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# 7 Social Security and Older Workers' Labor Market Responsiveness: The United States, Japan, and Sweden

Marcus E. Rebick

Social security and other public transfer programs aimed at improving the welfare of the elderly have been well established in all Organization for Economic Cooperation and Development (OECD) countries. A secondary goal of public support programs for older individuals has been to open job opportunities for younger individuals by encouraging earlier retirement of older workers. This kind of program has been explicitly tried in several European countries, including the United Kingdom. In part as a result of the adoption of better social support for older people, the age of full retirement from the labor force has fallen substantially in the OECD, and there is some debate as to whether the programs have encouraged the retirement of too many individuals who would prefer to continue working.<sup>1</sup> There is also an argument that these programs have exacerbated unemployment problems for older workers through the creation of work disincentives.<sup>2</sup>

This paper examines some of the outcomes of public assistance programs for the middle-aged and older individual that have been adopted in three countries in the OECD: the United States, Japan, and Sweden. I address the ques-

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1. An excellent survey of early retirement programs in the OECD that addresses this question may be found in OECD (1992a), chap. 5.

2. An example of this argument applied specifically to older workers in Japan may be found in Shimada et al. (1982).

tion of whether the growth of these programs has discouraged economic flexibility by encouraging older individuals to either retire early or to remain in the state of unemployment during downturns in the business cycle. In particular, I examine fluctuations in employment and participation rates for different demographic groups over the business cycle and look for evidence that these fluctuations have become more severe since the expansion of benefits during the 1960s and early 1970s. I also look directly at how participation in benefits of such programs varies with economic conditions.

I have chosen these three countries because of their widely differing institutions in the labor market, because of their different ideological orientations toward social protection programs, and also because they face the common challenge of a rapidly aging labor force. In addition, all three countries share the feature that they have responded relatively well, by European standards, to the economic circumstances of the 1970s and 1980s, so that failing economic performance is less likely to be a concern for this study.

The countries differ substantially in the kinds of social programs that have been developed to support earlier retirement. The United States saw the introduction of an early retirement program as early as 1961 (1956 in the case of women). Since that time, most of the initiative in encouraging earlier retirement has come through changes in the provisions of private employee pension plans. Sweden is notable for its introduction in 1976 of a partial pension program designed to encourage partial retirement, a program that has been a model for other European countries. Sweden had also relaxed the qualifications necessary for receipt of disability benefits in the early 1970s. In the Japanese case, the age of normal retirement is 60, rather than 65, as it is in the other two countries.

In this study, I propose to examine the extent to which various government labor market programs, including early retirement programs, are used by older individuals in response to economic fluctuations. I begin section 7.1 of the paper with a brief survey of the different government labor market programs used in each of three countries. Section 7.2 provides an overview of the conditions for mature and older workers by examining secular trends in labor force participation rates, unemployment rates, and indicators of well-being in the three countries. Section 7.3 looks at cyclical movements in participation and employment over the business cycle. Time series analysis of participation and employment is used to show the relative responsiveness of different demographic groups in the labor force. Section 7.4 then looks at the response during subperiods within each country to see how the cyclical response of employment of older demographic groups has changed over time as the social programs have grown and matured. In section 7.5, I present direct evidence on changes in the participation rates in public benefits over the business cycle, and in section 7.6, I offer conclusions.

## 7.1 Social Security Programs for the Mature and Older: Institutional Description

All countries in the OECD have developed public pension systems (known in the United States as Social Security) for the purpose of ensuring economic security for the elderly.<sup>3</sup> Although there were existing pension systems for parts of the labor force, Sweden introduced a national pension system in 1913, the United States introduced Social Security in 1935, and Japan developed its National Pension System in 1946. The existence of social security systems on paper, however, may have very little potential impact on labor supply. Instead, it is the size of the benefits, the extent of coverage of the population, and the conditions for benefit eligibility that influence aggregate behavior for specific demographic groups. Benefits may reduce labor supply through (1) the income effect of increased lifetime unearned wealth and (2) the substitution effect if benefits are reduced by working. This is particularly true of unemployment insurance and public pension systems that include an earnings test.

In general, the level of benefits, the extent of coverage, and the eligibility for benefits at earlier ages all increased over time in all three countries. It is this consistent trend that will allow me to test for changes in labor supply behavior caused by growth in the social insurance system. I begin this section with a brief summary of the different benefits and eligibility conditions in the three countries. I then describe the changes in the level of benefits and the extent of coverage over time. Finally, I look briefly at the effects of private pension plans and at the public pension financing arrangements on the labor market.

### 7.1.1 Public Economic Security Programs

Table 7.1 provides a summary description of the principal forms of public benefits, including unemployment insurance offered to older individuals, in each of the three countries. (A more comprehensive description of the different programs is provided in appendix A.) Here I list the main points that are particularly important in distinguishing the programs offered.

1. The *United States* offers the least variety in the way of programs targeted for its older workers. Unemployment insurance (UI) benefits are only available if one is dismissed from one's job. The normal age of retirement under the Social Security system is 65, but since 1956 and 1962 an early retirement option has been available for women and men, respectively, at age 62. Early retirement involves a reduction in the lifetime annuity and also includes an earnings test that reduces the benefit if the individual continues to work.

3. Throughout this paper, all income figures are evaluated at 1990 levels and converted to U.S. dollars, using the purchasing power parity index for consumption goods developed by the OECD for the year 1990. These levels may be found in OECD (1992b), table 2.5, row 1. Gross domestic product (GDP) deflators used were: United States—*Economic Report of the President, 1992*, table B-3; Japan and Sweden—World Bank, *World Tables 1992*, pp. 348–49 and 576–77, respectively.

**Table 7.1 Public Early Retirement and Disability Schemes in the United States, Japan, and Sweden, 1961–1990 (1990 U.S. dollars)**

Country	Retirement Age		Program	Conditions for Eligibility	Amount of Pension
	Normal	Early			
United States	65 <sup>1</sup>	62	Early retirement option (began 1956 for women, 1961 for men)	Person is unable to work due to physical or medical impairment expected to last at least 1 year or result in death	Benefits reduced 5/9 of 1% for each month prior to normal age <sup>2</sup>
			Disability insurance program		
Japan	60 (males) 56 (females)		Unemployment insurance	Involuntary separation	50% replacement rate
			Employee pension	Full retirement, partial retirement (less than 3/5 of full-time work), or below earnings test point	Approximately 40% of income including bonuses
			Disability pension	Must qualify as having disability	
			Unemployment insurance		60–80% replacement rate for up to 300 days, up to \$35/day
Sweden	65	60	Actuarially reduced pension (began 1963)	Unemployment benefit has been paid for maximum period, or labor market assistance been paid for 450 days and opportunity to earn a salary is permanently reduced by one-half	Pension reduced by 0.6% per month for each month prior to age 65
			Early retirement (began 1972)		Full pension
		60	Flexible retirement with part-time employment (began 1976)	Employed 5 out of the last 12 months; worker must transfer	65% of salary lost due to part-time employment <sup>3</sup>

Table 7.1 (continued)

Country	Retirement Age		Program	Conditions for Eligibility	Amount of Pension
	Normal	Early			
Sweden (cont.)			Disability (began 1960)	from full- to part-time work and work at least 17 hours a week Working capacity reduced by one-half due to physical or mental impairment or on grounds of redundancy (special medical examination not required, 1972–1991); partial disability available on grounds of premature aging or mental incapacity	Full pension
			Unemployment insurance	Must have worked 5 months out of last year	90% of earnings up to \$50 per day; up to 450 days
			Labor market assistance	No longer eligible for unemployment insurance	\$21 per day; up to 300 days before age 60; after age 60, available until age 65

Sources: United States and Sweden: Excerpted from Mirkin (1987), exhibit 1, and augmented from appendix 1. Japan: appendix A (this paper).

<sup>1</sup>In 1983, eligibility age for full retirement benefits was raised from 65 to 67.

<sup>2</sup>In 1983, the early retirement reduction in benefits claimed at age 62 was raised from 20 percent to 30 percent, to be phased in gradually between 2002 and 2027.

<sup>3</sup>65%, except for 1981–1987, where it was 50 percent.

2. *Sweden* offers the largest spectrum of different kinds of assistance programs, including an old-age pension with a normal retirement age of 65 (67 before 1976) and an early retirement option with actuarially reduced benefits and, unlike the United States, no earnings test. Other programs include partial pensions (up to 65 percent replacement of lost earnings for reduced working hours since 1976); liberal unemployment benefits (up to 90 percent replacement rate for 450 days); labor market assistance (smaller unemployment insurance benefits that are available after regular benefits run out) up through age 65, since 1971. Among the most important early retirement benefits are those

offered by disability pensions. Between 1972 and 1991, mature and older workers have been able to take the disability pension if they experienced difficulty finding jobs. As a result, roughly 13 percent of Swedes ages 55–59 and more than 30 percent of ages 60–64 were receiving disability pensions in the late 1980s. This was by far the most popular early retirement program.<sup>4</sup> Disability pensions given for difficulty in finding jobs will resemble unemployment insurance in their impact on labor supply. The impact will be even greater, however, since these pension benefits are typically much larger than those offered by unemployment insurance.

3. *Japan* allows individuals to collect both unemployment insurance and public pensions at the same time. Japan currently has the earliest normal retirement age for employees: age 60 for men and age 56 for women. The retirement age for women is being increased from 56 to 60 over the period from 1986 to 2000. The self-employed, part-time workers, and nonworking spouses have a normal retirement age of 65. Japan has an earnings test on wage income that is substantially relaxed after age 65.<sup>5</sup>

Japan's pension system provides unequal levels of protection for its entire population, since the average employee receives benefits starting at age 60 that are about four times larger than those received by the self-employed starting at age 65. Families in which the self-employed members are the top earners still make up almost a quarter of individuals covered directly or indirectly under the Japanese pension system. For these individuals the pension system offers very low benefits (table 7.4), well below the minimum poverty line.

### 7.1.2 Trends in the Levels of Benefits and Extent of Coverage

At present, the replacement rates on Swedish public pensions (57 percent) are higher on average than in the United States (43 percent) or Japan (42 percent) (Japan 1991, 202–3). As indicated in Table 7.1 through 7.4, however, there have been some significant changes to the programs offered over time, changes that could have important implications for labor supply and the timing of retirement.

Tables 7.2–7.4 present evidence on the average level of benefits paid out for different pension systems over the period from 1960 to the present. Prior to 1970, all three countries increased the coverage of their pension systems.<sup>6</sup> Since the public pension plans pay benefits based on the number of years of coverage, there is a time lag before the increase in coverage translates into increases in the number of older workers who have sizable public pension ben-

4. For comparison, the rate of disability reciprocity in the United States is only 7 percent of those eligible for benefits in the age group 55–59. In Sweden, the second most popular program, the partial pension, was used by some 13 percent of men and 7 percent of women ages 60–64.

5. Appendix A indicates that there are loopholes in the system that allow one to avoid the earnings test.

6. For a description of these trends, see Quinn, Burkhauser, and Myers (1990) for the United States, Japanese Ministry of Welfare, *Jigyō Nenpo*, for Japan, and Lagerström (1976) for Sweden.

**Table 7.2 OASDI\* Retiree and Disability: Average Monthly Benefits in the United States, by Age and Sex (1990 U.S. dollars)**

Year	Retiree		Disability	
	62-64	65-69	55-59	60-64
<b>Men</b>				
1960	—	\$393	\$403	\$408
1970	365	444	465	469
1980	568	630	635	649
1990	612	648	681	685
<b>Women</b>				
1960	234	274	335	332
1970	282	347	372	376
1980	378	465	447	456
1990	388	459	445	438

Source: Social Security Administration 1960-1991.

\*OASDI = Old-Age, Survivors, and Disability Insurance.

**Table 7.3 Sweden's Basic Old-Age, Supplementary, Disability, and Partial Pensions: Average Monthly Benefit, 1978-1988\* (1990 U.S. dollars)**

Year	Basic and Supplementary Old-Age	Basic and Supplementary Disability	Partial Pension
	65-69	60-64	60-64
1978	\$649	\$653	\$416*
1983	899	760	317
1988	950	764	362

Sources: National Insurance Board (1978, 1983, 1988). *Allmän Försäkring* (National Insurance) (Stockholm).

\*All benefit averages were deflated to 1990 kronur and then converted to 1990 dollars.

†1979.

**Table 7.4 Japan's Employee Pension and National Pension: Average Monthly Benefit, 1970-1990\* (1990 U.S. dollars)**

Year	Employee Pension (New Recipients)		National Pension
	Men	Women	
1970	\$190		\$ 53
1975	417		104
1980	552		128
1985	\$773	\$437	143
1988	818	435	153

Source: Japanese Ministry of Welfare, *Jigyō Nenpo* (Annual Report) (Social Insurance Bureau).

\*All benefit averages were deflated to 1990 yen and then converted to 1990 dollars.



efits to consider in their retirement decisions. All three countries also increased the real levels of benefits through the 1970s and, in the case of Sweden and Japan, in the 1980s as well. The increases in Japan are the most dramatic, with the employee pension increasing threefold on average. In the United States and Sweden, the level of old-age benefits doubled over the 1970s. In an exception to the general trend, Sweden saw a decrease in the average level of benefits paid out for the partial pension during the period 1980–86 as the government cut the replacement rate for forgone earnings from 65 percent to 50 percent over this period.

### 7.1.3 Financing Arrangements and Their Effect on the Labor Market

Both social security systems and unemployment insurance are supported through payroll taxes in the three countries. The United States is closest to being fully funded today, although that was not always the case. Japan is closest to having a pay-as-you-go system (Clark 1991). In general, payroll tax rates for public pensions have increased over time in all three countries because of (1) aging of the population in the presence of less than full funding of social security, (2) the move toward full funding in the United States, and (3) the increase in defined benefits relative to real wages. In the first two cases, increases in payroll tax rates may reduce labor supply if the substitution effect of lower after-tax wage rates dominates the income effect of lower take-home pay. For the third case, however, the accompanying increase in defined benefits makes the computation more complex. The aforementioned substitution and income effects may largely disappear, since there is also an increase in the rate of deferred compensation in the form of the pension. At the same time, however, there is an increase in lifetime wealth (from previous years of participation in the system) that may reduce labor supply. A detailed analysis of the effects of public pension payroll tax increases is beyond the scope of the paper, but in general the trends toward increased tax rates should reinforce the effects on labor supply caused by the increase in benefit levels and coverage.

The United States is the only country with partial experience rating for unemployment insurance, with the degree of experience rating varying by state. Experience rating may have some effect on the willingness of firms to lay off older workers in the case of the United States, and this may be one reason why movement of older workers out of the U.S. labor force is less likely to be seen in the form of unemployment.

### 7.1.4 Private Pension Coverage

Private pensions are important components of compensation in all three countries, but there are some important differences in terms of their effect on retirement and of their share of total retirement income. The important differences from the perspective of this paper are (1) the relative share of private pensions in postretirement income and (2) the manner in which retirement wealth accrues to those still working (Kotlikoff and Wise 1989).

In the *United States*, private pensions exist as both defined benefit plans and defined contribution plans; the former is still the most prevalent, with 80 percent of all pension plan participants in 1985 (Clark and McDermed 1990, 2). Defined benefit plans set a retirement date based on either age alone or some combination of age and service that usually results in a retirement age between 60 and 65. The provisions of private pension plans vary, but the typical U.S. defined benefit pension plan offers substantial incentives for retirement on or before the normal retirement date of the Social Security program (Quinn, Burkhauser, and Myers 1990; Hurd 1990). In 1990, private pensions made up roughly one-fifth of nonearnings income for individuals over age 65 in the United States. Social security made up roughly two-fifths of nonearnings income for the same group (Social Security Administration 1960–1991).

In *Sweden*, private pensions are offered by all employers in the Swedish Employers' Confederation. Their level of benefits is roughly one-sixth of the levels offered by the basic and supplementary public pensions. There is no earnings test on the pensions, and (unlike in the United States) delaying retirement does not delay payment of these pensions. Therefore, their impact on retirement is likely to be similar to that of the public pensions.

In *Japan*, employers have the options of making lump-sum payments, offering fixed-period annuities, or augmenting the level of benefits paid through the public pension system. These benefits are usually calculated at the age of mandatory retirement (ages 55 to 60). As a result, working past the age of 60 has no effect on pension wealth, and the private pension system does not offer direct incentives to retire in the sense of U.S. pensions.<sup>7</sup> Japanese private pensions are also unlikely to provide major incentives to retire by providing greater economic security. The average lump-sum severance payment represents three years of base salary, or a lifetime annuity of approximately 22 percent of base salary.<sup>8</sup> This is approximately one-third the size of the employee pension annuity and not likely to be a major component of income after retirement.

This concludes the overview of economic security systems in the three countries. The next section begins an examination of the characteristics of the labor markets of the three countries, looking at secular trends in employment and labor force participation over the past 20 years.

## 7.2 Secular Trends in Employment and Participation and Well-being

Table 7.5 gives the labor force participation rates for older men and women between 1971 and 1990.<sup>9</sup> For the men, the most notable trends are the substan-

7. The augmented portion of the employee pension is not subject to the earnings test.

8. The figures for the size of the lump-sum pension (37.7 months of base salary) come from Japanese Ministry of Labor (1987), *Taishokkin no Shikyū Jittai* (Survey of Severance Payments). The annuity is calculated assuming the individual lives twenty years after mandatory retirement and the real rate of interest is 4 percent.

9. Five-year averages are used to avoid confusing secular changes with short-term economic fluctuations.

**Table 7.5 Labor Force Participation Rates in the United States, Japan, and Sweden, by Sex and Age Groups**

Group	1971-75	1986-90	Change
<i>Men</i>			
55-59			
United States	85.5%	78.8%	-6.7%
Japan	92.2	91.3	-0.9
Sweden	89.9	86.6	-3.3
60-64			
United States	68.0	54.3	-13.7
Japan	80.5	71.9	-8.6
Sweden	75.8	63.9	-11.9
65+			
United States	22.3	15.8	-6.5
Japan	46.3	36.0	-10.3
Sweden	23.9	13.4	-10.5
<i>Women</i>			
55-59			
United States	47.9	53.1	+5.2
Japan	49.5	51.5	+2.0
Sweden	57.7	78.5	+20.8
60-64			
United States	34.0	34.0	0.0
Japan	38.1	38.9	+0.8
Sweden	35.6	50.5	+14.9
65+			
United States	8.3	7.4	-0.9
Japan	16.0	15.7	-0.3
Sweden	7.2	4.4	-2.8

Source: Organization for Economic Cooperation and Development (OECD). Labor Force Statistics.

tial 5- to 15-point declines in the participation rates for the 60-64, and 65-and-over age groups in all three countries. U.S. men age 55-59 also show a substantial decline of 7 points in their labor force participation rate. In all three countries, the trends for women exhibit a sharp contrast to the male trend, with increasing participation rates for 55- to 64-year-olds in Sweden and for 55- to 59-year-olds in the United States and Japan. The trends for Swedish women are the most dramatic, with age groups 55-59 and 60-64 showing 21- and 15-point increases, respectively, over the past two decades. Finally, Japan is notable for having higher labor force participation rates than the other countries. Japan's labor force participation rates in the 65-and-older age group were the highest among the seven largest economies in the OECD.<sup>10</sup>

10. A problem with the Japanese figures stems from the extent of self-employment in Japan. The extent to which the self-employed are actually working is open to question (Rebick 1993).

Turning to trends in unemployment, table 7.6 gives a matching set of age-specific unemployment rates. Unemployment rates have been fairly steady in the United States and Sweden over the 1970–90 period, although the early 1980s were a period of higher unemployment. The unemployment rates of both Japanese men and women show a rising secular trend over this period, especially for men in the 60–64-year-old age group. In Sweden, there is a drop in the unemployment rate for older men after the mid-1970s that corresponds to the lowering of the normal retirement age from 67 to 65 in 1976. At the same time, unemployment insurance benefits were restricted to those under the age of 65.

The secular trends in labor force participation for older men can be imputed to rising private and public pension levels and to increased pension coverage. The trends for women seem to be related to the increased labor force participation rates of women in more recent birth cohorts (Laczko and Phillipson 1991) and to the fact that women typically have poorer pension benefits because pen-

**Table 7.6** Unemployment Rates in the United States, Japan, and Sweden, by Sex and Age Groups

Group	1971–75	1986–90	Change
<i>Men</i>			
55–59			
United States	3.0%	3.9%	+0.9%
Japan	2.2	3.2	+1.0
Sweden	1.5	1.3	–0.2
60–64			
United States	3.4	3.6	+0.2
Japan	2.2	6.5	+4.3
Sweden	2.8	2.5	–0.3
65+			
United States	3.7	2.8	–0.9
Japan	1.4	1.5	+0.1
Sweden	3.6	0.3	–3.3
<i>Women</i>			
55–59			
United States	3.7	3.1	–0.6
Japan	1.0	2.0	+1.0
Sweden	1.7	1.3	–0.4
60–64			
United States	3.4	2.9	–0.5
Japan	0.7	1.7	+1.0
Sweden	2.7	3.2	+0.5
65+			
United States	3.8	2.8	–1.0
Japan	0.0	0.5	+0.5
Sweden	2.4	0.3	–2.1

Source: Organization for Economic Cooperation and Development (OECD), Labor Force Statistics

sion levels are tied to length of employment and wage levels. On the other hand, the trends in the unemployment rates in Sweden and Japan seem to come in part from changes in public support programs. In Japan the 60–64 age group receives better benefits today than in 1970, while in Sweden unemployment benefits for those over the age of 65 have been eliminated.

The effects the increased benefits from the social programs have on well-being are not in doubt. All three countries have seen substantial declines in the poverty rates of older groups. Table 7.7 shows the trends in poverty rates for older groups in each of the three countries over time. Although the poverty measures are not necessarily comparable between the three countries, the table does indicate that the trend toward lower poverty among the older groups of the population have been similar in all three countries.

A question of importance in the discussion of well-being is the issue of *who* retires early. Studies in the United States (Quinn, Burkhauser, and Myers 1990) and Japan (Seike 1989) indicate that the less healthy and the more poorly educated tend to retire earliest, other things equal. Although these studies suggest that the social protection programs are effective in reaching the least advan-

**Table 7.7** Trends in Poverty for Older-Age Groups in the United States, Sweden, and Japan

	Year				
	1967	1970	1975	1980	1985
<i>United States<sup>a</sup></i>					
Age 60–64					
Men	13%	11%	10%	8%	10%
Women	19	16	13	13	12
Age 65 and over					
Men	24	19	11	11	9
Women	34	28	18	19	16
<i>Sweden<sup>b</sup></i>					
Married, over 45					
Employed	2			2	
Not employed	11			0	
Single, over 45					
Employed	7			3	
Not employed	17			5	
<i>Japan<sup>c</sup></i>					
Age 60–64			34.4	16.6	11.7
Age 65–74			41.4	20.1	14.4

Sources: Bureau of the Census, *Current Population Reports*, Series P-60: No. 95, table 1; No. 106, table 11; No. 133, table 11; No. 158, table 7. Japan: Preston and Kono 1988, table 11.6. Sweden: Erikson and Fritzell 1988, table 12.3.

<sup>a</sup>Percentage below official absolute poverty line (post-1969 definition).

<sup>b</sup>Percentage below relative poverty line (one-half medial disposable income of whole population).

<sup>c</sup>Percentage of Japanese living in households with monthly expenditures less than \$509 (1990 U.S. dollars).

taged, other evidence in the United States also shows that the lowest-paid workers are least likely to retire early, probably because their total wealth including pensions is insufficient (Quinn, Burkhauser, and Myers). This suggests that the social protection programs may be inadequate in providing protection for some of the neediest.

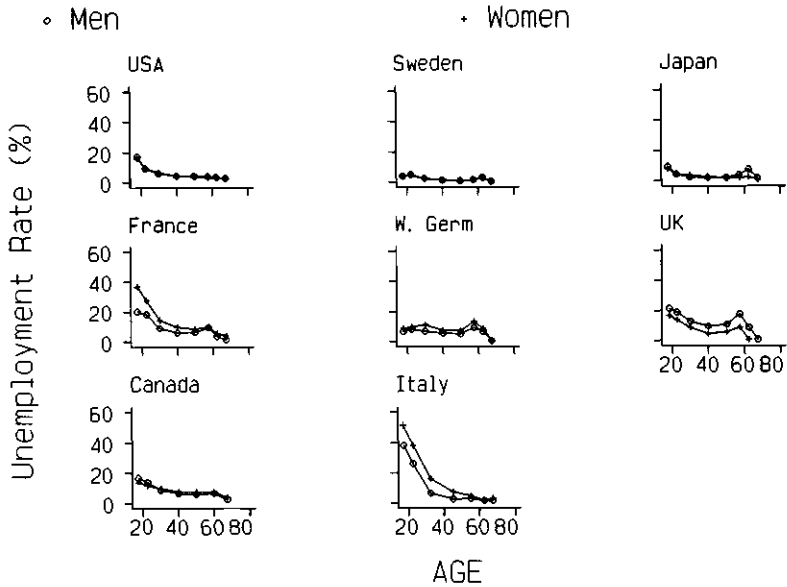
A more difficult question is the extent to which the programs ameliorate the income losses experienced with job loss. In order to examine this question carefully, analysis of longitudinal data is required. One study of the 1969–79 decade in the United States found that 11 percent of couples without pensions fell into poverty during the one- to two-year period immediately following retirement (Burkhauser and Duncan 1988). At the same transition, only 2 percent of those with pensions fell into poverty, illustrating the importance of private pensions as a supplement to social security. The evidence from Sweden given in table 7.7 also suggests that improvements in the level of social security and unemployment benefits lowered the poverty rates for the mature and older unemployed between 1967 and 1980. The poverty rate for not-employed single individuals over age 45 fell from 17 percent to 5 percent.

In conclusion, it appears that the increase in coverage and levels of benefits in all three countries was successful in achieving the goal of greater social protection. At the same time, the labor force participation rates for men fell, possibly as a result of these changes in social benefits.

### **7.3 Cyclical Movements in Employment Levels of Older Workers**

This section looks at the extent to which employment and participation movements over the business cycle are more severe for the older age groups. As mentioned earlier, Japan and Sweden offer better job protection for younger and prime-age workers. One way to see how strongly unemployment hits different demographic groups is to look at cross-sectional profiles of the age structure of unemployment. Figure 7.1 shows the unemployment profiles for men and women in the G7 countries and Sweden during 1987. It is apparent that there is considerable variation across countries in the extent to which unemployment is concentrated in the older age groups. The United States, Italy, and Japanese women show relatively low unemployment rates for older participants, while Japanese men, Sweden, France, West Germany, and the United Kingdom show relatively high unemployment rates for older participants in comparison with prime-age participants.

The variation in the age structure of unemployment across countries may be due to differences in the methods of providing benefits to nonworking individuals. For example, the relatively high unemployment rates for older people in Sweden and Japan may actually reflect retirement from the labor force, when unemployment benefits are used in addition to or in place of pensions as an income support for those who stop working. In order to avoid the reporting problems that result from differences in protection programs in the three countries, it is useful to look at movements in both unemployment rates and partici-



**Figure 7.1** Unemployment rates for G7 countries and Sweden in 1987, by age  
*Source:* OECD, Labor Force Statistics.

pation rates over the business cycle. In this way, fluctuations in the numbers of discouraged workers may also be considered.

Adopting a method used by Clark and Summers (1981), I use a simple time series analysis to analyze employment fluctuations by different demographic groups over the business cycle. Clark and Summers developed this method explicitly to compare the differential response of different demographic groups to business conditions in the United States, assuming that some groups will exhibit stronger discouraged-worker effects than other. Using their approach, I focus on the employment/population ratio rather than the unemployment rate as an indicator of labor movements over the business cycle. Decomposition of the employment/population ratio into the employment rate and the labor force participation rate yields:

$$(1) \quad \log E_{it}/N_{it} = \log E_{it}/P_{it} + \log P_{it}/N_{it},$$

where  $E_{it}$  is employment,  $N_{it}$  is the population, and  $P_{it}$  represents participants for the  $i$ th demographic group at time  $t$ . I then examine the cyclical movements in all of the terms, using current and lagged values of the unemployment rate of prime-age males (who show the strongest attachment to the labor force) as a measure of the business cycle:

$$(2) \quad \log E_{it}/N_{it} = \alpha_0 + \sum \alpha_j UR_{t-j+1} + \alpha_{25} t + \varepsilon_t$$

$$(3) \quad \log E_{it}/P_{it} = \beta_0 + \sum \beta_j UR_{t-j+1} + \beta_{25} t + \varepsilon_t$$

$$(4) \quad \log P_{it}/N_{it} = \gamma_0 + \sum \gamma_j UR_{t-j+1} + \gamma_{25} t + \varepsilon_t$$

where *UR* refers to the unemployment rate of prime-age males, defined as 35- to 44-year-old men in the case of the United States and Sweden and 30- to 39-year-old men for Japan. The sums  $\sum \alpha_j$  and  $\sum \beta_j$  and  $\sum \gamma_j$  of the coefficients on the current and lagged values of *UR* will then show the respective percentage responses of the employment/population ratio, the employment rate, and the labor force participation rate to a one-point change in the unemployment rate of prime-age males over the long run. The use of lagged terms allows for longer-term adjustments to shocks in the business cycle, including adjustment costs and the role of future expectations.

An advantage of using the unemployment rate of prime-age males as an explanatory variable, rather than a more conventional measure such as detrended output, is that there is less reason to expect a simultaneous equation bias.<sup>11</sup> In addition, I am able to examine the relative response of the older groups to a labor market measure of the business cycle. The labor force participation rate of prime-age males is unlikely to show a major response to cyclical fluctuations, and so the unemployment rate of prime-age males provides a useful metric by which the responsiveness of other groups can be measured. If other groups show a response similar in magnitude to that of prime-age workers, then the sums of the coefficients on the contemporaneous and lagged unemployment rates of prime-age men should come to approximately minus-one for the employment/population ratio and the employment rate, and zero for the labor force participation rate. These sums represent the long-run response of different demographic groups to the business cycle.

I use a monthly deseasonalized time series<sup>12</sup> and twelve monthly lags in my estimations.<sup>13</sup> As in Clark and Summers (1981), I include a time trend to allow for secular shifts in the average participation and employment rates. I model the error structure as an AR1 process, and use a maximum-likelihood procedure (TSP) to estimate the generalized least-squares model.<sup>14</sup> The lagged variables are estimated using an Almon distributed lag model of order 6 for ease in estimation.<sup>15</sup> I report more details on the results of the regressions themselves in appendix B. For ease of exposition, I show only the estimates of the long-run responses  $\sum \alpha_j$  and  $\sum \beta_j$  and  $\sum \gamma_j$  in table 7.8. In each case I have

11. I have also repeated the procedure using the detrended growth in gross domestic product as a measure of the business cycle. Although the results for specific demographic groups are slightly different, the overall conclusions of the paper are not affected. These results are available from the author on request.

12. The time series span the period 1949–92 for the United States, 1976–92 for Sweden, and 1962–92 for Japan.

13. Increasing the number of lags slightly increases the size of the long-run response but does not affect the overall conclusions of the paper.

14. A simultaneous equations model was also estimated with the cross-equation restriction that the long-run responses obey the identity in equation (1). The basic results of the paper remain the same.

15. Results are virtually unchanged if an unconstrained lag model is used.



**Table 7.8** Cyclical Response of Participation and Employment: United States–Sweden–Japan Comparisons, by Age Group (standard errors in parentheses)

Demographic Groups	Dependent Variable	United States 1949–1992	Sweden 1976–1992 <sup>a</sup>	Japan 1962–1992
<i>Men</i> Age 55–64	<u>Employment</u>	-1.20*	-2.36*	-1.39*
	Population	(0.37)	(0.18)	(0.13)
	<u>Employment</u>	-1.14*	-1.54*	-0.93*
	Labor force	(0.05)	(0.12)	(0.05)
	LFPR <sup>b</sup>	-0.16	-0.77*	-0.46*
		(0.33)	(0.16)	(0.12)
Age 65+	<u>Employment</u>	-1.35	-10.67*	-3.33*
	Population	(0.90)	(4.03)	(0.34)
	<u>Employment</u>	-0.60*	0.31	-0.43*
	Labor force	(0.10)	(0.23)	(0.06)
	LFPR <sup>b</sup>	-0.61	-10.99*	-2.91*
		(0.86)	(3.92)	(0.33)
<i>Women</i> Age 55–64	<u>Employment</u>	0.004	-1.39*	-1.36*
	Population	(0.93)	(0.41)	(0.31)
	<u>Employment</u>	-0.74*	-1.59*	-0.25*
	Labor force	(0.06)	(0.18)	(0.03)
	LFPR <sup>b</sup>	0.48	0.28	-1.13*
		(0.89)	(0.38)	(0.30)
Age 65+	<u>Employment</u>	-1.58	7.98	-3.30*
	Population	(1.25)	(6.05)	(1.21)
	<u>Employment</u>	-0.29*	1.41*	-0.15*
	Labor force	(0.08)	(0.64)	(0.04)
	LFPR <sup>b</sup>	-1.12	6.81	-3.14*
		(1.23)	(6.09)	(1.17)

Sources: United States: *Employment and Earnings*. Japan: Labor Force Survey. Sweden: Labor Force Survey.

Note: Figures reported in the table are sums of coefficients of prime-age male contemporary and eleven lagged unemployment rates in regressions where the dependent variables are the  $\log(\text{employment/population rate})$ ,  $\log(\text{employment rate})$ , and  $\log(\text{participation rate})$  for different age groups. Results are multiplied by  $100 \times$  the detrended standard deviation of the explanatory variable for comparability across countries. Prime-age males are 35–44 in the United States and Sweden and 30–39 in Japan. All data are deseasonalized, monthly observations covering the period from 1949 to 1991 for the United States, 1962 to 1991 for Japan, and 1976 to 1991 for Sweden. A time trend and constant term are included in all regressions. The Japanese regressions include an additional dummy variable set to one for the period after October 1967, when the methods of the Labor Force Survey changed. Regressions correct for AR1 autocorrelation using a maximum likelihood procedure. Details of estimates are shown in appendix B.

<sup>a</sup>The estimates are for the period 1976–1985 in the case of men and women over age 65.

<sup>b</sup>LFPR = Labor Force Participation Rate.

\*Significantly different from zero at the 5 percent level.

multiplied these estimates by one standard deviation in the detrended unemployment rate of prime-age males, the explanatory variable used to represent the business cycle. The two age groups that I analyze are *mature*, defined as ages 55 to 64, and *older*, defined as over 65.

The results given in table 7.8 indicate some differences in the behavior of mature and older workers across the three countries. For the employment/population variable, the overall Japanese response is significantly larger than that of the United States, for all women and older men. The differences are much more striking for the older groups. This is interesting, given that the standard deviation in prime-age male unemployment (measured in percentage terms) is much smaller in Japan at 0.3 than in the United States at 1.23. Similarly, Sweden shows larger responses than the United States for men and mature women and no significant difference for older men. Again, this is interesting in light of the fact that in Sweden, one standard deviation in the prime-age male unemployment rate is only 0.7. Japan and Sweden, countries known for stable employment and low unemployment, rely on their mature and older workers for a substantial proportion of flexibility in aggregate employment levels.<sup>16</sup> Despite this tendency, however, the absolute size of the response to the business cycle of the mature groups in these two low-unemployment countries is only slightly larger than that seen in the United States.<sup>17</sup>

Looking at the breakdown of the response in the employment/population ratio into the employment/labor force ratio and the labor force participation rate (LFPR), it is clear that the unemployment age profiles of figure 7.1 by themselves do not accurately portray the relative response of mature and older groups. This is especially true for women and older men in Japan and older men in Sweden, where the fluctuations in the labor force participation rates dominate the response in the overall employment/population ratio. The LFPR response is not statistically significant for any of the older groups in the United States, but the results shown here indicate that this is not a universal phenomenon.

Although the behavior over the business cycle of Japanese, Swedish and U.S. labor markets for mature and older workers are substantially different, it is unlikely that all of these differences are related to supply-side effects gener-

16. Abraham and Houseman (1989) and Hashimoto (1993) note that the relative importance of hours reductions for labor input flexibility is greater in Japan than in the United States, especially over the short run. The data that I am using do not allow me to investigate this factor for separate demographic groups. Hashimoto also reports on the importance of *kyūgyōsha*, workers who are sent home on reduced pay during slack business periods. These workers are not unemployed from the perspective of economic security since they remain employed by their firms, but the prevalence of the practice indicates that the flexibility of labor input is greater than simple hours and unemployment rate fluctuations would indicate. The same paper estimates that the *kyūgyōsha* may represent up to 2 percent of the labor force during economic downturns.

17. For similar results from a comparison of Germany and the United States, see Abraham and Houseman (1993), pages 110–14.

ated by the social security benefits offered by the different countries. The availability of benefits will not affect behavior over the business cycle unless wages are lowered during downturns to induce workers to leave their jobs. Rather, total business cycle response of the employment/population ratio will be related to demand-side factors such as whether or not firms preferentially fire older workers during business downturns.<sup>18</sup> The effect of social programs will primarily be to determine the breakdown of the employment/population response into employment and labor force participation responses. For example, the relative importance of the labor force participation response for mature men in Sweden and Japan (in comparison with the United States) may be due to the fact that it is easier to take public pensions in these countries and then return to work without penalty. In the U.S. case, the early retirement pension lowers Social Security benefits for the rest of the retiree's life and will be subject to an earnings test if the individual returns to work.

To account for the difference in overall response on the demand side, it is necessary to look beyond the social security programs to other institutions in the labor markets of these countries. In the United States, age discrimination—discouraging legislation and the seniority preference system of unions make older U.S. workers less vulnerable in comparison with their Japanese counterparts. The steepness of seniority-earnings profiles in Japan also provides a stronger financial incentive for Japanese firms to dismiss their older workers if the compensation for the oldest workers is greater than their value to the firm. If firms have specific investments in all workers, then dismissal of older workers during downturns would be rational since their asset value to the firm is lower, given the shortness of the remainder of their working life. Finally, older workers are less likely to be a deliberate target of company dismissal policy when, as in the United States, they have lower participation rates, even in the best economic conditions.

In Sweden, older workers are explicitly protected by legislation drafted during the 1970s, a period of many plant closings. Workers over the age of 45 must be given six months notice of dismissal, and employers must try to find other jobs for those who have lost the ability to perform their usual jobs (Ginsberg 1985). In addition, Swedish unions use a seniority rule for layoffs, also protecting their older workers.

Some evidence on the extent to which labor market responses may have been affected on the supply side by economic security programs may be inferred by looking at participation and employment responses during periods when the benefits available were different from those offered today. This is the subject of the next section.

18. It is possible that personnel management practices may be affected by the availability of benefits—it is easier both psychologically and politically to fire workers if they will be provided for. This point is emphasized in OECD (1992a).

#### 7.4 Changes in the Pattern of Response over Time within Countries

To examine changes in the response pattern of demographic groups, I modify models (2), (3), and (4) used in the previous section to allow for different subperiods to be examined. This is done by interacting a dummy variable set equal to zero in the first subperiod and one in the second subperiod, with the lagged prime-age male unemployment rates and the time trend to generate an additional set of thirteen terms. If the sum of the twelve coefficients on the interactive unemployment rate terms is not significantly different from zero, then we can conclude that the null hypothesis, that there is no difference in business cycle response between the two periods, is supported by the data.<sup>19</sup>

In table 7.9, I report the results of this procedure for the United States and Japan.<sup>20</sup> The two subperiods chosen for the United States are 1949–75 and 1977–92. The size of pension benefits increased in real terms until 1975 and then remained constant. Therefore, the 1977–92 period represents a period of higher benefits, where we should expect to see an increase in the response of the employment/population ratio if social protection programs are responsible for the kinds of response shown in table 7.8. For Japan, the two periods covered are 1962–75, and 1977–92, the latter period having much higher public pension benefits and extension of unemployment benefits for mature and older workers.<sup>21</sup>

For each country in table 7.9, the column on the left shows the response of the dependent variable to the contemporaneous and lagged levels of prime-age male unemployment for the first subperiod, just as table 7.8 showed the response over the entire sample period. The right-hand column then shows the *change* in the response that occurs in the second period, and its significance. The actual second-period response point estimate would be given by the sum of the point estimates in the two columns. For example, mature men in the United States show a statistically significant employment/population response of  $-1.18$  from 1949 to 1975. From 1977 to 1992 the response was  $-1.37$  ( $-1.18 - 0.19$ ), but the change between the two periods was not significant, as the standard error of  $.60$  for the  $-.19$  change indicates.

The U.S. results indicate that mature and older women have seen some increase in the responsiveness of their employment/population ratio response to fluctuations in the prime-age male unemployment rate, but the results have low significance. This effect comes from an increased response in their labor force participation rate. At the same time, the response of the employment/labor

19. The model actually used for estimation is slightly more complex, in that I include a third set of interactions to cover the one-year period after the beginning of the second period in order to remove a one-year transition from consideration and to sharpen the statistical test.

20. Sweden does not have age-specific employment and participation data available prior to 1970, and the brevity of the period 1970–76 makes analysis using time series difficult. Consequently, this section presents results for only Japan and the United States.

21. The detailed results of the regressions are provided in supplementary tables available from the author.

**Table 7.9** Cyclical Response of Participation and Employment, United States and Japan: Comparisons between Subperiods (standard error in parentheses)

Demographic Groups	Dependent Variable	United States		Japan	
		1949-1975	1977-1992	1962-1975	1977-1992
		Sum of Lagged Unemployment	Additive Change in Sum of Lagged Unemployment	Sum of Lagged Unemployment	Additive Change in Sum of Lagged Unemployment
<i>Men</i> Age 55-64	<u>Employment</u>	-1.18*	-0.19	-0.98*	-0.54*
	Population	(0.43)	(0.60)	(0.25)	(0.20)
	<u>Employment</u>	-1.30*	0.16*	-0.69*	-0.12
	Labor force	(0.06)	(0.06)	(0.11)	(0.09)
	LFPR	-0.13	-0.11	-0.33	-0.39*
		(0.38)	(0.55)	(0.23)	(0.18)
Age 65+	<u>Employment</u>	-3.08*	3.14*	-4.37*	1.49*
	Population	(0.94)	(1.02)	(0.68)	(0.56)
	<u>Employment</u>	-1.14*	0.81*	-0.32*	0.17*
	Labor force	(0.08)	(0.08)	(0.10)	(0.08)
	LFPR	-1.91*	2.36*	-4.06*	1.33*
		(0.95)	(1.04)	(0.68)	(0.55)
<i>Women</i> Age 55-64	<u>Employment</u>	0.63	-2.52	-3.25*	1.63*
	Population	(1.06)	(1.56)	(0.59)	(0.48)
	<u>Employment</u>	-0.88*	0.24*	-0.24*	-0.06
	Labor force	(0.07)	(0.07)	(0.08)	(0.07)
	LFPR	1.03	-2.24	-3.16*	1.83*
		(1.01)	(1.51)	(0.57)	(0.47)
Age 65+	<u>Employment</u>	-0.47	-1.46	-9.02*	7.73*
	Population	(1.47)	(1.52)	(1.22)	(0.98)
	<u>Employment</u>	-0.68*	0.60*	-0.16	0.04
	Labor force	(0.09)	(0.09)	(0.09)	(0.08)
	LFPR	0.37	-2.22	-8.99*	7.90*
		(1.45)	(1.49)	(1.21)	(0.97)

Sources: United States: *Employment and Earnings*. Japan: Labor Force Survey. Sweden: Labor Force Survey.

Note: Figures reported in columns 1 and 3 of the table are sums of coefficients of prime-age male contemporary and eleven lagged monthly unemployment rates in regressions where the dependent variables are log(participation rate), log(employment rate), and log(employment ratio) for different age groups. Columns 2 and 4 contain the sums of the coefficients on the lagged prime-age male unemployment rates interacted with a dummy variable set equal to one during the second period. In addition, there is a time trend and set of lagged variables interacted with a dummy variable for a transition period of one year between the two main periods. For other details, see table 7.8. Detailed results available from the author.

\*Significantly different from zero at the 5 percent level.

force ratio has significantly declined, partly offsetting the increase in the participation response. The size of this significant decline in the response of the employment/labor force ratio, however, is smaller than the (less significant) increase in the response of the labor force participation rate. Mature U.S. men show a similar decline in the employment/labor force response, but overall there is no significant change in their employment/population ratio responsiveness. Older U.S. men show a significant decline in *both* participation and employment responses during the second period.

Turning to the estimates for Japan, mature Japanese men show an increase in their employment/population response after 1975, mainly from an increased response in the participation rate. Mature and older Japanese women as well as older Japanese men show a significant *decrease* in their employment/population response, also coming from a decline in the participation response. The data used here indicate that changes in the unemployment insurance legislation in 1975 did not give rise to a major increase in the unemployment response of older groups. Increases in the level of benefits in the employee pension system may have doubled the participation response of mature Japanese men, but the absolute size of this effect remains small—an increase in prime-age male unemployment of one standard deviation now yields a 0.7-point drop in the labor force participation rate of mature men as opposed to the 0.3-point drop it would have yielded in the years 1962–75.

In conclusion, evidence from employment series taken by different sub-periods provides little evidence that introduction and/or extension of social benefit programs for older workers has greatly increased the responsiveness of their employment rates over the business cycle. The exceptions to this may be mature Japanese men, a group that showed significantly higher responses in the employment/population ratio after 1975, and U.S. women, who show some evidence of a greater discouraged-worker effect after 1975. In the next section, I look directly at fluctuations in the rate of participation in pension and unemployment benefits over the business cycle.

## 7.5 Participation in Public Support Benefits over the Cycle

This section of the paper examines the use of public support programs over the past twenty to thirty years in the three countries. In particular, I distinguish secular and cyclical trends and attempt to look at the impact of changes in legislation during the period. In general, my procedure is to regress the percentage of individuals in a given age group that are receiving benefits on the unemployment rate of prime-age men and a time trend.<sup>22</sup> Since most of the data on benefits are only available as annual data, I use only current unemployment rates of prime-age men as an explanatory variable.

22. For the United States, I use the fraction of those eligible for benefits that receive them (the take-up rate).

## 7.5.1 United States

Table 7.10 displays the results for the United States. Women show a positive correlation between participation in the old-age pension for both the 62–64 age group and the 65–69 age group, but the significance level is not high. Men only show a low-significance positive response for the over-65 age group. More important than the significance levels, the estimated elasticity of the response is very low. There is little change in participation in Social Security benefits over the business cycle. Recipients of disability pensions also show no variation over the business cycle. As expected, unemployment insurance recipients in the 55–64 age group are positively correlated with the prime-age male unemployment rate, but the elasticities are less than one for both men and women (which is consistent with the results on the employment rate from column 2 in table 7.8). I conclude that with the exception of unemployment insurance, U.S. old-age, survivors, and disability insurance (OASDI) is unlikely to have had much effect on the fluctuations in employment of mature workers in the United States over the business cycle.

**Table 7.10** Cyclical and Secular Changes in Benefit Participation Rates: United States, 1960–1987 (dependent variable is the log of the fraction of those eligible receiving the benefit)

Explanatory Variable	Full Pension		Actuarially Reduced Pension		Disability Pension <sup>a</sup>		Unemployment Insurance	
	Men 65–69	Women 65–69	Men 62–64	Women 62–64	Men 55–59	Women 55–59	Men 55–64	Women 55–64
Log unemployment rate, prime-age men	.031 (.020)	.026 (.017)	-.01 (.06)	.039 (.024)	-.024 (.11)	-.06 (.13)	.84* (.13)	.54* (.13)
Time trend	.007* (.001)	.003* (.0008)	.035* (.003)	.021* (.001)	.21* (.005)	.027* (.007)	-.039* (.007)	-.014 (.007)
Constant	-.60* (.13)	-.34* (.11)	-3.85* (.39)	-2.55* (.16)	-4.92* (.69)	-5.1* (.86)	2.22* (.84)	-1.3 (.82)
R <sup>2</sup>	.80	.62	.90	.96	.67	.51	.65	.40
Exponential of mean of dependent variable	.83	.82	.32	.33	.072	.057	.030	.016

Sources: Social Security Administration, *Annual Statistical Supplements; Employment and Earnings; Labor Force Statistics Derived from the Current Population Survey, 1948–87*, U.S. Department of Labor Bulletin 2307.

Note: Standard errors in parentheses.

<sup>a</sup>1981 is not included for disability pensions.

\*Significantly different from zero at the 5 percent level.

## 7.5.2 Sweden

The evidence for Sweden is shown in table 7.11, using data for the period 1975–88. Evidence is shown only for the various pension programs. The uptake of the basic and supplementary old-age pension increases during periods of high unemployment; the elasticity of response is statistically indistinguishable from one. Although the participation in disability benefits among 60 to 64-year-olds shows no statistically significant correlation with prime-age male unemployment, new participation of individuals claiming disability pensions on the basis of labor market difficulties does show a significant positive response for women and, to a lesser degree of significance, for men as well. The elasticities are statistically indistinguishable from one. In all cases, the secular trends for participation in these benefits are positive.

The estimates for the partial pension system show no significant correlation between the business cycle and participation in benefits. The declining secular

**Table 7.11** Cyclical and Secular Changes in Benefit Participation Rates: Sweden, 1976–1988 (dependent variable is the log of the fraction of the demographic group receiving the benefit)

Explanatory Variable	Basic pension		Disability Pension <sup>a</sup>		Disability Pension For Labor Market Difficulties (new take-ups only)		Partial Pension <sup>b</sup>	
	Men 60–64	Women 60–64	Men 60–64	Women 60–64	Men 60–64	Women 60–64	Men 60–64	Women 60–64
Log unemployment rate, prime-age men	.62* (.20)	.97* (.33)	-.015 (.06)	-.02 (.04)	.62 (.48)	.71* (.31)	-.09 (.31)	.13 (.25)
Time trend	.05* (.02)	.05 (.025)	.04* (.004)	.05* (.002)	.14* (.03)	.09* (.02)	-.06* (.02)	-.01 (.02)
Constant	-5.2* (1.9)	-3.7 (3.1)	-5.5* (.47)	-6.19* (.33)	-13.5* (3.9)	-9.3* (2.5)	2.61 (2.5)	-.99 (2.1)
R <sup>2</sup>	.82	.73	.90	.96	.72	.78	.51	.73
Exponential, mean of the dependent variable	.03	.02	.12	.12	.01	.01	.13	.07

Sources: Sweden Labor Force Survey; National Social Insurance Board. *Allmän Försäkring*, (National Insurance). (Stockholm).

Note: Standard errors in parentheses.

<sup>a</sup>1970–1988.

<sup>b</sup>1977–1988.

\*Significantly different from zero at the 5 percent level.



trend in the participation rate for men reflects the fact that benefit levels were cut back from 65 percent replacement of the reduction in earnings to 50 percent of the reduction in earnings between 1980 and 1986. Given the limited number of observations, changes in the replacement rates may overwhelm any observable effect from the business cycle for this pension plan.

### 7.5.3 Japan

The results for Japan are shown in table 7.12. The number of pension recipients and the number of unemployment insurance recipients both show a positive elasticity with respect to the unemployment rate of prime-age men, but the unemployment insurance (UI) recipients show a substantially higher elasticity. The earnings test-reduced pension shows negative elasticities of the recipient rate with respect to the unemployment rate (as would be expected).

As the time trend coefficient estimates indicate, the rates of employee pen-

**Table 7.12** Cyclical and Secular Changes in Benefit Participation Rates: Japan, 1981–1990 (dependent variable is the log of the fraction of the demographic group receiving the benefit)

Explanatory Variable	Employee Pension		Full Employee Pension		Earnings Test-Reduced Pension		Unemployment Insurance <sup>a</sup>
	Men 60–64	Women 60–64	Men 60–64	Women 60–64	Men 60–64	Women 60–64	Men 55–64
Log unemployment rate, 30–39-year-old men	0.17*	0.13*	0.38*	0.24*	-.74*	-.30*	.73*
	(.03)	(.01)	(.04)	(.02)	(.18)	(.10)	(.10)
Time trend	0.02*	0.05*	0.03*	0.07*	0.013	-.03*	-.03*
	(.001)	(.0006)	(.002)	(.001)	(.007)	(.004)	(.005)
Post-1984 dummy							-.38*
							(.05)
Constant	-2.7*	-5.3*	-2.4*	-6.4*	-6.8*	-1.9*	2.0*
	(.14)	(.07)	(0.20)	(0.1)	(.87)	(.47)	(.68)
R <sup>2</sup>	.99	.99	.98	.99	.78	.90	.98
Exponential, mean of the dependent variable	0.39	0.24	0.32	0.20	0.07	0.04	0.03

Sources: Unemployment rates and population figures: Labor Force Survey. Numbers of benefits recipients: Social Insurance Bureau, *Jigyō Nenpo*; Japanese Ministry of Labor *Employment Insurance Annual Report*.

Note: A dummy variable set to one for the period 1985–90 is used in the regression for the unemployment recipient rate, since recipients over age 65 are included in the period 1975 to 1984. Standard errors in parentheses.

<sup>a</sup>1976–1990.

\*Significantly different from zero at the 5 percent level.

sion participation for both men and women increased over the 1980s, reflecting the decline in labor force participation over this period, the increased availability of pensions for women, and the decline in self-employment by cohort. The UI recipient rate also shows a declining trend over time, with a sharp drop in 1985 when UI benefits were cut back.

From these observations we can conclude that both pensions and unemployment benefits are used for income support during downturns in the business cycle. Since both the employee pension and unemployment insurance may be collected at the same time, this is not surprising.

In conclusion, the participation rates in most of the social benefits increase with downturns in the business cycle, in accordance with the labor market responses estimated in section 7.3. Notable exceptions are the actuarially reduced early retirement schemes in the United States and Sweden. In these cases, there are no financial advantages to receiving the benefits, so workers may prefer to wait and find work, in the U.S. case, or take benefits from another program, as in the Swedish case. Finally, there is no evidence that the benefits have affected the decision whether or not to work during economic downturns.

## 7.6 Conclusions

In this study, I examined the extent to which government labor market programs, including early retirement programs, are used by older individuals in the United States, Japan, and Sweden in response to economic fluctuations. I found that these programs are more heavily used by workers in Sweden and Japan, where the responsiveness of older demographic groups to economic conditions is greater than that shown by older groups in the United States. There has been a significant decrease in poverty rates of older demographic groups over the time period in which these programs were expanded. This suggests that these programs have had a major impact in improving the well-being of older individuals.

Previous research indicated that the introduction of social programs for the elderly affected overall trends in participation of older workers. This paper shows that there is no conclusive evidence that introduction of these programs had major effects on the labor market responsiveness of the older demographic groups, in terms of fluctuations in employment over the business cycle. Labor market responsiveness varies among the three countries for a variety of reasons, likely related to differences in institutions that constrain a firm's ability to adjust its demand for labor of different demographic groups. Consequently, evaluation of programs for older individuals should concentrate on their long-run impact on labor force participation rates and on the efficiency with which they improve economic security, rather than on their impact on labor market flexibility.

## Appendix A

### *Description of Unemployment and Pension Programs*

Foster (1990) provides a good survey of general information on employee benefits in the United States and Sweden. For Japan, see Japanese Ministry of Welfare, *Outline of Social Insurance in Japan* (Social Insurance Agency).

#### **United States**

The United States offers both unemployment insurance and old-age pension benefits to older retirees. Normal retirement benefits begin at age 65 in the United States, with early retirement benefits available from age 62. Formerly it was possible for a retiree to collect both a pension and unemployment insurance at the same time, although this depended on individual state practice. Since 1980, this has not been possible in any state (Hamermesh 1980).

*Unemployment Insurance.* Unemployment insurance benefits are available only to employees who have lost their jobs involuntarily. Unemployment insurance benefits replace 50 percent of earnings (up to a maximum of \$419 per week in 1990 dollars).

*Public Pensions.* Pensions are calculated on a formula based on "average indexed monthly earnings," which provides a replacement ratio that varies inversely with the level of earnings. There is a ceiling on covered earnings (\$51,300 in 1990). Early retirement benefits are available as early as age 62, with an actuarial reduction of 0.9 percent in the benefit level for each month they are taken before age 65. The pension computation also includes an earnings test that reduces benefits by one-half of the income earned over a minimum threshold (\$6,840 in 1990), for those aged 62 to 64. The earnings test reduction rate is lowered to one-third after age 65, while the minimum threshold is raised.

#### **Sweden**

In comparison with the United States and Japan, Sweden offers the widest range of different support programs for retirees, including early receipt of public pensions at reduced benefit levels, partial pensions (for part-time workers), unemployment insurance, and disability pensions.

*National Pension.* Public pensions of a *national basic pension (AFP)* of fixed value calculated from a base amount paid to every Swedish resident at retirement along with the *national supplementary pension (ATP)* with benefits related to earnings during preretirement years. There is a ceiling (7.5 times the

base amount) on pensionable earnings. The full pension for thirty years of insured earnings is set at 60 percent of the average of the pensionable income for the fifteen best years. The normal retirement age in Sweden is 65 (67 prior to 1976), and there is an option for early retirement at age 60 (62 before 1976). There is no earnings test for pensions in Sweden.

*Partial Pensions.* This program has been available since 1976. Between ages 60 and 64, workers whose hours are reduced by at least five hours per week are eligible for the partial pension if they have ten years of pensionable income since age 45. The pension replaces 65 percent of the earnings lost by reducing hours (50 percent between 1980 and 1987), not counting any reduction in the wage rate that may accompany the reduction in working hours. For those who enroll in this program, there is no reduction in regular pension benefits after age 65.

*Disability Pensions.* This pension provides for the loss of at least 50 percent of earnings capacity or permanent unemployment after age 60. The latter provision was abolished in 1991. The pension pays between 50 percent and 100 percent of the retirement pension, according to the degree of disability.

*Unemployment Insurance.* Two kinds of benefits are available: *unemployment insurance*, and *labor market assistance*. Unemployment insurance benefits range from \$16 to \$50 per day and are available for 450 days for those over the age of 55. Labor market assistance is available after unemployment insurance benefits run out; it pays \$19 per day. Between age 55 and 59, these are available for 300 days. After age 60, they are available until age 65. Unlike the case of Japan, any pensions received from the social security system or a private plan are subtracted from the benefit.

## Japan

Japan offers two major kinds of public assistance programs that could be used for early retirement: unemployment insurance and public pensions.

*Unemployment Insurance.* Unemployment insurance benefits replace between 60 percent and 80 percent of wage earnings up to a maximum benefit (\$37 per day in 1989). In order for a person to qualify for benefits, they must have been covered by the system for at least six months prior to leaving their job. They must also report to a public employment center for help with job placement. Unemployed individuals are not required to take a job that pays less than 60 percent of the most recent wage, that pays less than the unemployment benefit, that is unsuitable for the person's skills, or that involves an unreasonable commute or change of residence. In practice, most public employment offices are not strict about forcing beneficiaries to engage in job search.

Benefits are paid for up to 300 days in the case of 45- to 65-year-olds, although the period of benefits is tied to tenure at the last job (with the exception of the period between 1975 and 1984). There are also possible extensions to the 300-day maximum in the case of individuals whose circumstances make it especially difficult for them to find new work.

*Public Pensions.* The main public pension for private sector employees is the *employee pension*, part of the national pension program. The employee pension is available to women at age 56 and to men at age 60. The pension is computed on a formula that includes a fixed part and a part that is proportional to the average wages earned during the time that the individual has been enrolled in the system:

$$\text{Pension} = (a_1 + [a_2 \cdot \text{Average wage}]) \cdot \text{Months of coverage} \cdot \text{COLA} ,$$

where COLA refers to a cost-of-living adjustment. There is a cap on months of coverage (480 in 1990) and a cap on monthly wages that are used for the computation of the average wage (\$2,807 in 1989). The major reforms of the early 1970s doubled the size of the fixed coefficient  $a_1$  in real terms. More important, past wages were substantially revalued to take account of both inflation and economic growth. This led to a substantial increase in the real value of the pensions. A second factor increasing real values of the pension after 1973 has been the increase in the coverage period for the average individual as the pension system matured.

There is an earnings test (substantially relaxed after age 65). Up to age 64, at selected earnings cutoff points, the pension is reduced by fixed percentages with 100 percent of the pension lost when monthly earnings exceed \$1,159 in 1990 dollars. The Japanese earnings test produces a fairly flat budget constraint (with notches) up to the point where benefits are reduced to zero. The earnings test is not applied, however, to those employees who are employed for less than three-fifths of normal working hours in the firm. Also, bonuses are not considered earnings from the perspective of the public pension system. By increasing the bonus portion of pay, employers can keep covered earnings below the earnings test points, even in the case where employees are working full time (Rebick 1993). There is no reliable statistical evidence on how widespread this practice is.

## Appendix B

### Regression Results for Table 7.8

**Table 7B.1** Cyclical Response of Participation, Employment, and Employment/  
Population Ratio: United States, 1949–1992

Demographic Group	Dependent Variable	Constant	Trend	Sum Lagged	$\rho$	$R^2$
<i>Men</i>						
Age 55–64	<u>Employment</u>	-0.39	-5.7e-04	-0.97	0.97	1
	Population	(0.024)	(6.5e-05)	(0.3)	(0.0097)	
	<u>Employment</u>	0.0033	3.6e-05	-0.93	0.66	0.92
	Labor force	(0.002)	(3.3e-06)	(0.039)	(0.033)	
	LFPR <sup>a</sup>	-0.39	-5.9e-04	-0.13	0.98	1
		(0.026)	(7.2e-05)	(0.27)	(0.0081)	
Age 65+	<u>Employment</u>	-1.9	-2.2e-03	-1.1	0.93	1
	Population	(0.042)	(8.9e-05)	(0.73)	(0.016)	
	<u>Employment</u>	-0.0093	4.3e-05	-0.48	0.73	0.7
	Labor force	(0.0043)	(7.3e-06)	(0.083)	(0.03)	
	LFPR <sup>a</sup>	-1.9	-2.2e-03	-0.5	0.93	1
		(0.04)	(8.3e-05)	(0.7)	(0.017)	
<i>Women</i>						
Age 55–64	<u>Employment</u>	-0.76	1.0e-03	0.0031	0.99	0.98
	Population	(0.088)	(2.5e-04)	(0.76)	(0.0071)	
	<u>Employment</u>	-0.0086	2.5e-05	-0.6	0.62	0.73
	Labor force	(0.0026)	(4.4e-06)	(0.051)	(0.035)	
	LFPR <sup>a</sup>	-0.74	1.0e-03	0.39	0.99	0.99
		(0.09)	(2.6e-04)	(0.72)	(0.0067)	
Age 65+	<u>Employment</u>	-2.5	-5.3e-04	-1.3	0.89	0.91
	Population	(0.054)	(1.0e-04)	(1)	(0.02)	
	<u>Employment</u>	-0.025	-1.8e-06	-0.23	0.52	0.34
	Labor force	(0.0035)	(5.8e-06)	(0.068)	(0.038)	
	LFPR <sup>a</sup>	-2.5	-5.3e-04	-0.91	0.89	0.91
		(0.054)	(1.0e-04)	(1)	(0.019)	

Sources: U.S. Population Bureau, *Employment and Earnings*, (monthly series), 1949 to March 1992.

Notes: The dependent variable is the log of the participation rate, employment rate, or employment/population ratio for the demographic group. "Sum Lagged" refers to the sum of the coefficients on the current and lagged unemployment rates of prime-age males (age 35–44) over the last year. "Trend" is a simple time trend. Regressions were estimated using TSP's AR1 procedure, maximum likelihood method. Standard errors lie below the regression coefficients estimates.

<sup>a</sup> LFPR = Labor Force Participation Rate.

**Table 7B.2 Cyclical Response of Participation, Employment, Employment/  
Population Ratio: Sweden, 1976–1992<sup>a</sup>**

Demographic Group	Dependent Variable	Constant	Sum Lagged	Trend	$\rho$	$R^2$
<i>Men</i>						
Age 55–64	<u>Employment</u>	-0.28	-3.6	-3.7e-04	-0.1	0.75
	Population	(0.0045)	(0.28)	(2.0e-05)	(0.073)	
	<u>Employment</u>	0.0086	-2.4	3.6e-05	0.4	0.73
	Labor force LFPR <sup>b</sup>	(0.0029)	(0.18)	(1.4e-05)	(0.068)	
Age 65+	<u>Employment</u>	-1.9	-16	-4.9e-04	0.05	0.37
	Population	(0.17)	(6.2)	(7.0e-04)	(0.097)	
	<u>Employment</u>	-0.013	0.48	-4.0e-05	0.064	0.077
	Labor force LFPR <sup>b</sup>	(0.0097)	(0.35)	(4.0e-05)	(0.097)	
Age 65+	<u>Employment</u>	-1.9	-17	-4.5e-04	0.044	0.39
	Population	(0.16)	(6)	(6.9e-04)	(0.097)	
	<u>Employment</u>	-0.36	-2.1	1.5e-03	0.37	0.94
	Population	(0.01)	(0.62)	(4.6e-05)	(0.069)	
Age 55–64	<u>Employment</u>	0.0072	-2.4	3.9e-05	0.55	0.73
	Labor force LFPR <sup>b</sup>	(0.0046)	(0.28)	(2.1e-05)	(0.062)	
	<u>Employment</u>	-0.37	0.43	1.5e-03	0.37	0.95
	Population	(0.0093)	(0.57)	(4.3e-05)	(0.069)	
Age 65+	<u>Employment</u>	-4	12	-4.3e-03	-0.12	0.37
	Population	(0.25)	(9.2)	(1.1e-03)	(0.097)	
	<u>Employment</u>	-0.081	2.2	-3.7e-04	0.17	0.17
	Labor force LFPR <sup>b</sup>	(0.027)	(0.97)	(1.1e-04)	(0.11)	
Age 65+	<u>Employment</u>	-3.9	10	-4.0e-03	-0.13	0.35
	Population	(0.26)	(9.3)	(1.1e-03)	(0.097)	

Source: Labor Force Survey (monthly series), January 1975 to March 1992.

Note: See note to table 7B.1 for details of estimation.

<sup>a</sup> The estimates are for 1976–85 in the case of the older (65+) men and women.

<sup>b</sup> LFPR = Labor Force Participation Rate.

**Table 7B.3** Cyclical Response of Participation, Employment, Employment/  
Population Ratio: Japan, 1962–1992

Demographic Group	Dependent Variable	Constant	Constant I	Trend	Sum Lagged	$\rho$	$R^2$
<i>Men</i>							
Age 55–64	<u>Employment</u>	-0.16	0.014	-1.1e-04	-5	0.62	0.95
	Population	(0.01)	(0.0036)	(2.3e-05)	(0.47)	(0.043)	
	<u>Employment</u>	0.018	-0.0026	2.1e-05	-3.3	0.54	0.95
	Labor force	(0.0041)	(0.0014)	(9.3e-06)	(0.19)	(0.046)	
	LFPR <sup>a</sup>	-0.17	0.016	-1.2e-04	-1.7	0.63	0.88
		(0.0097)	(0.0033)	(2.2e-05)	(0.44)	(0.042)	
Age 65+	<u>Employment</u>	-0.84	-0.037	-9.6e-04	-12	0.59	0.98
	Population	(0.027)	(0.0092)	(6.0e-05)	(1.2)	(0.044)	
	<u>Employment</u>	0.013	-0.0033	2.8e-05	-1.5	0.5	0.71
	Labor force	(0.0046)	(0.0016)	(1.0e-05)	(0.21)	(0.047)	
	LFPR <sup>a</sup>	-0.85	-0.034	-9.8e-04	-10	0.59	0.98
		(0.026)	(0.0090)	(5.8e-05)	(1.2)	(0.044)	
<i>Women</i>							
Age 55–64	<u>Employment</u>	-0.67	-0.019	2.8e-04	-4.9	0.64	0.63
	Population	(0.025)	(0.0084)	(5.5e-05)	(1.1)	(0.042)	
	<u>Employment</u>	-0.0089	0.0046	-2.4e-05	-0.89	0.26	0.73
	Labor force	(0.0027)	(9.5e-04)	(6.0e-06)	(0.12)	(0.052)	
	LFPR <sup>a</sup>	-0.66	-0.023	3.0e-04	-4	0.63	0.63
		(0.024)	(0.0082)	(5.4e-05)	(1.1)	(0.042)	
Age 65+	<u>Employment</u>	-1.6	-0.1	-2.2e-04	-12	0.83	0.93
	Population	(0.095)	(0.0028)	(2.2e-04)	(4.3)	(0.03)	
	<u>Employment</u>	0.0023	0.0033	9.9e-06	-0.52	0.07	0.11
	Labor force	(0.0029)	(0.0010)	(6.5e-06)	(0.13)	(0.054)	
	LFPR <sup>a</sup>	-1.6	-0.11	-2.2e-04	-11	0.82	0.93
		(0.092)	(0.028)	(2.1e-04)	(4.2)	(0.031)	

Source: Monthly Labor Survey (monthly series), September 1960 to March 1992.

Note: Prime-age males are age 30–39. Constant I is a dummy variable set to one from October 1967. For other details, see note to table 7B.1.

<sup>a</sup> LFPR = Labor Force Participation Rate.



## Appendix C

### *Statistical Sources*

All data used in this paper are available to the public, mainly through published documents.

#### United States

Labor force data from the Current Population Survey are published monthly in *Employment and Earnings* by the U.S. Population Bureau. All data used on the benefit levels and participation in benefits come from the *Annual Statistical Supplement* of the Social Security Administration.

#### Sweden

Monthly labor force data are from the Swedish Labor Force Survey. These are not published but are available from Statistiska centralbyrån, AM-avdelningen, 115 81 Stockholm. Data on benefits and participation in benefits come from an annual publication *Allmän Försäkring (National Insurance)*, published by the National Insurance Board, Stockholm.

#### Japan

Monthly labor force data after 1968 are available from the Japanese *Labor Force Survey*. This is published as annual volumes by the Japanese Ministry of Labor. For monthly data before 1968, it is necessary to use the monthly reports put out by the same ministry. Data on the level of benefits and participation in benefits may be found in the *Jigyō Nenpo* (Annual Report), an annual volume published by the Social Insurance Bureau of the Japanese Ministry of Welfare.

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