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Chapter Author: Pierre Pestieau, Jean-Philippe Stijns

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1 Social Security and Retirement in Belgium

Pierre Pestieau and Jean-Philippe Stijns

The future of Belgian social security is gloomy for a number of reasons pertaining to macroeconomic, demographic, and political factors. The unemployment rate is about 10 percent and should remain at that level for some time. In spite of recurrent programs to correct the marked imbalance in public finances, the ratio of debt to GNP is still about 130 percent. The ratio between those over sixty years of age and those of working age is expected to double between now and 2030. Finally, the Belgian political process makes any long-term policy reform difficult.

Social security benefit payments in 1990 amounted to 10.60 percent of GDP; this can be contrasted with 5.75 percent in 1961 and 6.46 percent in 1970. In 2048, all other things being equal, the aging of the population will push social security expenditure up by 63 percent. If such an increase cannot be supported, benefits will have to be cut drastically. It is forecast that the poverty rate among elderly people could then jump from the current 4.5 percent to 40 percent by 2040 (Delhausse, Perelman, and Pestieau 1996).

Among the reform options contemplated is a range of measures aimed at increasing the effective participation rate of people over age fifty and eventually raising both the age at which one can draw social security benefits (sixty) and the mandatory retirement age (sixty-five). In that respect, it is crucial to understand the interaction between social security and more generally social

Pierre Pestieau is professor of economics at the University of Liège and a research associate at the Center for Operations Research and Econometrics (CORE) and Delta, Paris. Jean-Philippe Stijns is a researcher at the Centre de Recherche en Economie Publique et de la Population (CREPP), University of Liège.

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insurance, on the one hand, and the labor force behavior of older Belgians, on the other hand. The purpose of this paper is to provide such an understanding.

This paper is divided into three sections. First, we present the relevant evidence on the labor market for older persons in Belgium. Second, we survey the main features of the Belgian social security system, providing some key figures, summarizing the relevant institutional details, and relating the latter to labor market evidence. In the third section, we present a simulation model aimed at assessing the retirement incentives underlying the Belgian social security system. In the appendix, we provide information on data sources, present a brief cross-country comparison, review previous empirical studies, and give an illustration of the fiscal treatment of retirement income.

Before proceeding, two remarks are in order. First, it is important to note that sections 1.1 and 1.3 do not rely on the same institutional setting. Section 1.3 is based on the current social security system after its most recent reform, outlined in section 1.2. The labor market behavior described in section 1.1 is influenced by institutional features some of which have now disappeared (for further discussion, see the appendix).

Second, two types of data are utilized in this study: those from surveys and those from administrative sources. In the first the observation unit is the individual or the household, in the second the benefit received: pension, unemployment compensation, or disability insurance payment. In the latter case, there is the possibility of double-counting as the same individual can draw benefits from two or even three retirement schemes.[1] In order to work with these figures, we had to normalize them.

1.1 The Labor Market Behavior of Older Persons in Belgium

1.1.1 Historical Trends

Figures 1.1 and 1.2 graph the labor force participation rates of men and women in different age groups since 1947. We focus on four age groups. For men, there is a decline in the labor force participation of all these groups. However, since the early 1990s, one observes a slight upturn. The most important drop concerns the age group sixty to sixty-four and to a lesser extent the age group fifty-five to fifty-nine. Note that, for both men and women over age sixty, the participation rate is negligible, at least as officially recorded. As we show below (figs. 1.7 and 1.8), most of the decline in participation rates before age sixty is due to mandatory early retirement programs (*prépension*) (for further discussion, see sec. 1.2.6).

The female labor force experienced a contrasting evolution. Indeed, there

1. Most commonly, pension receipts from public and private social security systems. However, the various types of social insurance are mutually exclusive in Belgium.

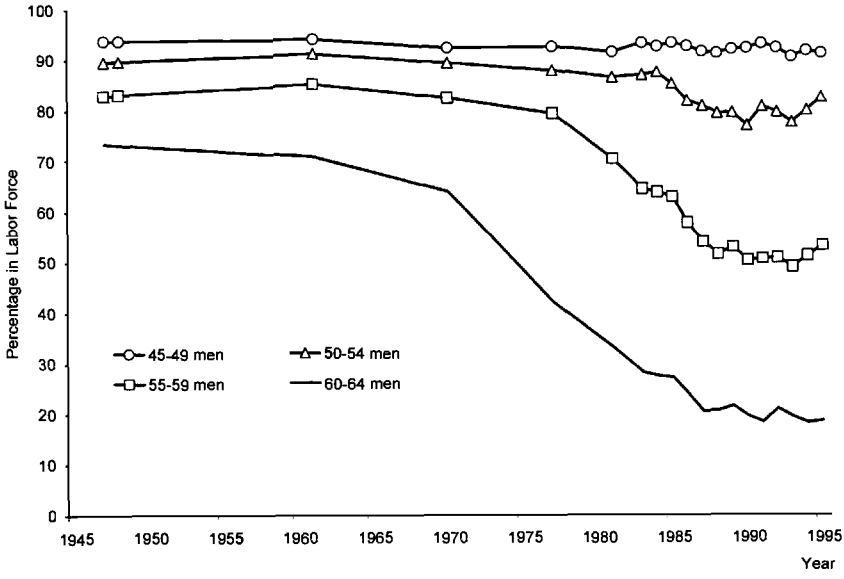

Fig. 1.1 Historical trends in the labor force participation of older men
Source: Federal Planning Bureau and Institut National de Statistique.

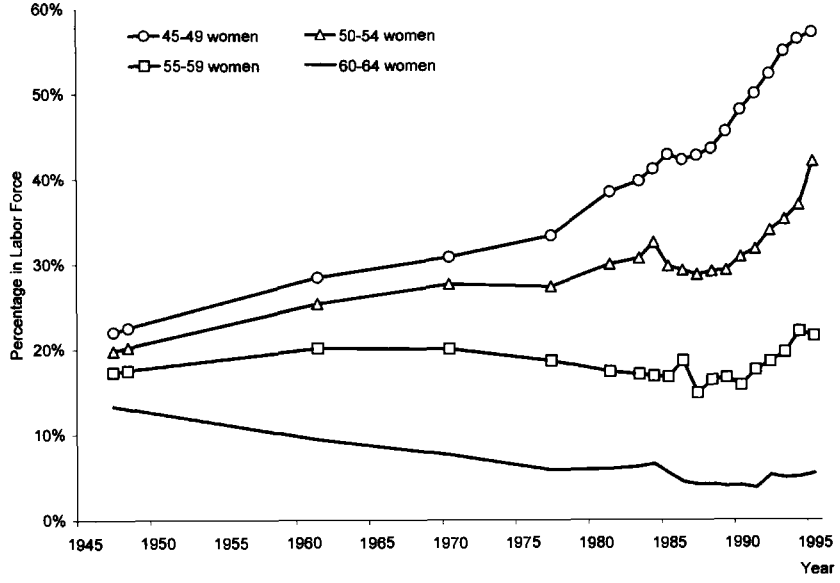

Fig. 1.2 Historical trends in the labor force participation of older women
Source: Federal Planning Bureau and Institut National de Statistique.

are two opposite trends: a structural trend of increasing participation and a downward trend similar to that of men that is the result of an explicit policy aimed at forcing elderly workers out of the labor force. For the youngest age groups, those between age forty-five and age fifty-four, participation is rising; for the oldest group, it is declining. For the intermediate age group, fifty-five to fifty-nine, one observes a contrasting evolution: a decline up to the mid-1980s, then an increase. The increase in the labor force participation of women aged fifty-five to fifty-nine is particularly marked since 1992. Whereas before 1992 women were allowed to retire as early as age fifty-five and retirement was mandatory at age sixty, in 1992 the early retirement age was raised to sixty and the mandatory retirement age to sixty-five—an attempt to restore parity to the rules governing men's and women's retirement behavior.

To explain this trend in labor market participation, it is tempting to consider the extent of social security generosity and particularly its evolution over time. Two remarks here are in order. First, given that in general there is no way to draw social security benefits before age sixty, earlier retirement is financed by unemployment insurance, disability insurance, or mandatory sectoral programs of early retirement. Second, such low participation rates can be explained not only in terms of secular trends witnessed elsewhere but also as a consequence of an unprecedentedly high level of unemployment.

In Belgium, since 1956, the entire workforce is covered by the social security system and more generally by the various social insurance schemes. To measure the generosity of social insurance, we can use the increasing percentage of men (fig. 1.3) and women (fig. 1.4) drawing social security, disability insurance, and mandatory early retirement benefits. The increase is impressive. Fewer than 40 percent of men and 37 percent of women over age fifty-five in 1961 drew such benefits, whereas more than 80 percent of men and 66 percent of women over age fifty-five in 1995 did so.

Another way to assess the generosity of benefit payments over time is to consider the evolution of the replacement rate. We use as an indicator of gross replacement the ratio of average full career pension over average wage (see the appendix). This is far from giving an accurate picture of what is going on, however. Hence, in figure 1.5 we also give the net replacement rate for a couple with one wage earner—which is much higher than the gross rate. In 1994, the gross rate was 0.55 and the net rate 0.85. Wage incomes are subject to high payroll taxes and progressive income taxes, whereas pension benefits are hardly taxed (there is an important tax exemption on the income tax and a very small payroll tax). As shown in figure 1.5, the net replacement rate was quite steady until 1982 and then increased rapidly. Lately, there has been a trend toward taxing retirement income. One can thus expect that the gap between net and gross replacement rates will narrow.

Table 1.1 provides net replacement rates for alternative cases with respect to wage level and marital status. It clearly appears that the net replacement rate reaches its highest level for low-wage, single-earner households (0.91). High-

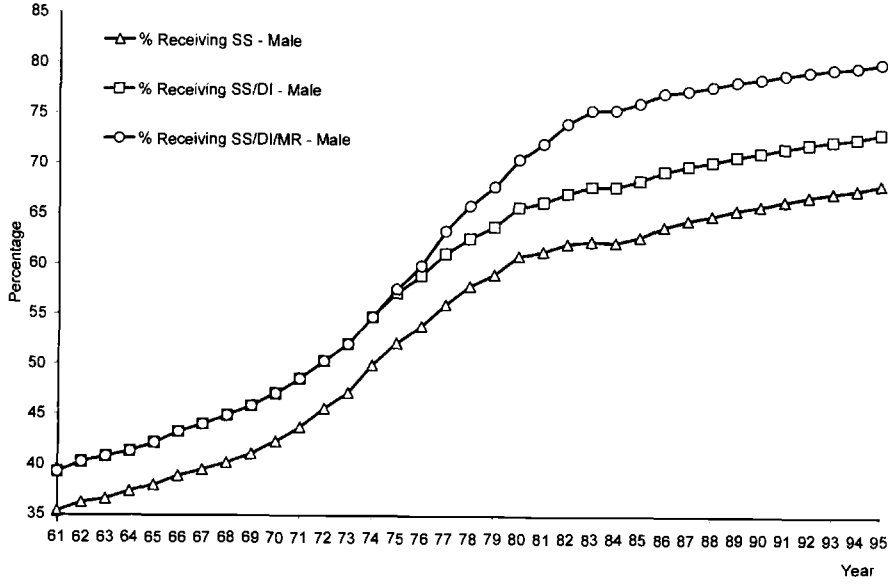

Fig. 1.3 Receipt of social security (SS), disability insurance (DI), and mandatory retirement (MR), age 55 and over, males
Source: Bouillot and Perelman (1995); own computations.

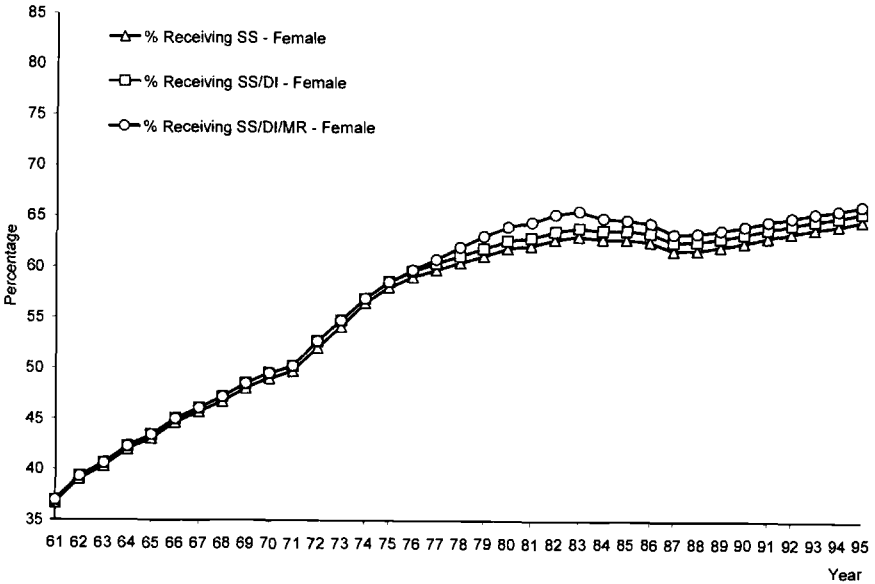

Fig. 1.4 Receipt of social security (SS), disability insurance (DI), and mandatory retirement (MR), age 55 and over, females
Source: Bouillot and Perelman (1995); own computations.

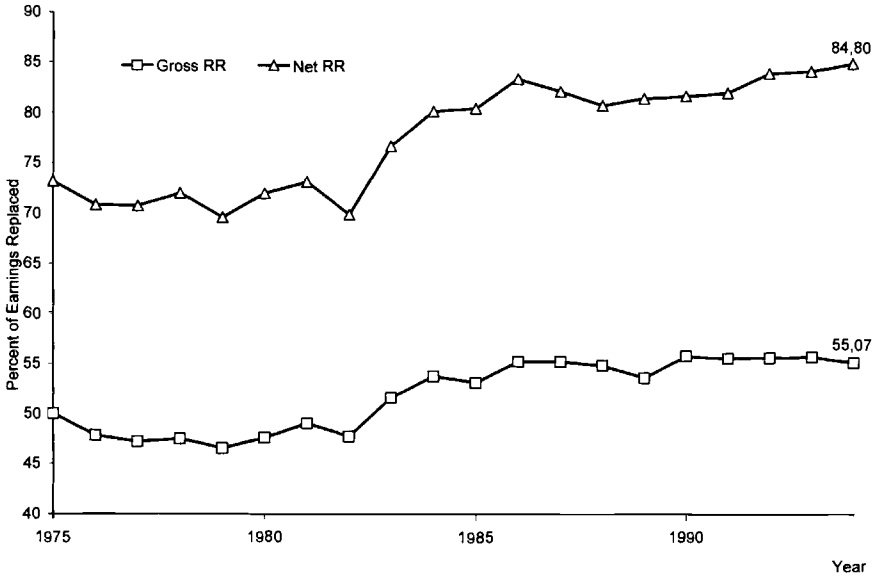

Fig. 1.5 Social security replacement rates (RRs) over time
Source: Own computations.

Table 1.1 Net Rates of Replacement in 1991, Complete Career

	Workers in the Household[a]					
	2			1		
Wage ratio to average wage	⅔	1	2	⅔	1	2
Replacement ratio (%)	81	73	53	91	80	60

Source: EUROSTAT (1992).
[a]The rate is the same for a single and for a married person whose spouse works as well.

wage households where the wage earner is single or where both the husband and the wife work show a much lower replacement ratio (0.53).

Comparing the time-series patterns of labor force participation and those of net replacement rates yields a mixed picture. On the one hand, there is some negative correlation between the generosity of the program and the labor force participation of men and, to a lesser extent, women aged sixty to sixty-five, but the correlation is far from perfect. Furthermore, one must look elsewhere for the reasons for the decline in labor force participation among those aged fifty to sixty. As we shall see, over the last several decades Belgium has induced or even forced large numbers of older workers to retire in order to open up jobs for the young.

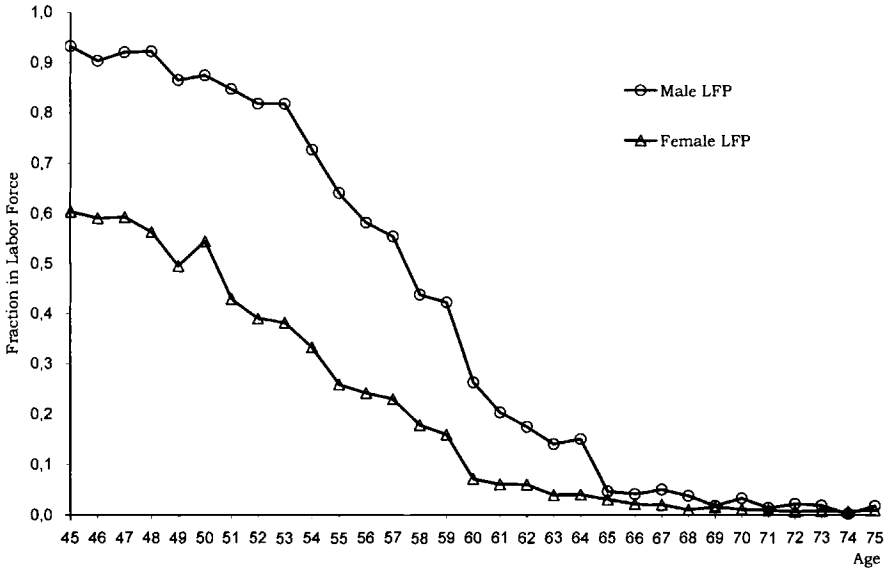

Fig. 1.6 Labor force participation (LFP) rates by age and sex
Source: Institut National de Statistique.

1.1.2 Labor Market Behavior in 1995

By focusing on the most recent period, one can get a clearer and more complete picture of labor market behavior as well as of the generosity of social security and other programs. The age pattern of participation for men and women is depicted in figure 1.6. At age forty-five, the participation rate of men is close to 94 percent, much higher than that of women (60 percent). There is then a continuous gradual decline for women; for men, the decline is slow until age fifty-two, at which point the pace steepens. Hence, the participation gap closes substantially by age sixty. By age seventy, participation rates are negligible for both sexes.

Figure 1.7 considers in more detail the allocation of time among men as they age, by distinguishing alternative social insurance statuses: (i) employed; (ii) unemployed; (iii) disabled; (iv) benefiting from an early retirement scheme; and (v) retired. The bottom line shows the share of men employed. The rate of employment declines slowly after age forty-eight, then at a higher pace after age fifty-three, reaching 50 percent at age fifty-seven. Mainly the self-employed work beyond age sixty-five.

First, from age forty-six to age sixty-five, the rate of unemployment appears quite stable. In reality, relatively more older workers than younger workers are unemployed, but most workers over age fifty-five are not included in government unemployment statistics. Nonemployment is also taken care of by disability insurance and particularly mandatory early retirement programs, to

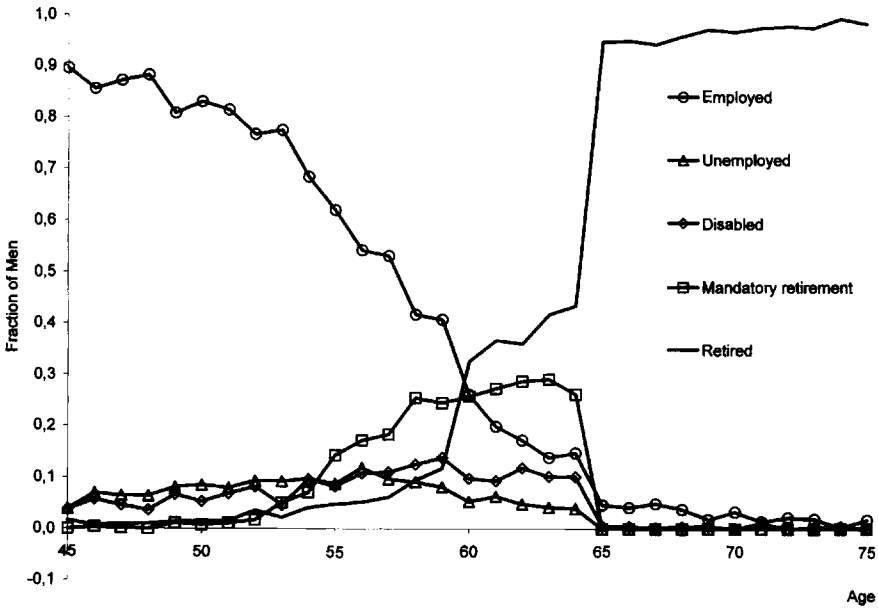

Fig. 1.7 Distribution of activities of men by age
Source: Institut National de Statistique, Labor Force Survey 1995.

which we return in section 1.2.6. The percentage of retirees under age sixty may be surprising (although still low). Apart from the usual statistical noise found in surveys, the majority of unemployed persons age fifty-five and over are not included in unemployment statistics and are classified as retired. Naturally, the number of pensioners increases quickly between age sixty and age sixty-five.

The same exercise is repeated for women in figure 1.8. Not surprisingly, the rate of employment is much lower for women than for men and declines quickly over age sixty. First, while women over age sixty are legally permitted to work, many are entitled to full benefits. Second, unemployment benefits are not available to women over age sixty, no matter how many years of service they have on record. Since until 1992 women could draw retirement benefits as early as age fifty-five, the share of pensioners in 1995 is still important for women aged fifty-eight and over. Another interesting feature is the share of women classified in other "statuses," most likely housework.

1.1.3 Income Sources of Older Persons

Figure 1.9 graphs the various sources of income of older households. Since our data come from the CSB (Centrum voor Sociaal Beleid, Universiteit Antwerpen) Panel of Belgian Households, the unit is the household, and the age is that of the head of the family. We consider the distribution of income across

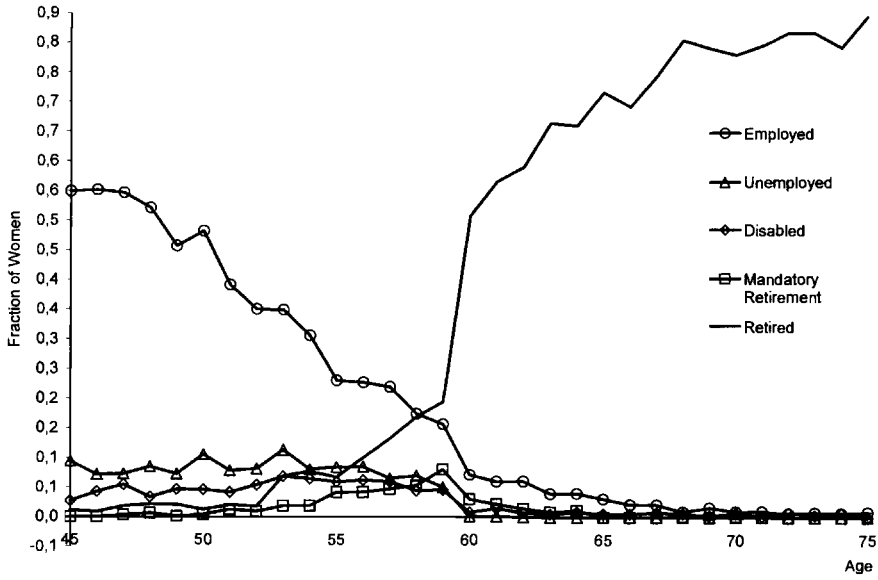

Fig. 1.8 Distribution of activities of women by age
Source: Institut National de Statistique, Labor Force Survey 1995.

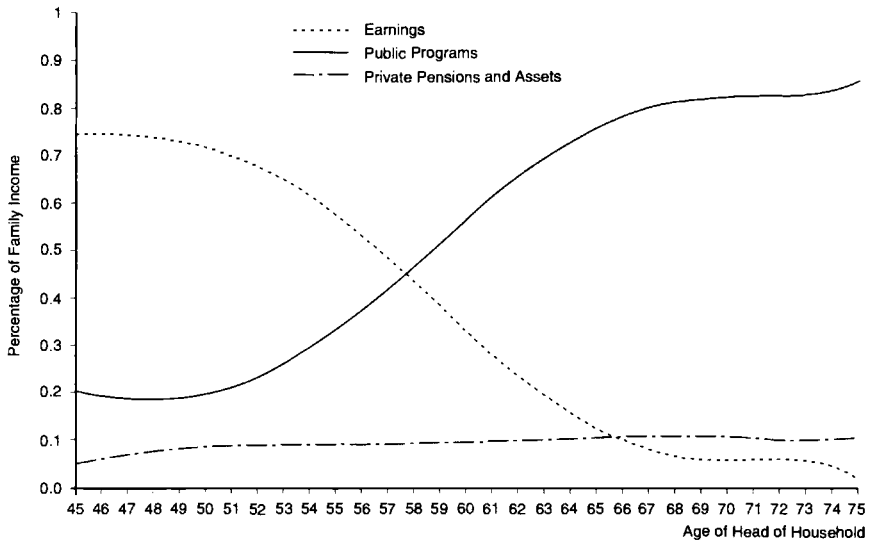

Fig. 1.9 Breakdown of source of family income
Source: Own computations; Centrum voor Sociaal Beleid, Universiteit Antwerpen.

three sources: earnings, social security and maintenance income, and capital income including private (occupational) pensions. Private pension income is indeed very small and cannot be distinguished from the return on other financial investments. The predominance of public programs among the resources of older persons is quite striking.

1.2 Key Features of the Belgian Social Security System

1.2.1 A Complex System

Belgium has three major pension schemes, one for public employees, one for the self-employed, and one for employees in the private sector (see also OECD 1994; and de Callataÿ and Turtelboom 1997). These are supplemented by a welfare scheme guaranteeing a minimum old age pension and by mandatory early retirement programs. Although these schemes operate under quite different rules for benefits and contributions, they are characterized by heavy government intervention and are financially unfunded.

In addition to these schemes, which are known as the first pillar of the pension system, private retirement accounts are also available; they are funded and financed by employers (the second pillar) or individual savings (the third pillar). These parallel schemes benefit from tax breaks; they are by no means obligatory. In any case, so far they have been limited in size: assets of private pension funds amount to only about 10 percent of GDP (EEC 1994), whereas social security pension rights represent more than 250 percent (Bouillot and Perelman 1995; OECD 1994). Table 1.2 provides data on average benefits and number of pensioners for the three major social security schemes plus the guaranteed minimum pension and the mandatory early retirement schemes.

Private-sector employees represent by far the most important category in terms of overall benefits and number of pensioners. They are the main focus of our study. Civil servants have on average the highest retirement benefits.

Table 1.2 **Categories of Pensions Schemes, 1995**

	Benefits as % of GDP	Number of Pensioners (1,000)[a]	Average Amount in Relative Terms
Private-sector employees	5.72	1,347	87.3
Self-employed	.71	246	59.1
Mandatory early retirement	.64	128	102.8
Minimum old age pensioners	.14	50	56.7
Public-sector employees	3.38	405	170.7
All schemes	10.59	2,175	100.0

Sources: Bouillot and Perelman (1995); own calculations.

[a]Including surviving spouses. There is the possibility of double-counting.

1.2.2 Private-Sector Employees

Employee pensions were organized in the private sector much later than in the public sector. Prior to 1924, an optional insurance subsidized by the government allowed interested workers to accumulate capital in a savings bank, the Caisse d'Epargne et de Retraite (CGER). In 1926, a compulsory funded scheme came into effect. After the Second World War, this system was gradually replaced, first by a mixed system, then by an exclusively pay-as-you-go system in 1967.

Private-sector pensions are financed mainly by payroll taxes and marginally by government transfers (the latter represent about 11 percent of overall benefits). In contrast to benefits, there is no limit on contributions. Payroll tax rates are 7.5 percent for employees and 8.86 percent for employers.

Private-sector employees can retire between the ages of sixty and sixty-five; they are entitled to a pension provided that they have fulfilled two-thirds of a complete career of forty-five years, that is, provided that they have worked for at least thirty years. The pension is based on salary during the entire career, length of the career, and an accrual factor that depends on marital status when retired. The pension benefit formula for private-sector employees can be sketched by the following equation, which assumes no employment history interruption but a career of x (≤ 45) years:

$$B_m = \frac{x}{45} 0.75y, \quad \text{for married pensioners with only one pension,}$$

or

$$B_s = \frac{x}{45} 0.60y, \quad \begin{array}{l}\text{for a household with more than one pension,} \\ \text{or for a single pensioner,}\end{array}$$

where y is the average of earnings duly indexed. In x as in y, years of unemployment or of sickness are accounted for as "years of career."[2] Surviving spouses receive B_s; they are treated as a single pensioner.[3] There are floors and ceilings: in 1996, the minimum household pension amounted to 56 percent of average net wages, and pensionable earnings are subject to a low ceiling, only 20 percent above average gross wages.

Both pensions and the ceiling are indexed to consumer prices. Occasional discretionary increases reflect wage growth; the last such increase was granted in 1991. The frequency of discretionary increases is unclear. Whether they must occur every other year is very rarely debated. This is not the only instance

2. Before 1996, women received a full pension for a forty-year career; they are now subject to the same regulations as men but will enjoy a transition period (of thirteen years). Before 1992, the pension was reduced by 5 percent for each year of retirement before the official retirement age.

3. Survival benefits are prorated with respect to the maximum number of years the late worker could have possibly worked from the age of twenty (relative maximum and minimum numbers apply, however).

when ambiguity is built into the system for political reasons. Minimum pensions are also linked to the consumer price index and are increased regularly.

1.2.3 Public-Sector Pensions

The social security scheme for public employees is the oldest.[4] Pensions are paid out of the general government budget. Public employees are taxed for the survivor's pension scheme at a rate of only 7.5 percent. Civil servants' retirement benefits are viewed as deferred income.

The mandatory retirement age is now sixty-five for both men and women. However, it is possible to opt for an incomplete career and take retirement at age sixty. Further, the legal retirement age is sixty or even younger for certain sectors of the workforce (e.g., teachers, military personnel).

Pension benefits are the product of the reference salary (the average salary for the five years preceding retirement), the number of years of service, and a benefit accrual factor (*tantième*), which ranges from one-thirtieth for university professors and magistrates to one-sixtieth for most civil servants. The product of career length and the accrual factor represents the nominal replacement rate, which cannot exceed 75 percent of the reference salary.

In addition to this limit, the civil servants' pension cannot exceed an absolute ceiling, about three times average net wages in 1995. There is also a floor equivalent to 56 percent of mean net wages for a single civil servant and 70 percent for a married civil servant. Except when computing this minimum pension, the household structure does not matter.

Finally, public-sector pensions are automatically indexed to salaries (*péréquation*); in other words, public-sector pensioners share in the economic growth that occurs during their retirement.

1.2.4 The Self-Employed

In 1956, compulsory insurance was set up for the self-employed, with proportional contributions giving the right to a fixed pension based on the number of years worked. In 1984, this fixed-rate system was replaced by one calculated proportionally on actual earnings. Expenses are covered by individual contributions[5] and an annual government transfer of funds (37 percent of overall benefits) from general revenues.

Pensions can be taken as early as age sixty, but the pension for men is reduced by 5 percent annually up to age sixty-five. The self-employed are also still subject to the rules applied to private-sector employees before 1992, except that imputed incomes are still used for years prior 1984.

4. Dating back to the law of 21 July 1844 covering civil and ecclesiastical pensions. The scheme as it stands today covers civil servants in the federal government and in the regional and local authorities and employees in certain public enterprises.

5. The rate is 16.7 percent for incomes below BF 1.8 million and 12.27 percent for incomes above.

1.2.5 Fiscal Treatment of Pension Benefits

Direct taxes on social security income are low in Belgium owing to the allowance of a large tax deduction. Payroll taxes are very low and concern only very high pensions. Beneficiaries receiving the highest pension benefits in the private sector are subject to an average tax rate of 9.8 percent—if there is no other income. First, note that public-sector retirees draw relatively higher benefits and pay much higher taxes. Second, the 9.8 percent rate applies only to households without additional sources of income. (The appendix provides more details.)

1.2.6 Mandatory Early Retirement

Compared to the United States and, to a lesser extent, other European Union countries, the social treatment of elderly workers in Belgium has two main original features: mandatory early retirement plans are widespread for those under sixty, the age of eligibility for social security benefits, and civil servants (by law) and public-sector employees (by collective agreement) cannot work after the mandatory retirement age of sixty-five. The minimum legal age for mandatory early retirement is sixty for workers in industries without a collective agreement (involving employers'/employees' joint responsibilities) and fifty-eight for workers covered by newly concluded collective agreements. If a preexisting collective agreement is renewed, lower minimum mandatory retirement ages are allowed than would be imposed by current law. The employer is normally required to hire one (usually younger) unemployed worker in the place of each retired worker.

The minimum age for mandatory retirement can be lowered to fifty in industries experiencing structural problems. These industries also need not replace the retired worker—an exemption granted by the government on a case-by-case basis.

This somewhat ad hoc system leads to a large variety of mandatory early retirement ages. In any case, mandatory early retirement implies that workers cannot draw social security benefits before the age of sixty-five (sixty for female workers).[6] Benefits are, however, computed as if workers had kept their jobs until the regular retirement age. These schemes are cofinanced by the employer and the government through unemployment compensation. The employer must pay the worker half the difference between unemployment compensation and the worker's former net wages.[7]

Table 1.3 shows the evolution of mandatory retirement as a percentage of population since 1985. Mandatory retirement programs concern only private-sector employees. They date back to 1976; their overall importance has been

6. The difference in the treatment of female and male workers will disappear, as a result of the 1996 reform, as the social security rules are gradually changed to achieve parity across genders.

7. Pensionable earnings are subject to a ceiling, and minimum benefits are defined by collective agreement. Fiscal rules are applied, but payroll taxes are low, and a large deductible is granted.

Table 1.3 **Early Retirement in Percentage of Age-Group Population**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
55–64:											
Men	7.24	5.79	9.59	10.10	10.48	10.93	10.93	10.74	10.78	10.71	10.42
Women	1.12	.81	1.64	1.71	1.73	1.74	1.67	1.51	1.35	1.22	1.19
Total	4.10	3.06	5.52	5.81	6.01	6.25	6.22	6.05	6.00	5.91	5.76
55–59:											
Men	11.57	13.78	15.19	15.58	15.86	16.46	16.15	15.15	15.42	15.64	15.49
Women	2.53	3.33	4.10	4.43	4.58	4.74	4.81	4.60	4.43	4.22	4.15
Total	6.91	8.41	9.49	9.85	10.08	10.45	10.35	9.76	9.82	9.82	9.72
60–64:											
Men	16.82	18.80	20.50	21.49	22.54	23.86	24.59	25.53	26.01	26.50	26.52
Women	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Total	7.93	8.84	9.65	10.16	10.68	11.32	11.68	12.16	12.40	12.67	12.70

Source: Office National pour l'Emploi.

quite steady since 1987. Yet, over the last five years, one can observe a slightly contrasting evolution across age groups. Whereas the rate of early retirement between age fifty-five and age fifty-nine has recently declined, that for those aged sixty to sixty-four has increased.

Indeed, mandatory retirement is now progressively phased out. Over the last decade, the legal minimum age for mandatory retirement in the case of a new collective agreement has steadily increased from fifty to fifty-eight. In 1992, retirement at age sixty was made more attractive (see the appendix) with a view to switching from mandatory early retirement to so-called flexible retirement. However, in 1995, mandatory early retirement still represented about 15 percent of men aged fifty-five to fifty-nine and 25 percent of men aged sixty to sixty-four.

Very few women are covered by these programs, and, if they are, they are under age sixty. The reason is simple: the mandatory retirement age for private-sector female employees was sixty prior to 1996, and, furthermore, early retirement involved mainly the traditional industrial sectors (e.g., coal, steel, and glass), in which the majority of workers are men.

1.2.7 Guaranteed Minimum Old Age Income

The guaranteed minimum old age income program was initiated in 1946 and was extended, taking its current form, in 1969. No personal contributions are required as it is fully financed by the government. It is a means-tested welfare program. This program supplies assistance to all persons who have reached the legal pension age. From table 1.2 above, one can see that the benefits provided by this scheme are equivalent to 56 percent of average social security receipts.

1.2.8 Social Security and the Labor Market

An alternative means of analyzing labor force trends is through the evolution of the hazard rates that provide at each age the percentage increase of the labor force retiring from work (relative to the participation rate of workers at the previous age). Figure 1.10 shows the hazard rate for men. In it one observes a number of spikes. Those after age sixty-five are not relevant: they are generated by a very small labor force (negligible denominator) and cannot be accounted for by any feature of the social security system. The increase in the number of workers leaving the labor force at age sixty, the age of eligibility for social security, is striking. The spike at age sixty-five corresponds to the mandatory retirement constraint. The spike at age fifty-eight coincides with the standard age of mandatory early retirement.

In figure 1.11, the hazard rate for women is plotted. Focusing again on the relevant spikes, we note that the most pronounced spike occurs at age sixty, the mandatory retirement age for private-sector female employees before 1996. The spike at age sixty-five is occasioned by the civil servants who retire at that age. Before 1992, women were eligible for early retirement as early as age

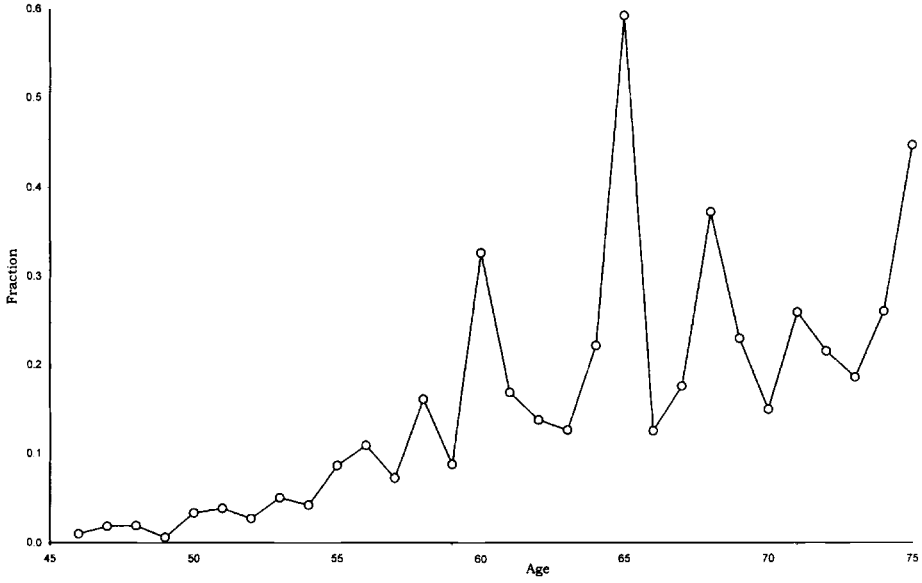

Fig. 1.10 Hazard rate out of the labor force for men
Source: Institut National de Statistique, Labor Force Survey.

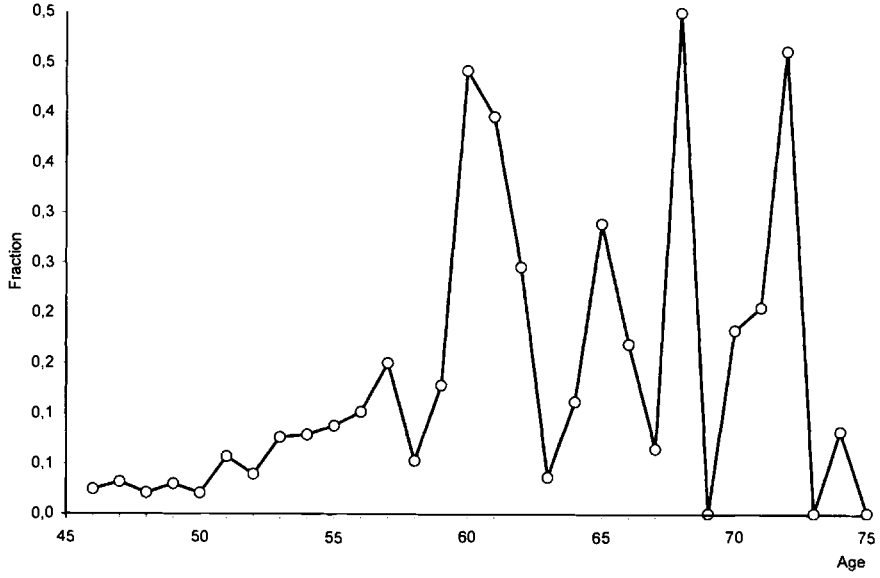

Fig. 1.11 Hazard rate out of the labor force for women
Source: Institut National de Statistique, Labor Force Survey.

fifty-five;[8] this, combined with mandatory early retirement schemes, can explain the small spike at age fifty-eight. Finally, Pepermans (1992) has shown that women in Belgium tend to retire the same year as their husbands, that is, at an average age that is three years younger than their husbands' age at retirement.

1.2.9 The Future

Will Belgium be able to afford its publicly financed social security system, operating entirely on a pay-as-you-go basis, in the first half of the next century? This question is clearly at the heart of political debate in Belgium, as it is in many other countries. To answer it, two approaches have been used.

The first consists in assessing the cost of the benefits to which the system is currently committed, that is, the present value of current and future benefits and contributions. According to Bouillot and Perelman (1995), gross commitments—which cover the social security wealth of all workers—have risen from 164.4 percent of GDP in 1961 to 292.5 percent of GDP in 1985 and will amount to 388.8 percent of GDP in 2040. Bouillot and Perelman measure gross commitments as the present value of the rights to benefits that living generations have acquired during their careers. This approach identifies as the most important characteristic of the Belgian social security system the fact that it is a defined-benefit system. Taking another point of view, the OECD (1994) estimates the present value of future pension expenditures in 1990 to be equal to 571 percent of GDP. On the other hand, the present value of future contributions ceteris paribus would represent only 406 percent of GDP, thus leaving Belgium with net commitments of merely 165 percent of GDP in 1990.

The second approach consists in projecting the annual increase in pension benefits under the assumption that the replacement rate is kept constant. According to the Belgian Planning Bureau, under plausible hypotheses private-sector pension expenditures, which represent about 6.6 percent of GDP, would jump to about 11 percent by 2030 (Englert, Fasquelle, and Weeman 1994). Note that these figures do not encompass civil servants' pensions. This oversight introduces a downward bias since former public-sector employees will undoubtedly constitute a growing share of retirees in the future. Indeed, in a recent study, de Callataÿ and Turtelboom (1997) show in their baseline projection that public-sector pension benefits would more than double as a percentage of GDP from 1995 to 2030.

Among the reform options debated, the increased participation of older workers is often stressed. As de Callataÿ and Turtelboom (1997, 30) write: "Labor market participation in Belgium is currently so low—and, correspondingly, the elderly dependency ratio so high—that any return to labor market participation and unemployment rates seen in other industrialized countries

8. Albeit with a 5 percent benefit reduction per year of anticipation on top of the current prorated rate, i.e., the same system as that applied to men before 1992.

will soften the demographic impact on pension expenditures. This underscores the critical contribution to the public finances that could be made by policy measures that would strengthen labor market performance in Belgium over the coming years."

1.3 Retirement Incentives

In this section, we use a simulation model aimed at assessing the incentives that the social security system gives workers to retire (this methodology is described in Diamond and Gruber, chap. 11 in this volume). We first focus on social security per se, which provides benefits only at age sixty. However, section 1.3.3 investigates the case of a worker who is entitled to unemployment benefits.

1.3.1 Base-Case Results

Table 1.4 shows the base-case results. The base-case worker was born in 1930. Having begun to work at age twenty, his career (forty-five years) will be complete in 1995. His wage profile is given in figure 1A.1 below in the appendix. He is entitled to social security benefits from 1990 on, that is, when he reaches the age of sixty. His wife is three years younger than he is and has never worked. He no longer has dependent children and is receiving standard fiscal deductions.

Consider first the replacement-rate column. From age fifty-five to age fifty-nine, pension benefits are not available, but payroll taxes must, of course, be

Table 1.4 **Base-Case Incentive Calculations**

Last Year of Work	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Age 54	...	4,193,746	0	0	0
Age 55	...	4,247,922	54,176	.013	−.129
Age 56	...	4,304,178	56,256	.013	−.134
Age 57	...	4,365,004	60,826	.014	−.145
Age 58	...	4,427,306	62,302	.014	−.148
Age 59	.749	4,493,147	65,841	.015	−.157
Age 60	.771	4,285,110	−208,037	−.046	.496
Age 61	.794	4,076,567	−208,543	−.049	.497
Age 62	.817	3,870,541	−206,026	−.051	.491
Age 63	.839	3,665,171	−205,370	−.053	.489
Age 64	.863	3,466,790	−198,381	−.054	.473
Age 65	.874	3,244,903	−221,888	−.064	.529
Age 66	.882	3,027,124	−217,779	−.067	.519
Age 67	.890	2,827,248	−199,876	−.066	.476
Age 68	.898	2,632,906	−194,342	−.069	.463
Age 69	.905	2,448,357	−184,549	−.070	.440

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

paid in the case of continued work. At age sixty, the first year benefits can be claimed, the replacement rate is roughly 75 percent. The level of pension increases between the ages of sixty and sixty-four because of career completion and between the ages of sixty-five and sixty-nine because low-earnings years are replaced by higher-earnings years. This explains the overtime profile of the replacement rate. Note that, at age sixty-five, it is equal to 0.863 and close to the one given in figure 1.5 and table 1.1 above.[9] The next three columns show the evolution of social security wealth.

Additional years of work affect the computation of social security wealth in five ways: (i) Payroll taxes are paid (negative effect). (ii) As long as the career lasts for fewer than forty-five years, benefits are increased by a factor of one-sixtieth (i.e., $0.75 \times 1/45$) (positive effect). (iii) An additional year of work can replace a previous low-earnings year (positive effect). (iv) An additional year of work at age sixty and beyond implies fewer years over which benefits can be claimed (negative effect). (v) There is always some chance that the worker and/or his spouse will die (negative effect). These five effects operate differently between the ages of fifty-five and fifty-nine, between the ages of sixty and sixty-four, and over age sixty-four:

	i	ii	iii	iv	v
55–59	−	+	0	0	0
60–64	−	+	0	−	−
65+	−	0	+	−	−

The period from age sixty to age sixty-five is one during which the system is actuarially unfair. Working one additional year brings for a couple a gross benefit increase of $1/45 \times 0.75$ for all coming years but a loss of a full year's pension benefits. It is, therefore, not surprising that, during this period, social security wealth decreases rapidly. Naturally, beyond age sixty-five, when the work career is complete, social security wealth declines even more quickly. One must add, however, that very few people have the opportunity of working beyond age sixty-five; in other words, there is no real choice beyond that age.

Between the ages of fifty-five and fifty-nine, the effect ii dominates effect i. Consequently, social security wealth increases moderately, and workers are subject to small subsidy rates. Therefore, one cannot rely solely on social security incentives to explain retirement between age fifty-five and age fifty-nine. In Belgium, most cases of retirement between those ages are induced by existing social insurance schemes: unemployment, disability, sickness, etc. We return to this point in section 1.3.3 below. Of course, mandatory early retirement also plays an important role here, as explained above.

9. There is a 6 percent difference between our results and those of EUROSTAT. This difference is the result of the fact that the reference for wages is the median for us and the mean for EUROSTAT.

Table 1.5 **Incentive Calculations—Single Worker**

Last Year of Work	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Age 54	. . .	2,742,452	0	0	0
Age 55	. . .	2,740,106	−2,346	−.001	.006
Age 56	. . .	2,740,954	848	.000	−.002
Age 57	. . .	2,744,944	3,990	.001	−.010
Age 58	. . .	2,752,092	7,148	.003	−.017
Age 59	.696	2,762,366	10,274	.004	−.024
Age 60	.713	2,531,229	−231,137	−.084	.551
Age 61	.726	2,283,319	−247,910	−.098	.590
Age 62	.736	2,030,821	−252,498	−.111	.601
Age 63	.746	1,785,965	−244,857	−.121	.583
Age 64	.756	1,548,965	−237,000	−.133	.564
Age 65	.756	1,292,551	−256,414	−.166	.611
Age 66	.756	1,049,869	−242,681	−.188	.578
Age 67	.756	820,740	−229,129	−.218	.546
Age 68	.756	604,909	−215,832	−.263	.514
Age 69	.756	402,269	−202,640	−.335	.483

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

Over age sixty, the accrual rate steadily decreases from −5 percent to −7 percent, with a corresponding tax rate turning around 50 percent. This shock is explained by the sudden availability of benefits coupled with increasing mortality. Working at the age of sixty-five corresponds to the largest negative accrual since, above that age, effect iii is the only potentially positive effect on social security wealth.

1.3.2 Other Cases

Table 1.5 explores the same questions for a single worker. In this case, payroll taxes are the same as before, but the expected benefits are lower. The theoretical gross replacement rate for a married couple is 0.75 and for a single person only 0.60. Further, the life expectancy of a woman who is three years younger than her husband exceeds that of her husband by seven years. It is, therefore, not surprising that both social security wealth and replacement rates are consistently lower for a single worker than for a married couple the husband of which is working. Thus, over age fifty-five, additional work is but very little subsidized. Over age sixty, tax rates are consistently higher for single than for married workers. It is striking to compare the levels of social security wealth across these two tables, which reveal a quite high implicit tax imposed on single male workers.

Table 1.6 considers an alternative earnings history. We assume that the worker started to work at age twenty-five and that he has an incomplete earnings history through age seventy. We further assume that he contemplates

Table 1.6 **Incentive Calculations—Incomplete Earnings Profile**

Last Year of Work	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Age 54	. . .	3,414,293	0	0	0
Age 55	. . .	3,475,489	61,196	.018	−.146
Age 56	. . .	3,537,615	62,126	.018	−.148
Age 57	. . .	3,600,628	63,013	.018	−.150
Age 58	. . .	3,664,527	63,899	.018	−.152
Age 59	.609	3,729,189	64,662	.018	−.154
Age 60	.626	3,568,662	−160,527	−.043	.382
Age 61	.644	3,408,441	−160,221	−.045	.382
Age 62	.661	3,249,660	−158,781	−.047	.378
Age 63	.679	3,092,053	−157,607	−.048	.375
Age 64	.696	2,951,595	−140,458	−.045	.335
Age 65	.713	2,819,284	−132,311	−.045	.315
Age 66	.731	2,689,043	−130,240	−.046	.310
Age 67	.748	2,566,851	−122,192	−.045	.291
Age 68	.766	2,444,245	−122,606	−.048	.292
Age 69	.783	2,327,145	−117,100	−.048	.279

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

working that long even though we know that in Belgium this is almost impossible. With such a history, before age sixty there is an important work subsidy, and at age sixty and after the tax for working one more year is lower than in the base-case calculation.

In table 1.7, we summarize the results obtained under alternative assumptions about lifetime earnings, the discount rate, survival probability, and the gender-age gap. Not surprisingly, these assumptions lead to expected differences in terms of the replacement rate and social security wealth. For example, with an older wife or with a higher mortality risk, social security wealth is lower; with higher lifetime income, the replacement rate is lower, and social security wealth is higher. Yet the tax rate is relatively steady for all these cases, ranging from 0.382 (incomplete history) to 0.583 (tenth percentile). Figures 1.12–1.16 present the tax-subsidy age profile for these alternative assumptions.

1.3.3 Incentive Computations for a Worker Entitled to Unemployment Benefits

Entitlement to unemployment benefits[10] is available to workers in case of (involuntary) layoff. It has consequences both in terms of replacement income and in terms of pension rights. We have taken unemployment insurance net

10. We have chosen unemployment compensation as replacement income. We could have chosen instead early mandatory retirement or disability benefits. But, in general, mandatory early retirement is not chosen voluntarily and implies retirement at age sixty-five. Disability benefits are in principle subject to some screening.

Table 1.7 **Incentive Calculations—Summary of Other Cases (last year of work is age 59)**

Case	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Base case	.771	4,285,110	−208,037	−.046	.496
Single worker	.713	2,531,229	−231,137	−.084	.551
Diminishing earnings	.764	3,802,341	−219,650	−.055	.535
Incomplete history	.626	3,568,662	−160,527	−.043	.382
10th percentile	.894	3,919,982	−195,212	−.047	.583
90th percentile	.695	5,420,567	−372,833	−.064	.564
Discount = 6%	.771	2,345,182	−195,993	−.077	.467
Discount = 1%	.771	6,229,508	−195,272	−.030	.465
Higher mortality risk	.771	3,831,585	−207,276	−.051	.494
Lower mortality risk	.771	4,651,405	−195,056	−.040	.465
Wife born 1927	.771	3,684,036	−212,455	−.055	.506
Wife born 1939	.771	4,608,155	−195,316	−.041	.465

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

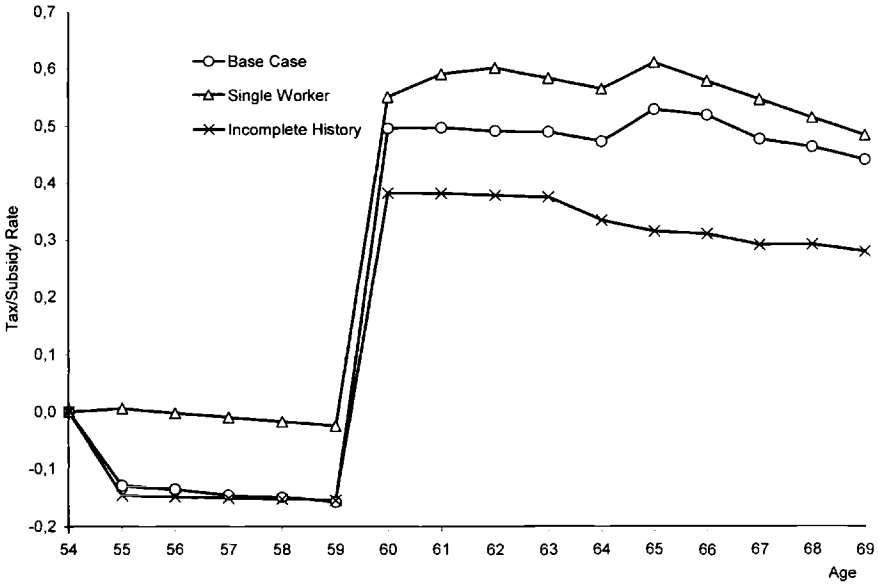

Fig. 1.12 **Tax/subsidy rates across career profiles and marital status**

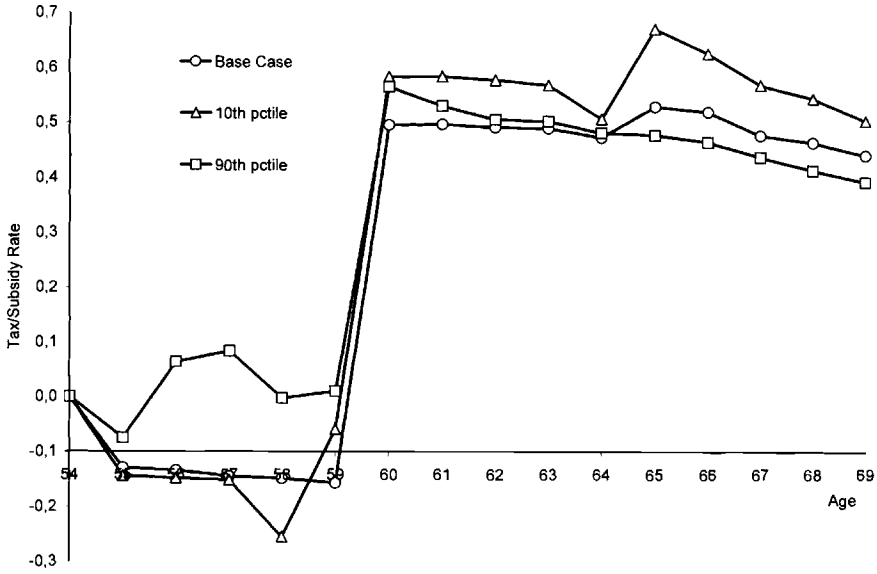

Fig. 1.13 Tax/subsidy rates across earnings profiles

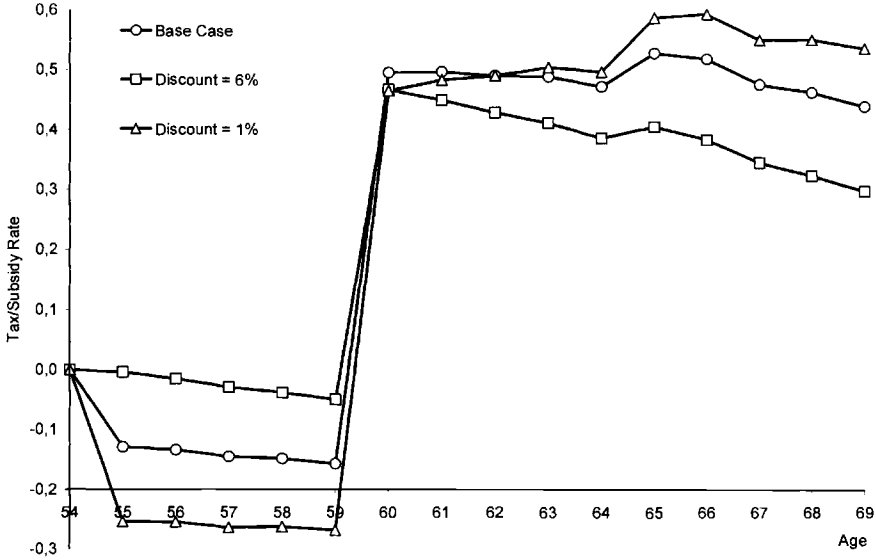

Fig. 1.14 Tax/subsidy rates across discount rates

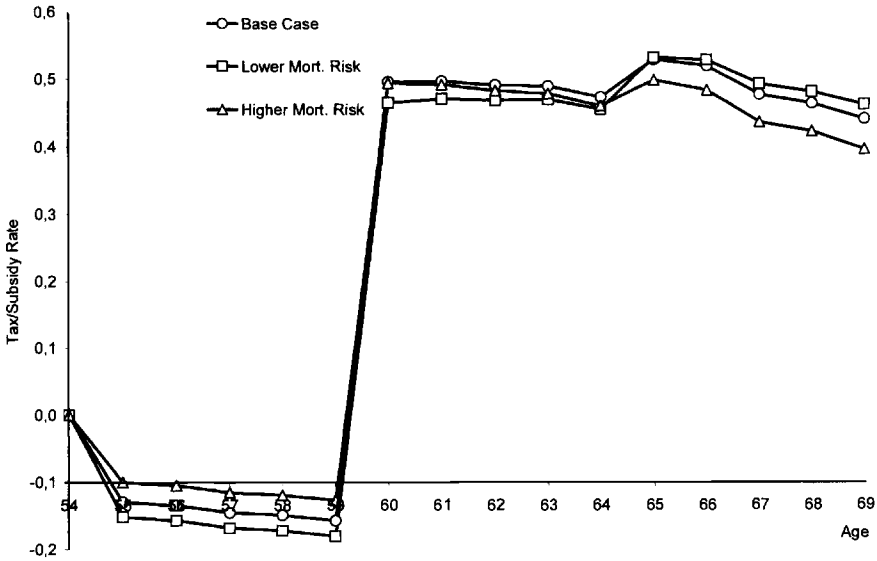

Fig. 1.15 Tax/subsidy rates across mortality risk

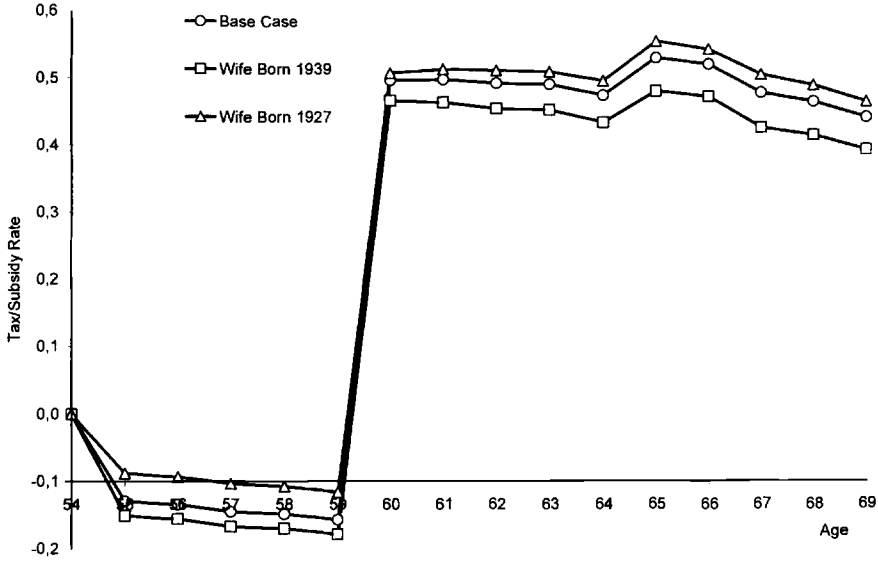

Fig. 1.16 Tax/subsidy rates across wife's age

Table 1.8 **Net Replacement Rates (%) with Unemployment Benefits, 1994–95**

	Single	Married[a]
First year	79	70
Following years	55	64

Source: Martin (1996).

[a]Spouse not working.

Table 1.9 **Base-Case Incentive Calculations, Worker Entitled to Unemployment Benefits**

Last Year of Work	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Age 54	...	6,173,342	0	0	0
Age 55	...	5,828,691	−344,651	−.056	.821
Age 56	...	5,488,842	−339,849	−.058	.809
Age 57	...	5,157,398	−331,444	−.060	.789
Age 58	...	4,833,646	−323,752	−.063	.771
Age 59	.749	4,493,147	−340,500	−.070	.811
Age 60	.771	4,285,110	−208,037	−.046	.496
Age 61	.794	4,076,567	−208,543	−.049	.497
Age 62	.817	3,870,541	−206,026	−.051	.491
Age 63	.839	3,665,171	−205,370	−.053	.489
Age 64	.863	3,466,790	−198,381	−.054	.473
Age 65	.874	3,244,903	−221,888	−.064	.529
Age 66	.882	3,027,124	−217,779	−.067	.519
Age 67	.890	2,827,248	−199,876	−.066	.476
Age 68	.898	2,632,906	−194,342	−.069	.463
Age 69	.905	2,448,357	−184,549	−.070	.440

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

replacement rates directly from Martin (1996). Table 1.8 summarizes the results of interest for this paper. Years of unemployment benefits are fully taken into account for pension computation. Besides, the worker is imputed his last wages for these years.

Table 1.9 presents the base-case results (corresponding to table 1.4 above) while assuming that the worker is entitled to unemployment benefits. Only rows corresponding to the last year of work for ages fifty-four to fifty-eight change since, once pension benefits are available, workers are assumed to opt for them if they stop working. The observed increase in social security wealth stems from the accounting of unemployment benefits. One also observes that, between the ages of fifty-five and fifty-nine, there is an important tax on continued work. Indeed, the worker now forgoes unemployment insurance benefits, while his pension rights are left almost unchanged whether he works or not. In the same way, tables 1.10 and 1.11 duplicate tables 1.5 and 1.6 above for single

Table 1.10 **Incentive Calculations—Single Worker, Worker Entitled to Unemployment Benefits**

Last Year of Work	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Age 54	. . .	4,371,072	0	0	0
Age 55	. . .	4,050,244	−320,828	−.073	.764
Age 56	. . .	3,738,690	−311,553	−.077	.742
Age 57	. . .	3,434,903	−303,788	−.081	.724
Age 58	. . .	3,144,095	−290,808	−.085	.693
Age 59	.696	2,762,366	−381,729	−.121	.909
Age 60	.713	2,531,229	−231,137	−.084	.551
Age 61	.726	2,283,319	−247,910	−.098	.590
Age 62	.736	2,030,821	−252,498	−.111	.601
Age 63	.746	1,785,965	−244,857	−.121	.583
Age 64	.756	1,548,965	−237,000	−.133	.564
Age 65	.756	1,292,551	−256,414	−.166	.611
Age 66	.756	1,049,869	−242,681	−.188	.578
Age 67	.756	820,740	−229,129	−.218	.546
Age 68	.756	604,909	−215,832	−.263	.514
Age 69	.756	402,269	−202,640	−.335	.483

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

Table 1.11 **Incentive Calculations—Incomplete Earnings Profile, Worker Entitled to Unemployment Benefits**

Last Year of Work	Replacement Rate	SSW[a]	Accrual[a]	Accrual Rate	Tax/ Subsidy
Age 54	. . .	5,312,097	0	0	0
Age 55	. . .	4,983,382	−328,715	−.062	.783
Age 56	. . .	4,663,627	−319,755	−.064	.762
Age 57	. . .	4,351,954	−311,673	−.067	.742
Age 58	. . .	4,051,148	−300,806	−.069	.716
Age 59	.609	3,729,189	−321,959	−.079	.767
Age 60	.626	3,568,662	−160,527	−.043	.382
Age 61	.644	3,408,411	−160,221	−.045	.382
Age 62	.661	3,249,660	−158,781	−.047	.378
Age 63	.679	3,092,053	−157,607	−.048	.375
Age 64	.696	2,951,595	−140,458	−.045	.335
Age 65	.713	2,819,284	−132,311	−.045	.315
Age 66	.731	2,689,043	−130,240	−.046	.310
Age 67	.748	2,566,851	−122,192	−.045	.291
Age 68	.766	2,444,245	−122,606	−.048	.292
Age 69	.783	2,327,145	−117,100	−.048	.279

[a]Both SSW (social security wealth) and ΔSSW (accrual) are in Belgian francs ($1.00 ≈ BF 32.00).

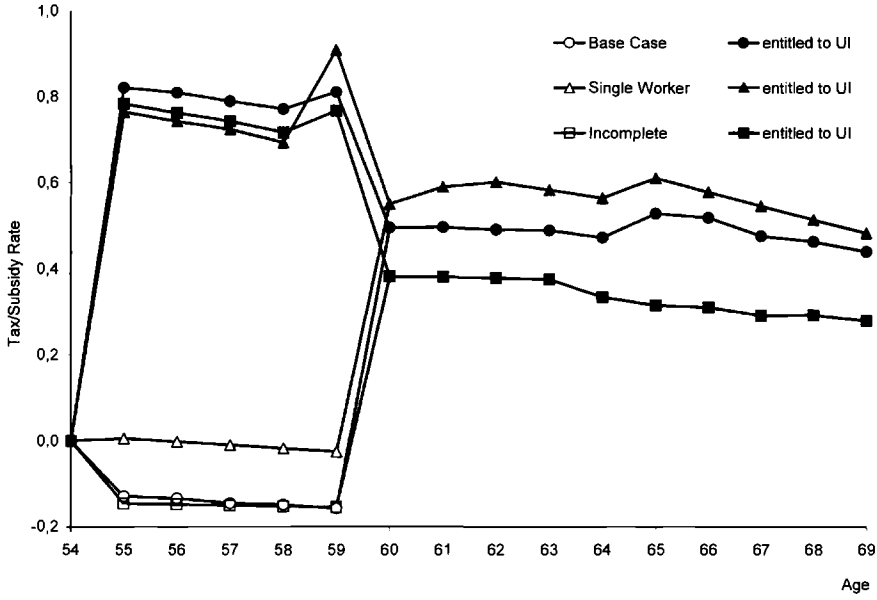

Fig. 1.17 Tax/subsidy rates with and without entitlement to unemployment insurance (UI), base, single, and incomplete career case

workers and the incomplete earnings profile cases when workers who stop working before age sixty are entitled to unemployment compensation. In both instances, continued work before ages fifty-five and fifty-nine appears to be heavily penalized. Again, this is not surprising and explains why so many workers withdraw from the labor force at those ages.

Figure 1.17 contrasts tax/subsidy rates with and without unemployment benefits for the base, single, and incomplete career cases. Single workers face lower tax rates between age fifty-four and age fifty-eight since unemployment insurance net replacement rates are lower for them. However, at age fifty-nine, this worker is subject to a higher tax rate on further work as singles have a 79 percent net replacement rate on their first year of unemployment. Naturally, a worker whose career can be completed faces a lower tax rate on continued work than does the base-case worker.

Figure 1.18 investigates the same issue while varying income level. Interestingly, the lower the income level, the higher the tax rate on continued work. Indeed, workers with higher wages still see their social security wealth increase thanks to real-wage growth, while lower-wage earners have hit the minimum pension threshold and are imputed years of career anyway.

What can be concluded from these results? Once a worker has been laid off, he is given very little monetary incentive to get back to work. Indeed, for low-

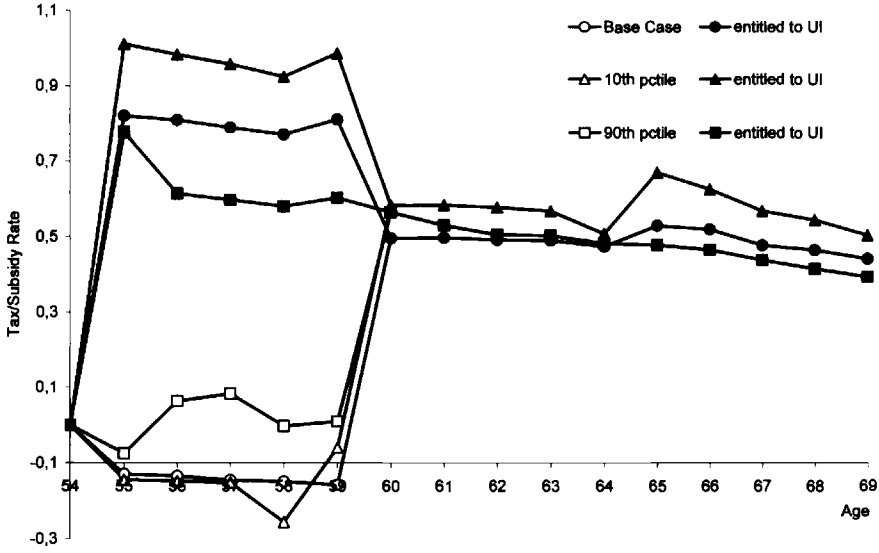

Fig. 1.18 Tax/subsidy rates with and without entitlement to unemployment insurance (UI), varying income level

income (first-decile) workers, tax rates between the ages of fifty-four and fifty-nine are around 100 percent! This again reflects the pervasive government policy of pushing older workers out of labor force, even prior to the legal age of retirement. However, these figures should not be used to explain why one would wish to leave the labor force voluntarily.

1.4 Conclusion

Belgian social insurance—in particular, the treatment of retirement age—is at a crossroads. On the one hand, because of the huge unemployment problem among young people, the government tends to force workers out of the labor market earlier than governments elsewhere. At the same time, those who retire at the normal and the early retirement ages enjoy a level of welfare equivalent to if not higher than that enjoyed by those in other age classes.

On the other hand, the fact of an aging population implies that social security expenditures will double by 2040 if the replacement ratio is kept constant and the mandatory retirement age maintained at its current level. Irrespective of the forecast methods used, Belgium is faced with steeply rising expenditures on retirement and health care. Although the outlook is similar in other European countries, the problem in Belgium is aggravated by the marked size of the public debt. It seems inevitable that social security benefits will become

less generous and that, above all, the effective retirement age will have to be raised. Unfortunately, drastic reforms of social security and of the civil servants' pension schemes have been viewed as quasi suicidal by all recent Belgian governments.

Appendix

Data Appendix

Historical Data

Historical Trends in Labor Force Participation of Older Men and Women (Figs. 1.1 and 1.2 above)

Sources. Our sources here are Institut National de Statistique, decennial census until 1981; Institut National de Statistique, Labor Force Survey from 1983 until 1995.

Social Security, Disability Insurance, and Mandatory Retirement Receipt of Older Men and Women (Figs. 1.3 and 1.4 above)

Sources. Our sources here are Bouillot and Perelman (1995) and our own computations. Results come from administrative data. Percentages have been adjusted so that the percentage of the population receiving social security, disability insurance, or mandatory retirement compensation (males and females) corresponds to that given by the Labor Force Survey in 1993. Note that, from 1961 until 1987, actual data (see below) have been used; from 1988 to 1995, the Belgian Federal Planning Bureau's projections are reported, after the above-mentioned adjustment.

Data. Pension outlays and number of pensioners (private sector) are taken from Office National des Pensions, *Statistique annuelle des bénéficiaires de pensions.* Number of pensioners (public sector) is taken from Ministère de la Prévoyance Sociale, *Annuaire statistique de la sécurité sociale.* The breakdown by age of pensioners (private sector) is taken from Institut National de Maladie Invalidité, *Rapport général,* pt. 3, *Rapport statistique.* The minimum guaranteed income to the elderly (welfare) is taken from Office National des Pensions, *Statistique annuelle des bénéficiaires de pension.* Total population is taken from Institut National de la Statistique, *Statistiques démographiques.* The number taking mandatory retirement is taken from June issues of the *Bulletin mensuel* (Office National pour l'Emploi) and from information supplied by various individuals in the Office Natonal pour l'Emploi.

Social Security Replacement Rates (Gross and Net) over Time (Fig. 1.5 above)

Source. Our source is our own computations. Mean gross pension receipts have been computed for a worker with a complete career on the year of his or her retirement. This mean pension is a weighted average of single and married pension earners. Mean gross wages of private-sector workers (thus including the self-employed) have been computed. The ratio of these two means defines our gross replacement rate. Our net replacement rate corresponds to the ratio of mean net pension receipts over mean net wages. Taxes on replacement earnings have been accounted for. Both payroll and income taxes have been deducted from mean gross wages. Income taxes have been computed using the average tax rate.

Data. The average income tax rate is taken from Institut National de la Statistique, *Statistiques financières.* Average pension receipts for a complete career are taken from Office National des Pensions, *Statistique annuelle des bénéficiaires de pension.* Average wages and payroll taxes are taken from Office National de la Sécurité Sociale, *Rapport annuel.*

Contemporaneous Data

General Remarks

Most data come from the Labor Market Survey conducted in Belgium by the Institut National de Statistique and published by EUROSTAT. The following main distinctions apply.

Computations related to labor force participation (e.g., fig. 1.6 above) have been undertaken using the following ILO definitions: *working active:* had a paid job for at least one hour during the survey week; accomplished nonpaid help in the family company or farm; *unemployed:* has no job (i.e., worked less than an hour during the survey week); is actively seeking a job; is available for work within the fifteen days following the interview; *active:* working active or unemployed. Note that this classification scheme proceeds from subjective answers.

The following categories of (in)activity (figs. 1.7 and 1.8 above) are distinguished: *employed; unemployed; disabled; mandatory early retired; retired;* and *other.* Here, the surveyed person determines which category best describes himself or herself with regard to the labor market. Therefore, adding up the employed and the unemployed will not necessarily give back what the ILO definitions imply.

The Labor Market Survey is so constructed that, for characteristics concerning more than 5 percent of the active population, the standard deviation at the NUTS 2 (regional) level does not exceed 8 percent (taking account of the sam-

pling for unemployment). Numbers regarding smaller groups have to be considered with some care, as in the case of specific *age-to-age* figures.[11]

Labor Market Participation Rates by Age and Sex in 1995 (Fig. 1.6 above) and Distribution of Activities of Men and Women by Age in 1995 (Figs. 1.7 and 1.8 above)

Source. Our source is Institut National de la Statistique, 1995 Labor Force Survey.

Breakdown of Source of Family Income (Fig. 1.9 above)

Source. Our source is our own computations. Series have been smoothed with a (sixth-degree) polynomial.

Data. Data are taken from the Household Survey, Center voor Sociaal Beleid, Universiteit Antwerpen, and from our own computations.

Hazard Rate Out of the Labor Force for Men and Women (Figs. 1.10 and 1.11 above)

Source. Our source is Institut National de la Statistique, 1992–95 Labor Force Surveys. Three pairs of years have been used: 1992–93, 1993–94, and 1994–95. The mean hazard rate over these years is reported while substituting a zero in the case of a negative hazard rate. The purpose of this substitution is to eliminate cohort effects from labor market data and get rid of negative hazard rates.

Studying Retirement Incentives in Belgium

Simulations (Figs. 1.12–1.18 above)

Earnings patterns come from figure 1A.1. Note that, in our computations, we have assumed that, once granted, social security benefits are indexed to the CPI. Since January 1976, they are no longer indexed to wage growth (this is in contrast to the system prevailing for public-sector employees, the so-called *péréquation*). Limited discretionary increases were granted in 1990 and 1991. There is no particular reason to believe that this will happen again in the near future.

We decided to present a consistent social security system throughout the years covered by our simulations. Recall that, in our case-study approach, our worker is supposed to be age sixty-five in 1995. In the Belgian system, he is hence allowed to retire at any time between 1990 and 1995. In fact, public policy changed in 1992. First, in Belgium, past income record is indexed to

11. There were 77,689 responses to the 1992 survey, 81,219 to the 1993 survey, 81,281 to the 1994 survey, and 80,319 to the 1995 survey. The nonresponse rate is about 10 percent. Nonresponses are not accounted for.

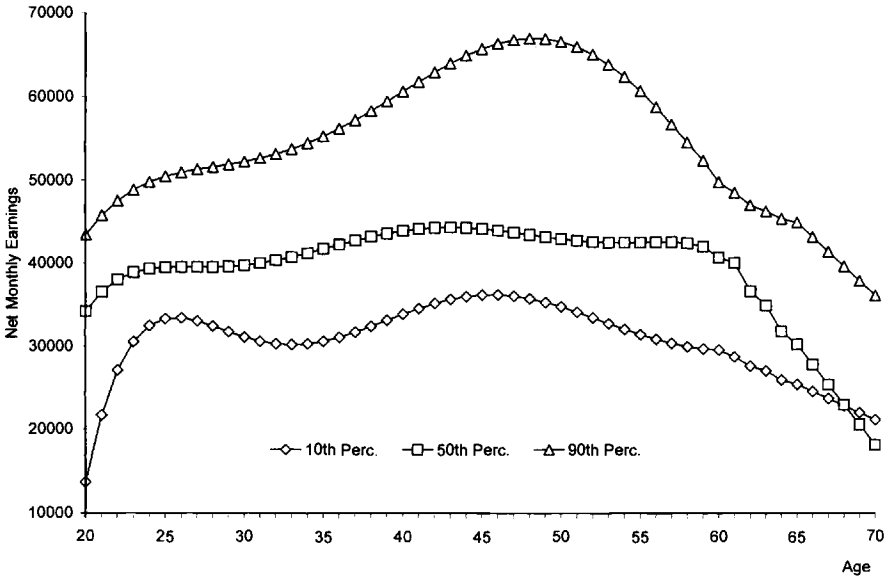

Fig. 1A.1 Earnings-age profile
Source: Own computations; Center voor Sociaal Beleid, Universiteit Antwerpen.

the CPI but also adjusted on a discretionary basis to account for wage growth. However, there has been no adjustment since 1992. Note that this wage-growth adjustment played a role in the retirement decisions reached by workers turning age sixty or sixty-one in 1990 and 1991. We have left out of our analysis this potential incentive to delayed retirement. Second, during these very two years, however, the former system still prevailed, and pensions were reduced by 5 percent for each year of early retirement. This factor acted in the opposite way, providing incentives for early retirement. We have also left out of our analysis this potential incentive to early retirement. We can assume that, on the whole, these two factors counterbalanced each other.

Further, as explained above, benefits are capped with respect to the income stream to be considered. This ceiling is itself adjusted to the CPI and also to wage growth on a discretionary basis. Again, since 1992, there has been no such adjustment. We have again voluntarily neglected this factor for 1990–91. At the time of writing, an automatic adjustment mechanism is being introduced. It does not, however, concern the period under investigation.

These three conventions are natural in the case of Belgium. Indeed, de Callataÿ and Turtelboom (1997) rely on the same hypotheses. This, in fact, enables us to frame all our computations in real terms, rather than hazarding the future real and nominal growth rates as well as the share of growth that the labor factor will be able to capture.

Benefit computation is, in fact, based on gross earnings. We have therefore

Table 1A.1 Labor Participation and Unemployment

	Participation Rate, Men Aged 55–64		Unemployment Rate, 1995
	1979	1994	
The United States	70.8	62.6	5.5
Japan	81.5	81.2	3.1
Germany	63.2	45.0	8.2
France	67.0	39.1	11.6
Italy	36.8	30.7	12.2
The United Kingdom	70.2	64.5	8.7
Belgium	44.5	33.0	9.4
The Netherlands	63.2	40.7	6.5
Spain	73.8	48.6	22.7
Sweden	77.8	68.8	9.2

Source: OECD (1996).

used the Belgian income tax rules in 1992 to convert net monthly earnings into gross yearly income. Net monthly income was obtained anew while using the 1992 fiscal rules as an approximation. Indeed, fiscal rules were not indexed during the period covered by our investigation.

Comparisons with Other Countries

One of the main motivations for early retirement is reducing unemployment. Table 1A.1 provides the labor force participation rate for men aged fifty-five to sixty-four and the rate of unemployment in a number of OECD countries. One sees that countries with high unemployment rates tend to have low labor force participation rates among elderly workers. This evidence can be interpreted in two ways. First, it could imply that policies promoting early retirement do not work. Second, it could simply imply that, without such policies in place, unemployment would be even higher.

Earlier Studies of Flexible Retirement in Belgium

Luttgens and Perelman (1987) studied the retirement behavior of a sample of male blue-collar workers who reached age sixty during the period 1973–77. During that period, a full-career worker with a career of z years gets a yearly pension equal to

$$y\frac{45 - z}{45} \times \left(1 - \frac{5z}{100}\right)$$

of the pension he would get retiring at age sixty-five. Luttgens and Perelman show that social security did not have a significant influence on the early retire-

Table 1A.2 Aggregate Taxation Rate on Social Security Benefits (%)

	Relative Gross Amount	Global Taxation Rate	Relative Net Amount
Maximum pension[a]	168	9.8	152
(Floor + max)/2	134	4.0	129
Highest zero tax pension	127	.0	127
Floor[b]	100	.0	100

Source: Own calculations.

[a]Married worker having received ceiling wages from age 20 to age 64.

[b]Married worker with a complete career (45 years).

ment decision, and they justify their result by means of the actuarial neutrality of social security.

More recently, Pepermans (1992) addressed the same problem using a sample of individuals aged fifty to seventy in 1985. On the basis of his model, he computes the relevant probability that a typical worker (male, married, with a nonworking spouse) will retire before age sixty-five, the legal retirement age: 0.196 at age sixty, 0.396 at age sixty-three, and 0.917 at age sixty-five. There is a clear bias in his study since, in that period, most workers retiring early did not choose to do so. As noted above, since 1991 voluntary early retirement has been made more attractive.

The Average Tax Rate for Private-Sector Retirees

Table 1A.2 provides the average tax rate on social security benefits for a couple only one of whom is a wage earner. There are three components: a health care payroll tax of 3.55 percent; a "solidarity" income tax of at most 2 percent; and the personal income tax, which can be very high (the marginal rate is 25 percent). However, for those whose reported income is restricted to social security benefits, there is a tax exemption, which amounts to about 90 percent of mean household income.

Table 1A.2 also shows that the exemption amounts to 130 percent of the minimum household pension. The average tax rate on the maximum private-sector pension is lower than 10 percent. A pension in between the minimum and the maximum is taxed at 4 percent. Note, however, that these reasonable tax rates hold for pensioners who are relying solely on social security. Although, as has been shown in section 1.1.3, this is a reasonable assumption for most aged people, we can conjecture than pensioners receiving high social security benefits may in fact be subject to higher tax rates owing to additional sources of income.

References

Bouillot, L., and S. Perelman. 1995. Evaluation patrimoniale des droits à la pension. *Revue belge de sécurité sociale* 37, no. 4:803–31.

de Callataÿ, E., and B. Turtelboom. 1997. Pension reform in Belgium. *Cahiers economiques de Bruxelles,* no. 156:371–412.

Delhausse, B., S. Perelman, and P. Pestieau. 1996. Retirement and growing old: Which model of protection? In *International perspective on supplementary pensions: Actors and issues,* ed. E. Reynaud, L. Roberts, B. Davies, and G. Hugues. London: Quorum.

Englert, M., N. Fasquelle, and S. Weeman. 1994. Les perspectives d'évolution à très long terme de la sécurité sociale (1991–2050). Planning Paper no. 66. Brussels: Planning Bureau.

European Economic Commission (EEC). 1994. Supplementary pension in the European Union. Development Report by the European Commission's Network of Experts on Supplementary Pensions. Brussels.

EUROSTAT. 1992. Rapport entre revenu de retraite et revenu d'activité au moment du départ à la retraite. Luxembourg.

Luttgens, A., and S. Perelman. 1987. Public pensions, health status and other determinants of retirement: A case study on Belgian aged workers. University of Liège, Department of Economics. Mimeo.

Martin, J. 1996. Indicateurs de taux de remplacement aux fins de comparaisons internationales. *Revue economique de l'OECD* (Paris) 26, no. 1:116–32.

OECD. 1994. *OECD economic survey: Belgium, Luxembourg.* Paris.

———. 1996. *Employment in Europe.* Brussels: European Commission.

Pepermans, G. 1992. Retirement decision in a discrete choice model and implications for the government budget: The case of Belgium. *Journal of Population Economics* 5, no. 3:229–43.