Volume Title: Social Security and Retirement around the World

Volume Author/Editor: Jonathan Gruber and David A. Wise, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-31011-6

Volume URL: http://www.nber.org/books/grub99-1

Publication Date: January 1999

Chapter Title: Introduction to "Social Security and Retirement around the World"

Chapter Author: Jonathan Gruber, David A. Wise

Chapter URL: http://www.nber.org/chapters/c7247

Chapter pages in book: (p. 1 - 35)

Introduction and Summary

Jonathan Gruber and David A. Wise

In almost every industrialized country, the population is aging rapidly, and individuals are living longer. These demographic trends have placed enormous pressure on the financial viability of the social security systems in these countries. The financial pressure is compounded by another trend. In virtually every country, employees are leaving the labor force at younger and younger ages. In some countries, the labor force participation rates of sixty- to sixty-four-year-old men have fallen by 75 percent over the past three decades.

What accounts for the striking decline in labor force participation? One explanation is that social security provisions themselves provide enormous incentive to leave the labor force early, thus by their very structure exacerbating the financial problems they face. It is this aspect of social security plan provisions that is emphasized in this volume. By considering the relation between plan provisions, on the one hand, and labor force participation rates, on the other, we hope to draw attention to the important role that social security can play in the labor force decisions of older persons.

This volume contains analyses based on evidence from eleven industrialized countries. In this summary, we attempt to distill key conclusions that can be drawn from the collective findings of the individual papers. The project relies on analyses of social security provisions and labor force participation conducted by a number of economists in their own countries: Pierre Pestieau and Jean-Philippe Stijns in Belgium, Jonathan Gruber in Canada, Didier Blanchet

Jonathan Gruber is professor of economics at the Massachusetts Institute of Technology and director of the Children's Program at the National Bureau of Economic Research. David A. Wise is the John F. Stambaugh Professor of Political Economy at the John F. Kennedy School of Government, Harvard University, and the director for Health and Retirement Programs at the National Bureau of Economic Research.

The authors acknowledge the support of the National Institute on Aging through grant 5 P20 AG12810 to the National Bureau of Economic Research.

and Louis-Paul Pelé in France, Axel Börsch-Supan and Reinhold Schnabel in Germany, Agar Brugiavini in Italy, Naohiro Yashiro and Takashi Oshio in Japan, Arie Kapteyn and Klaas de Vos in the Netherlands, Michele Boldrin, Sergi Jimenez-Martin, and Franco Peracchi in Spain, Mårten Palme and Ingemar Svensson in Sweden, Richard Blundell and Paul Johnson in the United Kingdom, and Peter Diamond and Jonathan Gruber in the United States.

The central feature of the project is an attempt to present comparable descriptive data and analytic calculations for each of these eleven countries. The country studies all follow the same format. Each begins with a description of the historical evolution of labor force participation and then presents data on the current age-specific activities and income sources of men and women in terms of the following: (1) labor force participation rates by age interval between 1960 and the present; (2) the proportion of employees covered by the public pension system, and the proportion of persons over age fifty-five receiving public pensions, from 1960 to the present; (3) replacement rates under the public pension system from 1960 to the present; (4) current labor force participation rates by age; (5) labor force status (employed, unemployed, disabled, retired); (5) proportion receiving various public "pensions" (e.g., old age, disability, survivor) by age; (6) proportions receiving employer-provided pensions by age; (7) source of household income by age; and (8) retirement and public pension hazard rates by age. In some instances, the presentation is adjusted to match individual country circumstances; in other cases, additional information is presented that is particularly important for a specific country. Each study then describes the institutional features of the country's social security system, highlighting any interactions with other public and private programs that might also influence retirement behavior. Finally, the core of each study is a detailed analysis of the retirement incentives inherent in the provisions of the given country's retirement income system. By making the same analytic calculations, and by presenting the same simulations for each of the countries, the individual studies provide a means of comparing retirement incentives among nations.

We begin this introduction by describing the dramatic fall in labor force participation rates over the past three decades, the phenomenon that provides the primary motivation for this project. We then describe the decline in labor force participation with age that is reflected in current labor force patterns. We draw attention in particular to the forgone productive capacity implicit in the low participation rates of older persons. We then use data from several countries to illustrate the relation between social security provisions and withdrawal from the labor force. These illustrative country data are also used to explain the key methods used in each of the country papers. We also point out important ways in which public and private policies differ among the countries, differences that must be kept in mind when making comparisons between countries. Finally, we present a summary of key findings for all the coun-

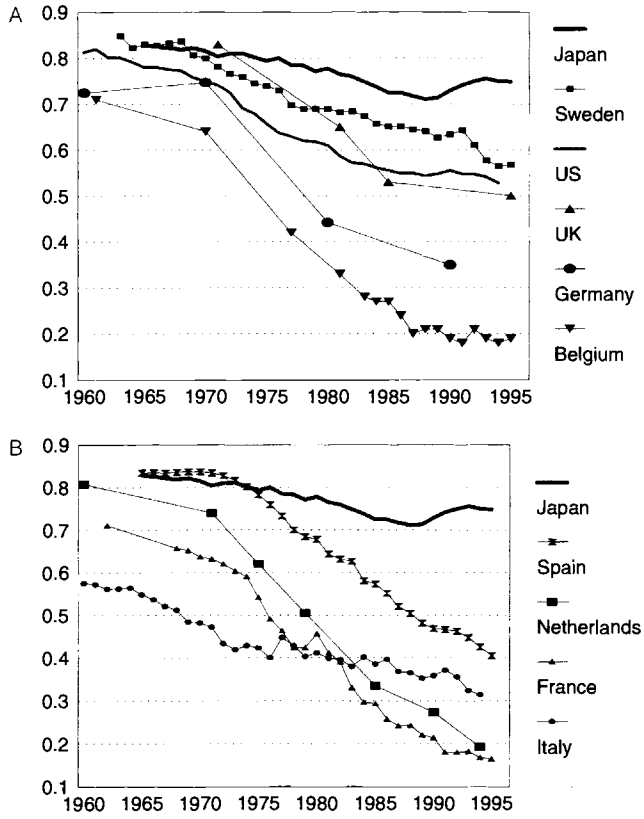


Fig. 1 Labor force participation trends for men aged 60 to 64

tries, emphasizing the relation between social security provisions and retirement patterns.

Labor Force Participation

The Decline since 1960

The decline in the labor force participation of older persons is one of the most dramatic features of labor force change over the past several decades. The decline has been striking in all but one of the countries studied here. The labor force participation rates of men aged sixty to sixty-four for the years 1960–66 are shown for each of the eleven countries in figure 1. The decline was substantial in each country but was much greater in some than in others. In the early 1960s, the participation rates were above 70 percent in each coun-

try and above 80 percent in several. By the mid-1990s, the rate had fallen to below 20 percent in Belgium, Italy, France, and the Netherlands, to about 35 percent in Germany, and to 40 percent in Spain. Although U.S. analysts have often emphasized the "dramatic" fall in that country, the decline in the United States from 82 to 53 percent was modest in comparison to the much more precipitous decline in these European countries. The decline to 57 percent in Sweden was also large, but modest when compared to the fall in other countries. Japan stands out with the smallest decline of all the countries, from about 83 to 75 percent. The labor force participation rates of forty-five- to fifty-nine-year-old men, as well as of those age sixty and older, have also declined substantially, and these trends can be seen in the individual country papers.

Each of the country papers presents completely parallel labor force and other data for men and women, including current labor force participation and departure rates by age, which are key components of the analysis in this volume. To simplify the exposition, and to limit the number of figures presented, we emphasize the data for men here. In addition, the cross-country comparisons, which are made toward the end of the introduction, are more easily interpreted for men than for women. In some respects, however, the labor force trends for older women are just as dramatic as those for men. Although the labor force participation rate of women of *all ages combined* has been increasing, this is not the pattern for older women. In seven of the ten countries for which data are available, the labor force participation rates of women aged sixty to sixty-four have been *declining* in the past three decades—in some cases by a factor of two—even though the participation rate of women started from a much lower base in the early 1960s. In no country has there been a general increase in this age group, in spite of the sharp trend toward increasing participation rates of women at younger ages. In some countries—the Netherlands and Belgium, for example—the participation rate since 1960 of women in this age group has never exceeded 10 percent! With the possible exception of one of the countries, the labor force participation rates of women at older ages—which have always been lower than the participation rates of men—are now declining. Most important, the current labor force departure rates for women at older ages are quite consistent with the departure rates for men, as explained below. Perhaps most important, by looking at the individual country papers, it is clear that the same within-country incentives that affect the retirement patterns of men apply equally to women. Indeed, women tend to leave the labor force at earlier ages than men. That is, women who are in the labor force at age sixty, for example, are typically more likely than men to retire at that age. In some countries, benefits are available at younger ages for women than for men. The incentives to leave the labor force—discussed in detail below—and the actual labor force departures at older ages appear to be at least as important for women as for men.

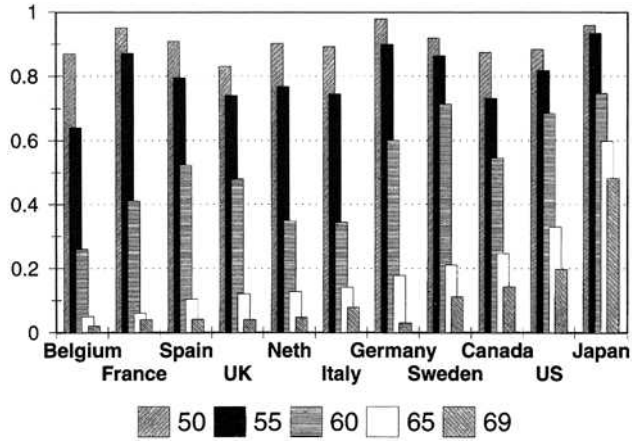


Fig. 2 Labor force participation by country and age

The Decline with Age and "Unused Productive Capacity"

The current relation between labor force participation and age for men is shown for each of the countries in figure 2. The countries are ordered by labor force participation at age sixty-five. At age fifty, approximately 90 percent of men are in the labor force in all the countries. The decline after age fifty varies greatly among countries. By age sixty-nine, virtually no men in Belgium are working; in Japan, almost 50 percent are still in the labor force. Indeed, most men in Belgium are no longer in the labor force at age sixty-five, and only about 25 percent are working at age sixty. In Japan, on the other hand, 60 percent are working at age sixty-five and 75 percent at age sixty.

There are many implications of the withdrawal of older men from the workforce. Some have to do with the differential political influence of older and younger voters. Some have to do with the psychological well-being of older persons as they age. We emphasize here the forgone productive capacity of older employees who leave the workforce. Figure 3*a* helps explain this idea and provides a simple way of comparing the extent of labor force withdrawal of older men across countries. This figure shows the labor force participation of men aged fifty to sixty-nine in three countries: Japan, Spain, and Belgium. For Japan, consider the height above the LFP (labor force participation) curve, which is the proportion of men not working at a given age (1 − LFP). Loosely speaking, we can refer to this measure as the *unused productive capacity* at that age. If the unused capacity is added up over all ages, we find the area above the LFP curve. Dividing by the total area of the figure (1 × 19) yields a rough measure of the unused capacity over the age range fifty to sixty-nine as a percentage of the total labor capacity in that age range. In Japan, the value of the unused capacity measure is 22 percent. It is clear from the figure that

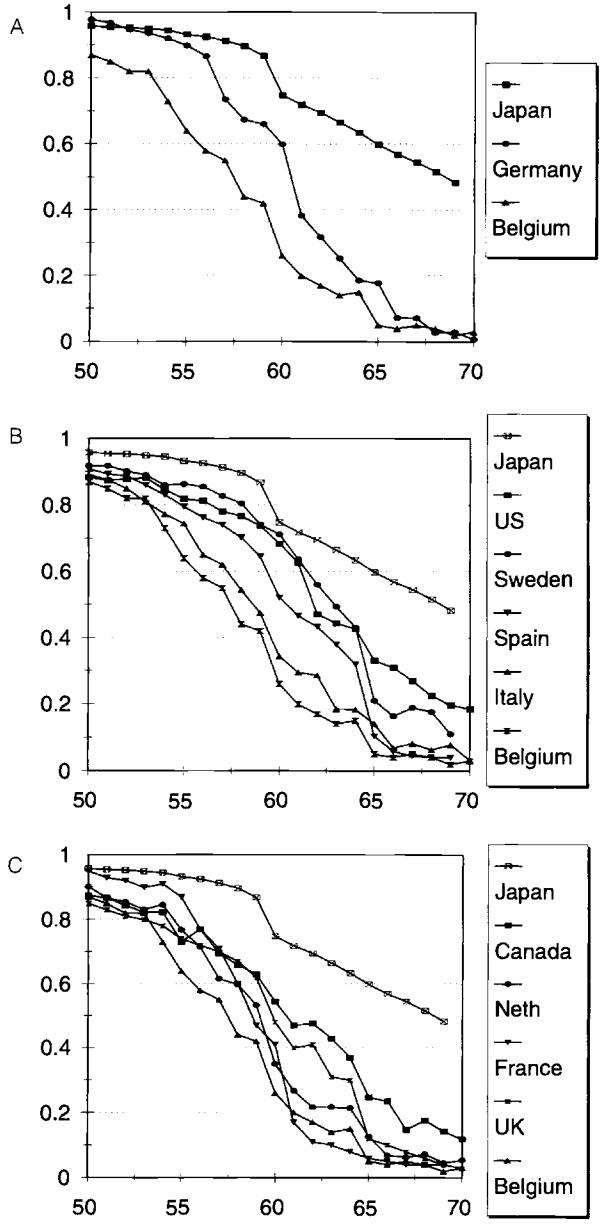


Fig. 3 Labor force participation of men by age and country

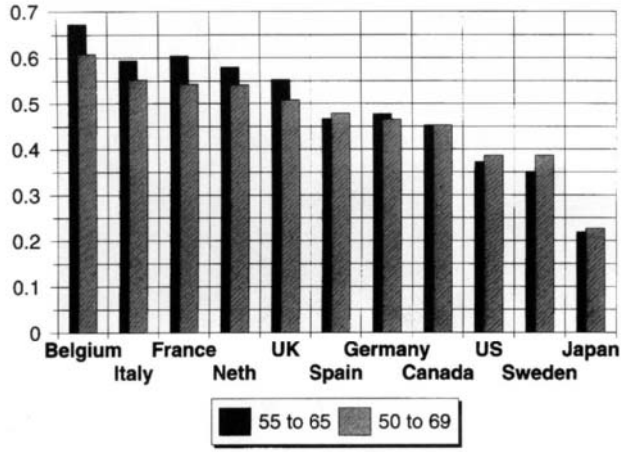


Fig. 4 Unused productive capacity

many more older men are out of the labor force in Belgium, where the unused capacity measure is 61 percent. In Spain, the unused capacity measure is 48 percent.

We emphasize that these are only relative measures; there is no reason to assume that all men who are not working should, or could, work. In particular, this measure might differ across countries because of differences in health status. Or unused capacity may be higher in countries in which a larger proportion of jobs are physically demanding.[1] Nevertheless, these enormous differences across fairly similar industrialized countries are striking.

The labor force participation profiles for the other countries are shown in figure 3*b*, *c*. For comparison, the profiles for Japan and Belgium are shown in each panel. The unused productive capacity measures for all the countries are shown in figure 4. For the entire age range from fifty to sixty-nine, the unused capacity measures range from a high of 61 percent in Belgium to a low of 23 percent in Japan. In the age range fifty-five to sixty-five, unused capacity ranges from 67 percent in Belgium to 22 percent in Japan. We consider below how this relative measure is related to the provisions of the social security programs in the countries.

1. In addition, our measure of unused capacity is crude. A more refined measure would account not only for participation but also for the nature of that participation, i.e., hours of work. It would account as well for the fact that moving from higher-paying (marginal product) jobs to lower-paying (marginal product) jobs increases unused capacity. For example, the higher labor force participation of older men in Japan may be due to less rigorous work in the secondary sector; we would therefore understate unused capacity for that country. Moreover, some of what is called *unused productive capacity* may include nonmarket work, such as off-the-books handiwork or volunteer labor; this would lower measured unused capacity. An appropriate measurement of unused capacity across countries is an important priority for future work.

The Incentive Effects of Plan Provisions

The key feature of each of the chapters in this volume is the highly detailed computation of plan retirement incentives. In this section, we provide a very brief overview of the provisions of social security plans that can create large retirement incentives. We then present evidence on how these incentives appear to be reflected in retirement behavior.

Two features of social security plans have an important effect on labor force participation incentives. The first is the age at which benefits are first available. This is called the *early retirement age.* The "normal" retirement age is also important, but, as the data will show, it is typically much less important than the early retirement age. It may once have been that most people were expected to retire at the normal retirement age; now, in most countries, few people work until the normal retirement age.

The extent to which people continue to work after the early retirement age is closely related to the second important feature of plan provisions, the pattern of benefit accrual. Suppose that, at a given age, a person has acquired entitlement to future benefits on retirement. The present discounted value of these benefits is the person's social security wealth at that age (SSW_a). The key consideration for retirement decisions is how this wealth will evolve with continued work. If a person is age fifty-nine, for example, what is the change in social security wealth if he retires at age sixty instead of age fifty-nine? The difference between social security wealth if retirement is at age a and social security wealth if retirement is at age $a + 1$, $SSW_{a+1} - SSW_a$, is called *social security wealth accrual.*

We compare social security wealth accrual to net wage earnings over the year. If the accrual is positive, it adds to total compensation from working the additional year; if the accrual is negative, it reduces total compensation. The ratio of the accrual to net wage earnings is an implicit tax on earnings if the accrual is negative and an implicit subsidy to earnings if the accrual is positive. Thus, a negative accrual discourages continuation in the labor force, and a positive accrual encourages continued labor force participation. This accrual rate, and the associated tax rate, is a key calculation that is made in the same way for each of the countries considered here. As it turns out, the pension accrual is typically negative at older ages: continuation in the labor force means a loss in the present value of net pension benefits, which imposes an implicit tax on work and provides an incentive to leave the labor force.[2]

The magnitude of social security wealth accrual and the corresponding tax or subsidy differ greatly from country to country and are determined by several provisions. The most important determinant of accrual is the adjustment to

2. While several authors have compared social security provisions in several countries—e.g., Kohli, Rein, Guillemard, and van Gunsteren (1991) and OECD (1995a, 1995b)—there has been no analytic calculation of the incentive effects of plan provisions whose results were comparable across countries.

benefits if a person works for another year. An additional year of work means a delay in receiving benefits, which will be received for one less year. In some countries, an "actuarial" adjustment is made, increasing benefits to offset the fact that they are received for fewer years. But, in other countries, no such adjustment is made. The greater the adjustment, the greater the inducement to continue working. If the adjustment is not large enough to offset the fewer years that benefits are received, however, there is an incentive to leave the labor force. Second, a person who continues to work must pay social security taxes on earnings, lowering net social security accrual. These tax payments make retirement more attractive. Third, the additional year of earnings is often used to recompute social security benefits, which are typically based on some measure of lifetime average earnings. Since earnings are often higher later in life than earlier, this may raise net accrual, making retirement less attractive. This effect may be especially important for the younger old, who are not fully "vested" in their social security systems until they have paid in for some minimal number of years. Finally, a delay in receiving benefits raises the odds that the worker might die before being able to collect any benefits. This lowers net social security accrual and may be an important consideration for the oldest workers.

In addition to social security plan provisions, other government and private programs may also affect the relation between social security plan provisions and observed retirement patterns. One is the availability of employer-provided pension plans. For example, half the employees in the United States are covered by employer-provided plans, about half of which are "defined-benefit" plans that have substantial retirement incentive effects, as emphasized by Stock and Wise (1990a, 1990b) and Lumsdaine, Stock, and Wise (1991, 1992, 1994). In most European countries, employer-provided plans are much less prevalent; the most important exceptions are the United Kingdom and the Netherlands. The other programs that may have an important effect on retirement are unemployment and disability insurance. In many European countries, these programs essentially provide early retirement benefits before the official social security early retirement age. While these other programs affect the comparisons that are made here, the basic relation between social security plan provisions and retirement is typically quite clear. In cases where these plans are especially important, the country studies have incorporated them into the "social security" incentive calculations.

Country-Specific Examples

To illustrate the relation between social security plan provisions and retirement behavior, we draw on the data for three countries: Germany, France, and the United States. The analysis of incentive effects presented in this volume pertains primarily to current country social security systems or to the systems as they existed until recently. Data for these three countries, however, allow a

simple within-country comparison of change in plan provisions over time and the corresponding change in the labor force participation of older people. The experience of these countries also highlights a feature of retirement that is common to all countries, the concentration of retirement at social security early and normal retirement ages. These three examples also help draw attention to the features of other social programs—disability and unemployment, in particular—that often interact with the social security program in a country. In the final section, we discuss the overall evidence from the eleven countries and draw general conclusions on the basis of between-country comparisons.

The German Case

The German experience provides a clean example: a large fraction of employees is covered by the social security system, but few employees are covered by employer-provided pension plans, and such plans that do exist typically provide small benefits. On the other hand, "retirement" is to some extent encouraged in Germany by liberal disability and unemployment programs in addition to the social security plan provisions.

Before 1972, the social security retirement age in Germany was sixty-five, except for disability, and there was no social security early retirement age. But 1972 legislation provided for early retirement at age sixty for women and at age sixty-three for men (given the accumulation of required social security work years). In addition, the liberal use of disability and unemployment benefits effectively expanded the early retirement option. In a large fraction of cases, social security early retirement benefits were made available with no reduction in benefits; benefits taken at the early retirement age were the same as if they were taken at the normal retirement age. This greatly increased the net tax on work since delaying retirement simply reduced the number of years that one could receive benefits, without increasing the annual benefit.

In fact, there was a dramatic response to this increase in retirement incentives. Over the next few years, the mean retirement age of white-collar workers was reduced by 5.5 years, as shown in figure 5.[3]

The correspondence between plan provisions and retirement can also be demonstrated by considering the relation between retirement and social security provisions at a point in time. The detailed provisions of the 1972 legislation are mirrored in retirement rates by age. Figure 6 shows the proportion of men employed at a given age who retire at that age—the *hazard,* or *departure,* rate. The ages of key plan provisions are also noted on the figure so that the correspondence between provisions and retirement can be easily seen. Men who are "disabled" or "unemployed" at age sixty and have been employed for a certain number of years under the social security system are eligible for early retirement at that age. There is a corresponding large jump in the retirement rate at that age. Men who have been employed for thirty-five years are eligible for

3. The mean retirement age is the average age of persons retiring in a given year.

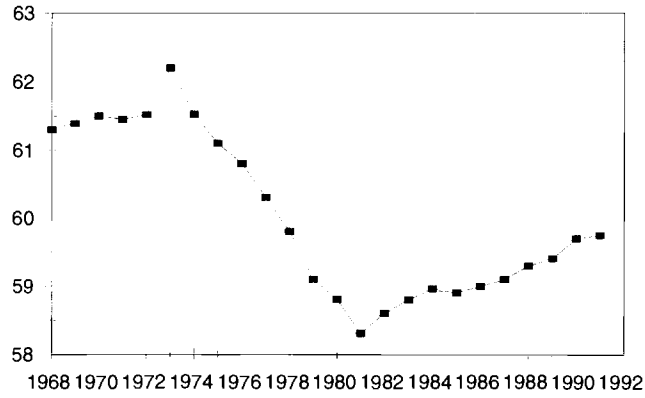


Fig. 5 Mean retirement age in Germany

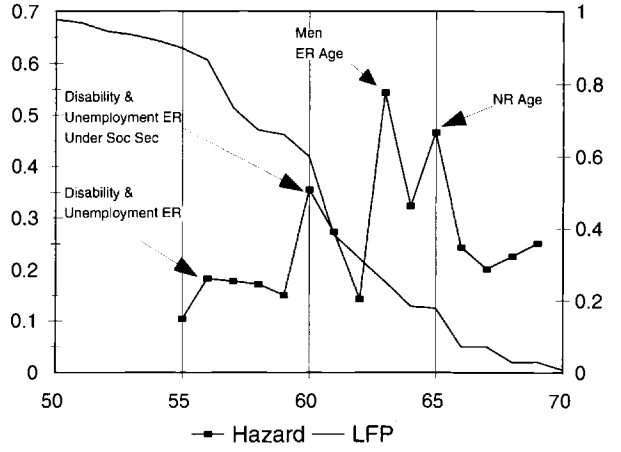


Fig. 6 Hazard and labor force participation rates for Germany
Note: ER = early retirement; NR = normal retirement.

early retirement at age sixty-three, and there is a corresponding jump in the retirement rate at that age. The normal retirement age is sixty-five, and there is a corresponding spike at that age as well. By age sixty-five, however, fewer than 29 percent of men are still in the labor force. In addition, even before age sixty, liberal interpretation of disability and unemployment plan provisions effectively serves to provide early retirement benefits (discussed further below).

But retirement eligibility may not by itself induce retirement. In Germany, a high price is paid for not retiring if eligible. Consider, for example, the prospects faced by a man with median earnings whose wife is three years younger than he is and who—like 40 percent of older German workers—would be

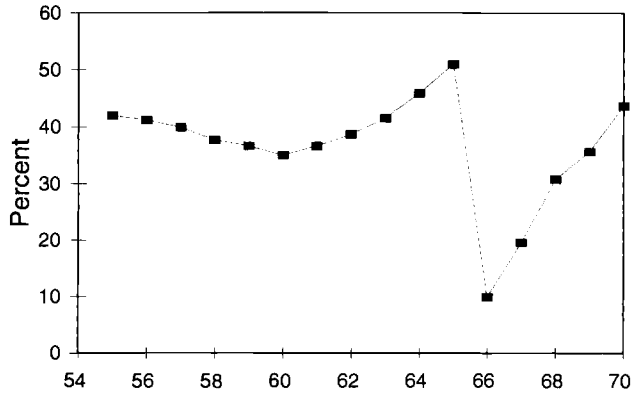


Fig. 7 Tax rates on work in Germany

eligible for disability benefits were he to leave the labor force. Suppose he could retire at age sixty but was considering postponing retirement until age sixty-five. The receipt of benefits for five fewer years would not be offset by larger benefits. Indeed, the present value of benefits if taken at age sixty-five would be much less than the present value of benefits if taken at age sixty; that is, the social security accrual rate is negative. Were retirement postponed by five years, the present value of the benefits would fall by almost 18 percent. Delaying retirement from age sixty to age sixty-one would reduce benefits by over 4 percent. This large negative accrual rate implies a substantial tax on additional work. The 4 percent reduction in benefits from delaying retirement to age sixty-one is equivalent to a tax of roughly 35 percent on the net wage earnings from working an additional year. This represents an enormous disincentive to continued work.

The tax rates on earnings for each additional year in the labor force from age fifty-five to age seventy are shown in figure 7. It is clear that the cost of postponing retirement is very large; a large fraction of what would be gained in wage earnings if the person worked between age sixty and age sixty-five, for example, is lost by way of reduced pension benefits. Thus, a large fraction of employees retire as soon as they are eligible.

The net effect on labor force participation is illustrated in figure 8, which describes the labor force status of men by age.[4] Retirement under the social security plan begins at age sixty, and labor force participation declines rapidly thereafter; by age sixty-five, virtually all men are retired under the social security retirement system.

4. Note that the labor force participation figures given here do not correspond exactly to the hazard rates shown earlier. The labor force status estimates are based on a nationally representative micro-data survey, while the hazard rate estimates are taken from administrative data on pension receipt.

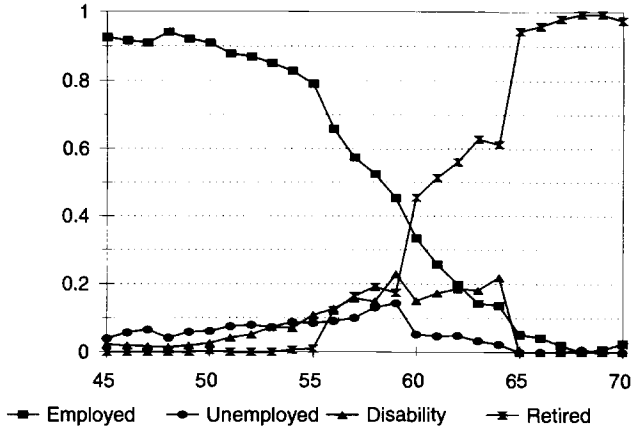


Fig. 8 Status of men by age in Germany

This figure also illustrates the interaction of the social security system and other programs. The labor force participation of men starts to fall well before the social security early retirement age. Indeed, at age fifty-nine—just before the social security early retirement age—only about 50 percent of employees are still in the labor force. The fall coincides with the increase in the proportion of men who are receiving unemployment benefits and the proportion receiving disability benefits. These programs in effect provide retirement benefits before the social security early retirement age. At age sixty, most of those receiving unemployment, and many of those receiving disability benefits, switch to receiving social security benefits instead. At age sixty-five, all those receiving disability benefits switch to social security.

The French Case

The experience in France provides another illustration of the effect of changes in plan provisions. Prior to 1972, the normal social security retirement age in France was sixty-five, and early retirement provisions were uncommon. In the early 1970s, early retirement provisions were introduced by way of a guaranteed income for persons age sixty and over who lost their jobs. In 1983, sixty became the *normal* retirement age. In addition, guaranteed income was provided for persons age fifty-seven and older who lost their jobs.

The effect of this series of reforms is easily seen in the panels of figure 9, which show the *distribution* of social security retirement ages of several cohorts—those attaining age sixty in 1972, 1978, 1982, and 1986, respectively. (These figures must be distinguished from those in, for example, fig. 6 above for Germany, which shows hazard or departure rates; fig. 9 shows the distribution of retirement ages.) In the early 1970s, the modal retirement age was sixty-five, as shown for the cohort that reached age sixty in 1972 (and age sixty-five

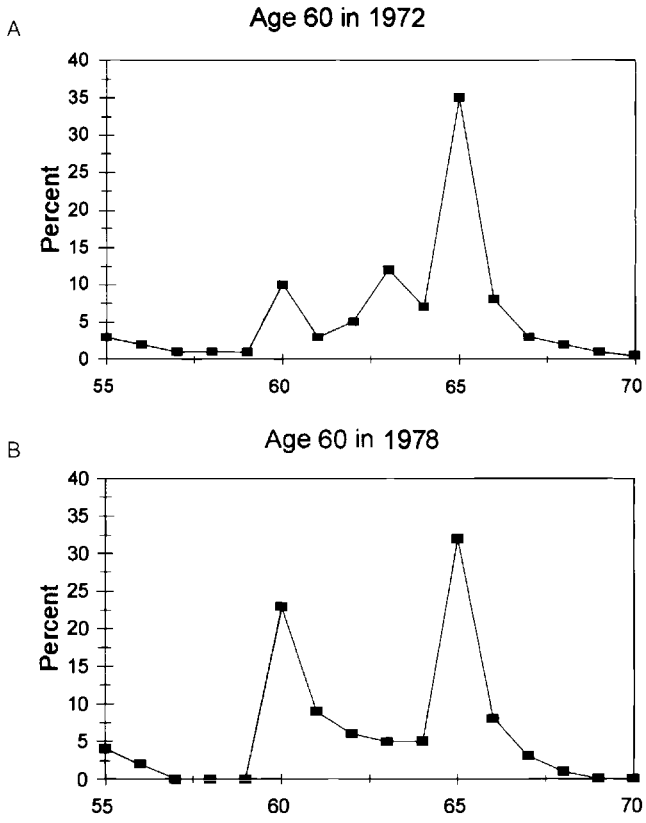


Fig. 9 Retirement ages in France: *a*, Age 60 in 1972; *b*, Age 60 in 1978; *c*, Age 60 in 1982; *d*, Age 60 in 1986

in 1977). But, as early as 1963, special allowances were provided for some workers who became unemployed at age sixty or older, perhaps reflected in the small spike at age sixty. Beginning in 1972, a "resource maintenance" program provided grants equal 60–70 percent of last earnings to persons who became unemployed between age sixty and age sixty-four. The effect of these programs seems to be reflected in the increasing proportion of workers retiring at age sixty, as shown in the second and third (1978 and 1982) panels of figure 9. Such allowances were also provided for younger workers in some industry sectors. In addition, early retirement before age sixty-five was available under some pension plans. In 1983, sixty became the normal social security retirement age (and guaranteed income was provided for persons age fifty-seven and older who lost their jobs). Shortly after that, the modal retirement age did indeed become sixty, as shown in the panel for the cohort reaching age sixty in 1986.

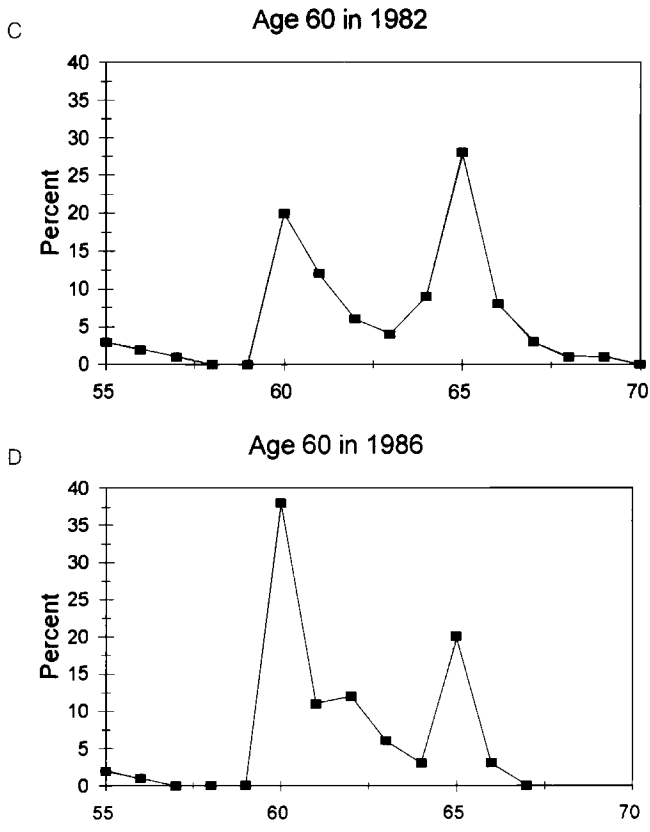


Fig. 9 (cont.) Retirement ages in France

As in Germany, the current labor force departure rates in France also correspond closely to social security provisions. And, like the German provisions, the French social security provisions also impose a large tax on continued employment past the early retirement eligibility age, as shown in figure 10. The implicit tax on continued labor force participation earnings at age sixty is close to 70 percent. The negative tax rates (large subsidy) prior to age fifty-eight reflect the sharp increases in social security entitlement for continuing in the labor force during these years; workers receive much lower social security benefits unless they work until that age. But the incentive to stay in the labor force provided by this accrual is largely canceled by the guaranteed income for persons who become unemployed at age fifty-seven and older. The age-specific rates of departure from the labor force in France are shown in figure 11. Approximately 60 percent of employees who remain in the labor force until the social security early retirement age—sixty—retire then. But, even before that

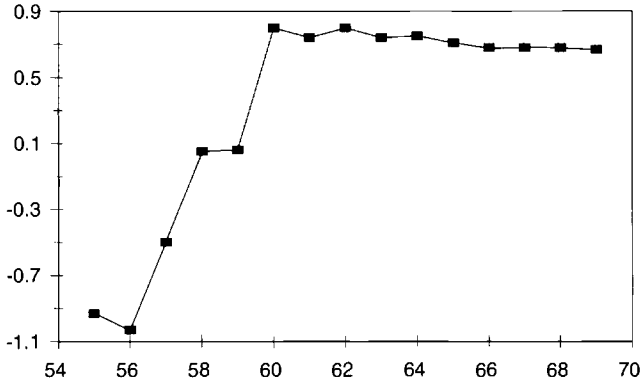


Fig. 10 Tax rates on work in France

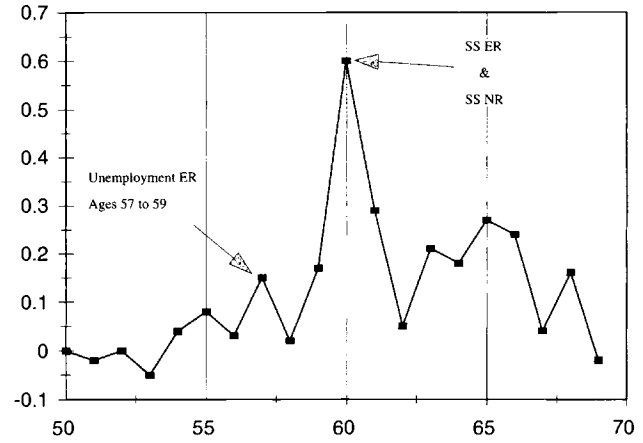


Fig. 11 Hazard rates for France
Note: ER = early retirement; NR = normal retirement; SS = social security.

age, departure rates are substantial, apparently reflecting the guaranteed income provisions for employees who become unemployed, even if they are not eligible for social security benefits. Thus, as in Germany, there is a large incentive to take retirement benefits once they are available.

The U.S. Case

As in Germany and France, changes in the age of eligibility for social security benefits in the United States had a large effect on retirement behavior. This pattern is illustrated in figure 12, which shows the hazard rates out of the labor force for men in 1960, 1970, and 1980 (from Burtless and Moffitt 1984). In 1960, the normal retirement age was sixty-five, and there was no opportunity for early retirement under social security. In that year, the hazard rate was low

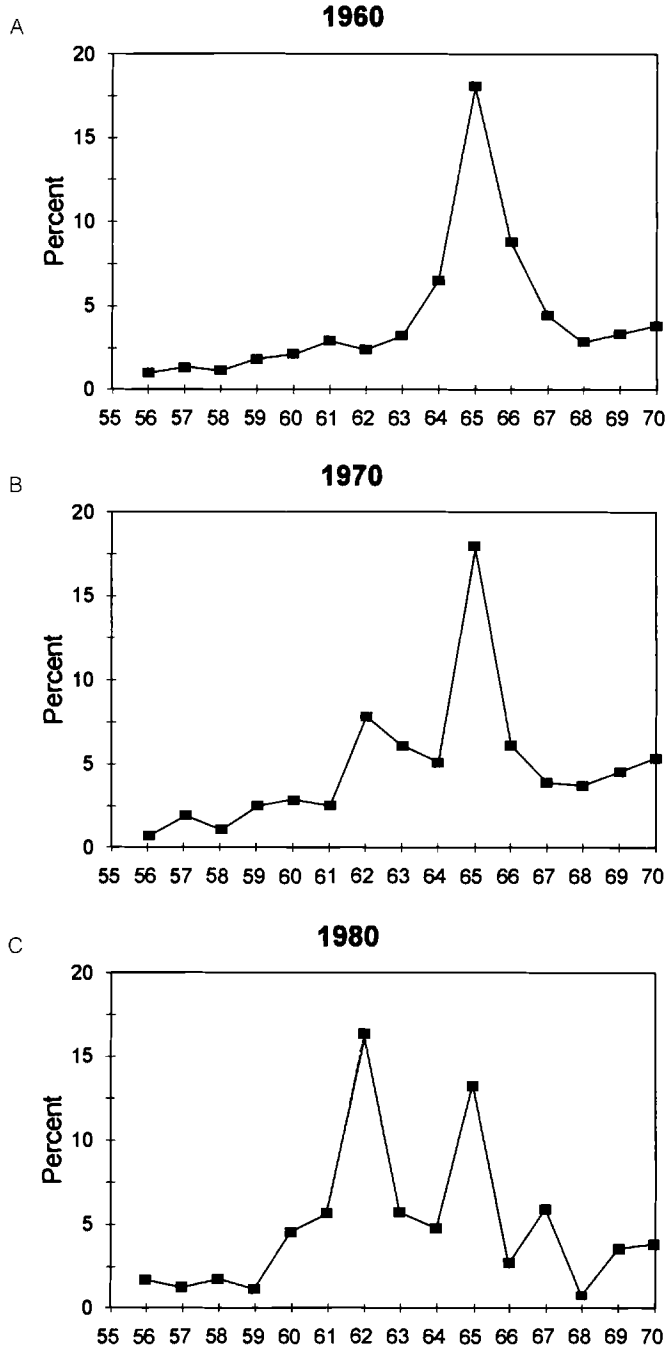


Fig. 12 Retirement hazards in the United States: *a*, 1960; *b*, 1970; *c*, 1980
Source: Burtless and Moffitt (1984).

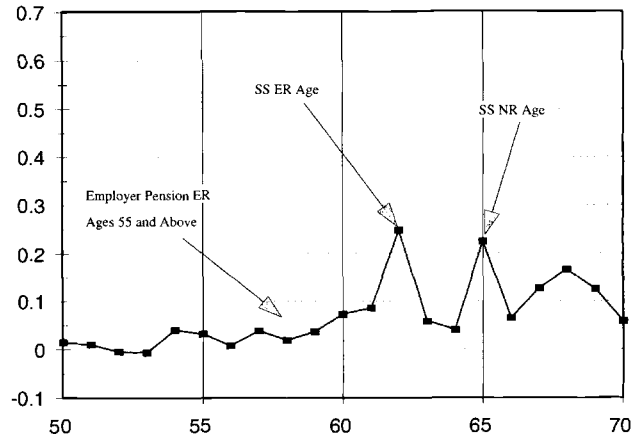


Fig. 13 Hazard rates for the United States
Note: ER = early retirement; NR = normal retirement; SS = social security.

until age sixty-five, when the departure rate jumped precipitously, reflecting the availability of social security benefits.

In 1961, early eligibility for retirement benefits for men at age sixty-two was introduced.[5] The effect of the introduction of early retirement on labor force departure rates is striking. Starting in 1970, and visible most clearly in 1980, there was a dramatic increase in the departure rate at age sixty-two and a corresponding decrease at age sixty-five. As a result, since 1980, the highest rate of labor force departure has been at age sixty-two.[6] Thus, as in Germany and France, in the United States the data suggest a very strong influence of social security incentives on retirement.

There is also, as in France and Germany, a strong, contemporaneous correspondence in the United States between social security early and normal retirement ages and departure from the labor force, as shown in figure 13. But there is a noticeable difference between the U.S. departure rates and those in France and Germany; the departure rates in the United States are much lower. Whereas, in France and Germany, the departure rates at the social security early retirement age are approximately 60 percent, in the United States the departure rate is only about 25 percent.

The difference corresponds to large differences in the tax on continued wage earnings. The tax in the United States is shown in figure 14. At age sixty-two, the tax rate in the United States is essentially zero, whereas in France the tax at the early retirement age (sixty) is close to 70 percent. In Germany, the tax rates just at and after the early retirement age are about 40 percent.

5. It had been introduced for women in 1956.

6. This evolution proceeded fairly slowly. A similar pattern is seen in Canada, as documented by Baker and Benjamin (1996): early retirement at age sixty was introduced in 1987, but not until the early 1990s was it reflected in a limited way in retirement behavior.

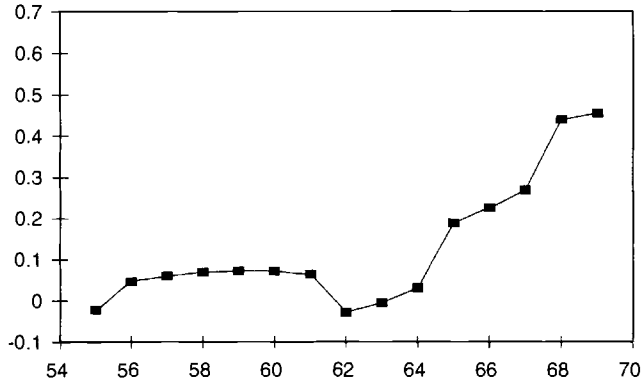


Fig. 14 Tax rates on work in the United States

There are four reasons why the tax rate at the early retirement age is so much lower in the United States. First, the "replacement rate" is much lower in the United States; thus, wage earnings exceed social security benefits by much more than in Germany or France. At age sixty-two, social security replaces about 41 percent of previous earnings on average, whereas, at age sixty, the replacement rate is 62 percent in Germany and 91 percent in France. Aside from other features of the programs, higher replacement rates increase the retirement incentives in Germany and France. The benefit forgone is much lower in the United States. Second, between age sixty-two and age sixty-five, the U.S. system provides an actuarial adjustment to benefits if their receipt is delayed, which offsets to a large extent the fewer years benefits are received. There is no actuarial adjustment in Germany or France.[7] Third, payroll tax rates to finance the program are much lower in the United States, which lowers the tax on additional work. Finally, the U.S. system allows higher earnings later in life to replace low earnings in earlier years; this is not true in Germany, but it can occur in France.

After the normal retirement age (sixty-five), however, tax rates become much higher in the United States, approaching 50 percent by age seventy. This is primarily because the actuarial adjustment after age sixty-five is much less than the "fair" rate—that which would be required to equate the expected present value of benefits if their initial receipt is delayed.

Finally, figure 13 shows an increase in departure rates around age fifty-five, well before the social security early retirement age. A similar but much more pronounced pattern is evident in figures 6 and 11 above for Germany and France, respectively. In those countries, the increase is associated with the receipt of unemployment and/or disability benefits. In the United States, on the other hand, the increase is apparently associated with employer-provided pension plan early retirement ages, which are common at fifty-five and are typi-

7. Reforms in 1992 introduced such an adjustment in Germany.

cally between fifty-five and sixty. The estimated hazard rates in figure 13 are imprecise, however, and thus do not show a precise increase at age fifty-five.[8]

To summarize, these three country illustrations make clear the very close correspondence between retirement ages and the statutory social security eligibility for early and normal retirement benefits. In all three cases, there are large jumps in labor force departure rates at the early retirement age in particular and at the normal retirement age as well. The correspondence is demonstrated most convincingly by within-country changes in retirement behavior over time, which follow on changes in statutory provisions. In addition, the jump in departure rates, at the early retirement age in particular, appears to be much greater in countries where the tax on continued work is large (Germany and France) than in countries where it is smaller (the United States). We turn now to an overview of the conclusions that seem warranted on the basis of the combined results in all eleven countries.

All Countries

In distilling the evidence from all the countries studied in this volume, three features of the data stand out. First, as in the three country illustrations, there is a strong correspondence between early and normal retirement ages and departure from the labor force. Second, the social security provisions in most countries place a heavy tax burden on work past the age of early retirement eligibility and thus provide a strong incentive to withdraw from the labor force early. Third, the tax—and thus the incentive to leave the labor force—varies substantially among countries. So does retirement behavior. Thus, by considering comparisons across the countries, we are able to draw general conclusions about the relation between the tax penalty on work and retirement behavior. Although the between-country comparisons suggest a rather strong relation between these provisions and retirement—in particular, the unused capacity measure—we do not attempt to assign quantitative magnitudes to the effects. We will try to summarize the results for all the countries, however, in a way that makes clear that economic incentives to retire are indeed associated with early departure from the labor force. More precise quantitative estimates of the effects of specific provisions must await more formal analysis.[9]

Early Retirement Provisions and Departure Rates

Perhaps the easiest way to see the relation between departure rates and early retirement provisions is to consider graphs of hazard rates for each of the countries, like those shown above for Germany, France, and the United States.

8. This jump in the hazard rate is more apparent in longitudinal data, as shown in Welch and Peracchi (1994).

9. Some analyses are reviewed on a country-by-country basis in appendices to the individual country papers.

These are shown for men in the first of the two panels that are presented for each country individually in figures 15*a* through 15*k*. The top panel for each country also shows the labor force participation rates by age for each country. It is evident that there is typically a strong correspondence between retirement plan provisions and labor force departure rates. In virtually every country, there is a sharp jump in the departure rate at the social security early retirement age, when employees are first eligible for benefits.[10] In every country, there is also a jump in departure at the normal retirement age. We emphasize the early retirement age, however, because in most countries only a small fraction of men remain in the labor force until the normal retirement age. Thus, the large departure rates at the normal retirement age apply to only a small fraction of employees.

Although the social security early retirement age is the most critical of plan provisions, as emphasized above, in many countries unemployment and disability programs effectively provide early retirement at younger ages. The effects of these programs are reflected in the departure rates before the social security early retirement ages. To understand the implications of departure rates, it is useful to have in mind a few illustrations of their cumulative effect: if 5 percent of those still employed leave each year, after five years 24 percent will have left. If 10 percent leave each year, 41 percent will have left over five years; if 20 percent leave each year, 67 percent will have left over five years. The effects of unemployment and disability programs seem especially evident in Belgium, France, the Netherlands, and Germany, where labor force departure rates approach or exceed 20 percent before the social security early retirement age. (These programs are also labeled on the first panels of fig. 15.) In contrast, in Sweden—which has no early retirement and normal retirement at sixty-five—departure rates before age sixty are typically well below 5 percent. Departure rates before the social security early retirement age are also much smaller in the United States and Canada, although in these countries employer-provided pension plans—with typical early retirement ages between fifty-five and sixty—provide incentive for some employees to retire at earlier ages.

To understand further the importance of unemployment and disability programs, the proportion of men reporting that they are unemployed or disabled is shown in the lower panel for each country in figure 15. These panels also show the proportion of men who are employed and the proportion who are retired. At age fifty-nine, for example, 22 percent of men are receiving unemployment or disability benefits in Belgium, 21 percent in France, 27 percent in the Netherlands, 33 percent in the United Kingdom, and 37 percent in Germany. Even in Sweden, where departure rates are relatively low before age sixty, 24 percent are receiving unemployment or disability benefits at age

10. In the Netherlands, the jump is not in fact at the social security retirement age but at the common employer plan early retirement age. In the Netherlands, employer plans are virtually universal and are mandated by law.

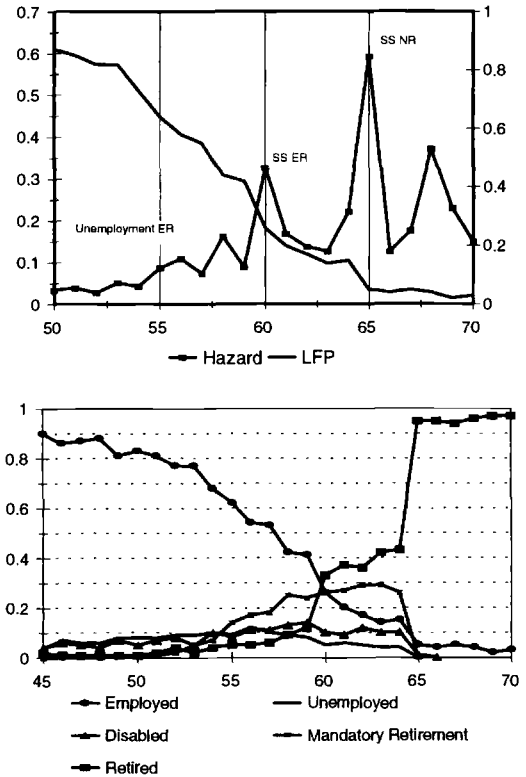


Fig. 15A Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Belgium

Note: ER = early retirement; NR = normal retirement; SS = social security.

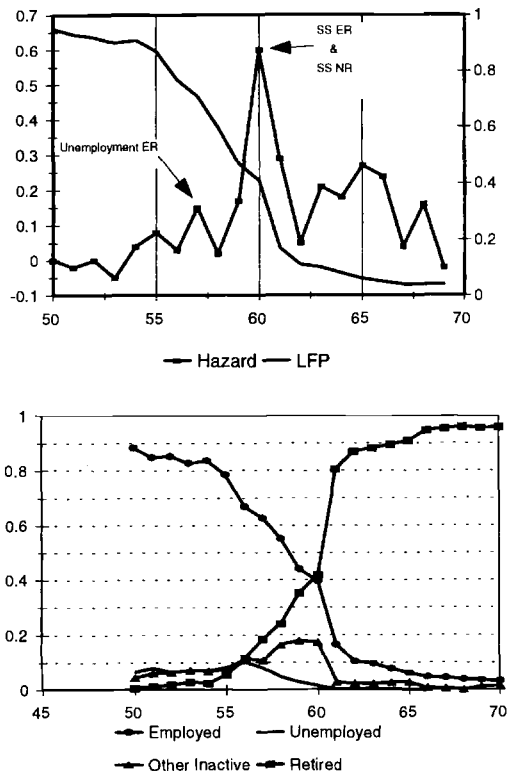
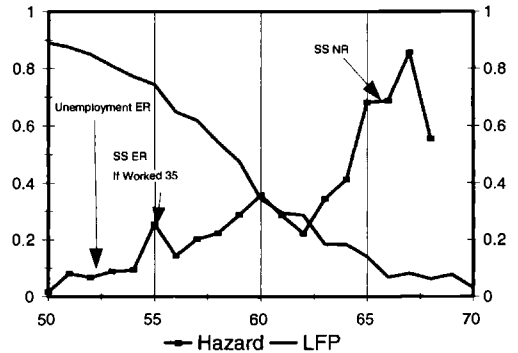


Fig. 15B Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, France



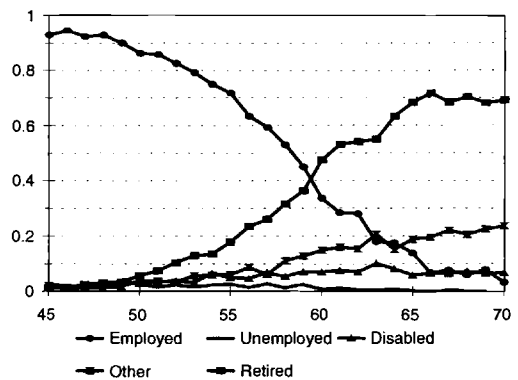
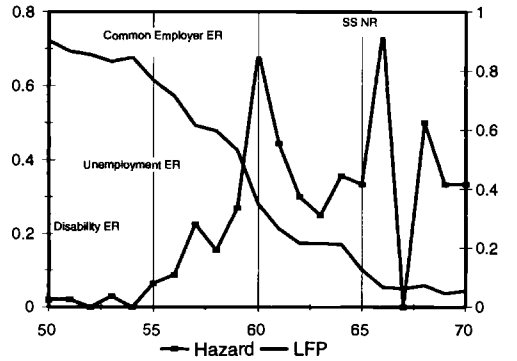


Fig. 15C Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Italy



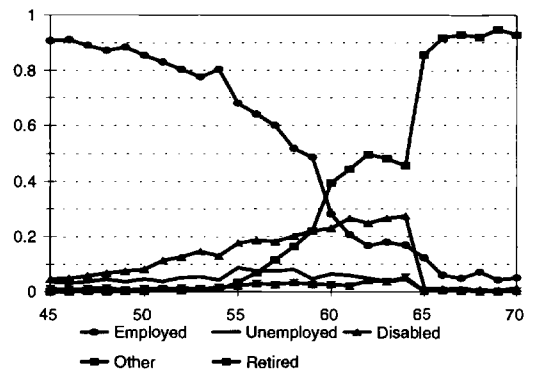


Fig. 15D Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, the Netherlands

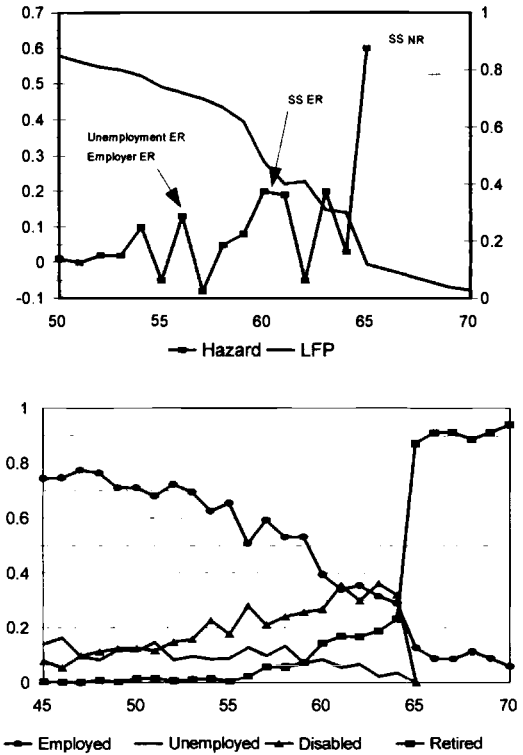


Fig. 15E Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, the United Kingdom

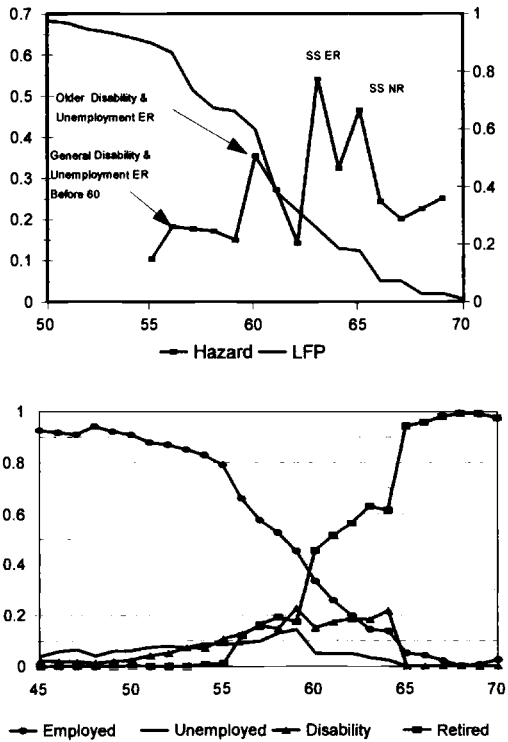


Fig. 15F Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Germany

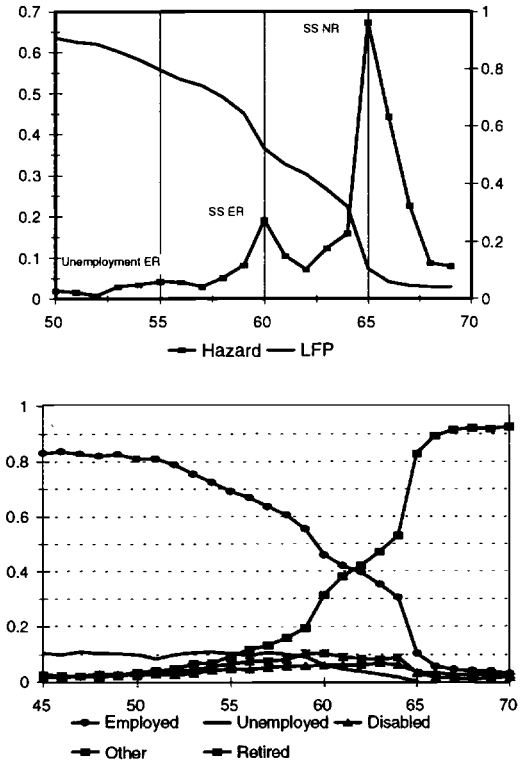


Fig. 15G Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Spain

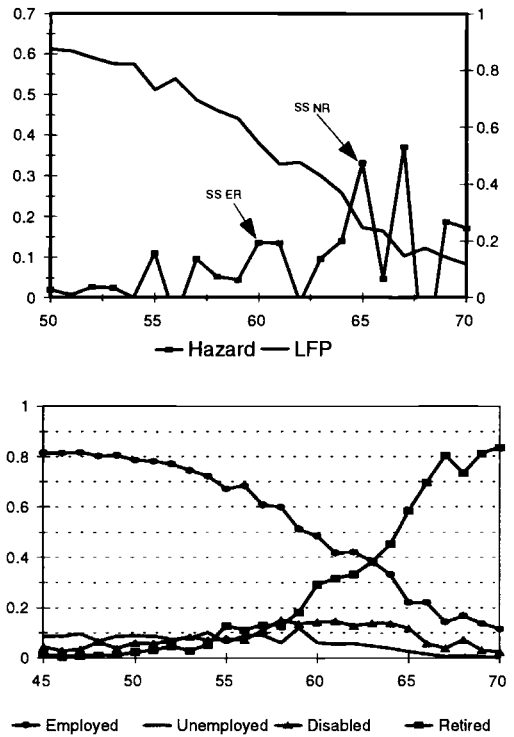


Fig. 15H Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Canada

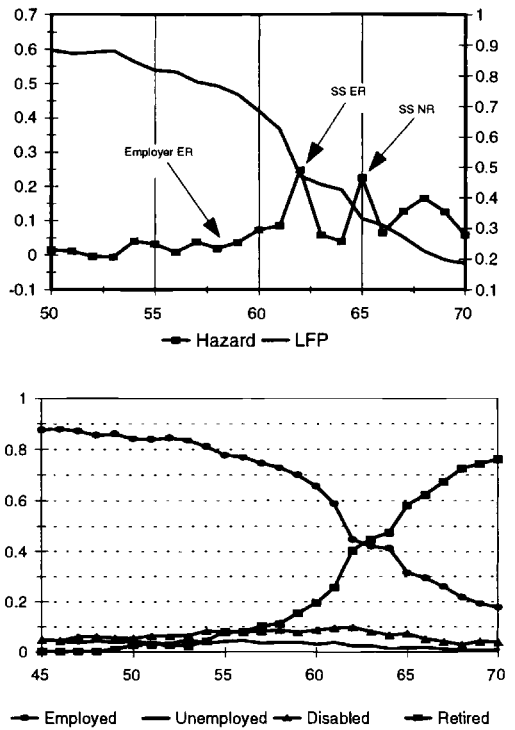


Fig. 15I Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, the United States

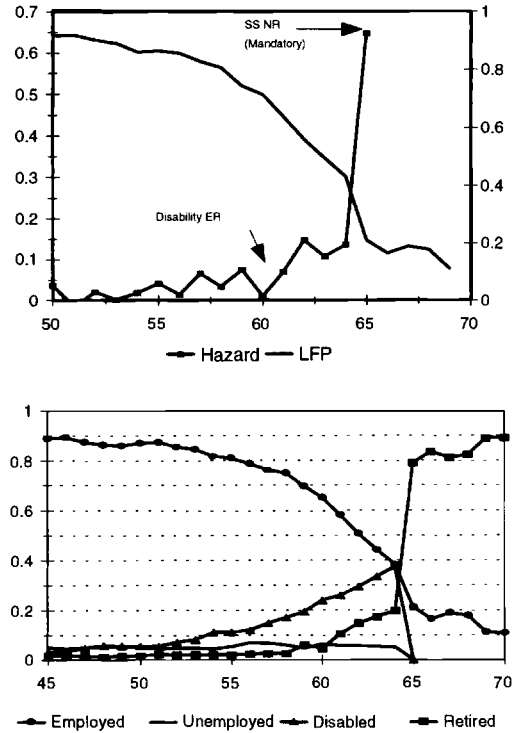


Fig. 15J Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Sweden

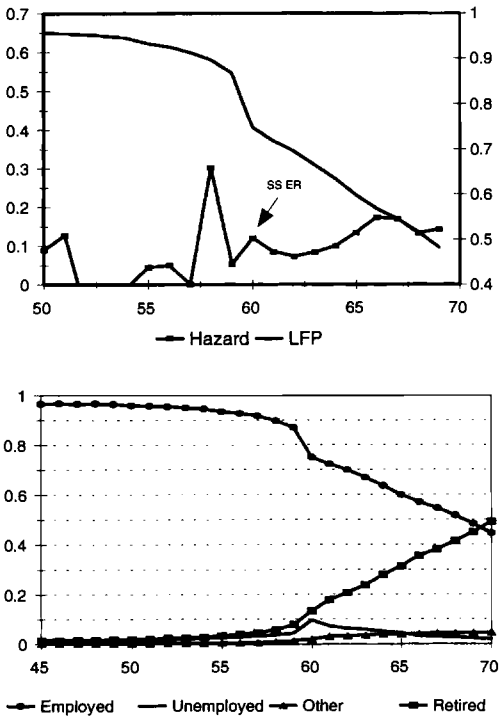


Fig. 15K Hazard and labor force participation rates *(top)*, and status of men by age *(bottom)*, Japan

fifty-nine. In the United States and Japan, on the other hand, only about 12 percent are receiving unemployment or disability benefits at age fifty-nine.

The relation between these programs and social security is made clear in these figures as well. For example, in France, almost all those who are unemployed at age sixty begin to receive social security benefits at that age and thereafter are officially classified as retired. In the Netherlands, the United Kingdom, Germany, and Sweden, the large fraction of persons receiving disability benefits before age sixty-five then starts to receive social security benefits and is classified as retired.

In short, the conclusion is clear: as was apparent in the more detailed data for Germany, France, and the United States, the collective evidence for all countries combined shows that statutory social security eligibility ages contribute in important ways to early departure from the labor force. In addition, unemployment and disability programs serve as early retirement programs in many countries.

Implicit Tax Rates and Incentives to Retire

The three illustrative country descriptions also suggested that the jump in the departure rate at the social security early retirement age is magnified by greater implicit tax penalties on wage earnings after social security eligibility. In particular, in France and Germany, with large taxes on continued work, the departure rate was much greater than in the United States, with a much smaller implicit tax on work. We explore this relation further here, drawing on the broader evidence from all the countries in the study. Labor force participation and retirement incentives for all eleven countries are summarized in table 1. The countries are ordered by the unused productive capacity of men between the ages of fifty-five and sixty-five, which is explained above and shown in figure 4 above. The panels of figure 15 follow the same order.

We emphasize, first, that, once employees are eligible for social security benefits, a heavy tax burden is often imposed on persons who continue to work. The third to last column of the table shows the implicit tax rate on labor earnings at the early retirement age for each country. It is clear that, in many countries, these tax rates are extremely high, in particular, in those countries at the top of the table—those with the greatest unused labor capacity. Thus, it is evident that the implicit tax on earnings can provide a strong incentive to leave the labor force.

The fourth column of the table shows replacement rates at the early retirement age, which are also very large in many countries, especially those with the greatest unused labor capacity.

Casual perusal of this table suggests a strong relation between unused labor capacity and the tax rate on continued work. To see the relation more clearly, it is useful to divide the countries into three groups: (1) those with high unused capacity (Belgium, France, Italy, the Netherlands, and the United Kingdom); (2) those with medium unused capacity (Germany, Spain, and Canada); and

Table 1 **Unused Labor Capacity, Key Plan Features, and the Retirement Rate at Early Retirement Age, by Country**

Country	Unused Labor Capacity, 55–65	Men Out of Labor Force, Age 59	Early Retirement Age	Replacement Rate at Early Retirement Age (%)	Accrual in Next Year (%)	Implicit Tax on Earnings in Next Year (%)	Tax Force Early Retirement Age to 69	Hazard Rate at Early Retirement Age (%)
Belgium	67	58	"60"	77	−5.6	82	8.87	33
France	60	53	60	91	−7.0	80	7.25	65
Italy	59	53	"55"	75	−5.8	81	9.20	10
The Netherlands	58	47	"60"	91	−12.8	141	8.32	70
The United Kingdom	55	38	60	48	−10.0	75	3.77	22
Germany	48	34	60	62	−4.1	35	3.45	55
Spain	47	36	60	63	4.2	−23	2.49	20
Canada	45	37	60	20	−1.0	8	2.37	32
The United States	37	26	62	41	0.2	−1	1.57	25
Sweden	35	26	60	54	−4.1	28	2.18	5
Japan	22	13	60	54	−3.9	47	1.65	12

Note: In some countries, the effective early retirement age is ambiguous. The ages in quotation marks are intended to signal cases where the ambiguity is perhaps the greatest, but the availability of unemployment and disability benefits creates ambiguities in other cases as well. The calculations presented in this table and in fig. 17 below are taken from the individual country papers and pertain to the following cases:

Belgium: The social security early retirement age is 60, but employees who are laid off are eligible for large benefits at younger ages. Thus, the accrual, implicit tax, and tax force measures treat unemployment benefits as early retirement benefits available at age 55.

France: Counting social security benefits, available at age 60, but not accounting for guaranteed income benefits for those losing their jobs at age 57 or older.

Italy: Social security benefits for private-sector employees, not counting disability availability.

The Netherlands: In addition to public social security benefits, the calculations account for virtually universal employer private pension benefits. The employer plan is assumed to provide for early retirement at age 60. There is no social security early retirement in the Netherlands, but employer early retirement benefits are commonly available at age 60.

The United Kingdom: Based on social security benefits only, but counting "incapacity" benefits at age 60 as early retirement benefits.

Germany: Counting social security benefits and assuming that a person is eligible for "early" disability benefits.

Spain: Based on Régimen General de la Seguridad Social (the main social security program).

Canada: Counting social security benefits only.

The United States: Counting social security benefits only.

Sweden: Counting social security benefits only. The hazard rate at the early retirement age is the average of the rates between age 59 and age 61.

Japan: Assuming the "diminishing-earnings" profile described in Yashiro and Oshio (chap. 6 in this volume). The employment option is to work in the primary firm until age 60 and then a secondary firm, where the worker would be eligible for the 25 percent wage subsidy were his earnings low enough.

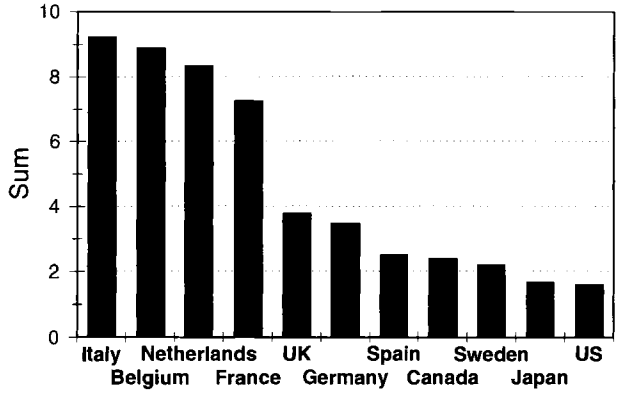


Fig. 16 Sum of tax rates on work

(3) those with low unused capacity (the United States, Sweden, and, in particular, Japan). The average replacement rate at early retirement in the first group is 76.6 percent of median earnings and the average tax on continued labor earnings in that year 91.8 percent. In the third group—with the least unused labor capacity—the average replacement rate at the early retirement age is 50 percent and the tax rate on continued earnings 24.7 percent. These comparisons point to a strong correlation between social security incentives and unused capacity.

There is no completely satisfactory way to summarize the country-specific incentives for early retirement. One crude measure is based on the implicit taxation of labor earnings once a person is eligible for social security benefits. We sum the implied tax rates on continued work beginning with the early retirement age—when a person is first eligible for social security benefits—and running through age sixty-nine. We call this the *tax force* to retire. This measure is reported in the second to last column of table 1. The measure is shown in figure 16, in which the countries follow the same order as in table 1. This figure suggests once again that there is a strong relation between social security penalties on work and retirement. The average tax force to retire is 7.5 in the first group of countries in table 1 and 1.8 in the third group.

The relation is formalized in figure 17, which presents scatter plots of the tax force to retire and unused labor capacity between age fifty-five and age sixty-five. Figures 17*a* and 17*b* are based on the sum of tax rates from the early retirement age through age sixty-nine. Japan is included in figure 17*a* but excluded from figure 17*b*. Figure 17*c* is based on the sum of tax rates from age fifty-five to age sixty-nine in all countries. In either case, the relation is clear; there is a strong correspondence between the tax force to retire and unused labor capacity. The relation is nonlinear, however. Thus, in the lower panels of each figure, unused capacity is plotted against the logarithm of the tax force. The solid line in these panels shows the "fit" of the data by a regression of

unused capacity on the logarithm of the tax force. About 81 percent of the variation in unused capacity can be explained by the early retirement to age sixty-nine tax force to retire when Japan is included, and 86 percent can be explained when Japan is excluded. When the age fifty-five to age sixty-nine tax force measure is used, 82 percent of the variation is explained, including Japan.[11] Thus, these data suggest a strong relation between social security incentives to quit work and the labor force departure of older workers.

The correspondence between the two should be understood in a broader context, however. There are two distinct issues. First, while it seems apparent that social security provisions do affect labor force participation, it also seems apparent from the country papers that, in at least some instances, the provisions were adopted to encourage older workers to leave the labor force. For example, anecdotal evidence suggests that, in some countries, it was thought that withdrawal of older employees from the workforce would provide more job opportunities for young workers. This possibility does not by itself bring into question a causal interpretation of the relation between plan provisions and retirement. To the extent that it is true, it simply says that, in some instances, the provisions were adopted for a particular reason. And the data show that they worked.

The second issue, however, must temper a causal interpretation of the results. It could be argued that, to some extent at least, the social security provisions were adopted to accommodate existing labor force participation patterns, rather than the patterns being determined by the provisions. For example, early retirement benefits could be provided to support persons who are unable to find work and thus already out of the labor force. While this is surely possible, the weight of the evidence suggests otherwise. The German, French, and U.S. illustrations provide strong evidence that changes in plan provisions induced subsequent changes in retirement rates, not the other way around.

The data in the second column of table 1 above can be interpreted in the light of both these issues. These data show the proportion of men who have left the labor force by age fifty-nine. This is before the official social security early retirement age in all countries, with the exception of Italy, where the early retirement age is younger in some instances. The nonparticipation rate at age fifty-nine varies from a high of 58 percent in Belgium to a low of 13 percent in Japan. A large part of the difference across countries can apparently be ascribed to differences in disability and unemployment insurance provisions. One might think of the labor force participation at this age as the level at which the force of the official social security provisions is first felt. As emphasized above, however, in many instances, these other programs effectively provide

11. Japan appears to be an outlier when the first tax force measure is used, although not when the second tax force measure is used. That Japan appears to be an outlier in one version may reflect a weakness of our summary measure of unused capacity. A rather high share of Japan's labor force is self-employed and not covered by the social security system, and the very high participation rate at older ages in Japan is largely in the secondary sector and is often part-time.

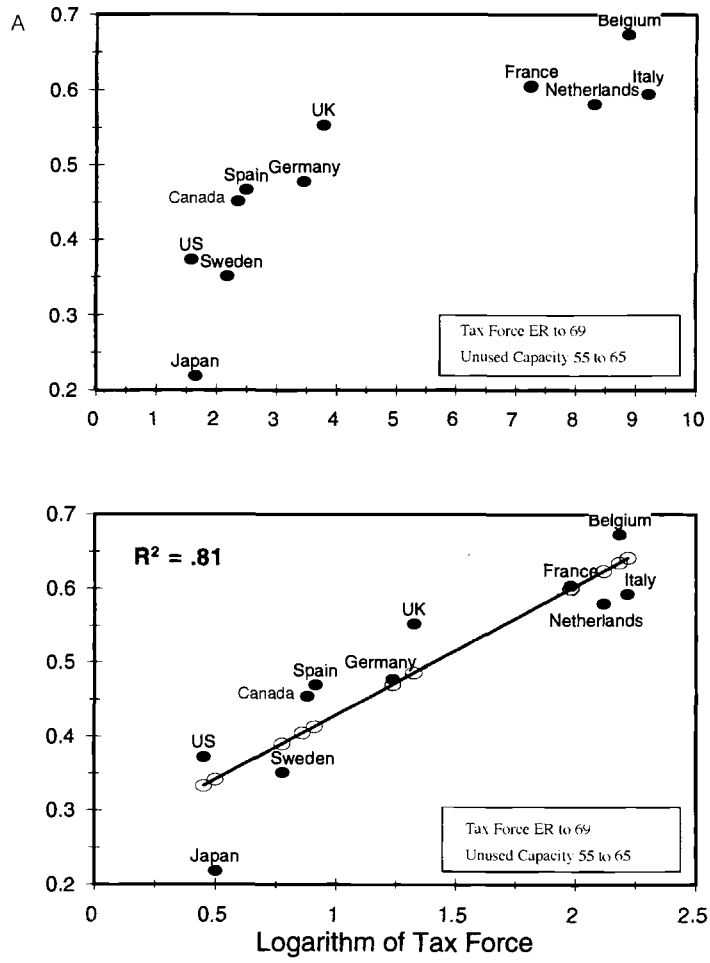


Fig. 17 Unused capacity vs. tax force
Note: ER = early retirement.

early retirement at younger ages than the official social security early retirement age. It is perhaps not surprising that these levels are also strongly related to the unused capacity measures.

Why were these provisions adopted? One possibility, consistent with the first issue above, is that they were part of an effort to facilitate the early withdrawal of older employees from the labor force. And, like the social security provisions themselves, they worked. Again, this does not by itself question the causal relation between the provisions and retirement; to the extent that it is

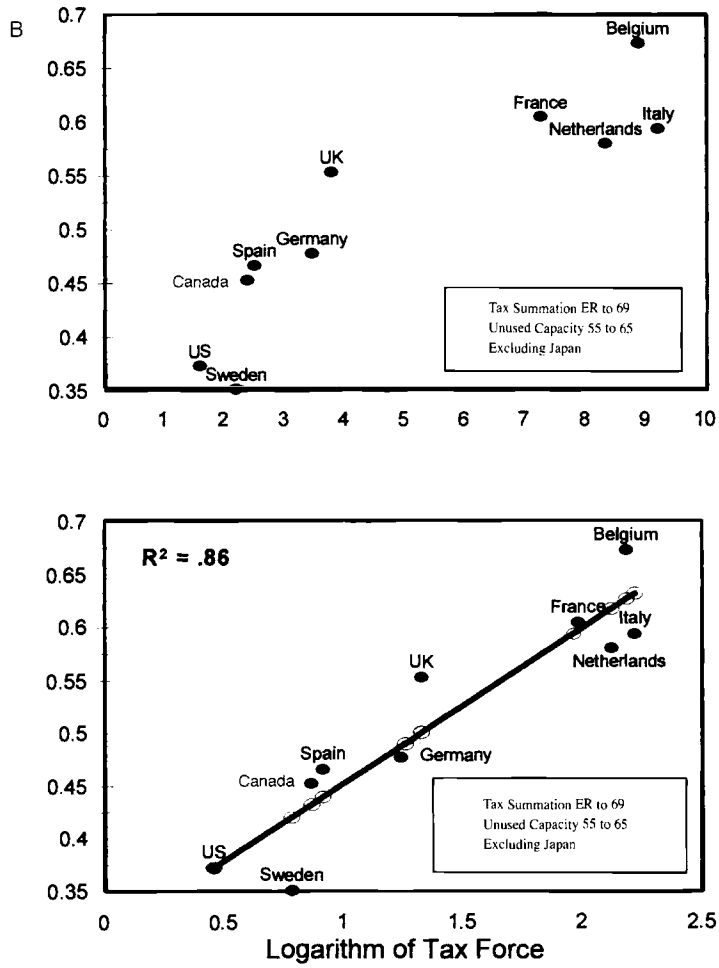


Fig. 17 (cont.) Unused capacity vs. tax force

true, it suggests a reason for adopting the provisions. But these pseudo–early retirement programs could also have been adopted to accommodate preexisting labor force departure rates, and this possibility must temper a causal interpretation of the relation between program provisions and retirement. Again, however, the data for the three illustrative countries provide strong evidence of a causal link between provisions and retirement. Ultimately, the extent of any reverse causality cannot be determined by these descriptive statistics; it can be addressed only with more detailed analysis.

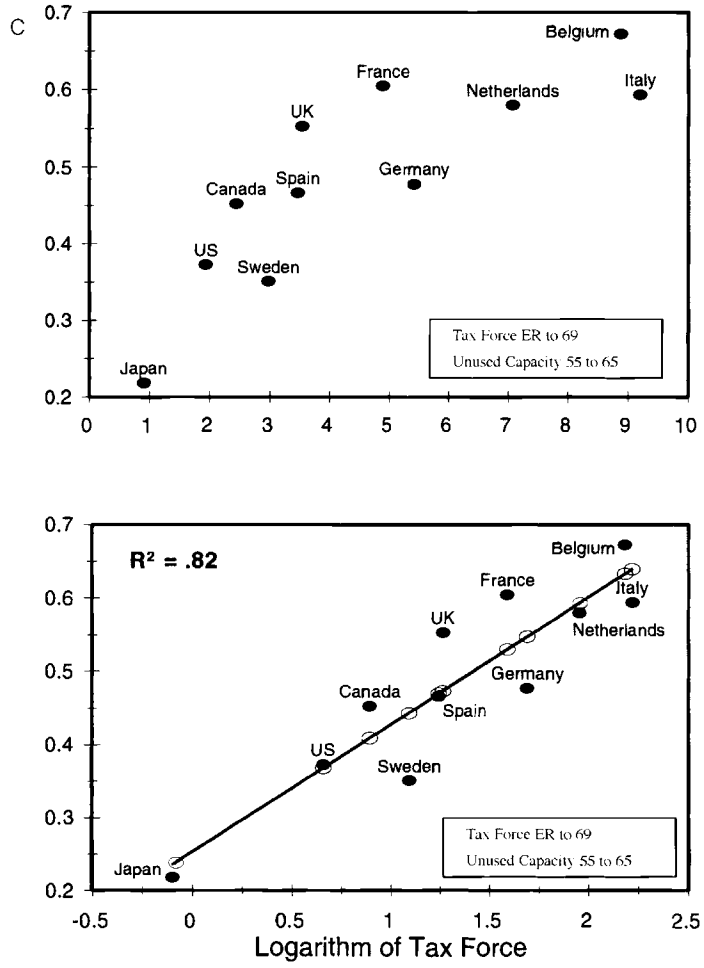


Fig. 17 (cont.) Unused capacity vs. tax force

Conclusions

The populations in all industrialized countries are aging rapidly, and individual life expectancies are increasing. Yet older workers are leaving the labor force at younger and younger ages. In several countries in our study, participation rates for men aged sixty to sixty-four have fallen from over 70 percent in the early 1960s to less than 20 percent now. This decline in labor force participation magnifies population trends, further increasing the number of retirees relative to the number of persons who are working. Together, these trends have put enormous pressure on the financial solvency of social security systems around the world. Ironically, we argue, the provisions of the social security systems themselves typically contribute to labor force withdrawal.

It is clear that there is a strong correspondence between the age at which benefits are available and departure from the labor force. Social security programs often provide generous retirement benefits at young ages. In addition, the provisions of these programs often imply large financial penalties on labor earnings beyond the social security early retirement age. Furthermore, in many countries, disability and unemployment programs effectively provide early retirement benefits before the official social security early retirement age. We conclude that social security program provisions have indeed contributed to the decline in the labor force participation of older persons, substantially reducing the potential productive capacity of the labor force. It seems evident that, if the trend toward early retirement is to be reversed, a move that will almost surely be dictated by demographic trends, changing the provisions of social security programs that induce early retirement will play a key role.

References

Baker, Michael, and Dwayne Benjamin. 1996. Early retirement provisions and the labour force behavior of older men: Evidence from Canada. University of Toronto, Department of Economics. Mimeo.

Burtless, Gary, and Robert Moffitt. 1984. The effect of social security benefits on the labor supply of the aged. In *Retirement and economic behavior,* ed. H. Aaron and G. Burtless. Washington, D.C.: Brookings.

Kohli, M., M. Rein, A.-M. Guillemard, and H. van Gunsteren, eds. 1991. *Time for retirement: Comparative studies of early exit from the labor force.* Cambridge: Cambridge University Press.

Lumsdaine, Robin L., James H. Stock, and David A. Wise. 1991. Fenêtres et retraites. *Annales d'economie et de statistique* 20/21:219–42.

———. 1992. Three models of retirement: Computational complexity versus predictive validity. In *Topics in the economics of aging,* ed. D. Wise. Chicago: University of Chicago Press.

———. 1994. Pension plan provisions and retirement: Men and women, Medicare, and models. In *Studies in the economics of aging,* ed. D. Wise. Chicago: University of Chicago Press.

OECD. 1995a. The labor market and older workers. Social Policy Studies Series, no. 17. Paris.

———. 1995b. The transition from work to retirement. Social Policy Studies Series, no. 16. Paris.

Stock, James H., and David A. Wise. 1990a. The pension inducement to retire: An option value analysis. In *Issues in the economics of aging,* ed. D. Wise. Chicago: University of Chicago Press.

———. 1990b. Pensions, the option value of work, and retirement. *Econometrica* 58, no. 5:1151–80.

Welch, Finis, and F. Peracchi. 1994. Trends in labor force transitions of older men and women. *Journal of Labor Economics* 12, no. 2:210–42.