of products. The first problem is the lack of technical data on the frequency and disability level of non-sufficient people. As a result, the insurer is rightly cautious when it comes to close contracts and select risks; secondly, the dynamics of risk increases with ageing, thus creating the need for higher insurance premiums for the elderly.

The option offered by private insurers grants access to the product starting from a fairly young age group, for whom the risk of disability is low, as is the relevant premium. Furthermore, with a payment scheme split up over a sufficiently long period of time, even across the entire work career, it is possible to reduce the premium paid by the policy holder.

Nevertheless, generally people can hardly understand the scope of the problem of non self-sufficiency in all its aspects. This issue has emerged only recently and although the situation is expected to worsen, the majority of the people will become fully aware of it through first hand experience, or if a family member or someone very close becomes non self-sufficient; clearly, when the problem does occur, it is too late to mitigate its economic implications.

This is not a minor issue, especially if we consider that the risk becomes catastrophic, both on the individual and the collective national level. It is therefore imperative to find solutions that, to be truly effective, must be put in place quickly, before the problem becomes too large to be managed; these solutions must provide for a distribution of costs over various levels, but at the same time people must remain conscientious consumers.

In this context, the development of social security schemes to accumulate savings over time can become a key tool to finance Long Term Care coverage. Upon retirement, or when they reach an age when the perceive the risk of becoming non self-sufficient, policy holders have two options: full annuity for those who do not want coverage against risk, or a lower annuity — whereby the difference might be used to fund LTC coverage.
For people who are already senior citizens, it seems appropriate to envisage a product that gives immediate coverage with respect to a single insurance premium; it is therefore possible to meet the current needs of this group of customers, who are highly exposed to risk. Even though the premium requested is high — due to the abovementioned reasons — the higher concentration of savings among the older groups, resulting from a life cycle that favours consumption during young age, could reduce the size of the problem.

In order to provide integrated and concrete solutions to the problem of care for the elderly, services offered by companies operating in the health care sector can easily complete the line of LTC products. These companies specialize in offers that are not specifically based on an insurance rationale, but instead complement it, by providing services such as integrated home care, including health care services like organization and management of care services for the elderly directly at home.

In this regard, insurance companies are able to provide a thorough and global response to the problem of health care for senior citizens. The solution must be found by public institutions and private business operators alike. They should play different but integrated roles, and work together to reach the same goal.

11. Conclusions

In spite of their quite different approaches in terms of service providers and sources of financing, all the health care systems of the advanced countries feature an increase in health care expenditure higher than the GDP. So far, many reforms have been put in place to curb the costs of the system, on both the demand and the supply side. In addition, prevention campaigns have been launched to promote positive lifestyles.

Although these reforms have contributed to the improvement of the system efficiency, health care spending is constantly on the rise. A further increase in expenditure is expected in the next few years: social security will have to encompass special care forms for the increasing number of non self-sufficient people, due to the ageing of population. Health care spending will also increase for the citizens’ growing demand for better quality and faster medical treatments, and especially for the increasing use of medical technology.

The health care issue is therefore a major challenge for national governments, who must strike a balance between the expectations of better services and the lack of resources. Measures aimed at increasing tax revenues through higher contributions can hardly be considered, because they would have adverse effects on the competitiveness of companies, all the more so if the highest charges weighted on the cost of labour.

Against this background, the diversification of sources of financing seems unavoidable. In terms of policy, the problem is to find the right mix of public and private mechanisms to obtain the resources necessary to provide health care services meeting the population’s requirements. It is therefore very important to define the right way and time frame to carry out the necessary changes without distorting the inspiring principle of the health care system, which in Europe is based upon the concept of solidarity.

In this context, the supply of health care services can better meet demand thanks to the wide range of solutions offered by private insurance and insurers’ ability to provide flexible and tailor-made answers. Furthermore, private insurance has made health care systems in most countries more dynamic, as individuals have the opportunity to choose the most suitable health care operators and to speed up treatment.

Policy-makers must make room for the insurers so that they can exploit their full potential and become a means to finance health care expenditure. In so doing, they must respect the
freedom of action and the pursuit of the goals typical of all economic activities. However, insurance must be prevented from becoming an ineffective resource allocation tool, as well as a tool that discriminates among citizens. It won’t be easy to reconcile these goals but it is imperative to do so, if the insurer wants to contribute to the economic growth and the social development of a nation.

In this context, the Dutch and the Swiss systems must be mentioned. In these countries, insurance plays a crucial role in financing expenditure given citizens’ obligation to underwrite a policy covering health care expenses. The State regulates the supply of insurance companies and ensures a non-discriminatory access to health care by subsidizing the less well-to-do.

Undoubtedly, the insurer’s contribution could be even more significant if the subjects involved in health care manage to ‘team up’, task that must be undertaken by policy makers and cannot disregard the specific role of all subjects involved in the process. It is certainly not possible to do without the regulatory measures of the State, as the failure of health care services based on free market mechanisms has shown. It is up to the State, but not only to it, to promote greater transparency among the different parties involved, but also to widespread information so that citizens can take conscious choices and monitor how the system works.

It is also necessary to create synergies with other social security instruments, such as complementary social security that is already in place in a number of countries, albeit in a limited way. Savings accumulation meets these targets and with the passing of time it could party be transferred somewhere else to finance health and long term care coverage. Law makers should thus provide for a flexible use of accumulated capital, to meet needs that might change during the individual’s life span. People’s financial resources may be deposited on accounts that are opened to cover medical expenses. For example, some countries have set up a system of Health Care Savings Accounts which are usually coupled by a medical insurance: they cover specific services with higher financial risks often exceeding people’s economic availability.

Hopefully, in the near future the health care system will manage to harmonize goals and synergies of both the public and the private sector and place emphasis on health and wellbeing of all, while complying with the solidarity principle which is a progress indicator for countries wishing to support and promote social cohesion.

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Longevity, Systemic Models and Business Risk

by Andrea Battista

“It is better to have a permanent income than to be fascinating.” Oscar Wilde.

“Specialization may be a great temptation for the scientist. For the philosopher it is the mortal sin.” K.R. Popper.

1. Introduction

It is certainly the case that in recent years, conference programmes, the contents pages of magazines and the daily, weekly national and international press have been crammed full of items on the issue of social security in general, and more particularly those aspects relating to complementary social security.

Despite this the issue of payment of retirement pensions, i.e. the final stage of the welfare system of which the accumulation stage is a mere, though essential tool, has undeniably been relegated to the back burner of public debate, possibly owing to priorities in time. Now it is time to create a reservoir of welfare resources, and in the future — not necessarily the near future in Italy’s case — their distribution to the pensioners of tomorrow will have to be dealt with.

Even from a scientific viewpoint, certain schools of thought\(^1\) have only recently provided interesting contributions, not only based on an (albeit valuable) mathematical-actuarial approach, but rather on a wide multidisciplinary approach (from macroeconomics to finance) which is vital in tackling a phenomenon affecting human life, i.e. an event which is par excellence at the centre of everybody’s interest.

When it comes to business behaviour, available surveys on important issues related to management and ‘key’ risks suggest that the issue is not at the centre of attention of corporate managers, and even less do they suggest that there is widespread strong structural and organisational preparation for tackling the phenomenon at all levels of the insurance industry.

For example, mention should be made of the recent Tillinghast survey (2004) on the subject of risk management, which showed a multifaceted situation in which the attention paid to demographic aspects was increasing but still insufficient.

Whereas 84% of those interviewed stated that they tend to develop demographic risk measures, 69% try to include that risk in the overall Enterprise Risk Management process and only 39% declared that they were satisfied with the tools at their disposal for the management of that risk.

This may seem surprising for economic players such as life insurance companies, which for at least a couple of centuries have monitored, assessed and summarised human life — or rather the length and quality of its evolution. Clearly, together with its numerous repercussions — from the ageing of the population structure at any moment in history to the consequences for

\(^1\) Managing Director of Duomo Assicurazioni, Cattolica Group.

\(^2\) Reference is made in particular to the research directed by the Wharton School of Philadelphia and for Italy Cerp in Turin.
the labour market and pension systems, to the dynamics of family life — the progressive extension of human life itself is an essential element which cannot be neglected: it is really ‘the greatest of challenges’, a kind of final fulfilment of the historical function of life insurance the institutional role that insurance companies may be called upon to play in that context.

As to the role and institutional function of insurance companies, one should be explicit: we are dealing with activities and tasks that can and should be carried out not because of some kind of ‘hunting preserves’ preset by law but because of specific characteristics linked to their intrinsic nature as insurance companies.

The above remarks are all the more correct and relevant given that the increase in longevity is a widespread, well known, systematic and theoretically irreversible phenomenon for the advanced western world.

Who would be willing to bet on a reverse of increasing life expectancy in western countries, even in a far distant future? Rather, there is a need to understand whether we are approaching the genetic limits of the increase in life expectancy, and many researchers believe that this is still not the case (e.g. J.W. Vaupel of the Max Planck Institute2).

As was mentioned above, the phenomenon of ageing is typically multidisciplinary, particularly in its macroeconomic and social content, and a correct approach must begin from the growing situation on which insurance companies world-wide can be said to have little, or perhaps more correctly, no influence whatsoever.

Structural ageing progressively generates new needs: the demand for health care increases — or rather it explodes — which may or may not be connected to the dynamics of the non self-sufficient population, as is suggested by trends in all advanced countries.

If micro-aspects are considered, the customer life value tends to change, i.e. it increases sharply. Older customers do not easily change the loyalty relation developed over time and they have savings already allocated, to be allocated or to be mobilised.

Statistically, the average age of service buyers changes; and with it some of their decision making propensities, e.g. their propensity to risk taking. In the case of contracts in force over very long periods of time, the function, and role of the prospective solvency of insurance companies become much more important as does its monitoring. The few remarks made so far already help us understand the pervasive importance of the phenomenon. The impact of ageing on the social and economic balance varies from country to country. In 2003 the Centre for Strategic and International Studies in Washington (CSIS) published a detailed report3 in which a vulnerability index to ageing phenomena was set out: together with France and Spain, Italy was shown to be one of the highly vulnerable countries4.

In this article we would like to focus on longevity and the related risk consisting in a lack of resources due to an actual longer than expected life span, on which expectation the savings-consumption life cycle had been planned. Using a classification of societies according to demographic risk management approaches, we obtain a four-pillars longevity risk allocation model partially mirroring the traditional four pillars focusing on the accumulation side; then, the tools and procedures for managing the risk on the part of insurance companies and the role they can realistically play will be identified. Finally, we shall claim that financial markets — with their intrinsic structural creativity and allocating dynamics — may also play a vital role within the system.

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2 Quoted in Reday–Mulvey, G., Working beyond 60.
3 Cited in Corneli, A., Invecchiamento: la sfida del XXI secolo.
4 The least vulnerable country identified by the research was Australia, thanks to its good demographic flows, flexible public sector and effective old-age insurance schemes.
In Italy at least, it will, it appears, take a long time before a real pension market can be developed, but taking action now is vital. Implicitly, we maintain that we are faced with a problem of supply rather than of demand, not so much because ‘insurance is sold, not bought’, as the old saying goes, but rather because today the supply side seems to be more markedly obstacle-ridden. To paraphrase Say, the demand will also be created by an adequate supply and effective public (tax and statutory) policies, although the inertia pull of some passive behaviours should not be underestimated.

Our basic conviction is that wherever a widespread cultural deficit occurs in either demand or supply, an interdisciplinary debate needs to be progressively and continuously stimulated in order to overcome this deficit in the medium term, (while resisting the temptation of scientific specialisation) to the benefit of a conscious demand, an adequate and effective supply and, finally, a market leading social well-being.

2. The Evolution of Social Models of Longevity Risk Cover

The extension of human life does not — nor will it — necessarily eliminate the volatility of the length of the lives of individuals; rather, volatility (the downside in the following examples) is or may be accentuated by social phenomena, such as the so called Saturday night carnage, or blind terrorist attacks, which on an individual level tend to weaken, rather than strengthen — the (at least perceived) certainty of a longer life.

Also the phenomenon of so-called rectangularisation of the longevity function (Pitacco), and of the coverage of the way and means of distribution and of both moving towards the most extreme age on the distribution curve of the age of death, should not be translated into an automatic financialisation of the final stage of the life cycle. Recent studies have also shown that the chance of spending all one’s accumulated savings before the end of life is real and significant, although it depends on the allocation of available assets.

If the tautological saying of B. Franklin still holds true (nothing is more certain than death and taxes) it is equally true that for individuals nothing is less certain than the time of death.

Before state pension systems were created, during the long centuries of pre-industrial society, the demographic risk in its double and symmetrical guise of risk of mortality and risk of longevity obviously existed but were de facto managed within the — often numerous — family. The early death of the only source of income implied mobilising the family’s energies, often with dramatic consequences for expectations of personal growth. Social communities, which were often small and with strong local roots, were able to provide support to some extent. Longevity too was managed in the family, thanks to the numerous family members, the absence of women on the labour market and the early exit of young people from the education system. To sum up the situation in the vocabulary of political philosophy, it certainly was a co-operative system based on voluntary relationships, hinging on the family but fundamentally independent from the market.

In his well known and visionary *The New Financial Order: Risk in 21st Century*, Robert Shiller provides an effective synthesis of the family’s role as an intergenerational risk management mechanism, and states that intergenerational social security systems are a formalisation of the roles played by the family which, in the past, was the main mechanism for the sharing of risks among generations.

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5 Elsewhere, with reference to the accumulation stage, we coined the phrase ‘diet syndrome’: it can always start next Monday.
7 Author’s translation.
That mechanism basically characterised the dynamic of human societies at different latitudes for centuries and provides a rough idea of what still occurs in less socially and economically developed countries.

In the modern western world, thanks to the initiatives by Bismarck and Beveridge in Europe and F.D. Roosevelt in the U.S., i.e. the birth and development of the Welfare State, a second stage progressively and rapidly emerges, the opposite to the first stage in its functioning principles of almost pure state monopoly. Through universal and mandatory pension systems, the state takes on the management of the longevity risk and conceptually accepts nearly the entire risk when replacement rates not far from 100% of the last income are planned and implemented.

The system is based on a fundamentally coercive logic: the state replaced a private non-market player i.e. the family. The initiative was certainly born of very good intentions of fostering inter- and intragenerational solidarity and responded to situations and developments which could hardly be tackled differently. However it also caused important repercussions, such as decreasing individual responsibilities and objectively weakening the role of the family in social dynamics.

Although it would be extremely risky, in a modern economy, to rely solely on the family with its limited resources, withdrawal of its authority leaves gaps which are difficult to fill.

At the beginning of the twenty-first century, the issue of the structural scarcity of available resources means that this second stage is out of date in western countries. The historical generosity of public systems has come up against unbreachable limits:

- in the public spending/Gross Domestic Product ratio already reached coupled with an unfavourable age class structure (Figure 1);
- in competitive globalisation, which makes the burden of that ratio difficult to sustain in many industrialised countries;
- in the ageing of the population: theoretically, when the working-age population share structurally matches the retirement-age population, in a pay-as-you-go system ensuring maintenance of full standards of living, half the available income would go to pension expenditure.

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* With reference to less developed countries, the following issue appears to be very interesting, although not included in the scope of the present article: is the transition to a ‘second stage’ similar to that of the western world in the twentieth century inevitable or may a more advanced stage be implemented immediately? Lessons may be drawn from the case of Chile.
The replacement strategies of the public sector are not mere theory, since the withdrawal of the State from the roles played so far is de facto unfeasible, not only in the field of welfare, even if we were all convinced and agreed that it was be desirable. Perhaps in this case mere replacement would be tactically and conceptually wrong. Mutatis mutandis, in the end it would be the same historical mistake made by the state with reference to the family.

In principle, the complex management of the full longevity risk calls for a marked capacity for ‘ex post adjustments’, typically exclusive to the state, since it works through the general tax system, even though it still meets many obstacles in this matter too. As a matter of fact, the options actually available (and therefore used) at political level tend to involve the maintaining or slightly decreasing of the tax burden, against a background of structural public deficits which, albeit to different degrees and according to different dynamics, trouble all advanced economies. Therefore, we are dealing with a real, though not traditional social good9, given that it is not the classic problems of free riding and lack of a capacity for full appropriation which are emerging.

Indeed, we can safely assume that no rational person voluntarily plunges into poverty in old age by taking excessive risks (for example excessive consumption) in a typical case of moral gambling simply because he or she can rely upon the public safety net. Rather, we are faced with the public sector’s usual tendency, which I would call ‘ex post financial flexibility’: to be rigidly tied to contracts and to the need for complying with their obligations which makes the risk (be it the insurance risk or any other) for private operators costly and potentially catastrophic.

Furthermore, the ‘demographic game’ is a serious source of uncertainty for individuals, which tends to reduce the production of a commodity compared to what the expected average value of the commodity to operators with a rational maximising attitude would suggest10.

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9The term is used in the traditional sense of economic theory.
10A comparison can be made with the issue of research and development, where the marked uncertainty of investments (not excluding the possibility of 100% losses) generally renders R&D investments socially sub-optimal. This point is made convincingly by S. Rossi, “La Regina ed il cavallo”.

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The position of public and private operators may be considered very similar in terms of accountability. In general, demographic losses are in large part not suffered by those who have taken on the risk which results in them, but it will be future generations of politicians and managers who will be held accountable.

However, there is a fundamental difference which tends to prevail: private accounting systems at least unveil such losses when they take place, through the reservation obligations\textsuperscript{11}, whereas the state balance sheets record the demographic loss only gradually when it takes place through outbound cash flows. Many years ago the second public debt — which was hidden and much greater than the first — was widely discussed. With the arrival of I.F.R.S., it is very likely that the logic of fair value will further restrict the degree of freedom in terms of the assessment of demographic liabilities.

On the other hand, when it comes to the longevity risk it is very easy to make mistakes: Let’s take, though only as an ‘indirect’ example, forecasts made by the Italian Social Security Agency (INPS) less than twenty years ago\textsuperscript{12}. With reference to the number of pensions of private employees in Italy, the forecast model supplied the following figures:

\begin{tabular}{|c|c|}
  \hline
  Year & Number of pensions (thousands) \\
  \hline
  1990 & 9,407.000 \\
  1995 & 9,340.000 \\
  2000 & 9,361.000 \\
  2005 & 9,525.000 \\
  2015 & 9,859.000 \\
  \hline
\end{tabular}

The actual figures so far were the following:

\begin{tabular}{|c|c|}
  \hline
  Year & Number of pensions (thousands) \\
  \hline
  1990 & 9,871.000 \\
  1995 & 10,520.000 \\
  2000 & 10,334.000 \\
  \hline
\end{tabular}

The gap was already significant only two years after the forecasts were published and revealed its systematic nature (error through weakness), even though regulatory amendments have progressively limited the access to pensions for younger people.

We think that the key aspect of demographic risk and longevity forecasts derives from the characteristics of scientific knowledge: indeterminate nature of the reality, the conjectural nature of science and, finally, the inevitably ‘unforeseeable’ nature of scientific discoveries\textsuperscript{13}.

We do not have a theory which can explain precisely the longevity of a given population, even if the initial conditions are perfectly known (indeterminism); even if such a theory were available, it would still be always open to falsification and surpassed at a later stage (conjecturalism). However, let us pretend that we have a well-formed theory allowing us to make exact forecasts in terms of longevity and that it is the final and true theory.

Since the length of human life undoubtedly depends — mostly but not exclusively — on scientific progress, i.e. new discoveries and their applications – not only in the field of medicine – its clear that fairly approximate forecasts would require the perfect knowledge of future discoveries (and their impact), which is logically impossible and contradictory, since if perfectly known, they would no longer be future discoveries.

\textsuperscript{11} In Italy, mention can be made of the ISVAP 343/D circular letter, which defines reservation obligations for insufficient pensions and envisages the option of amortising charges in time.

\textsuperscript{12} Taken from Palladino, 2003, “Le pensioni domani: si salvi chi può!”

\textsuperscript{13} There is no need to mention that this reflection is fully dependent upon the epistemological lessons of K.R. Popper.
The logical corollary of this syllogism is that, although a structured and constant collaboration between the worlds of science and insurance is certainly useful for allowing full exploitation of at least all the information available, clearly it cannot logically solve the problem of forecasting the length of human life; the impact of research on longevity is assessable at most after events have taken place: we must be aware of how little we know.

Personally, I believe that this is the ultimate reason why statistical-actuarial sources and not medical-biological sources are (and will remain) sounder methodologies and hence provide more reliable forecasts on longevity.

The synthesis of the path of logic taken so far may be formulated as follows:
• From the age of Bismarck onwards, the state has taken on and maintained a kind of monopoly of the market in the longevity risk cover.
• This was due to both strong structural reasons (ex post financial flexibility, public yield expected to be greater than private yield and limited accountability of the political decision-makers) and ideological reasons (progressive weakening of the role of families and individual responsibility, while the role of the state was strengthened).
• In today’s context, the state still remains the main natural ‘owner’ of risk management.
• The powerful development of longevity, together with the ‘financial crisis’ of the State and the intrinsic limits of modern families as ‘risk absorbers’ prospectively lead to developing a – complementary and not substitutive - role for a private market in demographic longevity risk and the tools for managing that risk.

Let us prepare ourselves therefore to enter a third phase in which:
1. the state, in its traditional role as pension supplier;
2. individual/family resources accumulated or freely available (precautionary financial savings);
3. the insurance system through life pensions deriving from accumulated savings will all be necessary — but none of them will be sufficient on their own — either individually or collectively to face the phenomenon of human longevity and its related challenges.

Many years will be necessary to transform the current system into a balanced three-pillars system, but finding a socially viable alternative in the long run is difficult.

Admittedly, in the Anglo-Saxon world this converging stage has already begun and some of the problems that emerged may provide those who follow with useful lessons for dealing with the issue.

Moreover, if the problem is presented in this way, the public sector may be persuaded to agree, since, apart from a few ideological extremists, and the usual — and inevitable — fluctuations and inconsistencies of the politique politicienne everyone agrees that current trends are unsustainable.

For clarity's sake, it is worth mentioning that the ‘three pillars’ briefly outlined here do not match those normally referred to when one speaks of new social security systems, which are formed bearing in mind the stage at which resources are accumulated.

As a matter of fact, the third pillar of this model includes all forms of private social security however accumulated, whereas the second accounts for the accumulated financial resources — albeit not allocated — which can be spent since they are not destined to one's heirs.

As regards the fourth pillar, we shall see below that even the slightest similarity between the two models fades out completely: the same number of current and prospective pillars during the accumulation and payment stages occurs by chance.
3. The Four-Pillars Model

Starting from that systemic model, the fact which comes out can be summarised by a slogan: ‘the third pillar needs the fourth’.

If it is true that the insurance system, also from the historical viewpoint, in commercial terms seems to be the obvious interface for customers to meet their longevity needs and the natural bearer of the risk, as already hinted at, this does not automatically mean that this risk can and should be fully borne by the insurance or reinsurance system.

There are three main reasons:

• the ‘non pooling’ nature of the longevity risk: the increase of the portfolio and the dispersion of the risk over a large number of individuals does not reduce the risk impact;
• the tendentially catastrophic risk size;
• the widespread indifference by players — both insurance and reinsurance companies — to taking on the risk.

That approach seems to be vital also at tactical and political level, because it helps insurance players to avoid the (instrumental) allegation of simply playing for position.

Like the three pillars model, where financing the system, increasingly requires that the incomes of individuals working beyond the age of 60 can and must be integrated into it so also in managing payment rates, the ‘three-protection-shields’ model must be complemented by the fourth shield: the ‘rest of the world’, which takes on part of the current risk and is rewarded through the most dynamic and flexible allocation mechanism ever invented and gradually implemented by mankind: the financial market.

This is certainly not an easy task and perhaps attributing the relevant accountability is difficult\(^{14}\): the optimism of the will, although always necessary, is often opposed by the pessimism of the mind. In general however, we feel that the reasons used for opposing this approach have more the whiff of a brake on the action than binding chains, as will be explained in the last paragraph below. Finally, it is worth highlighting which players I consider unfit for the role of additional ‘pillars’ in the management of the longevity risk: pension funds and industrial businesses.

As far as pension funds are concerned, my statement is apparently counter-intuitive, but it is based on the fact that, since pension funds do not have their own assets and since their assets and liabilities are dynamically identical, they do not have the necessary resources to cover unexpected — but possible — losses.

A pension fund taking on the longevity risk, in particular according to the defined contribution model but also simply in the distribution stage of defined contribution plans, runs the risk of ‘getting stuck’ in conflicts which, for example, in Italy eventually led to the well-known destiny of the glorious pension fund of the employees of Comit (an Italian bank).

The Italian legal system ruled on that limit (article 6 of the new single text on complementary social security): even though it allows pension funds to directly manage the payment stage, in the final analysis it considers it a residual hypothesis subject to strict control.

\(A\) fortiori we can say that neither are industrial businesses natural bearers of the longevity risk. To begin with, they are not familiar with the risk, do not have — nor are they encouraged to develop — the necessary risk management approach to run it, do not have their own

\(^{14}\) Since this is a general interest, I obviously believe that first of all the politicians must do their part — although this is further complicated by the undeniably international nature of the issue.
allocated ad hoc capital and, finally, their wage policy would be strongly influenced by it, since future contributions are the only possible form of adjustment.

The case of defined contribution schemes in the British market described by David Miles\textsuperscript{15} really seems to be illuminating and final.

According to recent data provided by KPMG in the UK, a one-year increase in the average life expectancy of all employees will entail additional costs amounting to 20 billion Pounds for pension liabilities. Italian law learned the lesson and virtually does not envisage defined contribution schemes, with the exception of those designed for self-employed workers.

Businesses are not natural bearers of the longevity risk because their financial flexibility is limited, even very limited in an age of competitive globalisation: they cannot translate actuarial deficits into an increase in the cost of labour, nor can the cost of labour be easily lessened through the reduction of contributions in order to balance the defined contribution fund.

4. Longevity as Business Risk

Our basic hypothesis is that only the combined and synergic implementation of a heterogeneous number of adequate tools partially internal and partially external to the corporate system can allow life insurance companies to correctly carry out the role that the evolution described in the the basic situation would tend to assign them.

On the other hand, it is apparent that in a modern system only insurance companies can jointly access all risk management tools: that is why they play a necessary role in facing the needs caused by the progress of longevity. This is their ontological peculiarity, which (potentially) is the origin of their statutory peculiarities, and not vice versa.

Before dealing with each one of them briefly, we list below the management tools which can be identified, grouped according to their macro-types:

- internal asset soundness tools,
- internal management and organisational tools,
- external systemic balance tools.

The classification above partly matches that reported in Blake, Cairns and Dowd (2006)\textsuperscript{16}, although that is less focused on highlighting the internal means available to businesses.

The internal asset soundness tools provide the pre-requisites starting to play a role, rather than a means of avoiding/covering the risk, and include:

1. the solvency margin, i.e. the allocated capital,
2. the adjustment of technical reserves.

They both entail costs and not revenues for the business system.

Internal managerial and organisational tools are related to the strictly managerial aspects of how enterprises deal with longevity risk management. They include:

3. contingency loading,
4. risk limits,
5. the dynamic adjustment of operational variables.

\textsuperscript{15} See the article by David Miles dated 31-1-2005 available on the website la voce.info.
6. product flexibility and risk sharing with the insured,
7. bundling marketing policies.

The list mostly includes possible sources of income or means to contain costs; consequently, those are tools for tackling the risk.

Finally, external systemic readjustment tools are mainly ways of containing costs and are: 
8. reinsurance,
9. hedging through financial markets (in particular derivatives).

We will dedicate the last paragraph of our article to the last item, since it is the key stone in the creation of the fourth pillar and goes beyond the normal boundaries of insurance companies.

5. Solvency Margin

We consider this to be a simple prerequisite rather than a tool for managing risk profitably: without adequate capital such a significant risk cannot be taken on over a long period of time, during which unexpected losses cannot be considered an unlikely occurrence. Without adequate funding, managing short-term fluctuations and consequently safeguarding customers/annuitants would not be viable.

The funding level must be defined by developing adequate quantitative models, as happens with other types of risks.

Consequently, there is a need for an adequate remuneration of the risk through contingency loading and asset management margins.

6. Technical Reserves Adjustment

This item is also included in the group of prerequisites: a cautious year by year assessment of reserves is a vital element and the obligations expected must be immediately and prudently identified. In this case too, the prerequisite generates costs.

7. Contingency Loading

If the general expectation is that the risk is prospectively unmanageable, then clearly that element has to be ‘costed’ at the time of taking it on. As far as insured customers are concerned, they have to pay for covering the concrete risk that human life might be extended. Of course, there is an upper ceiling for determining that contingency loading, i.e. the need that value for money (i.e. money’s worth, according to O. Mitchell’s terminology) remains sufficient to avoid affecting the potential customer’s (already small) willingness to pay.

Therefore, it is the willingness to acknowledge the value of risk cover which may define the amount of contingency loading, rather than a quantitative determination theoretical model, which however is always useful for defining the basic decision-making framework. Such contingency loading is an additional revenue; and so is in logical juxtaposition to possible future losses.
8. Risk Limits

Against this background, it is vital that the maximum impact of the risk be absorbed by other income sources generated by the business, however difficult it may be to identify consistent negatively correlated income sources, apart from the one deriving from the mortality risk: in addition to being sound, the ideal player must be well diversified.

This makes the it plausible to hypothesise that competent risk managers should be capable of generating income from other sources and not niche operators for whom the longevity risk is their core business. So far this is precisely what happened at least in the Italian market where operators in the pension market tend to be the main insurance groups.

9. Dynamic Adjustment of Operational Variables

If the hypotheses used proves to be inadequate, immediate action is vital to employ future generations: together with the risk limits, this allows the containment of the risk within absolute limits consistent with the size and risk tolerance of the business. In general, we believe that the demographic risk needs to assume a precise organisational importance and exceeds mere technicalities.

Financial risk management has become an important instrument thanks to the development of A.L.M. systems and their respective organisational processes, such as interfunctional committees; in the same way, equivalent operational mechanisms need to be developed over time to deal with the longevity risk in a profitable way.

10. Product Flexibility and Risk-Sharing with the Insured

The insured is the main bearer of the risk whenever it arises and tends to remain so unless articulate alternative mechanisms are developed.

It should not come as a shock therefore that a share of the risk is taken on by the subscriber, not only by allowing modification of the conversion coefficients during the deferment period, but for example also by means of bonus mechanisms, i.e. the participation in the mortality proceeds or losses related to a generation of annuitants.

We are aware of the limits and inevitable commercial scepticism, but it is an option worth exploring. Also the implementation of projected survival tables (future — and not current — expected longevity is ‘sold’) is crucial but not sufficient. The same should hold true as regards risk differences. Gender and age remain general variables, which could be usefully integrated with other assessments aimed at a correct ‘calibration’ of the risk: sooner or later the issue of a longer life expectancy for the affluent population will have to be dealt with pragmatically.

Also the diagnosis of genetic propensity to certain diseases could contribute to the correct calibration of the risk, but I prefer not to venture into an area whis is extremely thorny from the insurance point of view.

Research and development conducted by reinsurers can and must make an important contribution, since they appear to be the most obvious and natural instruments in terms of product development, provided that returns from the investments made are possible on a global scale.
11. Bundling Marketing Policies

Longevity risk cover is a very precious ‘commodity’ both in itself and as part of the commodity of insurance in general. In other sectors, access to ‘precious goods’ becomes possible if other goods are also bought. Without going so far, it can be worth exploring all possible forms of bundling, by encouraging a wider range of cover and including them in integrated packages. In the case of an individual customer, such a model would allow adding a source of further profit to cover the risk, while offering the traditional benefits of one stop shopping and integrated assistance.

If we take only the most technical example with reference the customer’s profitability, those who take a pension at the end of a 20-year term assurance policy obviously would enjoy a very different profitability profile from that of a new customer who subscribes to an immediate annuity.

Term assurance and annuity in the same side of the balance are a form of natural hedge insofar as the expected life extensions take place proportionally in all age groups. In this sense the mortality gap, i.e. the widespread lack of cover in case of an early death, may provide other opportunities.

Compensation between long and short positions fosters bundling: of course the correlation between the life increases of younger age groups and older age groups needs to be calibrated. The existence of a mortality derivatives market would really be decisive, since it would allow greater flexibility in ‘adjusting’ the positions taken on naturally through commercial activities.

12. Reinsurance

Reinsurance is a traditional tool of the insurance market, especially in accident insurance, in some ways comparable to capital owned by third parties, which in the case of longevity seems to have suffered and still be suffering from a sharp lack of supply.

We believe that some of the points made in the present analysis may be valid also for reinsurers and that the development of a reinsurance market is vital also in relation to the topic dealt with below.

The first step — which was insufficient albeit daring — accompanying the 2004 attempted issue of longevity bonds by the European Investment Bank — and above all the fascinating idea of a longevity market, as shown below — raises hopes of possible medium-term developments also in this field.

Limiting the duration of the expected lifetime of the contract and anchoring it to an index and not a given population seem to be the steps required from reinsurers for the development of reinsurance relations. The world of unpaired annuities — where the expected life of those insured is shorter — is also about to enjoy the benefits of a reinsurance approach.

Much is required from reinsurers in terms of research and development of new solutions: perhaps competition in a sufficiently developed longevity market might stimulate the players in this sector.

In contrast, unfortunately, we think that the management of traditional assets does not look as promising as a source of cover, since it is hard to identify direct investment tools which increase revenue so as to deal with possible losses generated by the longevity risk.

For example, direct investment in the care for the aged would be exposed to other forms of risk which are neither diversifiable nor immunisable, i.e. all the other risks typical of this sector.
of operation.

The same holds true of investments in pharmaceutical shares, and of the topics discussed below: direct hedging through the purchase of shares issued by pharmaceutical companies is unfeasible, since investors would be exposed to undesired incremental risks which could annul the effects of cover.

To conclude this short analysis, we believe that all the tools described here, considered jointly, can make the risk reasonably manageable so long as they are included in an adequate organisational context which, as already acknowledged in the case of other risk sources, plays a fundamental role in developing the correct cultural and suitable operational mechanisms. We stress the adverb jointly because longevity is not and never will be a world of ‘killer applications’, which are after all rather simple, not to say banal, solutions. The longevity risk can be effectively managed only through an articulated ‘blend’ of skills and technical approaches on the one hand and managerial vision and tools on the other.

An adequate but sustainable strategy of contingency loading, flexible articulated products included in suitable supply packages may be the correct approach to potentially profitable risk management on the part of insurance companies, the natural bearers of the risk and professional interface with the client. However, when longevity becomes an issue of general interest and epoch-making importance, we cannot manage without the contribution provided by the possibility of opening a widespread market.

13. The Hypothesis of a Longevity Market

The hypothesis of creating a longevity market, i.e. a virtual place where operators originally not involved in the issue start investing and take on the risk, is fascinating and systemically necessary and is a great challenge. All those who for any reason participate in the world of longevity should feel stimulated by it.

Of course there are significant obstacles, but the correct intellectual and operational attitude is needed to face them.

Isn’t there sufficient available data? It can be created gradually by calling upon all the players involved.

Isn’t there a revenue culture in both supply and demand?

This goal can be achieved slowly, but continuously and determinedly.

Don’t investors demand why longevity investments are not included in management mandates and benchmarks? The solution entails highlighting the possible value of a group of assets completely unrelated to traditional financial variables, which in general are widely appreciated by certain kinds of investors.

Do the first attempts fail? They will be useful lessons for the future and not unappealable sentences.

After all, the history of the derivatives market is riddled with operational segments and experiences which proved successful over time by overcoming obstacles or very real failures which seemed insurmountable and final.

The natural ‘prime mover’ syndrome must be overcome, since the perception is that risks are more numerous than benefits for those in the vanguard in a world full of repetition.

An interesting scientific literature on the subject of longevity bonds has begun to emerge,
a fundamental prerequisite for the development of derivatives markets, as is shown by experience of the Black and Scholes model — now an integral part of the history of economics and economic theory and the birth of which as a reference scheme was crucial to the development of derivative shares.

We refer in particular to the recent work by Blake and his co-authors\textsuperscript{17}, who consolidated older research and identified a series of derivatives connected to longevity, though not necessarily related to cash shares, following the model of traditionally well-known shares: swaps, futures, options, caps, floors etc.

Literature is beginning to appear in more weighty and widely circulated magazines\textsuperscript{18}, and this is also an encouraging — if somewhat timid — sign.

As regards issuers, we believe that a fundamental role can be played by operators who profit from an increasing life expectancy, i.e. all those who have a customer lifetime value strongly sensitive to the increasing life expectancy. The importance of the role played by such operators, who might be termed longevity risk ‘natural hedgers’ lies in the fact that they could contribute to the overcoming of the chronic lack of reinsurance supply, and could even be a natural competitor marked by a competitive edge which cannot be replicated.

At this point, mention should be made of the pharmaceutical industry for which:

- presumably there exists a complex but steady long-term functional correlation between ageing of the population and the value that can be created by the industry;
- the relation works in two ways: not only is ageing the precondition for the creation of value, but it is also partially the result of the value that was created: according to some researchers, approximately 40% of the years in an average life gained between 1986 and 2000 in the US may be traced to the introduction of new medicines;
- the invested capital is significant, tends to grow, covers long time spans and debt obviously useful as a source of funding, if only to streamline the capital structure;
- the size, reliability and sophistication of businesses are noteworthy and are an important factor in the creation of potentially large markets.

It is well known that the consumption of medicines grows exponentially among the elderly: in Italy, in 2004 a patient of over 75 years of age, assisted by the national health service cost 11 times as much as a person between the ages of 25 and 34\textsuperscript{19}.

Those older than 65 account for 60% of the expenditure: it is clearly possible to define a reasonably sound quantitative model relating the increase in longevity to the increase in expenditure and, consequently, to earnings.

Moreover, since at present there is a clear and acknowledged gap between structural supply and demand, those who operate on the supply side may achieve interesting — perhaps temporary — benefits in the form of low financing costs in the long and very long run, i.e. a position in the rate curve which for the private fund-seeker is always difficult to reach and entails high costs.

It was not by chance that in 2004 the EIB tried to issue longevity bonds at a price 20% lower that its usual standard price: it was probably excessive but obviously it will take a long time before a general understanding of fair issue pricing is achieved.

As regards the pharmaceutical industry, it seems clear that one can speak of a real relation between assets and liabilities. In this case, assets are not meant to be specifically identified

\textsuperscript{17}E.g. “Living with mortality”, which was cited above.

\textsuperscript{18}E.g. “Life and pensions”

\textsuperscript{19}Source: Italian Higher Health Care Authority.
items in the balance sheet: if one wished one could think of the cost of research and development, which are the primary origin of new medium-term gains.

However, the profits of a business over $T+1$ time by definition derive from its investments (both tangible and intangible, recorded and unrecorded) in previous T periods, in other words they emerge from the asset side of the statement of assets and liabilities, though they may not be reflected in the accounts prospectus.

_Mutatis mutandis_, the situation does not look too different from that of inflation connected to public utilities, although in the case of the pharmaceutical industry the assessment of the longevity/proceeds relationship is obviously less clear-cut than that of inflation/utility.

The fact that utilities manage to link their proceeds to inflation provided the management with an important source of products linked to inflation, and risks were eventually allocated to subjects operating with liabilities naturally connected to inflation.

It may be maintained that the inflation-linked market developed precisely when this hedging mechanism was put into motion together with the natural provider of cover. Obviously, not all pharmaceutical companies are the same in terms of their product ranges. The roles they play depend not only on their financial structure and propensity towards running into debts, but also on their corporate core business, since the consumption of certain types of medicines is particularly linked to the extension of human life and consequently to a population structure marked by a higher average age, with a significant incidence of older age groups.

It seems difficult to identify other sectors which are as important and in which the correlation with longevity appears to be as significant. Another interesting example of liabilities, financial in nature though belonging to a niche, naturally linked to the longevity risk could be provided by reverse mortgage. The product has already become common on the Anglo-Saxon markets and allows a person normally of advanced years to take out a loan against real estate, amounting to a share of the real estate's value. The money is repaid from the sale of the real estate when the beneficiary passes away, or it is repaid by his or her heirs wishing to buy the real estate. Clearly, in this case the total margins of the operation (though not the annual ones) last the length of the beneficiary's life after the loan has been made; this is economic and not financial hedging.

In contrast to the case of inflation, unfortunately the State is not a natural issuer, although it has ideal characteristics in terms of minimising the credit risk: obviously the state is already overexposed to the longevity risk owing to its implicit and explicit pension burden. In any case, during the initial stage, the state could issue bonds to foster the development of a very important market, if its balance sheet would be only slightly affected.

For the creation of a market, issuers, investors, ‘speculators’ and even arbitragistes, are required or there will be insufficient operational structures and critical mass needed to develop attractive liquid markets: after all the huge power of derivative markets derived from their formidable liquid assets.

Investors operating with groups of assets not linked to the market activity and characterised by beta estimates approaching zero, such as traditional hedge funds for example could be interested parties. We believe that there is room for investments banks, which bear huge risks, to create books (albeit initially small) that are not systematically covered. Since this was the case with inflation, which is a major part of the real economy rather than financial the same could happen with longevity in the future.

Among the first criticisms levelled at longevity bonds is that they are basic risk carriers and, in the light of their duration, they entail a marked credit risk. In developed derivative markets tools are found to manage basic risk, which in any case is a fraction of the total risk, especially in a high correlation environment such as the phenomenon of the extension of human life.
Furthermore, the price of cover may adjust and remunerate the risk: if less cover is provided, it must cost less. In contrast, tools for managing credit risk are now almost standard, such as credit default swap and collaterals, which would be useful to support issuing longevity bonds.

The experience of derivative markets teaches us that reaching a ‘critical mass’ in terms of operators and volumes is vital: from that stage onwards the problem lies with controlling development.

In addition to technical aspects — however important they may be — we think that a basic prerequisite can be identified: the mindset of operators should not be such as to lead them to believe that by ‘betting’ against longevity losses are inevitable, regardless of the base value set. In this case, whenever we identify a natural hedger such as the pharmaceutical industry, why should it have to self-finance at a cost that ex post would be perceived to be systematically higher?

14. Conclusions

Regardless of value points of reference, which in life tends to see the good and the positive, longevity, i.e. the extension of effective life expectancy, may be considered ‘good news’ for humanity who can and will be able to benefit therefrom.

No rational person would opt for the ‘Botswana alternative’ with its 30 years of life expectancy at birth. Actually, “old age is not so bad when you consider the alternatives”, as M. Chevalier said.

Moreover, it may be (is) good news also for insurance companies as private economic operators on a free market called upon by their shareholders to create value in a form which is sustainable over time: where there is risk, there is an opportunity to create value. The correlation between ‘good news for the world/good news for the companies’ is the logical confirmation of the social role played by insurance companies and is bound to increase the importance of insurance operators.

When longevity tends towards the infinite, the demographic risk component fades out and the cover of needs becomes a pure saving process even before income is generated: we might say that at that stage the fourth pillar of accumulation becomes dominant.

The demand side still shows a marked and clear cut preference for liquid assets since the implicit risk assessment — and consequently the willingness to pay — on the part of potential customers is very different from that (much more limited) carried out by insurance players and their planners.

Undoubtedly, companies play a social role (as do other financial intermediaries) in directing demand downwards by means of the tools used in a developed business relationship. The systematic nature and size of the longevity risk make it unmanageable for all players if they do not act jointly. In any case, this risk cannot be renounced: it has been taken on in a very mechanical manner for decades rather than been selected: it would be a mistake to go from one extreme to the other.

Consequently, ‘sharing’ will be the general watch word for everyone, and where there is sharing there must also be collaboration between players with different institutional roles and competition aimed at selecting the best representatives of each group.

An example is provided by the financial world, which shows that risks can be managed not only through diversification but also by distributing them among different people in the most suitable way, for example according to their natural liabilities in addition to different market
Hence, sharing is the watch word which holds good for everyone. For insurance companies, which must distribute the risk burden among various management tools and develop more sophisticated tools/products: substantial capability and social accountability must go hand in hand. For individuals, who need to plan their lives by distributing the burden of supporting the resource accumulation process among all four pillars. For public pension systems, which need to distribute the risk they manage in the fairest possible way among generations. Finally, for the State which since it cannot take on the full risk, needs to encourage, regulate and monitor the evolution of the system or act as the player of last resort using the tax system as a final option, without limiting individual liberties.

The stakes are very high, including and above all from the ethical point of view. If longevity becomes a globally relevant and socially unmanageable risk, the pressure to contain health care expenditure for older age groups — which de facto means a reduction of life expectancy — could become irresistible and for the first time in history, longevity would cease being a goal for mankind, possibly changing the ultimate meaning of social-economic development.
Abstracts from  
*The Employment Dilemma and the Future of Work*¹  

by Orio Giarini* and Patrick M. Liedtke**

1. Foreword

The first question that any reader who had a look at the inside cover information on this report would ask is: Why would somebody reprint a text whose major work was done exactly 10 years ago? The answer is simple and two-fold: firstly, quite simply because we have run out of books. There is still a strong demand for this publication and we have been reproducing off-print versions of the original and then the slightly updated manuscript for a number of years now. But secondly, and more importantly, because in the recent past a new wave of thinking about the future of work and how to organize the socio-economic system has found its way into the mainstream. Interestingly enough, our ideas back in 1996 are being discussed anew.

If the authors have one qualm about their work of ten years ago, it’s our failure to stronger influence the political and economic debates in this area. Not that we could reproach ourselves or our public for the general lack of success or visibility of the work. The report has been translated into eight languages since its original appearance, was reprinted in some countries in several editions and became an economic best-seller in Germany. In addition, the authors were invited to discuss with the highest politicians in several countries, toured the whole of Europe and North America with their ideas, participated in expert conferences and parliamentary hearings, contributed to special national and international working groups, appeared in numerous talk-shows, TV events and radio interviews, and published scores of breakout papers based on this book.

And still, many of the shortcomings that we pointed out and analyzed a decade ago are still not resolved. Concepts like the fourth pillar (i.e. part-time working of the elderly), the importance of unremunerated work, the increasing flexibility and demands of the working environment, the need to renegotiate the contract between the workless and society, between the pension contributors and the benefactors etc. are still with us; perhaps even more pronounced than they were before.

Modern societies are trying to develop concepts that allow them to protect their citizens and at the same time stay competitive in the globalized markets. The approach of the new welfare state is no longer to arrange for full coverage of (ideally) all risks but to replace the existing extraordinarily expensive systems with more targeted and efficient approaches. They achieve this by requiring people to take on more risks individually and to organise their adequate protection themselves. This is the so-called ‘risk shift from public to private’, a concept we have been developing for a number of years. In reality, usually as a consequence of half-hearted or partial reforms, this has often led to an erosion of the protective systems rather than their real modernization. Genuine protection mechanisms, like insurance, provide cover for those risks that an individual cannot (or does not want to) bear. Today’s

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² Former Secretary-General, The Geneva Association.  
³ Secretary General and Managing Director, The Geneva Association (www.genevaassociation.org).
social security systems do anything but that, often protecting large groups of people against risks that they need no (or different) protection for, while excluding or leaving out others. We propose several possible solutions, among the most ambitious: (1) Organising a basic layer of remunerated work for those who cannot find employment otherwise, keeping them active and engaged; and (2) the encouragement and empowerment of the elderly to stay in employment for many years beyond age 60 or 65, but at terms (part-time work is the key component) that are more suitable to them.

Despite all this, it is very encouraging to see how the general discussions about how to reorganise the modern welfare state are beginning to shift into what we would consider the right direction. Besides these abstracts we also reprint a slightly edited version of our original report in the hope that the new availability of this book too will continue to make a positive impact. It can be requested at: risk_institute@genevaassociation.org.

2. Productive Work in the Service Economy

Up to now and during the course of the Industrial Revolution monetarised² paid work, mostly in the manufacturing industries, was the key and practically the only fundamental reference for economic development. Even the ‘traditional’ subdivision of the economy in three sectors at the beginning of the Industrial Revolution (agriculture as the previous heart of the economy, manufacturing as the rising segment and services as largely independent and unrelated activities in regard with the former two) is a sign for the concentration on remunerated manufacturing work and the negligence of the service activities that in fact complement products and utilisation systems instead of belonging to an individual and exclusive group of their own.

In the contemporary Service Economy, that is less determined by the mere production of goods than by a number of services revolving around them, we obviously need a different approach.

Not only the easily detectable shift of working population away from the first two sectors towards the service sector documents the change of our economy. It is also the growing dominance of services within the other two sectors that highlights the transformation from the age of industrialisation towards the modern Service Economy. For instance, intrasectoral services of the secondary sector are estimated to have doubled from less than 15% of the overall economy in 1950 to 30% in 1990, accounting for more than half of all jobs within the industry. If these figures are added to the traditionally estimated proportion of the service sector they will account for about 80% of the modern economy in terms of job functions. Only a diminishing part of remunerated work, currently 20% in ‘advanced’ countries, is still linked to strictly manufacturing activities.

Services dominate all economic production sectors, which increasingly depend on research and development, quality control, maintenance, financing, insuring, publicity and distribution, customer services, recycling etc. in order to render the best possible results. The value of a product is no longer strictly related to its production costs but to its performance over a period of time. The ‘sell and forget’ mentality of the era of mass production has withered away. The costs of production are now distributed in time from the very first initiatives at the level of research and development up to the moment of waste disposal and elimination after the utilisation of the products or systems.

This process has stimulated the amount of non-remunerated work as the producers of goods and services try to shift part of the work towards the consumer. The consumption of goods and

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²We propose to use the terminology as follows: ‘monetarised’ refers to systems where some form of exchange has taken place either for money (monetised) or not (non-monetised) but using implicitly a system of reference. ‘Non-monetarised’ refers to systems where no exchange at all takes place: basically self-production systems. It is absolutely essential to make a difference therefore between non-monetised and non-monetarised systems.
services is no longer a totally separated activity from the production function. It is more and more inserted into this global production system, particularly at the level of distribution and above all utilisation and finally recycling or disposal. The introduction of self-service restaurants, transferring the ordering and disposing process to the individual consumer instead of a waiter, or the substitution of bank clerk attendance by automated teller machines, demanding a higher usage knowledge of the clients, are just two examples. Alvin Toffler has described this phenomenon as the transformation of the consumer to the ‘prosumer’.

We observe here the reappearance of the value of self-production and self-consumption, that were dismissed by economic thinking in the course of the Industrial Revolution. Precisely because material products have less and less value per se unless they are adequately utilised, the economic value of utilisation and the self-production and self-consumption processes it stimulates require a reintegration of these activities as fully value productive in economic and social terms. Monetarised production is interdependent at a higher degree than ever with the non-monetarised production. The amount of work done for auto- or self-production is meant to increase particularly in relation with the utilisation of complex products, services or systems. As a consequence, these two forms of work became increasingly complementary to the remunerated work in the process of producing ‘performance value’.

This performance value, describing the new productivity of the Service Economy, is measured as the functioning of a product, system or service during a period of time with a minimum of acquisition, maintenance, operating and disposition cost, possible in-built loss prevention and a maximum of result achievement. The cost-benefit ratio is no longer satisfactorily estimated by comparing production costs versus selling price. The set of costs now comprises the design of a product or system, its manufacturing and distribution, its utilisation and elimination, including partial or total recycling. The benefits are instead measured by the performance during the period of utilisation.

It has to be understood that service functions have today absorbed the manufacturing process in a similar way as the industrialisation had started to absorb the agricultural production system 200 years ago. As a direct consequence we have to either adapt our current social and economic theories to the situation that is at our hands or set up a new general social and economic theory that helps us to better understand reality and provides us with the necessary tools to solve the new problems we are facing. Since the changes are so dramatic a mere expansion of current ideas recognized as the ‘prevailing opinion’ will not be sufficient. We need a new understanding of how our environment works to further the work in our field.

3. The Economic Context for Productive Labor: Some Premises

3.1 The pricing system, uncertainty and risk

Classical and neoclassical economics are based on a notion of value built into an ‘equilibrium system’. Prices are supposed to represent the equilibrium point between supply and demand at a given point in time. At that point, all prices together represent the general equilibrium system.

While classical economics underlined the importance of the supply-side in this equation, the neoclassical school emphasized the priority of demand. But in either cases, reference to the equilibrium system was identical, one side of the equation being by definition considered equal to the other.

It is here that the notion of performance as measurement of value as well as the increasing importance of service functions in the economic system require a fundamental change in approach. Indeed, the notion of performance cannot be identified with a point in time but must
refer to a period of time. First of all, the very period during which the system is utilised is inevitably uncertain and can be expressed only as a probability. Second, the functioning of such a system will also occur within a context of events, some of which are bound to be uncertain. All future costs, linked to performance, can be understood — even when they are strictly monetarized — only in terms of probability.

Therefore, the economic system which the Service Economy is leading to is an economic system that is by definition uncertain. In classical economics, uncertainty is equated with inadequate, insufficient or asymmetric information, as if such information could ever be obtained completely. In the case of the Service Economy and the notion of performance value, uncertainty, and more generally disequilibrium as a condition to the development and dynamic systems, is a key factor.

Given the functioning of a very large number of economic activities in today's world, it is clear that any price set at a given moment merely represents a probability which will be confronted with costs arising in the future and which cannot be precisely determined.

This has always been the case with the activity of the insurance industry and also explains why this discipline has largely been overlooked by both classical and neoclassical economic theory as taught in universities around the world today.

It is indeed paradoxical that increasingly the price fixing mechanism of all sorts of activities is beginning to resemble the probabilistic one that faces an insurance manager. This is true for example of a research manager having to choose investment in different projects with varying probabilities of success. This applies to all investments or mechanisms having to do with the leasing of any kind of material and also to any type of production process likely to face unknown future costs related to waste management, pollution and other liabilities. It is another paradox of history that insurance, largely neglected by economic thinking for the last two centuries, is taking centre stage in much the same way as the textile industry symbolised practical application of the new methods of industrial production in the 18th century.

All of this points clearly to the fact that the equilibrium system of classical and neoclassical economic theory is based on a deterministic philosophy which the hard sciences abandoned at the beginning of last century. The notion of price uncertainty and disequilibrium is rooted in the philosophy linked to indeterministic systems which for many decades have indicated the way forward in physics and other hard sciences. This also means that the notion of risk, within an indeterministic framework, is not the equivalent of threat but of opportunity and real development.

3.2 Risk management, Vulnerability and Volatility

The notion of risk management, as well as the risk management function and professional activity, was first introduced in the United States about 50 years ago. It was the consequence of the growing vulnerability in the performance of modern technologies used in the production system.

Over time, it became obvious that the success of technology in the modern economic system had increased the necessity to control vulnerabilities for very clear economic reasons. First, because specialisation has been reducing and at the same time multiplying the classes of risks and their homogeneity. Whereas in the past a more limited number of different risks had to be faced, the new situation confronted the economy with more specific and varied potential hazards due to the new production reality. In addition, technology has become increasingly reliable, with the positive effect that accidents are occurring less and less often. Nevertheless, due to the increasingly complex and interrelated technological systems employed today, in the
increasingly improbable case of a breakdown, the consequences are getting more and more serious in absolute as well as in relative terms. All this increases the level of uncertainty and the economic relevance of risk management.

These risks have nothing to do with entrepreneurial, commercial or financial risks, since they depend on the surrounding environment and they occur independently of the will of any economic or social actor. They simply reflect the vulnerability of a system. But because of their gravity, over time they have become more and more strategically important for the contemporary industrial world even if this type of risk is often dismissed in economic textbooks. The profession of risk management therefore developed not only in the United States but also in the rest of the world as a practical reaction to the changing constraints in the economic system.

A second important change intervened in the 1970s when, due to the modification in the way to produce wealth and the new rigidities of supply, the nominal rate of economic growth in the industrialised countries started to decline. The notion of vulnerability therefore extended to the social systems, and the welfare state in general. It is from this analysis that we can open the door to reconsider adequate social policies in the future understanding of the changing conditions of economic development to increase of the wealth of nations and cope with risks and vulnerabilities.

1973 was not only the year of the first oil crisis but also the year when the international monetary authorities decided to abandon the fixed exchange-rate system. At the same time, inflation started soaring after a period of lower, creeping inflation. The mainstream economic community took some time to recognise that inflation was in fact a structural and not simply a cyclical problem. As a consequence, the central banks and the monetary authorities took time to come to the conclusion that it was essential to reduce inflation to a minimum in order to avoid the economy going wildly astray.

But for many years, it was not recognised that something fundamentally new had occurred in the economy (the impact of a service based economy) and so, for a while, the dominant policy of many governments during the 1970s was to accept and even stimulate deficits and to rely on a future ‘normal’ recovery (a historically rather exceptional 6-percent GDP growth per year was expected to return for good) to re-establish some sort of equilibrium. This never happened and all the major turmoils experienced in the industrialised countries during the 1970s and into the 1980s are largely due to this misjudgement.

In the meantime, the basic constituents of monetary uncertainty like inflation rates, interest rates, exchange rates etc. started to modify the nature of the banking system and to a large extent of the functioning of industrial companies. The latter began to realise that the abrupt modifications in monetary conditions were in many cases having more impact on the profitability of their activities, than their main industrial performance.

The banks and the other financial institutions, following in industry’s footsteps, were soon to begin talking about risk management, modifying fundamentally the role and conception they had of their own business and becoming involved in managing monetary risks as well as starting to work on their own investment programmes. The development of derivatives and other systems was the consequence of this situation. We are currently in the middle of this other gigantic wave in the global revolution of the economics of uncertainty and risk management, as a key feature of the global Service Economy.

The concept itself of risk management has become common also for the financial community and for the development of the wealth of nations, it is now clear that it is a strategy for managing risks which is the key issue in order to develop the wealth of nations in all directions and sectors of activity.
3.3 The Role of Demand and Supply in the Service Economy

Whereas priority in economic theories could in the past swing from supply to demand, considered individually and separately as workable instruments, we now need not only to reassess the importance of the supply-side, (i.e. service-based production in a period of time) but also the fact that the selection function of demand is an absolute necessity, that is a complement to the production function.

We would stress that in the new Service Economy, demand is not simply confined to its traditional function as an indicator of equilibrium. For in the changed circumstances of the Service Economy, systems of production and consumption are extended in a time whose length in each specific case is merely a probabilistic assumption.

In this context, the role of demand is much more important than it was in neo-classical economics. Demand represents a selection mechanism which is not only confined to selecting products and services offered on the market. A large number of production proposals and ideas for new products and system are submitted to this selection process and many never reach the market and will never be priced. This is particularly the case with formulating strategies for technological innovation which frequently involve a portfolio of projects — each requiring separate investment — only few of which have any chance of success and will actually ‘appear’ on the market.

This role of demand, recognised as being essentially a selection system, is also an indication of the change of the philosophical system of reference. As Karl Popper noted, in the Lamarckian system, selection functioned as a kind of normative activity of nature, whereby demand would indicate to production what was to do. This might be partly true of known products, but clearly no consumer ever told Mozart to compose his operas or a computer manufacturer to invent computers. In fact, selection is essential to maintain the normal working of a system and to checking the efficiency for production in the economic and social sense. It is the ‘producer’ who invents and proposes new or different ‘products’.

It is furthermore obvious that, at a time when performance represents the value of production, the consumer becomes much more than a simple ‘user’: s/he invests time or money, or both, in the utilisation of systems, products and services in order to insure that they work and perform satisfactorily. The consumer has become prosumer.

It seems clear that in the modern Service Economy, consumers are ceasing to be passive buyers and are beginning to make their own contribution to the utilisation and wealth creation which have very much become a part of production. They often co-produce.

3.3 Mobilizing Technology

In 1973 the oil crisis struck. If it had been only an oil problem, this would have justified an increase in inflation of about 1 to 2% only. This was the result of deep research carried out in the major research institutes in the world, taking into consideration the effects of the increase in the oil cost in all economic activities. Such studies had already been carried out with input-output models one or two years before the first oil crisis. Therefore the oil crisis was just one aspect of something deeper concerning the transformation of the economy. A key aspect of which was that service functions, concerning in particular research storage and distribution, utilization costs etc., were in fact the key economic factors and the pure manufacturing aspects became a sub-system.

Industrial and manufacturing companies in the world, in the main, understood this situation: they did not need new economic theories, experience was enough. They just had to
face obvious problems which needed new solutions that more often than not were found and put into practice. It is at the general macro-economic level that the situation was showing obvious difficulties in understanding the fundamental reasons for the new rigidities of supply, for the persistence of inflation and the failure, during the 1970s, of the stop and go economic policies. This leads inevitably to better understand the mechanism and possibilities of science and technology.

Technology has been an indicator of economic development as much in the stone age or later the iron age as it is today in the information age. All these epochs are defined by a specific level of technology.

But a fundamental change took place at the end of last century: for the first time in history, scientific discoveries started making new forms of technological development possible. This key phenomenon (a marriage between science and technology) was behind a unique growth rate in the industrialised countries for a quarter of a century after World War II.

The marriage, however, not only made technology increasingly dependent on the ability of well educated engineers and specialists to manipulate processes and materials. Because of the link to, and therefore reliance on, basic scientific discoveries, technology was also increasingly dependent on a phenomenon exogenous to the economic process. In other words, raising prices would be of no avail if a needed technological solution was dependent on fundamental scientific knowledge not yet available.

This was the case after 1973 when everybody hoped that, with the price of oil soaring, alternatives could be found thanks to technological progress. Ten years later oil prices went down, but only as a result of slow adjustment in the consumption of energy and extraction costs of oil. Meanwhile, an incredible development started elsewhere as scientific knowledge in the field of information storage and distribution achieved an unforeseen level of maturity. We refer to microelectronics.

In addition, another fundamental change had taken place on the supply or production side of the economy: the growth of services as a paradoxical consequence of the success of manufacturing technology.

There are, of course, always and in all sectors, opportunities for technological improvements but, as they happen in any other human or natural activity, they operate through a process of diminishing returns. Each given set of technologies can be developed up to a maximum boundary, beyond which new inventions (for technology) and new discoveries (for fundamental research) will be needed and developed in a negentropy process. Only when there is a major scientific breakthrough, introducing a new set of technologies thanks to a superior level of knowledge, can progress in efficiency be achieved that overcomes the law of diminishing returns. We can expect breakthroughs to happen but we ignore their nature, when and where they will take place and we cannot command them at our will when they are of a fundamental nature. As a consequence, (economic) policy making should not rely on a given technological dream or ideology to become reality, but stay within the boundaries of the commandable.

4. A Long Term Global Aspect of the Development of the Population³

The Industrial Revolution and its transformation of society and human life was the spark that led to an immense population growth often described as an explosion. The last two centuries were certainly not the first phase of rapid population growth in human history, but

they unquestionably experienced the most dramatic of such increases. Earlier increases were usually compensated in ensuing years in part through the effects of plagues, famines and war. The Industrial Revolution, however, had a major impact on these regulative factors.

It is estimated that the world population at the beginning of the agricultural age, around 10,000 BC, lay somewhere between five and ten million people, mostly living in Eurasia. They were still engaged in hunting and gathering, forming widely spread groups or clans of about four to five families with 20 to 25 members in total. The population density never even reached one person per square kilometre and varied greatly by region and due to meteorological conditions. Plagues were still not a major factor due to the low population density, but violent deaths and times of scarce food together with high death-rates of new-born children kept the average life-expectancy fairly low.

With the introduction of the first agricultural techniques, man had to settle down to work the fields. This led to a greater independence from short-term environmental changes and made the support of an increased population possible. The agricultural society could feed substantially more people than the preceding pre-neolithic one and growth rates rose to about 0.5% to 1.0% in a favourable year. But the appearance of settlements brought an unto then unknown factor of population control into existence: the plague. This new phenomenon had a decisive impact on the demographic situation since in some years the death rates could jump from a usual level of about 30 to 40 per 1000 inhabitants to ten times as much. This sudden disappearance of up to half the population meant a catastrophe, but it kept otherwise uncontrolled population growth at bay. As a consequence, for nearly 12,000 years afterwards, the world population did not always grow steadily but at a fairly constant rate until it reached about 650 to 850 million in 1750, the birth-date of the Industrial Revolution.

Figure 1: Population Growth

![Population Growth Graph](image)

Source: Cipolla, *The Economic History of World Population.*
Due to the exploitation of new energy sources, more efficient production systems and advances in medicine and hygiene as a consequence of the Industrial Revolution, previous limits for population growth were overcome. In the industrialised society famines became uncommon thanks to the scientific and more efficient approach to farming and an improved infrastructure that made food shipments from one location to another in shorter time possible. The introduction of new drugs and especially the discovery of vaccines together with superior hygiene and sanitation contained the plagues. During the ensuing two hundred years war, as the third exogene force, should exert the strongest influence on population growth.

Within one hundred years, from 1750 to 1850, world population nearly doubled from around 750 to 1200 million. It then grew even faster until reaching 2500 million in 1950 and today, in 1996, there are close to 6 billion people living on this planet.

Demographically, the trend of a growing society can be explained by increasing life-expectancy in general and falling death-rates, especially among new-born and children, that overcompensated the decreasing birth-rates. Only rather recently do we experience a situation where in some early-industrialised countries the birth-rates have fallen below the death-rates, causing the population to shrink ‘naturally’, i.e. not as a consequence of famines, sudden plagues or war action.

These developments display a close correlation to the beginning and the extent of the transformation towards an industrialised society in different regions of the earth. At the start of the industrialization process in England in 1750, the yearly death-rate was 30 per 1,000 inhabitants. Fifty years later, when the percentage of people working in the agricultural sector had decreased to around 40%, the death-rate had fallen to 23‰. Other nations experienced a similar development: Germany’s death-rate fell from 27‰ to 18.5‰, France’s from 24‰ to 19.5‰ and Russia’s from 40‰ to 29.5‰, all between 1850 and 1900, the times when the industrialisation process began in these countries. Today, peacetime death-rates for most countries tend to be substantially lower than 10‰.

While the industrialisation had an immediate impact on death-rates and life-expectancy, the drop of the birth-rates lagged substantially. This created a situation where for some decades the population of countries in course of industrialisation displayed accelerated growth. Today, we can observe this phenomenon in many developing countries where only a more mature economy promises to retain population growth.

5. Working Population and Employment in the Industrial Revolution System

According to the Human Development Report 1995 of the United Nations, world population amounted to 5.4 billion in 1992 and was growing at an estimated rate of 1.5% per year. According to this estimate, there will be 6.1 billion people in the year 2000 and about 7 billion another ten years later.

Population growth, however, is far from being homogeneous throughout the world. While the industrialised countries experience a very moderate growth rate of less than 1½% per year, developing countries expand at 1.8% p.a. It is hardly perceivable, that developing countries will continue to grow at such accelerated rate in the future as well since this would imply doubling every 39 years. And indeed, if we examine the dynamics of population growth, comparing the average growth rate from 1960 to 1992 with the estimated growth rate for 1992 to 2000, there is a significant decline from 2.3% to 1.8%. It seems that the industrialisation process is provoking the same reaction, first accelerated growth and then stability or even slight decline, in the now developing countries as it did in the industrialised ones during the last two centuries.
As a consequence of improved living standards, sanitation, health services and a decline in new-born and maternal mortality rates, life expectancy is growing everywhere and has added another 17 years since 1960 to the average life-span. It is now 65.7 years at birth, meaning that a new-born child would live for nearly 66 years if prevailing patterns of mortality at the time of birth were to stay the same throughout the child’s life. But it is rather unlikely that it should stay the same over the coming years. In the past, life expectancy displayed a growing trend, especially for those over 60 years of age who can today expect another 20 years of life in industrialised countries. While in developing countries there is no gender related difference in life expectancy, in industrialised countries women can enjoy life for an additional five years in comparison to men.

If we take these developments into account, we seem to face a future where the population of the developing countries will have doubled by the year 2025 while that of industrialised countries will grow much slower. It will also be a future of a more mature society since both average age and life expectancy will continue to increase. The ratio of the population defined as dependent, those under 15 and those over 64, to the working age population aged 15 to 64, will fall. In industrialised countries it has already reached 50% while the developing countries exhibit higher rates due to their very ‘young’ demographic structure.

As a consequence of these developments, the composition of labour supply by age, gender and qualification is undergoing a substantial transformation in time due to the changing socio-demographic factors. In turn, these changes in the labour force will also affect future labour demand because of varying economic preferences of an otherwise structured society. This in turn will have an impact on labour supply as new opportunities will arise and some established jobs will experience a fall in demand, thus causing the system to shift its priorities and incentives.

In a purely accounting sense, the majority of employment growth in the past can be attributed to population growth. The OECD estimates that about 85% of the employment growth in its member countries in the 1980s were caused by a growing population. We should therefore expect the regions with the highest growth rates to display the highest rates in employment growth. However, national differences in the evolution of participation rates, especially the generally increasing but regionally varying participation of women and older people in the labour market, and dissimilar capacities to absorb an increased labour force without causing unemployment can account for substantial differences in this development.

Since the old-age dependency ratio is expected to rise in most countries, necessitating changes in the financing of old-age pension schemes and variations in the retirement age, this will affect the composition of the labour force as well. Since demographics have to be, at least over the period of one generation, accepted as an exogenous factor, the increase in old-age dependency ratio from about 19% today to over 22% in 2005 in industrialised countries, according to the OECD, has to be fought on other grounds.

Immigration from countries with considerably ‘younger’ demographics in developing regions of the world can only be partly a solution. To keep the old-age dependency in industrialised countries on today’s level, a net influx of almost 200 million working-age immigrants, about one fifth of the actual OECD population, over the next ten years would be necessary. The ensuing social problems can hardly be imagined. For comparison, the European Community experienced a net migration inflow during the last decade of about 1.4% of the total population and even traditional immigration countries like the USA and Canada displayed proportions of just 2.8%.

The most logical solution to the problem of increasing old-age dependency would be to lift the age limit. The extension of the working age population definition from now 15 to 64 by another five years to then 15 to 69, would immediately add 3.9% of the US, 4.7% of the French
and 4.9% of the German population to the independent age group. This technical change would reduce the dependency rate drastically, overcompensating the demographic effects of the next years. An extension of just one or two years should more than suffice to counterbalance the immediate demographic changes. With augmenting life-expectancies, however, a continuous elevation of the age limit will be necessary.

An altogether different effect is the likely decline in the relative numbers of young people entering the labour force. This implies that the effect of usually more qualified labour market entrants leading to an upskill of the workforce will diminish. Stimulated immigration will have a similar effect on the mean qualification of the workers since immigrants to industrialised countries are on average less highly skilled than the national workforce. As a consequence, more future resources will have to be allocated or greater incentives will have to be provided to retrain workers throughout their active lives.

We have to bear the intricacies of these demographic developments and their impact on the structure and composition of the labour market in mind when thinking about the future of work.

6. Integrating the Monetarised and Non-Monetarised Activities

Up to the beginning of the Industrial Revolution, the majority of resources which was produced and consumed, mainly in the agricultural sector, was related to a system of self-production and self-consumption, a non-monetarised system. As we have already seen, the Industrial Revolution accelerated the process of specialisation and therefore of exchange. The process of exchange affects — as already explained — what we have termed the monetarised part of an economy, where the value of goods exchanged is either implicit (non-monetised) or explicit (monetised) with reference to the value of what we call money. Keeping these distinctions between monetised, non-monetised and non-monetarised in mind, an essentially agricultural society can be defined as predominantly non-monetarised, whereas when commercial exchanges take place, only a part — at least at the beginning of the process — is specifically monetised.

The fundamental importance of money in the economy is relatively new, albeit the history of money has very ancient origins: obviously, different forms of it have existed since prehistoric times. But they were then far from dominant in the ‘economic’ process. It was with the development of the Industrial Revolution that money became the essential tool to organise the new production system. It was necessary to have a developed commercial system functioning, as the case of England at the turn of the 18th century, so that part of the flow of money could be saved, and transformed into capital for investment. This was absolutely necessary because the new production tools, increasingly important and costly, needed more investment. What at that time was still considered a marginal phenomenon was in fact the key and the most dynamic tool to develop the wealth of nations: the manufacturing system based on investment and therefore linked as such to the monetarisation, and even more to the monetisation of the economy. Herein lie the roots of an economic research that, up to the beginning of this century, focused on the question of productive employment as the one essentially connected to a remunerated activity within the settings of the industrial production system. Other activities, especially services and all forms of self-production and self-consumption, were regarded as socially equitable and noble, but subordinate.

Although this new type of production greatly helped two centuries ago to create the modern world where, despite all the terrible crises and setbacks in history, a substantial step forward was made for the wealth and the welfare of people, a legitimate question may be posed: How

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4 Ratios estimated according to ILO (1995): Yearbook of Labour Statistics, Table 1.
far are all these basic assumptions valid in a situation in which services have become the key and greatest part of the production function itself? Should we not overcome the traditional notion that productive employment, in fact that the notion itself of employment, is linked still today essentially and exclusively to this process of monetarisation?

The success of the development of productivity and industrial production has created a very paradoxical situation. Already at the start of this century, Arthur Pigou, the pioneer of welfare economics has shortly touched one of the shortcomings of the economic system in this sphere without necessarily arriving to further conclusions. He reflected on the fact, that if a bachelor employing a woman as a housekeeper were to marry her, national income would fall, since her previously paid work would now be performed unpaid. But unremunerated work and the concepts of non-monetarised and non-monetised parts of the economy go far beyond housekeeping and its omission leaving a gap in national income accounting. We can also observe the fact that where service activities are the key issue, the monetarisation and/or the monetisation system does not necessarily always produce the net positive results which were obvious in the classical period of the Industrial Revolution.

Let us consider the case of health costs: The developments in the capacity of drugs, doctors and instruments to ameliorate health, which was also possible thanks to the Industrial Revolution and to the monetarised systems, has undoubtedly brought decisive advantages. On the other side, when today the high costs of hospital treatments stimulate policies to convince patients to rather stay at home, it is obvious here that the non-monetarised as well as the non-monetised system is called upon to rescue us against an implicit level of inefficiency of the monetarised system. It is clear that women’s work is a social conquest, but it is also clear today that the care of children can be solved either by developing, for money, a system of kindergartens or through the mobilisation of grandmothers or grandfathers who can do the equivalent job for free where the conditions of the family allow such solutions.

Why is the work done by specialised people in the kindergartens part of the productive work, which adds to GNP, whereas the equivalent work of the grandmothers or grandfathers is not? It would seem that in many areas the non-monetarised is called to come to the rescue of what seems to be the limits of efficiency and, in some cases, of the monetarised organisation of the economy. Can we therefore still divide the notion of productive employment between what belongs to the official monetised economy and the performance of activities, which can be defined as productive from a social and even from an indirect financial point of view, but which are not recognised as such?

In the Service Economy, it would appear that the link between monetarised and non-monetarised activities is one of interdependence and that a growing part of these non-monetarised activities, are in fact a form of productive work in the sense of contributing to the wealth of nations and in some cases even as an essential element in the functioning of the monetarised world itself. Albeit there is probably a question of optimum equilibrium of the monetarised and non-monetarised activities, it has to be recognised that their mutual integration and the resulting synergies are becoming more and more important.

7. The Need of a Basic Income

7.1 The Minimum Guaranteed Income

We have already emphasised the importance, for a modern economy, to include in the strategy for developing the wealth of nations non-monetarised and non-monetised activities and work. It is, however, important to avoid any misunderstanding on the value and social importance of money. There is no question of going back to the old utopias of the last centuries.
or to new ones, dreaming of a money-less society. Money has been one of the essential creations of civilisation for making real progress possible. Of course the human shortcomings are such that money, like religions or medical drugs, instead of being used only for the good, can be and are sometimes misused for the evil. But it should also be clear that the old utopias for a money-less society of the past were in fact subconscious tentatives to escape modern realities and possibilities in their positive sense, and reflect simply resistance to new possible amelioration. A Robinson Crusoe type of society whatever the myth and particularly in a situation of massive human interdependence, is impracticable and most likely leads to disaster.

Since our current economic system is based to a large extent on the use of money and we do not aim for a change in this, it is essential that everybody has access to a certain amount of money to pay for the necessities of life. These include adequate nutrition, clothing, housing, health care etc. Unfortunately, for 1.4 billion people, approximately one fourth of the world population, even these necessities of life seem out of reach since they subsist below the poverty level as determined by the United Nations in 1995.

Therefore, any sort of employment policy, keeping in mind the necessity of developing productive types of jobs, must aim at the minimum essential availability and access to money. It is a first step to personal freedom. By private and — when necessary — by public means everybody should have access to a necessary minimum amount of money for a productive work. It has been suggested that one possible alternative to provide this minimum amount of money is very simple: a universal, unconditional basic income paid by the state to each individual citizen. A basic income would provide each individual with a form of material independence never previously enjoyed in the Industrial Revolution, except perhaps by large property holders. Women would no longer depend on men for subsistence, nor workers on employers for wages, nor the unemployed on a state office for their social benefits. The shock that nowadays follows any radical change in a family’s situation, such as the bread-winner dying or becoming unemployed, would be cushioned.

A basic universal income would possibly unify and simplify the current immensely complex tax and benefits system. At present, the state often distributes more in tax allowance than in social security benefits, but few people understand or recognise this. Under the basic income scheme, all income from all sources would be taxed, and everyone would pay according to their age and health. The basic income scheme would thus abolish the poverty trap, under which at present many low earners often lose income benefits of various forms, as well as the unemployment trap, which makes it unprofitable for people to return to work, when the moral hazards effects are not taken adequately into consideration.

Above all, a basic universal income would encourage risk-taking and innovation by individuals. Absolute poverty is an inhibitor to the risk-taking and activity creation that constitute the main chance for women, the young and the elderly to gain access to wealth creation, through productive or unproductive activities, in terms of monetarised material wealth or non-monetarised activities. Education and training can be integrated with employment so as to reflect an individual’s choice and not merely the needs of the employer. Work motivation would then tend to replace financial interest as the main criterion for job selection. Technological change would be easier, as workers would have fewer reasons for protecting jobs, since their basic incomes and personal dignity would be guaranteed through the basic income scheme.

Arguments against the basic income scheme focus mainly on costs and work incentives. Some experts have worked out revenue-neutral schemes using current figures, keeping basic incomes near the present supplementary benefit levels and taking account of tax relief and income-tax allowances. Some people would certainly change from formal employment to self-employment or self-servicing activities, for example, taking the optimisation of the utilization period of the goods around them into their own hands, rather than relying on expensive expert
services. This possible increase in the ‘informal’ economy would still increase overall wealth as measured in assets and system operation, even if it did not qualify as an increase according to the Industrial Revolution’s criterion which measures only paid employment resulting in products that are sold. Socially useful non-monetarised activities would equally be encouraged by a basic income scheme, such as looking after one’s own parents rather than locking them up in other people’s homes. Various forms of cooperative would become possible, and could be established by workers pooling their basic incomes for the time it takes for a venture to become commercially viable.

The debate on basic incomes has started and has already produced various formulae, for example, Milton Friedman’s idea of ‘negative income tax’. In fact, the proliferation of many sorts of benefits, insurance schemes and allowances makes the prospect of a basic income increasingly likely, a process that will be accelerated over time by two major areas of concern: first, the need to co-ordinate what already exists, and second the challenge of giving incentive to a risk-prone society while meeting its minimum survival needs and avoiding the negative incentives and moral hazards engendered by the speculative behaviour of individuals whose sole purpose is to accumulate privileges from as many sources as possible.

7.2 The Negative Income Tax

The negative income tax aims to provide a viable solution for the problem of how to organise a basic income system efficiently. It constitutes an alternative much in the spirit of the preceding chapter, relieving our society of the perverse effects of the current social security system on economic efficiency and the social structure. It would not only be easier to manage and therefore cheaper to organise but also more humane since it would replace the current incoherent set of income support and welfare systems with a single concordant program of monetary assistance. Any disincentives to work inherent in so many other schemes could be reduced through the adequate introduction of a negative income tax.

The negative income tax is a noncategorical welfare program that depends only on income and not on other characteristics of an individual such as age, marital status, disability etc. Any individual that does not have an income receives some basic grant, those with modest levels of income receive lesser supplements in such a way as not to hurt the incentive to work more. This can be achieved by permitting the individuals to keep most their earnings while gradually phasing out additional monetary support. In this way the feared poverty trap, a situation where the withdrawal of financial support compensates or overcompensates additional earnings leaving the individual worse off than if he had not worked, can efficiently be evaded.

Critics of the negative income tax argue that it would undermine the work ethic, resulting in reductions in the work effort of the affected people. This adverse situation, however, is very much subject to the level of benefits granted. If they are too generous, people will opt not to work or work less, as a real-world experiment in New Jersey demonstrated. The question is therefore rather one of fine-tuning the negative income tax system in such a way as to avoid impact on working morale. The second criticism about the high costs of this system is more about ethics than economics since it rises the question whether people should be left living under the poverty line — even if they could be helped — for the sake of improved market efficiency. The current welfare provisions do not comprise every needy person in hardly any industrialised country and is therefore cheaper than an alternative that would reach everyone in need.

Still another mechanism is proposed by Gary Becker: the Earned Income Tax Credit (EITC). He maintains that this system would be a wonderful “alternative to both a higher minimum wage and an extensive welfare program sharply targeting poor families without
reducing employment, encouraging a welfare mentality or rising governments spending\textsuperscript{5}.” The EITC is family based and works as follows: until a given limit of family income, the family receives an additional credit equal to 40\% of its income. With higher income this credit phases out until finally the family receives no tax credit at all.

Becker judges this system as superior to others since it rewards rather than penalized poor families with working members. It evades the disadvantages of rising minimum wages, it does not affect the incentives of companies to employ workers with few skills and it even increases the incentives of the less skilled to get training. However, the moral hazard component that is inherent in all systems like Becker’s cannot entirely be eliminated. When the subsidy phases out and then disappears at a certain level, there is moral hazard present. The impact of this moral hazard on human behaviour can only be guessed. From our point of view we welcome this proposal since it is an interesting approach to subsidise work and not idleness, a concept which we regard as of utmost importance.

7.3 Incentives and Moral Hazard Effects of Unemployment Benefits

Most industrialised countries have arrangements that permit the payment of unemployment benefits in one form or another for different periods of time to most groups of unemployed people. Some schemes offer all eligible individuals the same fixed money sum while others tie the level of benefit to an individual’s previous earnings and replace a certain proportion of these, usually subject to an upper ceiling. The entitlement rules vary considerably from one country to another but usually involve a minimum time of more or less regular contribution and a disqualification or reduction in the case of voluntary redundancy. Unemployment benefits are subject to eligibility conditions which state that claimants must be available for work, willing to work and co-operate with the public employment services.

The rationale for unemployment benefits is to relieve people who have lost their job through no fault of their own, hence voluntary unemployment is usually excluded, from immediate financial concerns, thus allowing for a more efficient job search. These benefits, therefore, have an economic as well as a social equity objective, e.g. reducing poverty among the unemployed and cushioning the adverse effects of high and rising unemployment.

With unemployment rates often approaching or, in unfortunate cases, exceeding 10\%, the relatively generous provisions have typically led to expenditures equal to 2\% of GDP for income maintenance. These comprise all forms of cash benefit to compensate for unemployment, except early retirement. In addition to unemployment insurance and assistance, this covers publicly-funded redundancy payments, compensation to workers whose employers go bankrupt and special support of various groups such as construction workers laid off during bad weather.

While on the one hand public employment services provide many incentives to attract people back to the labour market, helping them in their search for a new job, on the other hand, generous provisions always entail a certain risk of moral hazard and abuse, and may even lead to benefit fraud. The unlawful actions include false declarations, claiming benefit while not being available for work, not actively searching for work as required by legislation, non-declaration of earnings from casual work by benefit recipients or multiple claiming of benefits to name just the more common. The public employment services tries to enforce eligibility for benefits effectively through adequate control and other measures, thus preventing — to a certain extent — improper or illegal actions by the unemployed. Specific acts like the refusal to take up suitable work, in some cases even if at a lower qualification level than desired by

the unemployed, or the rejection or non-attendance of training courses usually lead to temporary and upon repetitive refusal to permanent suspension of benefits.

The problem of moral hazard is substantially different from benefit abuse or fraud. It occurs when individuals change their behaviour due to the existence of an insurance or benefit system in such a way as to become or stay eligible without infringing the law. In many cases an individual’s employment status is under his control, since a worker’s behaviour can influence the chances that he will lose his job. Similarly, an unemployed person can control the intensity with which he seeks a new job while receiving unemployment benefits. People might behave in such a way as to gain from becoming or staying unemployed. This gain not necessarily has to be in financial terms, since individuals could opt to accept more leisure time and reduced compensation through the benefit system instead of less leisure time and higher income through remunerated work.

The question of whether and to what extent the moral hazard problem of unemployment benefit systems is prominent cannot easily be answered since these systems are multidimensional and difficult to characterise in a single indicator. But it seems that higher replacement rates, and the ratio of income which is received when unemployed to that which could be received in employment, correlate positively with longer duration of unemployment. Some studies have concluded that there is, others that there is no cross-country correlation between unemployment benefits and aggregate unemployment, thus largely ruling out a moral hazard effect. However, negative findings may be misleading because simple measures of benefit generosity have been used, because there might be a reverse causality present or because cross-country relativities in unemployment rates have changed considerably during time. The OECD concludes that although earlier research did not detect a significant cross-country correlation between benefits and aggregate employment rates, more recent regressions, modelling unemployment as a lagged function of benefit entitlements, suggest that replacement rates and duration of benefits affect unemployment rates. They also report that high benefit entitlements may not only affect long-term unemployment but may encourage short employment spells, voluntary job-leaving, and involuntary part-time unemployment. It is as if the moral hazard problem were inherent in the actual unemployment benefit systems and not negligible.

8. Work As an Element of Personality

Under present prevailing conditions, full-time remunerated work, around at least 35-40 hours a week, is considered in most cases the only measure of an individual’s contribution to the productive activity. It is here, in most cases, where a large part of our social contacts are established and individuals find and define their place in society. In official forms there is always a question about our professional occupation just as there is always a question about our gender: our personality is very much linked to it. The entire network of social interaction is heavily dependant on our position in the (remunerated) working world and the scant honouring of other activities has lead to the perverse situation that somebody engaged in valuable non-monetised work — and here only the example of household and child education work shall be cited — receives much less that his due share of social recognition. It is obvious that this has adverse effects on motivation and self-esteem.

But many problems also lurk in the monetised sphere of the economy for its participants. Many people strongly identify themselves with their jobs, they have endured long years of

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education often going through a rigorous selection process to attain their current job. In addition, they are facing the constant risk of becoming redundant. Since the productive activity of every person lies at the heart of our economy, it is not surprising at all that the social focus on this element of personality is extremely pronounced.

Nevertheless, a series of other activities are gaining importance in a society that is sometimes characterised as one of leisure rather than work, a concept that is not entirely true since much of the so-called leisure time is spent on voluntary work. In Germany, between one fourth and one third of the male working age population engage in honorary work. In these cases, secondary or voluntary activities like sports, charities, community work etc. are also linked to the personality of the individual, more often than not in a very positive way. Even if these activities do not contribute directly to the monetised part of the economy, they are a valuable element that deserves recognition since they also add to the wealth and the welfare of people.

The increasing differentiation of the various kinds of productive work as complementary elements of personality is rather new. But it definitively helps in the judgement of the contribution of people to society and/or the economic system.

We recall once again our philosophical stance: we are much more what we produce than what we consume. Even consumption, in a Veblenian sense, is just a way to produce an image of ourselves. And the majority of people, we believe, are conscious that their value is very much linked to their level of self-esteem and usefulness in society. We definitely support the idea that in fact we consume and need to consume in order to produce, for ourselves and for society, rather than the other way around. In this context the question of work as an element of personality takes on a wholly new dimension.

9. Part-Time Work and Flexible Working Time

The question of part-time work is closely interconnected with general working-time and reductions in working-time. We should remember that what today is considered full-time would have during the last century corresponded to part-time work, since annual working hours declined from around 3,500 or 4,000 to under 2,000 for most industrialised countries. This development of steady working-time reduction has traditionally been part of the progress of allocating the gains accruing to workers from productivity growth between increases in income and increases in leisure time. Thus, the decline in weekly working hours and the increase in paid holidays observed throughout the industrialised world over many decades reflect the extent to which workers have taken productivity advances in the form of more leisure rather than higher income.

Today, in most ‘industrialised’ countries full-time employment consists of about 40 hours of work per week and is usually defined either by employers’ and labour organisations in mutual agreement or the legal system. Whenever we speak of part-time work we refer to arrangements that, based on the weekly work time of a full-time employee in a given industry, define the working time as a partial amount of that time. This part-time work comprises considerably less working hours that the full-time variant, in most cases 1/2, 1/3 or 2/3.

Besides the traditional form of full-time employment — whatever the total amount of working hours encompassed by the arrangement — we have witnessed an increase in part-time work places over the last years. Part-time working schedules appeal to employees who can enjoy a more individualised balance between work and leisure and to employers as a means to increase or fine-tune operating times and acquire cheaper labour. Part-time workers tend to be less expensive for employers due to the fact that their social contributions and wages are often reduced more than proportionally in comparison to full-time employees. This has lead in many
countries to a controversial debate about how to handle part-time work and the challenges it creates for the tax and the social systems.

The introduction of part-time work on a broader basis has been an important step towards greater flexibility. It has also made a significant contribution to employment growth over the last 10 years. The OECD reckons that people’s demand for part-time work still remains high, suggesting a potential for a further development of such jobs in many countries.

The growing interest and government support in the recent past has lead to various measures designed to facilitate the creation of part-time workplaces, be they shared or not, and to enhance the employment rights of part-timers. Some countries have even introduced financial incentives to encourage the development of part-time employment in the private sector, like France where employers’ social security contributions are currently reduced by 30% on new part-time jobs. The public sector can play a leading role in responding to demands for more flexible working hours in general and more specifically part-time work.

As a feasible alternative to otherwise unavoidable redundancies the development of part-time work is equally possible in the public and in the private sectors. Part-time jobs in the public sector have grown in many countries notably and now account for a considerable proportion of the employed personnel, e.g. in Sweden, according to the 1985 census data, about 40% to 50% of women at the central state level work part-time. For the private non-agricultural sectors, the European Community estimated that 31% of women, but only 4% of men were employed in 1992 on a part-time basis. Although many men increasingly work full-time, it is women who make up the vast majority of part-time workers — about 85% in the EU.

The advantages of part-time work for all parties concerned are manifold. Besides the already mentioned ones, the development of part-time work can contribute to increase the number of people in employment, helping to cushion the socially and economically expensive division between employed and unemployed. Part-time workers may prove to be more productive and motivated than full-timers due to the reduced affects of fatigue, a better job organisation and the greater leisure time they enjoy. Improved possibilities to work part-time may also attract different groups of people who would otherwise not be in the labour force, thus increasing the productive capacity of the economy but diminishing the impact on recorded unemployment. These groups comprise married women with or without children, retirees wishing for a gradual reduction of their work-load instead of a sudden end, older workers with diverted interests, students who help financing their education etc.

More recently, the chronometrical dimension, i.e. the total amount of working-time, has increasingly been joined by the chronological element, i.e. the distribution of working-time over different periods of time — which is often what is meant when talking about flexible working. The time periods can be varying and range from a weekly or monthly distribution to yearly arrangements. Today in many companies employees (and employers) have the option to adapt their work time to the requirements of their job. While the overall amount of working hours remains constant, periods of over-time are compensated for either through additional holidays or intervals with reduced work time. However, there are often limits to how many hours of over-time an employee can accumulate and certain key operating times have always to be covered. Whereas today most arrangements operate on a monthly basis, there are initiatives to extend the time frame to yearly or even longer periods.

For the future, we imagine a combination of both elements, the chronometrical and the chronological, part-time and flexible time. Employees and employers would have the freedom to decide on personalised and specific amounts of work time for, say, a year in advance and the basic terms of how this work has to be accomplished. Within this framework the work is delivered as the job requires. Employees would gain the freedom to decide just what amount of work they are willing to do and adjust their distribution of work and leisure according to
their own preferences. Employers would achieve higher flexibility within the arrangement and obtain a better motivated work force that would be more productive.

10. Work in the Life-Cycle from 18 to 80

10.1 Work Intensity in the Life-Cycle from 18 to 80

To identify the current work intensity in the life cycle, we have to examine the participation rates of people in the monetised labour market. This is the ratio of active population, i.e. all persons of either sex who furnish the supply of remunerated labour for the production of goods and services regardless of their employment status, in comparison to the total number of people in a given age group. The higher the proportion of the active population in a specific age group, the higher their work intensity. This intensity is subject to legal framework, social influences and individual decisions.

Figure 2: Active Population Chart

As we can see, there is a sharp increase in economic activity for people between 15 and 24 years of age as a result of the end of secondary or higher education. Before the age of 15 there is usually only negligible activity in the labour market — at least in industrialised countries. This changes when mandatory school attendance terminates and individuals can join the work force according to their personal inclinations and needs.

Afterwards, the work intensity is more or less stable over a period of several decades. For men, the proportion of economically active people typically reaches over 90%, while that of
women often tends to be lower. Depending on the integration of women into the labour force, in various countries the activity level only rarely exceeds 75%. During this time, the participation rates of women exhibit a particular but very characteristic drop between the age of 30 and 39. An obvious explanation for this phenomenon is the preference or necessity of women this age to spend their time dedicated to domestic and/or child-caring activities.

At the end of the second phase we can observe that the proportion of people who provide labour supply diminishes gradually. It is the moment when retirement becomes a major factor in the decision on working time and economic activity. Afterwards, more and more people drop out from the labour market opting to devote more time to other activities than to remunerated work.

10.2 Education and Work in the Course of the New Life Cycle

If we accept the idea that the work intensity of the population is correlated to the individual preference of personal work intensity, we might have a curve that is similar to the one denominated ‘active population’ in the following chart. It is the simplification of the depicted activity curves of the respective nations in so far as it displays a more abrupt start of working intensity after the end of education and has to be regarded as being qualitative rather than quantitative in nature.

Here we will now propose an alternative system for the distribution of work and work intensity that seems better suited to the individual’s needs throughout different stages of economic activity. During the first phase of education, there should be an integration of part-time work into the tertiary education system on an official increased level. This would enhance the possibilities for the younger to gain working experience while still studying without necessarily submitting them to the stress of attaining an unsuited job besides being enrolled in full-time education. At the same time this would relieve them of at least part of their financial problems. The integration of part-time work into the education system would also foster the connections between theory and practice and provide closer links between institutions of higher education and the rest of the economy.

During the second phase, there would be room for changes of work time according to personal needs. Educating parents who might wish to spend more time with their family could opt for fewer hours while their children are still young and increase their work time as their children grow up and depend less and less on them. Other employees might want to embark on additional projects not strictly related to their job and prefer to work less during a certain time. In general, this concept of flexible quantities would lead to a much greater variety of how much people work during their life-cycle than was traditional in the past.

This second stage will gradually phase out instead of suddenly ending. There will be more possibilities for the older to gradually retire by reducing their work-load according to their individual preferences and needs. At the age of 60 people still have a 20-year life expectancy and their gradual retirement could be a beneficial complement to the established three pillars of the social security system. It would also help to reduce the demographic stress on pay-as-you-go (or big scale capital accumulation) pension system in ageing societies. Voluntary work, already present to a lesser extent, might increase, in part as a non-monetised substitute of previous remunerated work since many older people like to stay active without necessarily the need or the wish for monetary compensation.

During all three phases, education or training and retraining will be present, albeit to different degrees. As we have previously explained, constant education is necessary to stay in the labour market and to meet the demands of an ever more complex and ever faster changing society.
10.3 Integrating Part-Time Jobs for the Younger in the Period of Education

The lack of experience is a serious handicap that many young persons face when they enter the labour market. This problem, which is basically independent of the level of educational attainment, becomes more prominent as they grow older. According to the OECD, young people with higher levels of education face less risk of unemployment in most countries. Nevertheless, they are two or three, in some cases such as Italy even five, times more likely to be (or become) unemployed than more mature workers with comparable levels of education.

The requirement for better and higher education should not deprive young people of their opportunities in attaining work experience. There is definitely a need to improve the school-to-
work transition in most countries, especially since we are facing a situation where the typical age of obtaining a first degree from higher education is increasing, reaching 25 years in countries like Germany and Switzerland. The traditional system where largely full-time attendance at educational institutions is followed by entry into the labour market seems to be only the second best alternative. A parallel system where part-time work is integrated into education appears to be more promising. The so-called ‘dual apprenticeship system’ as implemented in Austria, Germany and Switzerland where a large majority of youths engage in training organised and run by employers as well as spend one day or two in educational institutions are examples of the second level of schooling. Unfortunately, the institutionalisation of such a dual system in the third level as well is receiving not enough attention. Usually, only certain job placements when students engage in work for a short time during higher education have been established. A real two-tier system of higher education is largely unknown.

Virtually all young people eventually make the transition from education to the labour market. The better they are prepared, the easier they will find an adequate job and the greater will be the gains for society. We have to establish a system where, on the one hand, the educational level is as high as possible, but where, on the other hand, the attainment of these high levels of education does not pose additional problems in form of degenerate possibilities for a smooth transition to the labour market.

10.4 Part-Time Jobs for the Over 60’s

First, we would like to prove a common prejudice wrong: older workers contribute in a very positive way to the success of their employers instead of being a burden like conventional corporate opinion tends to believe. There exists quite a number of studies on this issue that demonstrate the general positive contribution of older workers. They are experienced, reliable, work hard, are effective in their job, think before they act and display good team-working abilities. They are also subject to lower turnover and seem to be more flexible towards new assignments and changing work conditions as their younger colleagues. These very positive characteristics of older workers can and definitely should be exploited not only until the age of retirement, 60 years in most industrialised countries, but for a longer period. Longer life expectancies and improved health conditions would permit this.

One of the major problems for the employment of older workers resides in the system of remuneration by seniority. Traditionally, older workers have been more expensive than their younger counterparts who, in fact, have been subsidising the higher wages of the former. This has lead to a situation where older workers might be paid more than their effective productivity, providing the employer with an incentive to get rid of them, or, in the case of general redundancy, to shed them first. The situation is even worse in some countries where the contribution to pension systems increases with age, thus making older workers even more expensive.

Nevertheless, there seems to be a new movement towards performance-based remuneration in many countries, especially in the Anglo-Saxon countries, that will promote the competitiveness of older workers. Part-time work in this context could contribute considerably to the transformation of the remuneration system since the switch of older workers reaching retirement age from full-time to part-time employment with partial pension relieves some of the financial constraint, both for the employer and the employee.

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However, the current distribution of income for the older population, those aged 65 and over, still does not reflect a major shift towards increased income from part-time work according to the EBRI\textsuperscript{9}. Their data for 1994 show that with 44% of total income social security is the largest source of income, followed by pension and retirement plans with 20%. Earnings, accounting for 15%, range even behind income from assets, amounting to 17%. The slight pick-up of the elderly’s income from earnings from 13% in 1984 should be interpreted with caution, since it first fell from a previous peak 21% in 1974, as a feeble sign that things are changing.

The question of gradual retirement as a complement to the established three pillars of the social security system and as an expression of personal choice and individual preferences is closely linked to part-time work. Even in countries like Germany, France or Japan, where rather traditional attitudes to part-time work have dominated for long, attitudes are starting to change. Especially the wish of the over 60s for more flexible ways to organise their lives have contributed to the greater recognition of more flexible work patterns.

So far, the experiences with part-time work as the component of a gradual retirement are mainly positive\textsuperscript{10}. Introductory organisational problems can be overcome rather quickly and the initial investments in extra administrative, planning and sometimes equipment cost are compensated through reductions in absenteeism, increased flexibility, improved morale and productivity growth. It is noteworthy that ignorance appears to be one of the bigger obstacles to part-time work of older workers, especially when they are past the official retirement age. People tend to be sceptical where part-time work has not been experienced, but where developed, it is generally welcomed by supervisors\textsuperscript{11}. Younger colleagues can also benefit through an endowment process of valuable skills from the development of part-time work for more experienced workers that would otherwise be fully retiring.

Since generally the benefits of part-time work for the older outweigh the costs, there are structurally and medically no obstacles, and practice shows that many more tasks could be performed by part-time workers than is currently the case, the development of part-time proves an ideal way of lengthening and/or flexibilising the working life.

11. A Multi-Layer System of Work

\textit{11.1 Providing a First Layer of Work}

In organising the first layer it should be taken into account that, although it would correspond more or less to what is today considered part-time work, the notion of part-time should be abandoned and instead the first layer be considered a basic unit of work. Since this layer of employment would only concern a very small part of the time available in everyday life, it would allow for a more flexible definition of individual personality, reflecting the full range of the individual’s productive activities. Therefore, an individual’s professional and personal identity would not necessarily be based on first-layer work, but rather on his or her second-layer free entrepreneurial activities.

The basic unit of work, equivalent to a part-time job and remunerated at a minimum level to avoid absolute poverty, would concern people between the ages of 18 and 80 years. The three major population groups belonging to categories of generally excluded people from the Industrial Revolution, i.e. the young, the old and women, could through this project achieve


social reinclusion in a most productive way. The young would have more opportunities for combining a practical job experience with education and at the same time be able to learn how to self-support themselves. This would also help to create a demand for higher education institutions like universities to be better integrated in society through personal and practical links between theory and practice. Women with small children, but also men in similar situations, wishing simply to organise their family life differently would also benefit from this system. Finally, older people, who around their 60s would start a period of gradual retirement but who could also continue to feel useful in society and above all remain ready, in their mature age, to use previous experience and a lifelong education to prepare themselves for new productive activities, both in the monetarised and non-monetarised system.

Especially this latter would help to provide security and better social integration for older people who at 60 still have a life expectancy of 20 years. In such circumstances, the possibility to obtain and the general provision of a part-time job (remunerated or partly remunerated, or supported in a non-remunerated activity) would constitute an essential complement to the traditional three pillars of the social security system (government pensions, occupational pensions and private savings of all sorts). It would also reduce the burden upon the younger generations of supporting a growing older population and thereby place all of them, young and old alike, in a much better position economically and culturally to develop appropriate activities.

We have already stressed that this first layer is not to be considered a part-time job in the traditional way but simply a basic unit of reference for direct and indirect public policies. Therefore, all financial resources currently earmarked for additional unemployment benefit, income support and welfare aid should converge to form the financial basis for such schemes. We can after all already detect in many places the growing pressure gradually to transform these financial transfers into some form of salary to stimulate people back to work. People should be helped to be active and not be paid to remain idle. They are all producers and not consumers in the first place.

The basic unit of full employment, corresponding to what today is defined as part-time employment, constitutes a very large part of the employment environment as a whole. In Europe, over the last 20 years, more part-time jobs have been created than the traditional full-time ones. Many of these part-time jobs are of course not necessarily of a type acceptable to those seeking employment. On the other hand, they are an almost ideal solution for a growing number of people. Where part-time jobs are underprotected in terms of normal social security standards, legislation and regulations will be needed to remedy the situation. This trend is already a verifiable reality and such a movement, which started a few years ago in many industrialised countries, should be continued. Part-time jobs at all ages but in particular for older people were once penalised in various ways. The fiscal system, the educational system, the very organisation of the three pillars of the social security still often make part-time jobs inefficient or difficult to make a success of. Many practical measures are now taken in some countries to improve the situation.

In many cases where part-time work is introduced, employers do not just substitute two new part-time jobs for one previous full-time work place, they sometimes set a dynamic development in motion, much in the sense of an economic acceleration process. It appears that through the enhanced productivity of part-timers more employment can be created in a more efficient environment. Two part-time jobs are not just equivalent to one full-time job, they are more productive and therefore more valuable, leading to an improved situation where the simple equation of one plus one adds up to a little bit more than two. The same could hold true of a basic layer of employment.

Faced with the problem of dismissing older workers on the one hand and of hiring young ones on the other, more and more companies in a variety of countries are adopting innovative
schemes which involve developing activities to create the equivalent of part-time jobs. These initiatives are valuable and should be fostered. Governments, especially locally, but also nationally and internationally, can devise many incentives or create conditions to facilitate and encourage the development of the basic unit of the first-layer full-employment. As a further step, one could rationalise and develop appropriate initiatives where public authorities intervene directly to provide the equivalent of part-time jobs. One of the main concerns today is with social services, especially when compulsory military service is giving way to professional army, since they would lose many of their currently engaged work force. The necessity to provide a first layer of work meets in this case the demand for cheap and in most cases low skilled labour. Of course, an adequate rearrangement of the social services would be necessary.

Furthermore, the connections between the monetarised and the non-monetarised economies have to be better understood and developed: indeed, many initiatives, without fully acknowledging this fact, have already incorporated something of this approach. The effort to reduce hospital costs is one example. Implicit in the enormous drive to diminish the cost of hospitalisation is a call for self-production activities of the family or of the friends who are expected to take over what is completely monetarised within a hospital system. The same applies in the case of the care of children whose parents are at work. One either seeks a fully monetarised solution (investment in nurseries) or one mobilises private homes to use their facilities for that purpose (something that is already happening with millions of grand-parents) and leaving the public authorities to intervene at two levels: verification of the adequacy of personal infrastructures providing such ‘home’ services and the provision of some financial help, encouragement or fiscal advantage for those undertaking such tasks. The total cost of the latter solution would in that case be much lower than merely relying on a totally monetarised system. Discovering and utilising the interdependencies of monetarised and non-monetarised activities systematically opens up new and interesting possibilities.

We would urge that serious consideration be given to non-monetarised activities, i.e. those performed by people for themselves and which as such are not subject to a system of exchange. Incentives or an appropriate environment should be considered also as an economic means to a greater level of wealth when this is then achieved through self-education, self-repair or self-healing activities. In addition, many benevolent activities, which avoid paying others for work, can be encouraged even further through the normal development of society.

A key issue for policy design will be the quantification of the increase of wealth produced by self-production and the non-monetised activities. The recognition of this increase in a more adequate economic theory and its evaluation through proper indicators will be essential.

11.2 The Key Role of a Second Layer of Private Initiative Based Monetarised Employment

We have already suggested the possibility of stimulating or even guaranteeing, at the public level if necessary, the availability of at least a part-time remunerated job. It is on this function that government social policy should concentrate. This is even more important not only because of the growth of the population, but also of the longer active life cycle of which mankind is now benefitting. This official stimulation and in extreme cases provision of a first layer of work should as little as possible interfere with a second layer of work, that resides entirely in the monetarised private sphere. There is a fundamental misunderstanding to be avoided: the development of a public policy aiming to provide a minimum part-time job (roughly of about 20 hours per week or 1000 hours per year) is not conceived as a substitute for private initiative. Quite the opposite, the limited time of work and the relative meagre compensation does not preclude nor discourage, for those who might need to benefit from it, the addition of — or the complete substitution of the first layer by — a second activity which
would be entirely linked to their own initiative or in any case to a private type of ‘production’.

We believe that in a modern society the anxiety to remain without any sort of employment should be eliminated as a goal and that this would reinforce the possibilities for private initiative above or at the place of this first-layer work. The second layer of monetarised work is to remain at the centre of the economy, allowing any individual to substitute the first layer completely by taking up a remunerated job of his own preference. As such, the second layer of economic activity corresponds very much to our current system of career employments, but in a very flexible way.

Individuals would be free to decide whether or how much they work on this level. It can comprise as little as one additional hour per week to the basic work layer, for example spent on remunerated private teaching, or as much as 80 to 100 weekly hours, then in substitution of the first layer of course, which corresponds to the work load of economically very active people. Naturally, the monetary income of people in excess of what they absolutely need to subsist above the poverty level depends on their endeavours in the monetarised part of the economy. Payments will be determined in exactly the same way as they are now, leaving this dimension of the conventional system of obtaining income largely untouched.

Compared to our current economy, the second layer of work has to be and will be more flexible since it has to comply with the preferences of very different groups of our society. It will gradually erode the conventional concept of a more or less fixed working week of 40 or 45 hours, adapting the organisation of work to the exigencies of the people involved. As a consequence, it will fit more and more in the interests of those doing it, gaining in productivity through higher morale of those employed.

The second layer of work also provides the means to obtain additional income during retirement via occupational pensions and private capital accumulation and later melting. Traditional state-organised pension systems will be complemented by these two other pillars of the social security system. Already, there is a movement towards enhancing and diversifying future old-age income.

11.3 A Third Layer of Productive Non-Monetarised and Non-Monetised Work

On top of the already mentioned first and second layers of work, there is a third one. It comprises all fields of non-monetarised work. The work of the third level is in contrast to the previous two unremunerated and totally voluntary in nature. It is therefore a complement in the sense that the active person contributes to the welfare of the society or of a part of the society without any compensation in monetary terms. Many activities that have either no market value or whose market value cannot effectively be assessed are possible activities of the third layer of work.

There is a strong contribution to our society of non-monetarised work and many people are already engaged in such activities. In Germany, the Commission for Demographic Change states a very high activity level of the population: 27.2% of men aged 25 to 34 and 16.3% of women in the same age group are engaged in some sort of benevolent or voluntary work on a regular basis, many of them as honorary members of the board. Most of this work is carried out in the health, social, cultural or political sectors of the economy. This high level of activity remains fairly constant throughout the life cycle. The next higher age groups, those aged between 35 and 44, those between 45 and 54 and those between 55 and 64, display activity levels of 29.2%, 25.4% and 28.9%, respectively. The equivalent female figures amount to 16.3% and then drop to around 13%. This proves the theory of constant voluntary activity during all stages of life correct.
The Seniority Expert Service in Germany expects future changes in voluntary work and the inclination to take up such work: more and more people will probably provide more and higher skilled work without expecting monetary compensation. Especially the elder are willing to share their experience and their personal connections either here or in developing countries with other less fortunate people than themselves.

REFERENCES


On the basis of a voluntary network, partly supported by The Geneva Association, The Risk Institute was established in order to extend the studies on the issues of risk, vulnerability and uncertainties to the broader cultural, economic, social and political levels of modern society.

The starting point defining the programme of action was an informal meeting held in Paris in 1986. Among the participants were Raymond Barre, Fabio Padoa, Richard Piani, Edward Ploman, Alvin and Heidi Toffler and Orio Giarini.


The book stresses the point that uncertainty is not simply the result of inadequate or insufficient information. Every action extending into the future is by definition uncertain to various degrees. Every ‘perfect system’ (or ideology) is a utopia, often a dangerous one: the total elimination of uncertainty in human societies implies the elimination of freedom. Learning and life are about the ability and capacity to cope, manage, face, contain and take advantage of risk and uncertainty.

In 2002, The Risk Institute published with Economica (Paris) the book *Itinéraire vers la retraite à 80 ans*. Ever since the The Risk Institute has been mainly concerned with a research programme on social and economic issues deriving from extending human life expectancy (usually and wrongly defined as the ‘ageing’ society), which is considered the most relevant social phenomenon of our times. This is particularly relevant in the context of the new service economy. The Risk Institute has contributed to the organisation of the conference on “Health, Ageing and Work” held in Trieste and Duino on 21-23 October 2004. On this basis, it has taken the initiative to publish these EUROPEAN PAPERS ON THE THE NEW WELFARE — The Counter-Ageing Society, in two versions (one in English and one in Italian), with the support of various institutions.

**Service Economics and Risk Management in a Nutshell**

- Economics is a social ‘science’ originating as a consequence of the industrial revolution, and developing for about two centuries. It is NOT the ‘science’ of economy per se, but of a specific phenomenon starting in the eighteenth century. It concentrates on the manufacturing of goods, and — culturally or philosophically — is linked to a deterministic thinking (rather valid, because useful, until the beginning of last century). From all this derives the definitions of a series of fundamental concepts: value, equilibrium, productivity, the role of prices (explicit and implicit ones) etc.

- Within this framework the role and place of an important economic sector such as insurance remains secondary (rightly so at the time of Adam Smith). Uncertainty is linked to incomplete information. The basic paradigm is the reference to equilibrium, which implies complete information, even if in our era this is still admittedly imperfect. In this
perspective, science is implicitly considered as a means to reduce the information gap and finally to eliminate it. And insurance with it. So, why bother to integrate insurance (and risk management) in the basic studying and learning of economics? The very idea of imperfection is wrong as it is based on a kind of ideological determinism.

• The point is that information is by nature ‘imperfect’, because the value (economic value) is not the result of a static equilibrium, but of a dynamic disequilibrium. Even when economists like Samuelson admit dynamic analysis, the phenomena analysed are presented as series of sequentially static states.

• To really understand this, one has to go back to the process of producing wealth: the first step is to recognise that services today are production functions for over 80% of all resources used. Services are NOT a sector, but production tools in all economic activities. The most advanced ‘manufacturing-industrial’ companies are those where service functions are dominant: research, development, quality control in ‘production’, information, storage, distribution, utilisation, etc. and finally waste management (the ecological issues are totally integrated in the modern economic cycle in this way).

• The second step is to realise that the value of a service-based economy is not dependent on the existence of a ‘product’ (even if this is a service), but in its performance in time: this is the source of two basic forms of uncertainties. The first refers to the duration of performance in (future) time. The second to the events which might alter the mode and quality of this performance (and here we rediscover the notion of Risk Management).

All this leads to the idea that the pricing system of insurance is NOT just an odd case with reference to the rest of the economy (the famous question of the reversal of the costs and prices cycle): in the service economy, the pricing system of insurance based on uncertainty is now at the core of the whole economy. Whenever a ‘product’ is sold today, its future performance will add to the present price paid future foreseen and unforeseeable costs. In most cases, higher than the cost of the initial ‘product’. Some ‘products’ then, as in the case of waste management and environmental costs, become a sort of negative public goods often paid by taxes (determined ex post). The liability explosion is strictly interconnected with this issue.

It seems a paradox, but insurance (and risk management) is simply at the core of the modern, service-based economy. Just the opposite of the normal, current perception and understanding. For the moment, insurance will not make considerable progress as long as the basics of economics are still the ones deriving from the traditional (no longer existing in fact) industrial-manufacturing era. Obviously there is no question of services totally replacing manufacturing. They are both needed: there is no service without a tool and vice-versa. The question is just a reversal in the priorities (from hard products to services). And this alters the notion of value, from the one fixed in an equilibrium system between supply and demand at a given moment in time, to the one in which any price given at any moment in time is just a contract or commitment such as an insurance policy: most of the costs in the ‘utilisation’ process — or performance — (determining the real value of any economic system) intervene ‘later’ in time, and are inevitably just ‘probable’.

Linked to this process (and to the impact of technology) is an understanding of the notion of vulnerability as a basic reference to risk management. For more details on this issue, see the study on “The Limits to Certainty — Managing Risk in the Service Economy” published under the auspices of The Risk Institute and The Club of Rome*.
Macros Research was founded in 1987 in Milan and conducts surveys and research on behalf of the financial sector, insurance companies and banks.

It belongs to the Macros Group, which also includes two other companies: Macros Consulting, operating in the field of top management strategic consulting, and Macros Risk Management, a consulting company dealing with integrated risk management.

Macros Research carries out research projects and studies according to a multidisciplinary approach to analyse and investigate — both under an economic and financial perspective — the management of economic and social risks in the public and private sectors.

The goal of Macros Research is promoting and carrying out theoretical and empirical research in the area of insurance economics with reference to the extension of the life cycle and its impact on the welfare, social security and health care systems. Among the various research projects conducted by Macros Research, the following are particularly meaningful:

- Pension and Welfare systems in Italy and the OECD countries
- Private savings and the public pension systems
- Ageing society and the labour market
- Long term care
- Insurance Economics
- Risk Management

Macros Research published several books and articles and, in collaboration with the Risk Institute, is the editor of the *European Papers on the New Welfare – The Counter-Ageing Society*. Since its inception, Macros Research has stood out thanks to its international vision confirmed by over 20 years of collaboration with the Geneva Association, the Risk Institute of Geneva-Milan-Trieste, national and international universities and research institutes. The organization of international conferences and seminars in collaboration with experts from all over the world is another indicator of the international commitment of Macros Research.

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Montepaschi Vita, life insurance Company of the Banking Group Monte dei Paschi di Siena, is the first example of bancassurance in Italy. Operational since 1991, the company is a leader in the bancassurance business and holds an important position in the national insurance market.

The interest of Montepaschi Vita in the scientific research is witnessed by the many initiatives in this area. Noteworthy is the Montepaschi Vita Annual Forum, proposed from 2002 as an annual appointment for reflection and debate among Italian and European leading financial and insurance actors on key topics linked to the new paradigms of value. Key themes of the debates are the new modalities of creation of value in the new international scenarios. Considerable attention has been given to the redistribution of social responsibilities and the risk shift from public to private, with the emphasis on the role that insurance and financial groups are asked to play.

The topic is of crucial importance not only in Italy, on the threshold of a welfare mix reform, but also in many European countries involved in switching functions and roles between public and private sectors. The very concept of savings is experiencing an interesting evolution, no long dealing only with security and profitability aspects, but also finalisation, with specific goals connected to the new social trends and new needs triggered by the erosion of previous public services.

The scenario offers great opportunities but also presents great risks. Insurers, with their vocation as ‘risk manager’, are the best place to cope with these new challenges. The new role of private financial operators has highlighted the importance of the ‘social pact’ and also the trust there has to be between these players and citizens/clients in providing financial leverage and skills to cover ‘social’ risks.

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Fondiaria-Sai, set up on December 31\textsuperscript{st}, 2002 following the incorporation of ‘La Fondiaria Assicurazioni’ in ‘Sai-Società Assicuratrice Industriale’, is a leading Italian insurance Group with more than nine million customers and premium income of almost 10 billion euros. In proposing the insurance, pension fund, financial and banking products and services of its high prestige brands (Sai, Fondiaria, Milano, NuovaMaa, Previdente, Italia, Siat, Sasa, etc.), the Group is sustained by the professional competence of around 6,000 employees and the expertise of the most widespread insurance-financial consulting and sales network on the Italian market: 3,500 agencies, 1,500 financial promoters and 3,500 outlets with bankassurance agreements. Fondiaria-Sai, lead company of a group comprising around 100 companies, subsidiaries and associates, also active in the sectors of real property, agriculture, assistance and services, is listed on the Milan Stock Exchange.

Fondiaria Sai Group has always been aware of its responsibility to create not only shareholder value but also ethical value for its stakeholders: customers, employees, public authorities, local communities and entities that operate in the territory and in civil society. To foster a ‘culture of solidarity’ in our country, the Group has set up the Fondiaria-Sai Foundation — which provides contributions in the social-assistance and cultural sector — and publishes an annual Social Report, a document that reflects, in a tangible and transparent manner, the way in which the Company fulfils its social responsibilities adopting an original approach that, involving University students in drafting the Report, generates economic-social benefits.

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The Geneva Association is a unique non-profit worldwide organisation formed by some 80 Chief Executive Officers of the most important insurance companies in Europe, North America, South America, Asia, Africa and Australia. Its main goal is to research the growing economic importance of insurance activities in the major sectors of the economy.

The Geneva Association acts as a forum for its members, providing a worldwide unique platform for the top insurance CEOs. It organises the framework for its members and their companies to exchange ideas and discuss key strategic issues. To this end, it has established large international networks of experts and high-level industry platforms. The Geneva Association serves as a catalyst for progress in this unprecedented period of fundamental change in the insurance industry. It seeks to clarify the key role that insurance plays in the further development of the modern economy.

Its activities are focused around 6 research programmes which constitute the core of its research activities:

1) **Risk Management**: The aim of this programme is to research and illustrate the new risks in the emerging service economy.

2) **Insurance and Finance**: This research programme comprises academic and professional research activities in the fields of finance where they are relevant to the insurance and risk management sector.

3) **The Four Pillars — Research Programme on Social Security, Insurance, Savings and Employment**: To identify possible solutions to the problem of the future financing of pensions and, more generally, of social security in our post-industrial societies.

4) **Health and Ageing**: This programme seeks to bring together facts, figures and analyses linked to issues in health. The key is to test new and promising ideas, linking them to related studies and initiatives in the health sector and trying to find solutions for the future financing of healthcare.

5) **Insurance Economics**: It is dedicated to making an original contribution to the progress of insurance through promoting studies of the interdependence between economics and insurance, to highlighting the importance of risk and insurance economics as part of the modern general economic theory.

6) **PROGRES (regulation and legal issues)**: This research programme focuses on questions related to regulation, supervision and international co-operation of insurance and financial services as well as other legal issues of importance.

Today, after more than 30 years of existence, The Geneva Association has become a fixture for the insurance world through the quality of its research and the expertise of its global networks.

*President: Henri de Castries (CEO, AXA, Paris)*

*Secretary General and Managing Director: Patrick Liedtke (Geneva)*
The International Insurance Society, New York, awards Orio Giarini the Hall of Fame award 2006

The Motivation:

“The International Insurance Society has awarded you its prestigious Hall of Fame award for 2006 presented on July 17 in Chicago, at the 42nd international seminar. Your contributions to the insurance industry over the past three decades have been monumental. Your work at the helm of The Geneva Association resulted in its becoming a highly respected global think-tank, a powerhouse of insurance executives. Your political, academic and industry achievements have made a positive difference in the fields of risk and insurance economics as well as in the professional insurance sector. You are known and respected throughout the world for your accomplished research writings, for your creation of insurance research networks, and your creation of international newsletters that deal with issues in the insurance sector. We are delighted to give you the recognition you so well deserve before an audience of global insurance leaders...”.

Patrick Kenny, President and Chief Executive, International Insurance Society, New York

The Insurance Hall of Fame, founded in 1965 by the International Insurance Society, is the most prestigious honour in the insurance industry. Those selected for entry — to date 115 people from over 20 countries — have made significant and long ranging contributions to the advancement of insurance in its ability to benefit individuals and societies. For more information: www.iisonline.org.

The laureates of The Insurance Hall of Fame, with their histories, digital photography, and audio-videos are shown on the website www.insurancehalloffame.org. They are also showing in New York City at the Claire and Joseph Smetana Gallery of the Insurance Hall of Fame, which is located at the St. John University.
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