

# *Social Security, Retirement Incentives, and Retirement Behavior: An International Perspective*

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*Issue Brief*

- Escalating rates of early retirement are imposing fiscal pressure on retirement systems around the world. In some developed countries, the labor-force participation rates of men ages 60–64 have fallen by 75 percent over the last three decades. One explanation for this striking decline is social security program provisions which create disincentives to continued labor-force participation by older workers.
- There are substantial differences among developed nations in the labor-force participation of older workers. While two-thirds of 60-year-old American males are working, only one-quarter of men that age are working in Belgium. Over the entire 55–65 age range, 63 percent of American males are working, compared with only 40 percent of French males and 33 percent of Belgians males.
- There is strong evidence that the early retirement provisions of social security systems in developed countries determine the modal age of retirement. There is a strong relationship between early retirement ages and labor-force withdrawal rates; for example, in France, 60 percent of those working at the early entitlement age of 60 leave the labor force at that age.
- The core of this analysis is the construction of “implicit tax/subsidy rates” on additional work at older ages through each nation’s social security system. These rates measure the change in a worker’s retirement wealth entitlement from delaying retirement for one year, relative to the amount that would have been earned over that year.
- The U.S. Social Security system has an actuarial adjustment for delayed benefits claiming and other features that avoid financial incentives to leave the labor force at age 62 for a married worker; there is a slight disincentive to work for single workers and high wage earners. However, at ages 65 and older there is a stronger incentive to leave the labor force, with implicit tax rates on work of 19 percent for married workers and 33 percent for single workers.
- By comparison, other nations do not have actuarially fair adjustments, and as a result impose substantial taxes on additional work at older ages. In several countries, implicit tax rates on work at older ages approach or exceed 100 percent. This is because by delaying retirement, workers forgo benefits which often replace close to their full wage, in addition to having to pay the high payroll taxes required to finance generous social security benefits.
- There is a striking correlation across nations between high implicit tax rates on additional work and low labor-force participation rates among older workers. This suggests that social security program incentives are an important determinant of retirement.
- These findings have important policy implications for reforming social security programs in the United States and abroad. Policymakers must consider how program reforms will affect incentives for continued work at older ages.

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## Introduction

Social Security is the largest entitlement program in the United States.

Social Security

benefits payments in 1997 were more than \$316 billion, almost 18 percent of the federal budget and about 4 percent of the U.S. gross domestic product (GDP), which represents a doubling as share of GDP over the past 30 years.<sup>1</sup> The U.S. Social Security also faces a long-term fiscal imbalance. The convergence of several trends in the early 21st century will cause problems with the long-run solvency of the program.

Two are demographic trends: the aging of the baby boom cohort and the drop in the fertility rate of U.S. families. As a result, the ratio of persons over age 65 to those ages 20–64 has risen from 0.14 in 1950 to 0.21 today, and is projected to rise to 0.36 by 2030 and to 0.41 by 2070. Another trend is the reduction in the growth rate of real wages in the United States, which has lowered the base of earnings on which Social Security benefits commitments can be financed. As a result, current estimates imply that if the structure remains unchanged, payroll taxes to finance this program—currently at 12.4 percent of payroll—would have to rise to over 18 percent (Stuerle and Bakija, 1994) to meet projected obligations.<sup>2</sup>

Such fiscal imbalance is reflected not only in the U.S. Social Security system, but also in other systems around the industrialized world. Indeed, the projected actuarial deficits in social security systems in other nations dwarf those in the United States. Chart 1 shows the ratio of the number of persons age 65 and over to the number ages 20–64 for a sample of 11 countries.<sup>3</sup> In six of the countries, this ratio will exceed 0.5 by 2050; in Japan, it will exceed 0.6, so that for every working-age person there would be only 0.6 retirement-age person. These demographic trends have placed substantial 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 60 to 64-year-old men have fallen by 75 percent over the past three decades. In the United States, the trend has been less pronounced but striking nonetheless, with labor-force participation among 60 to 64-year-olds falling from 80 percent in 1960 to 52 percent in 1994.

What accounts for the striking decline in labor-force participation? One explanation is that social security provisions themselves provide enormous incentive for workers to leave the labor force early, thus by their very structure exacerbating the program's financial problems. This *Issue Brief* discusses the financial incentives for retirement faced by older workers in the United States and other countries and the relation to workers' retirement decisions. It summarizes evidence from the 11 countries examined in *Social Security and Retirement Around the World* (Gruber and Wise, 1999b): Canada, France, Germany, Italy, Japan, the Netherlands, Belgium, Spain, Sweden, the United Kingdom, and the United States.

The analysis begins with a review of the trends in labor-force participation in the United States and around the world, highlighting the remarkable reduction in older workers' participation. It documents the current patterns of labor-force participation by older workers in the United States and in these other countries, and illustrates the relationship between social security provisions and withdrawal from the labor force, in two steps. First, the discussion focuses on three "case studies" of countries that have changed the underlying structure of their early retirement provisions over the

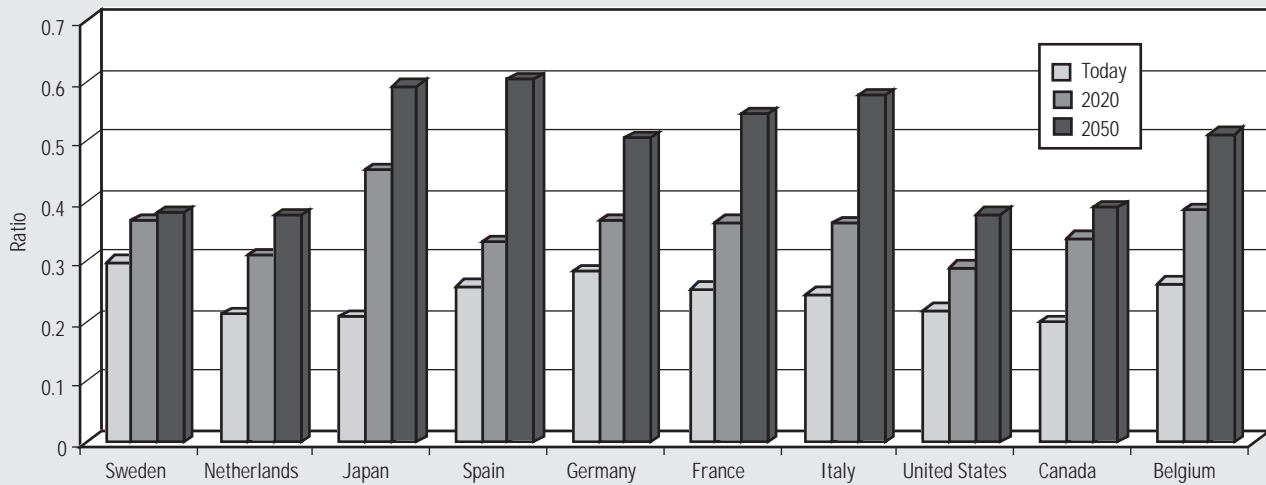
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<sup>1</sup> For the source of information on details of the U.S. Social Security system, see U.S. Congress (1998).

<sup>2</sup> Another source of long-term imbalance is the rapid expansion of Social Security benefit levels in the post-World War II era.

<sup>3</sup> Figure from Gruber and Wise (1998).

Chart 1  
Ratio of Population Ages 65 and Older to Population Ages 20-64



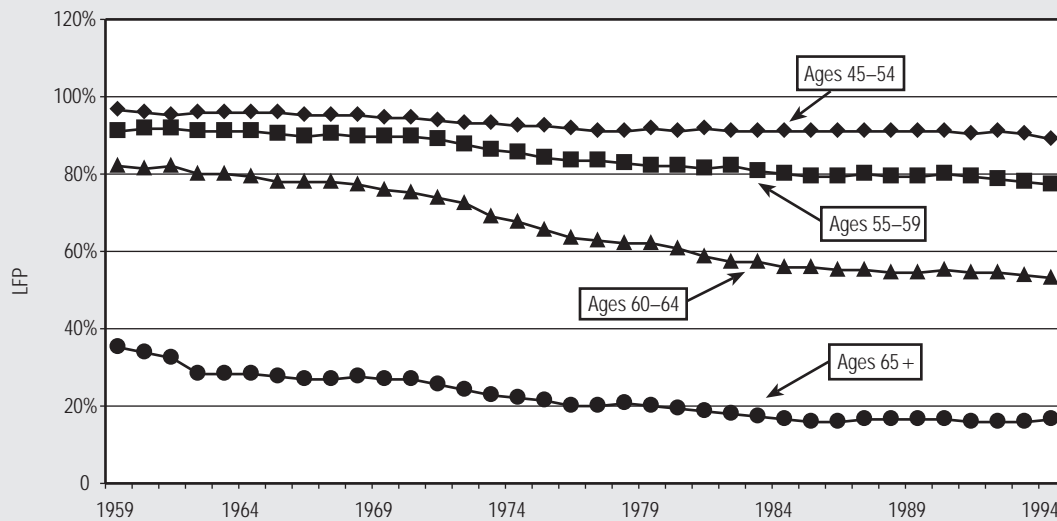
Source: Jonathan Gruber and David Wise, "Social Security and Retirement: An International Comparison," *American Economic Review Papers and Proceedings*, Vol. 88 (2), (May 1998): 158-163.

past 40 years: the United States, Germany, and France. Second, it considers all 11 countries to document the retirement incentives inherent in their different systems, and compares these incentives with actual retirement patterns across this sample of nations.

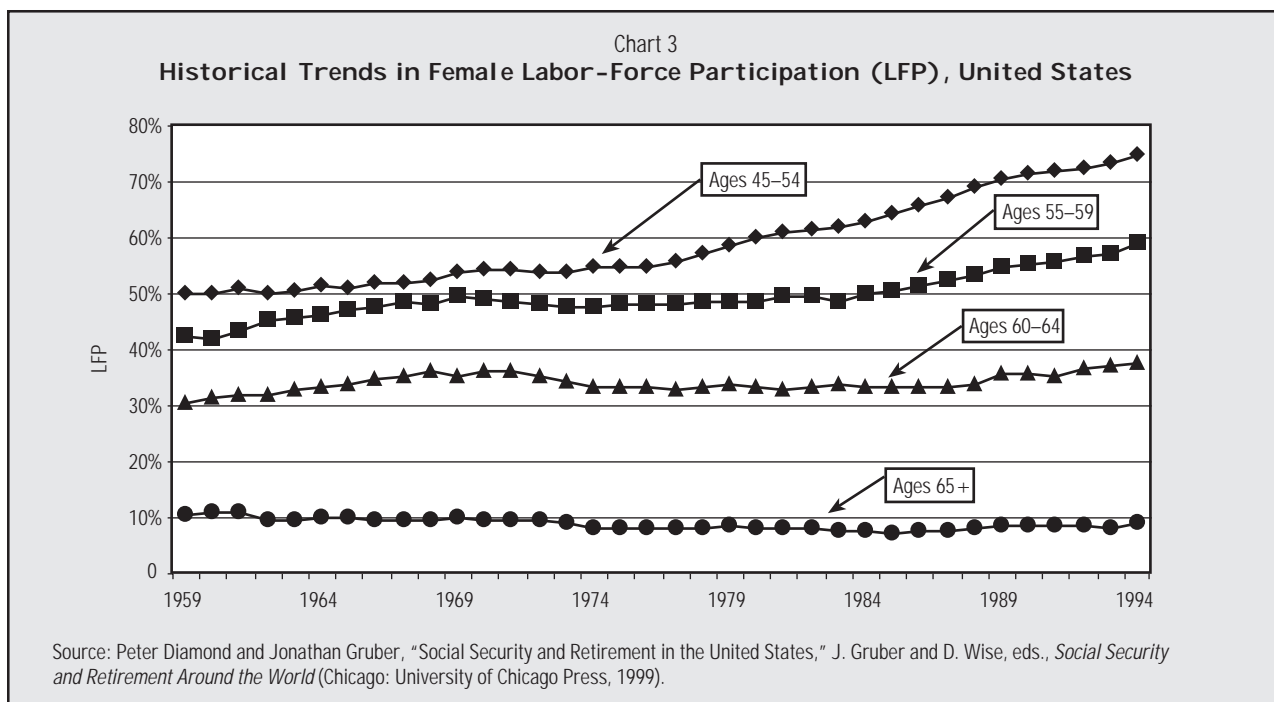
The study finds a striking correlation between the tax on work at older ages and withdrawal from the labor force, with countries that tax work heavily at older ages experiencing much lower labor-force participation. This finding has important implications both for other

nations and the United States as they face the inevitable reform of their social security systems. For other countries, it implies that moving toward a system that less heavily penalizes work at older ages could result in substantial savings to their social security programs. For the United States, which has a system that currently is neutral with respect to early retirement between ages 62 and 65 but penalizes work after 65, it suggests that care must be taken that reforms to the system do not introduce new incentives for workers to withdraw from the

Chart 2  
Historical Trends in Male Labor-Force Participation (LFP), United States



Source: Peter Diamond and Jonathan Gruber, "Social Security and Retirement in the United States," J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).



labor force at early ages. Moreover, the findings suggest that insufficient attention has been paid to the truly crucial determinant of retirement, the early retirement age, as opposed to the normal retirement age, which is typically less important.

## Labor Force Participation

The decline in older persons' labor-force participation is one of the most dramatic features of labor-

force trends over the past several decades.

### The Decline Since 1960

Charts 2 and 3 show the decline in U.S. labor-force participation rates of men and women in different age groups since 1960: ages 45–54; 55–59; 60–64; and 65 and older.<sup>4</sup> Men's participation rates fell in all of these groups. The decline among the youngest group was slight, while for 60 to 64-year-olds' labor-force participation fell from more than 80 percent in 1960 to 52 percent in 1994. There was also a large percentage decline (albeit from a smaller base) for the oldest group, whose participation rates were halved, from 35 percent to 17 percent over the same period. These trends have slowed since the mid-1980s.<sup>5</sup>

For women, the pattern is quite different: the trend toward earlier retirement is eclipsed by *increased*

labor-force participation across cohorts. For females ages 60–64, there was a slight downward trend in the post-World War II years, but this has been reversed since the mid-1980s (Quinn, 1999).

The dramatic decline in older men's labor-force participation in the United States is well-known, and has been the subject of much commentary, particularly the role of Social Security and employer-provided pension plans. What is less well known, however, is that the decline is much more striking in other industrialized nations. Chart 4 shows the labor-force participation rates of men ages 60–64 for the years 1960–1996 for the various countries.<sup>6</sup> The decline was substantial in each of these countries, but was much greater in some countries than in others. In the early 1960s, the participation rates were above 70 percent in each of the countries and above 80 percent in several countries. By the mid-1990s, the rate had fallen to less than 20 percent in Belgium, France, and the Netherlands. It had fallen to about 35 percent in Germany and 40 percent in Spain.

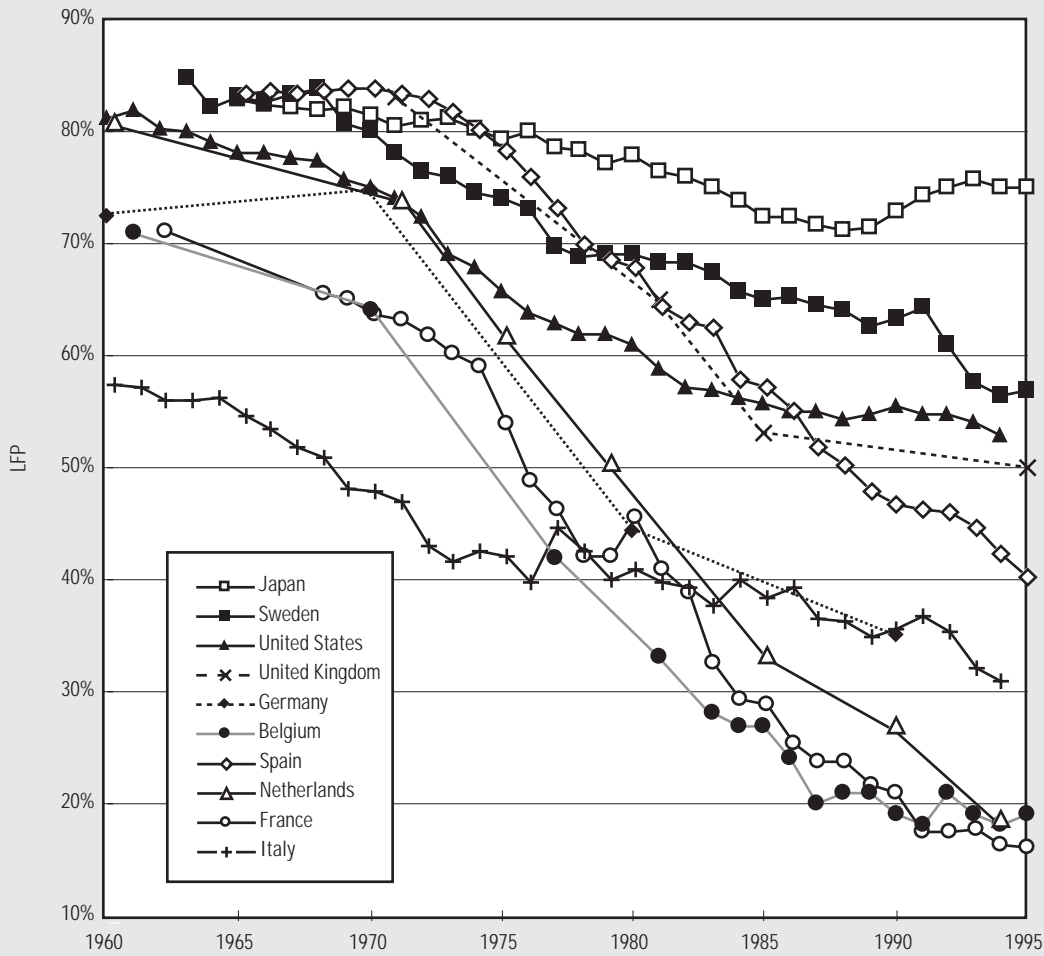
The U.S. decline, from 82 percent to 53 percent, was modest compared with the much more precipitous decline in these European countries. The decline to

<sup>4</sup> Figures from Diamond and Gruber (1999).

<sup>5</sup> See Joseph Quinn, "Retirement Patterns and Bridge Jobs in the 1990s," EBRI Issue Brief no. 206 (Employee Benefit Research Institute, February 1999).

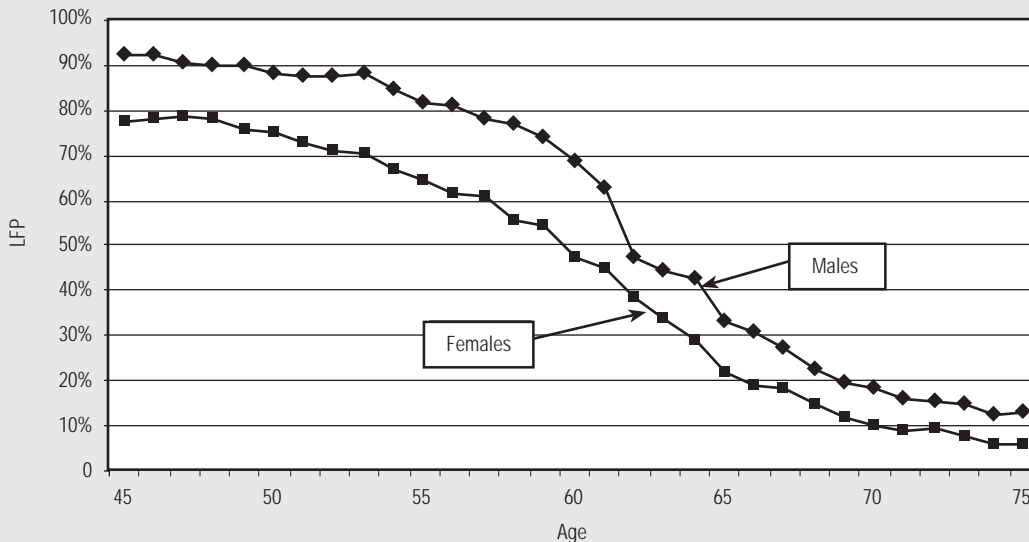
<sup>6</sup> Figure from Gruber and Wise (1999a).

Chart 4  
**Labor Force Participation (LFP) Trends for Men Ages 60-64**



Source: Jonathan Gruber and David Wise, "Introduction and Summary," in J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

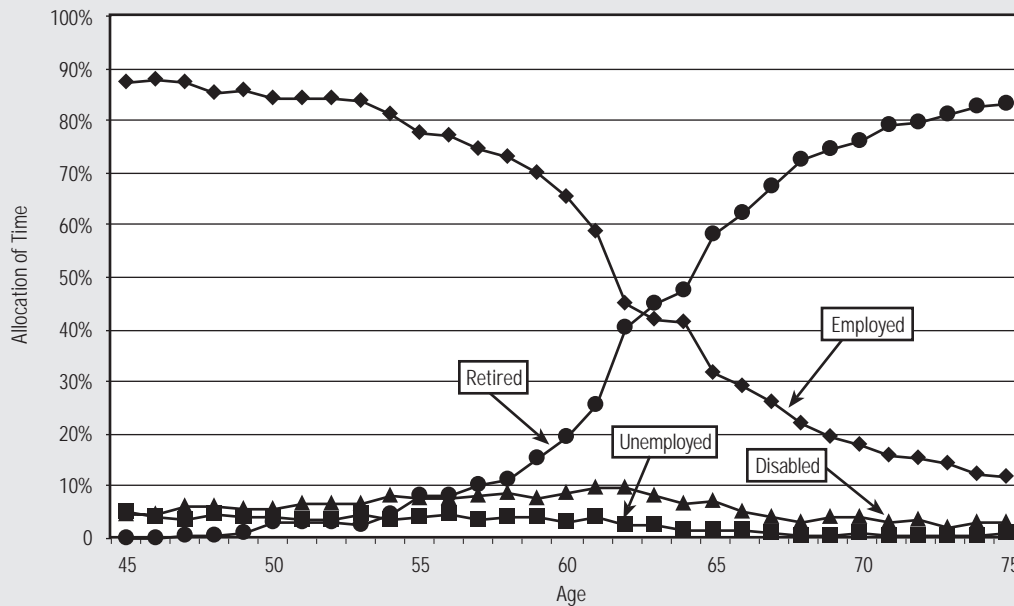
Chart 5  
**Labor-Force Participation (LFP) Rates by Age and Gender, United States, 1994-1995**



Source: Peter Diamond and Jonathan Gruber, "Social Security and Retirement in the United States," J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).



Chart 6  
Men's Allocation of Time, By Age, United States, 1994–1995



Source: Peter Diamond and Jonathan Gruber, "Social Security and Retirement in the United States," J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

57 percent in Sweden was also large but modest when compared with the fall in other countries. Japan stands out with the smallest decline of all the countries, from about 83 percent to 75 percent over the period. Labor-force participation rates of 45 to 59-year-old men, as well as those age 60 and older, also declined substantially.

The individual country analyses summarized here also present parallel information for women. While women's overall labor-force participation is increasing in the industrialized world, most other countries differ from the United States in that for older women ages 60–64 labor-force participation is still falling, albeit less precipitously than for males.

### The Decline With Age and "Nonwork"

Of particular interest for the analysis is the current relationship between labor-force participation and age. Chart 5 shows the age pattern of participation for U.S. men and women.<sup>7</sup> At age 45, the participation of men is significantly higher, although almost 80 percent of 45-year-old women were working in 1994–1995. There was a gradual parallel decline for men and women until age 55, at which age the pace steepens; this is particularly true for men, so that the participation gap closes substantially by age 62. By age 75, participation has dropped quite low, with fewer than 20 percent of men and 10 percent of women participating in the labor force.

Chart 6 shows in more detail men's allocation of

time as they age, dividing activities at each age into employment, unemployment, disability, and retirement.<sup>8</sup> The top line, showing the share of men employed, mirrors the age trend in chart 5. There is very little age trend related to either unemployment or disability, although both categories shrink somewhat with age. The dominant trend depicted here is increased retirement with age.

This relationship between labor-force participation and age for men is shown for each of the countries in the sample in chart 7.<sup>9</sup> The countries are ordered by labor-force participation at age 65. At age 50, approximately 90 percent of men are in the labor force in all 11 countries, but after age 50 the decline varies greatly among countries. By age 65, virtually no men in Belgium are working; in Japan, about 60 percent are still in the labor force. Indeed, only about 25 percent of men in Belgium are working at age 60, while in Japan 75 percent are working at age 60.

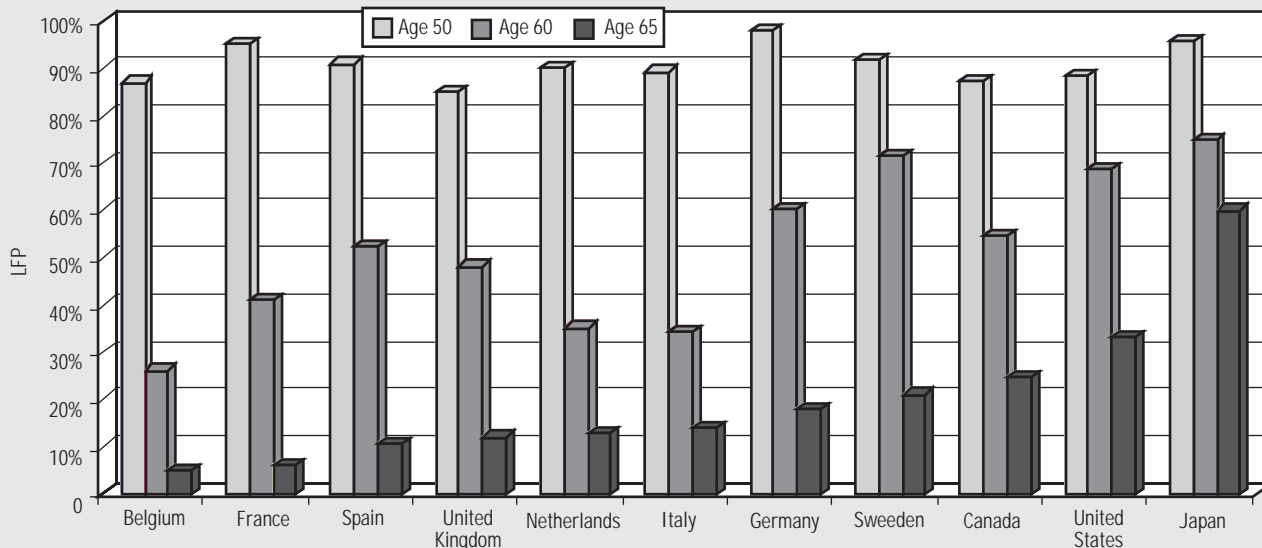
One simple means of comparing the extent of older men's labor-force withdrawal across countries is to compare the average proportion of men not participating in the labor market. That is, consider the proportion of

<sup>7</sup> Figure from Diamond and Gruber (1999).

<sup>8</sup> Figure from Diamond and Gruber (1999).

<sup>9</sup> Figure from Gruber and Wise (1998).

Chart 7  
Labor Force Participation (LFP) by Country and Age



Source: Jonathan Gruber and David Wise, "Social Security and Retirement: An International Comparison," *American Economic Review Papers and Proceedings*, Vol. 88 (2) (May 1998): 158-163.

men not working at a given age (1-LFP, where LFP is the labor-force participation rate); this is about 0.95 for Belgium and about 0.40 for Japan at age 65, for example. Loosely speaking, this can be defined as *nonwork* at that age. If nonwork is added up over all ages, and divided by the number of ages, total nonwork for a given age range can be measured as a percent of total work capacity in that age range. Of course, 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, nonwork may be higher in countries in which a larger proportion of jobs are physically demanding. And it may be that older men who are measured as being out of the labor force are actually working in the underground economy, as has been suggested anecdotally for some European nations. Nevertheless, this represents a reasonable snapshot of the rough magnitudes of relative labor-force participation at older ages across our sample of countries.

Nonwork measures for men over the age 55-65 range for all of the countries are shown in chart 8.<sup>10</sup> Nonwork ranges from 67 percent in Belgium to 22 percent in Japan. The United States is toward the bottom of the range, with a nonwork measure of 37 percent. Despite the caveats above, these enormous differences across fairly similar industrialized countries are striking. The following section discusses how this relative measure is related to the provisions of the social security programs in the countries.

## Incentive Effects

This section provides a brief overview of social security plan provisions that can create large incentives to

retire, and presents evidence of 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. The normal retirement age may once have been when most people were expected to retire; currently, in most countries, few people work until the "normal" retirement age.<sup>11</sup>

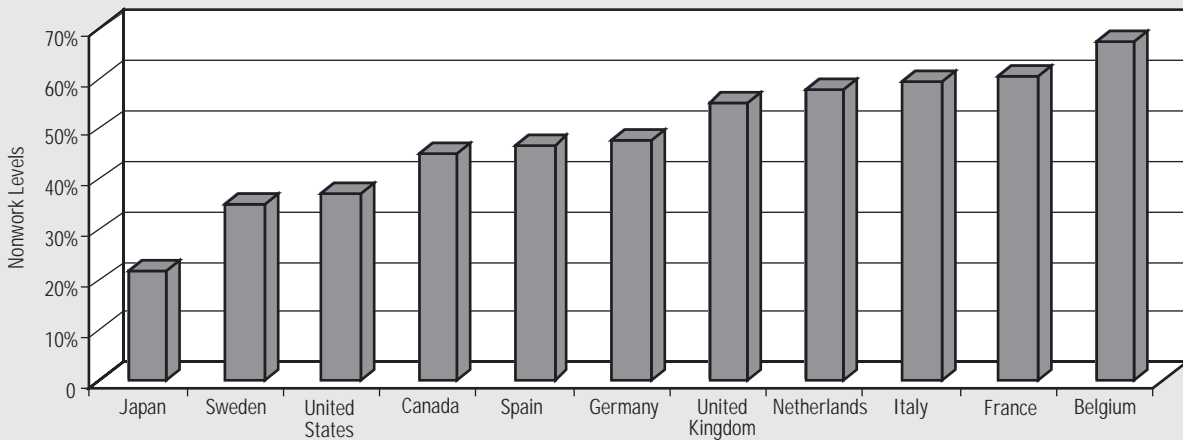
The extent to which people continue to work after the early retirement age is closely related to the second important feature of plan provisions: the pattern of benefit accrual. At a given retirement age (say age 62), each individual has earned an entitlement to a stream of

<sup>10</sup> Figure from Gruber and Wise (1998).

<sup>11</sup> As shown below, age 62 is now the most typical retirement age for men in the United States.



Chart 8  
Nonwork by Country, 55 to 65-Year-Old Men



Source: Jonathan Gruber and David Wise, "Social Security and Retirement: An International Comparison," *American Economic Review Papers and Proceedings*, Vol. 88 (2) (May 1998): 158-163.

future benefits until death. The sum of this future stream of benefits, expressed in terms of today's dollars, is *Social Security Wealth* (SSW). A key consideration for retirement decisions is how the stream of future benefits, and thus the SSW, will change if a worker decides to delay retirement for one year. The difference between the SSW a worker who retires next year would receive and what he or she would receive by retiring this year is called the *SSW accrual*. If the SSW accrual is positive, delaying retirement results in an increase in the present value of the future stream of benefits from delaying retirement; if it is negative, delaying retirement results in a decrease in the present value of the future stream of benefits.

SSW accrual is compared 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 therefore acts as a *tax* on earnings if the accrual is negative and a *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 total future pension entitlement, which imposes a tax on work and provides an incentive to leave the labor force.

The magnitude of the SSW accrual, and the corresponding tax or subsidy, differ greatly from country

to country, and are determined by several provisions. The first is the adjustment to benefits that is made if a person works for another year. An additional year of work means a delay in receiving some or all of the benefits, and that the benefits will be received for one less year.<sup>12</sup> In some countries, there is an "actuarial" adjustment, such that benefits are increased to offset the fact that they are received for fewer years. But in other countries there is no such adjustment. The greater the adjustment, the greater the inducement to continue working. If the adjustment is not large enough to offset the fewer years of benefit receipt, 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, all else equal. Third, the additional year of earnings is often used in the recomputation of 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

<sup>12</sup> In particular, there may be an important distinction in some cases between the ages of retirement and of benefits claiming. In the United States, for example, individuals can delay claiming benefits until after they are retired, or can claim benefits and continue to work (although benefits are reduced once their earnings exceed a certain ceiling). In practice, this does not seem to be a very important distinction in most countries, where claiming and retirement are simultaneous. Thus, for ease of exposition, we refer to them as the same decision in this Issue Brief.

*Employer-provided plans are much less prevalent in most European countries than in the United States; the most important exceptions are the United Kingdom and the Netherlands.*

for some minimal number of years.<sup>13</sup>

Fourth, a delay in receiving benefits raises the odds that the worker might die without being able to collect any benefits. This lowers net social security accrual and may be an important consideration for the oldest workers.

Last is the size of the benefits to which the worker and his or her family are entitled. If a system is actuarially fair, due to actuarial adjustments and other factors, then the generosity of the benefits does not determine the tax or subsidy rate. But if there is no actuarial adjustment (as is the case in most countries), then higher benefits will be associated with higher tax rates on work. If the worker receives no return from delaying retirement through higher benefits later in life, then the more that his or her earnings are replaced by social security, the larger the incentive to leave the labor force.

In addition to social security plan provisions, other government and private programs may also affect the relationship between social security plan provisions and observed retirement patterns. One is the availability of employer-provided pension plans. For example, half of employees in the United States are covered by employer-provided plans, and about half of these 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). Employer-provided plans are much less prevalent in most European countries than in the United States; 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 relationship between social security plan provisions and retirement is typically quite clear. In some cases where these plans are especially important, the country analyses have incorporated them into the “social security” incentive calculations.

The remainder of this discussion focuses on the role of these two important features of social security systems: the age of benefits entitlement and the implicit tax on work inherent in social security benefit provisions.

## *Age of Benefits Entitlement*

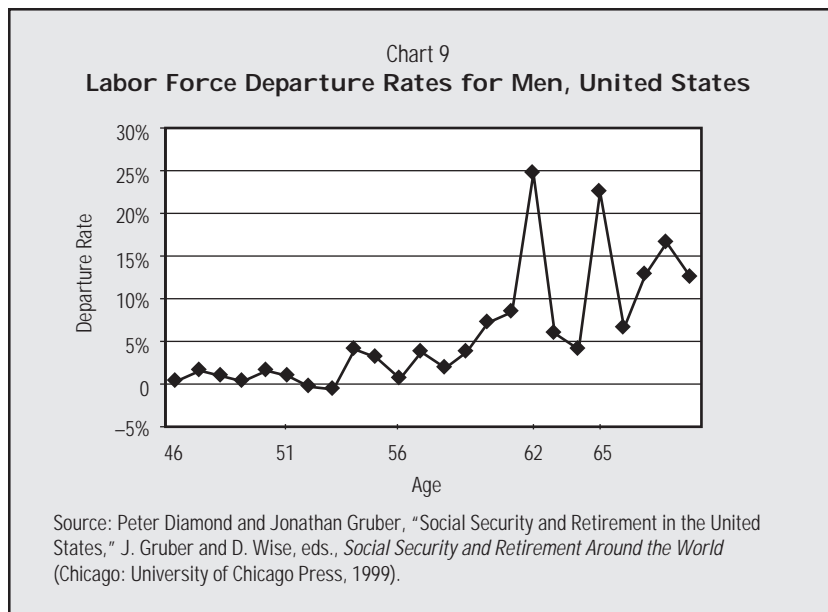
To illustrate the relationship between social security plan provisions and retirement behavior, evi-

dence is presented from the United States and two other countries that have seen substantial changes in the structure of their social security systems: Germany and France. Data from these three countries allow a simple within-country comparison of change in plan provisions over time and the corresponding change in older people’s labor-force participation. 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. The final section discusses overall evidence based on the 11 countries and draws general conclusions based on between-country comparisons.

### The U.S. Case

*Key Institutional Features*—To understand the retirement implications of the Social Security structure in the

<sup>13</sup> That is, in all systems benefits are based on the highest X years of earnings; for example, in the United States, the highest 35 years of earnings are used. This means that for workers who have worked fewer than 35 years, another year of earnings replaces a zero in the computation of their average earnings; for workers who have worked 35 years or more, another year of earnings replaces only a lower year. Thus, for those “younger old” who have worked fewer than 35 years, another year of work may be particularly important in raising their average earnings and thus their benefits.



United States, and the corresponding implications of systems in other countries, it is useful to review the institutional structure of

the U.S. system. The normal retirement age for receipt of Social Security benefits is 65, although women have been able to claim reduced benefits since 1956 and men since 1961. The system is financed by a payroll tax of 5.3 percentage points on both the employer and employee, up to taxable maximum earnings per year of \$72,600. The amount that workers receive upon claiming their Social Security benefits is partially a function of their average indexed monthly earnings (AIME), which is the real monthly earnings averaged over the highest 35 years of earnings. A key feature of this process is that additional higher-earnings years can replace earlier lower-earnings years, since the calculation is based on 35 years of work. This function is progressive; a dollar of contributions yields a higher benefit for a low-income worker than for a higher-income worker.

Adjustments to the benefit level are made based on the age at which benefits are first claimed. For workers claiming before the normal retirement age (currently age 65, but scheduled to increase slowly to 67), benefits are decreased by 0.56 percent per month, so that for those claiming on their 62nd birthday, benefits are 80 percent of what they would be if they waited until the normal retirement age at 65.<sup>14</sup> This reduction is called the actuarial reduction factor. Individuals can also delay the receipt of benefits beyond age 65 and receive a delayed retirement credit (DRC). For workers reaching age 65 in 1996, an additional 5 percent is paid for each year of delayed receipt of benefits. Under current legislation, this amount will steadily increase until it reaches 8 percent per year in 2009. There are important additional benefit provisions based on family structure: spouses of Social Security beneficiaries receive an additional 50 percent of the primary earner's benefit, if

their Social Security entitlement based on their own earnings is lower than this level; dependent children are also eligible for 50 percent of the

earner's benefit; and surviving spouses receive 100 percent of the benefit.

*Correspondence With Retirement Decisions*—The clear correspondence between the Social Security system's structural features and individual retirement decisions in the United States is clearly visible by examining the departure or "hazard rate": the proportion of workers who retire at a given age. Chart 9 shows the hazard rate for men in the United States.<sup>15</sup> The striking fact about this figure is the dramatic increase in withdrawal at age 62 (precisely the age of eligibility for early retirement under Social Security) and at age 65 (the normal retirement age). That is, of those working at age 60, fewer than 10 percent retire when they turn 61; but of those working at age 61, 25 percent retire when they turn 62. These "spikes" are very suggestive of a Social Security role in explaining men's retirement behavior. There is also a small spike around age 55, which may reflect the early retirement provisions at that age under many pension plans. As noted above, about one-quarter of workers are covered by defined benefit pension plans, which have been shown by Stock and Wise (1990a, 1990b) and others to be important determinants of retirement decisions. There is another spike around age 68; the cause here is not clear, because the small denominator of the participation hazard after age 65 makes it

<sup>14</sup> As the normal retirement age increases, the actuarial adjustment will change as well, so that eventually those retiring at age 60 will receive only 70 percent of the benefits that they would receive from retiring at age 67.

<sup>15</sup> Figure from Diamond and Gruber (1999).

hard to interpret this finding.<sup>16</sup>

Moreover, changes over time 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 chart 10, which shows the hazard rates for men in 1960, 1970, and 1980.<sup>17</sup> In 1960, the normal retirement age was 65, and there was no opportunity for early retirement under Social Security. In that year, the hazard rate was low until age 65, when the departure rate jumped precipitously, reflecting the availability of Social Security benefits.

In 1961, men became eligible for retirement benefits at age 62,<sup>18</sup> producing a striking effect on early labor-force departure rates. Starting in 1970, and visible most clearly in 1980, there was a dramatic increase in the departure rate at age 62 and a corresponding decrease at age 65. As a result, since 1980 the highest rate of labor-force withdrawal occurred at age 62.<sup>19</sup> Thus, the U.S. data suggest a very strong influence of Social Security incentives on retirement: not only do current retirement ages correspond with benefits entitlement ages under the Social Security system, but a distinct shift toward retirement at 62 occurred after the early retirement age was introduced at that age.

## The German Case

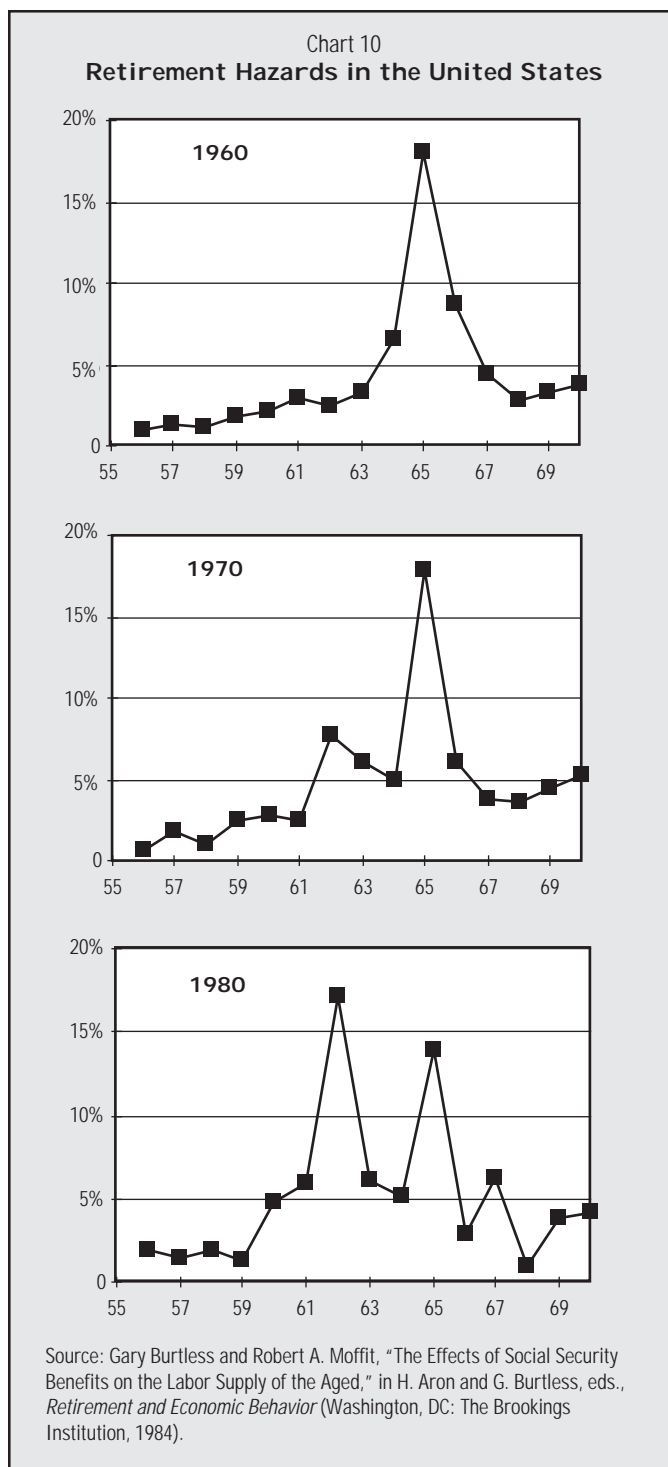
The German experience provides another striking example of the role of social security institutions in driving retirement decisions. Before 1972, the social security retirement age in Germany was 65, except for

<sup>16</sup> That is, the spike at age 65 represents a 9.5 percentage point change in labor-force participation, while the spike at age 68 represents only a 4.5 percentage point change; the latter appears almost as large as the former because the denominator is so much smaller.

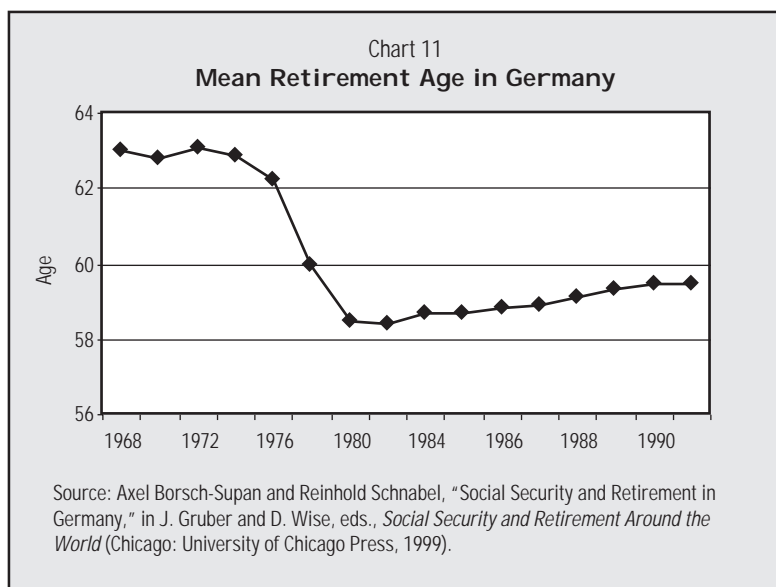
<sup>17</sup> Figure from Burtless and Moffitt (1984).

<sup>18</sup> Early eligibility was introduced for women in 1956.

<sup>19</sup> This evolution was fairly slow. A similar pattern is seen in Canada, as documented by Baker and Benjamin (1996): Early retirement at age 60 was introduced in 1987, but not until the early 1990s was it reflected in a limited way in retirement behavior.



disability, and there was no social security early retirement age. But legislation in 1972 provided for early retirement at age 60 for women and at age 63 for men. In addition, 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 provided at the early retirement age were the same as those 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 in Germany declined by 5.5 years (chart 11).<sup>20</sup>

The connection between plan provisions and retirement can also be demonstrated by considering the relationship between retirement and social security provisions at a point in time. The provisions of the 1972 legislation are reflected in the retirement rates by age, as illustrated by the hazard rates shown in chart 12.<sup>21</sup> The ages associated with key plan provisions are also noted on the chart, so that the relationship between provisions and retirement is easily seen. Men who are "disabled" or "unemployed" at age 60, and have a certain number of years of employment under the social security system, are eligible for early retirement. There is a corresponding large jump in the retirement rate at that age. Men who have been employed for 35 years are eligible for early retirement at age 63, and there is a corresponding jump in the retirement rate at that age. The normal retirement age is 65, and there is a corresponding spike at that age as well.

## The French Case

The experience in France also illustrates the effect of changes in plan provisions. Prior to 1972, the French social security normal retirement age was 65 and early retirement provisions were uncommon. In the early 1970s, "early retirement provisions" were introduced by way of guaranteed income for persons age 60 and older who lost their jobs. In 1983, age 60 became the *normal* retirement age. In addition, guaranteed income was provided for persons age 57 and older who lost their jobs.

The effect of this series of reforms is seen in chart 13, which shows the *distribution* of social security retirement ages for

workers attaining age 60 in 1972, before any of these changes, and in 1986, after they were all in place. (These figures must be distinguished from those in chart 12 for Germany, which shows hazard or departure rates; chart 13 shows the distribution of retirement ages.)<sup>22</sup> In the early 1970s, the typical retirement age was 65, as shown for the cohort that reached age 60 in 1972 (and age 65 in 1977). But as early as 1963, special allowances were provided for some workers who became unemployed at

<sup>20</sup> Figure from Borsch-Supan and Schnabel (1999). The mean retirement age is the average age of persons retiring in a given year. This figure examines only white-collar workers due to limited data.

<sup>21</sup> Figure from Borsch-Supan and Schnabel (1999).

<sup>22</sup> Figure from Blanchet and Pélé (1999).

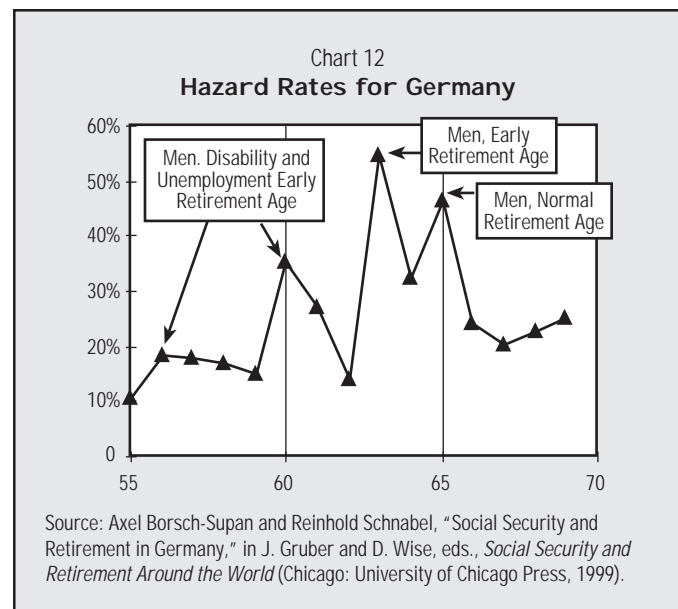
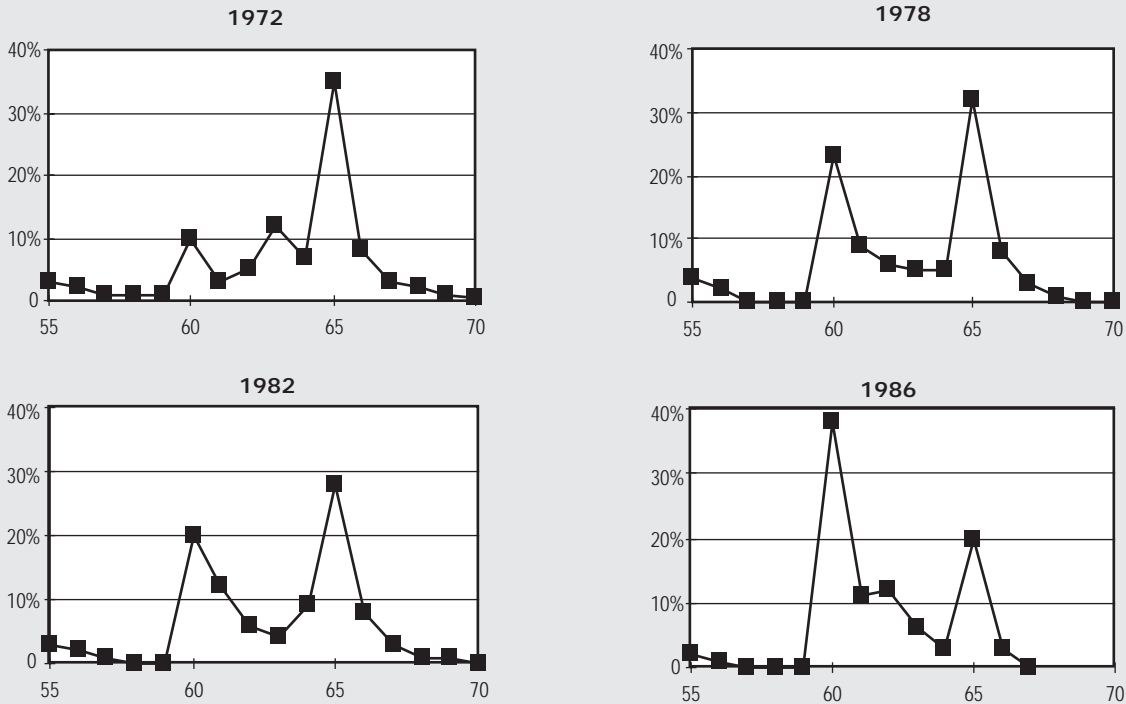




Chart 13  
Retirement Ages in France, Age 60



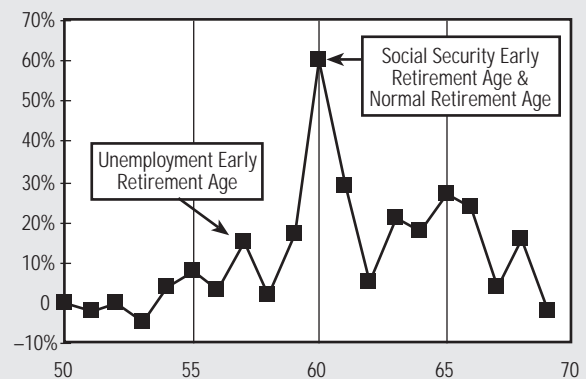
Source: Didier Blanchet and Louis-Paul P ele, "Social Security and Retirement in France," in J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

age 60 or older, perhaps reflected in the small spike at age 60. Beginning in 1972, a "resource maintenance" program provided grants, equal to 60–70 percent of last earnings, to persons who became unemployed between ages 60 and 64. The effect of these programs seems to be reflected in the increasing proportion of workers retiring at age 60, as shown in the second and third (1978 and 1982) panels of the chart. In 1983, age 60 became the normal social security retirement age. In addition, guaranteed income was provided for workers ages 57 and older who lost their jobs. Shortly after that, the typical retirement age did indeed become 60, as shown in the panel for the cohort reaching age 60 in 1986.

As in Germany, the current labor-force departure rates in France also correspond closely with social security provisions. The age-specific rates of departure from the labor force in France are shown in chart 14.<sup>23</sup> Approximately 60 percent of employees who remain in the labor force until the social security early retirement age of 60 retire at that age. But even before age 60, 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.

Chart 14  
Hazard Rates for France



Source: Didier Blanchet and Louis-Paul P ele, "Social Security and Retirement in France," in J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

<sup>23</sup> Figure from Blanchet and P ele (1999).



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.

## Tax Incentives to Retire

In distilling the evidence from all of the countries studied in this project, 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 for workers 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, general conclusions can be drawn about the relationship between the tax penalty on work and retirement behavior.

In order to facilitate these comparisons, a central feature of the project was a detailed computation of the retirement incentives inherent in the provisions of each country's retirement-income system. This included, in some cases, not only social security programs but also other quasi-early retirement options such as disability insurance. By making the same analytic calculations, the individual studies provide a means of comparing the retirement incentives among the nations. In each case, the study considered the incentives facing a male worker

Table 1  
United States Base—Case

Last Year of Work	Replacement Rate	SSW	Accrual	Accrual Rate	Tax/Subsidy
Age 61	40%	\$104,275			
Age 62	44	104,701	426	0.4%	-2.8%
Age 63	48	104,766	65	0.1	-0.5
Age 64	70	104,335	-432	-0.4	3.1
Age 65	75	101,882	-2,452	-2.4	18.8
Age 66	80	99,109	-2,773	-2.7	22.5
Age 67	85	95,964	-3,145	-3.2	26.9
Age 68	87	91,131	-4,833	-5.0	43.9
Age 69	90	86,412	-4,718	-5.2	45.5

Source: Axel Borsch-Supan and Reinhold Schnabel, "Social Security and Retirement in Germany," in J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

born in 1930, and thus turning 65 in 1995, who earned the median earnings in each year for his cohort and has a wife who is three years younger who did not work.

## Results for the United States

To illustrate the nature of these calculations, it is useful to start with the United States, and then to move to a summary of the international findings. Table 1 shows the basic results for the United States.<sup>24</sup> Each row represents the age of the worker in the last year of work; that is, the first row represents the effect of working during the 61st year and retiring on the 62nd birthday. The second column shows the net replacement rate, which is the benefit payment relative to the net-of-tax wage. At the youngest age of benefit eligibility, the replacement rate is 40 percent; that is, if the individual retires on his 62nd birthday, this Social Security benefit will replace 40 percent of his forgone wages. This rises over time due to the actuarial adjustment, which rewards workers for delayed claiming by increasing benefits. The major change occurs for retirement on the 65th birthday, when the wife turns 62, since at that point the spouse becomes entitled to dependent benefits. For the worker who works through his 69th year and collects on his 70th birthday, Social Security replaces almost 90 percent of his after-tax earnings.

The next three columns show the evolution of SSW over time. The worker retiring at the early retirement age will have accumulated \$104,275 in SSW. Working an additional year will increase the SSW by about \$426, as shown by the accrual rate in the fourth column. That is, the U.S. system is roughly "actuarially

<sup>25</sup> Tables 1 and 2 from Diamond and Gruber (1999).

Table 2  
Additional U.S. Incentive Calculations

Last Year of Work	Single Worker		10 <sup>th</sup> Percentile Earner		90 <sup>th</sup> Percentile Earner	
	Replacement rate	Tax/subsidy	Replacement rate	Tax/subsidy	Replacement rate	Tax/subsidy
Age 61	43.0%		53.0%		24.7%	
Age 62	46.5	8.3%	57.7	-6.4%	26.7	2.4%
Age 63	50.3	14.3	62.7	-8.0	29.0	1.5
Age 64	54.0	17.7	92.6	-3.5	43.2	2.8
Age 65	56.8	32.7	99.0	18.7	46.5	11.7
Age 66	59.8	35.2	105.6	23.8	50.1	1.4
Age 67	62.7	38.5	111.9	44.5	53.6	16.5
Age 68	65.7	41.2	115.6	67.3	55.9	27.2
Age 69	68.7	44.2	119.3	66.0	58.3	28.1

Source: Peter Diamond and Jonathan Gruber, "Social Security and Retirement in the United States," J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

fair" with respect to retirement at age 62; the fact that benefit receipt is delayed for a year and that the worker has to

pay another year of Social Security taxes is compensated by the actuarial adjustment to benefits and the fact that this next high-earnings year can replace a lower-earning year earlier in his or her career. As a result, as the final column shows, there is actually a small subsidy to work at age 62 under the system: The worker with median earnings who chooses to work an additional year at age 62 sees a net wage bonus of 2.8 percent.

At age 64, there is an implicit tax on work, but it is small. However, at age 65, the implicit tax on work jumps up dramatically. For this worker, working during his or 65th year means forgoing more than \$2,450 in SSW, which amounts to almost 19 percent of that year's earnings. This is because the actuarial adjustment for working beyond age 65 is unfair, given the forgone year of Social Security benefits. This tax rate rises further with age, so that for the worker who decides to work during the 70th year, the forgone SSW amounts are equal to almost half that year's earnings.<sup>25</sup>

The results in table 1 illustrate the retirement incentives under Social Security for one type of worker: a married male with a nonworking spouse. Table 2 summarizes the incentives under Social Security for other types of workers, showing both the replacement rate for retiring at a given age and the tax/subsidy rate for another year of work. The replacement rate for single

male workers is much lower than for their married counterparts, since they do not benefit from the dependents'

benefit that accrues to the married male with a nonworking spouse. The tax rates on additional work are also higher at most ages for single workers, for the same reason: Both the actuarial adjustment to benefits and the benefit recomputation from additional years of high earnings are worth more to married workers, since they get a 50 per-cent bonus on each extra benefit dollar.

Table 2 also compares low-earnings workers with higher-earnings workers. In particular, it shows results for workers at the 10th and 90th percentiles of the earnings distribution. Low wage earning workers have a much higher replacement rate, and high wage earning workers a correspondingly lower rate. Before age 65, there are small tax rates on work for higher wage earners and larger subsidies for low wage earners; this is because the actuarial adjustment and benefit recomputation is worth much more to a low earner as a share of earnings. After age 65, however, when actuarial adjustments become "unfair," the tax rates rise much more for low wage earners, since at their high replacement rates there is a greater penalty for unfair actuarial adjustments. This effect foreshadows somewhat what is seen below for other nations.

## International Comparison

Labor-force participation and retirement incentives for all 11 countries in our study are summarized in table 3, from Gruber and Wise (1999a). The countries are ordered by the amount of nonwork among men between ages 55 and 65, which is explained above and shown in chart 8.

The second column of the table shows the early retirement age under social security systems in each

<sup>25</sup> The much higher tax rates after age 65 will diminish over time, as the delayed retirement credit (DRC) provided to workers who work past that age is gradually increased from 5 percent to 8 percent over the next decade. The jump in the implicit tax on work in the 68th year is due to dependent benefits: If the worker delays claiming past age 68, that implies (given our assumed age difference) that dependent benefits are delayed past age 65, so that the unfair DRC penalizes the dependent as well.

Table 3  
International Summary

Country	Nonwork Age 55-65	Early Retirement Age	Replacement Rate at Early Retirement Age	Accrual in Next Year	Implicit Tax On Earnings in Next Year
Belgium	67	60	77%	-5.6%	82%
France	60	60	91	-7	80
Italy	59	55	75	-5.8	81
Netherlands	58	60	91	-12.8	141
United Kingdom	55	60	48	-10	75
Germany	48	60	62	-4.1	35
Spain	47	60	63	4.2	-23
Canada	45	60	20	-1	8
United States	37	62	40	0.4	-3
Sweden	35	60	54	-4.1	28
Japan	22	60	54	-3.9	47

Source: Jonathan Gruber and David Wise, "Introduction and Summary," in J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

country. In several countries there is no clearly defined early retirement age. For example, in Italy, one can retire upon the accumulation of 35 years of work experience, which is assumed to be age 55 in the table, since the "sample" worker begins working at age 20.

The third column shows the "replacement rate" of the social security system at that early retirement age. There is substantial variation in the replacement rates. In the United States, the replacement rate for this sample worker is about 40 percent of previous earnings. In France and the Netherlands, however, the replacement rate is 91 percent, and in the majority of countries it is over 60 percent.

The next two columns show the accrual rate of SSW and the associated implicit tax on earnings for a worker who works for one year beyond the early retirement age. The table summarizes the incentives facing a worker as he or she decides whether to retire at the youngest age of first benefits entitlement. As noted above, in the United States this accrual rate is positive, and the tax is negative, at the early retirement age, although the tax on work becomes substantial after age 65.

For the other countries, the story is generally quite different: delaying retirement past the age of early benefit entitlement leads to enormous reductions in SSW and associated very large tax rates on continued work. For example, in France, retiring at age 61 instead of age 60 implies a 7 percent reduction in the total value of one's SSW, which is 80 percent of earnings over that next year. That is, by working one more year, the worker forgoes in SSW four-fifths of what he or she will earn from work! Indeed, in the Netherlands, the tax rate is actually much greater than 141 percent; the median worker who continues in the labor force beyond the age of early benefits entitlement loses much more in SSW

than would be earned from the job.

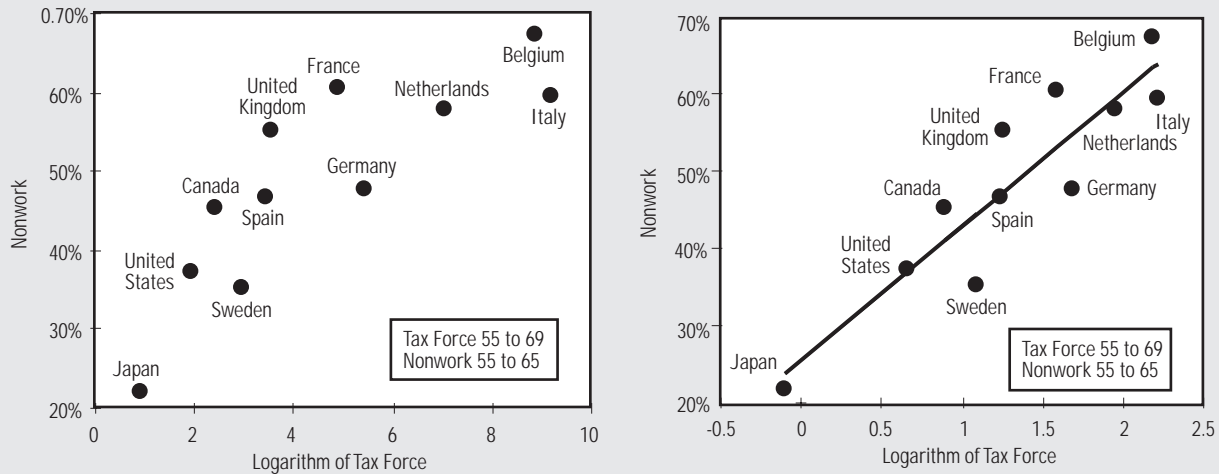
These enormous tax rates on continued work in many other countries are striking, particularly in contrast with the low

tax rates 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, between ages 62 and 65 the U.S. system provides an actuarial adjustment to benefits if receipt is delayed, which offsets to a large extent the fewer years of benefit receipt. There is no actuarial adjustment in countries such as France. Second, payroll tax rates to finance the program are much lower in the United States, which lowers the tax on additional work. Third, the U.S. system allows higher earnings later in life to replace low earnings in earlier years; this is not true in many other countries. Finally, these other countries have very high "replacement rates," which, when combined with the absence of actuarial adjustments for delayed retirement, cause large incentives for early labor-force retirement. For example, in a country such as the Netherlands, a worker essentially forgoes a benefit which replaces 90 percent of his or her earnings by working another year.

This table suggests a strong relationship between nonwork and the tax rate on continued work. To see the relationship more clearly, it is useful to divide the countries into three groups: (1) those with high nonwork: Belgium, France, Italy, the Netherlands, and the United Kingdom; (2) a medium nonwork group: Germany, Spain, and Canada; (3) and those with low nonwork: 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 is 91.8 percent. In the third group—with the least nonwork—the average replacement rate at the early

Chart 15  
Nonwork vs. Tax Force



Source: Jonathan Gruber and David Wise, "Introduction and Summary," in J. Gruber and D. Wise, eds., *Social Security and Retirement Around the World* (Chicago: University of Chicago Press, 1999).

retirement age is 50 percent and the tax rate on continued earnings is 24.7 percent. These comparisons point to a rather strong correlation between social security incentives and nonwork.

There is no completely satisfactory way to summarize the country-specific incentives for early retirement. One crude measure is based on implied tax rates on continued labor earnings once a person is eligible for social security benefits. It sums the implied tax rates (expressed as fractions) on continued work from age 55 through age 69, and is called the "tax force" to retire. This example begins with age 55 because, even though age 60 is the official "early retirement age" for most social security systems in this study, in practice these systems often offer important retirement incentives at earlier ages as well through related provisions that should be reflected in the comparisons.

The relationship is formalized in chart 15, which presents scatter plots of the tax force to retire and the amount of nonwork between ages 55 and 65.<sup>26</sup> The relationship is clear: There is a strong correspondence between the tax force to retire and nonwork. The relationship is nonlinear, however. Thus, in the lower panels of each figure, nonwork 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 nonwork on the logarithm of the tax force. This tax force measure can explain about 82 percent of the variation in nonwork across the sample of countries. Thus, these data suggest

a strong relationship between social security incentives to quit work and the labor force departure of older workers.

## Policy Implications

These findings suggest two conclusions about social security systems in the industrialized world: They often

place very high tax rates on continued work at older ages, and these tax rates appear to be causing a substantial reduction in work among older men. This has obvious implications for the design of social security programs both in the United States and abroad. For foreign nations that have very high implicit tax rates, reducing the penalty on continued work at older ages could substantially improve the long-run fiscal balance of their social security programs. One clear avenue to lower costs would be to raise the age of early benefits entitlement, given the huge take-up of benefits at the early retirement age in most countries.

Even without changing this sensitive policy issue, however, countries could reduce their tax rates on work in other ways. For example, they could introduce an actuarial adjustment for delayed benefits receipt beyond the early retirement age, or (to a much lesser extent) allow for benefits recomputation if workers have a higher-earning year at the end of their careers. The net fiscal implications of such policies depend on whether the

<sup>26</sup> Figure from Gruber and Wise (1999a).

*Differences in taxes across countries are associated with important differences in labor-force participation rates.*

current level of taxation on work beyond the early retirement age is high enough that lower taxes actually raise money through inducing more work effort. Given the post-NRA work tax rates that approach 100 percent in some countries, and the withdrawal from work at early ages, it stands to reason that lower tax rates through actuarial reductions for early retirement could improve the fiscal balance in these countries.

The U.S. case is somewhat different. Based on the calculations shown in this report, the U.S. Social Security system is neutral for the average married male worker concerning early retirement at age 62. On the other hand, the system continues to tax work for this group past age 65, a deficiency that will be largely remedied by the already-scheduled increase in the delayed retirement credit. Accelerating the phase-in of the higher DRC could remove current disincentives to work past age 65, although most workers have already retired before that age.

The more relevant issue for the United States is the implications of these findings for the debates over changing the normal and early retirement ages. Under current law, as noted above, the *normal* retirement age is scheduled to increase from age 65 to age 67 by 2022, with the *early* retirement remaining unchanged at age 62. There are a number of proposals to speed up the scheduled increase in the normal retirement age, or to increase it further (to age 70), or both. Some proposals also would raise the early retirement age.

Changing the normal retirement age while holding the early retirement age constant has three important implications for retirement decisions:

- First, it lowers the benefits that workers will receive for a given retirement age. For example, full receipt of benefits, called the primary insurance amount (PIA), currently requires retirement at age 65. But by 2022, full receipt of the PIA will require retirement at age 67, and the PIA will be reduced at ages of earlier retirement between

62 and 67. Thus, for example, those who retire at age 65 will receive only 80 percent of their full PIA. Likewise, workers who retire at age 62 will receive only 70 percent of their PIA rather than 80 percent; and workers who retire at age 70 will receive only 124 percent of their PIA, rather than the 132 percent they would receive today. This should lead to later retirement among all workers, due to an “income effect”—in order to maintain a given standard of living after retirement, workers will have to work longer.

- Second, it might change retirement “norms.” Lumsdaine, Stock, and Wise (1994) note that the high retirement rate at age 65 among those still in the labor force at that age is not easily explained by factors such as Social Security, private pensions, or Medicare eligibility. This suggests that other factors are at work. For example, there may be social “norms” about age 65 as a retirement age that operate independently of financial or medical incentives for retirement. If this norm effect is important, then there could be a substantial delay in retirement when the normal retirement age is increased, particularly for those currently retiring at age 65.<sup>27</sup>
- Third, raising the normal retirement age while holding the early retirement age constant raises the tax on work for some workers—a countervailing factor that has not been fully appreciated. Consider workers ages 62–63: Currently, for each extra month that they work beyond the early retirement age, their benefits increase only 0.56 percent of the PIA. But under current law, by 2022 they will receive only 0.42 percent of the PIA for each extra month of work. This reduces the incentive to work additional months and

<sup>27</sup> An open question is whether this “norm” effect operates only for those age 65 or for earlier ages as well. For example, suppose a worker decides to retire one year earlier than the norm; the shift from age 65 to age 67 would then raise his retirement age from age 64 to age 66.



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moves the United States toward the actuarial system used by other countries. A similar effect will operate for those ages 65–66, who now have a delayed retirement credit of 0.5 percent of the PIA per month, rising to 0.67 percent per month by 2008, but who by 2022 will have only a 0.56 percent monthly actuarial adjustment. For those age 64, on the other hand, the actuarial adjustment will remain the same as it is today for each additional month worked, so there will be no tax effect.

The evidence presented in this *Issue Brief* suggests that these countervailing tax effects should not be taken lightly. Differences in taxes across countries are associated with important differences in labor-force participation rates. Thus, for those in the age 62–63 range, increasing the normal retirement age could cause a *reduction* in labor-force participation by older workers, rather than an increase. For those ages 64–66, there may be an *increase* in labor-force participation due to norm effects from moving the normal retirement age to 67.

What can be done about these countervailing effects on retirement decisions? One alternative would be to maintain the current actuarial adjustment in the age 62–63 range. If the adjustment from age 62–63 were not reduced, but stayed at 0.56 percent of the PIA per month, there would be no increase in the tax on work at those ages. This would also imply even lower benefits for those retiring at those ages than under current law (benefits would be only 66.7 percent of PIA, rather than 70 percent), so that both the income and tax effects would work to delay retirement. The cost to this approach is distributional: There is concern that many of those retiring at age 62 may be unable to work yet not disabled enough to qualify for disability insurance, so that a further cut in benefits would be considered unfair.

A more radical alternative would be to increase the early retirement age to 64, along with the scheduled increase in the normal retirement age to 67, with the schedule of PIA adjustments simply shifted forward by two years. This would cause the same income effect that

operates under the normal retirement age increase: Benefits would be lower for those retiring early, raising labor-force participation to maintain a retirement life style. It would also have the norm effect of moving the normal retirement age. But most importantly, benefits would not even be available to those ages 62–63. Taking the facts that (a) there is currently little net “tax” on work at age 62, and (b) there is a huge labor force departure rate at that age (a “spike” in the hazard rate), it seems clear that the very availability of benefits induces retirement to a large extent. This is at least partially due to the fact that many workers would like to retire even before age 62, but cannot finance their retirement without Social Security benefits. It seems unambiguous that increasing the early retirement age would cause a significant delay in retirement, perhaps to age 64, for most persons who now retire between ages 62 and 64. On the other hand, this approach places hardship on persons who are unable to continue working past age 62.<sup>28</sup>

Another alternative, which would have much more modest effects, is to increase the period over which earnings are averaged to determine benefits. Currently, the 35 highest years of earnings are used to determine benefits. As noted earlier, this may provide a subsidy to additional work at older ages, since earnings later in life are generally higher than at younger ages. By lengthening this averaging period, say to 38 years as in many current proposals, work incentives could be further increased by providing more low- (or even zero-) earnings years to be replaced. This would have income effects that would lead to later retirement as well.

In summary, there are important and complicated retirement incentives associated with reforms to the Social Security system in the United States. Raising the normal retirement age has uncertain effects, with

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<sup>28</sup> Indeed, it is possible that a significant share of the potential savings to Social Security from raising the early retirement age could be offset by increased use of disability insurance among those ages 62–63 who can't turn to Social Security to finance their retirement.



the distinct possibility of an *increase* in retirement among those ages 62 to 63, relative to today. This could be offset by raising the scheduled actuarial reduction for that age group, but only at a distributional cost. Raising the early retirement age as well would be likely to significantly reduce retirement among those ages 62 to 63 who cannot afford to finance their retirement without Social Security benefits. Once again, however, this approach may have unattractive distributional costs.

## Conclusions

The populations of 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 ages 60–64 have fallen from more than 70 percent in the early 1960s to less than 20 percent today. 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. We argue the provisions of the social security systems themselves, ironically, contribute to the labor force withdrawal.

It is clear that there is a strong relationship 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 of older

workers in the labor force, substantially reducing the potential productive capacity of the labor force. It seems evident that if the trend to early retirement is to be reversed, as will almost surely be dictated by demographic trends, a key factor will be changing the provisions of social security programs that induce early retirement.

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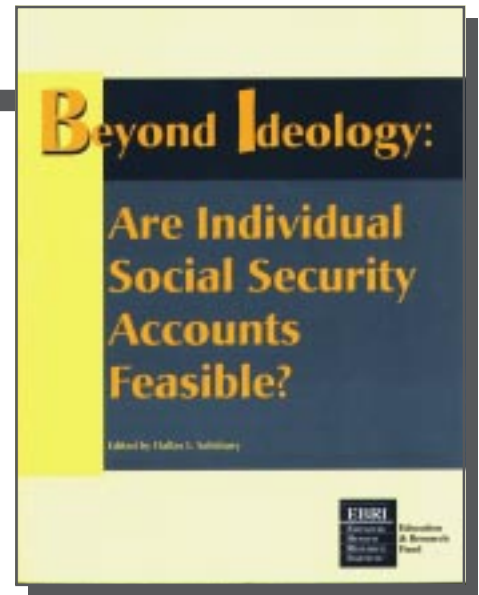
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