Europe's Demographic Deficit

A Plea for a Child Pension System

by

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Preliminary version

Tinbergen Lectures,

Amsterdam, 22 October 2004

1. Introduction

Nothing is more important for Europe's future than the question of whether the continent will be able to solve its demographic crisis and if so how? If we do not find an adequate solution, Europe will not have a future, and then being able to solve all the other problems will not matter very much.

You may think demography is not an economic problem. Well, I maintain it is, and I will try to convince you that I am right and that this topic is, indeed, appropriate for a Tinbergen Lecture. I am very grateful to the Royal Netherlands Economic Association for inviting me to give the lecture and share my ideas with you. Ever since my student times I have been impressed by Tinbergen, whose theories were highly valued by my teachers. I would not have dreamt that I would, one day, be invited to give a lecture in his honour.

I am not aware that Tinbergen wrote substantially about demographic problems or pensions. I only found three pages on pensions in his book "Economic Policy: Principles and Design" where he warned to extend the pension system too much. In his times, demography simply was not an issue. However, Tinbergen was all his life concerned with social and distributional problems. I am quite optimistic that he would have appreciated the topic.

My talk is about the lack of children. Children have become a nuisance factor in many European countries. They cost money, restrict one's freedom as a consumer and imply a downward slide in social status. To live life as a single person tends to become the norm, informal partnerships are replacing marriage, and if two people do marry, they are in no hurry to have children. They have their first child in their early thirties, and all too frequently no more children follow. The DINK family – double income, no

kids – is even more popular among an increasing number of young couples: Life is better with two incomes and no children than with one income and three children.

With a few exceptions like France and Ireland, the problem affects most European societies. The big Italian and Spanish families are being dissolved, giving way to a new lifestyle with increased consumption standards and few of the traditional family burdens. At best the Italian mammistas ensure a certain type of family coherence. Spanish, Italian and Czech women have fewer children than the women from all other developed countries in the world, rivalling only Switzerland, Germany and a few other EU countries as well as Japan. Europe's fun society is ageing, and it is ageing fast.

Elderly Europeans also participate in the fun society. Hordes of pensioners, using the income received from the European pay-as-you-go pension systems, cruise the seven seas on luxury liners and jet off to the remotest beaches of our planet. The pay-as-you-go pension systems have made Europeans world champions in tourism and created a breathtaking infrastructure with seaside resorts and leisure centres from Gran Canaria to the Maldives and the beautiful Pacific Islands.

Europeans pay high taxes and social security contributions. Almost nowhere else is so much deducted from the earned income of the active part of the population as in Europe in order to secure a comfortable income from transfer payments for the elderly. But when the DINK generation itself grows old, it will hope in vain to emulate their parents' pensioner lifestyle because there will be too few contributors to finance their pensions.

The whole problem has now gone beyond the perversion of values and extends to the viability of the state social systems and consequently also to the efficient

functioning of the public administration. More and more people wish to benefit from the state pension systems while the group of contributors continues to shrink. The European pension systems are slithering into crisis. The marvellous promises of the politicians and association representatives, who have preferred to ignore the demographers, have turned out to be hot air. Insoluble redistribution battles between old and young are threatening to shake Europe's political system to its roots.

The objective of this lecture is to shake up, warn and help bring about a change in policy. The lecture presents the most important facts on Europe's demographic crisis, shows its consequences and tries to determine its causes. The analysis of these causes in turn yields implications for social and economic policies which may yet succeed in averting the worst and perhaps again bring about a more balanced population structure over the long term.

2. The facts

The ageing of the European population is illustrated in Figure 1, which shows the evolution of the median age for a number of European countries as well as the EU average. The median age is the age which separates the population into two equally large groups of older and younger people. It can be seen that the median age of those countries that in 2003 belonged to the EU was about 33 until 1975 but has risen to 39 in 2000 and will rise to about 47 in 2035.

Figure 1: *Median age of the EU population 1950−2050*
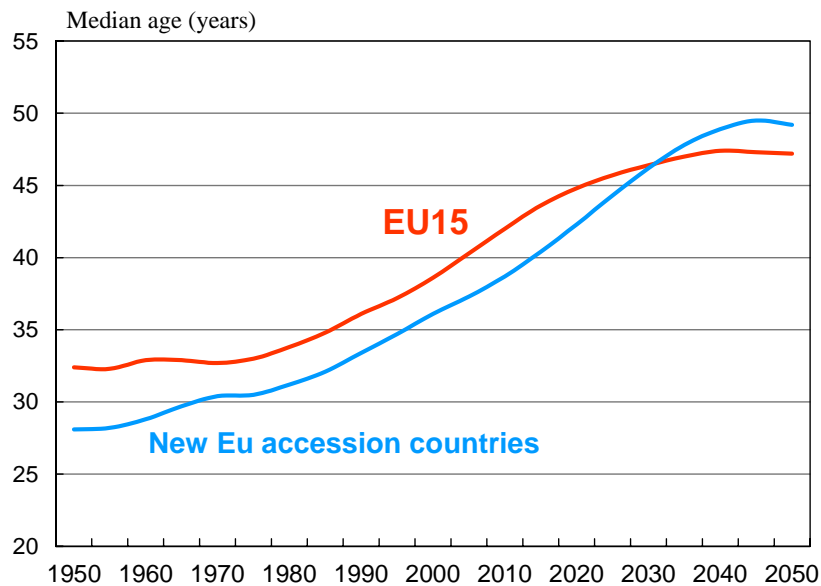
Sources: United Nations, Population Division, World Population Prospects: The 2002 Revision and World Urbanization Prospects: The 2001 Revision, (http://esa.un.org/unpp). 2004; Ifo Institute calculations.

In a world-wide comparison of median ages, as shown in Table 1, Italy, Switzerland and Germany trail behind Japan, which currently has the oldest population in the world. Note how low the median age of the US is relative to Europe. America is still a young country by all standards. Small wonder then that that country continues to exert such remarkable economic dynamism.

Unfortunately, eastern enlargement of the EU will not alleviate the problem. Although, the median age in the accession countries still is relatively low, it will increase faster than in the old EU countries and overtake it around 2035.

Table 1: Who is the oldest?

2000		
Rank	**Country / area**	**Median age**
1	Japan	41.3
2	Italy	40.2
3	Switzerland	40.2
4	Germany	39.9
5	Sweden	39.6
6	Finland	39.4
7	Belgium	39.1
8	Bulgaria	39.1
9	Greece	39.1
10	Croatia	38.9
:		
12	**EU15***	**38.6**
:		
14	**EU25***	**38.2**
:		
19	United Kingdom	37.7
:		
21	France	37.6
22	Netherlands	37.6
23	Spain	37.4
:		
34	Poland	35.2
35	**USA**	**35.2**

Legend: The table includes countries with more than 1 million inhabitants in 2000.
* Average (weighted with population sizes).
Sources: United Nations, Population Division. World Population Prospects: The 2002 Revision,
Homepage (http://www.un.org/popin/data.html), 2004, World Bank, *World Development Indicators*
2004, Ifo Institute calculations.

What is the cause of this high and still increasing median age of the Europeans?

As Table 2 illustrates, part of the explanation is the high life expectancy of the

Europeans, i.e. the high average age at death.[2] In Europe, life expectancy is significantly

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[2] The life expectancy for a particular calendar year is defined as the average age at death of an age
cohort born in 2004 which would result if this year's age-specific mortality rates remained constant
throughout the life cycle of this cohort.

higher than in the US and much higher than in many other parts of the world, including the developing countries and Eastern Europe. Only Japan has a higher one. And European life expectancy is increasing. Currently, every eight years life expectancy rises by another year.

Table 2: *Life expectancy at birth in 2003*

European Union		Accession countries		Other Countries	
Austria	78.9	Cyprus	77.5	Egypt	70.7
Belgium	78.4	Czech Republic	75.8	India	64.0
Denmark	77.4	Estonia	71.4	Iran	69.7
Finland	78.2	Hungary	72.2	Japan	81.0
France	79.4	Lithuania	73.5	Kenya	44.9
Germany	78.5	Latvia	70.9	Liberia	47.9
Greece	78.9	Malta	78.7	USA	77.4
Ireland	77.4	Poland	74.2		
Italy	79.5	Slovenia	75.9		
Luxemburg	78.6	Slovakia	74.2		
Netherlands	78.7	**Acc. countries***	**74.1**		
Portugal	77.4				
Spain	79.4				
Sweden	80.3				
United Kingdom	78.3				
EU15*	**78.9**				

Legend: * Average (weighted with population sizes).
Sources: U.S. Bureau of the Census, *International Data Base*,
(http://www.census.gov/ipc/www/idbprint.html), 2004, Table 10; World Bank, *World Development Indicators* 2004, Ifo Institute calculations.

However, this cannot be the only or even the main explanation of the increasing median age, since all available projections show that the EU25 population will not be rising. According to UN projections it will slightly increase by about 5 million until

2010, and thereafter will shrink, falling below today's level by about 2030. An increase of life expectancy in itself would imply that the population size continues to rise.

A projection of the European population is shown in Figure 2. Despite an assumed annual net immigration of about 654,000 people in the EU25 countries from non-EU countries, this projection shows that the resident population in the EU25 countries will have declined by about 21 million by 2050 compared to 2000. By contrast, the US population is expected to increase by about 124 million, with an assumed annual net immigration of about 1.1 million. In the EU25 countries only the number of citizens above 64 will rise by about 51 million until 2050, which is slightly more than the increase of the number of people in this age group in the US, where 47 million are expected.

Figure 2: *The evolution of the total population and those aged 65 and older in EU25 and the United States*
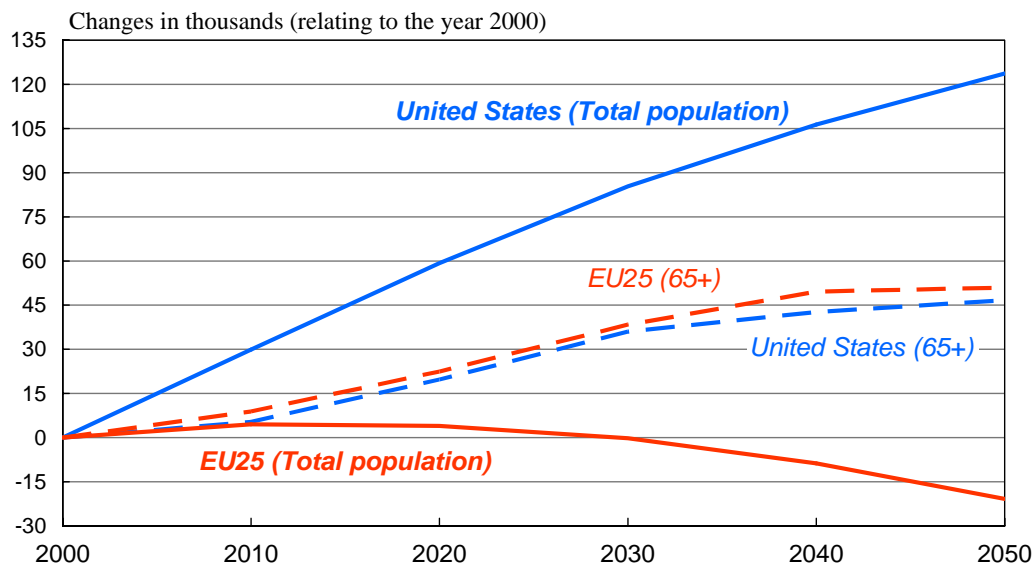
Note: Starting year 2000: Total population EU25: 452.1 million; of these, 71.3 million are 65 years and older; net immigration EU25 about 654.000 annually, cumulated national projections. Total population United States: 285.0 million; of these, 35.0 million are 65 years and older; net immigration about 1.115.000 annually.
Source: United Nations, Population Division, World Population Prospects: The 2002 Revision, (http://www.un.org/popin/data.html), 2004: Ifo Institute calculations.

The true cause of the particularly rapid ageing of the European population becomes obvious in an international comparison of fertility rates. Figure 3 gives an overview of the most recent fertility rankings available, using two alternative definitions of fertility. The left-hand scale shows the so-called fertility rate, i.e. the number of children per woman if the current age-specific birth rates of women stayed the same over time. The natural fertility rate that would keep the population constant is 2.08. One hundred women have to give birth to 101 girls to maintain the number of females in the population, since one percent of girls die before reaching the reproduction age. But when 101 girls are born, there are also 107 boys for biological reasons. Thus 208 children preserve the population.

The right-hand scale gives the current number of births per thousand inhabitants. While there is no natural steady-state value of this number, with the current European age distribution, about 14.6 children per thousand inhabitants would keep the population constant.
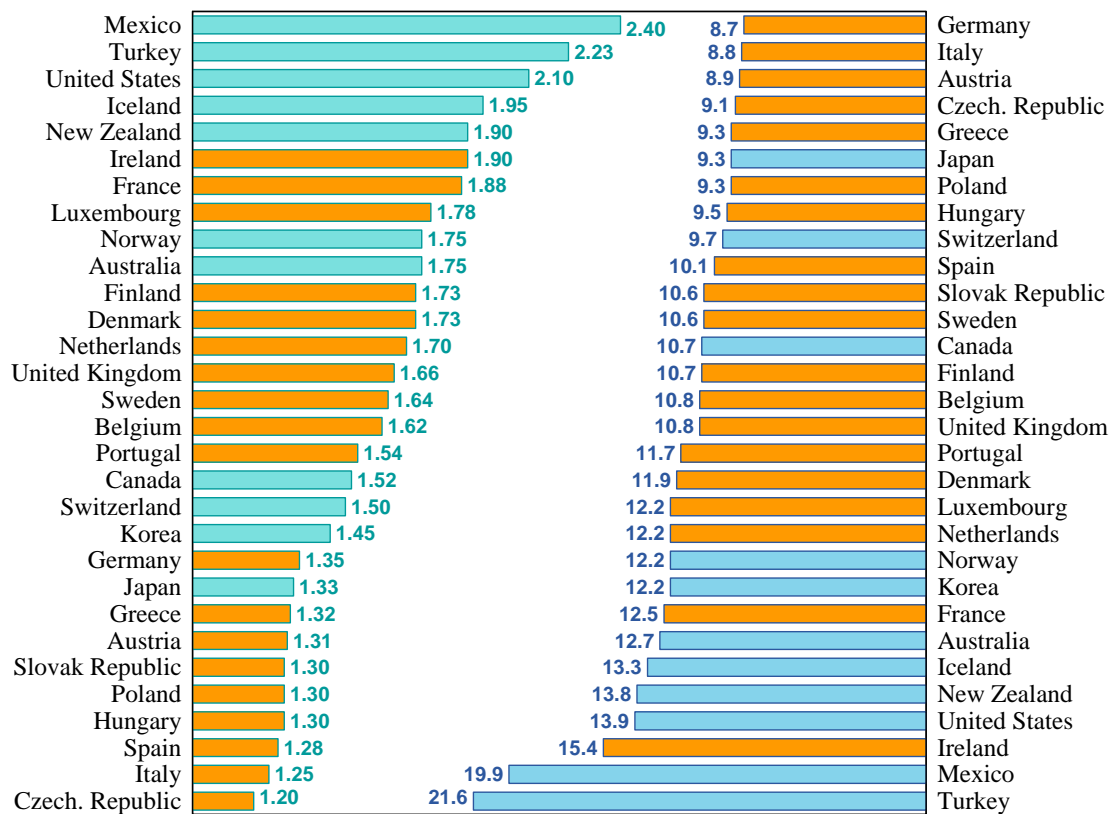
EU countries cover the eight lowest ranks in an OECD-wide comparison of fertility rates and the five lowest ranks in births per 1000 inhabitants. The countries, which on both accounts rank very low among all OECD countries, are the Czech Republic, Italy, Spain, Austria and Germany.

A striking feature is that France has a significantly higher fertility rate. Possible reasons will be examined later.

The Netherlands rank relatively high with a number of 1.75. Part of the reason for this good performance is the high fertility rate among non-natives. For example, Moroccans living in The Netherlands have a fertility rate of 3.3, African groups one of

3.0, and Turks one of 2.3. Foreign-born people in the Netherlands account for about one quarter (23%) of the new-born babies although their population share is only one tenth.[3]

Figure 3: *Comparison of fertility rates (left-hand) and birth rates per 1000 inhabitants (right-hand) in the OECD countries in 2002*

Country (fertility)	Fertility rate	Birth rate	Country (birth)
Mexico	2.40	8.7	Germany
Turkey	2.23	8.8	Italy
United States	2.10	8.9	Austria
Iceland	1.95	9.1	Czech. Republic
New Zealand	1.90	9.3	Greece
Ireland	1.90	9.3	Japan
France	1.88	9.3	Poland
Luxembourg	1.78	9.5	Hungary
Norway	1.75	9.7	Switzerland
Australia	1.75	10.1	Spain
Finland	1.73	10.6	Slovak Republic
Denmark	1.73	10.6	Sweden
Netherlands	1.70	10.7	Canada
United Kingdom	1.66	10.7	Finland
Sweden	1.64	10.8	Belgium
Belgium	1.62	10.8	United Kingdom
Portugal	1.54	11.7	Portugal
Canada	1.52	11.9	Denmark
Switzerland	1.50	12.2	Luxembourg
Korea	1.45	12.2	Netherlands
Germany	1.35	12.2	Norway
Japan	1.33	12.2	Korea
Greece	1.32	12.5	France
Austria	1.31	12.7	Australia
Slovak Republic	1.30	13.3	Iceland
Poland	1.30	13.8	New Zealand
Hungary	1.30	13.9	United States
Spain	1.28	15.4	Ireland
Italy	1.25	19.9	Mexico
Czech. Republic	1.20	21.6	Turkey

Legend: The fertility rate of a particular year is defined as the average number of births per woman, assuming that the age-specific fertility rates of this year stay unchanged throughout the life of a woman. The birth rate of a particular year is defined as the number of live births occurring during this year per 1000 inhabitants.
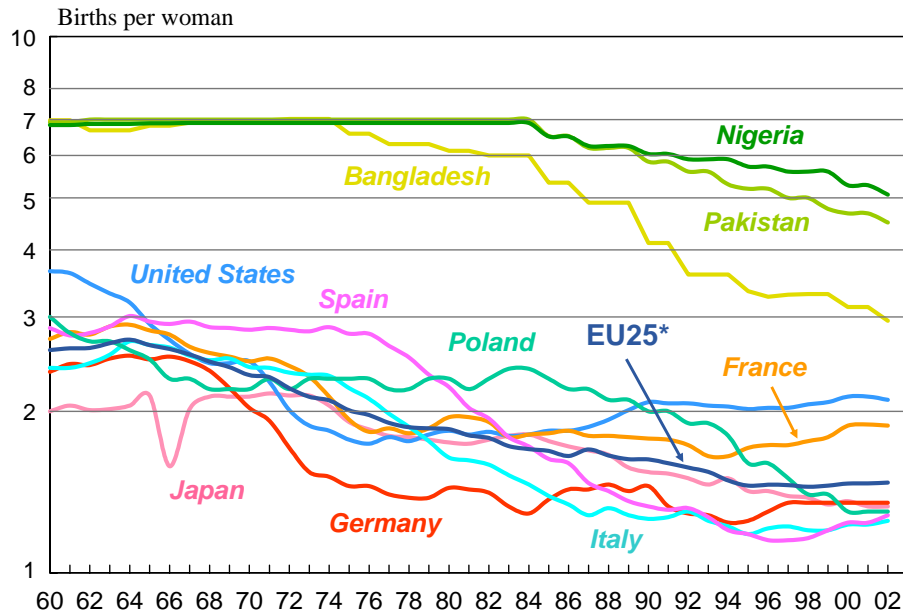Source: World Bank Group, World Development Indicators 2004.

There are remarkable differences among the two types of fertility accounts. Germany, for example, is number six from below in terms of fertility rates, but holds the lowest rank worldwide in terms of births per thousand inhabitants. The latter is due

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[3]   Source: Dutch Statistical Office, 2004, data on request; Ifo Institute calculations.

to the low number of women of childbearing potential which itself results from the low number of births that the country experienced in the 1970s. Figure 4 shows that in Germany the fertility rate declined as sharply as in Italy, for example, but the decline came about ten years earlier. While the generation of potential parents is still around, Germany today has an exceptionally small number of people in their thirties. This is part of the explanation of the low number of births per 1000 inhabitants. History has long lasting implications. It is foreseeable that Italy will experience the same effect in about ten years' time, when the low fertility rates the country experienced in the 1980s translate into a low number of women of childbearing age.

Figure 4: *Development of fertility rates in an international comparison (selected countries)*

Legend: Fertility rate defined as the average number of births per woman (age specific total fertility rate). *Average: weighted with population sizes.
Source: World Bank, World Development Indicators 2004, Ifo Institute calculations.

European birth rates declined over a long period of time. The development began already at about 1880. In the early 19th century, women had about five children or more, but during the last century, the birth rates declined in most countries with alarmingly low levels following the invention of modern contraception methods. Figure 5 shows the dramatic decline in the number of births in selected European countries.

Figure 5: *Births per 1000 inhabitants*

Sources: National Statistical Offices, World Bank Group, Database 2004.
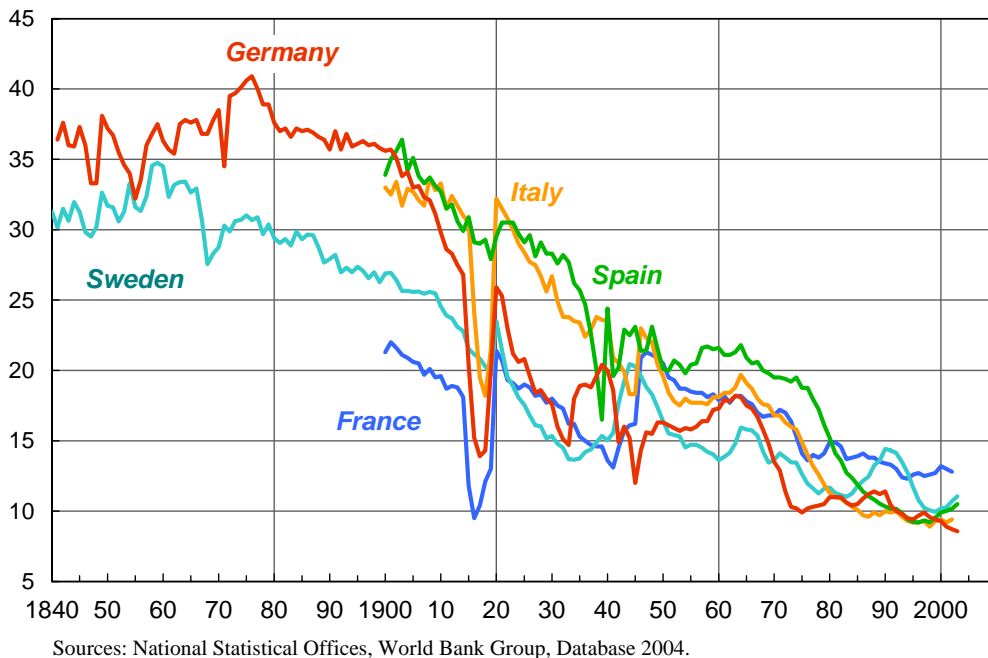
The dramatic nature of this demographic change is illustrated by the EU15 age pyramid as shown in Figure 6. It is obviously no longer a pyramid. The original pyramid has become a sort of Christmas tree whose branches cluster around the age group of forty. The biggest cohort comprised those born in 1964, who were 35 years of age in the year 2000 to which the pyramid applies and who are now 40. This cohort is the baby boomers. They currently generate the residual economic dynamics still to be

found in Europe, and they are paying for the pensions. In thirty years' time, these cohorts will be around seventy and all of them will be of pensionable age. However, they will not be followed by other cohorts of the same size to support the aged. That is the problem.

Figure 6: *Comparison of actual and constant population, EU15, 2000*
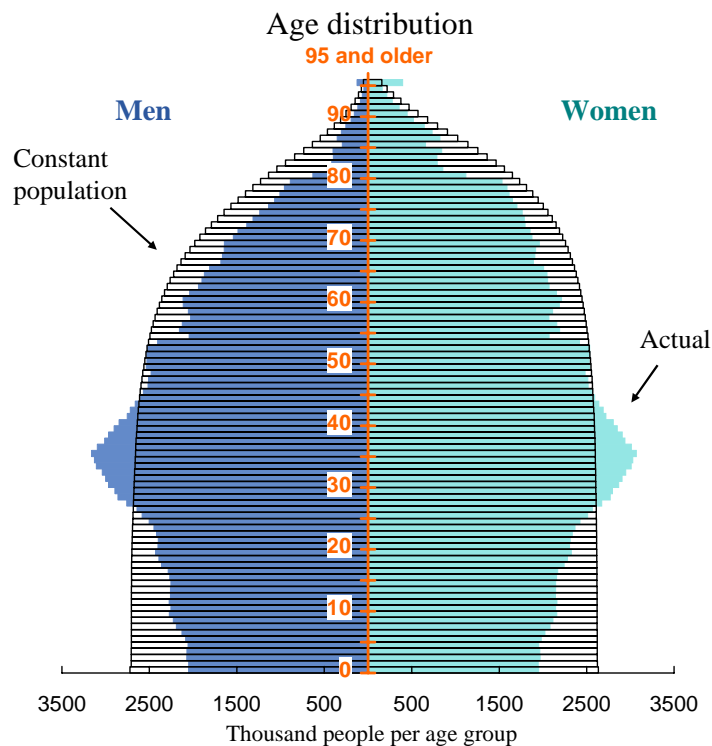
Equivalent constant population with equal number of persons in the age group 25-65.
Source: Eurostat, Ifo Institute calculations.

Figure 7 presents an international comparison of a key parameter of the age pyramid, the old age dependency ratio. It measures the number of those 65 and older in relation to those aged between 15 and 64. Shown is a country comparison over an entire century, from 1950 to 2050. The dependency ratio rises rapidly in all countries shown, but, with the exception of Japan, Europe clearly is affected much more strongly. While the EU15 dependency ratio rises from 14% in 1950 to 24% in 2000 and to 50% in 2050,

in the US it only goes up from 13% in 1950 to 19% in 2000 and to 32% in 2050. Spain and Italy are affected particularly strongly. In 1950, when the classical Spanish family was intact, 100 people at the age from 15 to 64 years were confronted with only 11 older people, but fifty years later, in 2000, there were already 24 older people and in 2050 there will be 68. In Italy, the respective numbers are 13, 27 and 65, which are not much better.

Figure 7: *Old age dependency in selected OECD countries and the EU: A centenarian comparison*
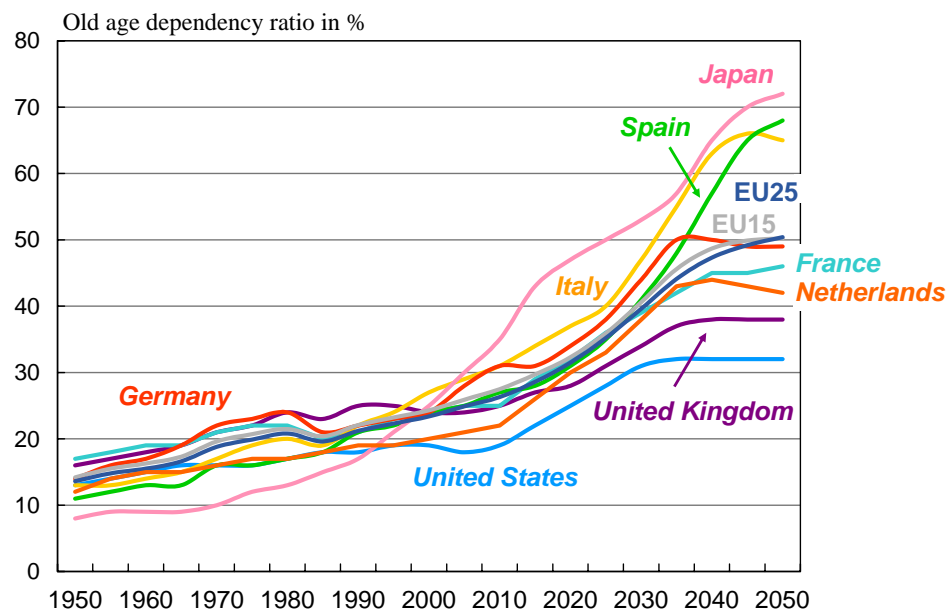
Legend: Old age dependency ratio defined as the ratio of the population aged 65 and over to those aged 15-64.
Source: United Nations, Population Division, World Population Prospects: The 2002 Revision, (http://www.un.org/popin/data.html), 2004, Ifo Institute calculations..

The Netherlands performs relatively better in this comparison. It today has and will continue to have a much lower old age dependency ratio than the EU average. However, even it will have severe problems. In the Netherlands, the old age dependency ratio will increase from 20% in 2000 to 43% in 2035, which is more than doubling in only thirty years time.

Because of their shortage of children, some European countries and also the EU countries as a whole are ageing more quickly and in a more sustained way than nearly all other countries. While Japan will have the highest old age dependency ratio in 2050 among all countries of the world, EU countries cover the next eight places in a world-wide ranking (Table 3).

Table 3: *World-wide ranking: Old age dependency ratio in 2050*

Rank	Country	Ratio as %
1	Japan	72
2	Spain	68
3	Italy	65
4	Slovenia	64
5	Greece	62
6	Czech Republic	59
7	Estonia	57
8	Latvia	56
9	Austria	55
10	Republic of Korea	55
15	China, Hong Kong SAR	53
17	EU25*	50
18	EU15*	50
22	Germany	49
29	France	46
40	The Netherlands	42
46	United Kingdom	38
56	United States	32
102	India	22

Legend: Old age dependency ratio defined as the ratio of the population aged 65 and over to those aged 15-64. This table includes countries with more than 1 million inhabitants in 2000.
*Average (weighted with population sizes).
Sources: United Nations, Population Division, *World Population Prospects: The 2002 Revision*, (http://www.un.org/popin/data.html), 2004, World Bank, *World Development Indicators 2004*, Ifo Institute calculations..

3. The consequences of the demographic crisis

3.1 *Pensions*

The consequences of the demographic crisis on the financing of the pay-as-you-go pension systems, in short PAYGO systems, are obvious. All EU countries have such systems, and in nearly every country, except for the Netherlands and the UK that rely also heavily on funded pensions, the PAYGO pension contributes the lion's share to people's consumption in old age. Because of the rising old age dependency ratio, the number of pensioners who must be supported by a young person in work is increasing, and that means either an increase in the social security contribution rate or a reduction of the level of pensions paid. The UN calculations shown in Figure 7 forecast more than a tripling of the EU15 and EU25 old age dependency ratios within 100 years and almost a doubling in the period between 2000 and about 2040. And yet, if anything, this forecast seems to underestimate the rise of the old age dependency ratio.
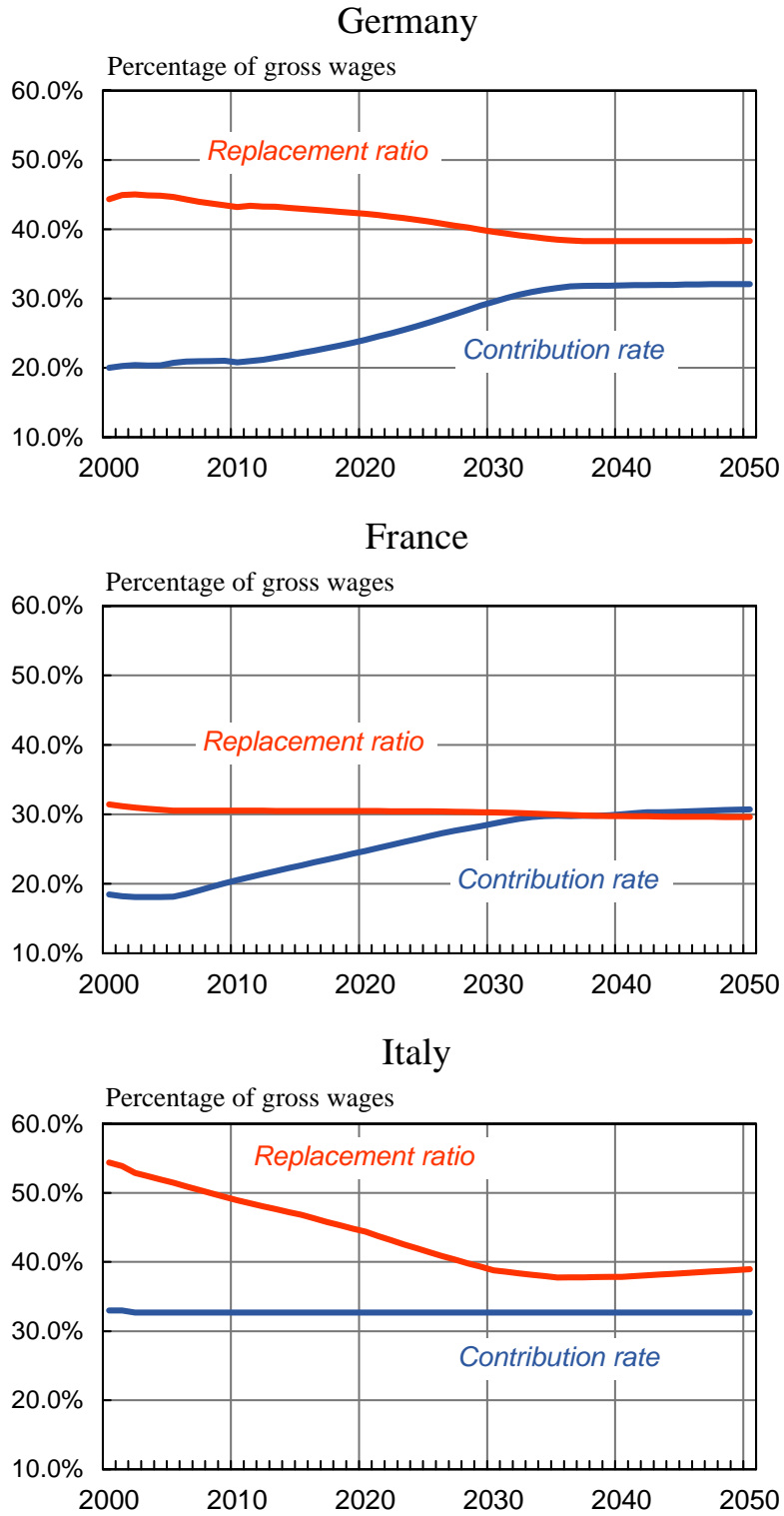
The most recent forecast for Germany by the German Federal Statistical Office, for example, suggest that the German old age dependency ratio will more than double in the period from 2000 to 2035, the year in which the demographic crisis is forecast to peak. And this is true despite the fact that considerable immigration of 200,000 people annually is assumed in the central forecasting variant.[4]

There is no need to work out a formal pension model to recognize that doubling the dependency ratio will mean either a doubling of the social security tax rate, or else a halving of pensions relative to gross incomes, i.e. the old age replacement rate. Politicians can decide on a point within this range, but they cannot prevent the shortage

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[4] Cf. Federal Statistical Office, *9th Coordinated Population Forecast*, Wiesbaden 2000.

Figure 8: Old age contribution and replacement rates in three European countries

Germany

Percentage of gross wages

France

Percentage of gross wages

Italy

Percentage of gross wages

Sources: CESifo Pension Model, Ifo Institute calculations.

of contributors, and in particular the dramatic crisis of the pension system.

Figure 8 shows the results of calculations that were made on the basis of the CESifo pension model for Germany, France and Italy, assuming that the legal situation in the respective country remains unchanged. The graphs show the average gross replacement ratio, i.e. the ratio between gross pensions and gross incomes as well as the effective pension contribution rate with regard to gross wages. In all cases the gap between the replacement ratio – the ratio of gross average pensions and gross average wages - and the contribution rate as a percentage of the gross wage is narrowing, with the point of maximal proximity occurring at around the year 2035. Around that year the pension crisis will peak in these countries because at that time the baby boomers born in the mid-1960s will be around seventy years old.

Despite this similarity, the countries plan to react quite differently to the crisis. In France, the replacement ratio is kept fairly constant. Therefore the contribution rate will increase from below 18.1% today to about 29.8% in 2035. In Italy, conversely, the contribution rate is being kept constant. Thus the replacement ratio will decline from today's 52.9% to 37.7%. Germany chooses a middle path with an increase in the contribution rate from 20.4% to 31.4% and a decline in the replacement ratio from 45.0 to 38.5.

The demographic distortions not only mean that higher contributions will have to be made in the decades to come but also that the contributors will receive lower pensions, both in relation to then-prevailing wages. A PAYGO system is an intergenerational redistribution scheme in favour of the starting generations. While the initial participants get pensions without having paid for them, later generations have to be satisfied with a rate of return below the market rate of interest: In addition to their

contributions, they pay an implicit tax that, in present value terms, is exactly equal to the introductory gifts. Moreover, at each point in time, the then existing implicit pension debt in terms of claims accumulated by the respective living generation equals the present value of all implicit taxes to be borne by all generations from that point in time onwards.[5] The implicit debt is rolled over from one generation to the next, but all future generations share its burden. For Germany an implicit debt-GDP ratio of 270% has been estimated.[6] When the European population shrinks, the debt will have to be serviced by fewer and fewer people and the implicit tax burden per person will rise.

The Ifo Institute made an attempt to measure the time paths of the implicit taxes in an intergenerational accounting system for selected OECD countries, considering all age cohorts from 1940 through 2000. Figure 9 shows the result of the calculations in terms of the implicit lifetime pension tax burden as a fraction of lifetime gross labour income.[7] The calculations which refer to the legal situation of the year 2002, assumed country specific average labour income profiles, the average country specific pension age as well as average probabilities and time paths of early retirement and of widows and orphans.

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[5] For the proof see Sinn (1998 and 2000).
[6] Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (2003).
[7] See Fenge and Werding (2003). For a similar study calculating implicit lifetime tax burdens for Germany alone see Sinn and Werding (2000).

Figure 9: *Implicit PAYGO taxes as a percentage of lifetime labour income*
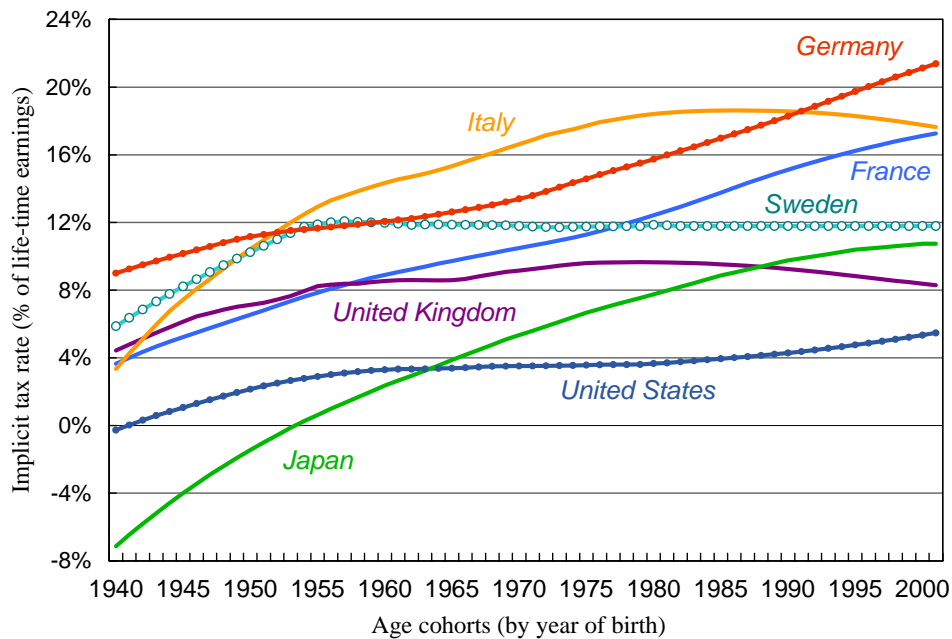
Source: Fenge and Werding (2004),

The figure shows that the implicit lifetime PAYGO tax rate increases strongly in all countries with Italy and Germany alternately taking the lead. Italians born after 1965 have to sacrifice more than 16% of their human capital to redeem the implicit debt of the pension system and Germans more than 12%. Germans born currently will even have to give up more than 20% of their lifetime income. The implicit tax rate is rather low for people who are now in their forties in Britain and France, where the tax rates range from 6% and 10%. However, things will even change for these countries. Frenchmen who are now in their twenties will have to bear 12% and more, and even British twenty-year-olds will have to pay 10%, although the British PAYGO system was curtailed significantly by the Thatcher government.

Things are better in Japan and the US, where the PAYGO pension systems operate on a much lower scale than in Europe. In both countries, the implicit tax rates

for people who are now 40 years old are only about 4%. However, the increase of the implicit tax rates for younger cohorts is particularly strong in Japan.

One could argue that an intergenerationally fair pension system is characterised by flat curves of the implicit tax rates across the generations. Judged by this criterion, the US and Sweden perform well, albeit on different burden levels. With its 1998 reform, Sweden introduced a number of elements making the system actuarially fair and bringing it close to a defined benefit system, and with its 1983 reform, the US expanded its Social Security Trust Fund system. Both reforms have helped making the tax curves flat across the generations.

3.2 *Fading economic dynamism*

The dire consequences of the demographic crisis are not restricted to the pension system. Europe's cultural and economic dynamics will increasingly flag. A study by Guilford (1967) showed that scientists of all disciplines attain their maximum performance at the age of about 35 on average.[8] As the European age pyramid of Figure 6 showed, the most heavily populated age groups in Europe are already around forty years old today and hence already beyond this maximum. These age groups will still bring Europe a few years of dynamic growth, but after another decade today's forty-year-olds will have become fifty-year-olds. At that age, there is less interest in making huge efforts than in preparing for retirement.

It is sometimes suggested that the depletion of the workforce due to ageing is of advantage to the labour market because it reduces the unemployment rate. This

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[8]   See also Weinert (1997, p. 98) and Lehmann (1953).

assumption is invalid. It originates from an excessively primitive and mechanical way of looking at economic activity and overlooks that ageing removes not only employees but also employers from the labour market. New businesses that create new jobs tend to be established by young people. In Europe, the average age of company founders is about 35 years, which coincides with the age of maximum scientific performance as mentioned above.[9] As Europe's most densely populated age cohorts are older than 35 years, the widespread ageing of the European population will not reduce unemployment. Quite to the contrary, one must fear an aggravation of the existing lack of entrepreneurs and jobs. That a country of old people would have lower unemployment than a country of young employable people is a strange idea.

The ageing of the European population will further weaken the innovative power on which Europe's international competitiveness depends. As Figure 10 shows, Europe lags very much behind the US in this regard, but is very slowly catching up. The demographic crisis incurs the risk that Europe will never manage to break even with the US. There is little hope that Europe will become the world's most dynamic region, as the EU heads of state had declared so proudly at the Lisbon Summit of March 2000.

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[9] European Commission, Enterprise DG: *Business Demography in Europe*, Observatory of European SMEs 2002, No 5, p. 32.
(Link: http://europa.eu.int/comm/enterprise/enterprise_policy/analysis/observatory.htm).

Figure 10: *Patent registrations of domestic origin per million inhabitants:*
A comparison between the United States and EU15
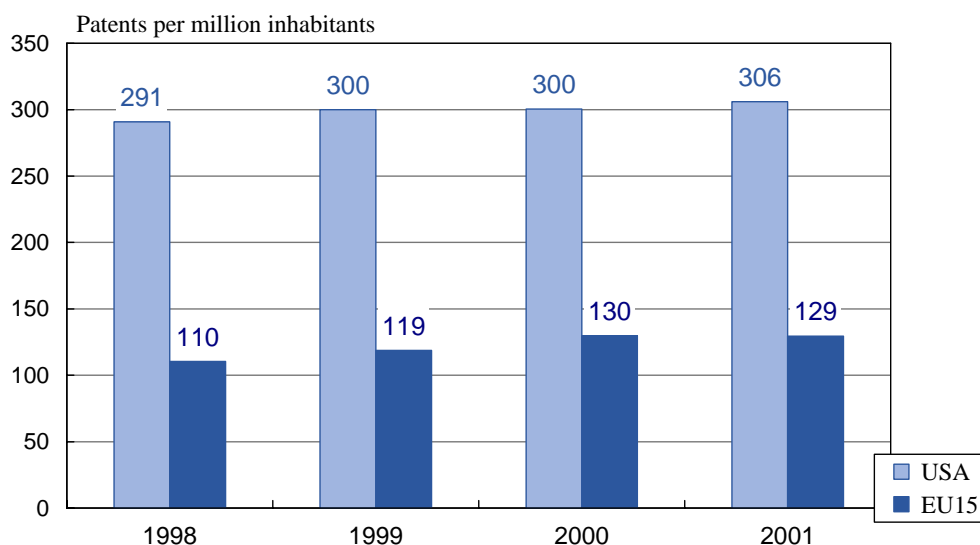
Legend: EU15: Patent applications from inventors with EU15 residence to the European Patent Office. United States:
Patents from investors with US residence granted by the US Patent & Trademark Office.
Source: United Nations, Population Division, World Population Prospects: The 2002 Revision, (http://www.un.org/
popin/data.html), 2004, Ifo Institute calculations.

Investors are foreseeing these demographic problems and are already holding
back. The stock markets, too, which are strongly influenced by the long-term profit
expectations of the investors, are already anticipating these developments. Only the
shares of retirement homes will prosper. They will rise above the general trend, for
retirement homes represent the future of the continent.

3.3 The road towards gerontocracy

Under the impact of these demographic changes, Europe is gradually being transformed
into a gerontocracy in which the old rule the roost. Even today no party can dare (to) act
against the interests of pensioners. This trend will be consolidated in the future.

In particular, it will not be possible to carry out reforms that effectively scale
back the pension system. While such reforms help the young by reducing their implicit

tax burden, they hurt the old who find themselves deprived of the claims they had thought to have built up with their pension contributions. Based on the methodology that Sinn and Uebelmesser (2002) had applied to Germany, Uebelmesser (2004) estimated the time at which the political majority for proportional pension and contribution cuts would be reached in Germany, France and Italy. The results are illustrated in Figure 11. The curve of the median age of voters specifies the age which splits the enfranchised population into two equally large age groups. In a democracy, a decision that would not match the interests of the median voter would not be able to find the majority of votes. The parties will consequently always endeavour to develop programmes which approach the preferences of the median voter as closely as possible irrespective of their ideological bias. Today, in 2004, the median voter in France is 47 years old and in Germany and Italy 48 years old, but in 2030 the median voter will already be 53 years old in France, 55 in Germany and 58 years in Italy. This shift will make for significant political change.

Figure 11: When will the EU countries topple?

Germany

France

Italy
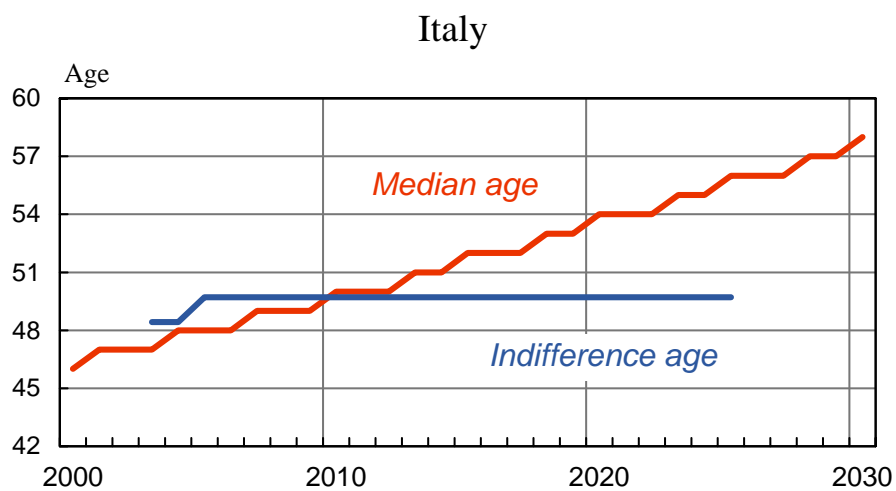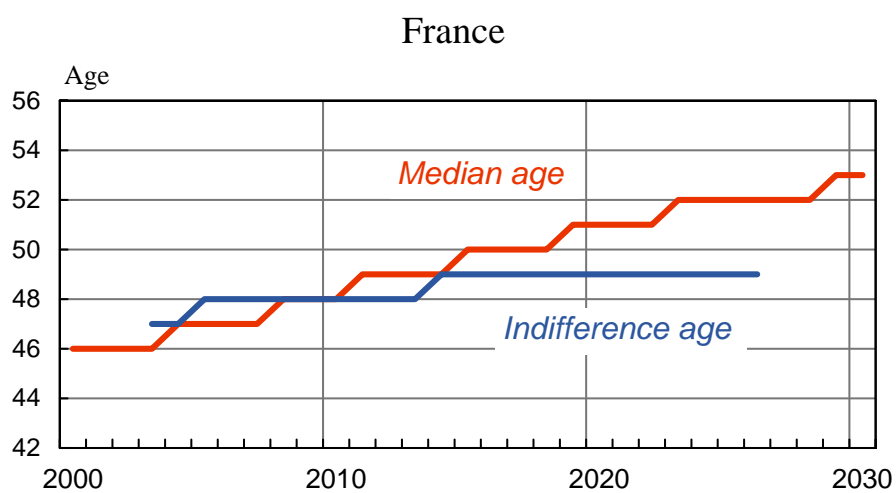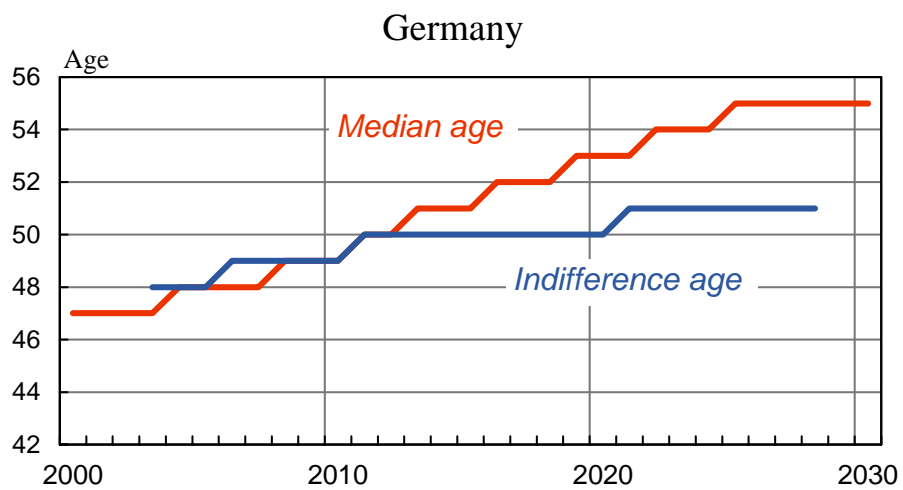
Source: Uebelmesser (2004).

The curves in the diagrams marked "indifference age" give that age in alternative calendar years, at which an average participant in the pension system is indifferent between a small proportional expansion and a small proportional curtailing of both pensions and contributions for all consecutive periods of time. Older people, who are nearer to pension age would prefer an expansion, younger people a curtailing of the pension system. If the indifference age exceeds the median age, the majority of the enfranchised population benefits from a pension cut. If the indifference age lies below the median age, a majority benefits from a further expansion of the pension system. The results shown in the graphs imply that a strategic majority in favour of pension cuts is nowhere assured. All three countries are already in a situation where there is a rough balance of those who gain and those who lose from pension cuts, and in a foreseeable period of time the losers will be in the majority. In Italy, this period is already beginning, in Germany it will begin around 2012, and in France it will begin 2014 at the latest. The European political system seems to be converting towards a gerontocracy rather soon.

4. The economic causes of the demographic crisis

Traditionally, people had children because they liked sex, because they liked children and because they liked to be secure in old age. Or to say it more bluntly, they had children because they could not avoid them, because they liked the consumption services children were providing and because they saw children as an investment opportunity. The first of these reasons for children has lost its importance because of the availability of contraceptives. And, as will be argued below, the investment motive has been largely eliminated because of the public pension systems. Thus only the second

reason, the consumption motive, remains. But this motive obviously is not enough to generate enough children to keep the population constant.
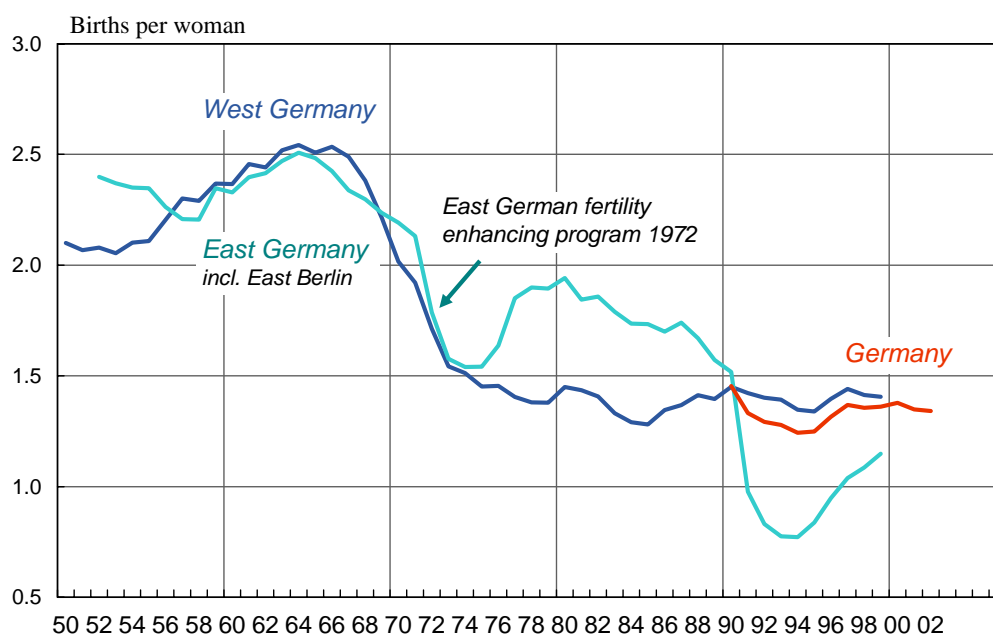
Of course, Europe's demographic crisis is the result of a general change in attitudes to marriage, children, the role of women, and other aspects of life which also have repercussions on fertility rates. However, the change in these attitudes may not be the cause, but rather itself the result of changed pharmaceutical and economic conditions. The Marxist slogan, which asserts that circumstances determine consciousness rather than the other way round, certainly also applies to the change in attitudes to children and family. As an economist, I fail to see another way of approaching the issue.

4.1. *Economic incentives to fertility: The accession of the Saarland and the former GDR to the Federal Republic of Germany*

How strongly decisions to have children are determined by economic incentives is illustrated by looking at the development of birth-rates in the GDR after the introduction of a comprehensive programme for increasing incentives to fertility in 1972: it ranged from greater rights for working mothers via a broad range of childcare facilities from early infancy and more financial aid for young families to the better provision of living space for families with children.[10] This programme had an impressive impact, as Figure 12 shows. Whereas fertility evolved in a very similar way in the two German states up to about 1972, birth rates in the GDR rose very significantly after the introduction of the programme.

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[10] Lampert (1976).

Figure 12: *Fertility rates in Germany since 1950*

Births per woman

West Germany

East Germany
incl. East Berlin

East German fertility
enhancing program 1972

Germany

50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02

Note: Total fertility rate: sum of age-specific fertility rates per woman.
Source: Federal Statistical Office, Special series 1, Series 1 1999, Special series 1, Series 1.1 2000-2002, 2004.

Similar evidence is provided by the accession of the Saarland, which had been placed under French administration immediately after the war, to the Federal Republic of Germany in 1957. Whereas birth rates there had remained at the comparatively high French level up to this point, they declined significantly after accession to the Federal Republic and increasingly approached the latter's average in the following years. Figure 13 illustrates this situation.

Figure 13: *Birth rates in the Saarland following accession to the Federal Republic of Germany*

Live births per 1000 inhabitants
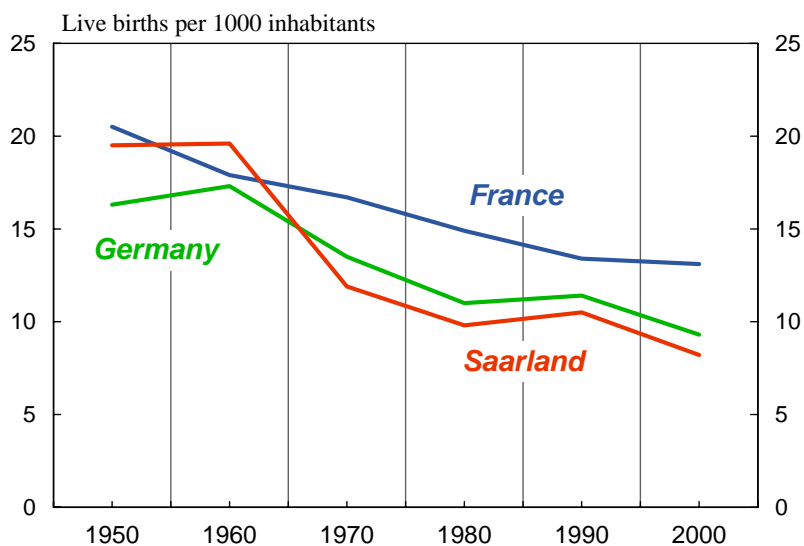
Source: Federal Statistical Office, Statistical Yearbook for the Federal Republic of Germany, various years and Statistical Yearbook for Foreign Countries, pp. 195 f.

This development was clearly due to the replacement, at accession, of the comprehensive French programme for promoting families and children with the comparatively meagre fiscal incentives offered by the West German government. Even today, French family policy is very much more comprehensive and generous than the German one, with the consequence that the French fertility rate was 1.88 in 2002, still far above the German rate of 1.35.[11]

Incidentally, it is striking that after the accession of both the Saarland and East Germany to the Federal Republic, their birth rates initially fell significantly below the level of the Federal Republic. This may have been due to the greater feeling of uncertainty among those affected by the change of regime which in turn produced a significant change in reproductive behaviour.

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[11] World Bank, *World Development Indicators* 2004.

4.2. *The example of France*

One of the interesting aspects of European demographic development is the relatively high fertility rate of the French population that, in addition to Figures 3 and 11, becomes evident if the French age pyramid is considered. Figure 14 shows the French pyramid in comparison to the German pyramid, to contrast two extreme examples.

None of the two pyramids deserves its name, since young age cohorts below the age of 25 or so are weaker than the cohorts in the thirties. However, for cohorts younger than 55 years of age, i.e. people born after the war, the French cohort is much smoother than the German one. While France had managed to substantially increase the birth rates after the war, the defeated Germany needed a considerably longer period of time, its birth rates peaking in 1964. And while the French age cohorts only gradually become weaker for birth years after 1964; the German cohorts shrink dramatically after the generation of the baby boomers. In Germany, the cohorts that today are around the age of 30 comprise 40% fewer people than the cohorts around 40. In France, the cohorts around 30 are only 12% weaker than those around 40. The comparison also suggests that the population ranking will change between the two countries in the foreseeable future. As there are already more births in France than in Germany today, in fifty years' time there will be more fifty year old people in France than in Germany, not counting immigration and nationalization.

Figure 14: *The French and German age pyramids compared*

France

95 and older

Men   Women

Germany

95 and older

Men   Women

2050
France   64,032 mill.
Germany   75,117 mill.

2000
France   59,039 mill.
Germany   82,260 mill.

800   600   400   200   0   200   400   600   800
Thousand people per age group

800   600   400   200   0   200   400   600   800
Thousand people per age group
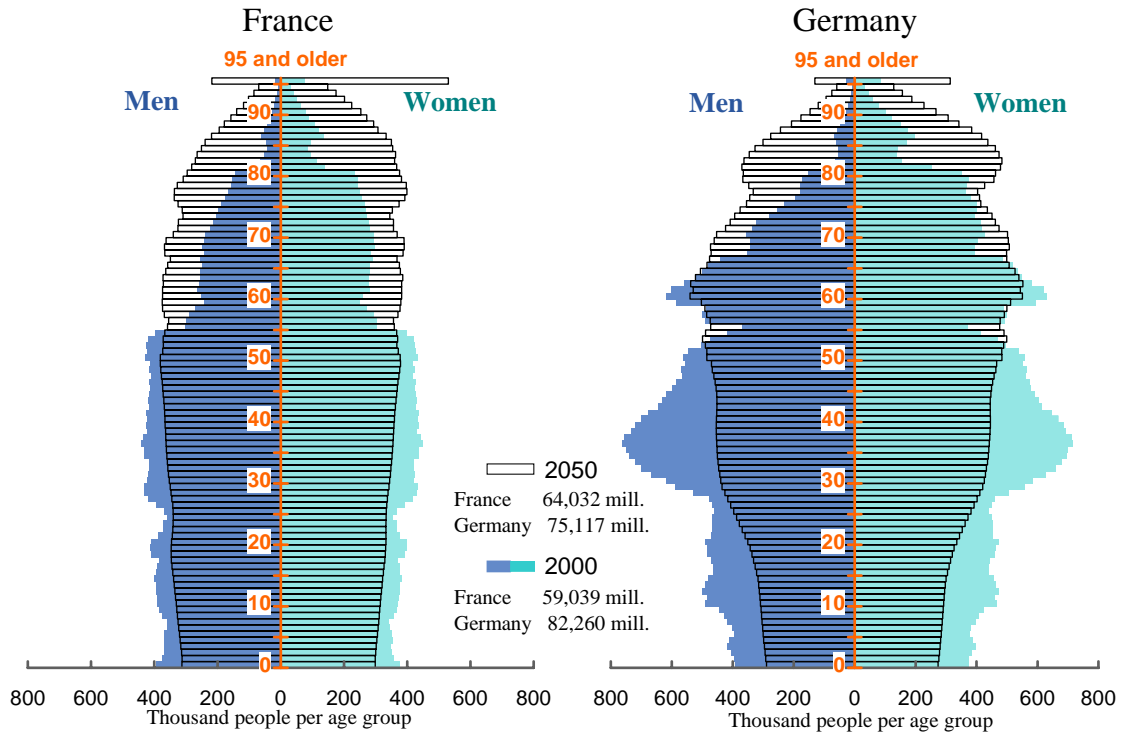
Annual French net immigration: 50.000. Annual German net immigration: at least 200.000
Sources: France: INSEE; Germany: Federal Statistical Office.

To explain these striking differences is by no means straightforward. But it should be noted that, in addition to the very much better kindergarten and crèche provision as well as the all-day schools offered by France, a different basic attitude to the ability of families with children to pay taxes appears to prevail quite generally in the two countries. The French attitude has led, for instance, to including children in the way that a family's income tax is split (known as the *quotient familial*), rather like the German taxation of spouses. The prevailing attitude in Germany is that the ability to pay taxes does not depend on the number of children and that the government should support child rearing with fixed subsidies that are equal for everyone. In France, in contrast, the opinion prevails that children reduce a family's ability to pay taxes and

families should therefore be aided by exemptions that imply a reduced indirect income tax progression. French economists often argue that the German system is unfair because it taxes families with equal per capita incomes differently and in fact raises the tax burden as the number of children increases. In addition, these differences mean that the fiscal incentives to have children in Germany are concentrated on the poorer families right up to socially marginalized groups, whereas in France they remain considerable for the middle and higher income groups. The French approach is held to be preferable because it also favours children being born into and raised within intact middle-class families. This would give them a better education and assure that inheritance would bring about a fairer distribution of wealth, as it were automatically, without state intervention.

In particular, the French concept of tax splitting for children comes into full effect with the third child, as only his child is given full weight in the corresponding tax formulas.[12] This could be one of the reasons for the measurable success of French family policy, because many families, which have made a decision to have children, usually already plan to have two children. The financial incentive for the third child leads to a significant change in behaviour and has a relatively strong impact on birth rates.

Calculations by the Ifo Institute show that the state benefits accruing through child allowance and tax savings on the third child in France are significantly greater than in Germany in percentage terms. A French couple with three children and only one earner drawing an average industrial wage has a 9.1% higher income than a French
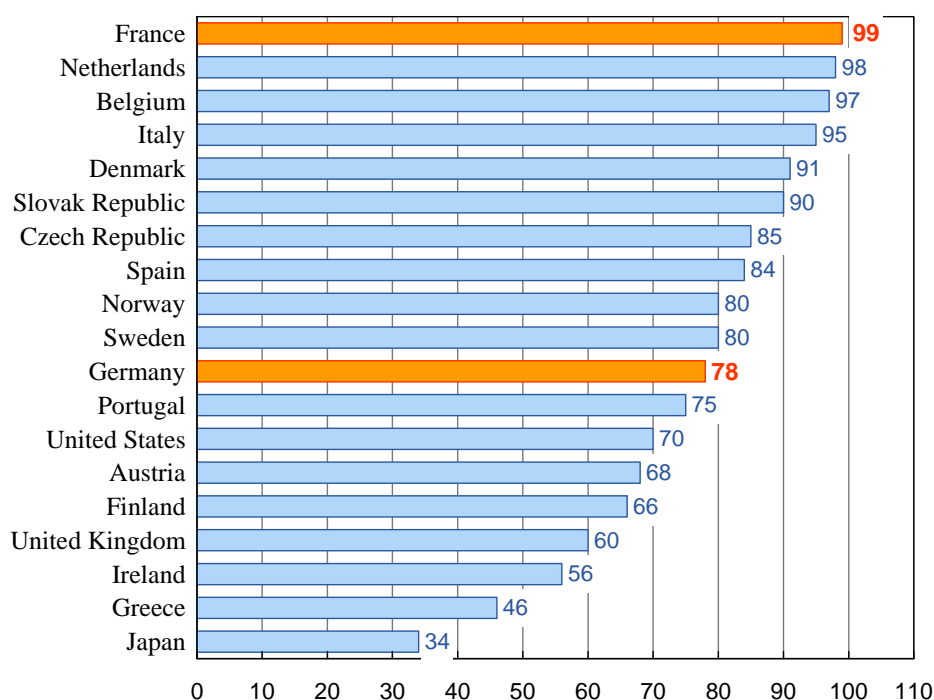
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[12] The first and second child are each allocated half weighting, the third one the full weighting in the splitting formula.

couple with two children and the same gross income. The corresponding increase in net income resulting from an additional child is only 6.5% in Germany. If the second spouse also earns an income of one third of the average wage, the net income increase for the third child is 7.5% in France and 5.9% in Germany. The effect of the child tax quotient becomes particularly apparent if the earned income of the second spouse amounts to two thirds of the average wage: the additional relief is then 7.7% in France but only 4.8% in Germany. Families in France enjoy much higher tax relief if they opt for a third child than is the case in Germany, particularly if the wives also work.

France also facilitates women's decisions to have children because with their ecole maternelle they offer a very comprehensive child-care system that significantly reduces the opportunity cost of mothers. Kindergartens and all-day nursery facilities affect the number of children because the lack of these facilities forces women to greatly cut back their occupational activity. Faced with the alternative of children or a career, they are opting increasingly for the latter. It means a considerable loss of income for those women who decide to have children. This loss in income probably represents the largest part of the costs of child rearing and is likely to be the main reason for the international differences in fertility rates. As figure 15 shows, France is the OECD champion in terms of child care facilities.

Figure 15: *Proportion of young children using formal child-care arrangements in selected countries (children aged 3 to mandatory school age) in %*

| Country	Value
France	99
Netherlands	98
Belgium	97
Italy	95
Denmark	91
Slovak Republic	90
Czech Republic	85
Spain	84
Norway	80
Sweden	80
Germany	78
Portugal	75
United States	70
Austria	68
Finland	66
United Kingdom	60
Ireland	56
Greece	46
Japan	34

Legend: The data (date from the years 1998-2000. United States: 1995) include both public and private provision, and cover the following types of formal child-care arrangements: group-care in child-care centres (nurseries, kindergarten, play-schools); residential care, including specialist services such as care for disabled children; childminders, based in their own home, looking after one or more children; care provided by a career who is not a family-member but frequently lives in with the family. Source: OECD Employment Outlook 2001, p. 144, Table 4.7.

However, other countries like Italy and Spain come close to the French degree of coverage, and their fertility rates are extremely low nevertheless. This suggests a more limited influence of this factor than many suspect.

4.3. *Women's wages*

A similar remark applies with regard to women's wages. Higher wages of women mean higher opportunity costs of raising children, and to this extent they can be seen as contributing to the decline of birth rates over time. After all, as shown in Figure 16, the gap between male and female wages has significantly declined in the EU countries over the last decades.

Figure 16: *France and Germany: Gender Wage Ratio 1995 – 2002*
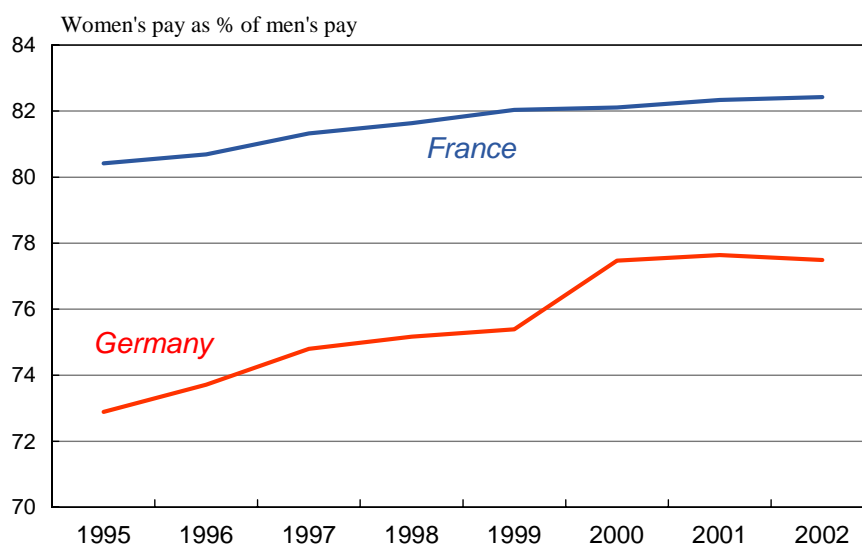
Note: Average gross annual earnings for men and women in industry and services; full-time employees in enterprises with 10 or more employees.
Source: Eurosat 2004, Theme Economy and Finance, Database.

However, it is nevertheless striking that birth rates are higher in France than in Germany despite the fact that the ratio of women's to men's wages appears to be higher in France. Perhaps this is because the higher wages provide women with the security they need to decide in favour of children, given that the liberalisation of divorce laws has reduced this security. The time consistent fertility rate in a situation of loose family ties may well be lower than the fertility rate with a firm commitment to marriage promises, an aspect that follows directly from the theory for which Kydland and Prescott were awarded the Nobel Prize in 2004.

4.4. *Fertility insurance and moral hazard*

Among the economic reasons for low European fertility rates, the pension insurance systems must be particularly stressed. Not only do they suffer from the consequences of

the demographic crisis, they themselves may be one of their principal causes since they reduce the fertility rates. Pension insurance is an insurance against not being able to have children, and as any insurance it produces a moral hazard effect. In the case at hand, the moral hazard effect is the reduction in the number of children that people decide to raise.[13]

Traditionally, children offered the possibility of investing in human capital and living on the fruits of this investment in old age. This was a particularly strong motive for having children before the capital market became available as a means to save for old age, but even with a capital market the motive remained because the rate of return on human capital is much higher than the rate of return on financial capital.[14] While the financial capital market offers savers only the marginal return to capital, human capital investment offers a family also the intra-marginal return. Thus, having children meant to be able to provide for one's old age much more easily than by investing in the capital market.

Arguably, the main economic justification of PAYGO pension insurance is that it protects people against not being able to have access to this type of human capital investment because they are infertile or do not find an appropriate partner. Even if one cannot have any children oneself, one does not have to suffer hardship in old age because one is sustained by other people's children. This mutual insurance protection is a great advantage for society. However, it leads to problems because it socialises the

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[13] See Sinn (2004b).
[14] While the real rate of return offered by the capital market lies in the range of 4%, the rate of return of human capital investment concerning men has been measured to be in the range of 6% to 9% for European countries and 10 % for the US. See Harmon, Walker, Westergaard-Nielsen (2001) for European countries and Card (1999) for the US.

fruits of human capital investment and thereby reduces the incentives to carry out such investment.

The European pension insurance systems followed Bismarck's system introduced in 1889 in Germany. In the years and decades following the German reform, one European country after the other introduced variants of Bismarck's PAYGO system, and other parts of the world including the US followed later, if on a smaller scale. Prior to the introduction of pension insurance, it was necessary in Europe to have children to secure one's provision in old age. Those without children had to beg for support from relatives and friends, an aspect that Bismarck had described very vividly in his fundamental speech given to the Reichstag in 1881. This situation has changed, as provision in old age no longer depends on having one's own children. It suffices if others bring children into the world who later pay the pensions. Except for France, most European pension formulas do not make pensions depend on the number of children in any significant way. Typically, the size of a pension depends on the number of years contributions were made, on the fact of being a national citizen or on the amount of contributions made during one's working life, but not on the number of children raised. Thus, one of the most important motives for wanting to have children has been eliminated by the pension insurance system.

The strength of the social insurance disincentive becomes clear if one realizes how unimportant provision for one's old age nowadays is in the decision to have children. Today, almost no young couple links the question of wanting to have children with how to provide for their own twilight years, although the actual economic link between the average number of children and the well-being in old age is as strong as

ever in the aggregate. This illustrates in all clarity the dramatic way in which the state pension system has influenced social norms.

It is no accident that Germany, the first country to introduce comprehensive pension insurance, now has the lowest number of births relative to its population in the whole world, and that Europe in general has such a poor fertility performance. Generations of Europeans since 1889 have found that they can manage quite well in old age even without children. And new living patterns, which are adapted to the new institutional circumstances, have spread from generation to generation by way of observation and imitation. Life as a single has become an attractive choice, and there has been a dramatic rise in the number of young couples who have no wish to have children, at least for the time being, and are not yet planning to marry either.

Formerly, childlessness jeopardized one's own life and had to be avoided at all costs. Today, childlessness represents a massive material gain that more and more people are claiming for themselves. The new car and the holiday on the Maldives can be financed with the money which was saved by not raising children or which the wife was able to earn additionally because she opted to work rather than to have children. It is precisely the lower middle classes with their traditionally high birth rates who have discovered in childlessness a way of bettering themselves economically. Although the disadvantages arising from childlessness still exists today, it has been shifted diffusely onto society at large. Europe is ageing, its dynamism is slowing, the welfare state is in crisis, and yet the individual gains little by making a contribution to preventing this development.

The relationship between childlessness and pension insurance has been widely discussed and documented in the literature under the heading of the so-called social

security hypothesis in the demographic sciences. Thus Ehrlich and Chong (1998) as well as Ehrlich and Kim (2001) showed in studies covering 57 countries that the introduction and extension of PAYGO pension systems has had a significantly negative impact on the founding of families and birth-rates in the period from 1960 to 1992. Similar results were obtained by Cigno and Rosati (1996, 1997)[15] and Cigno, Casolaro and Rosati (2000) confirmed the hypothesis for Germany.

The pension insurance system insures against not having children by socialising them. The degree of socialisation can be expressed in terms of the implicit taxes people have to pay during their lifetimes. As argued above in the context of Figure 8, these taxes can be expected to be between 5% (US) and 21% (Germany) of lifetime incomes for children born in 2000.

However, to assess the fiscal pension externality created by a child, not only this child's implicit tax, but also the implicit taxes to be paid by all of its descendants have to be taken into account. After all, the marginal decision for a child is not the marginal decision for this one individual, but the decision for a whole dynasty of individuals stretching to infinity. As I showed elsewhere, the present value of the implicit taxes paid by the dynasty founded with the birth of an additional child that would earn average income and has the average number of offspring is equal to the present value of the gross pension contributions this child is going to pay into the system during his lifetime. The pension claims, which the child acquires during his working years, do not have to be subtracted, because these claims are taken care of by this child's own offspring.[16]

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[15] As regards the effects of pensions financed by proportionate contributions on private savings, however, the studies come to different results: Whereas Ehrlich and Chong as well as Ehrlich and Kim find a negative correlation, Cigno and Rosati find a positive correlation – with a somewhat different specification of the relevant variables.

[16] See Sinn (1990, 1997).

A very cautious calculation for a German participant in the pension scheme who has the typical lifecycle income pattern gave a present value figure of €90,000 in 1997 which would be about €100,000 in 2004 values.[17] The calculation was cautious because it was assumed that the contribution rate would always stay constant at its current rate of 20% despite the fact that the demographic crisis requires a substantial increase. The present value of €100,000 is a positive fiscal externality that parents, who opt for a child, contribute to other groups of society outside of their own offspring. It is equivalent to a child tax imposed by the state on the parents at the birth of their child, but deferred together with interest at the going market rate until the child has grown up. If the state were to offset the effect of this tax by a corresponding transfer payment of €100,000 at the time of the child's birth, then, undoubtedly, very many more children would be born.[18]

5. Policy implications

What are the policy implications of these insights? The government policies which are being discussed as a reaction to the demographic crisis can be divided into passive and active policies. Passive policies try to cushion the consequences of the crisis for the state pension insurance scheme and the labour market. Active policies aim to increase the birth rate.

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[17] The following assumptions were made: starting employment liable to social insurance contributions at the age of 20 years; development of the annual earned income during the earnings phase following an average income profile derived from the German socioeconomic panel; consideration of the average probability of premature invalidity from the age of 54; definitive retirement at the age of 65; the average earned income of all contributors grows in real terms by 1.5% annually, a capital market interest rate of 4% in real terms and a contributions rate to social insurance of 20%, cf. Sinn (1997).

5.1 *Raising the retirement age*

The passive measures include raising the age limit for drawing pensions. Instead of early retirement and partial retirement schemes thought up by politicians to temporarily make the labour market statistics look better and so survive the next election, Europeans must work longer to compensate for the lack of the next generation of young contributors. It was ever thus in the history of mankind. Those who had no children to feed them in old age had to carry on working until they dropped dead, and nothing has changed in this respect despite the socialisation of the children's contributions to parents.

The retirement age will certainly have to be raised considerably to cope with the demographic crises that are looming in Europe. However, according to calculations by the United Nations, the formal European retirement age would have to be raised from 65 to 76 years if pensions relative to gross earnings in 2050 were to remain at 1995 levels. This retirement age is far beyond anything that seems feasible politically. With a reasonable increase in the retirement age of, say, two years, only a very limited contribution to alleviating the pension problem can be made.[19]

5.2 *Immigration*

A more comfortable alternative would seem to be the immigration of new contributors. And immigrants do, like children, make a positive fiscal contribution to the rest of society because they also pay the implicit pension tax needed to cover the gains of

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[18] Even if one deducts the state subsidies for raising children including free schooling, one still obtains a net fiscal externality of about €39,000.

[19] United Nations, Department of Economic and Social Affairs, Population Division, *Replacement Migration: Is it a Solution to Declining and Ageing Populations?* New York 2001, p. 87.

earlier generations. Permanent immigration, in which the children and grandchildren of the immigrants also remain in the country, definitely helps pension insurance. In the event of such immigration, the entire gross contributions made by the immigrants during their working lives can be regarded as net contributions to the fiscal system because their pension claims are financed by their own children. Calculations done for Germany show that currently a twenty year old immigrant may generate a positive fiscal externality in the order of €195,000 in present value terms.[20] Admittedly, however, immigration is not permanent in most cases. As early as ten years after immigration, more than half of the immigrants have returned to their home country and the return migration rises up to 80% after 25 years.[21] Such temporary immigration yields significantly smaller advantages for the pension system because the migrants retain their pension claims despite their return to their home country and these are not financed by their own children but by the collective of domestic contributors. An immigrant who arrives at the age of twenty, works up to the age of sixty five and leaves no children in the domestic pension system can be expected to contribute only about 40% of the original figure, or up to €80,000.

Incontestably, immigration provides support for the European pension system. However, it should not be overlooked that immigrants do not merely relieve the pension system but also burden the state elsewhere. They benefit from the redistribution of wealth in favour of poorer contributors in healthcare insurance and from public benefits like social welfare, unemployment benefits and unemployment assistance, on which

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[20] The premises assumed in calculating this value correspond to those used in calculating the fiscal contribution of a child. However, the earnings phase starts immediately after immigration. Cf. Sinn (1997). The published figure was €175.000 for 1997. Given the wage increases that have happened in the meantime today's corresponding figure would be the €195,000 cited in the text.

[21] Sinn and Werding (2001).

they tend to make above-average claims. In addition, and this is a very important effect, they are entitled to use the full range of public services which are available at no cost but represent a considerable burden on the state. These include roads, bridges, parks and other elements of the public infrastructure all the way to the protection offered by the constitutional state via its judiciary and its police force. Although they pay taxes for these services, these are insufficient to cover the actual costs incurred. Immigrants have below-average income and thus form part of the population who, in the European-style welfare state, receive more resources from the state than they pay for in the form of taxes and other contributions. Calculations made by the Ifo Institute in 2001 on the basis of the socio-economic panel for the immigrants who had entered Germany up to that time showed that they incurred a net fiscal burden to the state averaging €2,400 per capita and annum during the first ten years.[22] And this figure already includes the cash advantages accruing to the pension insurance scheme. In this light the picture obtained by looking only at pension insurance looks very different.

It also becomes obvious that immigration offers no solution to the pension problem when we realize how many people would have to immigrate in order to stabilise the pension system by keeping the old age dependency ratio of the population constant, i.e. the ratio of old people (60 and older) to younger ones (between 20 and 59). Assuming, for the sake of argument, that all immigrants were to remain young and permanently available as contributors to the pension system, the EU15 countries would need net immigration of 194 million people up to the year 2035. The total number of

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[22]   Sinn, Flaig, Werding, Munz, Düll and Hofmann (2001), p. 226f.

people resident in the EU15 would then rise from today's 380 million to about 576 million.

However, the assumption that foreigners do not age is, of course, unrealistic. The people streaming in from abroad are not free of the demographic problems plaguing Europe. The immigrants will also get older and will at some time become pensioners without being able to ensure full pension compensation by their offspring. If the immigrant populations have the same age structure as the existing population, then nothing is gained, even if the whole world immigrates to Europe. Immigrants would have to be significantly younger than the Europeans. Calculations by the United Nations on the dimensions of the replacement migration needed to stabilise the EU15 pension system in which these effects are considered show a far more problematic picture. No less than 701 million migrants or an average of 12.7 million people per year would be needed up to the year 2050 to stabilise today's old age dependency ratio.[23] The number of people living in the EU15 countries would accordingly have to rise to 1.2 billion in 2050. Three quarters of this population would then be made up of people having immigrated to the EU15 since 1995 and their progeny. These are astronomically high figures, which would, of course, never happen and should certainly not be interpreted as a recommendation. Their enormity shows very clearly just how small a contribution to solving Europe's demographic problems can be expected from immigration. The effects are greatly exaggerated in public discussions and the topic is already being abused in order to bring cheap labour into the EU countries for quite different reasons.

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[23] United Nations, op. cit. Scenario V, pp. 86-87.

5.3 *Partial funding of pension insurance*

Among the prudent passive reforms designed to alleviate the consequences of the demographic crisis is the partial conversion of pension insurance from a PAYGO system to a funded system. Every generation will eventually grow old and can continue to live reasonably well only by making the necessary provision in their youth. This means either forming human capital by producing and raising children or forming real capital by saving, to draw on later. A generation which has formed neither human nor real capital must starve.

In relative terms, Europeans are currently forming far less human capital than their forebears did for the reasons already mentioned. The relative loss of income which young people today are prepared to accept in return for raising children is significantly lower than it used to be. If they nonetheless want to avoid hardship in old age, their only option is to save considerable parts of their income today in order to secure a pension for themselves via capital formation because they can no longer expect it to be paid by the smaller number of future contributors. Real capital must be formed to the degree that human capital is lacking. This is the correct idea underlying the pension reforms that a number of European countries have carried out in recent years, including the Swedish reform of 1998 or the German reform of 2000, for example.[24] It may also be underlying the Dutch dual system which combines a PAYGO state pension covering basic needs with a funded private system organised by the employers.

By contrast, the British system of funded pensions is rather offered as an alternative to PAYGO pensions and was born out of the belief of a fundamental

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[24] Wissenschaftlicher Beirat des Bundesministeriums für Wirtschaft (Scientific Advisory Council attached to the Federal Ministry for Economics, 1998).

superiority of a funded system. Such fundamental superiority is not obvious, however, since, as was mentioned above, the rate of return disadvantage is a sign of intergenerational redistribution rather than of inefficiency. There is no reform that respects the claims of the old that would be able to reduce the present value of the implicit tax burden of the PAYGO system as is manifested in the rate of return disadvantage.[25] However, there are useful reforms that help master the imminent crises in the European PAYGO systems by filling the gap in human capital with real capital and thus ensuring the well-being of the elderly in the 2020s, 2030s and 2040s that is at risk.

Under German conditions, savings of four percent are already enough to form sufficient capital by the year 2035, when the demographic crisis will peak, in order to finance a quarter of all pensions.[26] And they will cover fully half of the pensions by the year 2075, when all pensioners will have contributed to the funded supplementary pension insurance throughout their lives. The partial funding proposed by the Scientific Advisory Council attached to the Federal Ministry for Economics, which has now become law, does offer a feasible way of overcoming the problems plaguing the German pension insurance system and probably those of other EU countries.

However, the decision on complementary savings must not become optional for the contributors. The necessary savings will not be made voluntarily even if savings are subsidised heavily as in the German case. This is shown by the extremely low German participation rate of 19% (as of Dec. 2003, two years after the reform.) of those eligible for public support. The reason is not the fecklessness of the citizens but the interactions

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[25] See Sinn (2000).
[26] Sinn (1999) as well as Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft (1998).

with the rest of the social system. A low earner obtains little benefit from saving voluntarily because he merely reduces his claim to the supplementary social benefit that he will get in old age anyway. In addition, the saver must always fear that in the event of additional pension reforms he will become ineligible to receive the PAYGO pension in old age on the grounds that he already has an income. Funded pension elements must therefore be made mandatory.

The Netherlands has given a very good example in this regard, since in addition to PAYGO system that covers basic needs, it has a mandatory funded system to which both employers and employees make contributions. The funds accumulated in that system are about the size of the Netherlands' annual GDP.

5.4 *The child pension*

An alternative to reacting in a merely passive way to declining birth rates and cushioning the consequences for the social system elsewhere is to try and counter the causes of the population decline, i.e. to pursue an active population policy. This does not mean proposing a government population policy which interferes with people's free decisions and placing their choice of having children under state tutelage. It cannot be the job of the state to intrude in a guiding manner into family planning, just as it is not part of its job to tell its citizens which normal economic decisions to take. But that is the whole point. Today, the state intervenes quite massively in family planning via the pensions system by socialising children's contributions to pension insurance and thus quashing the natural economic motives for having children. This massive state intervention was introduced for different reasons, and certainly not with the intention of reducing the number of children. However, it does have this effect and distorts the

decision to have children. To this extent, politics can no longer avoid the question of how to reduce these undesired distortions. Not more but less state influence on family planning is necessary.

The idea of encouraging the desire for children by helping young families more in the future than was the case in the past is not a bad one. The French example could be followed by other EU countries in order to bring the birth rates at least up to the French level. Thus the number of kindergartens per child of appropriate age could be raised in countries that are lagging behind France in this regard. Tax splitting for spouses could be extended by a child tax quotient on the French pattern or family compensation could be extended by cash payments. All these are sensible measures which are worth considering and will produce effects on family planning.

However, the problem is that all of them represent double intervention by the state. State pension insurance smothers the desire for children whereas other, compensating state expenditures reawaken it again. Such double intervention makes little sense in itself because it distorts behaviour in yet other ways which do not offset each other, but add to each other and result in net disadvantages to the citizens. Pension insurance, for example, creates artificial incentives for early retirement, for stopping to work or turning to unreported work. By contrast, family allowances that work against pension insurance in terms of child incentives inevitably involve artificial incentives for the immigration of people with many children and also encourage unreported work and a refusal to work by those who must finance these allowances with their taxes. Even though the incentive effects are netting out with regard to fertility choices, they will not be able to do so with regard to the other behavioural distortions created.

It is therefore better to retract the primary intervention in family planning implied by the pension system by reducing the degree of fiscal redistribution from families with children to persons without children. One way of doing this would be simply to scale down the pension system. But this strategy would not be compatible with the urgent need to master the pension crisis that is imminent for the twenties and thirties of this century. In a sense, more rather than less, social security pension is necessary today.

The partially funded pension offers a possible approach. As pointed out, Europeans today form less human capital than earlier generations did and must now save additional real capital to make up for it. There is no way to avoid this conclusion.

Raising fertility rates is essential for Europe in the very long run. It will bring new dynamism to the continent and help mitigate the pension problem. However, it will not be able to offer a real solution to the imminent crisis, because it simply comes too late. The baby-boomers are now forty, and for biological reasons they cannot have many more children. In thirty years time they will be seventy and want their pension from the following generation which is not there in sufficient size. Thus, the baby-boomers must be asked to save now so they can live on their capital when old. They still have 25 years to accumulate funds to supplement their meagre PAYGO pensions during 20 years of retirement.

Existing pension schemes with partial funding have taken account of the idea that the lack of human capital must be compensated for with additional real capital, but they have not thought through to its conclusion. They cure the symptoms of the European illness but not its causes. They do not reduce the disincentives to family

planning and lead to almost intolerable burdens on those who, by raising children, are already paying the entire contribution to the financing of the PAYGO pensions.

Instead of forcing an entire generation to accept their responsibilities collectively, the necessary savings could be concentrated on those without children, whereas those with a sufficient number of children could be granted today's PAYGO replacement rates despite the demographic crisis. After all, it is not they who caused this crisis. Those who fail to produce and raise children can reasonably be expected to feel at least some of the consequences of their decisions. They can be asked to invest the resources that parents invest in their children in the capital market so as to buy themselves an additional pension rather than claiming more and more funds from other people's children.

Pensions of childless people should not be reduced to zero, however. This would negate their main economic function of providing insurance protection against the economic consequences of childlessness. Despite moral hazard in terms of neglecting the investment in human capital, some insurance is always optimal when people are averse to the risk of being infertile or not being able to find an appropriate partner.[27] Moreover, the childless actually do make a certain if small contribution to co-financing children via the tax system. However, it would seem appropriate not to guarantee them today's replacement rates despite the demographic distortions to come since in the presence of moral hazard effects full coverage insurance is not efficient.

A reform that considers these aspects would basically create a three-pillar pension system.

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[27] See Sinn (2004b).

The first pillar consists of the existing PAYGO pension. The internal structure and the conditions under which such a pension is paid would not be changed. Each country could basically keep its present system. However, the contribution rate as well as the percent government subsidy, if any, would be fixed at today's level, and the demographics would work via the budget constraint. The replacement rate, which the pension system is able to provide, would gradually fall until the crisis years around 2035 in line with the increase in the old age dependency ratio (see Figure 7). In countries such as Germany, The Netherlands, Italy or Spain where the old age dependency ratio will double in that period of time this would mean that replacement rates are being cut in half in relation to today's values, unless other measures such as an increase in the retirement age or an increase in the labour force participation of women is brought about.[28] The resulting pension levels will be far too low by today's standards. Thus additional pillars are necessary.

For those who raise children a "child pension" could be introduced as a second pillar. The child pension is a PAYGO pension that is financed with an income tax paid by all members of society who earn an income on the grounds that all have parents. The tax liability is independent of membership in other pension systems and the pension claim is independent of previous incomes and employment. In particular, it is independent of previous contributions to earlier generations' pensions. What counts is the number of children raised. Mothers who have not had jobs but raised children are

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[28] According to calculations of the Ifo Institute, the German replacement rate would decline from 48% to 32% despite an increase in retirement age by two years and despite a substantial increase in women's labour force participation. 32% just happens to be the current level of social aid relative to average pensions.

entitled to the same pension as fathers who worked in the official labour market, for example.

The amount of tax necessary to finance the child pension is adjusted such that the sum of the PAYGO pension and the child pension satisfies today's replacement rate for an average or standardised family with, say, three children. The standardised family could be the OECD type with one full-income earner working the normal number of years who earns the country's average wage and a partner who earns a further third of that income. Under the conditions of the German tax system, the income tax satisfying these requirements has been calculated to be about 3.5% in the crisis year 2035, and it would prevent an increase in the effective contribution rate from today's 19.5% of gross wages to 31.4% in 2035.[29]

Focusing on three children is arbitrary, but it somehow follows the French idea of targeting family policies at the third child, which has turned out successful in terms of raising the fertility rate. Individuals who have shared the cost of raising at least three children will get the full child pension, individuals who raised fewer children will receive proportionately less. They will have to save to compensate for the lacking child pension.

The third pillar is therefore mandatory private savings on well defined individual accounts that provide old age pension annuities rather than lump-sum cash payments upon retirement. The private banking and insurance industry would have to offer well-defined and publicly controlled financial instruments for that purpose. As explained above, saving is mandatory to avoid free riding on the charity of the welfare state.

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[29] See Sinn (2004a, p. 397, Table 7.1).

Mandatory savings are a certain fraction of income, regardless of whether this is earned income or transfer income received from the state. Under German conditions, a savings rate of 8% of gross income has been calculated by the Ifo Institute to be sufficient to maintain today's replacement rate of nearly 50% until the crisis years around 2035 despite fixing contribution and government subsidy rates at today's levels.

Young people entering the labour market would automatically participate in the mandatory savings programme, but once the first child is born, one third of the accumulated savings is paid out and one third of the current savings obligation is waved. The second and third child have analogous financial implications, and mandatory savings are no longer required when the third child is born.

It would be clear to everyone that, in order to secure a sufficient pension in old age, he or she had to either invest in real or in human capital. Today's pension formulas hide the true economic situation from the participants because they establish pension claims on the ground of having provided pensions to earlier generations, although this provision makes no contribution whatsoever to securing one's own pension. Such contribution can only be made by raising new children. Charitable acts for earlier generations do not matter. The combination of the child pension and mandatory savings accounts establishes a legal relationship between individual behaviour and pension levels that really exists in the economy. In such a system, everyone is free to make his choices, but he will also be seeing the true economic consequences. Children will again acquire greater weight in life planning, and many undecided young couples will opt for children after all.

The savings obligations for the childless should be implemented by the European countries without delay, because the time for the accumulation of a compensatory stock of savings is becoming short.

5.5 *Phasing in the child pension*

There are alternative ways of phasing in the child pension. It will be a political decision whether only those children should count for the pension claims of parents who are born after the implementation of the new pension law or whether children born before should also be considered. From an incentive perspective the former may be preferable, but from the point of view of justice, the latter seems advisable. For example, child pension entitlements could be awarded to parents in proportion to the number of years after the pension reform during which they still have children below a certain age, say below the age until which they are legally obliged to finance their children.

Such a rule would imply a gradual phasing-in period that avoids a premature burden on the working generation as well as a particular hardship for parents with older children. Parents with young children born before the reform would receive part of the child pension, and parents with older children would typically enter the pension age before the demographic distortions can be felt and before the replacement rate drops significantly below today's level. Whatever the transition rule implemented, the tax necessary to finance the child pension cannot be a burden until the old age dependency ratio begins to change and the replacement rate begins to drop, which will not be the case before 2015 or thereabout.

5.6 *A Remark on the Dutch pension reform*

My proposal is not designed for the Dutch economy, as the Dutch pension system already has some of the elements other countries would still have to introduce. However, it does have implications for the new government plan to make pension funds accessible for families. The Netherlands has a PAYGO system that provides a basic pension for everyone plus a mandatory funded system that provides additional benefits depending on lifetime savings, which itself is a fixed proportion of income. The funds are subjected to cash flow rather than income taxation. Savings are tax exempt, and only withdrawals are taxed. The accumulated funds originally were accessible only at the time of retirement. However, the plan is to make the funds accessible at earlier stages of life under well-defined conditions, for example for the purpose of setting up a family. It allows the conversion of real capital into human capital.[30]

This is a good modification. However, the caveat is that, if young families make use of this plan, they reduce their pensions without receiving any compensation. The contributions the grown-up children make are socialized and available to all retirees, regardless of whether or not these have raised children. The conversion of real capital into human capital is a conversion of private capital into social capital. All the problematic incentive and justice problems discussed above apply.

The problem could be solved by amending the Dutch reform plan with the child pension system. An additional PAYGO pension financed with taxes to be paid by the children, handed out to parents in proportion to the number of children could make up

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[30] See Bovenberg (2004).

for the pension losses resulting from early liquidation for the purposes of family formation.

5.7 *The counterarguments*

There are a number of arguments that, outside the Netherlands, could be raised against the proposed reform.

For example, the proposal may be rejected on the grounds that young childless citizens are already sacrificing resources for their own pensions by paying their pension contributions, so that it is unfair to force them to pay twice by also saving for a funded pension. This argument fails to recognise that it is a normal duty of every generation to make *two* contributions in the generational context: in the active phase of life one must provide for both one's parents *and* one's children. The first of these two comes in the form of PAYGO pension contributions which flow to today's pensioners in full. But the second contribution is not made by many people because they decide not to have children. Seen in this way, it is certainly fair to insist that these people also make a second contribution, if only in the form of savings. They then secure the pension whose full financing can no longer be expected of the few future contributors, and parents receive a larger part of the pension contributions paid by their own children. In any case, to ask those who raise several children to save for their old age would subject them to a triple burden. As PAYGO pension contributors they now provide for the old, as parents they finance the pensions of all future pensioners, and as savers they must also finance their own pensions. One of these burdens is too much.

People who would like to, but cannot, have children may find the child pension unfair, because it effectively means that in addition to their bad luck they will receive a

lower aggregate PAYGO pension in old age than parents do. While understandable, such people should see that they do have the ability to save simply because they do not have children, do not have to finance them and do not have to sacrifice work time to raise them. They should accept that it is only fair that they invest the resources in the capital market that other people invest in their children. They have the ability and the necessary funds to do so.

It could further be argued that the child pension should not only be conditioned on the number of children, but also on their quality in terms of income they are able to earn and contributions to the PAYGO system they are making. Taken to the extreme, this argument simply means that the public pension system should be scaled down and replaced with mandatory intra-family transfers. There is much to be said for such a modification. However, such a sophisticated reform is unlikely to be politically expedient. It could also be countered by the argument that the differences in children's income levels resulting from their parents' own efforts are minimal. Such differences apparently result largely from congenital differences in intelligence and performance that parents can modify only to a very limited extent. Comprehensive insurance for parents with respect to such differences would therefore appear to be appropriate.

Faced with the idea of differentiating pension claims by the number of children, the casual reader may object that people do not act sufficiently rationally to anticipate the pension implications for their old age when they decide to have children. A system of child benefits seems much more effective insofar as it provides young families with the needed financial means immediately after the birth of their children. Young couples would see that others with children enjoy the financial help of the state, and they would therefore react with their family planning.

The careful reader will know that this argument is invalid simply because the pension system proposed here also provides the financial means when they are needed. To repeat: The auxiliary savings plan is mandatory for all income earners without children, but as soon as a child is born a third of the accumulated savings is paid out and a third of the current mandatory savings is waved. The child pension does provide the funds exactly at the right time, and everyone would know that children provide more funds without reducing the living standard in old age. In this regard there is no difference to child benefits.

The main difference, however, is, to repeat, that a child benefit system makes no contribution to fund the pensions of the childless and is a compensating double intervention that cannot perfectly correct the distortions resulting from the first one, the socialisation of children via the PAYGO system. The child pension system kills two birds with one stone, something which according to Tinbergen is impossible in policy making. It reduces the first intervention in the sense of scaling down the degree of socialisation of human capital, thus re-establishing some of the natural incentives for having children. And it funds the pensions of the childless, thereby solving the imminent pension crisis.

6. Concluding remarks

In a sense, this lecture comes too late, for the most heavily populated European age cohorts are just entering their fifth decade. These cohorts will no longer beget the children that Europe needs if it is not to depart from the world stage as an economically dynamic region. However, by combining the idea of partial funding with a re-establishment of fertility incentives it offers a way to solving the imminent pension

crisis that will peak around 2035 and at the same time paves the way for a more fertile development of the population in the longer run.

A pragmatic approach to the topic of family planning and fertility is urgently needed to limit the damage threatened by Europe's ageing societies. It will also require the governments to change course, for the systems of social security have separated the fate of the individual from the consequences of his family planning and have contributed decisively to changing society's value placed on the family and to the Europeans' lack of children. It is right for the state to contribute more to the cost of raising children and also to consider children more in taxation. The increased provision of kindergartens, the transition to all-day schools and the child tax quotient system on the French pattern are measures which are useful and will have the desired success.

However, it must not be ignored that some of these measures are being justified by the idea of double state intervention and could thus involve undesirable side-effects. Much suggests that the state would do well to retreat by reducing the degree to which the pension contributions paid by children to their parents' generation are socialised. Those who have no children can invest the money saved by not having to raise any in the financial markets in order to secure a pension whose full payment cannot be expected of the children of others. This could be the model for a new pension reform in which the contributions rates of the existing pension systems are fixed despite the demographic distortions and the additional payments needed to safeguard the living standard of the elderly come either as child-dependent PAYGO pensions or as funded pensions based on one's own savings.

These reforms demand more courage from the politicians and the representatives of the pension insurance systems than is evident today. Awareness among the electorate

is not sufficiently advanced in this respect. Much water will flow down the Rhine and the Ebro before forceful political measures are taken. But the politicians and association representatives, who block the way, continue to hush up this topic or push it aside with half-hearted legal arguments, incur the guilt of jeopardising the future of the European people.

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