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Introduction

Courtney C. Coile, Kevin Milligan, and David A. Wise

Project Overview

Through the coordination of the work of a team of analysts in 12 countries for nearly 20 years, the ISS project has used the vast differences in social security programs across countries as a natural laboratory to study the effects of retirement program provisions on the labor force participation (LFP) of older persons. The project's first several phases (Gruber and Wise 1999, 2004, and 2007) documented the strong relationship across countries between social security incentives and older men's LFP, confirmed this relationship in microeconomic analysis, and estimated the labor market and fiscal implications of social security reform. Later volumes have examined the relationship between disability insurance program provisions, health, and retirement (Wise 2012, 2016) and explored whether older employment affects youth unemployment (Gruber and Wise 2010) and whether older workers are healthy enough to work longer (Wise 2017). This analysis is the eighth phase of the ongoing project, and it is focused on recent trends in LFP and potential explanations for these changes in behavior.

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The results of the ongoing project are the product of analyses conducted for each country by analysts in that country. Researchers who have participated in this phase of the project are listed first below; those who have participated in prior phases are listed second in italics.

Belgium: Alain Jousten, Mathieu Lefebvre, *Arnaud Dellis*, *Raphaël Desmet*, *Sergio Perelman*, *Pierre Pestieau*, and *Jean-Philippe Stijns*

Canada: Kevin Milligan, Tammy Schirle, *Michael Baker*, and *Jonathan Gruber*

Denmark: Paul Bingley, Nabanita Datta Gupta, Peder J. Pedersen, and *Michael Jørgensen*

France: Didier Blanchet, Antoine Bozio, Corinne Prost, Muriel Roger, *Luc Behaghel*, *Thierry Debrand*, *Ronan Mahieu*, *Louis-Paul Pelé*, *Melika Ben Salem*, and *Emmanuelle Walraët*

Germany: Axel Börsch-Supan, Irene Ferrari, *Tabea Bucher-Koenen*, *Hendrik Jürges*, *Simone Kohnz*, *Giovanni Mastrobuoni*, *Johannes Rausch*, *Reinhold Schnabel*, *Morten Schuth*, and *Lars Thiel*

Italy: Agar Brugiavini, Giacomo Pasini, Guglielmo Weber, and *Franco Peracchi*

Japan: Takashi Oshio, Satoshi Shimizutani, Emiko Usui, *Mayu Fujii*, *Akiko Sato Oishi*, and *Naohiro Yashiro*

Netherlands: Adriaan Kalwij, Arie Kapteyn, and Klaas de Vos

Spain: Pilar García Gómez, Sergi Jiménez-Martín, Judit Vall-Castelló, *Michele Boldrín*, and *Franco Peracchi*

Sweden: Lisa Laun, Mårten Palme, *Per Johansson*, and *Ingemar Svensson*

UK: James Banks, Carl Emmerson, Gemma Tetlow, *Richard Blundell*, *Antoine Bozio*, *Paul Johnson*, *Costas Meghir*, and *Sarah Smith*

US: Courtney Coile, *Kevin Milligan*, *David Wise*, *Jonathan Gruber,* and *Peter Diamond*

An important goal of the project has been to present results that are as comparable as possible across countries. Thus the chapters for each phase are prepared according to a detailed template that we develop in consultation with country participants. In this introduction, we summarize the collective results of the country analyses and borrow freely from the country chapters. In large part, however, the results presented in the introduction could only be conveyed by a combined analysis of the data from each of the countries. The country chapters themselves present much more detail for each country and, in addition to the common analyses performed by all countries, often present country-specific analysis relevant to each particular country.

Introduction

At the turn of the 20th century, a majority of men in developed economies worked even at the oldest ages. As Costa (1998) documents, the LFP rate of

men aged 65 and older in 1900 was 65 percent in the United States, 61 percent in Britain, 58 percent in Germany, and 54 percent in France.[1] Given the relatively short life expectancies of the time, many men of this era would have spent few, if any, years in retirement.

By the late 20th century, however, work past age 65 had become the exception rather than the rule. The share of men aged 65–69 in the labor force in 1995 was only 4 percent in Germany, 5 percent in France, 15 percent in the United Kingdom, and 27 percent in the United States. Including men aged 70 and older (to match the earlier figures) would drive these values lower still. With life expectancies at older ages rising quickly over the same period—by 4.3 years for men at age 65 in the United States during the 20th century (Bell and Miller 2002), for example—retirement emerged as a distinct and important phase of life.

The growth of public pension programs has long been a leading candidate to explain this decline in older men's participation. Germany introduced the world's first old-age social insurance program in 1889, and other developed countries followed suit over the next several decades. Over time, many countries expanded their programs to cover more of the workforce, provide benefits for new categories of individuals such as survivors and the disabled, and offer more generous benefits.

The ISS project was started in the mid-1990s against this backdrop of decades of decline in older men's work and the growth of public pension programs in many developed countries. The project sought to use the vast differences in social security programs across countries as a natural laboratory to study the effects of retirement programs on the LFP of older persons.

As it turns out, the launch of the ISS project coincided with the end of the century-long decline in men's LFP. Not only was the declining trend arrested, but the employment rates rose tremendously in many countries. This is illustrated for men aged 60–64 in figure I.1. While the exact year of the trough varies across the country, the LFP has risen by an average of 17 percentage points in the 12 ISS countries between its lowest point and 2014, as noted on table I.1. Participation rose in every country, but the magnitude of the increase varied, from 7 points in Japan and Spain to 35 points in Germany and 44 points in the Netherlands.

Why did so many countries experience a substantial increase in men's LFP at this particular time, following a century of earlier withdrawal from the labor force? Why was the increase larger in some countries than others? The answers to these questions are pivotal as countries seek solutions to the fiscal and retirement security challenges posed by the expansion in life-spans and may want to encourage further increases in elderly labor supply. If the turnaround in labor supply is driven by demographic or global economic trends,

1. These data are for the years 1895–1901, depending on the country; see Costa (1998) for details.

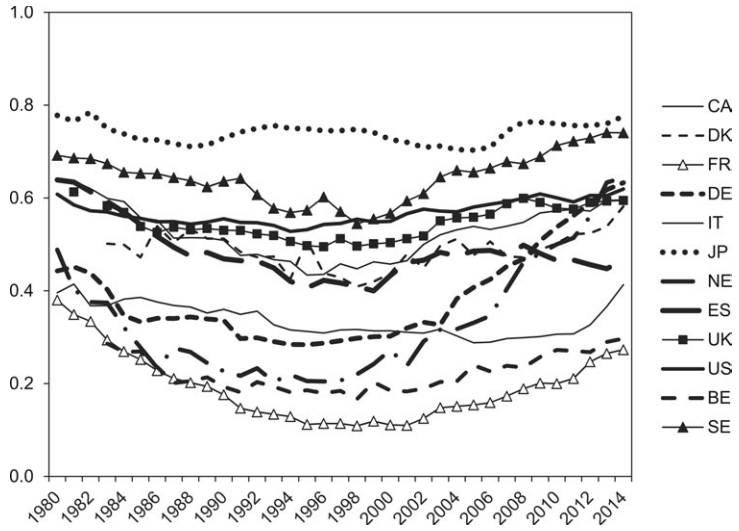


Fig. I.1 LFP of men aged 60–64, 1980–2014

Table I.1 Increase in LFP of men aged 60–64, trough to 2014

Country	Year of minimum LFP	Minimum LFP	2014 LFP	Difference
Belgium	1998	0.167	0.297	0.130
Canada	1995	0.434	0.596	0.162
Denmark	1998	0.409	0.582	0.173
France	1998	0.109	0.273	0.164
Germany	1995	0.284	0.633	0.349
Italy	2005	0.288	0.413	0.125
Japan	2005	0.703	0.776	0.073
Netherlands	1993	0.204	0.644	0.440
Spain	1999	0.400	0.466	0.066
Sweden	1998	0.545	0.740	0.195
UK	1996	0.495	0.595	0.100
US	1994	0.528	0.619	0.091
Average		0.381	0.553	0.172

then any one country's direct policy choices will change little. On the other hand, if policy changes around social security programs have contributed significantly to the turnaround in LFP, then further direct policy measures might be effective in prolonging work lives.

The goal of this phase of the ISS project is to begin to answer these questions by documenting the changes in the LFP and employment of older men and women from 1980 to the present and exploring the factors that may have contributed to these changes. The methods we use are primarily

descriptive, as we examine trends over time in the labor supply and in those factors that may affect it. By investigating these issues in a cross-country context, we can gauge whether trends observed in individual countries hold true in other countries. We can also potentially build a stronger case that a certain factor—say, improving health or education—may be contributing to changes in participation if we observe larger changes over time in participation in those countries where the factor also changed more rapidly. In some cases, we highlight interesting case studies from individual country chapters that suggest a role for a particular factor, although the individual chapters offer much more of this as well as additional analyses undertaken by the authors to shed light on questions of particular interest in their context. In future work with the ISS project, we will explore the individual factors in microdata and simulations for each country, which will contribute to making a stronger causal case.

Our analysis here in this introductory chapter shows that countries have had diverse experiences and reveals some indication of which factors may have played a more consistent role across countries. For health and education, we find little evidence that these are strong contributing factors. Health and education generally improved both in times when LFP rates were falling and when they were rising. Further, countries experiencing greater improvements in health and education over time did not see bigger increases in the older worker labor market participation in general. Turning to the expansion of women in the workforce over the last generation, we find that this factor may have had an impact on not just the work behavior of older women but also the work behavior of older men. Countries with a larger expansion of female LFP (measured at midcareer rather than in old age to avoid correlation with other factors affecting older women and older men's participation) saw larger increases in the participation of older men. Finally, institutional factors embedded in social security programs seem very important in explaining the older-age working patterns in some individual countries. While no one factor appears to explain the experience of all countries, examining what has happened in different countries enriches our understanding of why men and women are working longer and provides a path for future research.

Trends in LFP and Employment

We begin by describing trends in LFP and employment for men and women aged 55–69 in the 12 ISS countries from 1980 to the present. Figures I.2 and I.3 illustrate these trends for men and women, respectively. While for men there are not strong differences across cohorts in the share of the population working at age 55, for women in many countries, younger cohorts have been working more. For women, it is therefore harder to distinguish what part of the trend in elderly LFP is due to delayed retirement (which might relate to

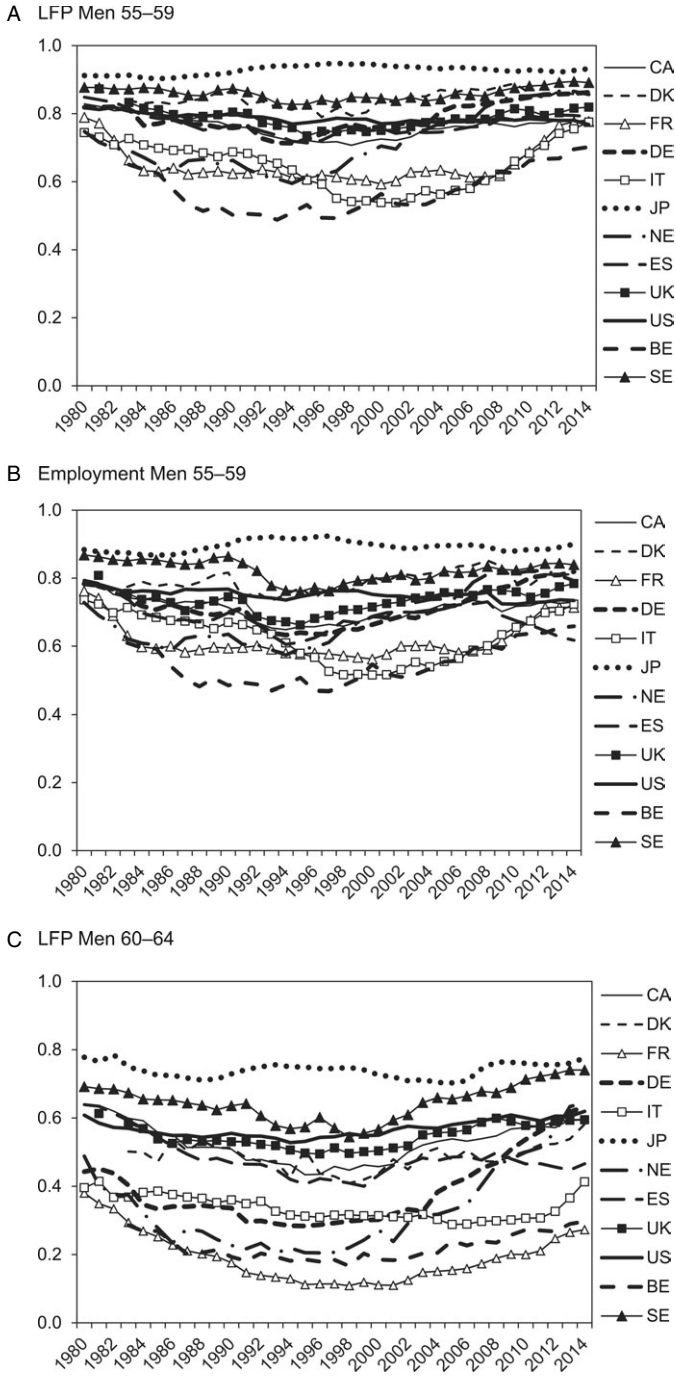
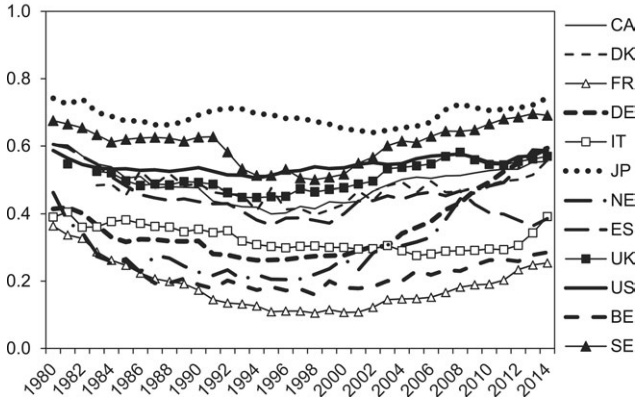
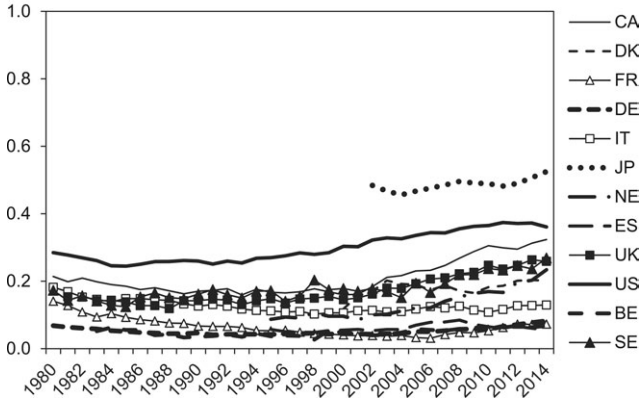


Fig. I.2 LFP and employment, men aged 55–69, 1980–2014

D Employment Men 60–64



E LFP Men 65–69



F Employment Men 65–69

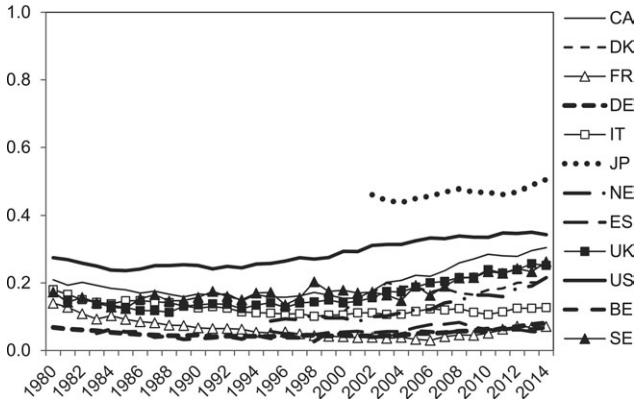


Fig. I.2 (cont.)

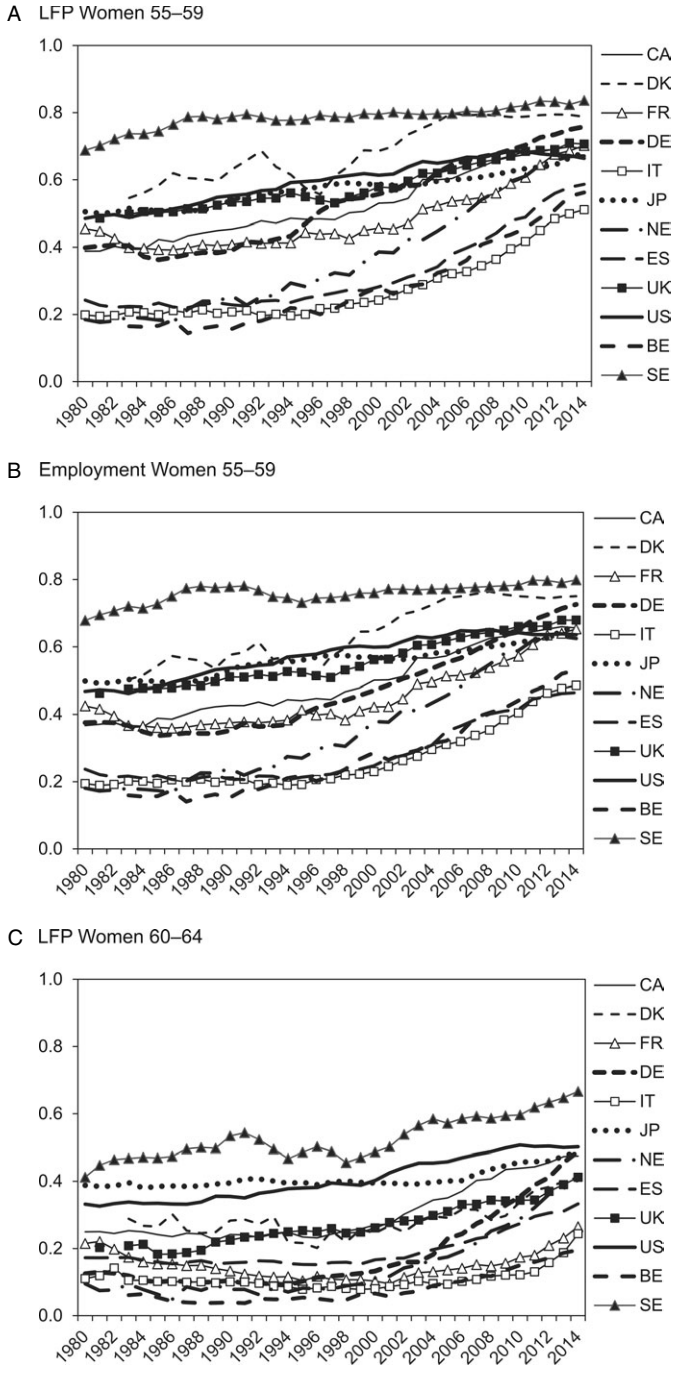


Fig. I.3 LFP and employment, women aged 55–69, 1980–2014

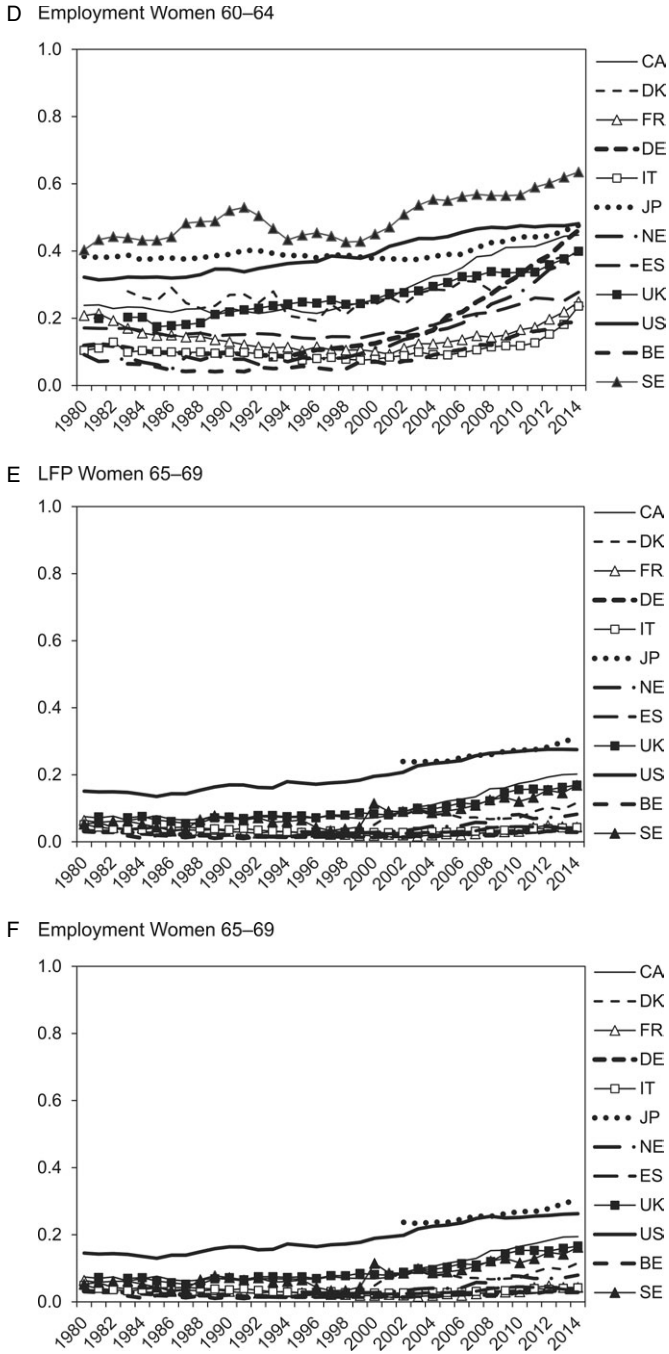

D Employment Women 60–64
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Fig. I.3 (cont.)

Table I.2 Increase in LFP, trough to 2014

	Men			Women		
Country	55–59	60–64	65–69	55–59	60–64	65–69
Belgium	0.214	0.130	0.041	0.418	0.159	0.019
Canada	0.075	0.162	0.164	0.304	0.250	0.138
Denmark	0.070	0.173		0.242	0.210	
France	0.184	0.164	0.042	0.310	0.170	0.027
Germany	0.150	0.349	0.041	0.395	0.296	0.024
Italy	0.237	0.125	0.026	0.316	0.166	0.016
Japan	0.029	0.073		0.182	0.107	
Netherlands	0.261	0.440	0.148	0.494	0.355	0.061
Spain	0.078	0.066	0.008	0.367	0.181	0.015
Sweden	0.064	0.195	0.128	0.148	0.254	0.135
UK	0.084	0.100	0.140	0.220	0.229	0.114
US	0.000	0.091	0.116	0.179	0.176	0.140
Average	0.126	0.172	0.085	0.298	0.213	0.069

Notes: Denmark and Japan are omitted for the 65–69 age group because the data series start after 2000. Data series for Spain and the Netherlands are included but begin only in 1995.

changes in health at older ages or in public pension provisions, for example) rather than these underlying cross-cohort differences. We present women alongside men in this analysis while emphasizing this different context and encourage readers to bear this point in mind with respect to the LFP rates presented in the individual country chapters as well.

Patterns in participation for men aged 55–59 are broadly similar to those for men aged 60–64, discussed above, though the magnitudes of the changes are somewhat smaller. As before, most (8 of 12) countries reached the trough of participation during the 1993–98 period. The average increase in participation from the trough to 2014 is 13 percentage points, an increase about three-quarters as large as that seen for men aged 60–64 (17 points). As before, the size of the change varies across countries, as seen in table I.2. There was no change in the United States, as participation remained relatively constant between the mid-1990s and 2014, and an increase of only 3 points in Japan, which consistently has the highest participation rate of all the countries. By contrast, participation rose by 7–8 points from the trough to 2014 in Canada, Denmark, Spain, and the UK and by 15–26 points in Belgium, France, Germany, Italy, and the Netherlands.

For men aged 65–69, there is a somewhat different pattern across countries. The largest increases are in Canada, the Netherlands, Sweden, the UK, and the US. Except for Sweden and the Netherlands, these countries had relatively small increases in participation in the two younger age groups. The average increase among all the countries from trough to 2014 for this age group is 8.5 points, smaller than the average increase in the other age groups.

Finally, we can add the increases across the three age groups in each country as one way to gauge the overall rise in participation at age 55–69. The Netherlands experienced by far the largest increase in participation (85 points), followed by Germany (54 points). The US and Spain had the smallest total increases (21 and 15 points), while the other countries fell in the middle (30–40 points).

Another finding from these figures is that while the employment rate is (unsurprisingly) slightly lower than the participation rate, trends over time in the two series are very similar. This is particularly true for the older age groups. The one exception is after the recent recession (2007 and beyond), where there is a bigger divergence between employment and participation for men aged 55–59, particularly in Spain. This suggests that normal cyclical trends in unemployment (which is the difference between the employed group and the labor force group) are unlikely to be an important factor. Because trends in LFP and employment are largely similar, we focus on participation in the remainder of the analysis.

Patterns in women's LFP are quite different from those of men. For women aged 55–59, the trough year is in the 1980s in all countries—in fact, it is 1980 or 1981 for about half the countries, which is essentially the beginning of our sample period. Thus, unlike the men's pattern of a U shape that reaches the bottom in the mid-1990s, here there is often no *U*, or only a shallow one with a trough in the mid-1980s. The average increase in women's LFP from the trough to 2014 in this age group is also much larger, 30 points versus 13 points for men. As noted above, increases in older women's participation may reflect both an increased propensity to delay retirement and the effect of rising participation (at all ages) across cohorts. For women, it seems likely that any tendency to retire earlier over the first half of our sample period that might arise from the same factors that are affecting men is being swamped by ever-increasing LFP among successive cohorts of women.[2]

There are notable differences across countries in the magnitude of the increase in participation over time, as seen in table I.2. Increases appear to be inversely proportional to initial participation rates, leading to a converging trend across countries. Denmark, Japan, the UK, and the US had participation rates of around 50 percent in 1980, and all experienced increases of less than 25 percentage points by 2014. Meanwhile, Belgium and the Netherlands had participation rates below 20 percent in the early 1980s and experienced increases of 40–50 percentage points.

At ages 60–64, there is similarly either no U shape or one that appears relatively shallow compared to the pattern for men. The average increase in participation from trough to 2014 for this age group is 21 percentage points, which is still very large but smaller than the 30 point increase at ages 55–59.

2. See Goldin (2006) for an overview of the changes in women's employment, education, and family roles during the 20th century.

The increase at ages 65–69 is smaller still, averaging 7 points. However, Canada, Sweden, the UK, and the US experienced increases about twice as large as the average in this oldest group, as was the case for men. Overall, LFP among women in all three age groups is now at an all-time high, and there is little suggestion in the figures that it has yet reached its peak.

Factors That May Affect LFP

Next, we turn to exploring those factors that may help to explain the changes in LFP. In the discussion below, we consider a number of potential factors, including changes in mortality and health, education and occupation, unemployment, social security program provisions, and women's LFP (which may affect men's participation).

Mortality and Health

Health is a critically important factor in individuals' retirement decisions, as established in early studies such as Diamond and Hausman (1984) and confirmed in more recent studies such as Wise (2016). It stands to reason that changes over time in the health of the older population may have had an impact on LFP.

Mortality rates offer a number of advantages as a measure of health. They can be measured consistently across countries and over long periods of time, generally quite precisely because they are typically based on vital statistics records for the full population rather than survey data. A clear disadvantage is that they may be an imperfect measure of work capacity at older ages, which is what is relevant for retirement decisions.[3] Also, the relationship between mortality and more subtle indicators of health does vary across countries, as can be seen in the individual country chapters in Wise (2012) and Wise (2017). However, Milligan and Wise (2012) find that there is a strong within-country relationship between changes over time in self-assessed health and changes in mortality. To the extent that self-assessed health may be a better measure of work capacity, this is reassuring. Time series on self-assessed health are unfortunately available for only about half of the ISS countries, so we do not use these data directly here, though some countries make use of them in their own chapters.[4]

3. A number of recent papers have explored the question of whether people are living healthier as well as longer lives. While studies such as Crimmins and Beltran (2011) have found that people are spending more years living with disease, studies such as Cutler, Ghosh, and Landrum (2014) and Chernew et al. (2016) find that disability-free life expectancy is rising faster than life expectancy, indicating that disability is increasingly being compressed into a shorter period before death. It seems possible if not likely that disability would matter more for labor supply than disease, as some diseases may not interfere with work or can be managed with medication or lifestyle changes.

4. In a majority of the countries for which data on self-assessed health is available, the share of older individuals reporting themselves to be in fair or poor health is declining over time—this

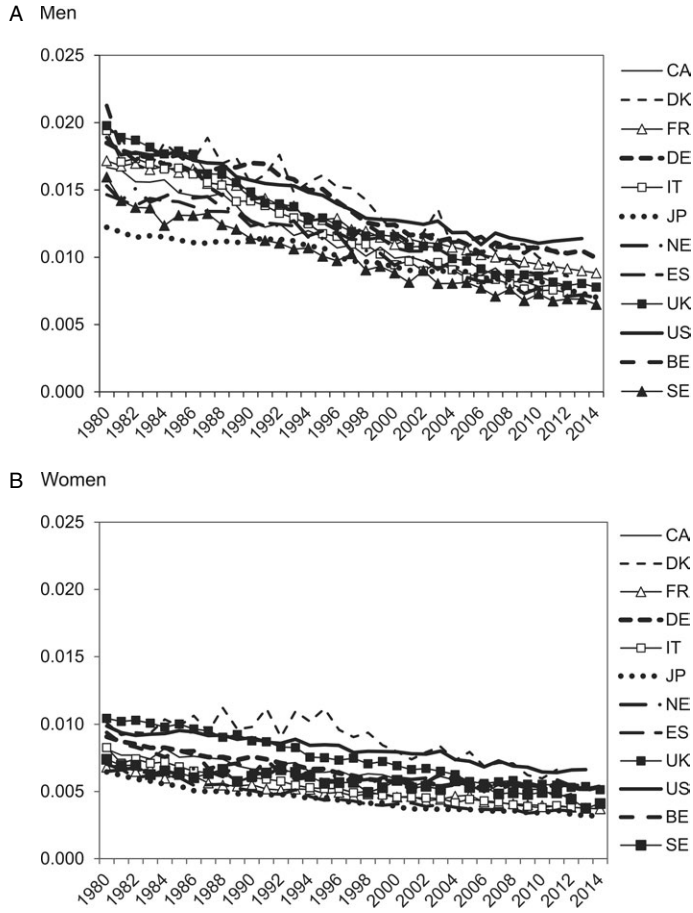

Fig. I.4 Mortality at age 60, men and women, 1980–2014

Mortality rates at older ages have declined substantially during the past several decades, as shown in figure I.4. For men, the average mortality rate at age 60 in 1980 was 1.7 percent. By 2011, this had dropped roughly in half, to 0.9 percent.[5] Mortality improved notably and continuously throughout

is the case in Denmark, Germany, Spain, Sweden, and the US (1980–95), though the share in fair or poor health is essentially flat over time in Canada, the UK, and the US (after 1995). As discussed below with respect to mortality, there is little evidence that trends over time in self-assessed health are driving trends in LFP, as there is no U-shaped trend in health (like there is in men's participation).

5. The year 2011 is used here because it is the last year for which all countries (except Germany) have data; Germany is excluded from these calculations because its data series ends earlier.

the period for all countries, with a somewhat smaller absolute decrease in Japan, which had the lowest initial mortality rate. Mortality rates in 1980 for women were far lower than those for men, averaging 0.9 percent. By 2011, this value had fallen to 0.5 percent.

In establishing changes in mortality rates as a possible driver of changes in LFP, one is immediately confronted by the difficulty that LFP for men exhibits a U shape with a trough in the mid-1990s, while mortality has improved continuously throughout this period. Thus the hypothesis that rising participation since the mid-1990s has been driven by improving health would appear to be undercut by the fact that health was also improving during the earlier part of our sample period when participation was falling. For women, the lack of a U shape in participation (or the presence of a shallower *U*) makes this problem a bit less glaring. Nonetheless, even for women, this constitutes weak evidence at best that changes in health may be driving changes in participation.

To continue to probe the plausibility of a causal relationship between mortality and LFP, in the left panel of figure I.5, we plot the change in participation for men aged 60–64 from 1995 to 2011 against the change in the mortality rate at age 60 over the same period. The slope is expected to be negative, as those countries in which the mortality rate fell more are expected to have a larger increase in participation. The figure shows that the slope is in fact negative, although the result is sensitive to the outlier observations. For women, the slope is negative, as seen in the right panel of the figure. The magnitude of the effect for women indicates that moving from being the country with the smallest mortality improvement (no improvement) to that with the largest improvement (a drop of 0.4 percent over the 16-year period) is associated with an increase in participation of about 5 percentage points (roughly one-third of the average increase of 14 points during this period). However, the lack of a robust effect for men casts doubt on the notion that this reflects a causal effect, as one would expect improvements in health to affect both genders in a similar way.

Overall, we find little evidence that improvements in health—as measured by mortality rates—are a driving force behind the increases in LFP over the past few decades. We base this assessment on the fact that there has been continuous improvement in mortality rates since 1980, whereas participation among men was falling for the first half of the sample period and rising for the second. Likewise, there is inconsistent evidence for the hypothesis that countries with faster improvement in mortality rates since 1995 also experienced faster growth in LFP. Of course, we cannot rule out the possibility that the results would differ if we were able to examine other health measures beyond mortality that might be more directly tied to work capacity; unfortunately, the lack of a consistent time series for such health measures in enough of the countries prevents us from exploring this further.

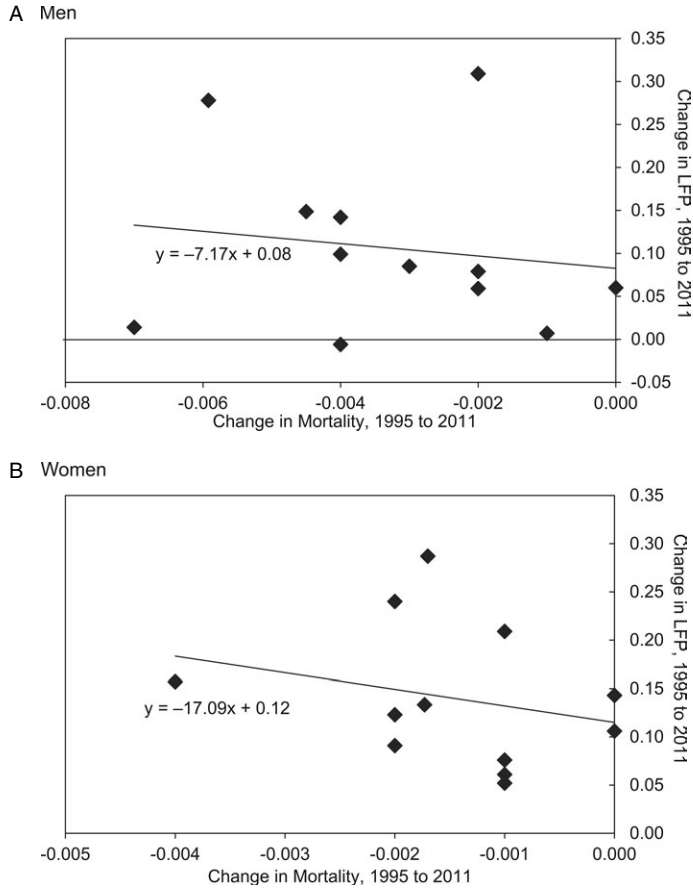

Fig. I.5 Change in LFP at ages 60–64 versus change in mortality rate, 1995–2011

Nonetheless, this analysis suggests that we need to look to other factors to explain recent increases in participation.

Education and Occupation

Education and occupation also offer promise as potential explanatory factors for changes in participation, especially with the shifts in labor demand induced by increased globalization and technical change. LFP rates at older ages tend to differ sharply by education—Coile, Milligan, and Wise (2016) report that for men aged 55–64 in all ISS countries, those in the highest education group have participation rates 20–40 percentage points higher than those in the lowest education groups. Occupation is a closely related factor, since one reason for the strong relationship between education and partici-

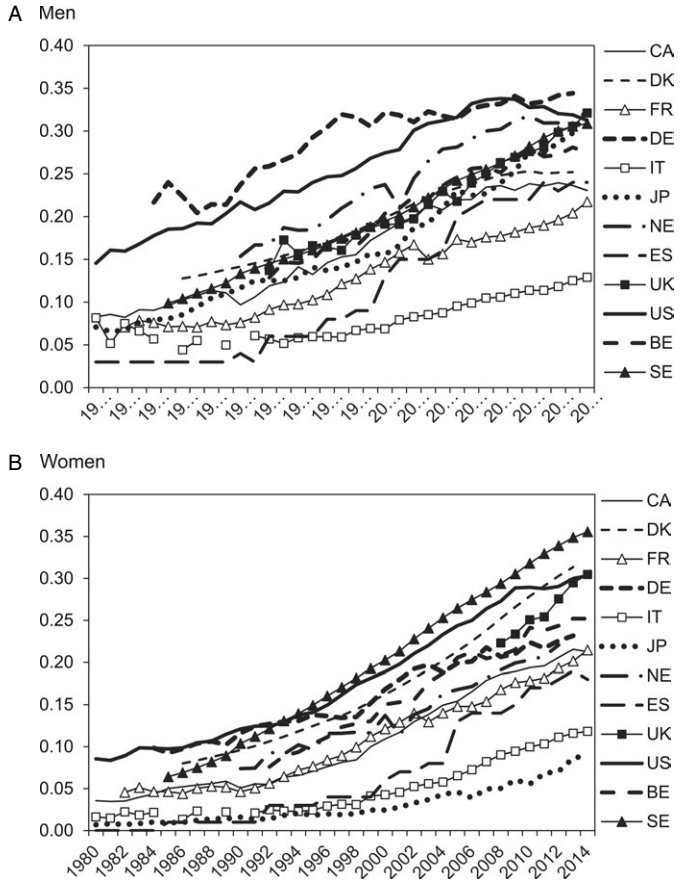

Fig. I.6 Share of men and women aged 55–64 with a college education, 1980–2014

pation may be that people with more education tend to have jobs that are less physically demanding, making it easier for them to work to older ages.[6] If successive cohorts nearing retirement age have higher levels of education and are more concentrated in white-collar occupations, this may tend to increase participation at older ages.

Figure I.6 shows the share of men and women aged 55–64 who have a college education. Over the period of 1980–2016, the share of men with a college education rises by 15–20 percentage points in virtually all countries, with the exception of Italy, where the increase is about 5 points. Compared

6. Belbase et al. (2016, p. 5) argue that the notion that it is difficult for blue-collar workers to remain on the job at older ages and easy for white-collar workers to do so is too simplistic and that it is "important to consider the particular abilities required by an occupation and whether these abilities decline significantly by the time workers reach typical retirement ages."

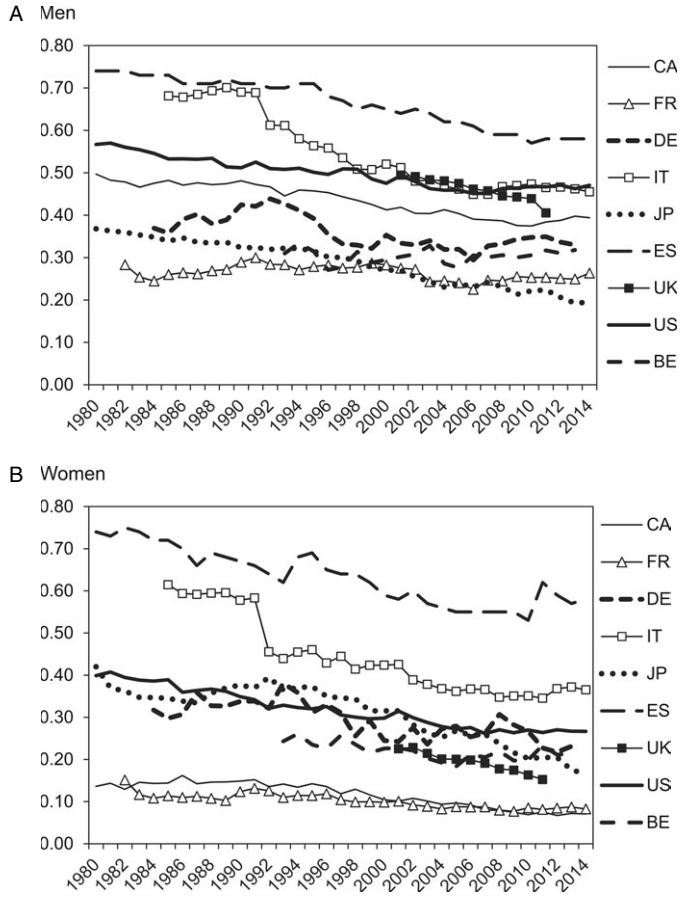

Fig. I.7 Share of men and women aged 55–64 in blue-collar work, 1980–2014

to men, women have a lower share initially in 1980, but the rate of growth over time is quite similar. By 2012 (the last year for which we have complete data), the average share of men and women with a college degree across all the ISS countries is 26 and 21 percent, respectively.

The share of men and women in blue-collar occupations is shown in figure I.7 for countries where these data are available.[7] There are large differences across countries at any point in time, which likely result as much from differences in the definition of blue collar in each country as from differences in the occupational composition of the workforce. The changes

7. The country chapters for Belgium, Denmark, Sweden, and the UK (chapters 1, 3, 10, and 11, respectively) provide a more detailed analysis of how the nature of work has changed over time (e.g., sector shifts, changes in physical demands).

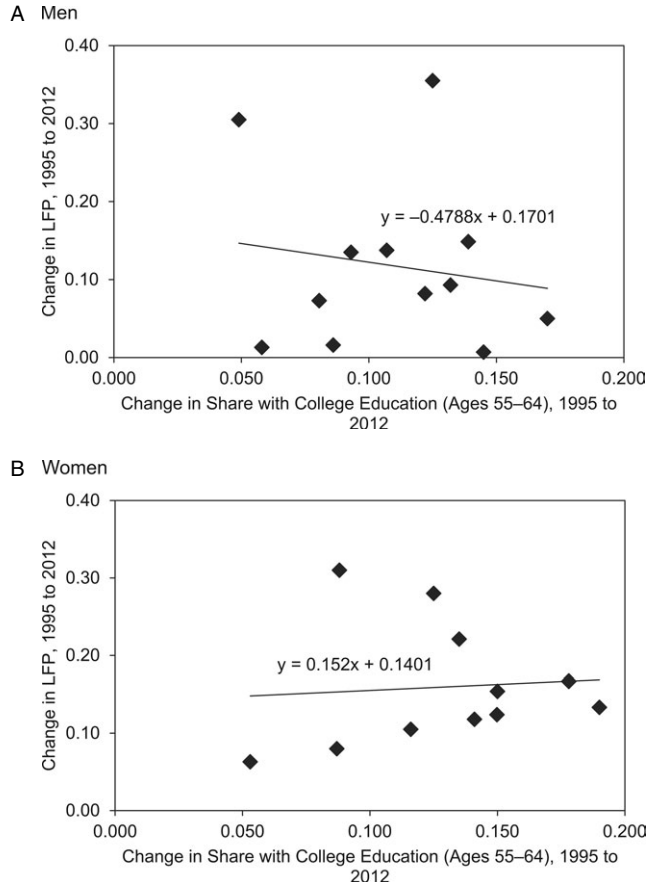

Fig. I.8 Change in LFP at ages 60–64 versus change in share with college, 1995–2012

over time within countries are of greater interest for our purposes. There are declines over time for men in most countries; France and Belgium, which have among the lowest rates of blue-collar work as defined here, have only minimal declines. If we compare countries that have a similar share of blue-collar work in 1980 in order to control for differences in definition, we see that the magnitude of changes over time varies by country. Italy and Spain, for example, have similarly high rates of blue-collar work at the beginning of the sample period, but the decrease is larger in Italy; Japan experiences a larger decrease than Germany. Results for women are largely similar, though the share of blue-collar work for women is substantially lower than for men in some countries, including Canada, France, and the US.

Could the rise in education and the decline in blue-collar employment be driving changes in LFP over the past several decades? As with mortality, one challenge to this hypothesis is that the share of men with a college educa-

tion continuously increases during this period (and the share in blue-collar employment continuously falls), while participation exhibits a U shape. Put differently, while the data from the mid-1990s to the present is consistent with this theory—men are reaching retirement with more education and more likely to be in white-collar employment and so are working longer—the data from the first half of the sample period is at odds with it. For women, the U shape is muted, so the conflict is less evident, but it remains difficult to draw any causal conclusion from this analysis.

We probe this relationship further by exploring whether countries that experienced a more rapid increase in the share of people with a college education also tended to have larger increases in participation since 1995. Here the expected slope is positive, but the actual slope for men is slightly negative. For women, the slope is positive; the magnitude suggests that if the change in the share with a college education were 10 percentage points higher, participation would rise by an additional 1.5 points.

Overall, the results for education are much the same as for health. The simple time-series data do not support the hypothesis that changes in health and education are driving changes in participation for men because they cannot explain the U shape in men's participation. And there is inconsistent evidence as to whether larger changes in these factors since 1995 are associated with larger changes in participation. In sum, we find little evidence to support some of the most frequently suggested explanations for why workers are retiring later—namely, that they are healthier and better educated.

Unemployment

We now turn to unemployment rates to explore what role, if any, differences in unemployment across countries or over time may have played in labor trends. Labor demand is cyclical, as firms respond to expansions and contractions to the demand for their products and services, and these fluctuations in labor demand may affect retirement behavior (Coile and Levine 2007). If there were a mismatch between labor demand and labor supply underlying the shifts in employment, we expect it would be evident—at least transitorily—in the unemployment rates. We graph the unemployment rates for men and women aged 55–64 in figure I.9 from 1980 to 2014.

In 10 of the 12 countries, the unemployment rate for older workers follows a more-or-less cyclical trend within a fairly narrow range over this time period. The case of Spain also follows this pattern—except the business-cycle pattern was simply much stronger. As can be seen in figure I.10, taken from chapter 9, the unemployment rate for older workers in Spain mirrored the trends for all workers over most of this period.[8] This elevated unemployment rate for older workers in Spain may help explain why the peak-to-trough LFP change in Spain is among the lowest in any of our countries for

8. The unemployment rate is defined as the number of unemployed individuals divided by the sum of employed and unemployed individuals.

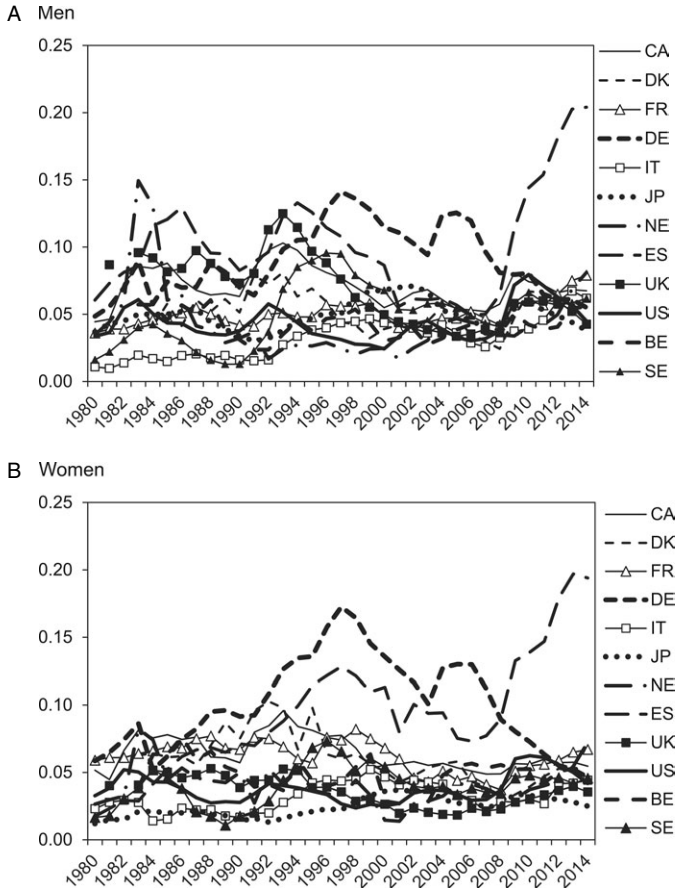

Fig. I.9 Unemployment for ages 55–64, men and women

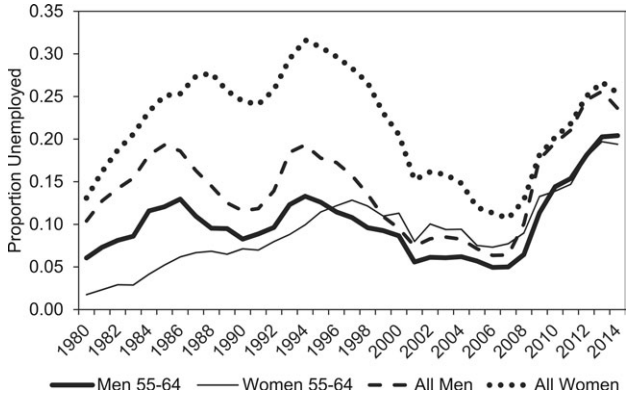

Fig. I.10 Unemployment in Spain

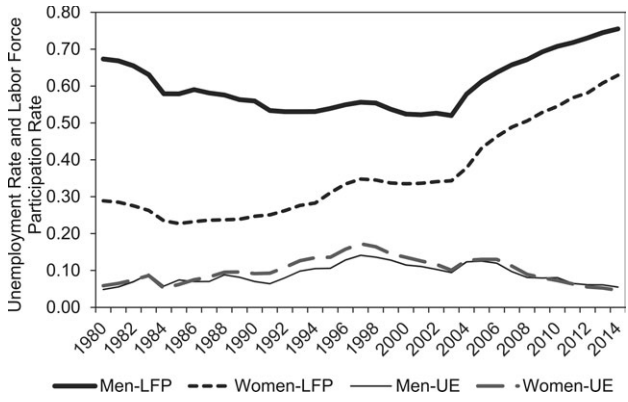

Fig. I.11 German labor force participation and unemployment for ages 55–64

both sexes in table I.2, as some discouraged job seekers may have exited the labor force early rather than continuing to look for jobs.

The other exception to the general pattern in figure I.9 is Germany, but there is a policy influence at play in this country. We graph data for Germany on its own in figure I.11 to investigate this case. As explained in chapter 5 in this volume, the enlarged unemployment episode of the 1990s in Germany has its roots in policy, as early retirement through extended unemployment benefits became available and popular. This new "bridge to retirement" led to higher reported rates of unemployment among older workers in Germany until 1997, when a new system of actuarial adjustments was phased in, making this option less attractive. Since that time, the rebound in LFP for both men and women is among the highest of any of our countries, as documented in table I.2. This inverse relationship between the unemployment rate and the LFP rate is most clear for men, as shown in figure I.11. For women, the story is more complicated by the continued increase of female LFP across cohorts.

Overall, unemployment does not seem to be a major driver of LFP trends. Over all of the remaining years and countries (omitting Spain and Germany, the case studies just discussed), the average unemployment rate at ages 55–64 is 5 percent for men and 4.5 percent for women. Naturally, there are fluctuations in this rate with the business cycle as well as some differences across countries, but they appear unrelated to the sustained increases in participation over the past 20 years. However, unusually high levels of unemployment in Spain in recent years may have dampened the increase in participation there, while a German early retirement scheme tied to unemployment appears to have had an impact on participation in that country.

Social Security

Another explanation for the turnaround in LFP over the last 20 years comes from the structure of social security benefits. As explored in previ-

ous rounds of the ISS project (most directly, Gruber and Wise 2004), the structure of social security benefits can induce a behavioral labor supply response among those entering the age range of retirement. This can happen through many channels, ranging from explicit pension eligibility ages to actuarial penalties and bonuses for retirement timing to minimum years of contributions, which may be affected by recessions and time out of the labor market.[9] If social security reforms over the past several decades have increased the financial incentives for continued work at older ages, this may be responsible for some or even much of the rise in LFP since the mid-1990s.

In addition, for some countries, it is the rules for disability insurance that matter more. Many countries have made changes to their disability insurance programs over the past several decades, including tightening eligibility requirements—for example, by eliminating provisions that exempted workers of a certain age or in certain industries from medical screening requirements. Previous ISS work in Wise (2012) gives a full account of the changes in disability insurance rules by country, while Wise (2016) examines the importance of disability insurance empirically, concluding that changes in the stringency of access to disability insurance can have a substantial effect on work at older ages.

In this round of the ISS project, we have not simulated the full dynamic social security or disability insurance incentives—including the timing and the accrual of benefits—that our previous research has shown to be important for retirement decisions. However, we can capture a sense of the importance of these incentives by looking at some simple examples. For ease of exposition, we focus here on three changes in eligibility ages for public pensions, although there are useful discussions of other changes to social security provisions in many of the individual chapters.

In Italy, eligibility ages for retirement benefits for men have increased substantially. As described in more detail in chapter 6, a series of reforms first introduced a minimum age (52) for the receipt of early retirement benefits in 1996 (previously, eligibility depended only on having a certain number of contribution years) and then increased it steadily over time, reaching age 63 in 2012. There were also changes to the normal retirement age for men over this period, going from age 60 to 66.

In figure I.12, we graph these statutory retirement ages (right-hand axis) and the LFP rates (left-hand axis) for the relevant age ranges for Italian men. At the top, the LFP rate at ages 50–54 begins to rise almost exactly when the minimum age for early retirement benefits is introduced in 1996. In the last 10 years of our graph, when the early retirement age is already far older

9. Countries in which workers may have special access to old-age pension (or other) benefits based on a minimum number of contribution years include Belgium, France, Germany, Italy, and Spain. More details on these provisions and (where applicable) the potential effect of changes in these provisions on participation are available in chapters 1, 4, 5, 6, and 9.

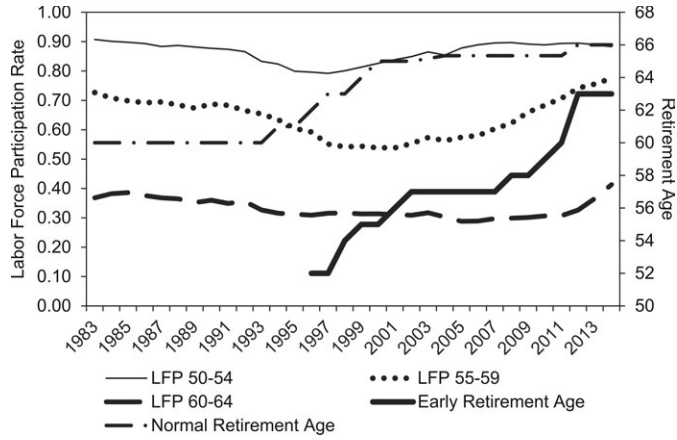

Fig. I.12 LFP and retirement ages for Italian men

than age 54, there is little more increase in the LFP rate for ages 50–54. For ages 55–59, there is a strong increase in participation from 54 percent in 2001 to 78 percent in 2014. Of note, the early retirement age started affecting this age range in 2000, almost exactly when the LFP rate began increasing. Finally, the LFP rate for ages 60–64 begins increasing in 2012, just as the early retirement eligibility age jumped from age 60 to age 63. Taken together, the timing of the changes in the LFP rate for Italian men moves in tight synchronicity with the upticks in the early retirement age. This suggests a strong relationship between social security incentives and the upswing in the LFP for older men in Italy.

A similar story can be told in the case of Japan. For women, the eligibility age for both the flat-rate and wage-based components of the pension rose from age 55 to 60 in a series of steps, starting in 1987, in order to match the eligibility age for men. There was a further increase in the eligibility age for the flat-rate benefit only starting in 2006 that affected both men and women. Figure I.13 juxtaposes the employment rates for women aged 55–59 (top panel) and those aged 60–64 (bottom panel) with the change in eligibility age. As the figure illustrates, the employment rate at ages 55–59 began to rise in the late 1980s, along with the rise in the eligibility age. For women aged 60–64, who were not directly affected by the initial increase in the eligibility age, employment remained flat until the mid-2000s and then began to rise once the eligibility age for the flat-rate benefit began to increase from age 60 to 64. Results for men, shown in chapter 7, reflect a similar increase in employment at ages 60–64, starting in the mid-2000s, which is also very likely related to the increase in the eligibility age during this period.

A final example comes from the UK, which has increased the state pension age for women from 60 to 65 in a series of steps. Figure I.14 shows the

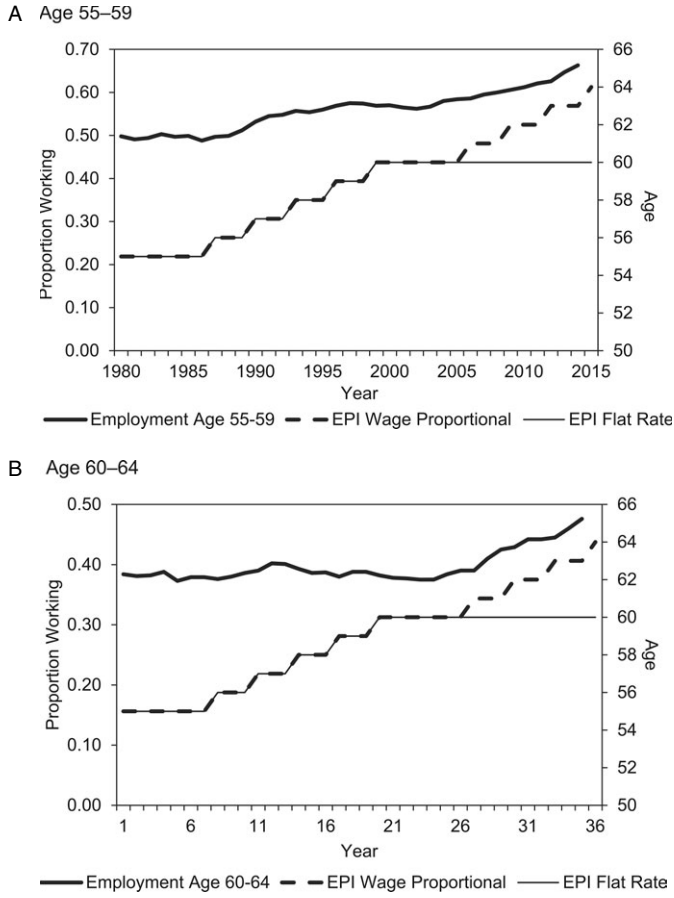

Fig. I.13 Employment and retirement ages for Japanese women

employment rate for women at single ages from 56 to 63 over the period of 2003–15. A striking pattern emerges. When the pension age was raised from 60 to 61 in 2010, employment at age 60 rose by 10 percentage points over the next two years. A similarly large and rapid increase in employment was seen at age 61 once the pension age was raised to 62 in 2012 and at age 62 once the pension age was raised to 63 in 2014. Aside from these three sharp increases, employment rates remained flat or rose only slowly throughout this period. The simultaneity of the eligibility age increases and surges in employment makes a strong case that pension reform is a key driver of higher employment among UK women. More generally, these three examples clearly indicate that social security provisions such as the eligibility age can exert an important influence on employment rate at older ages.

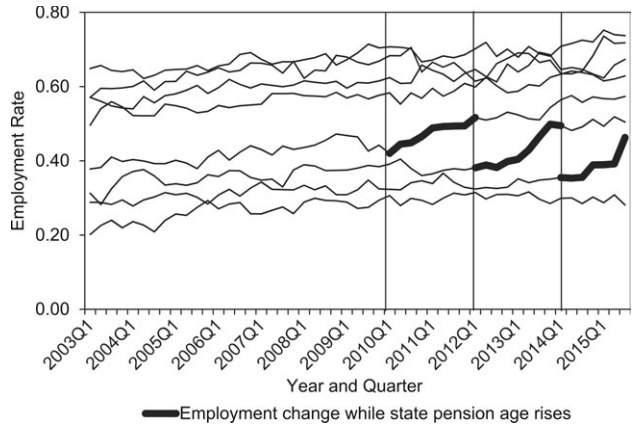

Fig. I.14 Employment for UK women by exact age (ages 56–63)

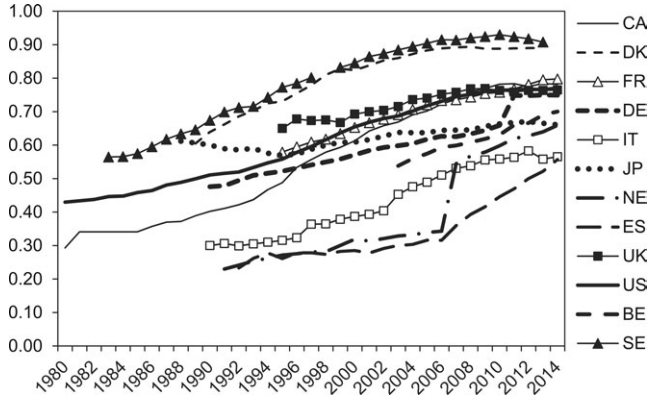

Fig. I.15 LFP of females aged 35–44, lagged 20 years

Women's LFP

The next factor to consider is the impact of the increasing LFP by women. While this increase is important on its own, the increase in work by older women over the last 20 years also has a potential impact on men. If married couples prefer to retire at the same time, women working later into their lives might keep men later in the workforce. This hypothesis was explored in depth for the cases of Canada, the US, and the UK by Schirle (2008), who finds that it explained between one-quarter and one-half of the change in the LFP by married men.

This channel is potentially important for explaining the upswing in male LFP after 1995, because the men arriving at ages 55–64 in the mid-1990s

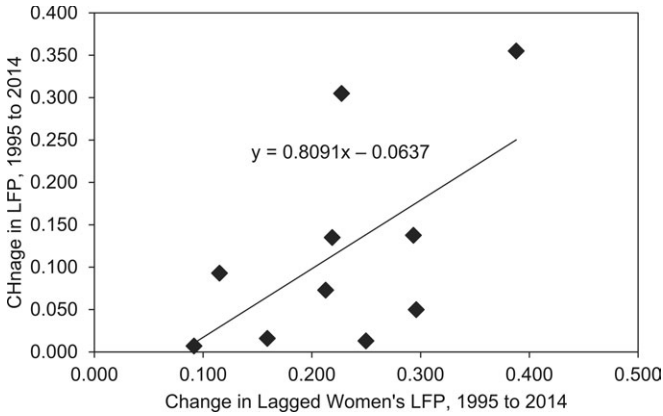

Fig. I.16 Change in LFP for men aged 60–64 versus change in lagged women's LFP, 1995–2014

were married to women who had much greater LFP throughout their lives than earlier cohorts. This is shown in figure I.16, where we graph the LFP of women aged 35–44 lagged by 20 years. These women were ages 55–64 in the year shown, and so these numbers give an indication of the proportion of men in the age range of 55–64 who were married to women with substantial lifetime labor force attachment. We focus on this measure rather than on the current participation of women aged 55–64 because the latter may be influenced by other factors—such as changes in social security provisions—that are also affecting older men's participation. Over the period of 1995–2014, the average LFP of women (using ages 35–44, or a 20-year lag) across our 12 countries grew dramatically, from 50 to 72 percent. It is also worth noting the vast difference across countries, with Sweden and Denmark showing very large shares of women working and Italy and Spain showing very low shares.

To explore the potential impact of this trend on men's participation, in figure I.16, we provide a scatter plot of the changes between 1995 and 2014 in the male LFP at ages 60–64 compared to the changes in female LFP, lagged 20 years. There is a clear and strong positive relationship evident here, with a coefficient on the trend line of 0.81. The magnitude of this coefficient suggests that having the participation of women (at a younger age) increase by an additional 10 percentage points over time is associated with an 8-point increase in the participation of older men. This provides additional support for the Schirle (2008) hypothesis about the male LFP and working spouses.

To show how the impact of women working may matter in a specific country, we bring up the case of Canada.[10] In figure I.17, we re-create the analysis

10. While the Canadian analysis is the most thorough investigation of this hypothesis, the country chapters for Germany, the Netherlands, Spain, and the US (chapters 5, 8, 9, and 12,

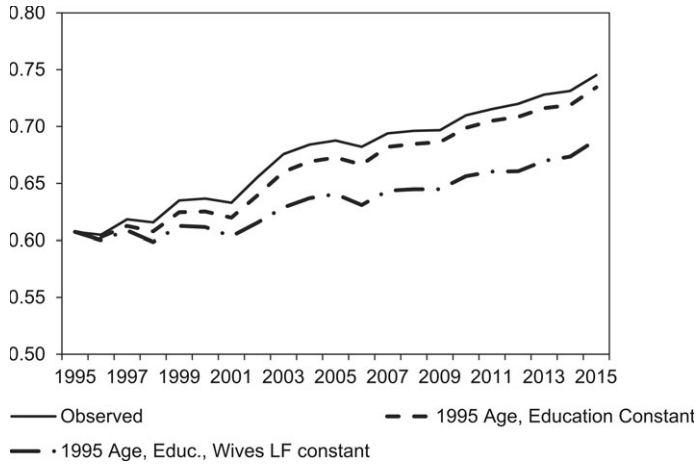

Fig. I.17 LFP of Canadian males, ages 55–64

presented in chapter 2 based on the methods of Schirle (2008). The analysis takes the observed LFP of males aged 55–64 from 1995 to 2015 and makes some adjustments. In the middle line, the adjustment accounts for changes in the age and education structure of the male population over this period. The bottom line makes a further adjustment by imposing the counterfactual that the LFP of wives stayed constant at the 1995 rate instead of increasing like it actually did. The results are striking. The increase in actual men's LFP is 13.8 percentage points from 1995 to 2015. This increase would have been 1.1 points smaller (12.7 points) if there had been no changes in men's education and age composition. Keeping wives' LFP constant at the 1995 level would have reduced the growth in men's participation by a further 4.6 percentage points. This suggests that the working wife effect alone accounts for 33 percent of the increase in male LFP during these two decades, while changes in men's education and age explain only 8 percent of the increase.

Cross-Country Regressions

To summarize our findings, we run some cross-country regressions incorporating all the contributing factors we discuss above. The dependent variable for the regression analysis is the LFP rate in the 55–64 age range, for a given year and country. Regressions are estimated separately by sex and include a full set of year and country dummies. We progressively add explan-

respectively) consider the effect of increasing women's participation on the participation of older men as well and find suggestive evidence that it played a role; by contrast, the chapter for Sweden (chapter 10) concludes that this "does not seem to be a dominating factor." The other countries do not take up this hypothesis in any significant way.

Table I.3 **Cross-country regressions for men. Dependent variable: Share in the labor force aged 55–64.**

	(1)	(2)	(3)	(4)	(5)	(6)
Normal retirement age	0.011	0.013	–0.038	0.006	–0.005	–0.008
	(0.007)	(0.007)	(0.029)	(0.007)	(0.015)	(0.017)
Early retirement age	–0.002	–0.004	–0.004	–0.002	0.001	0.004
	(0.005)	(0.006)	(0.014)	(0.004)	(0.007)	(0.005)
Log mortality		–0.048		–0.022	–0.054	0.088
		(0.142)		(0.120)	(0.074)	(0.061)
Self-assessed health as fair–poor			0.226			
			(0.283)			
College share				0.001	0.002	0.002
				(0.002)	(0.002)	(0.001)
Women LFP, lagged 20 years					0.244*	0.169***
					(0.120)	(0.036)
Blue-collar share						0.151
						(0.209)
Unemployment rate						–0.353***
						(0.088)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.917	0.922	0.900	0.940	0.937	0.979
Observations	324	312	160	278	228	173

Notes: Data are drawn from our 12 countries over the time period of 1980–2014, although not all data are available for all countries in all years. Each column reports results from a separate regression. We report the coefficient for each variable listed, with the standard error in parentheses below. The standard errors are robust-adjusted and clustered by country. All specifications include both year and country dummies.

atory variables including the social security normal and early retirement age, the log of the mortality rate, the proportion with college education, lagged female LFP rates, the blue-collar share, and the overall unemployment rate. The number of observations changes across specifications because of missing data for some of the explanatory variables in certain years and countries. The time period covered here is 1980–2014.

The goal of this analysis is descriptive, with the aim being to assess whether there is a common story across countries about which factors may play a role in explaining the increase in work at older ages. Of course, each individual country has its own experience, and the individual country chapters in this book provide this country-specific detail. In future work with the ISS project, careful microdata-based regression analysis of each country will examine the role of these factors—and of changing public pension incentives in particular—in a level of detail not possible here. We view this simple aggregate analysis as a setup for that future work.

The results are presented for men in table I.3 and for women in table I.4. In

Table I.4 **Cross-country regressions for women. Dependent variable: share in the labor force age 55–64.**

	(1)	(2)	(3)	(4)	(5)	(6)
Normal retirement age	0.009	0.006	–0.014	0.005	0.000	–0.001
	(0.005)	(0.006)	(0.019)	(0.004)	(0.006)	(0.009)
Early retirement age	–0.009*	–0.009**	–0.006	–0.010**	–0.002	0.001
	(0.004)	(0.004)	(0.011)	(0.003)	(0.004)	(0.003)
Log mortality		0.102		0.045	0.055	0.048
		(0.060)		(0.046)	(0.046)	(0.029)
Self-assessed health as fair–poor			0.120			
			(0.211)			
College share				0.000	–0.001	0.000
				(0.001)	(0.001)	(0.001)
Women LFP, lagged 20 years					0.408***	0.371**
					(0.057)	(0.112)
Blue-collar share						0.162
						(0.202)
Unemployment rate						–0.321**
						(0.105)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.941	0.946	0.937	0.952	0.961	0.979
Observations	324	312	144	262	215	166

Notes: Data are drawn from our 12 countries over the time period of 1980–2014, although not all data are available for all countries in all years. Each column reports results from a separate regression. We report the coefficient for each variable listed, with the standard error in parentheses below. The standard errors are robust-adjusted and clustered by country. All specifications include both year and country dummies.

the first column, we just include the statutory retirement ages, along with the country and year dummies. There is no clear statistical relationship apparent here for men or women. This is at some contrast to the experience of the individual cases of countries discussed above where there was a clear relationship between changes in the statutory ages and older worker LFP. Using a broad age range may explain the lack of significant results here—a more granular age-by-age analysis (as suggested by the Italy and UK examples) and the more detailed modeling of financial incentives that characterized previous ISS research may be better suited to picking up the influence of social security rules.

In column 2, we add a control for health through the log mortality rate. Again, there is no clear relationship available to be seen. In column 3, we use the share of respondents reporting fair or poor health, which results in a large drop in the sample size because many countries are missing data for this variable. There is no evidence of a strong relationship with this alternative measure of health. To maintain a larger sample, we continue with the

log mortality measure in the subsequent columns. We add the share with college education in column 4. There is not a clear relationship for either men or women.

In column 5, we add the female LFP rate, lagged 20 years to account for differences in cohort labor market participation by women over the years. We examined this explanatory factor earlier in the case of Canada. Here there is a statistically significant positive relationship for both men and women. For men, the estimated impact is 0.244, meaning that for every 1 percentage point increase in the female cohort LFP, the male LFP increases by about a quarter of a point. For females, the effect is stronger at 0.408, as might be expected given that this captures the effect of higher past participation on the women themselves rather than the spillover effect on their spouses.

In the final column, we include the share in blue-collar occupations and the (all-age) unemployment rate. We lose many countries here because of lack of data for the blue-collar occupations, and as noted earlier, this variable may capture different swaths of the population in different countries. The blue-collar rate does not have a statistically significant effect for either men or women. In contrast, the unemployment rate is strongly significant for men and women, embodying the strong procyclical pattern between elderly LFP and unemployment rates seen earlier.

This regression evidence is meant to summarize the discussion of the individual factors in this introductory chapter and provide motivation for future work. The clearest cross-country impacts seem to come from trends in female LFP and general business-cycle effects. There is no evidence for health or occupational impacts on broad LFP. For the institutional factors, we do not find evidence of an effect based on a fairly crude analysis that only includes eligibility-age variables. It remains for future work to undertake a more detailed analysis looking more deeply at the full range of institutional incentive effects—as was done in previous analyses of the ISS project—which may well uncover a stronger relationship.

Conclusion

This volume continues the work of the ISS project by documenting and investigating the upswing in LFP among older workers over the last two decades. We show that the rise in participation for both men and women is substantial and evident in all 12 countries that are a part of the project. The nature and timing of these changes are surprisingly similar across countries, with a U-shaped pattern for men that generally reaches its minimum in the mid-1990s and a much shallower *U* or continuously rising pattern for women. There are important differences across countries in the magnitude of the increase as well as in whether the largest change occurred at relatively young (55–59), middle (60–64), or older (65–69) ages.

We also examine different potential explanations for the upswing, includ-

ing changes in health, education, occupational mix, unemployment, and social security rules and incentives. All these factors have changed substantially over the past two decades, making it important to assess their role in explaining labor force trends. Perhaps surprisingly, despite the well-known association between health or education and retirement at the individual level, we find little evidence that improvements in these factors are key drivers of the increases in participation over time. We base this conclusion on the fact that these factors have tended to improve during times when participation has been rising as well as falling; further, those countries with the largest improvements in health or education have not necessarily experienced the largest increases in participation. While our analysis does not rule out the possibility of a role for these factors, it does suggest that they alone almost certainly cannot explain the large increases in participation over the past two decades. We similarly conclude that unemployment is not a major part of the story, though it may have been important in a few of our countries.

We find more evidence that the increase in female LFP across generations has had an important pull on male LFP. While we are naturally cautious about drawing causal implications from our simple analysis, this variable is significant in our cross-country regressions, and there is a strong positive association between changes in lagged women's LFP and in older men's participation across countries. Past work such as Schirle (2008) supports the conclusion that this factor has likely played a role, at least in some countries.

Finally, and perhaps most importantly, in particular country examples throughout this volume, some of which we discuss above, there is strongly suggestive evidence that social security rules like statutory retirement ages can also change labor market attachment. While we fail to find significant effects of these eligibility ages in our cross-country regressions, we attribute this finding to the simplicity of our aggregate analysis. Past studies in this project (notably, Gruber and Wise 1999, 2004; Wise 2016) as well as the work of many others have consistently found that social security incentives matter for retirement. In our past work, we have relied on differences across countries at a point in time (Gruber and Wise 1999) and on differences across individuals within countries (Gruber and Wise 2004) to uncover this relationship. In the two decades since this project began, many countries have enacted social security reforms. This offers a rich opportunity to make use of these reforms, which generate differences in social security incentives within countries over time, to revisit the role of social security program provisions on retirement behavior.

In sum, many important questions remain to be answered. How much of the reversal in LFP that we document here may be attributable to changes in social security rules? What are the relative roles of statutory retirement ages versus other program changes, such as those to actuarial adjustments and benefit formulas? Future work of the ISS project will examine these questions directly.

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