Working Paper

Socio-Demographic Changes and the Pension Problem in Austria

Jean-Pierre Gonnot

WP-90-022
May 1990

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FOREWORD

The project "Social Security, Family and Household in Aging Societies", conducted in collaboration with the Netherlands Interdisciplinary Demographic Institute (NIDI), has resulted so far in several cross-national comparisons involving twelve participating countries. In addition to the comparative studies, twelve individual country reports are being produced. The country study for Austria was produced at IIASA by Dr. Gonnot, who is also the coordinator of the international project. The other country studies will either appear as IIASA working papers or as papers of the respective national institutions. It is also planned to combine all studies into one volume.

Wolfgang Lutz
Deputy Leader
Population Program

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ABSTRACT

The aging of the Austrian population will reach, in the first half of the next century, a level which implies a dramatic deterioration of the performance of the State pension system. Parallel to aging, substantial changes in the marital composition of the elderly population and strong improvements in benefit entitlements for women will be observed. Different solutions to the pension problem are tested and compared.

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SOCIO-DEMOGRAPHIC CHANGES AND THE PENSION PROBLEM IN AUSTRIA

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1. Basic Demographic Trends in the Postwar Period

Since the end of the Second World War, demographic developments in Austria have followed a pattern which is similar to the one observed in many developed countries: a baby boom and a marriage boom followed by a baby bust and a marriage bust, increased divorce and survivorship.

With respect to fertility, three periods can be distinguished. From the end of the war to 1963, the secular downward trend was interrupted by the baby boom: the total fertility rate (TFR) rose from 2.00 in 1951 to a maximum of 2.82 in 1963 (see Figure 1). After 1964 fertility dropped, the TFR reaching 1.69 in 1976. Since this date, a much smoother decrease, accompanied by fluctuations, has been observed – the TFR was 1.44 in 1988 – which suggests that fertility might be in a process of stabilization.[1] This last period is also characterized by a strong increase in the proportion of births out of wedlock which has always been relatively high: from 13.5% in 1975 to 23.4% in 1987, but again with indication of levelling in the most recent years (see Figure 2).

A main feature of nuptiality since 1950 has been the scissors effect between intensity and age at marriage. The proportion ever-marrying increased in the 1950s – from 90.4% and 88.1% in 1951 for males and females respectively, to 93.0% and 93.9% in 1961; it remained at a high level till the early 1970s and steadily decreased afterwards – 74.6% for males and 77.8% for females in 1985 (see Table 1).[2] Between 1970 and 1980, first marriage rates dropped by 50% under age 20, by 30% between 20 and 25, and by 25% between 25 and 30. The mean age at first marriage decreased till the early 1970s – minima were observed in 1974/1975 for both males and females with 25.6 and 22.8 years, respectively – and started strongly increasing after 1980 – 26.9 and 24.7 years in 1988 (see Figure 3). Nevertheless, both figures are still far from values which prevailed between the wars – less than two-thirds marrying and age at marriage around 30. Legal marriage is still the dominant type of union, but consensual union is favored among the very young: in 1985, 73.2% of unions whose partners were aged 15 to 19 were consensual unions, 10.4% among the 20–24, and only 4.5% among the 25–29.

Similar changes can also be noted with regard to the remarriage of divorcees which increased during the 1950s and subsequently fell: 80% of divorced males and 65.1% of divorced females remarried in 1951 versus 60.6% and 44.6% in 1985. Still many more divorced males than females remarry. On the other hand, remarriage of widowed has constantly decreased and has now almost disappeared among women: 19.6% of widowers and 4.9% of widows remarried in 1951 while corresponding figures for 1985 are 7.4% and 1.4%.

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[1] A TFR of 1.54 was used for calculations which corresponds to the weighted average for the period 1981–85.

[2] Marital-status life-table statistics, based on census data for 1951, 1961, 1971 and 1981 and on a reconstruction of the population for 1985.

Figure 1.

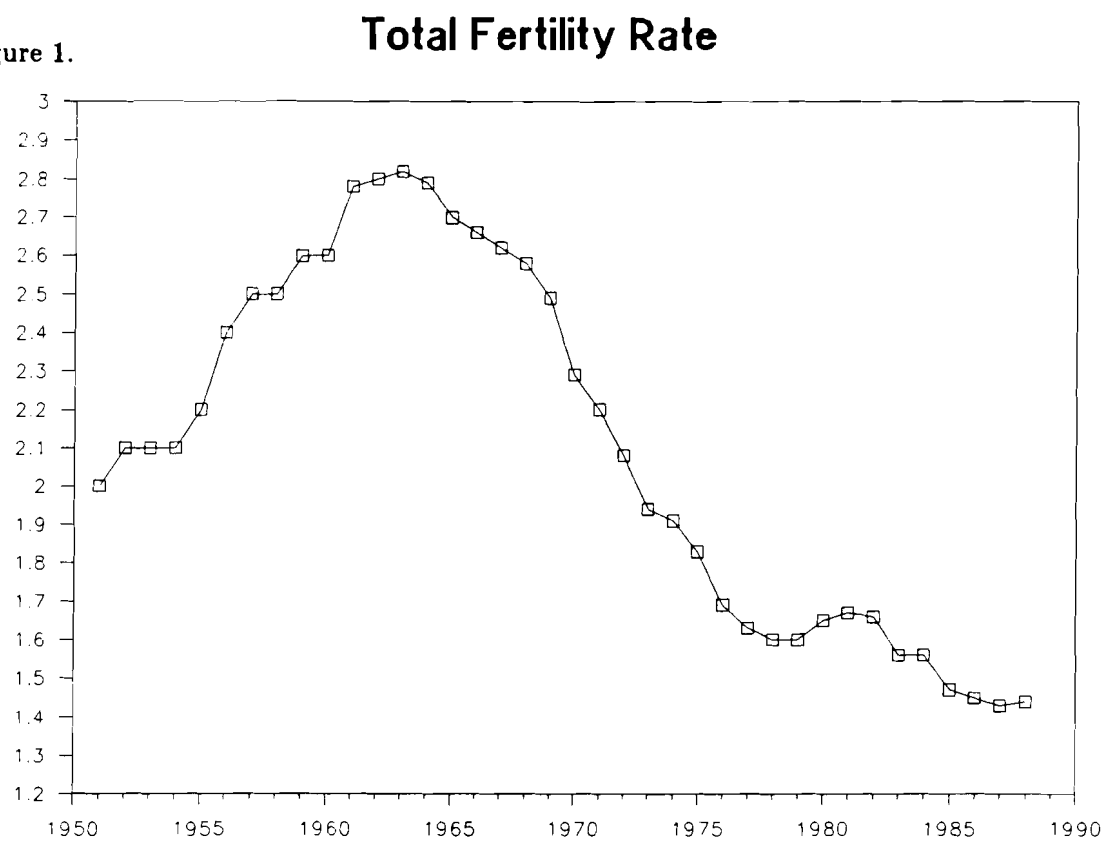


Figure 2.

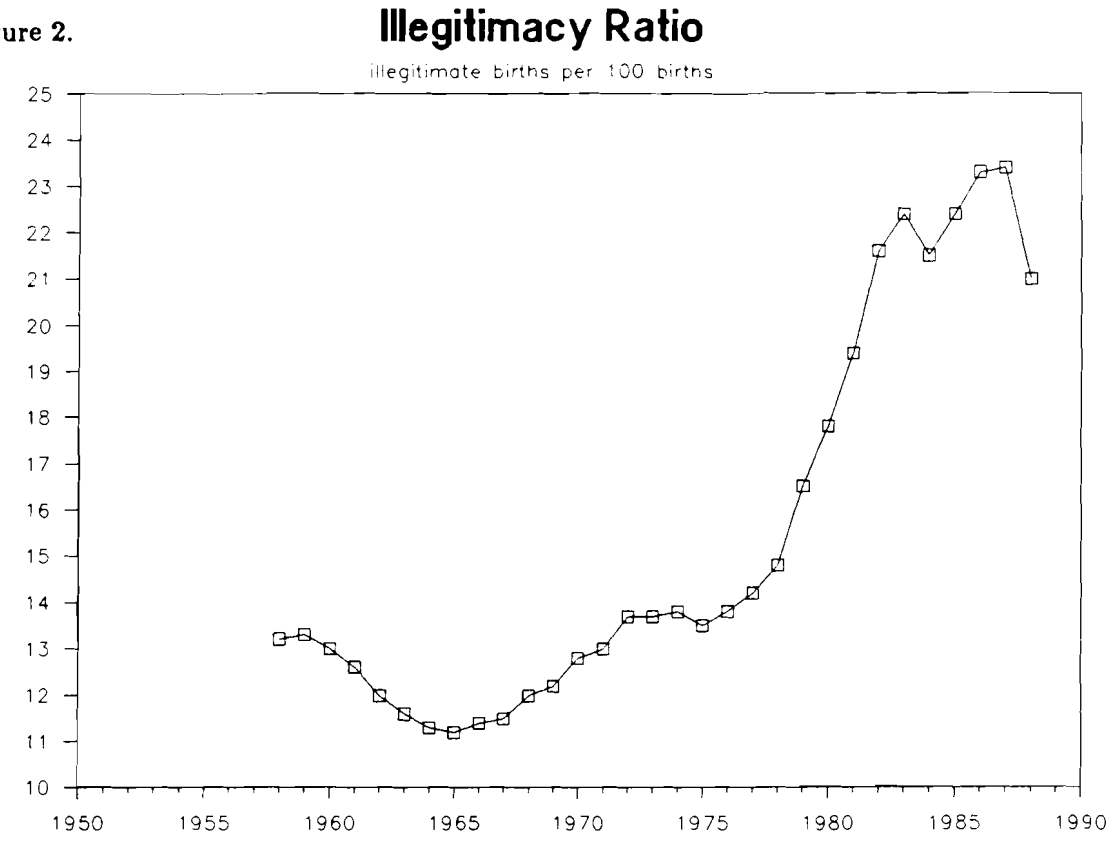
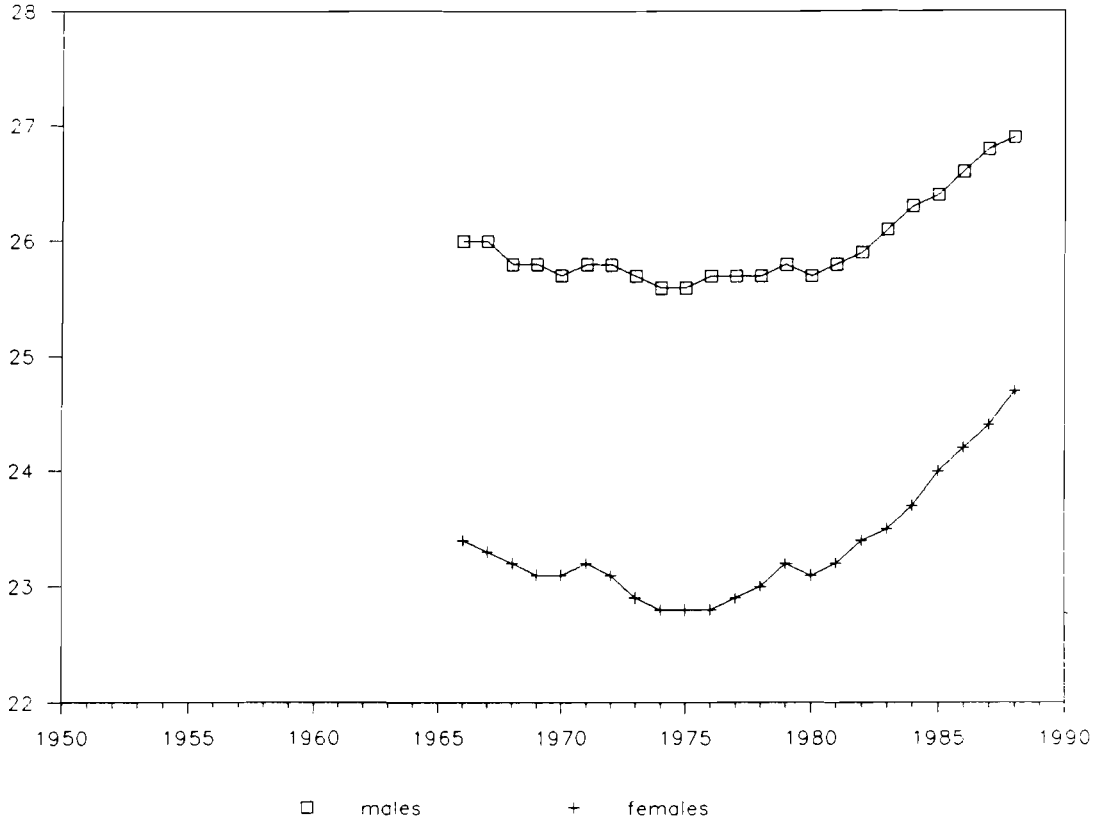


Table 1. Nuptiality and mortality, 1951–1985.

		1951	1961	1971	1981	1985	1951	1961	1971	1981	1985
				Females					Males		
A.	Nuptiality[a)]										
	Proportion ever-marrying	88.1	93.9	93.4	83.1	77.8	90.4	93.0	88.0	80.0	74.6
	Mean age at first marriage	24.7	23.3	23.0	24.9	25.8	27.4	26.5	26.3	27.5	28.5
	Proportion marriage ending in divorce	19.2	16.5	18.1	31.2	35.0	18.5	16.1	17.7	30.9	35.2
	Proportion divorced remarrying	65.1	69.8	68.1	44.7	44.6	80.0	83.4	79.4	60.4	60.6
	Proportion widowed remarrying	4.9	3.5	2.7	1.9	1.4	19.6	15.9	12.6	8.8	7.4
	Average length of widowhood married aged 60	6.6	7.6	7.8	8.6	8.7	2.9	2.4	2.2	1.8	1.8
B.	Mortality										
	Life expectancy (years)										
	at birth	67.8	72.8	73.7	76.4	77.4	62.4	66.5	66.6	69.3	70.4
	at age 60	17.3	19.0	19.0	20.4	21.0	14.9	15.5	15.2	16.4	17.0
	at age 80	6.1	6.3	6.3	6.6	6.9	5.0	4.9	5.3	5.4	5.8
	Survivors (per 1000 born)										
	at age 60	795	855	872	897	906	706	757	758	788	804
	at age 80	317	401	421	494	525	212	233	223	274	308

a) Marital-status life-table statistics except mean age at first marriage. All proportions per 100.

Figure 3. **Mean age at first marriage**



In the early 1950s, divorce was especially high in Austria due to the specific postwar context – about 19% of the marriages contracted in 1951 would have ended in divorce if current divorce conditions had prevailed during the whole life. Afterwards, it slightly decreased – around 16% of the marriages would have ended in divorce in 1961 – and then increased – around 24% of divorces in 1985. The trend still seems to be either somewhat upward or on the way to stabilization.

Between 1951 and 1985, life expectancy at birth increased by 9.6 years for women (from 67.8 to 77.4) and by 8.0 years for men (from 62.4 to 70.4 years). However, during this period, mortality changes were not regular. A strong improvement is indicated in the 1950s – plus 5.0 and 3.9 years respectively for women and men – followed in the 1960s by limited change for women – plus 0.9 year – and a stagnation for men. The 1960s also contrast with the subsequent period: since the beginning of the 1970s, mortality has steadily fallen – plus 2.7 years between 1971 and 1981 for both males and females. Since 1984, the increase in life expectancy has strongly accelerated, each year bringing a new rise of 0.3/0.5 years with a small additional bonus for males. As a consequence, the sex gap has started to slightly decline from a maximum of 7.1 to 6.6 years in 1988. During the 1950s the increase in the sex gap was mostly due to the stagnation of the male mortality at older age, while in the 1960s sex differentials in mortality at adult age played a major role. In 1985, about 90% of the women survived till age 60, and more than half till age 80 versus 80% and 30% of men, respectively. Except for infant mortality, male mortality in 1985 is thus very close to female mortality 35 years ago. This has important consequences for the last phase of the life-cycle. On average, women live 21 years beyond age 60, of which 9 years are spent by married women as widowed while figures for men are

respectively 17 years and 2 years.

Extrapolation of most recent trends consider as most probable a stabilization of both fertility, marriage and divorce at their present level.[3] On the contrary, the future of mortality is very uncertain both in the short and long run. A decrease of 30% in age-specific mortality rates for females and of 37% for males was assumed in the national scenario, reducing the sex gap by about one-fifth, with life expectancy reaching 81.7 and 76.1 respectively for women and men in 2005 versus 78.7 for men under the mortality scenario. In addition, it also assumed an annual net migration of 15,000 persons, 51.6% males aged 20.2 years on average, 51.6% females aged 27.9 on average, and having the same marital characteristics as the Austrian population.

2. Changes in the Size and Age Structure of the Population

Since the mid-1970s, the population growth in Austria has been close to zero with frequent birth deficits. In the future, no positive growth is to be expected in the absence of a substantial and constant inflow of migrants as illustrated by the figures in Table 2.[4] Under constant demographic conditions, the decrease of the population would first be limited between 1985 and 2000 from 7.566 million inhabitants to 7.452 million, but would strongly accelerate beyond this date to 7.004 million in 2015, 6.321 million in 2030, and 5.103 million in 2050. A similar pattern of change would be observed under any scenario which excludes international migration. Figures for the western scenario are very close to the benchmark scenario, except in 2050 (4.833 million), and both scenarios indicate the strongest decrease. If fertility would progressively return to replacement level by the year 2005, population will still decrease, but to a much lower extent: 7.252 million in 2015, 7.252 in 2030 and finally 6.884 in 2050. The decrease will also be more limited under the mortality scenario: 7.434 million in 2015, 6.940 in 2030 and 5.795 in 2050. On the other hand, under the assumptions included in the national specific scenario, and especially a net annual inflow of 15,000 migrants, the Austrian population would rise to 7.907 million in 2015, but would still experience a decrease afterwards to respectively 7.733 and 7.086 million in 2030 and 2050.

These figures show that the possible range of change in the size of the total population is fairly wide: the difference between the national and the western scenarios is 1.4 million in 2030 and 2.2 million in 2050. Substantial differences are also indicated regarding variations in the absolute and relative sizes of the three main age groups which compose the population: the young, the working-age population and the elderly. The number of younger people will decrease unless fertility returns to replacement level, and then it will remain approximatively constant. Under constant fertility conditions, the population under age 15 will steadily decrease from 1.378 million in 1985 to 879,000 in 2030 and 690,000 in 2050. A further fall in fertility to the lowest level observed in West Germany – 1.28 children per woman – would bring an additional decrease in the young age population of about 200,000: 692,000 in 2030 and 474,000 in 2050. On the contrary, migration as assumed in the national scenario would result in a more limited fall in the population under 15: 1.096 million in 2030 and 995,000 in 2050.

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[3] In the national scenario, it was assumed that although fertility might still slightly decrease in the short term as a result of the increase in the mean age at first marriage – nuptiality, divorce and illegitimacy remaining approximately constant – fertility will return to a level of 1.61 in the long term.

[4] It is recalled that the benchmark scenario assumes that demographic variables remain constant at their present level; the fertility scenario assumes that fertility returns to replacement level; the mortality scenario assumes that age specific mortality rates are decreased by 30% for women and 45% for men; and the western low scenario assumes West German fertility, Swedish marriage and divorce, and Swiss mortality. All changes occur gradually between 1985 and 2000.

Table 2. Population by broad age groups, 1950–2050.

	Absolute (1000s)				Relative (%)			
	0–14	15–59	60+	Total	0–14	15–59	60+	Total
1950	1579	4283	1074	6936	22.8	61.8	15.5	100.0
1960	1554	4213	1281	7048	22.0	59.8	18.2	100.0
1970	1819	4148	1500	7467	24.4	55.5	20.1	100.0
1980	1541	4564	1444	7549	20.4	60.4	19.1	100.0
1985	1378	4680	1508	7566	18.2	61.9	19.9	100.0
				Benchmark Scenario				
2000	1281	4633	1539	7452	17.2	62.2	20.6	100.0
2015	1017	4322	1665	7004	14.5	61.7	23.8	100.0
2030	879	3502	1940	6321	13.9	55.4	30.7	100.0
2050	690	2834	1579	5103	13.5	55.5	30.9	100.0
				Fertility Scenario				
2000	1379	4633	1539	7550	18.3	61.4	20.4	100.0
2015	1366	4419	1665	7450	18.3	59.3	22.4	100.0
2030	1370	3942	1940	7252	18.9	54.4	26.8	100.0
2050	1366	3939	1579	6884	19.8	57.2	22.9	100.0
				Mortality Scenario				
2000	1283	4652	1633	7567	17.0	61.5	21.6	100.0
2015	1024	4388	2022	7434	13.8	59.0	27.2	100.0
2030	889	3576	2475	6940	12.8	51.5	35.7	100.0
2050	700	2915	2180	5795	12.1	50.3	37.6	100.0
				Western Scenario				
2000	1232	4645	1605	7482	16.5	62.1	21.5	100.0
2015	866	4314	1895	7075	12.2	61.0	26.8	100.0
2030	692	3346	2267	6305	11.0	53.1	36.0	100.0
2050	474	2425	1934	4833	9.8	50.2	40.0	100.0
				National 1 Scenario				
2000	1312	4816	1630	7758	16.9	62.1	21.0	100.0
2015	1184	4725	1998	7907	15.0	59.8	25.3	100.0
2030	1096	4182	2455	7733	14.2	54.1	31.7	100.0
2050	995	3797	2294	7086	14.0	53.6	32.4	100.0

Parallel to the decline of the young age population, the working-age population will also certainly decrease in the long term. Till 2000, very little change is to be expected in the absence of migration. Under the assumption of an annual net migration flow of 15,000 individuals – national scenario – the working-age population would increase from 4.680 to 4.816 million. Between 2000 and 2015, it decreases by 311,000 under the benchmark scenario, 214,000 under the fertility scenario, 264,000 under the mortality scenario – which shows that the potential for saving years of life during adulthood is still substantial in Austria, especially for males – 331,000 under the western scenario and only 91,000 under the national scenario. Between 2015 and 2030, the fall is much more dramatic, ranging from 477,000 to 968,000 respectively under the fertility and western scenarios. Beyond this date, the working-age population would stabilize under the fertility scenario and continue to strongly decrease under other scenarios. Consequently, the size of the working-age population would be inferior to the value observed in 1985 by 15% to 30% in 2030 and by 15% to 50% in 2050.

The elderly population will steadily grow till around 2030 and then drop. In 2030, the population aged 60 and over would reach 1.940 million under constant mortality conditions (+ 28.6%), 2.475 under the low mortality scenario (+ 64.1%), and 2.455 million under the national scenario compared with 1.508 million in 1985. In 2050, the corresponding figures would be 1.579 million, 2.180 million and 2.294 million.

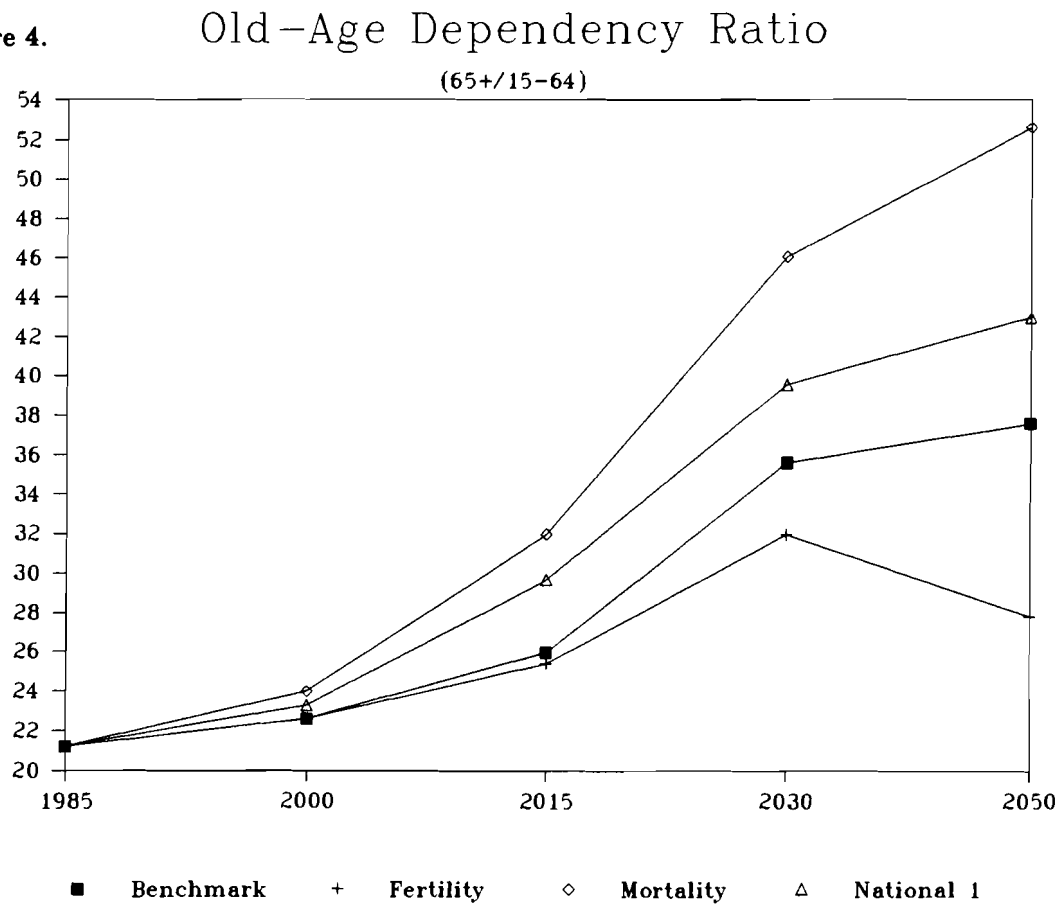
These trends have major consequences regarding the age structure of the population. The share of the young people in the total population will decrease unless fertility returns to replacement level: from 18.2% in 1985, it would change to between 10% to 14% in 2030/2050. Under the fertility scenario, it would remain constant and slightly increase beyond 2030 to 19.8%. The share of the working-age population will also decrease after a small rise during the period 1985–2000, especially between 2015 and 2030. In 2030, it would represent between 51.5% and 55.4% of the total population and between 50.2% and 57.2% – an increase of 2.8 percentage points is observed under the fertility scenario – in 2050 versus 61.9% in 1985. On the contrary, the share of the elderly population will sharply rise with most of the rise occurring between 2015 and 2030; starting from 19.9% in 1985, it would reach 26.8% in 2030 under the fertility scenario, 30.7% under the benchmark scenario, 31.7% under the national scenario, 35.7% under the low mortality scenario and 36% under the western scenario. Beyond 2030, it will decrease to 22.9% under the fertility scenario, remain approximatively constant under the benchmark scenario, and respectively increase to 32.4%, 37.6% and 40.0% under the national, mortality and western scenarios.

Therefore, under any scenario, the Austrian population will experience a substantial aging. This is also reflected by changes in the old-age dependency ratio (OADR) (see Table 3 and Figure 4). In 1985, there were 21.2 persons in the age group 65 and over per 100 population of working-age. In 2000, the ratio will not be very different: between 22.8 and 24.0. In 2015, the increase is still limited under the fertility and benchmark scenarios – respectively 25.4 and 26.0 – but more marked under the national scenario – 29.7 –, the western scenario – 30.5 – and the low mortality scenario – 32.0. The period 2015–2030 will definitely be that of maximum aging in Austria, the old-age dependency ratio reaching values of 35.6 under constant demographic conditions, 32.0 if fertility increases to 2.1, 39.6 under the national scenario, 44.7 under the western scenario and 46.1 if the low mortality would materialize. Figures for 2050 show that beyond 2030, aging will slow down especially under the benchmark and national scenarios to 37.6 and 43.0. Maximum OADR are observed under the western and mortality scenarios, 54.8 and 52.6, respectively. A slight "rejuvenation" would even be possible under the fertility scenario, 27.8. It is interesting to note that migration as assumed under the national scenario slightly adds to the aging of the population: in 2000 the OADR is 23.3 versus 22.6 if migration is excluded, and in 2030 figures are respectively 39.6 and 35.7. As indicated by changes in the total dependency ratio (TDR), the aging of the population will also be accompanied by an increase in the total number of persons in dependent ages per 100 in working ages: TDR

Table 3. Dependency ratios, 1985–2050.

Scenario	1985	2000	2015	2030	2050
			Under 15		
Benchmark	27.0	25.4	21.4	21.9	21.5
Fertility		27.7	28.2	30.9	31.7
Mortality		25.4	21.2	21.5	21.1
Western		24.4	18.2	17.8	16.8
National 1		25.1	22.8	23.1	23.3
			65 and Over		
Benchmark	21.2	22.6	26.0	35.6	37.6
Fertility		22.6	25.4	32.0	27.8
Mortality		24.0	32.0	46.1	52.6
Western		23.8	30.5	44.7	54.8
National 1		23.3	29.7	39.6	43.0
			Total		
Benchmark	48.1	48.1	47.5	57.5	59.1
Fertility		50.3	53.6	62.9	59.5
Mortality		49.4	53.1	67.6	73.7
Western		48.2	48.7	62.7	71.6
National 1		48.5	52.5	62.6	66.3

Figure 4.



between 59.1 under the benchmark scenario to 73.7 under the mortality scenario in 2050 versus 48.1 observed in 1985.

3. Changes in the Marital Composition of the Elderly Population

The marital structure of the elderly population in Austria bears the imprint of a severe sex imbalance which mostly results from war losses. In 1985 there were only 56.9 men aged 60 and over per 100 women (see Table 4). Consequently, only 34.7% of the elderly women were married versus 77.4% of the men, and almost half (49.2%) were widowed versus 13.4% of men (see Table 5). The proportion single is much higher among old females – 11.0% – than among old males – 5.8% – reflecting the traditional male overnuptiality. Slightly more old females than old males are divorced – 5.1% versus 3.4% – which is explained by higher remarriage among divorced males.

Table 4. Masculinity ratio for the population aged 60 and over.[a)]

	Scenario			
	Benchmark	Mortality	Western	National 1
1985	56.9			
2000	67.2	69.3	67.7	68.1
2015	73.5	82.9	75.4	77.5
2030	74.4	88.1	77.3	80.7
2050	72.3	90.2	75.5	82.1

a) Number of men per 100 women.

In the future, the sex imbalance will be progressively reduced to a level corresponding to the sex differentials in survivorship. Under present mortality conditions, this stationary masculinity ratio is about 72/75 and will be reached around 2010. Under the mortality scenario, which assumes that the sex gap in mortality will be reduced by half, the masculinity ratio would increase to 90.2 in 2050 and under the national scenario – sex gap approximatively reduced by one-fifth – to 82.1. However, it is difficult to estimate the impact of the improvement in the sex structure of the elderly population because the future living arrangements of the elderly also reflect the substantial changes in nuptiality which occurred in the recent past.

The proportion single at older age is mostly influenced by the nuptiality behavior at young adulthood. Therefore, little uncertainty exists with respect to the future, even in the long term (see Figures 5a and 5b). Till 2015, males and females show reverse trends: the proportion single among females indicates a small decrease to 8.3%, while among males it will increase to 9.5/10%. As a consequence, starting in 2010, more – very few more in fact – old males than females will be single, which is a reversal in a secular trend. Between 2015 and 2030, a sharp rise in the proportion single is observed for both males and females to respectively about 15/16% – 18% under the western scenario – and 13%. Beyond 2030, the increase will be limited, around 16/18% for both sexes in 2050, except under the western scenario – 31.1% single among old males and 23.6% among old females in 2050.

With constant marriage and divorce intensity, the percentage divorced in the elderly population will increase till 2015 and then stabilize at a level of 7% among males and about 11% among females (see Figures 6a and 6b). If the the Swedish pattern of marriage and divorce was progressively adopted, the proportion divorced would continue to in-

Table 5. Marital composition of the population aged 60 and over, 1985–2050.

	Females					Males				
	Single	Married	Divorced	Widowed	Total	Single	Married	Divorced	Widowed	Total
1985	11.0	34.7	5.1	49.2	100.0	5.8	77.4	3.4	13.4	100.0
					Benchmark Scenario					
2000	9.0	37.3	7.0	46.7	100.0	6.6	74.9	5.3	13.2	100.0
2015	8.3	37.8	10.4	43.5	100.0	10.0	70.1	7.2	12.8	100.0
2030	13.8	35.7	11.0	39.5	100.0	16.1	65.1	7.1	11.6	100.0
2050	16.9	31.7	10.7	40.7	100.0	17.9	62.2	7.0	12.9	100.0
					Western Scenario					
2000	9.0	39.4	7.0	44.5	100.0	6.6	71.4	5.5	16.5	100.0
2015	8.3	41.1	12.0	38.6	100.0	9.9	63.7	9.6	16.8	100.0
2030	13.6	37.1	16.4	33.0	100.0	18.1	54.5	12.2	15.2	100.0
2050	23.6	28.5	16.6	31.3	100.0	31.1	42.8	10.9	15.1	100.0
					Mortality Scenario					
2000	9.0	39.2	7.0	44.9	100.0	6.6	75.0	5.2	13.1	100.0
2015	8.3	44.5	10.2	37.0	100.0	9.5	70.6	7.0	12.9	100.0
2030	13.2	43.9	11.0	31.8	100.0	15.1	65.1	7.1	12.7	100.0
2050	16.5	39.2	10.9	33.4	100.0	17.4	60.5	7.0	15.2	100.0
					National 1 Scenario					
2000	9.0	36.9	6.9	47.1	100.0	6.6	73.3	5.3	14.9	100.0
2015	8.3	40.5	9.9	41.3	100.0	9.7	68.4	7.3	14.7	100.0
2030	12.5	39.8	10.5	37.1	100.0	16.2	62.2	7.6	14.0	100.0
2050	14.2	36.0	10.3	39.4	100.0	20.2	56.6	7.6	15.6	100.0

Figure 5a.

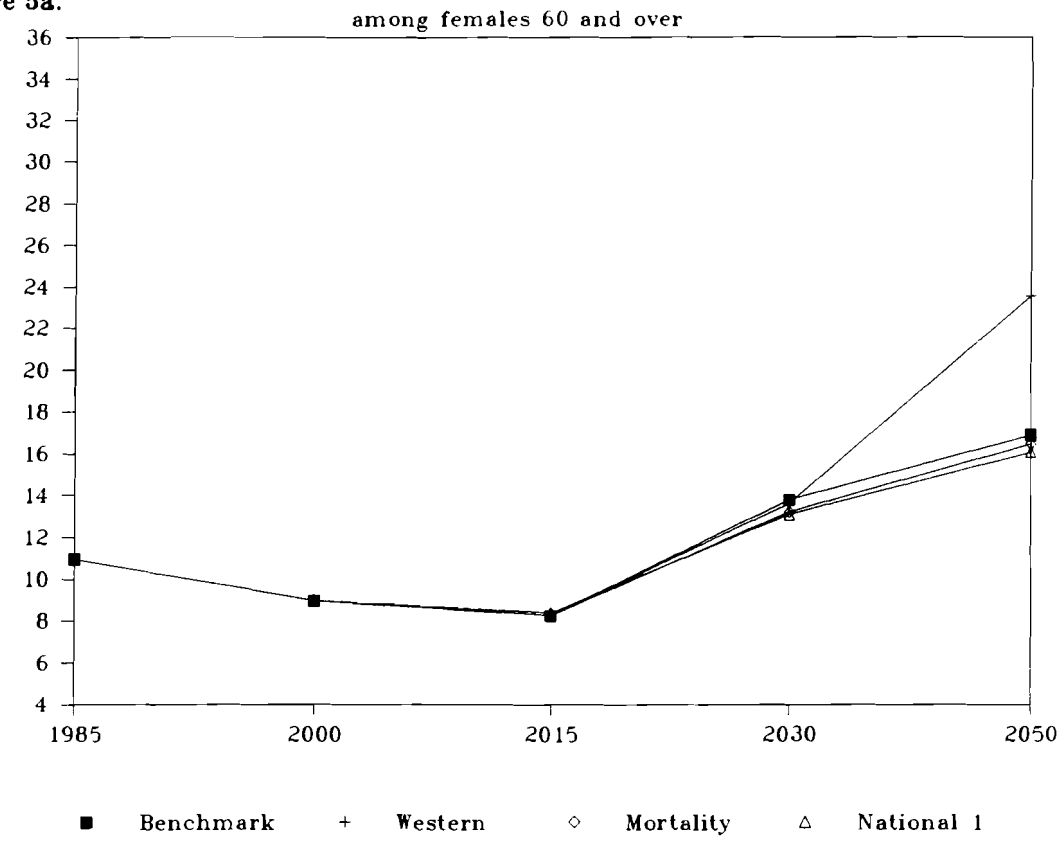


Figure 5b.

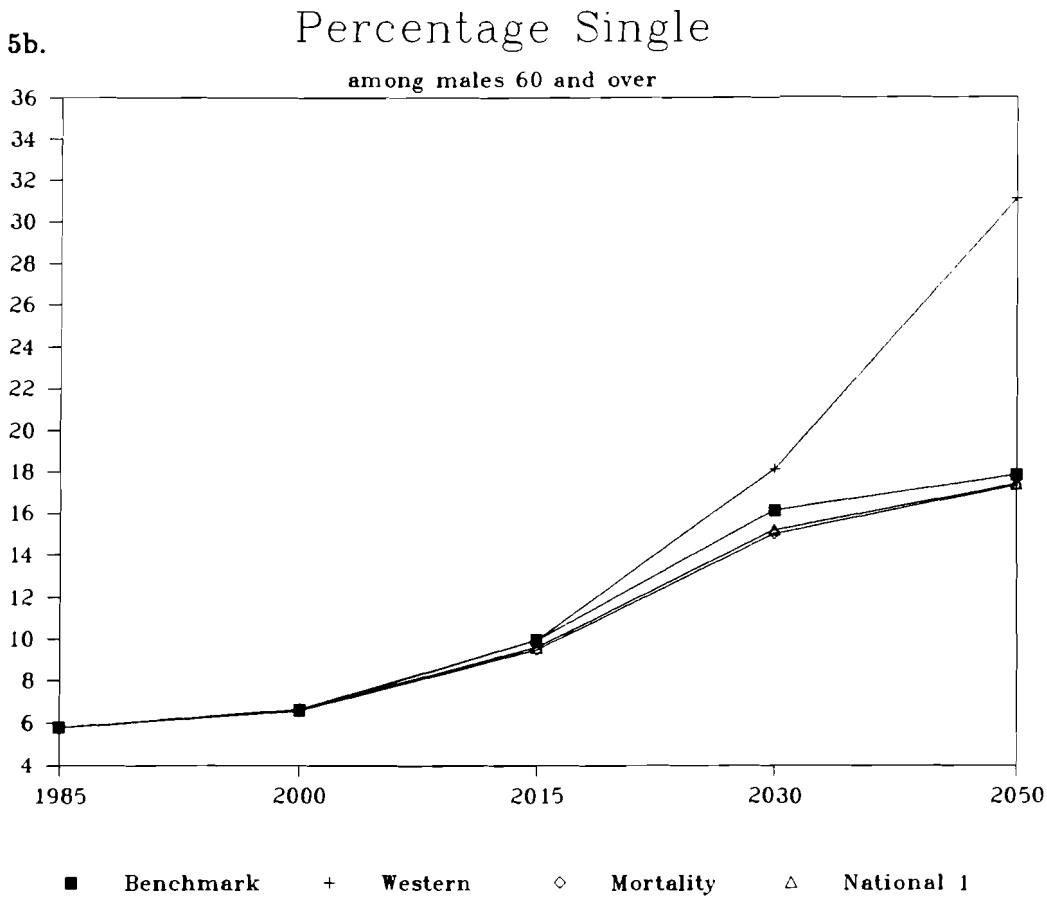


Figure 6a.

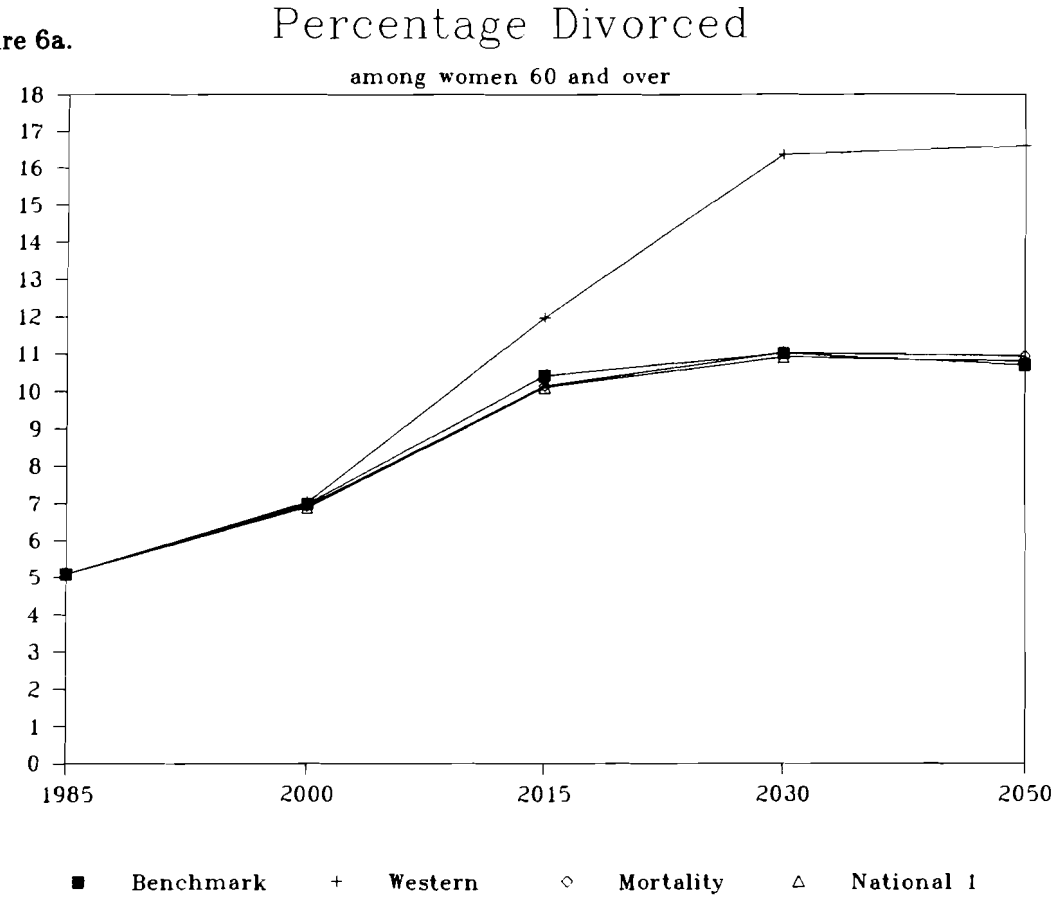
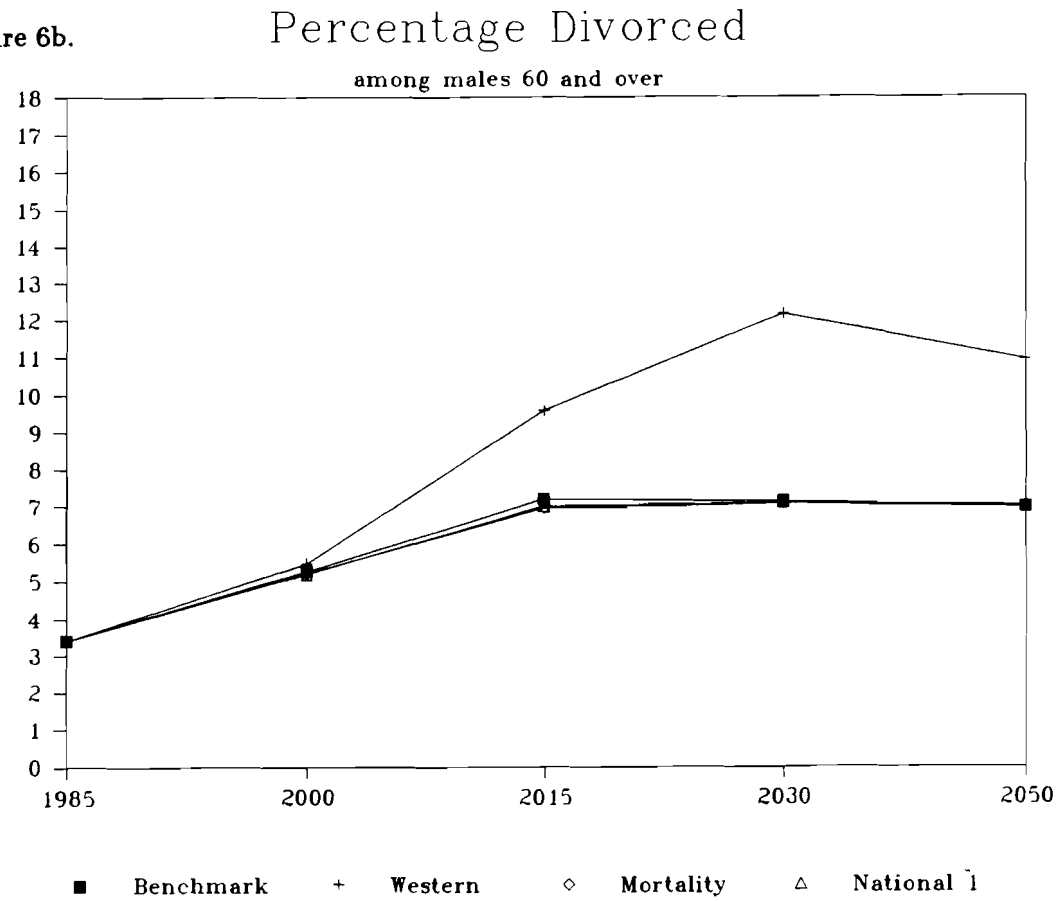


Figure 6b.



crease between 2015 and 2030, reaching respectively 12.2% and 16.4% among old males and females, decrease among males beyond 2030 – 10.9% in 2050 – and level off among females.

Future trends in the proportion married and widowed in the elderly population carry over much more uncertainty than the percentage single or divorced as they both depend on nuptiality behavior at adulthood and on mortality, especially sex difference in mortality, at older age. Nevertheless, in the case of Austria, trends are clear for both males and females.

Little change is to be expected in the proportion of males widowed. Under constant mortality conditions, it would approximatively remain constant around 11/13% (see also Figures 7a and 7b). A 50% reduction in the sex gap in mortality, as assumed under the low mortality scenario, would only increase the proportion by about 3 percentage points in 2050, and similar figures are indicated under the western scenario. Therefore, the increase in the proportion single and divorced among the male elderly will result in a substantial decrease in the proportion married: between 60.5% and 62.5% in 2050 with constant nuptiality, and 42.8% with the Swedish nuptiality versus 77.4% in 1985 (see Figures 8a and 8b).

The proportion widowed among the female elderly population will steadily decrease till 2030 under any scenario. Beyond this date, a small increase of about 2/3 percentage points is observed except under the western scenario which shows a decrease of the same size. While in 1985 about half of the women aged 60 and over were widowed, they will be about 40% in 2030 under the benchmark scenario and about one-third under other scenarios. Regarding the proportion of old women married, little variation is observed under the benchmark scenario while other scenarios show a rise with a maximum in 2015: 40.5% under the national scenario, 41.1% under the western scenario, and 44.5% under the mortality scenario versus 34.6% in 1985. Figures remain stable over the period 2015–2030 and slightly decrease afterwards. Only the western scenario would lead to a lower value than in 1985, 28.5% in 2050.

Thus, a main characteristic of future changes in the marital composition of the elderly population in Austria is the contrast between the fall in the proportion married among old males and the rise among females. All together, this leads to a small increase in the total population married till 2030 under the mortality and national scenarios, respectively 53.8% and 52.6% versus 50.2% in 1985, followed by a slight decrease. Under the benchmark and the western scenario, the decrease in the proportion married among old males more than offsets the increase among old females, and therefore the proportion married for both sex decreases, respectively 48.3% and 44.7% in 2030, and 44.5% and 34.6% in 2050.

Figure 7a.

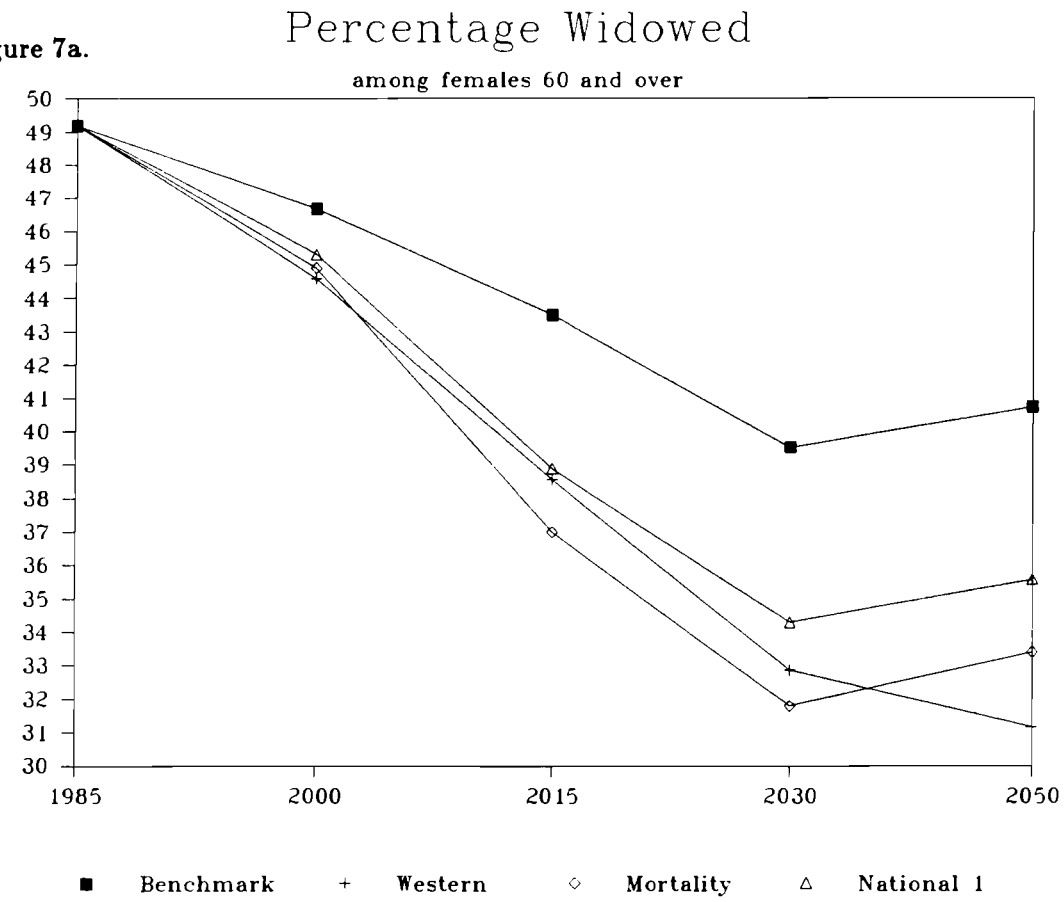


Figure 7b.

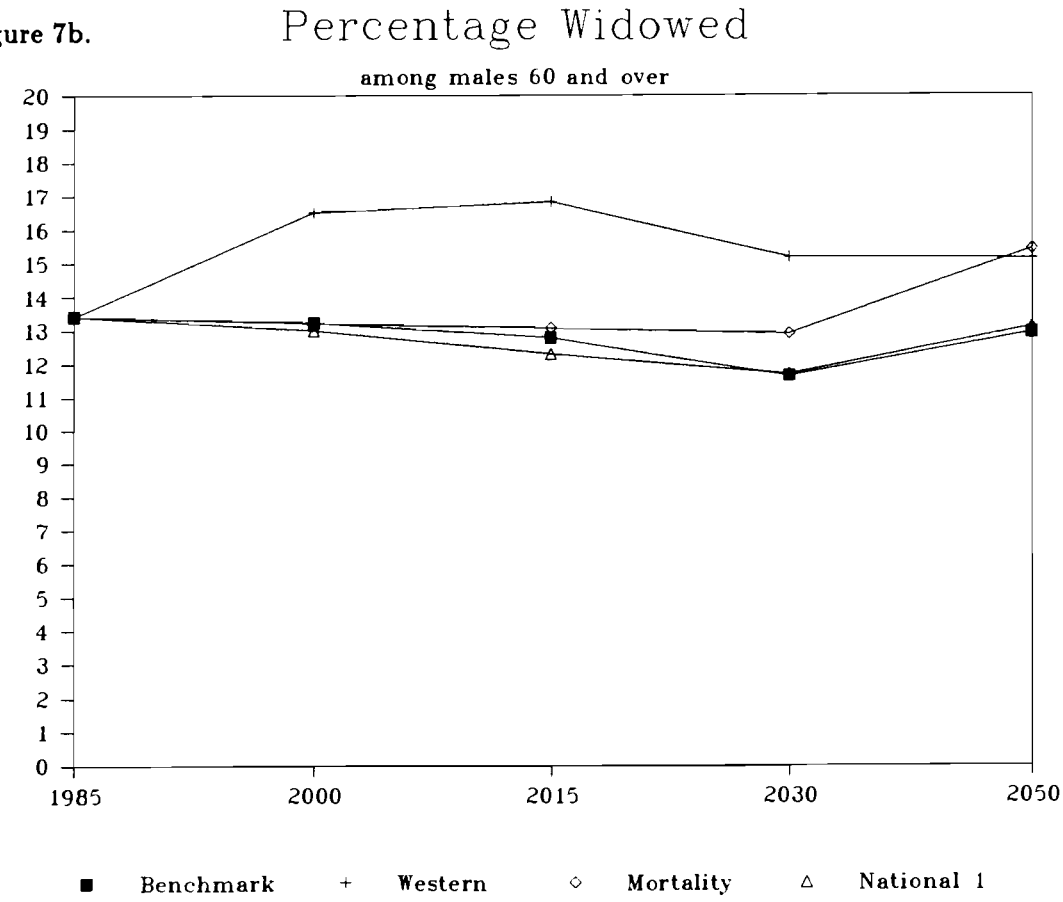


Figure 8a.

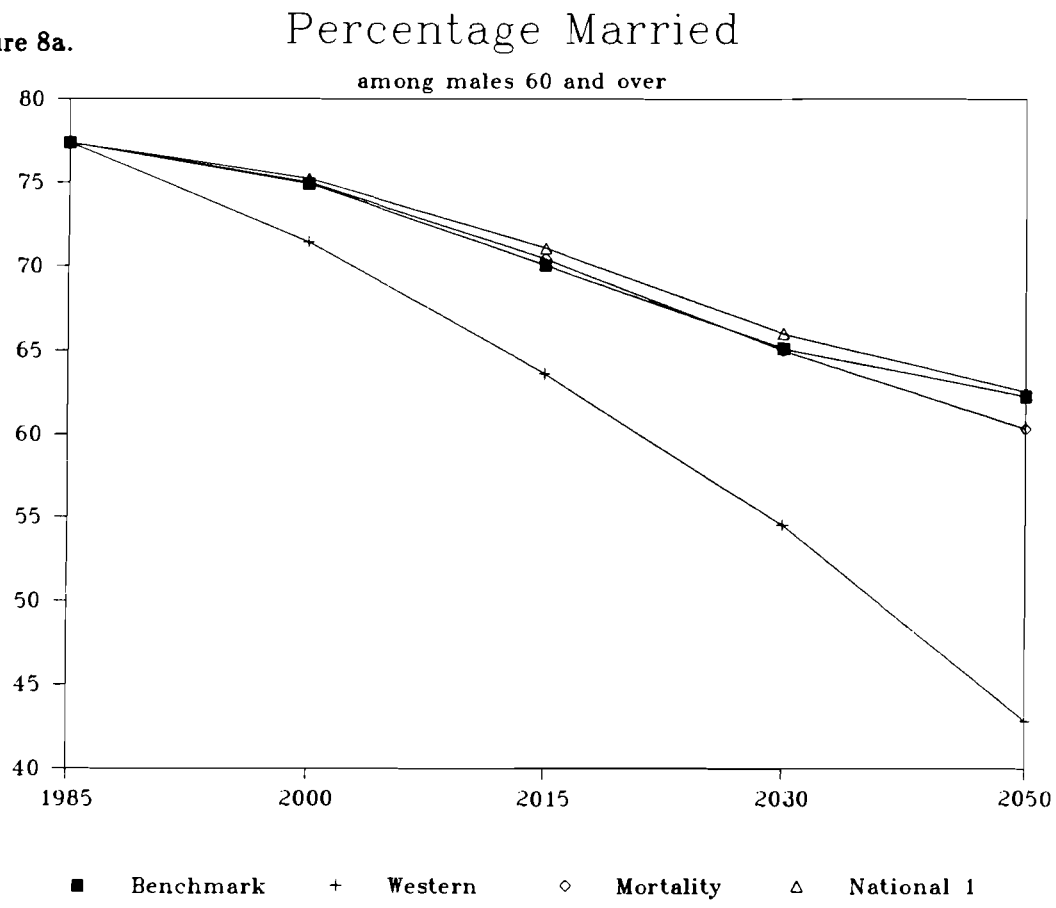
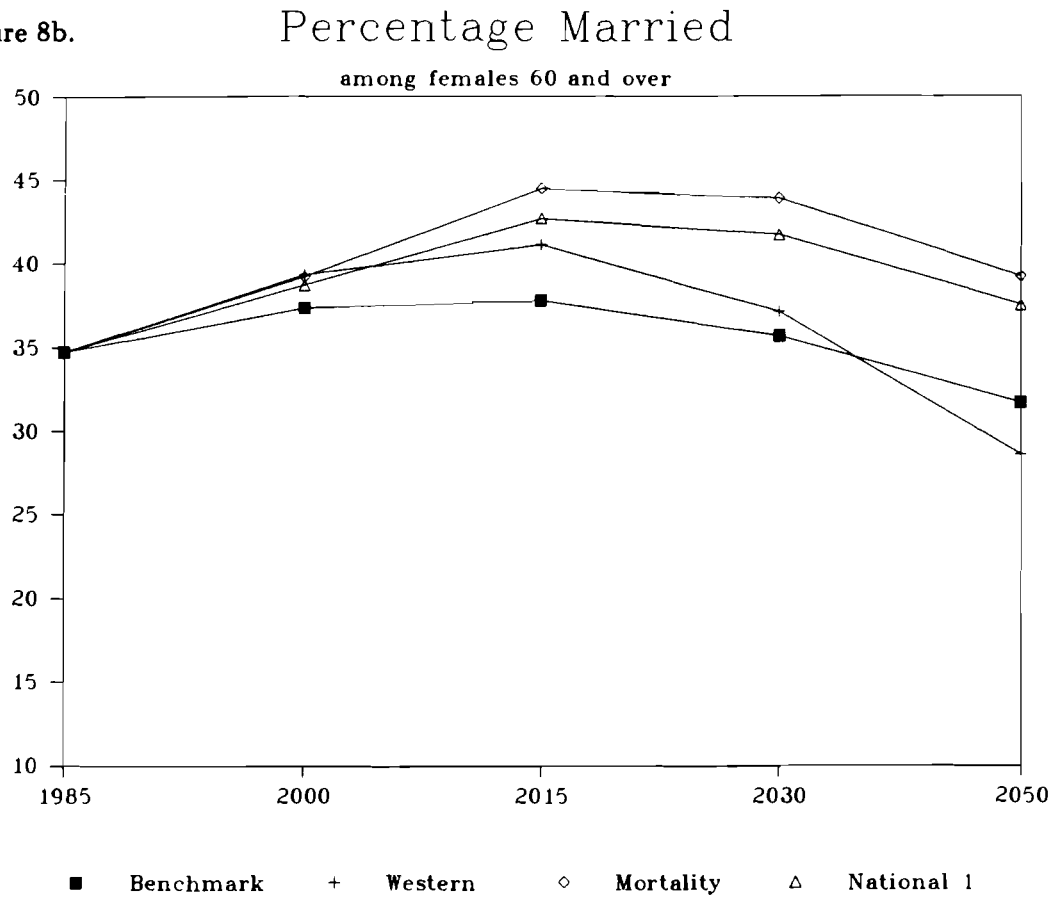


Figure 8b.



4. The Austrian State Pension System

The Austrian state pension system encompasses three main schemes: the employees scheme, the self-employed scheme and the civil servants scheme (see Table 6). The employees scheme includes funds for blue and white collar workers, and is by far the largest scheme. In 1985, it provided 72.3% of the total number of pensions and paid 68.6% of total benefits. The scheme for self-employed both for farmers and non-farmers is the second scheme with respect to the number of pensions – 17.8% – but third for the amount of benefits served – 13.3% versus 18.2% for the civil servants scheme. On the basis of the actual number of persons insured, it is expected that the share of the employees will grow to the detriment of the self-employed. The decreasing economic role of the self-employed is also reflected in the fact that the scheme for self-employed presently faces the less favorable demographic conditions according to the ratio between the number of pensions and the number of insured: 857 per thousand in 1985 versus 548 and 604 respectively for employees and civil servants.

Table 6. Characteristics of the different Austrian pension schemes, 1985.

	Scheme		
	Employees	Self-Employed	Civil Servants
Number of pensions paid (1000s)[a)]	1302 (72.3%)	321 (17.8%)	178 (9.9%)
Total benefits paid (millions of schillings)[a)]	124411 (68.6%)	24102 (13.3%)	32967 (18.2%)
Average annual old-age benefits (schillings)[a)]	104384	81004	185108
Number of persons insured (1000s)[a)]	2374 (77.9)	374 (12.3)	295 (9.7)
Ratio pensions/insured[a)] (per 1000)	548	857	604
Contribution rate	22.7	13.0[b)]	8.0
Full pension	79.5% for 45 years	79.5% for 45 years	80% for 34.5 years
Income basis for calculating benefits	last ten years	last ten years	last income
Upper ceiling for contribution and benefits	yes	yes	no

a) Table 1, page 177 in A. Guger (1987) *Umverteilung durch öffentliche Haushalte in Oesterreich.* Vienna: Austrian Institute for Economic Research

b) 12.5 for farmers

Both schemes differ in many respects. First, contribution varies from 8.0% of gross wages for civil servants – no employer's contribution from the State – to 12.5/13% for self-employed and 22.7% for employees – 10.25% paid by the employee and 12.45% by the

employer. Second, full pension requires 45 years of contribution for employees and self-employed but only 34.5 years for civil servants. At present, self-employed have a lower insurance record than other categories, and consequently lower benefits, because pension insurance only spread among self-employed after the Second World War. Third, the income basis for calculating the benefits is the last ten years for employees and self-employed while it is the last, and consequently the highest, salary for civil servants. Fourth, there is an upper ceiling for contribution and benefits for both employees and self-employed, but not for civil servants. As a consequence, returns, average benefits and conditions for financial equilibrium also differ between the three schemes.

Benefits are automatically but not strictly indexed for wage increase. The adjustment is based on a specific wage index which excludes both high and low salaries and which is weighted according to change in the unemployment rate.

Benefits are increased by 5% for each dependent child. Survivor benefits amount to 60% of the old-age benefits of the deceased spouse, and disability benefits are strictly equal to old-age benefits.

5. Retirement and Work Patterns

In Austria, eligible age for old-age pension is 60 for women and 65 for men, but under early retirement provisions women can retire at age 55 and men at age 60, and at any age if disable. In 1985, only 20% of the women and 6% of the men retired at pensionable age. Half of the male new retirees and 60% of the females go on retirement at eligible age and during the subsequent year: 55/56 years for women, 60/61 for both sexes, and 65/66 for men (see Figure 9). The rest of the new retirees is approximatively evenly distributed between ages 50 and 67. On average, men retire one year later than women: 59.8 years versus 58.9 years.[5] Figure 10, which displays the cumulated distribution of the new retirees, illustrates the importance of early retirement practice in Austria: 50% of the women are already on retirement before pensionable age (60 years) and about 80% of men before age 65.

Work record at mean age at retirement substantially varies between males and females. In 1985, the average number of years worked at mean age at retirement was estimated to 40.3 for men and 22.6 for women. However, in the future, the gap will be reduced as a result of recent changes in the sex and age pattern of economic activity. Since the early 1970s, female participation in the labor force shows a marked increase between ages 20 and 50 and only a slight decrease at older age (see Figure 11). On the contrary, activity rates for men have decreased at all ages and especially at 55 and 65. The impact of these changes on the future work record of both sexes is given in Table 7. Under the assumption of constant labor force participation rates, the average number of years worked would be progressively reduced to 36.6 years for men in 2050, namely a difference of 3.7 years, or 9.2%. During the same period, it would rise for women by 5.6 years, or 24.8%.

Much discrepancy also exists among women with respect to marital history (see Table 8 and Figure 12). According to an indirect estimate, the average number of years worked at mean age at retirement in 1985 was 29.5 years for single women, 26.5 years for divorced, 22.3 years for widowed and only 20.7 for married. Today, between ages 25 and 50, approximatively 90% of the unmarried women are active as compared to about 50% of the married women. Under constant conditions, differences in work record between marital statuses will continue to increase till 2000 and slowly decrease thereafter. By the year 2050, differences in work record between single females and males would be reduced to 2.1 years versus 10.8 years in 1985.

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[5]Claimants for disability pension aged 50 and over are assimilated to new retirees.

Figure 9.

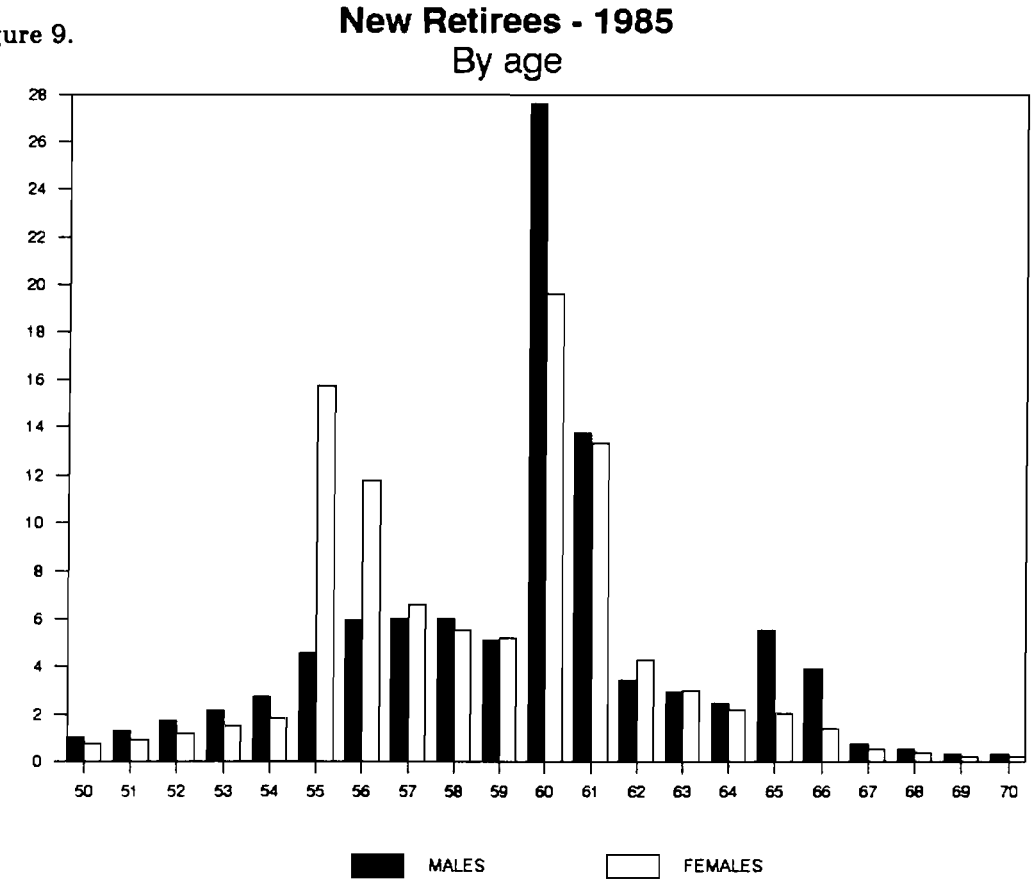


Figure 10.

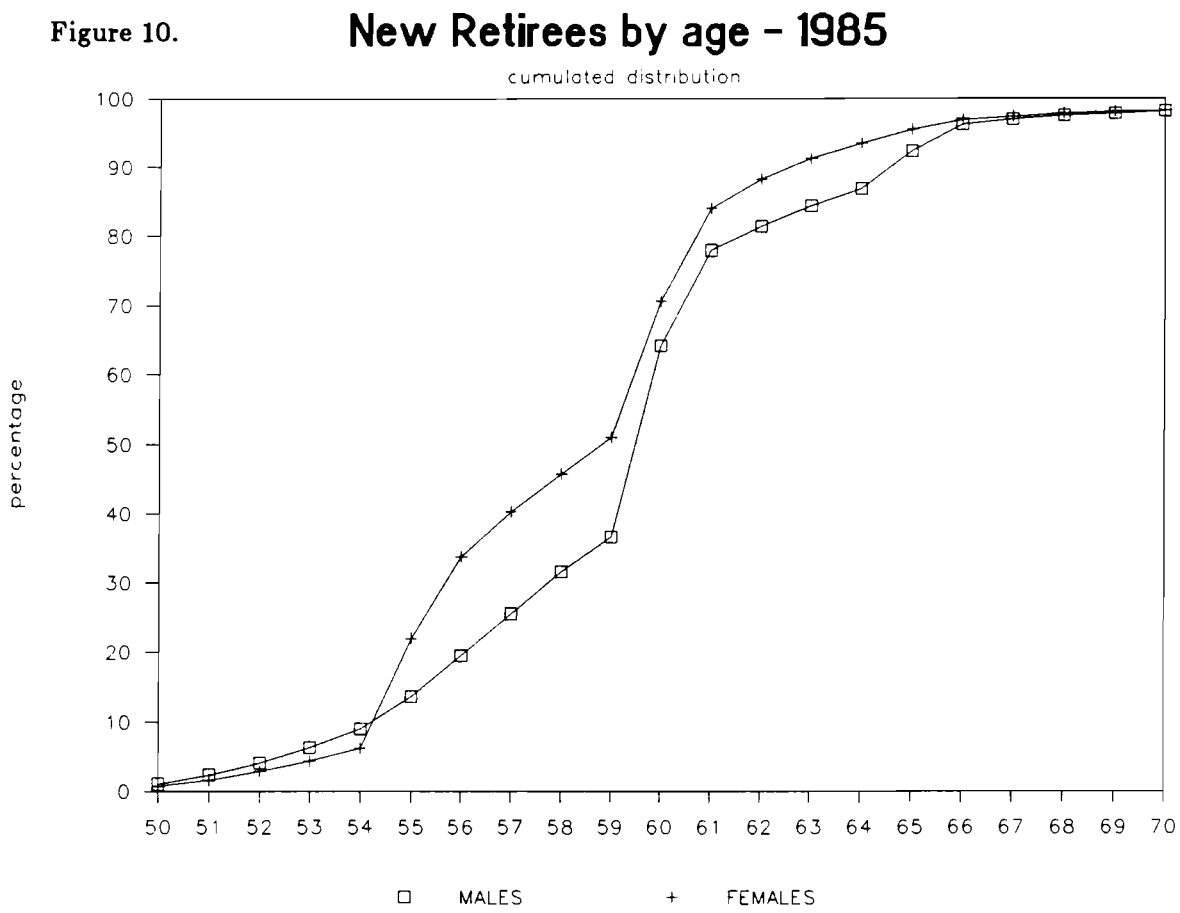


Figure 11.

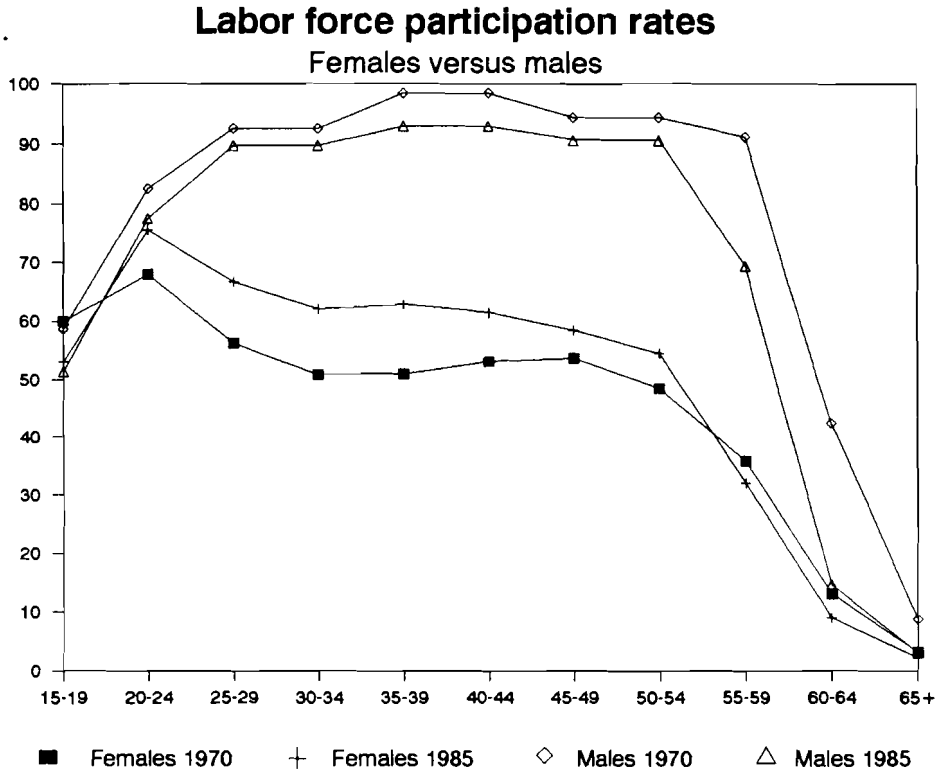


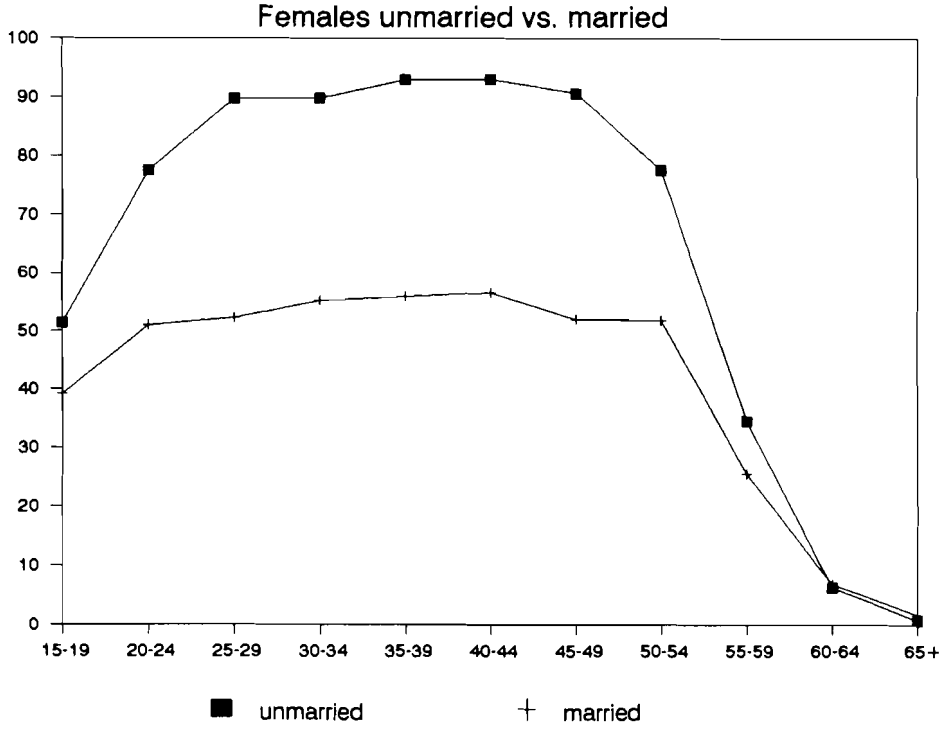
Table 7. Average number of years worked at mean age at retirement, 1985–2050 (constant labor force participation rates – benchmark scenario).

	1985	2000	2015	2030	2050
Males	40.3	39.4	37.8	36.8	36.6
Females	22.6	23.9	26.2	27.6	27.9

Table 8. Average number of years worked at mean age at retirement. Women by marital status, 1985 and 2030 (constant labor force participation rates – benchmark scenario).

	Single	Married	Divorced	Widowed
1985	29.5	20.7	26.5	22.3
2000	33.1	22.8	29.9	24.4
2015	34.2	24.3	30.8	26.0
2030	34.5	25.1	31.4	26.9

Figure 12. **Labor force participation rates 1985**



6. The Future of State Pensions

6.1. Pension expenditures

Estimated total State pension expenditures based on the use of the pension model amount to 218 billion Austrian Schillings for 1985 (see Table 9) while the observed figure was 181 billion Austrian Schillings, i.e. an overestimation of 20%. The difference evidently originated in the different simplifying assumptions used in the model, the most important ones being the fact that the model calculates entitlements on the basis of the number of years worked and not the number of years insured, and that benefits are not fully indexed for wage increase. In addition, it is not clear to which extent estimates for the future are also biased.

Table 9. Percentage claiming for old-age pension, 1985–2050 (maximum cohort activity rate).

	Date at Which Mean Age at Retirement is Reached				
	1985	2000	2015	2030	2050
Males	97.9	96.8	92.1	91.7	91.7
Females					
single	79.4	90.6	92.1	91.7	91.7
married	47.5	54.1	61.6	62.8	62.8
divorced	74.7	90.6	92.1	91.7	91.7
widowed	70.5	80.9	85.9	85.9	85.9

Calculations for the four common demographic scenarios assumed constant work and retirement patterns. The national scenario, in addition to the demographic assumptions presented in the first section of this paper, assumed that labor force participation rates will increase to the level observed in the German Democratic Republic in 1970 over the period 1985–2005. This also implies an increase in the mean age at retirement for men from 59.8 to 62.4, the mean age at retirement for women remaining at 58.9.

Analysis of Table 10 leads to clear conclusions (see also Figures 13 and 14). From 1985 to 2000, a moderate rise in total pension expenditures is to be expected under any demographic scenario: between plus 5% for the whole period under the benchmark scenario and 8% under the mortality scenario. Under the national scenario, the rise is only 1%, mostly because of the increase in age at retirement for males. A reason specific to Austria for the slow growth in total expenditures during this period is certainly the absolute decrease in survivors expenditures: about 10% for the demographic scenarios and 6% under the national scenario.

Beyond 2000, a period of approximatively 30 years will follow which is characterized by a steady and sharp increase in old-age expenditures and little variation in survivors expenditures. Under the benchmark scenario, the average annual growth rate does not substantially differ from the previous period – 0.7% between 2000 and 2015, 0.8% between 2015 and 2030 versus 0.6% between 1985 and 2000 – and the difference arises from the stagnation of the survivors expenditures. Under the other scenarios, this difference is much more contrasted: 1.3% between 2000 and 2015 under the western scenario versus 0.8% in the previous period – but a small decrease in survivors expenditures – 1.7% under both the mortality and the national scenario versus 0.2% and 0.9% respectively. During the second part of this period, 2015–2030, the growth is slightly lower under the western and mortality scenarios – 1.0% and 1.2% – while it continues at the same path under the national scenario because of additional pensions paid to older migrants.

A straightforward consequence of the difference in trends in old-age and survivors expenditures is the decrease in the share of survivors expenditures in total pension expenditures: from about 21% as estimated in 1985 as opposed to 26% observed, to between 11 and 15% in 2030, depending on the scenario.

As compared with 1985, old-age expenditures in 2030 would be 37% higher under the benchmark, 61% under the western scenario, 69% under the national scenario, and 76% under the mortality scenario, and corresponding figures for total pension expenditures would be 28%, 45%, 55% and 57%. In other words, under mortality scenario results in a rise in pension expenditures over the period 1985–2030 which is twice that which would be observed under constant demographic conditions. It should also be pointed out that these calculations assumed that the sex differential in salary will remain constant in the future. Under the other extreme assumptions of no difference in salary, an approximate additional increase in old-age expenditures of about 15% to 25% would be observed in 2030 depending on the time schedule of change.

Beyond 2030, reversal trends are indicated: pension expenditures will decrease under any scenario. The decrease would be limited under the national scenario (average annual growth rate of -0.1% between 2030 and 2050), but marked under other scenarios: -0.6% per year for total expenditures under the mortality scenario, -0.8% under the western scenario and -1.0% under the benchmark scenario.

6.2. Number of retirees

The tremendous increase in pension expenditures which will occur between 2000 and 2030 is evidently and principally due to the fact that the large cohorts of the baby boom will go on retirement although changes in entitlements will also play a role – negative for males, strongly positive for females.

Table 10. Pension expenditures, 1985–2050.

Scenario		1985	2000	2015	2030	2050	2000	2015	2030	2050
		Absolute (millions of Austrian Schillings)					Index (1985=100)			
Benchmark	old age	172698	188127	210255	236832	194687	109	122	137	113
	survivors	45147	41037	40927	41605	35095	91	91	92	78
	total	217845	229164	251182	278437	229782	105	115	128	105
Mortality	old age		198322	254315	303908	269670	115	147	176	156
	survivors		40781	38970	38789	35045	90	86	86	78
	total		239102	293284	342696	304715	110	135	157	140
Western	old age		195621	237806	277229	238854	113	138	161	138
	survivors		40610	40301	39427	31851	90	89	87	71
	total		236231	278107	316656	270705	108	128	145	124
National 1	old age		178447	230037	292252	288999	103	133	169	167
	survivors		42519	44159	45284	43958	94	98	100	97
	total		220966	274196	337536	332957	101	126	155	153
		Percentage					Average Annual Growth Rate (%)			
		1985	2000	2015	2030	2050	1985/00	2000/15	2015/30	2030/50
Benchmark	old age	79.3	82.1	83.7	85.1	84.7	0.6	0.7	0.8	-1.0
	survivors	20.7	17.9	16.3	14.9	15.3	-0.6	-0.0	0.1	-0.9
	total	100.0	100.0	100.0	100.0	100.0	0.3	0.6	0.7	-1.0
Mortality	old age		82.9	86.7	88.7	88.5	0.9	1.7	1.2	-0.6
	survivors		17.1	13.3	11.3	11.5	-0.7	-0.3	-0.0	-0.5
	total		100.0	100.0	100.0	100.0	0.6	1.4	1.0	-0.6
Western	old age		82.8	85.5	87.5	88.2	0.8	1.3	1.0	-0.7
	survivors		17.2	14.5	12.5	11.8	-0.7	-0.1	-0.1	-1.1
	total		100.0	100.0	100.0	100.0	0.5	1.1	0.9	-0.8
National 1	old age		80.8	83.9	86.6	86.8	0.2	1.7	1.6	-0.1
	survivors		19.2	16.1	13.4	13.2	-0.4	0.3	0.2	-0.1
	total		100.0	100.0	100.0	100.0	0.1	1.4	1.4	-0.1

Figure 13.

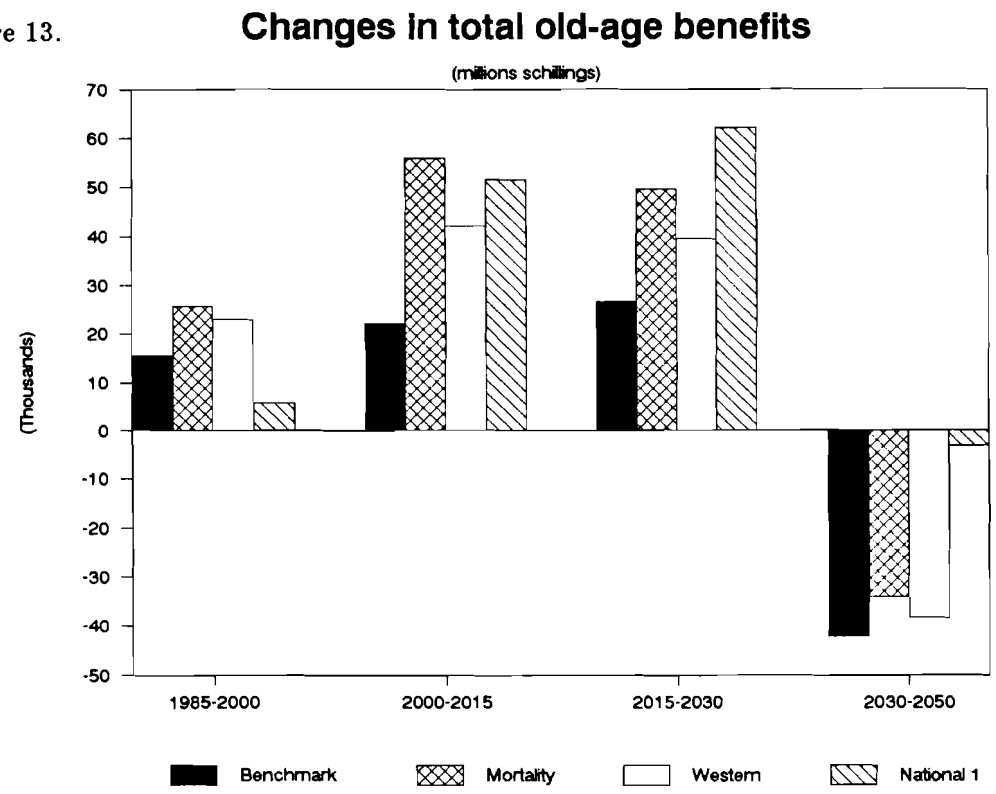
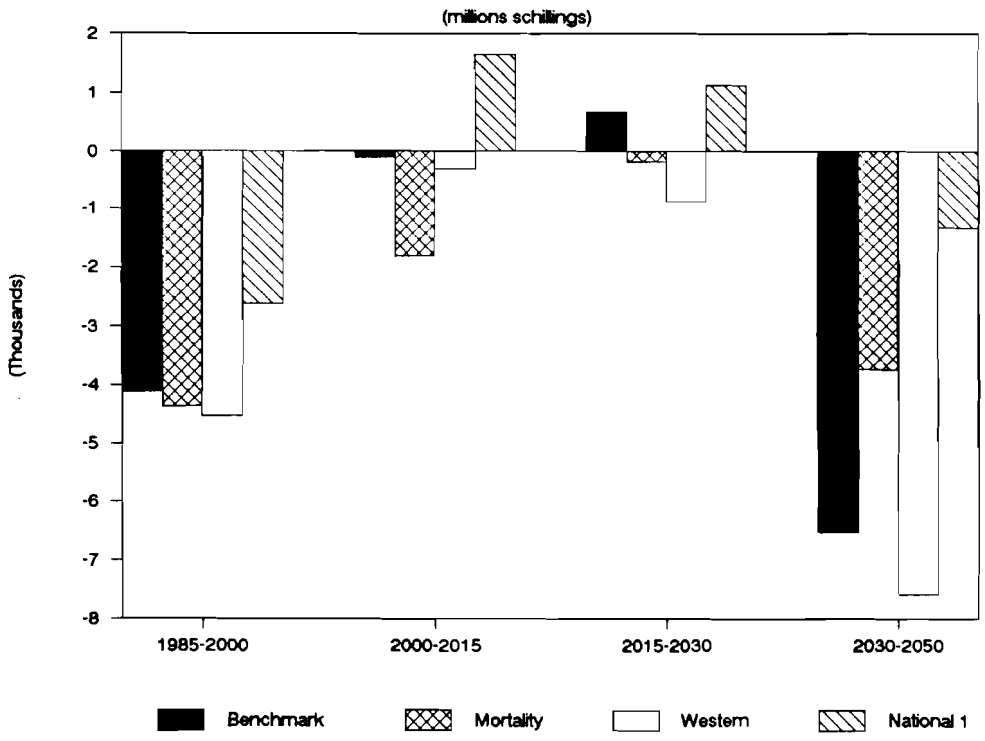


Figure 14.



In the absence of information on the number of persons insured, the model used data on labor force participation. This provides correct estimates of total and per capita pension expenditures but does not allow calculation of the number of beneficiaries.

However, an attempt to estimate of the number of retirees was made assuming that the proportion claiming for old-age pension is equal to the maximum cohort activity rate. This assumption is definitively too restrictive, but nevertheless permits some insights in time trends. Table 9 shows the percentage claimings for old-age pension by sex and marital status for women, among different cohorts reaching mean age at retirement, which were obtained under the assumption of constant activity rates. While 98% of the males claimed for old-age benefits in 1985, they would only comprise 92% in 2015. On the contrary, the percentage claimants among single and divorced women would increase from respectively 75% and 79% to 92% – same as for men – from 70% to 86% for widows and from 47% to 63% for married women. Whether the proportion claimants among males will decrease or not is a hazardous question. On the other hand, one can probably conclude that around 2015, the proportion claimants among males, single, divorced and possibly widowed women will be similar but will remain much lower among married women.

Table 11 and Figures 15a, 15b and 16 show results from calculations for both old-age retirees and survivors. Between 1985 and 2000, a similar increase of about 80,000/100,000 new retirees is indicated for each sex and under both scenarios. However, an exception is the national scenario for males, under which the number of male retirees indicates a small decrease as result of the increase in age at retirement.

Between 2000 and 2030, a stronger and steadier increase is observed except for males under the benchmark scenario – same linear trend from 1985 to 2030 – and under the national scenario – acceleration after 2015 due the retirement of migrants. The strongest increase is observed for females under the national scenario and corresponds to an increase in the number of married women on retirement. Indeed, besides a marked increase in the participation of women in the labor force, the national scenario also assumes that there are marital status differentials in activity levels which will completely disappear beyond 2005. Consequently the proportion of claimants among married women would be the same as among unmarried. The strongest increase for males is evidently observed under the mortality scenario: 2.8 times the increase observed under the benchmark scenario between 2000 and 2030.

Beyond 2030, much smaller cohorts will retire and the total number of old-age retirees will decrease. An exception is the national scenario under which migration would result in a stabilization of the number of male retirees till 2050.

Regarding the number of survivors, a decrease of about 30,000/60,000, namely 7% to 15%, and dependent on scenarios is to be expected between 1985 and 2015, compared with an estimated total of 414,000 in 1985. It is followed between 2015 and 2030 by a slight increase: maximum 21,000 under the national scenario, or a stagnation under the western scenario. Beyond 2030, a sharp decrease will occur, especially under the benchmark and western scenarios, of less than about 60,000 between 2030 and 2050.

6.3. Labor force

Within a pay-as-you-go system, the increase in pension expenditures is not a problem per se but rather should be considered in relation to variation in the labor force. According to figures in Table 12, the size of the labor force would remain approximatively constant between 1985 and 2000 – a 1% increase for the whole period – in the absence of external migration and assuming constant activity rates. Mortality improvement as assumed under the western and mortality scenario would give a 1% increase in the number of active. An additional 1% increase would result from the adoption of the Swedish pattern of nuptiality – western scenario – because a greater proportion of women would be unmarried and consequently active. From 2000 to 2015, a decrease of between 170,000 to

Table 11. Number of retirees, 1985–2050.

Scenario		1985	2000	2015	2030	2050
				Old-Age Retirees		
Benchmark	males	599	672	727	813	660
	females	603	670	780	891	746
	total	1202	1342	1506	1704	1407
Mortality	males		716	915	1106	988
	females		684	857	1007	885
	total		1400	1771	2113	1874
Western	males		701	829	962	814
	females		685	859	1018	908
	total		1386	1688	1980	1722
National 1	males		585	708	906	885
	females		718	982	1232	1144
	total		1303	1690	2137	2029
				Survivors		
Benchmark	males	8	9	10	10	9
	females	406	370	360	372	316
	total	414	378	370	383	325
Mortality	males		9	12	15	16
	females		367	340	343	312
	total		376	353	358	328
Western	males		12	15	16	13
	females		364	352	349	284
	total		376	366	365	297
National 1	males		9	11	13	14
	females		376	370	388	372
	total		385	381	402	386

Figure 15a.

Figure 15b.

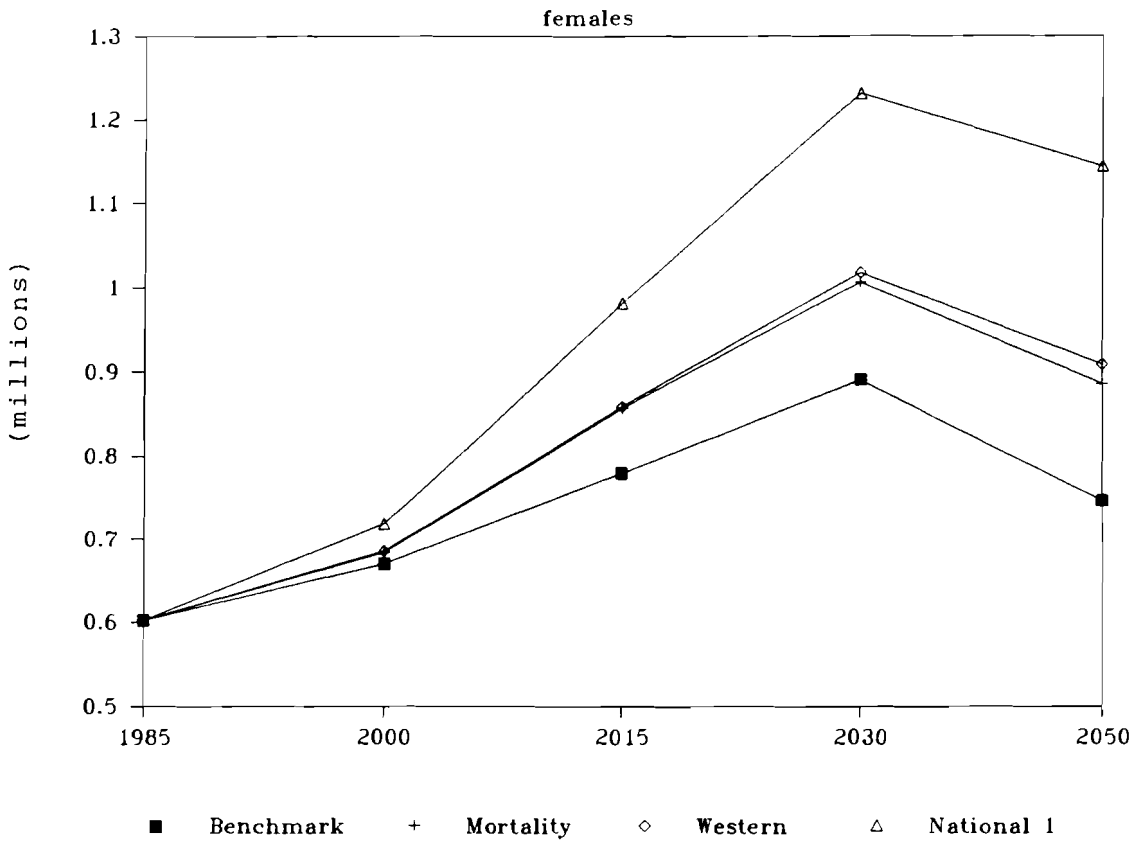
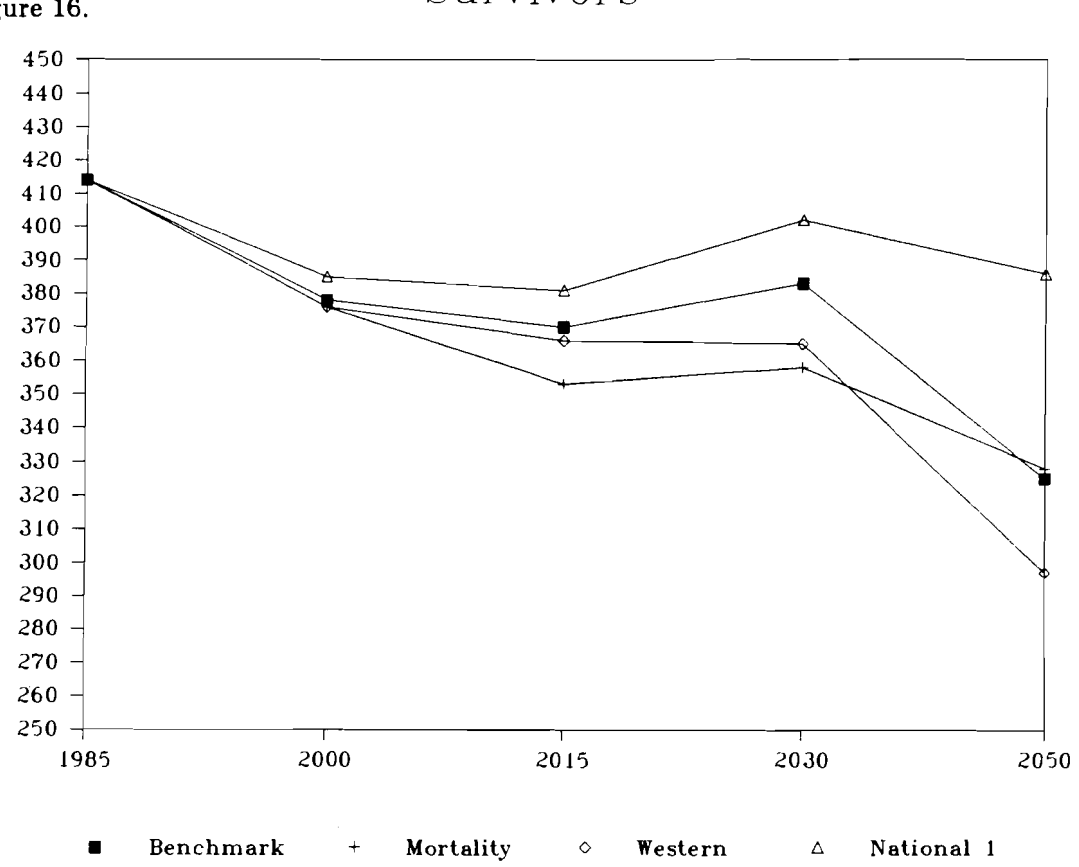


Figure 16.



230,000, namely 5% to 7% will be experienced. Starting in 2015, the fertility scenario diverges from the other demographic scenarios. The size of the labor force would level off at 2.9 million at around 2030 as opposed to 3.3 million in 1985, if fertility would return to replacement level by the year 2005. On the contrary, a steeper fall is indicated under the benchmark, mortality and western scenarios: about 2.6 million actives under all three scenarios in 2030 and respectively 2.1, 2.2 and 1.9 million in 2050 versus 3.3 million in 1985. This clearly illustrates the fact that any further drop in fertility will not have substantial effects on the labor force before 2040.

On the other hand, the assumption of a constant inflow of migrants together with an increase of the participation in the labor force, especially for women, would have a tremendous impact on the number of active as illustrated by Figure 17. The labor force would already reach 4.2 million in 2000 and a maximum of 4.5 million in 2015. Beyond this date, the inflow of migrants does not compensate for the depletion caused by the retirement of the large cohorts of baby boomers, and the labor would decrease to 4.2 million in 2030 and 3.8 million in 2050.

Another main characteristic of future changes in the labor force is its aging after 2015. Evidence of aging can be found in Table 13 which gives the overall activity for males and females. Except for the national scenario, all other scenarios assume constant age-specific activity rates. In 1985, the overall activity rate was 67.7 for males and 42.0 for females. Under the four common scenarios, little variation is observed till 2015. In 2030, the following values are obtained for males: 60.2 under the fertility scenario, 58.8 under the benchmark scenario, 55.2 under the western scenario, and 53.4 under the mor-

Table 12. Size of the labor force, 1985–2030 (constant activity rates).

Scenario		1985	2000	2015	2030	2050
				Absolute (1000s)		
Benchmark	males	1954	1983	1851	1525	1233
	females	1386	1407	1305	1063	851
	total	3340	3390	3156	2588	2084
Fertility	males		1983	1885	1703	1701
	females		1407	1336	1205	1202
	total		3390	3221	2908	2903
Western	males		1992	1864	1479	1074
	females		1436	1384	1100	789
	total		3428	3248	2579	1863
Mortality	males		1996	1899	1582	1293
	females		1410	1315	1075	866
	total		3406	3213	2657	2159
National 1	males		2413	2580	2443	2227
	females		1835	1915	1719	1546
	total		4248	4495	4162	3774
				Index		
Benchmark	males	100	101	95	78	63
	females	100	102	94	77	61
	total	100	101	94	77	62
Fertility	males		101	96	87	87
	females		102	96	87	87
	total		101	96	87	87
Western	males		102	95	76	55
	females		104	100	79	57
	total		103	97	77	56
Mortality	males		102	97	81	66
	females		102	95	78	62
	total		102	96	80	65
National 1	males		123	132	125	114
	females		132	138	124	112
	total		127	135	125	113

Figure 17.

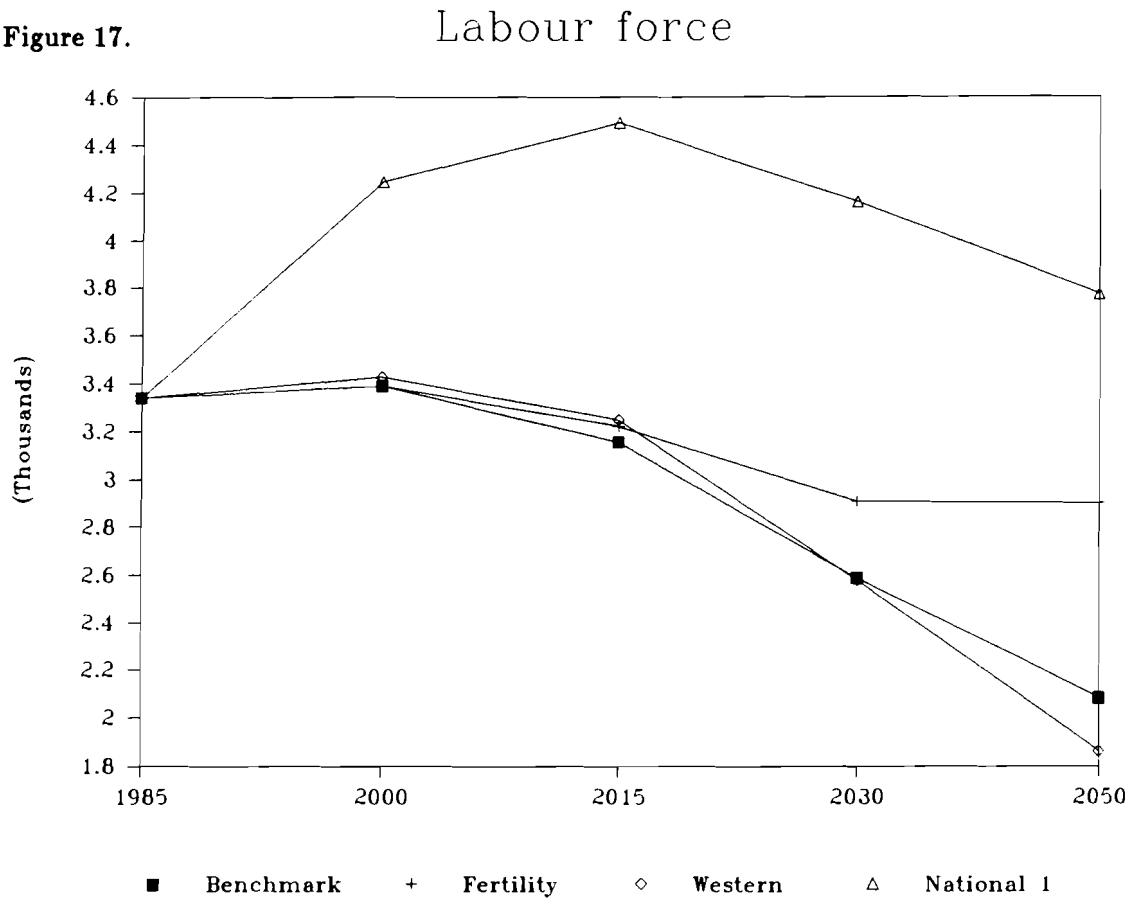


Table 13. Overall activity rate, 1985–2050.

Scenario	1985	2000	2015	2030	2050
			Males		
Benchmark	67.7	67.5	64.5	58.8	58.9
Fertility		67.5	64.4	60.2	63.7
Mortality		66.7	60.9	53.4	51.6
Western		67.0	62.5	55.2	52.1
National 1		78.4	79.0	75.3	74.3
			Females		
Benchmark	42.0	43.5	41.9	37.3	36.7
Fertility		43.5	42.1	39.2	41.8
Mortality		43.0	40.3	35.2	33.9
Western		43.8	42.9	37.5	34.3
National 1		54.5	55.4	50.7	50.0

tality scenario. Corresponding figures for females are 39.2, 37.3, 37.5 and 35.2. Between 2030 and 2050, an additional decrease of about 2/3 percentage points is observed under the benchmark, mortality and western scenarios, while a symmetrical increase is observed under the fertility scenario.

Before going on retirement, the large cohorts of baby boomers pass by ages at which activity rates are fairly low while cohorts at ages of maximum activity are much smaller. Results from the national scenario however show that a constant inflow of migrants together with a limited increase in the level of activity can offset to a great extent the aging of the labor force. Under this scenario, the overall activity rate rises to 78.4 and 54.5 in 2000 respectively for males and females. Between 2000 and 2015, it remains constant, decreases by about 5 percentage points till 2030, and then stabilizes again.

6.4. The ratio contribution/benefits

The impact of future changes in pension expenditures, relative to variations in the labor force, on the financial equilibrium of the system pension is reflected in the ratio contribution/benefits (see Table 14 and Figure 18). In 1985, the pension model gives a value of 0.71 for this ratio, corresponding to a markedly underfunded scheme. However, as already mentioned, assumptions used by the model lead to overestimation of pension expenditures by about 20% in 1985. Therefore, the value of this ratio for 1985 is to be interpreted with caution, and rather changes in the ratio over time will be considered.

Under the benchmark, mortality and western scenarios, the ratio continuously deteriorates over the period 1985–2050. The decrease is first smooth between 1985 and 2000 as little change is observed in both the labor force and the number of retirees. It accelerates between 2000 and 2015, and is even more accentuated between 2015 and 2030. Beyond this date, the decrease continues but is very limited. Values for 2050 are respectively 0.42, 0.33 and 0.32 for the benchmark, mortality and western scenarios. One can note that the strong improvement in mortality, especially for males, as assumed in the mortality scenario, and a smoother improvement combined with a further drop in the TFR to 1.28 would have similar impacts on the pension system. In both cases, the deterioration in the ratio is extremely strong: it is divided by more than 2.

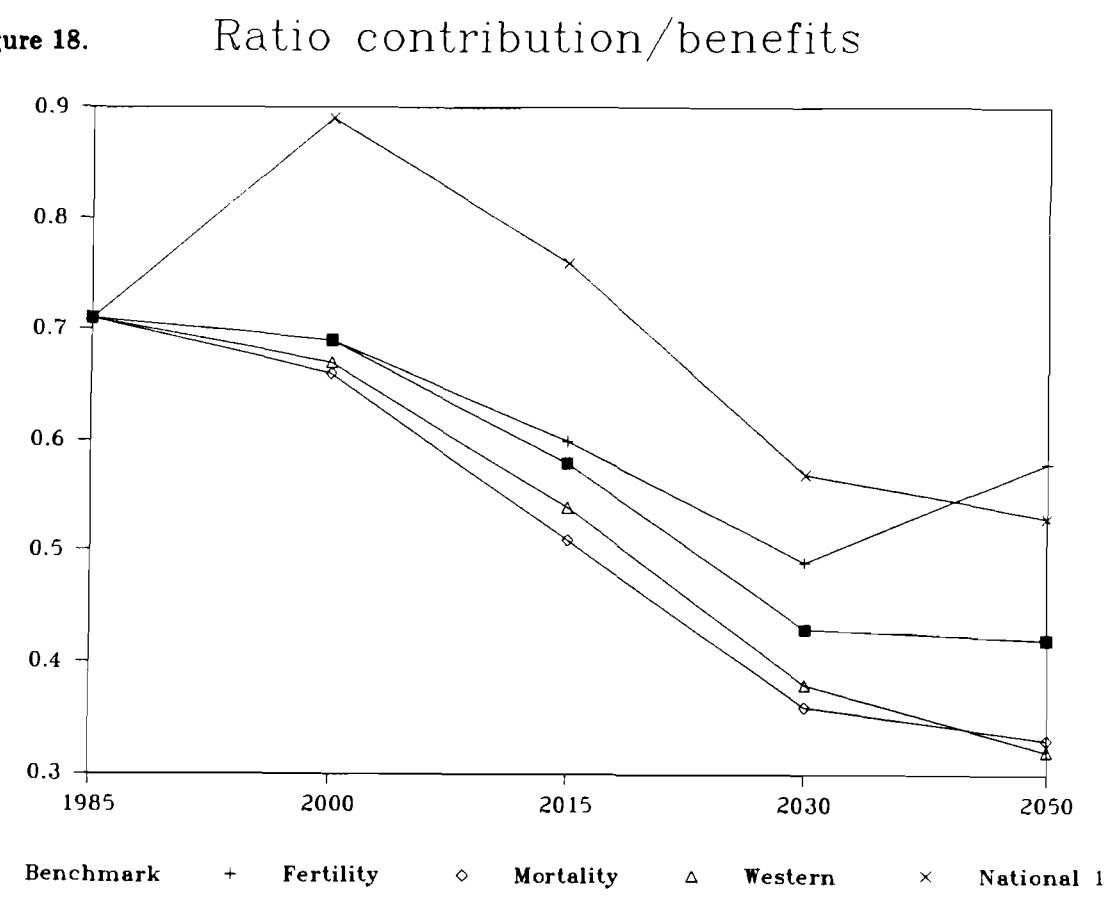
Under the fertility scenario, the pattern of changes is similar till 2030 although the fall is slightly lower. In 2030, the ratio contribution/benefit would be 0.49, which is only 6 percentage points above the benchmark. Beyond this date an improvement is indicated to 0.58. An increase in fertility would thus have limited impact prior to 2030.

Under the national scenario, a strong improvement in the ratio would be experienced till 2000 – to 0.89 – and will be followed by a deterioration between 2000 and 2030. Between 2000 and 2015 the deterioration is similar to the one observed under the other scenarios while between 2015 and 2030, it is obviously much stronger, even if the ratio remains higher – 0.57. Beyond 2030, a small decrease of minus 4 percentage points is indicated. Some calculations assuming no migration indicate better results – 0.62 in 2030 – and show that no benefits would result for the pension system from migration. On the contrary, it would slightly add to the deterioration, as assumed under the national scenario. Indeed, this conclusion depends very much on the level of migration assumed as well as on the age pattern of the migrants. In any case, given the age structure of the Austrian population and the level of fertility, migration seems to have limited possible impact.

Table 14. Ratio contribution/benefits.

Scenario	1985	2000	2015	2030	2050
Benchmark	0.71	0.69	0.58	0.43	0.42
Fertility		0.69	0.60	0.49	0.58
Mortality		0.66	0.51	0.36	0.33
Western		0.67	0.54	0.38	0.32
National 1		0.89	0.76	0.57	0.53

Figure 18.



6.5. Cutting benefits versus increasing contribution

Within the framework of a pay-as-you-go system, financial equilibrium can be reached by either cutting benefits or increasing contribution. Table 15 shows cuts in benefits and contribution rate corresponding to a balanced pension fund over the period 1985–2030 (see also Figure 19).

In 2000, cuts in average benefits would be limited to 3% under the benchmark and fertility scenarios, and 6% and 7% under the western and mortality scenarios as compared with 1985, while they could be increased by 25% under the national scenario. In 2015 cuts would range from 15% under the fertility scenario to 28% under the western scenario, while still a rise of 7% would be possible under the national scenario. In 2030, cuts would be necessary under any scenario and, except under the national scenario – minus 20% – would reach dramatic levels – minus 31% to minus 49%. In 2050, the situation would improve under the fertility scenario – minus "only" 18% – but continue to deteriorate in the other cases: minus 25% under the national scenario and with a maximum of 54/55% under the mortality and western scenarios.

The balanced contribution rate for 1985 as estimated by the model is 31.9%, while the actual rate is 22.7%. Again due to the overestimation of pension expenditures in 1985, this figure does not allow a strict interpretation but rather permits assessment of changes over time. Logically, variations in the contribution rate are symmetric to changes in average benefits and only maximum values desire to be commented. In 2030, in order to have the pension fund balanced, it would be necessary to set the contribution rate equal to 40% of the gross salary under the national scenario, 47% under the fertility scenario, 52% under the benchmark scenario, and about 60/63% under the western and mortality scenarios. And in 2050, figures are worse for the last three scenarios.

If we consider the most critical period, namely around 2030, two conclusions arise from these calculations. First, the "best" situation is, by far, observed under the national scenario. However, this situation corresponds to a marked deterioration in the performance of the pension system – a cut of 20% in benefits or an increase of 10 points in the contribution rate. Second, all other "pure" demographic scenarios result in a similar level of deterioration – 50% cuts in benefits or contributions higher than 60% of gross salary – which cannot be solved, under constant work and retirement conditions, by either cutting benefits or increasing contribution.

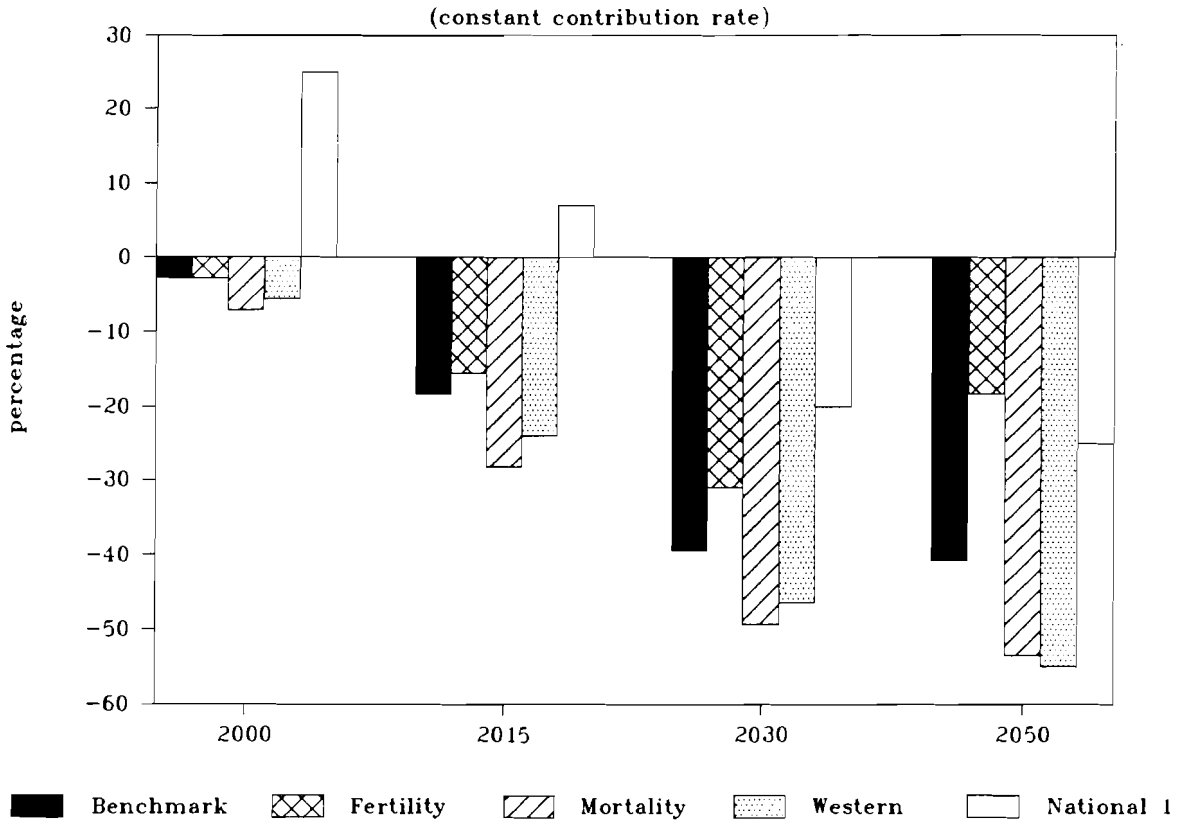
Table 15. Cuts in benefits and contribution rate corresponding to a balanced pension fund, 1985–2030.

Scenario	1985	2000	2015	2030	2050
		Cuts in Benefits[a] (percentage)			
Benchmark		-3	-18	-39	-41
Fertility		-3	-15	-31	-18
Mortality		-7	-28	-49	-54
Western		-6	-24	-46	-55
National 1		+25	+7	-20	-25
		Balanced Contribution Rate[b]			
Benchmark	31.9	33.0	38.9	52.4	53.7
Fertility		33.0	38.1	46.8	39.0
Mortality		34.3	44.5	62.7	68.5
Western		33.7	42.1	60.4	71.3
National 1		25.5	29.9	39.8	42.8

a) As compared with 1985

b) Actual rate 22.7%

Figure 19. Percentage changes in average benefits



7. Impact of Selected Policy Measures

7.1. Increasing the participation in the labor force and age at retirement

The so-called "GDR" scenario assumes that by the year 2005, both males and females would follow the pattern of labor force participation observed in 1985 in the German Democratic Republic, which is characterized by a high participation of women and no difference between marital statuses. The "65" scenario assumed that age at retirement is progressively raised to 65 years by the year 2005 for both males and females and that no survivor pensions are served under age 60.[6] Impacts of both scenarios on the size of the labor force, the number of retirees and the average number of years worked under constant demographic conditions are presented in Tables 16, 17 and 18.

Table 16. Increasing participation in the labor force and age at retirement. Impact on the size of the labor force, 1985–2050 – benchmark scenario.

Scenario		1985	2000	2015	2030	2050
				Size of the Labor Force		
Benchmark	females	1386	1407	1305	1063	851
	males	1954	1983	1851	1525	1233
	total	3340	3390	3156	2588	2084
				Absolute Difference with Benchmark		
			1985–00	2000–15	2015–30	2030–50
"GDR"	females		507	479	404	325
	males		322	319	315	244
	total		829	798	719	569
"65"	females		161	185	179	147
	males		232	256	282	223
	total		393	441	461	370
				Relative Difference (%)		
"GDR"	females		36.0	36.7	38.0	38.2
	males		16.2	17.2	20.7	19.8
	total		24.5	25.3	27.8	27.3
"65"	females		11.4	14.2	16.8	17.3
	males		11.7	13.8	18.5	18.1
	total		11.6	14.0	17.8	17.8

As expected the "GDR" scenario would lead to a strong immediate increase in the number of actives especially among females. By the year 2000, the difference with the benchmark scenario is plus 829,000, of which 507,000 are women. More important, perhaps, is the fact that a rise of 5/6 years in the age of retirement would result in a substantial increase in the size of the labor force which represents almost half – 393,000 – of

[6] Activity rates for the age groups 55–59 and 60–64 were also assumed to have an upward shift.

Table 17. Increasing participation in the labor force and age at retirement. Impact on the number of retirees, 1985–2050 – benchmark scenario.

Scenario		1985	2000	2015	2030	2050
			Number of Retirees (1000s)			
Benchmark	Females	596	675	783	893	749
	males	606	674	722	808	666
	total	1202	1356	1515	1708	1417
			Absolute Changes (1000s)			
"GDR"	females		224	180	178	145
	males		17	59	75	58
	total		241	240	253	203
"65"	females		-236	-291	-309	-240
	males		-253	-258	-266	-214
	total		-490	-550	-575	-454
			Relative Changes (%)			
"GDR"	females		33.2	23.0	19.9	19.3
	males		2.6	8.2	9.3	8.7
	total		17.8	15.8	14.8	14.3
"65"	females		-35.0	-37.2	-34.6	-32.0
	males		-37.6	-35.8	-32.9	-32.2
	total		-36.1	-36.3	-33.7	-32.1

Table 18. Increasing participation in the labor force and age at retirement. Impact on the average number of years worked, 1985–2050 – benchmark scenario.

Scenario		1985	2000	2015	2030	2050
Benchmark	males	40.3	39.4	37.8	36.8	36.6
	females	22.6	23.9	26.2	27.6	27.9
"GDR"	males		42.0	41.5	40.9	40.8
	females		33.5	34.5	34.7	34.6
"65"	males		42.5	42.8	42.0	41.9
	females		25.9	29.7	30.6	30.9

the total increase under the "GDR" scenario. By the year 2030, the bonus for the active population would amount to 28% under the "GDR" scenario and 18% under the "65" scenario.

Because it increases activity level, the "GDR" scenario would result in an increase in the number of retirees, especially female retirees: plus about 15% – 20% for females, less than 10% for males in the long run – compared with the benchmark. On the contrary, the number of retirees would approximatively drop by one-third under the "65" scenario.

Both scenarios also result in an increase in the work record of the retirees and consequently in an increase in entitlements. The increase is immediate and tremendous for women under the "GDR" scenario because of the dramatic rise in the participation in the labor force of the married women: from 22.6 years in 1985 to 33.5 years in 2000 versus 23.9 years under the benchmark scenario. In the short term, this seems to be an artifact but in the longer term, differences in entitlements would become real: 34.7 years versus 30.6 years under the "65" scenario and 25.6 years under the benchmark in 2030. The increase is more limited for males with a maximum of 42.0 years in 2015 for the "GDR" scenario and 42.8 years in 2030 for the "65" scenario, but contrasts with the decrease which would be observed under the benchmark scenario of 36.8 years in 2030.

The combined influence of changes in both the number of retirees and work records on total expenditures is summarized in Table 19. Under the "GDR" scenario, total expenditures would increase by 12/14% in comparison with the benchmark scenario – mostly due to the increase in benefits for women – while under the "65" scenario, the total benefits would be lower than under the benchmark scenario by between 29% in 2000 to 20% in 2050.

Table 20 shows the overall impact of both scenarios on the ratio contribution/benefits. The bonus from the "GDR" scenario as compared with the benchmark scenario turns out to be small and represents only 3/4 percentage points – 0.48 versus 0.43 in 2030. On the contrary, the "65" scenario brings about a strong improvement in the ratio contributions/benefits. In 2000, the scheme would be overfunded – ratio 1.08 – and the ratio would remain above its 1985 level till about 2020, and in 2030 would be lower by only 6 percentage points under the 1985 level. Alternatively, this corresponds to a 10% cut in benefits. In other words, under constant demographic conditions, raising age at retirement to age 65 would to a great extent solve the pension problem.

7.2. Contributory versus pay-as-you-go systems

Under the worse conditions for the pension system, namely the mortality scenario, a contribution rate of 65.3% would be necessary to balance the fund in 2030. Would a complementary contributory-based pension scheme perform better in Austria? Such a scheme is advantageous if the insurance premium is less than the corresponding increase in contribution under the pay-as-you-go (PAYG) system. Calculations have been carried out under two options: a) the scheme is run on a non-profitable basis and the whole principal and interests go to the insured; b) the scheme is run on a profitable basis by an insurance company which only refunds half of the principal. Both options were tested for three levels of real interest rate: 1%, 2% and 3% and assuming every active starts savings for pensions in 1990.

Balanced contribution rates under both the pure PAYG and the mixed systems for the year 2030 are presented in Table 21 for each sex and marital status for women. Under a contributory-based system, differences in contribution arise from differences in the number of years worked and thus in the principle saved.

Table 19. Increasing participation in the labor force and age at retirement. Impact on total benefits, 1985–2050 – benchmark scenario.

Scenario		1985	2000	2015	2030	2050
			Total Benefits (millions of schillings)			
Benchmark	males	110239	123345	136185	149769	120769
	females	107606	105819	114997	128668	109014
	total	217845	229164	251182	278437	229783
			Absolute Changes			
"GDR"	males		7195	3247	1883	4854
	females		24854	31461	34279	23892
	total		32049	34708	36161	28747
"65"	males		-39583	-40677	-42164	-26684
	females		-26349	-19448	-18509	-18321
	total		-65933	-60125	-60672	-45004
			Relative Changes (%)			
"GDR"	males		5.8	2.4	1.3	4.0
	females		23.5	27.4	26.6	21.9
	total		14.0	13.8	13.0	12.5
"65"	males		-32.1	-29.9	-28.2	-22.1
	females		-24.9	-16.9	-14.4	-16.8
	total		-28.8	-23.9	-21.8	-19.6

Table 20. Increasing participation in the labor force and age at retirement. Impact on the ratio contribution/benefits, 1985–2050.

Scenario	1985	2000	2015	2030	2050
Benchmark	0.71	0.69	0.58	0.43	0.42
"GDR"		0.73	0.63	0.48	0.47
"65"		1.08	0.88	0.65	0.62

Table 21. Contribution rates corresponding to fully-funded pension schemes in 2030.

Sex/ Marital Status	Pure Pay-as-You-Go System	Pay-as-You-Go + Complementary Private Insurance				Difference	
		Share of the Principal Returned	Rate of Interest 1%	2%	3%	1%	2%	3%
Males	65.3	all	39.0	34.9	31.8	-26.3	-30.4	-33.5
	65.3	half	49.9	40.8	35.1	-15.4	-24.5	-30.2
Females								
Single	65.3	all	37.4	33.8	31.0	-27.9	-31.5	-34.3
	65.3	half	46.8	38.6	33.6	-18.5	-26.7	-31.7
Married	65.3	all	44.2	39.8	36.3	-21.1	-25.5	-29.0
	65.3	half	58.0	47.3	40.6	-7.3	-18.0	-24.7
Divorced	65.3	all	39.2	35.4	32.4	-26.1	-29.9	-32.9
	65.3	half	49.8	41.0	35.5	-15.5	-24.3	-29.8
Widowed	65.3	all	43.3	39.0	35.6	-22.0	-26.3	-29.7
	65.3	half	56.4	46.1	39.6	-8.9	-19.2	-25.7

A first conclusion is that in 2030, the mixed system performs better than the PAYG system for both sexes and marital statuses. However, calculations for other years show that it only performs better for both sexes and marital statuses starting in the 2020s with a rate of interest of 3%, and in the 2030s with a rate of interest of 1%. Prior to this date retirees would get more from the existing PAYG system.

A second conclusion is that contribution rates are still very high under the mixed-system: 39% for males and between 37% and 44% for females, if the scheme is non-profitable and with a 1% interest rate. With a real rate of interest of 3%, all contribution rates are between 31% and 36%. If the scheme is profitable, it requires contribution rates between 47% and 58% at 1%, and between 34% and 40% at 3%. Therefore, a mixed system including a complementary contributory-based pension scheme would not provide any real solution to the pension problem in Austria.

8. Conclusion

The use of dynamic projections of the population by marital status combined with the scenario method brings new insights to future aging of the Austrian population as well as depicting the consequences for the State pension system. Despite existing uncertainty regarding future demographic trends, it shows that clear conclusions can be reached.

The aging of the Austrian population is certain. Neither an increase in fertility nor an inflow of migrants could offset the reshaping of the age pyramid due to the large cohorts of baby boomers. Under constant demographic conditions, the OADR would be 35.6 in 2030 versus 21.2 in 1985. If fertility would return to replacement level in the short term, the OADR would only be lowered by 3.6 percentage points in 2030. The same limited impact is observed for migration which, under the national scenario, adds to aging and

plays a negative role. In both cases, substantial impacts would require extreme and unrealistic values. Consequently, the amount of aging mostly depends on the future of mortality. The low mortality scenario indicates upward differences of 35% in the size of the elderly population, and about 10 percentage points in the OADR by the year 2030. But no one can tell if this is an upper limit. On the contrary, the time path of aging is well ascertained: maximum aging will occur between 2015 and 2030 and will slow down considerably thereafter. Also, it is certain that aging will be accompanied by substantial changes in the marital composition of the elderly. The proportion single and divorced will markedly increase, even under constant nuptiality, and reach 22–25% for both males and females aged 60 and over. At the same time, the proportion males married will strongly decrease from more than 75% in 1985 to about 60% under constant nuptiality, while the proportion widowed will remain approximatively constant. On the contrary, the proportion female widows will decrease from about 50% to 30%–40% depending on future male mortality. Corollarily, slightly more aged women will be married than at present – 35%.

Parallel to aging and due to recent changes in the working behavior, average work records will decrease for males from about 40 years in 1985 to about 37 years around 2030 assuming constant participation in the labor force, and strongly increase for females from about 23 to 28 years. As a consequence, every other thing being constant, average benefits will decrease by about 10% for males and increase by more than 20% for females. In addition, a greater proportion of women will claim for old-age benefits. However, little variation is to be expected in the strong discrepancies in entitlements observed at present between unmarried and married women if working behaviors remain unchanged.

Whether expressed in terms of cuts in average benefits or raises in contribution rates, the overall impact of socio-demographic changes on the performance of the State pension system looks dramatic. In order to balance the pension fund, assuming constant working and retirement behaviors, it would be necessary in 2030 to decrease average benefits by about 50% or, equivalently, the balance contribution rate would amount to 60% of the gross salary.

Simulations of different "policy measures" lead to strongly contrasted findings. First, an alternative contributory-based supplementary pension scheme would not bring any real solution, and would generate much discrepancy among women. Second, a rising level of activity, especially for women, would have limited impact: it certainly improves the contributions, but in the long run it leads to a tremendous rise in entitlements. Third, an increase in the mean age at retirement to about 65 years is by far the most efficient "solution" in the case of Austria. Under constant demographic conditions, it almost completely solves the pension problem. Indeed, it is certainly the combination of increasing age at retirement and participation in the labor force, as illustrated by the national scenario, which would give the best results. However, it should be pointed out that this disregards whether a policy aimed at increasing age at retirement has some economic rationale, and if a positive behavioral response can be expected from the mass of workers.