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SOCIAL SECURITY PROGRAMS AND RETIREMENT AROUND THE WORLD: THE RELATIONSHIP TO YOUTH EMPLOYMENT

INTRODUCTION AND SUMMARY

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ABSTRACT

This is the introduction and summary to the fourth phase of an ongoing project on Social Security Programs and Retirement Around the World. The first phase described the retirement incentives inherent in plan provisions and documented the strong relationship across countries between social security incentives to retire and the proportion of older persons out of the labor force. The second phase documented the large effects that changing plan provisions would have on the labor force participation of older workers. The third phase demonstrated the consequent fiscal implications that extending labor force participation would have on net program costs—reducing government social security benefit payments and increasing government tax revenues.

This volume presents the results of analyses of the relationship between the labor force participation of older persons and the labor force participation of younger persons in twelve countries. Why countries introduced plan provisions that encouraged older persons to leave the labor force is unclear. After the fact, it is now often claimed that these provisions were introduced to provide more jobs for the young, assuming that fewer older persons in the labor force would open up more job opportunities for the young. Now, the same reasoning is often used to argue against efforts in the same countries to reduce or eliminate the incentives for older persons to leave the labor force, claiming that the consequent increase in the employment of older person would reduce the employment of younger persons. The validity of such claims is addressed in this volume.

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Several years ago we began an international project to study the relationship between social security program provisions and retirement. Under pay-as-you-go social security systems most developed countries have made promises they can't keep. The systems in their current forms are not financially sustainable. What caused the problem? It has been common to assume that the problem was caused by aging populations. The number of older persons has increased very rapidly relative to the number of younger persons and this trend will continue. Thus the proportion of retirees has increased relative to the number of employed persons who must pay for the benefits of those who are retired. In addition, persons are living longer so that those who reach retirement age are receiving benefits longer than they used to. The effect of aging populations and increasing longevity has been compounded by another trend: until recently older persons had been leaving the labor force at younger and younger ages, further increasing the ratio of retirees to employed persons. What has not been widely appreciated is that the provisions of social security programs themselves often provide strong incentives to leave the labor force. By penalizing work, social security systems magnify the increased financial burden caused by aging populations and thus contribute to their own insolvency.

Why countries introduced plan provisions that encouraged older persons to leave the labor force is unclear. After the fact, it is now often claimed that these provisions were introduced to provide more jobs for the young, assuming

that fewer older persons in the labor force would open up more job opportunities for the young. In some cases this may have been a motivation for the provisions but in other instances it was not, as shown by illustrations presented below. Now, the same reasoning is also often used to argue against efforts in the same countries to reduce or eliminate the incentives for older persons to leave the labor force, claiming that the consequent increase in the employment of older person would reduce the employment of younger persons. Here are a few examples:

- "The Job Release Scheme is "a measure which allows older workers to retire early in order to release jobs for the registered unemployed" (The United Kingdom: the 1977 Labour Government: SOURCE …)

- "We will extend the voluntary Job Release Scheme to men over 60 so that those who want to retire early vacate jobs for those who are currently unemployed. This could take as many as 160,000 people out of unemployment and into work." (The United Kingdom: the 1987 Labour Party manifesto says: SOURCE …)

- "And I would like to speak to the elders, to those who have spent their lifetime working in this region, and well, I would like them to show the way, that life must change; when it is time to retire, leave the labor force in order to provide jobs for your sons and daughters. That is what I ask you. The Government makes it possible for you to retire at age 55. Then retire, with one's head held high, proud of your worker's life. This is what we are going to ask you… This is the "contrat de solidarité" [an early retirement scheme available to the 55+ who quit their job]. That those who are the oldest, those who have worked, leave the labor force, release jobs so that everyone can have a job." (France: Pierre Mauroy, French Prime Minister, in Lille 27th September 1981, quoted in Gaullier (1982), L'avenir à reculons, page 230.)

- "The lowering of the retirement age strengthens the positive effects on employment that early retirement policies made possible. It even widens these positive effects as a larger share of the population is concerned." (France: Ministry of Employment, in La retraite à 60 ans, Droit social n°4 – avril 1983.)

- “Unemployment among the youth is perhaps the most serious problem of today, because we cannot hide from the fact that we risk losing a whole generation of young persons from the labour market and from society as a whole.” (Denmark, with respect to the Post Employment Wage: The Minister of Labour, Svend Auken, Proceedings of Parliament, 1978).

The validity of such claims is addressed in this volume. It presents the results of analyses of the relationship between the labor force participation of older persons and the labor force participation of younger persons in twelve countries.

This is the fourth phase of the ongoing project. The first phase described the retirement incentives inherent in plan provisions and documented the strong relationship across countries between social security incentives to retire and the proportion of older persons out of the labor force (Gruber and Wise 1999). The second phase, based on microeconomic analysis of the relationship between a person’s decision to retire and the program incentives faced by that person, documented the large effects that changing plan provisions would have on the labor force participation of older workers. (Gruber and Wise 2004) The third phase demonstrated the consequent fiscal implications that extending labor force participation would have on net program costs—reducing government social security benefit payments and increasing government tax revenues. (Gruber and Wise 2007) The analyses in the first two phases, as well as the analysis in the third phase, are summarized in the introduction to the third phase.

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 the project are listed below. The authors of the country papers in this volume

are listed first; others who have participated in one or more of the first three phases are listed second and shown in italics

Belgium	Alain Jousten, Mathieu Lefèbvre, Sergio Perelman, Pierre Pestieau, *Raphaël Desmet, Arnaud Dellis,* and *Jean-Philippe Stijns*
Canada	Michael Baker, Jonathan Gruber, and Kevin Milligan
Denmark	Paul Bingley, Nabanita Datta Gupta, and Peder J. Pedersen
France	Melika Ben Salem, Didier Blanchet, Antoine Bozio, Muriel Roger, *Ronan Mahieu*, *Louis-Paul Pelé*, and *Emmanuelle Walraet*
Germany	Axel Börsch-Supan, Reinhold Schnabel, *Simone Kohnz*, *and Giovanni Mastrobuoni*
Italy	Agar Brugiavini and Franco Peracchi
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Sweden	Mårten Palme and Ingemar Svensson
United Kingdom	James Banks, Richard Blundell, Antonio Bozio, Carl Emmerson, *Paul Johnson, Costas Meghir,* and *Sarah Smith*
United States	Jonathan Gruber, Kevin Milligan, *Courtney Coile* and *Peter Diamond*

An important goal of the project has been to present results that were as comparable as possible across countries. Thus the papers for each phase were prepared according to a detailed template that we prepared in consultation with country participants.

In this introduction, we summarize the collective results of the country analyses. In large part, the results presented in the introduction could only be conveyed by combined analysis of the data from each of the countries. The country papers themselves present much more detail for each country and, in

addition to template analyses performed by each country, often present country-specific analysis relevant to a particular country.

The proposition that more work by older persons reduces the job opportunities for younger persons put forth in many different forms. It is sometimes referred to by economists as the “lump of labor” theory. Taken literally, this statement of the theory says that if an additional older worker is employed one younger worker must be displaced. The implication is that economies are boxed and that the box cannot be enlarged.

In this volume, we emphasize the relationship between the employment rate of older persons and the unemployment and employment rates of younger persons, in particular youth. We emphasize employment and unemployment rates because public discourse about the relationship is typically in terms of these rates—that the unemployment rate of youth, for example, will be increased if incentives for older persons to leave the labor force are eliminated.

1. The Context

At first glance, it seems clear that economies are not boxed. The flow of women into the labor force in the past few decades has increased the size of the labor force enormously in many countries. For example, the number of women in the labor force in the United Stated increased by almost 48 million between 1960 and 2007, from about 34 percent to 46 percent of the labor force. But the employment rate of men changed little as the proportion of women employed increased. Figure 1-1 shows the percent change in the employment rate of men compared to the percent increase in the female employment rate in the twelve

countries participating in this project. In this figure, the number of years over which the change occurred varies from country to country. The longest period is from 1960 to 2006 (in Germany) and the shortest from 1983 to 2004 (in Belgium). Two features of the data stand out. First, there was a small decline in the employment rate of men over this time period in all but one of the countries, but, second, on average, the smallest of the small declines were in the countries with the largest increase in the employment rate for women. For example, in the Netherlands, the employment rate of women increased by 54 percentage points, but the employment rate of men declined by only 1 percentage point. Very similar results are obtained if the same span of years is used for all countries—1983 to 2004.

The results are summarized more succinctly in Figure 1-2 that compares the six countries with the smallest to the six countries with the largest increase in the employment rate of women. The results are shown both for the variable-years version and the same-years version. The smallest of the small decreases in the employment of men are in the countries with the greatest increase in the employment rate of women. For example, for the same years (1983 to 2003) the average increase in the employment rate of women was 23 percentage points in the countries with the greatest increase and in these countries the decline in the employment rate of men was only 2 percentage points. On the other hand, the average increase in the employment rate of women was only 6 percentage points in the countries with the smallest increase in the employment rate of women and the decline in the employment rate of men in these countries was 4 percentage

points. In seems clear that the small decline in the employment rate of men was not tied to the increase in the employment of women. The boxed economy proposition seems quite inconsistent with these data.

Figure 1-1. Relationship between the increase in female employment rates and change in male employment rates, years vary by country

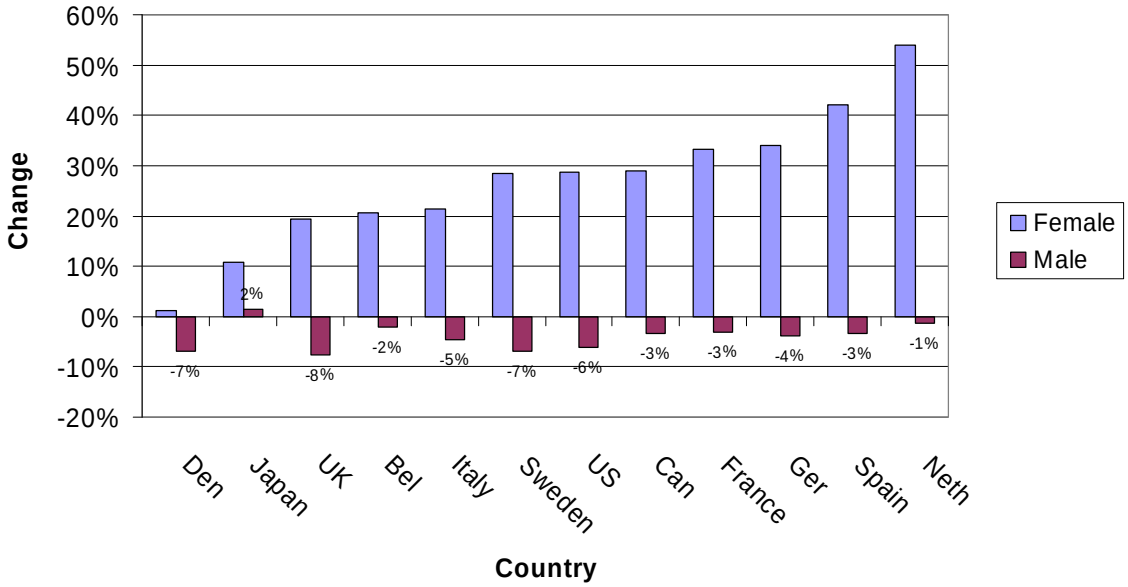
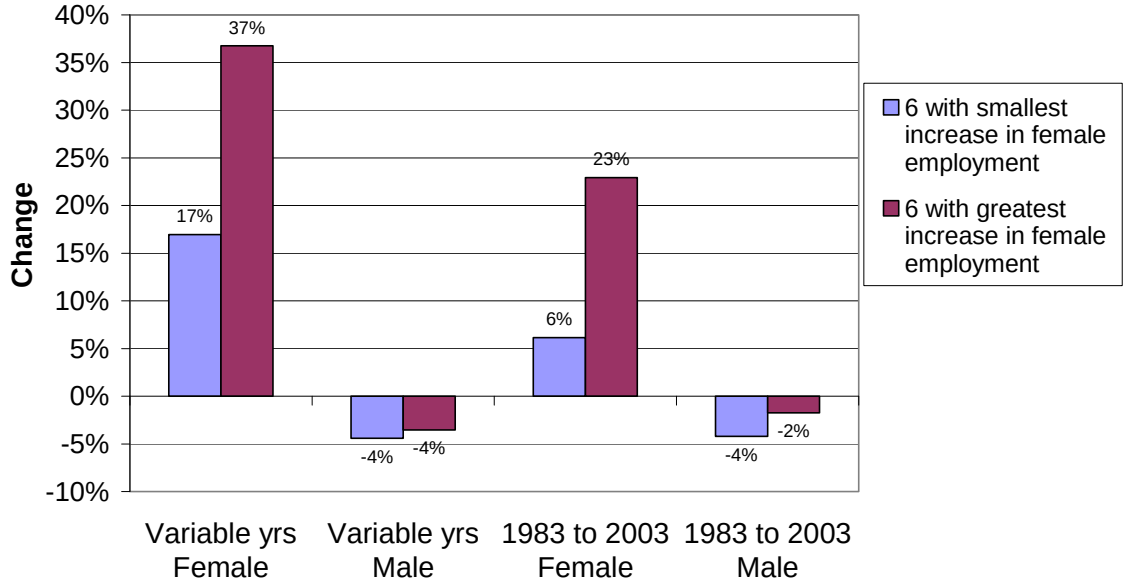


Figure 1-2. Compare the 6 countries with smallest increase with the 6 with the greatest increase in female employment, variable and same years



Why did the employment of men not decline when women entered the labor force in large numbers? The reason is that the economies grew and employed more people. Then why is it common for many observers to assume that a new entrant into the labor force must "crowd out" someone who is currently employed? Or, that a new employee can be hired only if a current employee leaves? Perhaps one reason is that this might be the case in one's own workplace at any given moment. A university president may say that the classics department can only make one new hire this year, but if someone retirees, two new hires can be made. But over time, the number of professors typically increases as the number of students increases. The "university economy" grows over time and the total number of employees increases. Even if the number of employees in one company or one industry can not increase in a given year (or

even in the long run in declining industries) this will not be true for the economy as a whole. Some companies or industries are declining but others are growing. As women entered the labor force, the growing segments of the economy far outstripped the declining segments.

Could there be another relationship between the old and the young? That is the question we address in this volume.

2. The Country Papers and the Data

Each of the country papers begins with an historical summary of the changes in social security program provisions over the past three or four decades. The key question is whether social security plan provisions, that provide incentives for older persons to leave the labor force, were prompted by concerns about youth unemployment in particular. The evidence is based on a review of legislation, press coverage, and other public discussion proceeding program changes. The evidence gained in this way is further checked against corresponding empirical evidence. For each country, the relationship between the timing of program reforms and the trends in the employment of older persons and the employment and unemployment of youth is described graphically. For example, if public discussion suggests the program changes may have been prompted by increasing youth unemployment, does the data show an increase in youth unemployment prior to the program reform?

The reason for emphasizing the extent to which the program provisions—that induce older persons to leave the labor force—were prompted by youth unemployment is to help to interpret the key relationships that are estimated in

the country papers, as explained below. The core analyses presented in each of the country papers are regression estimates of the relationship between the employment rates of persons 55 to 64 on the one hand and the employment and unemployment of youth 20 to 24 and prime age persons 25 to 54 on the other hand. Several different estimation specifications of these relationships are presented.

These estimates follow on the estimates in previous phases of the project. As noted above, the first phase of the project documented the strong relationship across countries between program provisions that induce retirement and the proportion of older persons out of the labor force. The second phase was based on micro estimation of the relationship between the retirement incentives faced by individuals and their retirement decisions. The central finding is the strong relationship between social security program provisions that penalize work and departure from the labor force. Now, the question is whether the departure of older persons from the labor force expands the job opportunities of youth.

The trends in the employment of older persons, however, reflect all determinants of the employment of older persons, not only the social security program incentives to leave the labor force. Thus, In addition to the template components of the country analyses, that are common to each of the country papers, a few of the country papers also present additional information that helps to explain the developments in that country. For example, while the estimates—of the "direct" effect of the employment of the old on the employment of the young—are the central focus of the analysis in this phase, we have also

considered whether it was feasible to estimate the relationship between changes over time in the incentives inherent in social security plan provisions and the employment of the young. The reason for considering this question was to address more directly the effects of plan provisions that are the subject of public discussion. This goal turned out to be very difficult to accomplish on a comparable basis across countries. In particular, we were unable, on a consistent basis across countries, to obtain a reliable measure of the average incentives faced by persons retired in a given year. Perhaps most important, even if the average were measured well, the average may not adequately capture the wide range of incentives faced by individuals. In short, the procedure we explored was not replicable across countries. Thus, such estimates are presented in only a few of the country papers.

The illustrations and the cross-country analyses presented in this introduction are based on data provided by each country. Key data series are shown here. Much of the answer to the central question posed in this volume can be seen in the data themselves.

Figures 2-1a to 2-1l show the data for each country. The first panel of each figure shows the actual data for three series—the employment of persons 55 to 64 (E 55-64), the employment of youth 20 to 24 (E 20-24), and the unemployment of youth 20 to 24 (UE 20-24).[1] To simplify the figures, we have not shown data for prime age persons (age 25 to 54). The employment and unemployment rates for the prime age group typically parallel closely the rates of

[1] In Sweden the data for youth are for the age range 16 to 24.

youth and both series are shown in the country papers. In the analysis below we present results for prime age persons, as well as for youth.

The figures below show two versions of the data for each country. The first panel shows the actual data as reported for each country. The second panel shows the data adjusted for changes in GDP per capita, GDP growth, and the proportion of GDP generated by manufacturing.[2] The years for which data are available varies from country to country. The longest period is from 1960 to 2006 (in Germany) and the shortest period from 1983 to 2004 (in Belgium).

To obtain the adjusted data for a given country, we first determine how each of the three employment series varies with GDP per capita, GDP growth, and the "manufacturing share" in that country. Then beginning with the first year of data for that country, the data for each subsequent year is adjusted based on the change in the predictor variables between the first year and the subsequent year. The same procedure is followed for each of the countries. (The details are shown in the appendix.) Thus the adjusted series eliminates the movement in each of the series that can be predicted by the change over time in the adjustment variables in that country. In particular, each of the employment series is adjusted for macroeconomic shocks to the economy that tend to affect each of the series. Of course the employment series may be affected by other influences

[2] The adjustment in the United States, Japan, Spain, and Sweden is based on GDP per capita and GDP growth only because the proportion of GDP generated by manufacturing is not available in all years for these countries.

imperfectly controlled for by the adjustment variables. Some such influences are mentioned in the country papers.[3]

In the subsequent analyses, we often show results based on both unadjusted and adjusted data. Both are shown for two reasons: One is that we often want to observe youth employment or unemployment rates prior to a given reform in a country. For this purpose we what to use the unadjusted data. The second reason is that it isn't clear that estimates based on the adjusted data always yield the best estimate of the effect of employment of the old on the employment of the young.

In addition, prolonged upward and downward trends in the employment of persons 55 to 64 are marked by left-right arrows in each of the figures. The arrows positions are determined on the basis of the unadjusted data and are in the same positions on the adjusted data figures. These prolonged upward and downward intervals are used in subsequent analysis.

Three features of the data stand out. First, in each country, the unadjusted data show substantial correlation among the series. As might be expected, the employment of youth is positively correlated with the employment of older persons. The unemployment of youth is negatively correlated with the employment of older persons. That is, macro "shocks" to the economy affect employment at all ages and in the same direction. Second, the variation over time in each of the series is typically reduced when the change associated with economic output per capita is controlled for. In some countries, the smoothing of

[3] For example, in France there was a change in the Labor Force Survey in 2002 and a change in the work week schedule in 2000.

the series trends is substantial. Third, and most important for our analysis, even after adjusting for economic growth and the manufacturing share much of the relationship between the employment of the old and the young remains.

Simple perusal of the data reveals no evidence that increases in the employment of older persons are related to a reduction in the employment of younger persons, or that decreases in the employment of older persons are associated with increases in the unemployment of younger persons.

Figure 2-1a. Belgium: employment of the old and the young, unadjusted data

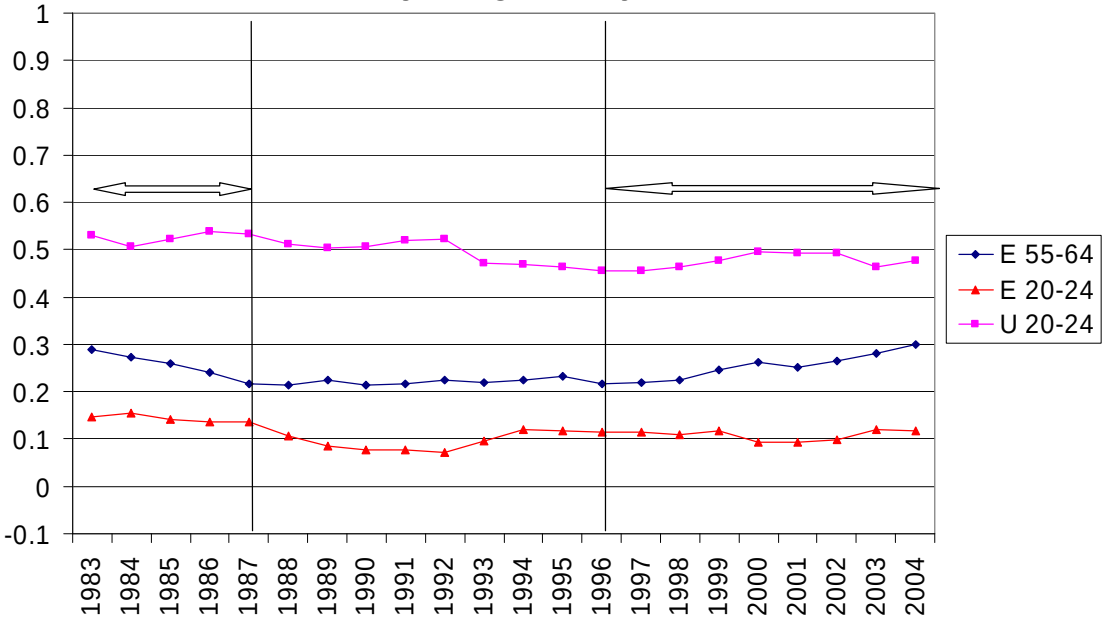


Figure 2-1a. Belgium: employment of the old and the young, adjusted data

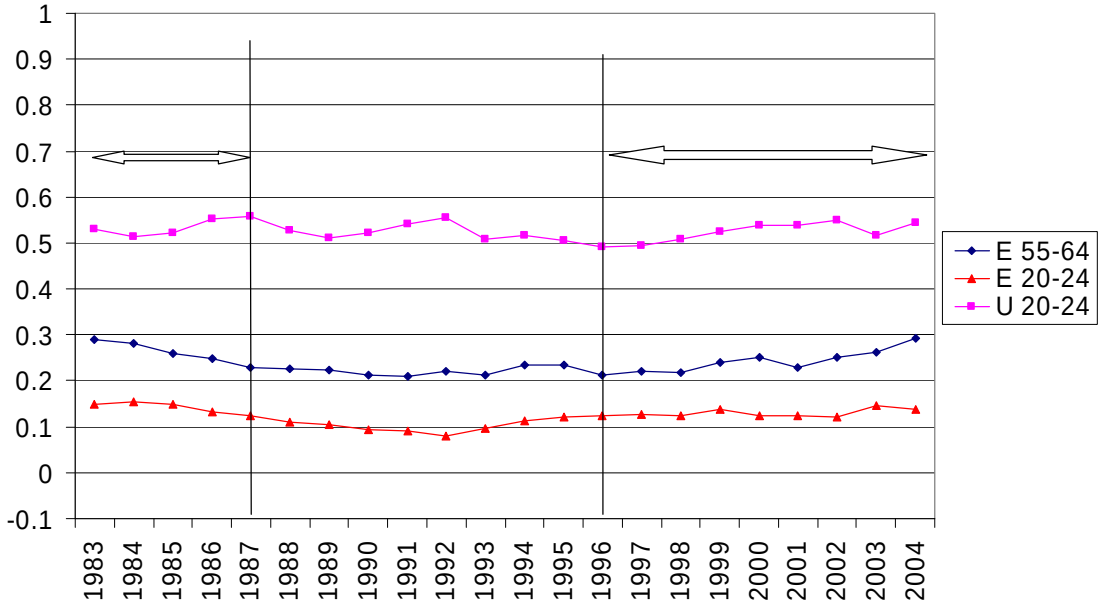


Figure 2-1b. Canada: employment of the old and the young, unadjusted data

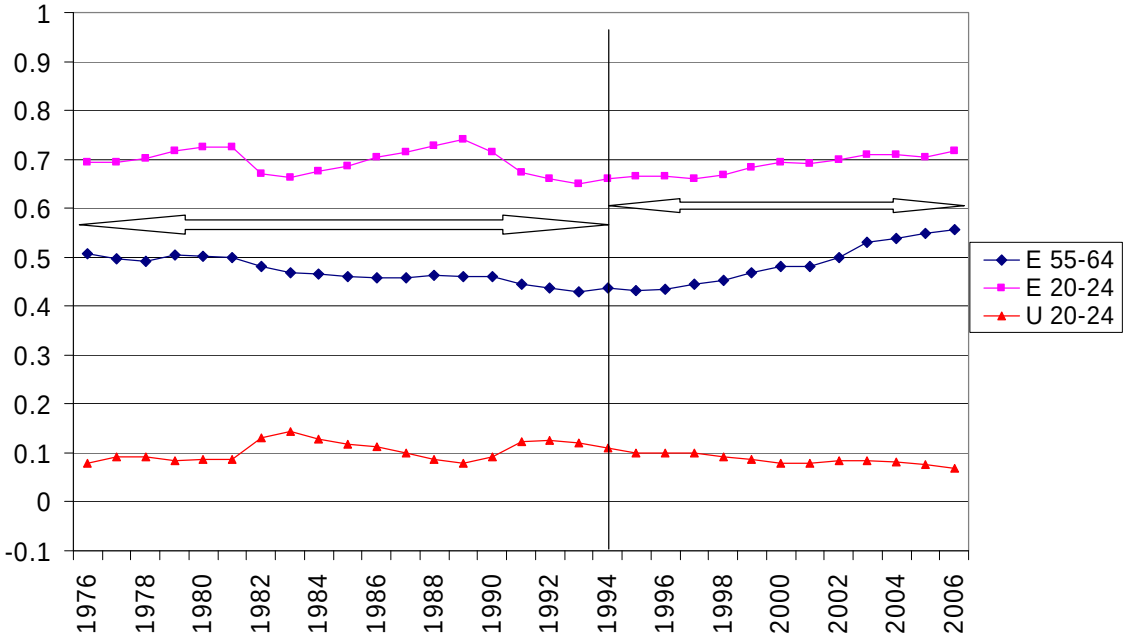


Figure 2-1b. Canada: employment of the old and the young, adjusted data

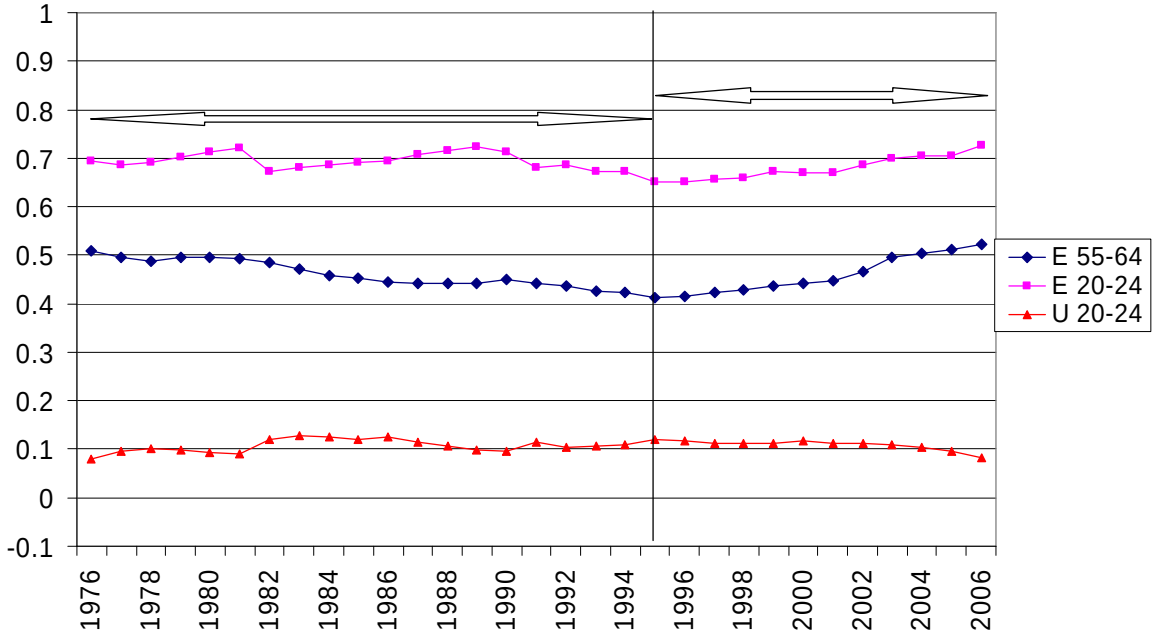


Figure 2-1c. Germany: employment of the old and the young, unadjusted data

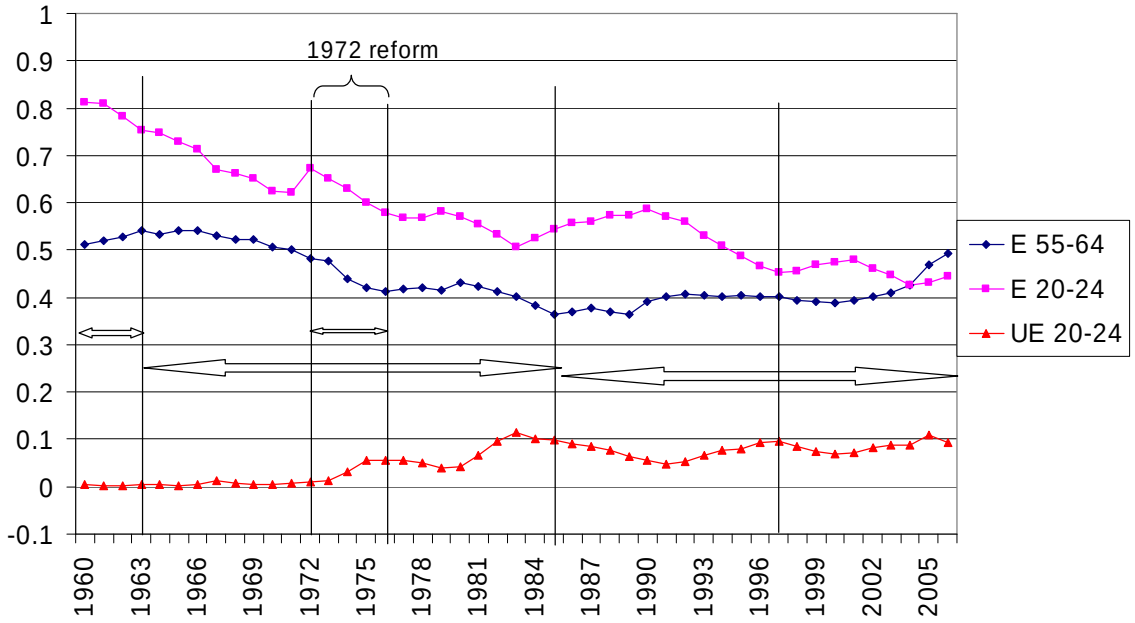


Figure 2-1c. Germany: employment of the old and the young, adjusted data

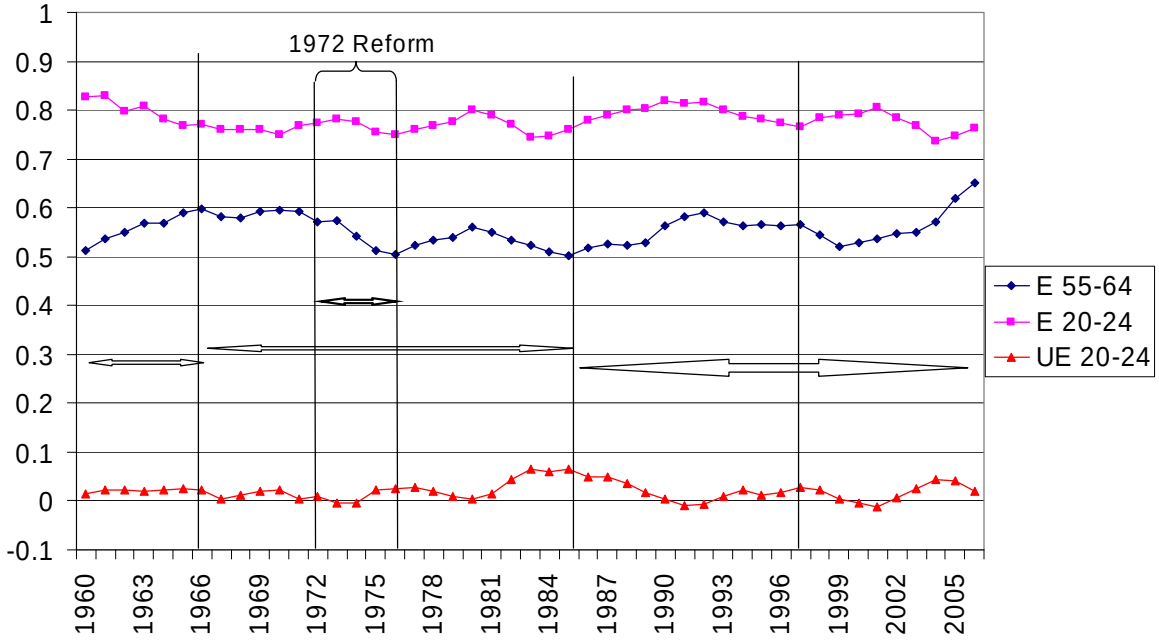


Figure 2-1d. Denmark: employment of the old and the young, unadjusted data

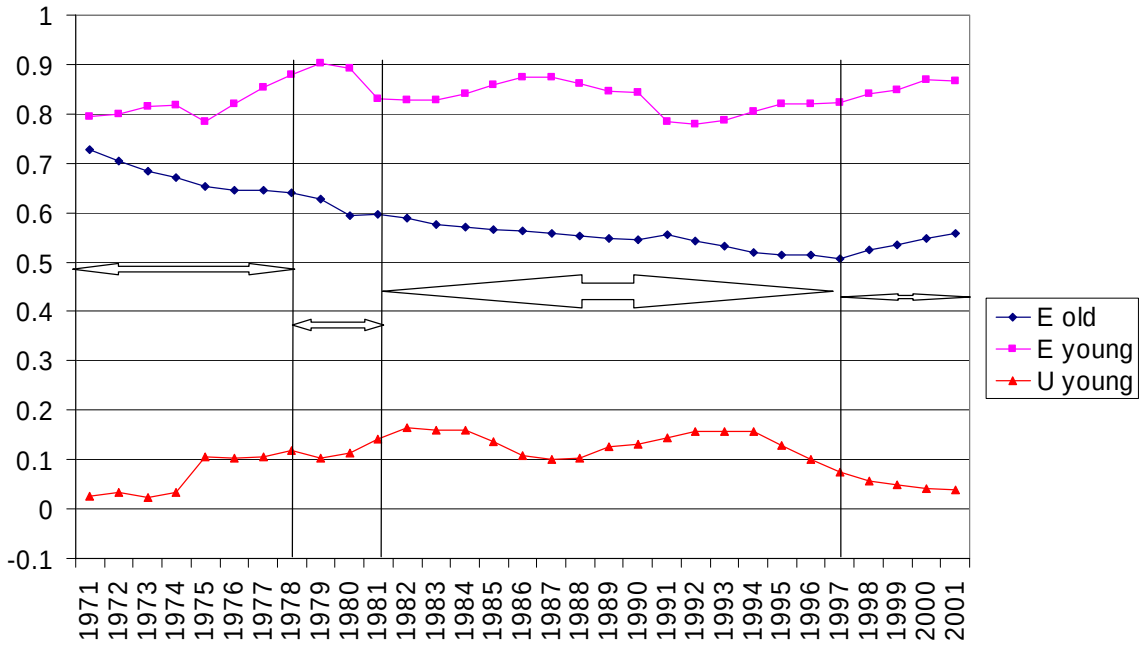


Figure 2-1d. Denmark: employment of the old and the young, adjusted data

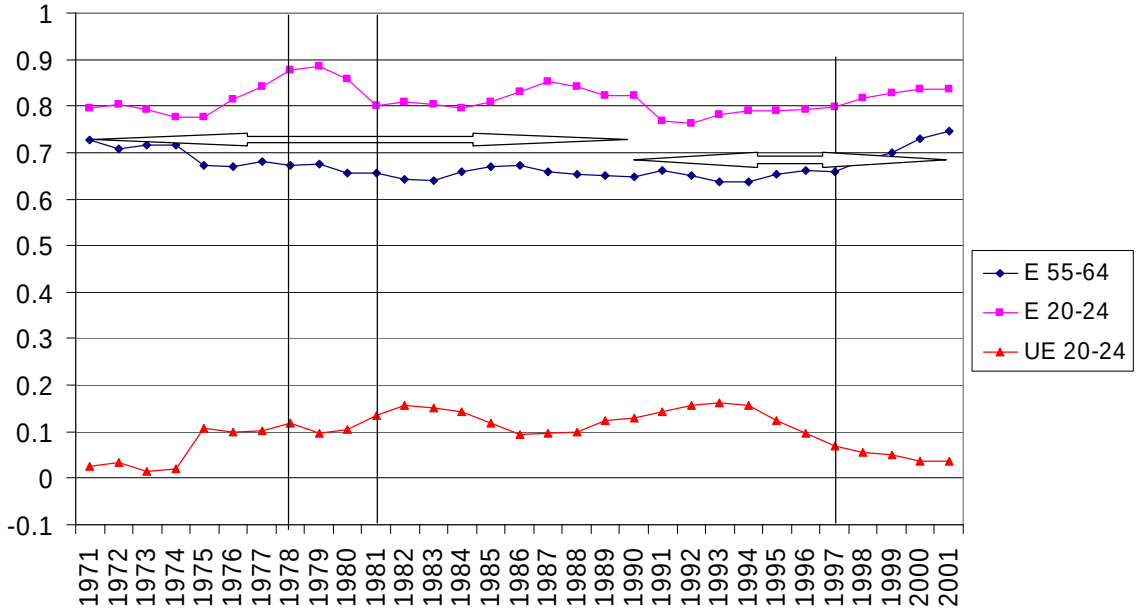


Figure 2-1e. Spain: employment of the old and the young, unadjusted data

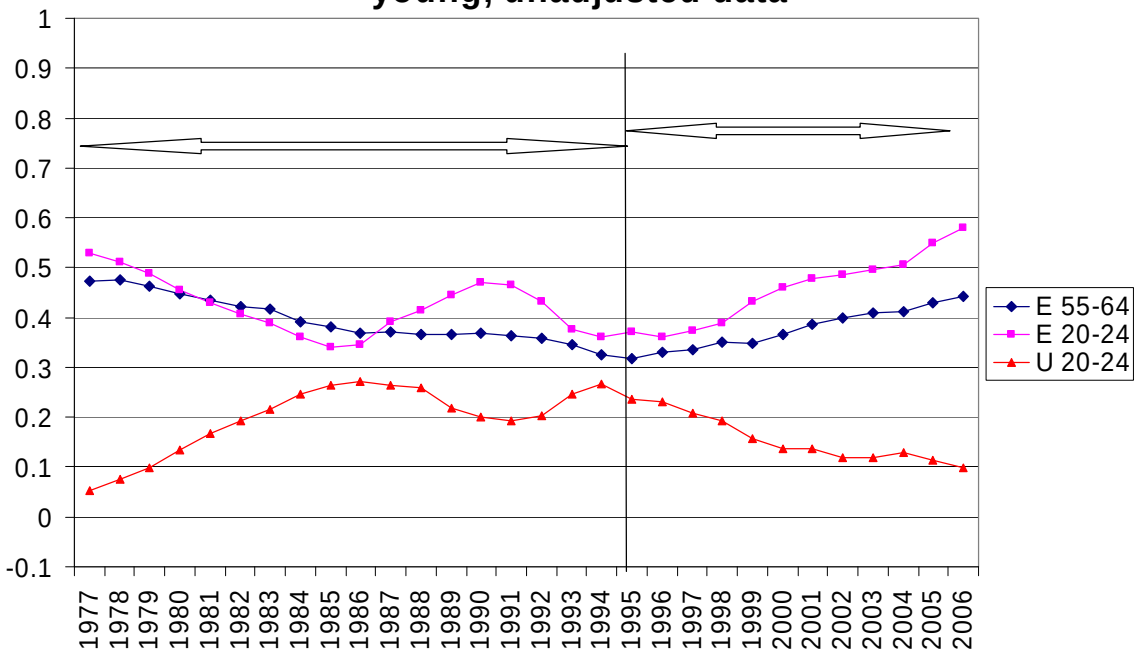


Figure 2-1e. Spain: employment of the old and the young, adjusted data

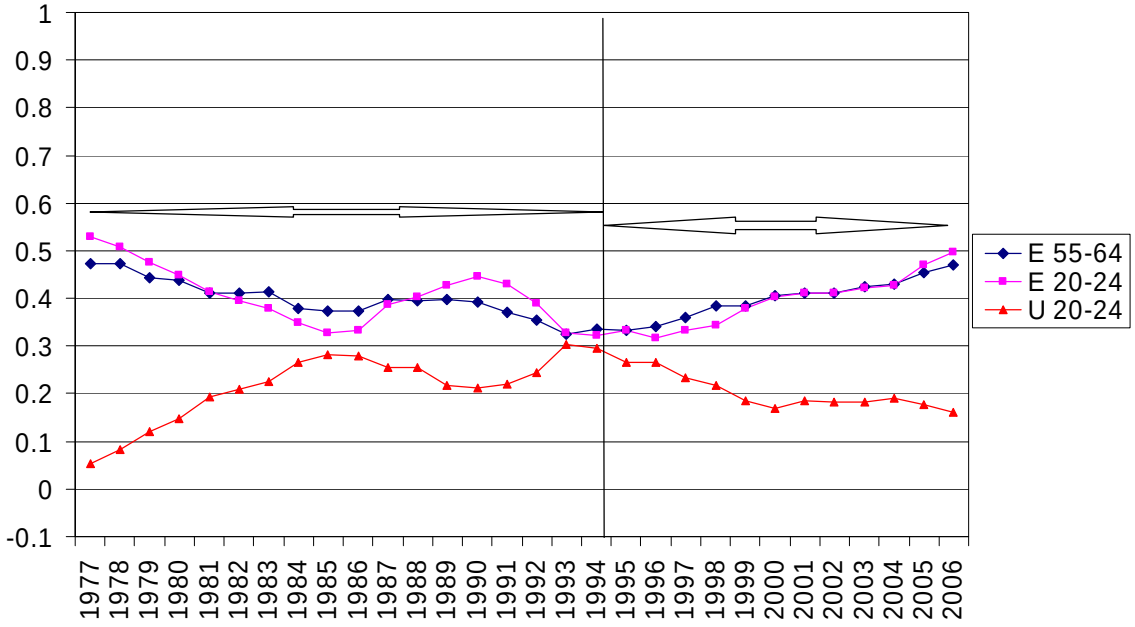


Figure 2-1f. France: employment of the old and the young, unadjusted data

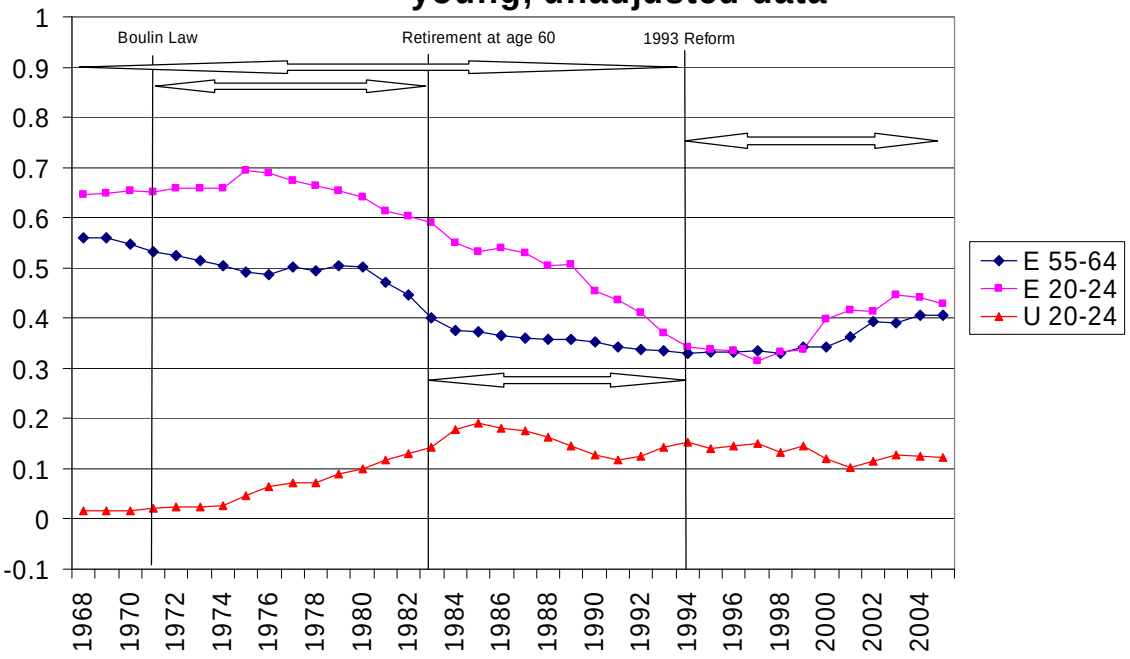


Figure 2-1f. France: employment of the old and the young, adjusted data

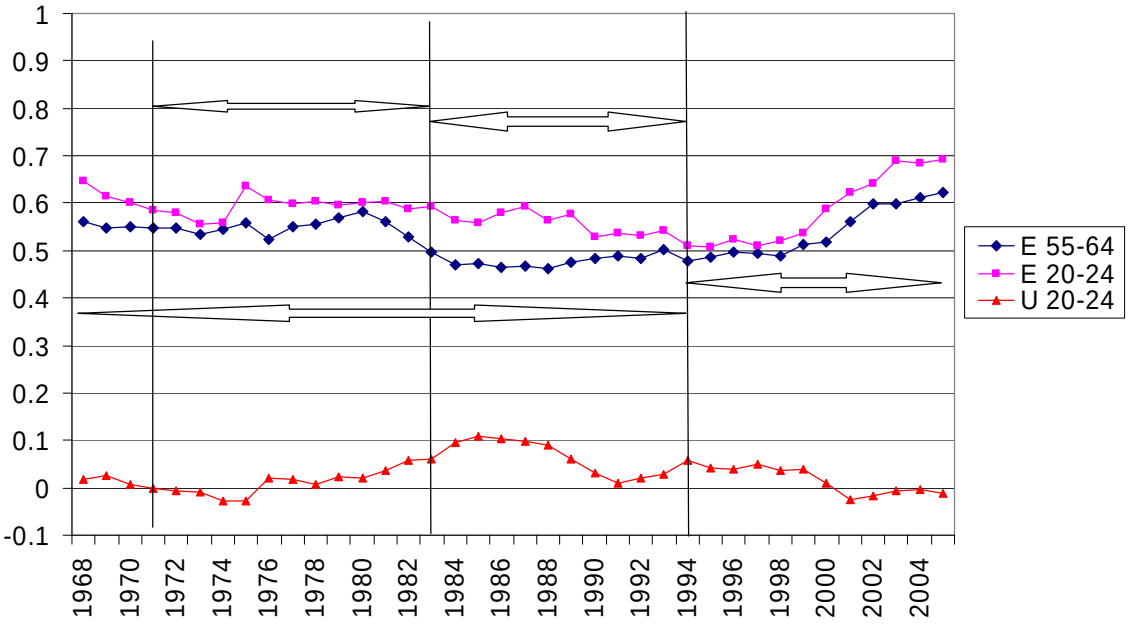


Figure 2-1g. Italy: employment of the old and the young, unadjusted data

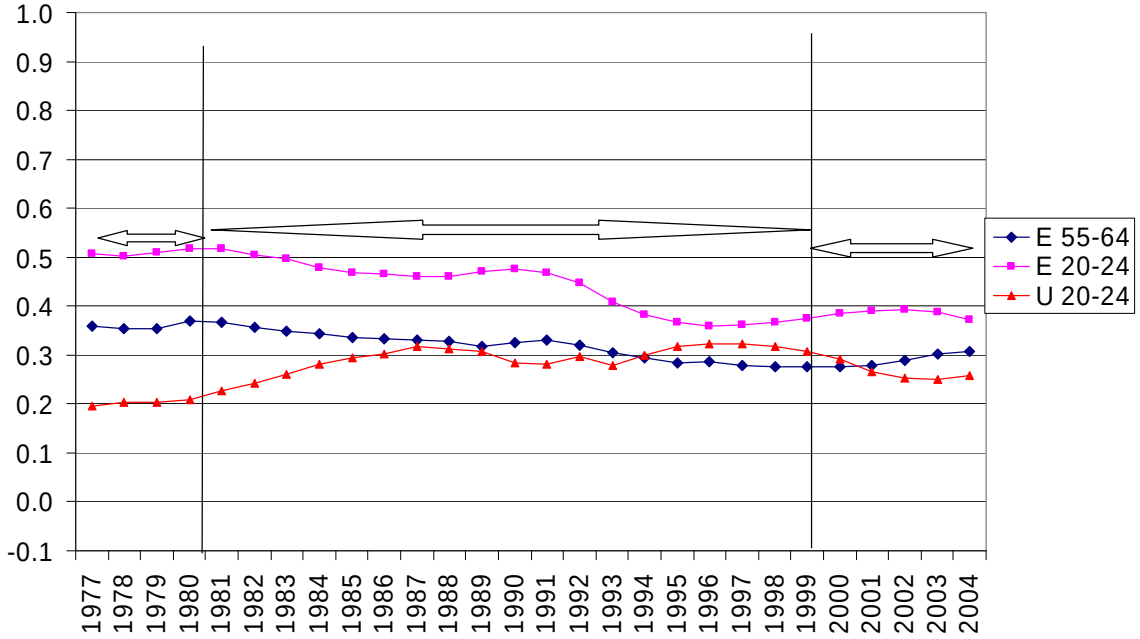


Figure 2-1g. Italy: employment of the old and the young, adjusted data

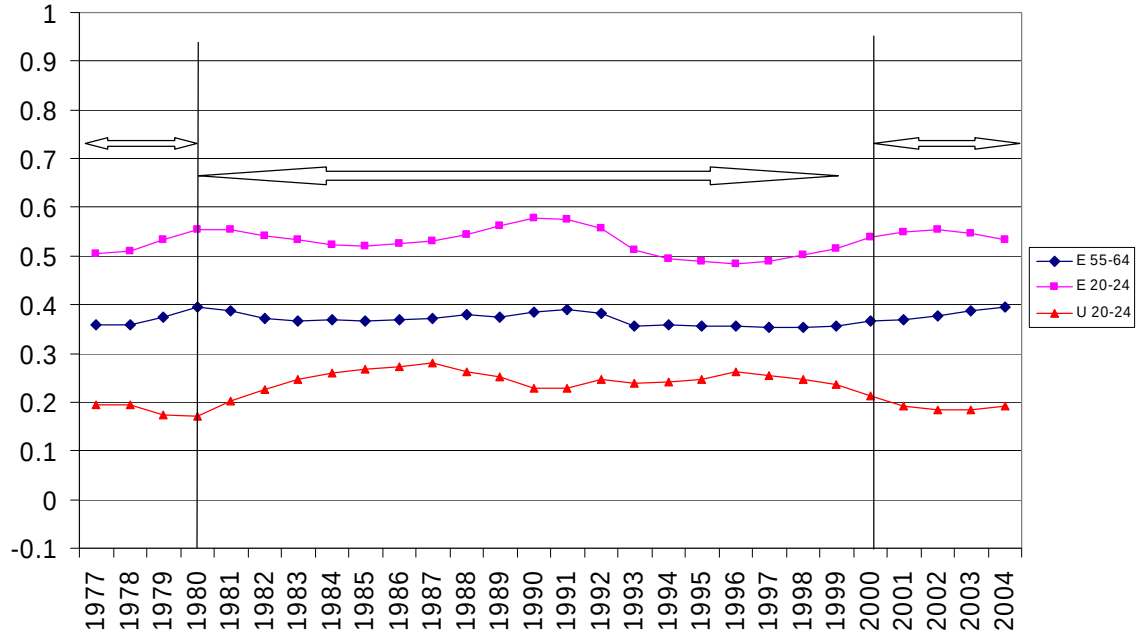


Figure 2-1h. Japan: employment of the old and the young, unadjusted data

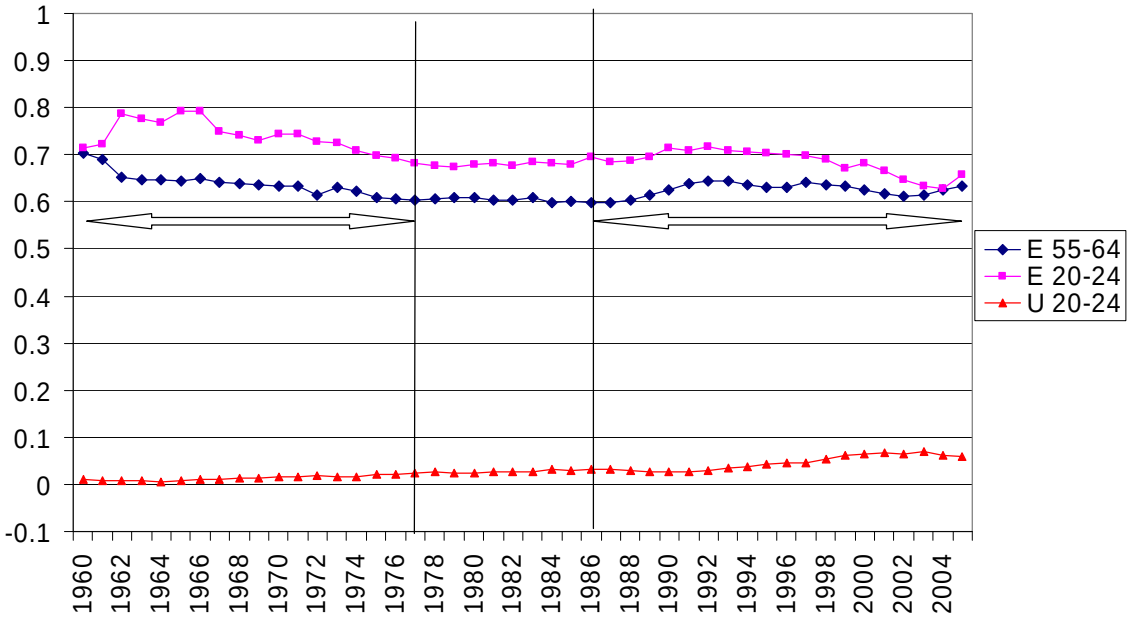


Figure 2-1h. Japan: employment of the old and the young, adjusted data

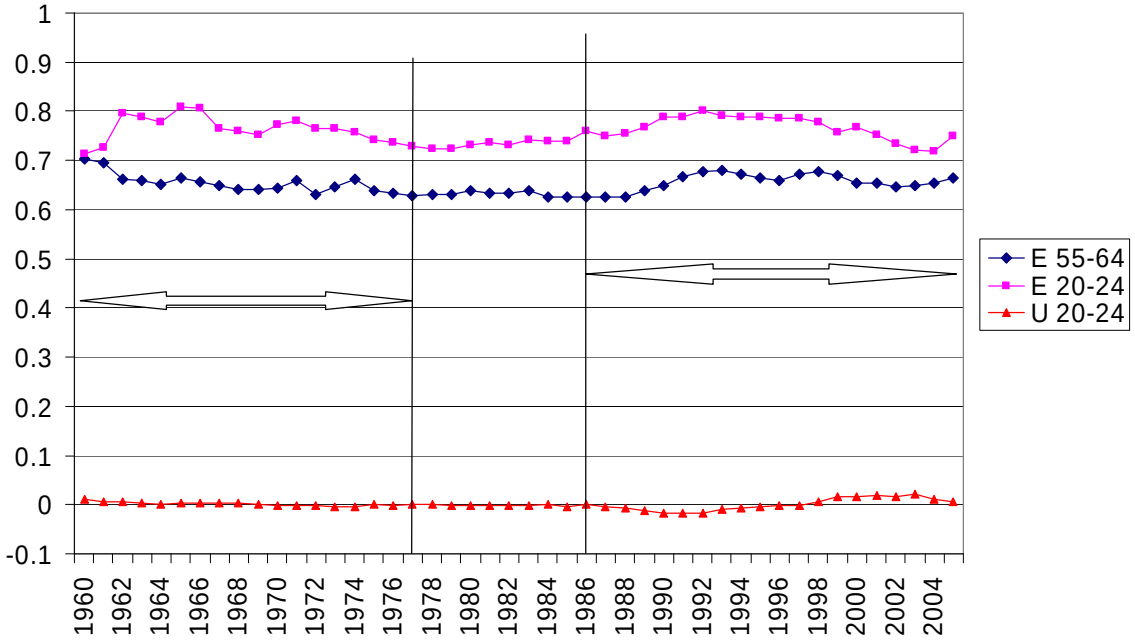


Figure 2-1i. Netherlands: employment of the old and the young, unadjusted data

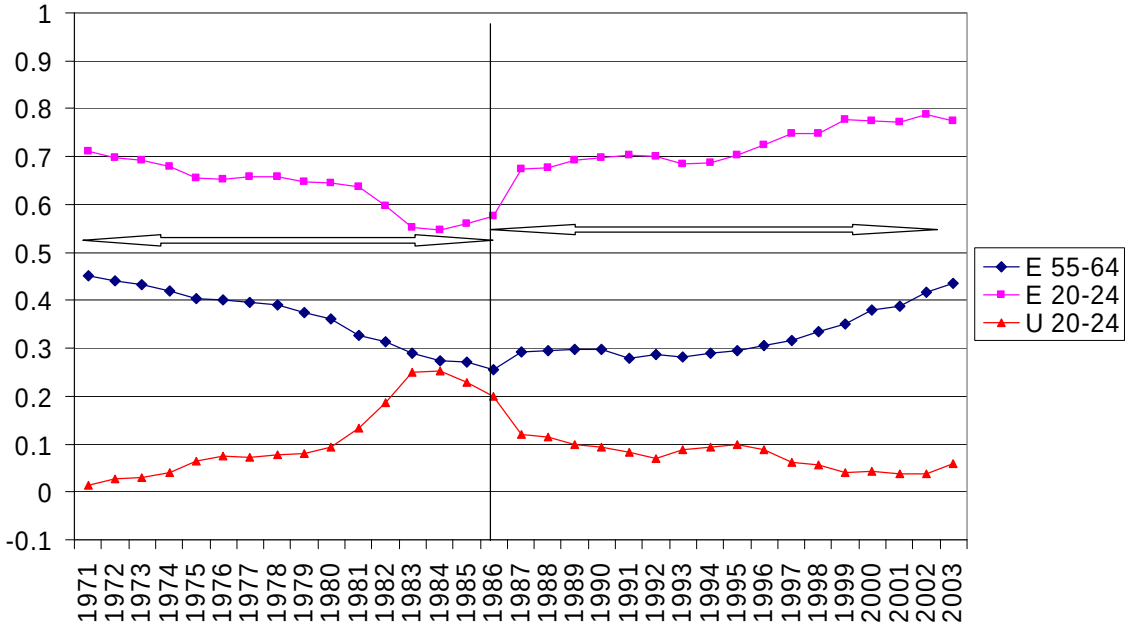


Figure 2-1i. Netherlands: employment of the old and the young, adjusted data

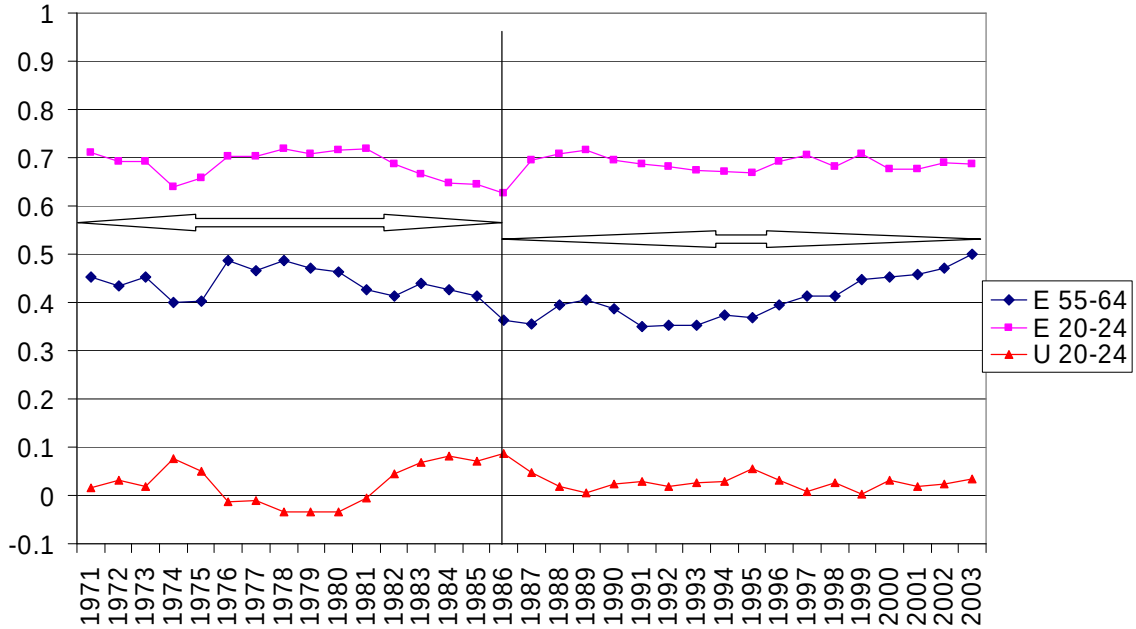


Figure 2-1j. Sweden: employment of the old and the young, unadjusted data

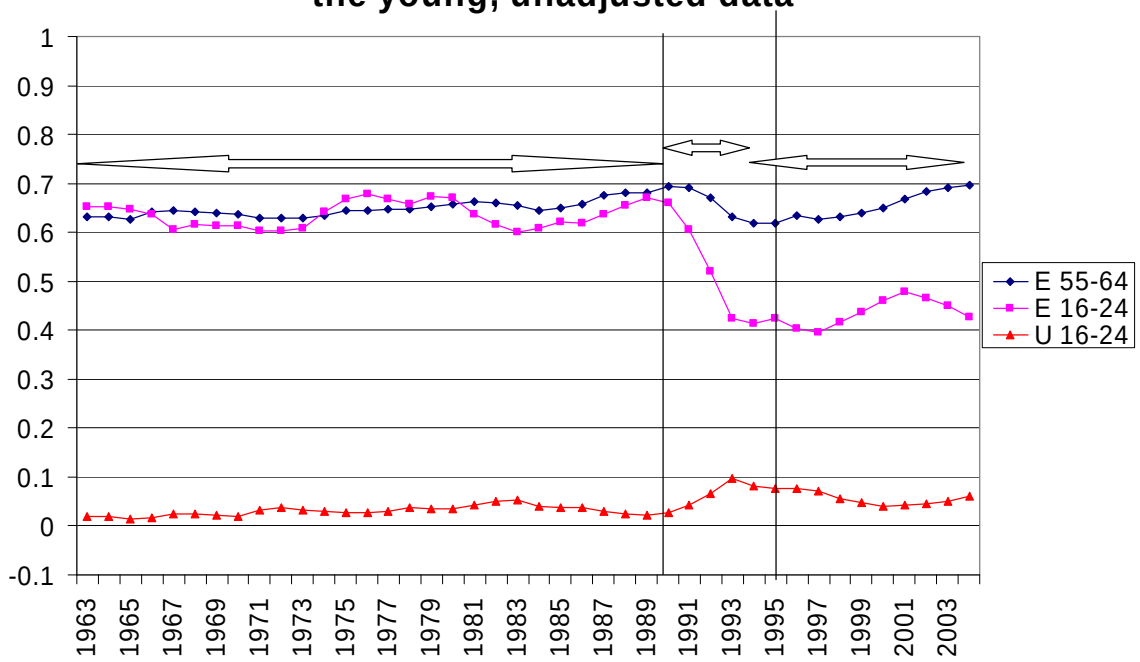


Figure 2-1j. Sweden: employment of the old and the young, adjusted data

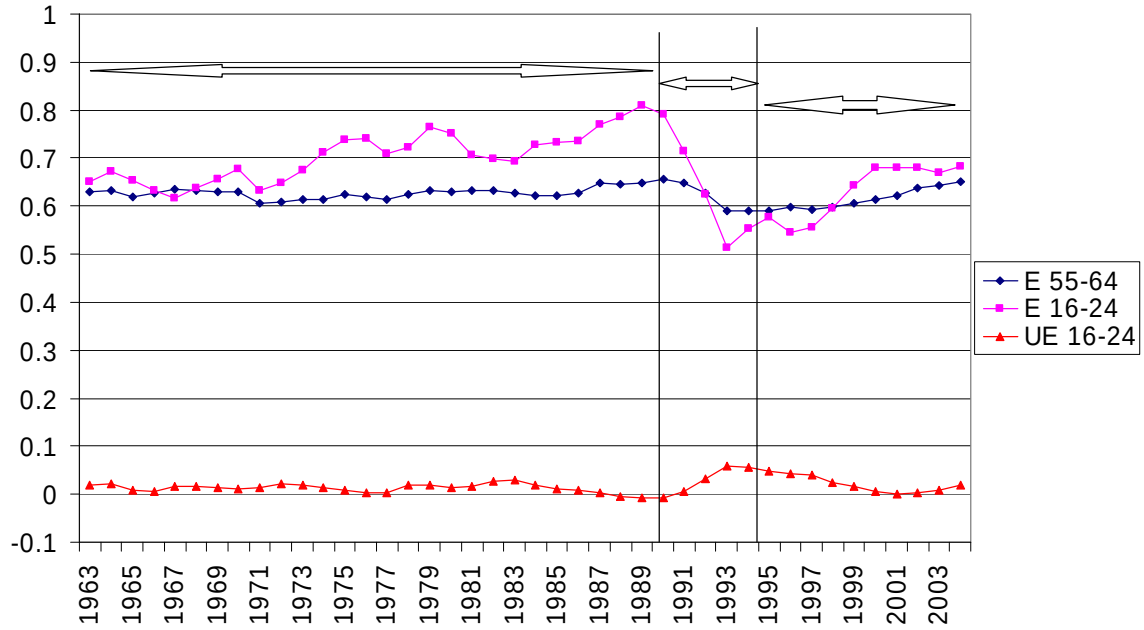


Figure 2-1k. United Kingdom: employment of the old and the young, unadjusted data

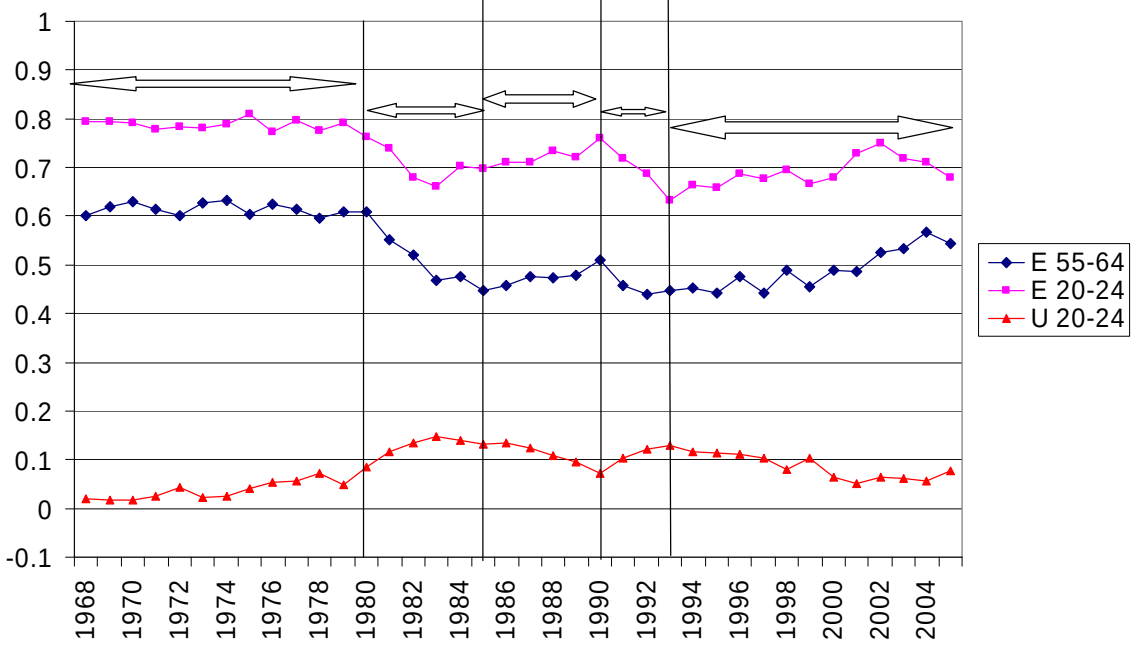


Figure 2-1k. United Kingdom: employment of the old and the young, adjusted data

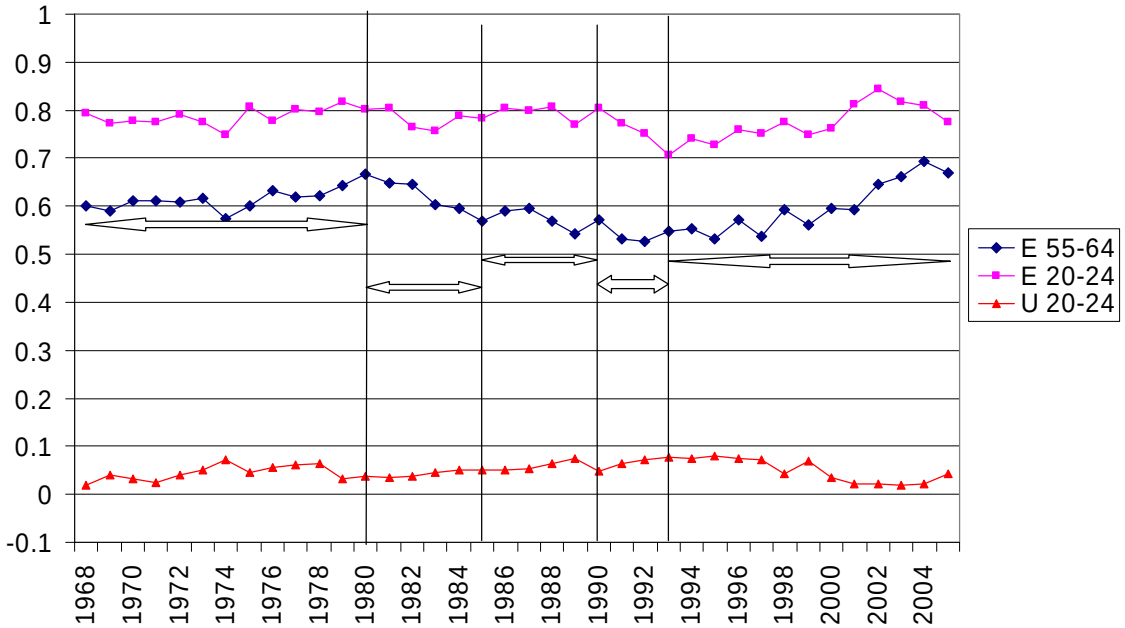


Figure 2-1l. United States: employment of the old and the young, unadjusted data

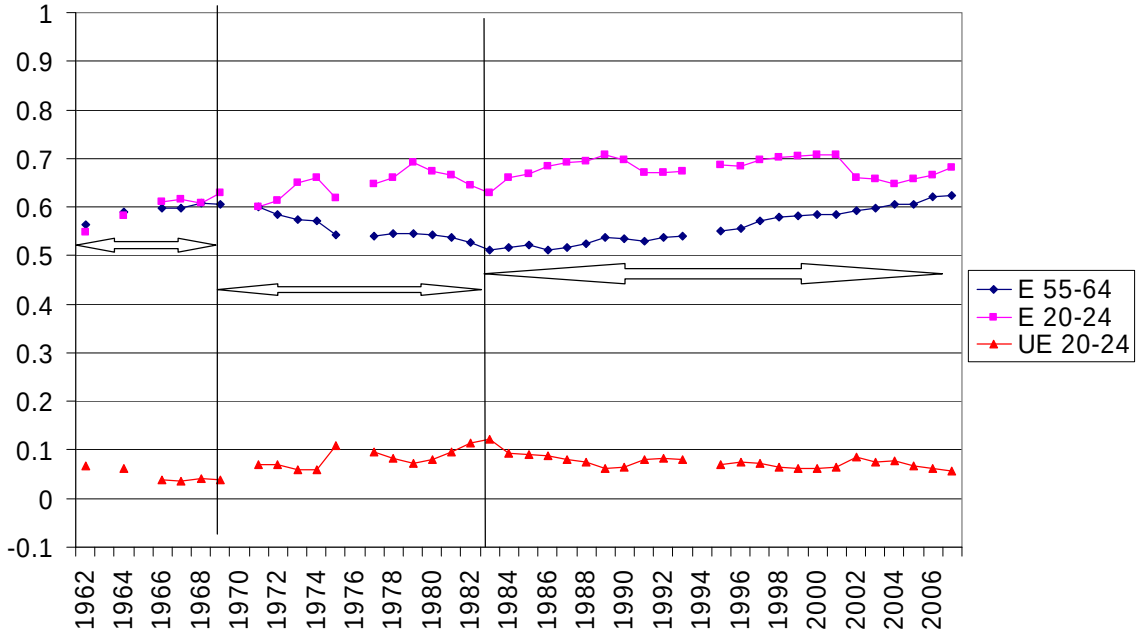
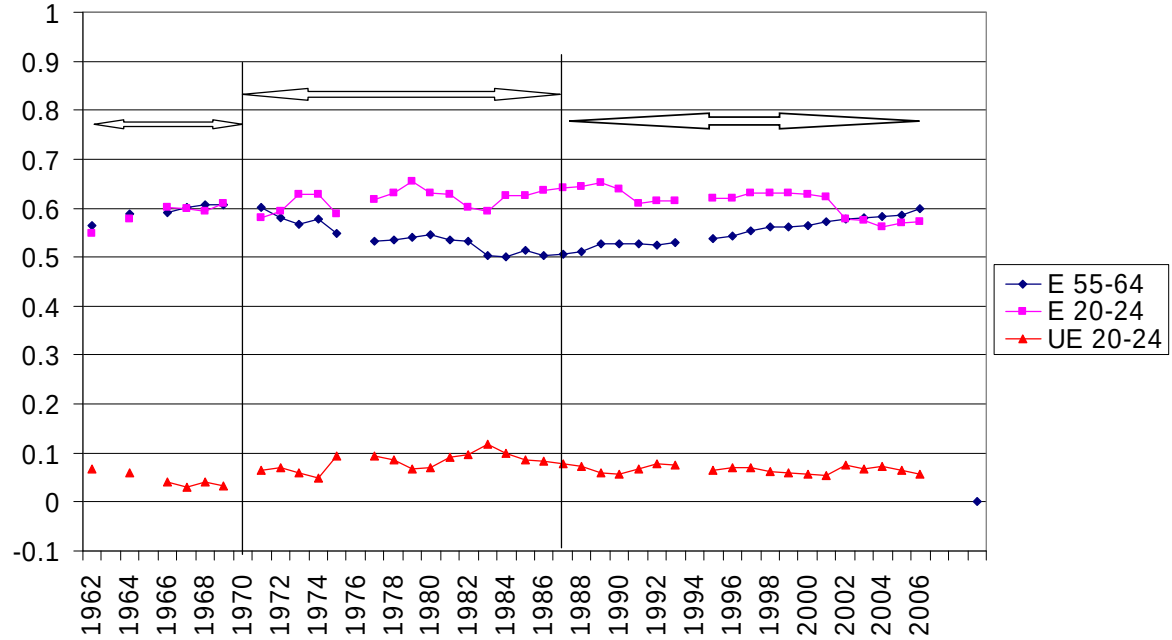


Figure 2-1l. United States: employment of the old and the young, adjusted data



We next consider a series of estimates of the relationship between the employment of older persons and the employment of youth and we show key results for prime age persons as well. In section 3 we begin by showing how the tax force to retire—emphasized in the first phase of the project is related to the employment of youth and prime age persons. In section 4 we show illustrative within-country "natural experiment" comparisons that help to demonstrate the relationship between within-country reforms and the consequent changes in the employment of the old on the one hand and changes in the employment of the young on the other hand. In section 5, we show cross-country comparisons based on various comparison methods. To simplify the presentations in sections 4 and 5 we show results only for youth. In section 6, we show more formal estimates based on panel regression analysis. In this section we show estimates for prime age persons, as well as for youth. As it turns out, all of the various estimation methods yield very consistent results. In particular, there is no evidence that reducing the employment of older persons provides more job opportunities for younger persons. And, there is no evidence that increasing the labor force participation of older persons reduces the job opportunities of younger persons. In section 7 we summarize the results.

3. The Employment of Youth and the Tax Force to Retire

We begin by recalling the key finding from the first phase of the project in which we considered the "tax force to retire." The tax force to retire can be explained in this way: Compensation for working another year, say at age 60, can be divided into two parts—the wage earnings for an additional year of work

and the change in the present value of future social security benefits. One might suppose that if benefits will be received for one fewer years, then annual benefits will be increased enough to offset their receipt of one fewer years. This is typically not the case, however. The present value of benefits declines in most countries. In some countries, the reduction in benefits is greater than 80 percent of wage earnings. We then consider the sum of these percents (the ratio of the loss in benefits to wage earnings) from the early retirement age in a country to age 69. We call this sum the tax force to retire.

The relationship between the tax force to retire and the proportion of men 55 to 65 was shown in the summary to the Phase I volume (Gruber and Wise 1999). One version of that relationship is reproduced as Figure 3-1. The strong relationship between the tax force to retire and the proportion of older men out of the labor force is apparent.

If the incentives that reduced the proportion of older persons in the labor force—increased the proportion out of the labor force—increase the job opportunities of young persons, then the tax force to retire should be related to youth employment. The greater the tax force to retire, the lower youth unemployment should be and the greater youth employment should be. And analogous relationships should be true for prime age persons. But this is not the case.

Figure 3-2 is the same as Figure 3-1 but with the addition of the unemployment rate of young men 20 to 24. Essentially there is no relationship across countries between the tax force for older persons to retire and the

unemployment of young men. Indeed, the actual relationship is slightly positive—the greater the tax force to retire the greater is youth unemployment.

Figure 3-3 shows the unemployment rate of all youth, male and female combined. Again there is a slightly positive relationship between the tax force to induce older persons to leave the labor force and the unemployment rate of youth 20 to 24.

Figure 3-4 shows the relationship between the tax force for older persons to leave the labor force and the employment of youth 20 to 24. If inducing older persons to leave the labor force provides more jobs for the young, then the tax force to retire—which is strongly related to the proportion of older persons out of the labor force—should also be strongly related to the employment of youth. But in fact the opposite is true. The greater the tax force to retire, the lower the employment rate of youth.

Figures 3-5 and 3-6 show the relationship between the tax force for older persons to leave the labor force and the unemployment and employment of prime age persons 25 to 54. Like the results for youth, the greater the tax force to retire the greater the unemployment and the lower the employment of prime age persons 25 to 54.

In short, these results provide no evidence that inducing older persons to leave the labor force frees up jobs for the young. If anything, the opposite is true; paying for old persons to leave the labor force reduces the employment rate and increases the unemployment rate of youth and of persons in their prime age working years..

Figure 3-1. Tax force to retire, men 55-65 out of the labor force

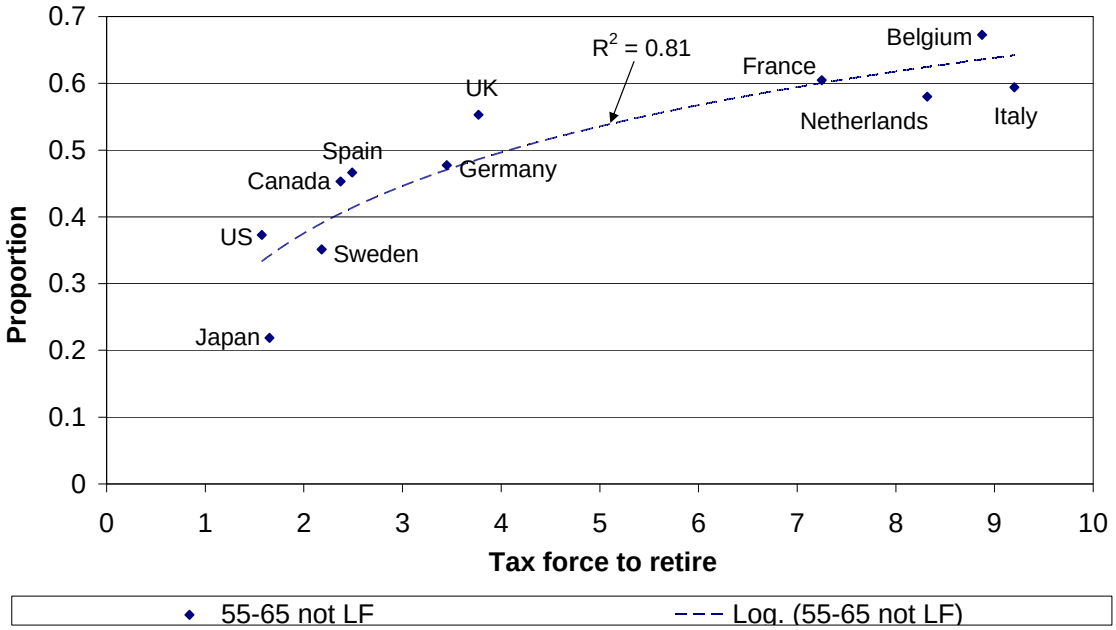


Figure 3-2. Tax force to retire, men 55-65 out of the labor force, men 20-24 unemployed (1995)

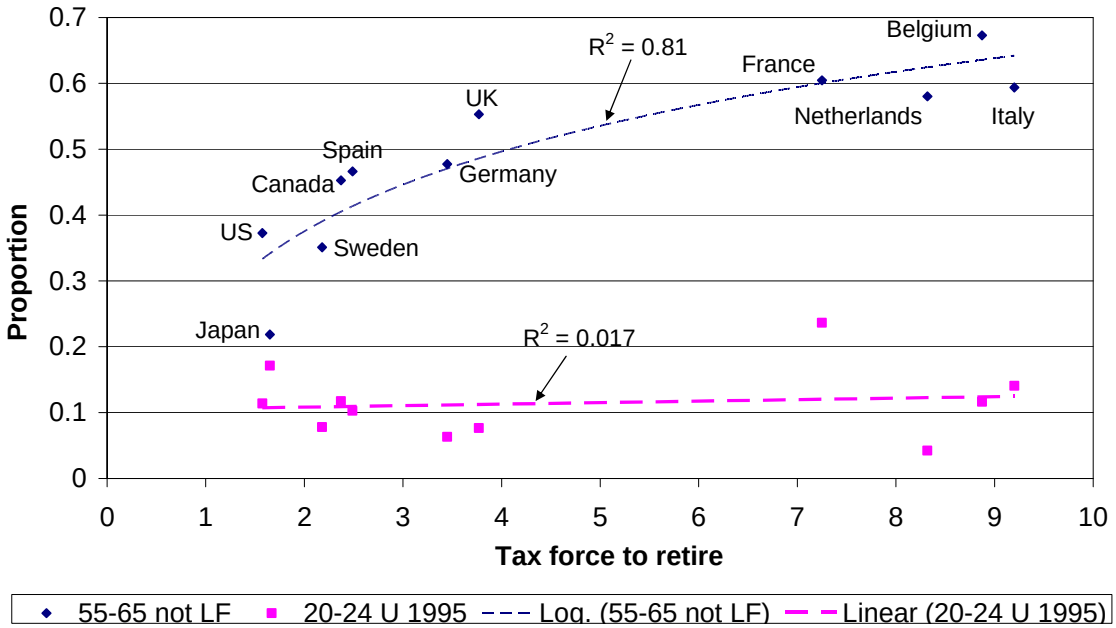


Figure 3-3. Tax force to retire, men 55-65 out of the labor force, youth 20-24 unemployed (1995)

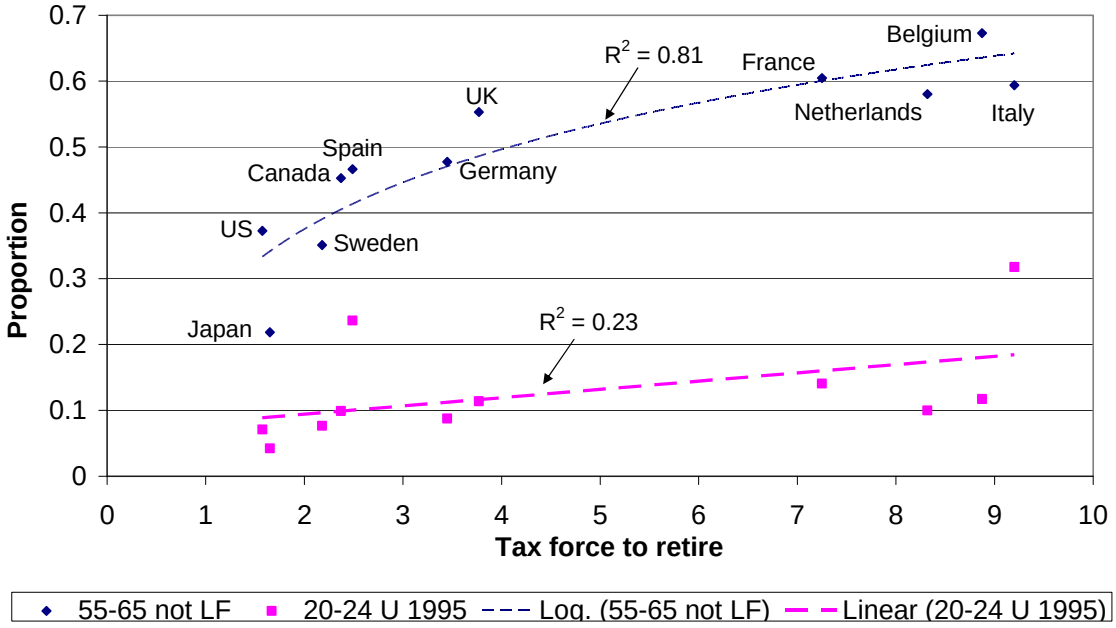


Figure 3-4. Tax force to retire, men 55-65 out of the labor force, Youth 20-24 employed (1995)

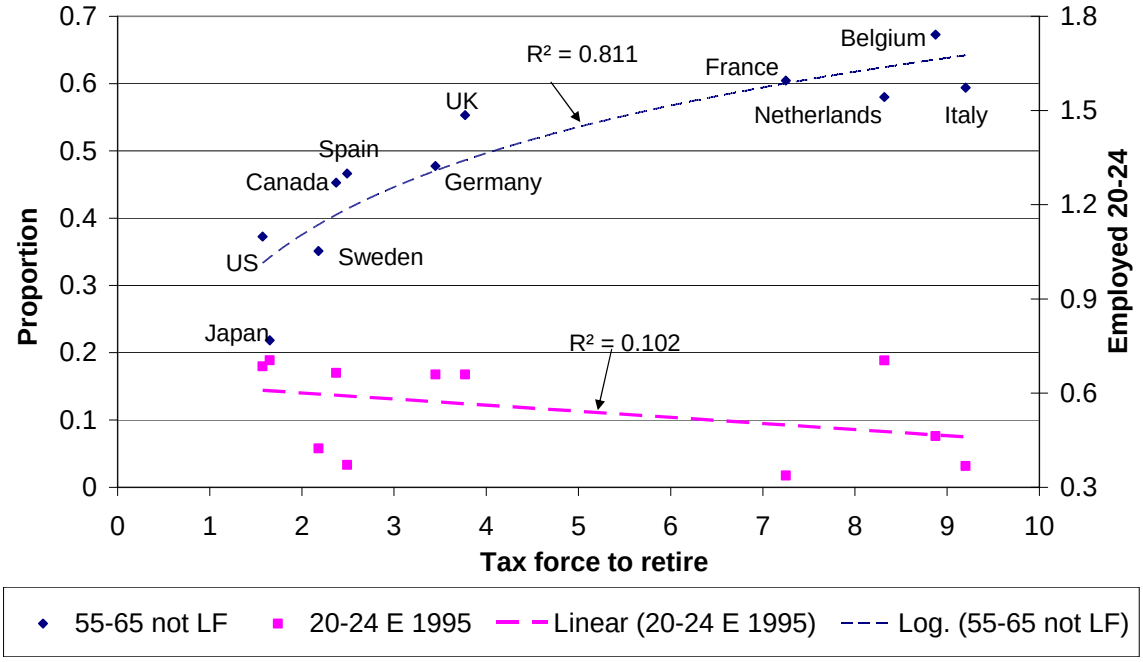


Figure 3-5. Tax force to retire, men 55-65 out of the labor force, prime age 25-54 unemployed (1995)

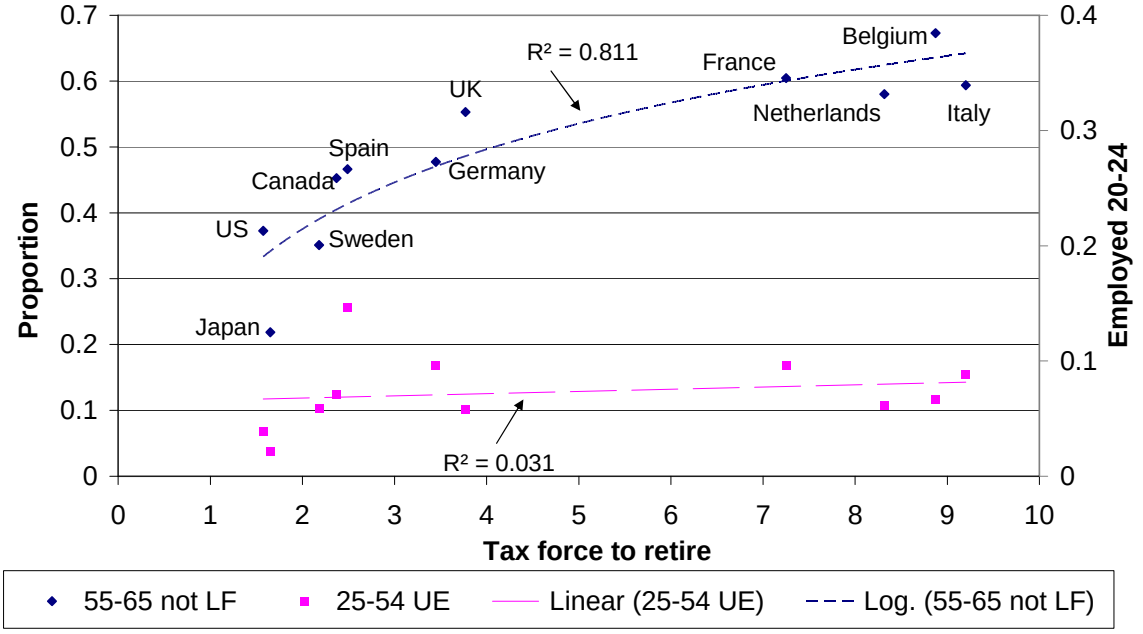
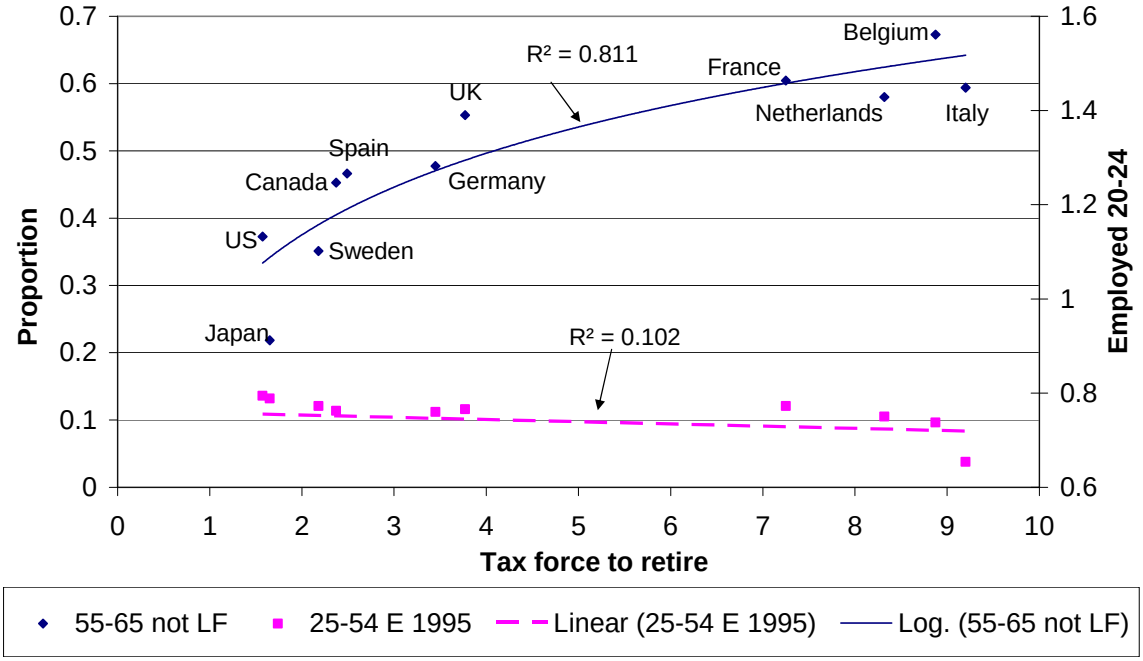


Figure 3-6. Tax force to retire, men 55-65 out of the labor force, prime age 25-54 employed (1995)



4. Within-Country Estimates of the Relationship between the Employment of the Old and the Young

In many instances it is possible to trace employment trends for both young and older workers that preceded a social security reform in a country and then to trace the effect of the reform on the labor force participation of older workers and, in turn, the relationship between the effect on older workers and the effect on younger workers. Several such illustrations are presented here. The illustrations serve two important purposes. One reason is simply to demonstrate—as we have in prior phases of the project—the effects of reform on the labor force participation of older workers, and then to show the corresponding effect on younger persons.

The second reason to present the illustrations is to help to judge the extent to which the further results shown below are affected by an important issue that complicates estimation of the causal relationship between employment of the old and the young. Suppose—as is now often claimed—that the program provisions that induced older persons to leave the labor force were prompted by increasing youth unemployment. In this case, a decline in youth unemployment following the introduction of retirement incentives could simply have been a continuation of the pre-incentive decline, and not caused by the incentive-induced decline in the employment of older persons. To address this issue, we have selected some examples in which specific reforms were apparently not prompted by concerns about youth unemployment (or employment). We call

these “natural experiment” or sometimes “natural experiment like” examples. We want examples where the reform that induced older persons to leave the labor force was “exogenous.” That is, not motivated by the employment or unemployment of youth. Or, we want examples that are not contaminated by the “endogeneity” problem. There is no sure way to correct for the problem, to the extent that it exists. But, as comparison with subsequent results show, the “natural experiment” results—that are not contaminated by endogeneity—are very similar to the findings from comparisons in which we are less sure of the extent of endogeneity. Thus the fact that later results are much like the findings from these and other natural experiments lends credence to the results obtained by other estimation methods.

We have emphasized the “endogeneity” issue. The natural experiment illustrations also address an additional and closely related issue. Economic shocks to the economy are likely to induce parallel movements in both the employment of the old and the employment of the young. We would like to evaluate the effect of precipitating events that are intended to induce older persons to leave the labor force, without a contemporaneous influence on the employment of the young—unlike macro economic shocks that tend to affect both simultaneously. The illustrations below also avoid the confounding effect of economic shocks. Thus the fact that later results are much like the natural experiment findings also adds credence to later results that could be confounded by imperfect control for macro shocks.

Consider first an example for Germany. Before 1972, the social security retirement age in Germany was 65, except for disability, and there was no social security early retirement age. But legislation in 1972 provided for early retirement at age 60 for women and at age 63 for men (given the accumulation of 35 required social security work years). In addition, increased liberal use of disability and unemployment benefits effectively expanded the early retirement option. Beginning in 1972 (with further provisions over the next 20 years), social security early retirement benefits were made available with no actuarial reduction in benefits available at the normal retirement age; benefits if taken at the early retirement age were the same as if they were taken at the normal retirement age. Delayed benefits were increased only through years of service, about 2.2 percent a each year, well below an actuarially fair adjustment. The 1972 reform greatly increased the incentive to leave the labor force early. Over the next four years the employment rate of persons 55 to 64 fell by about seven percentage points, a decrease of over 17 percent.

Looking at the unadjusted data in Figure 2-1c, it seems clear that this change could not have been motivated by an increase in the unemployment rate of youth, since this rate had been very low throughout the prior decade. The employment rate of youth had been falling in previous years, however. The adjusted data show essentially no change in either the unemployment or the employment rate over the prior 6 years, however.

The 1992 reform introduced actuarial adjustment of benefits, to be phased in beginning in 1998. In addition, benefits were based on net wages, rather than

gross wages, which further reduced the incentive to leave the labor force. Since this reform reduced the incentive for older persons to leave the labor force, it could not have been motivated by the desire to provide jobs for the young by inducing older persons to leave the labor force. Indeed, the labor force of older persons increased following this reform. Between 1997 and 2006, the employment rate of older persons increased from about 0.40 to 0.49, an increase of about 23 percent.

What was the effect of these reforms on the employment of youth? The results are shown in Figures 4-1a and b. Figure 4-1a shows results based on the unadjusted data. A seven percentage point reduction in the employment rate of older persons between 1972 and 1976 was associated with a two percentage point reduction in the employment of youth, not an increase, and was associated with a 1.7 percentage point increase in the unemployment rate of youth, not a reduction. The 15 percentage point increase in the employment rate of older persons following the1998 actuarial adjustment phase-in was associated with no change, not a decrease, in employment rate of youth and a slight reduction, not an increase, in the unemployment rate of youth. The results based on the adjusted data, shown in Figure 4-1b are essentially the same. Thus the effect of these reforms was quite inconsistent with the boxed economy view of the German economy.

Figure 4-1a. Response to reforms in Germany, 1972 and 1998 to 2006, unadjusted data

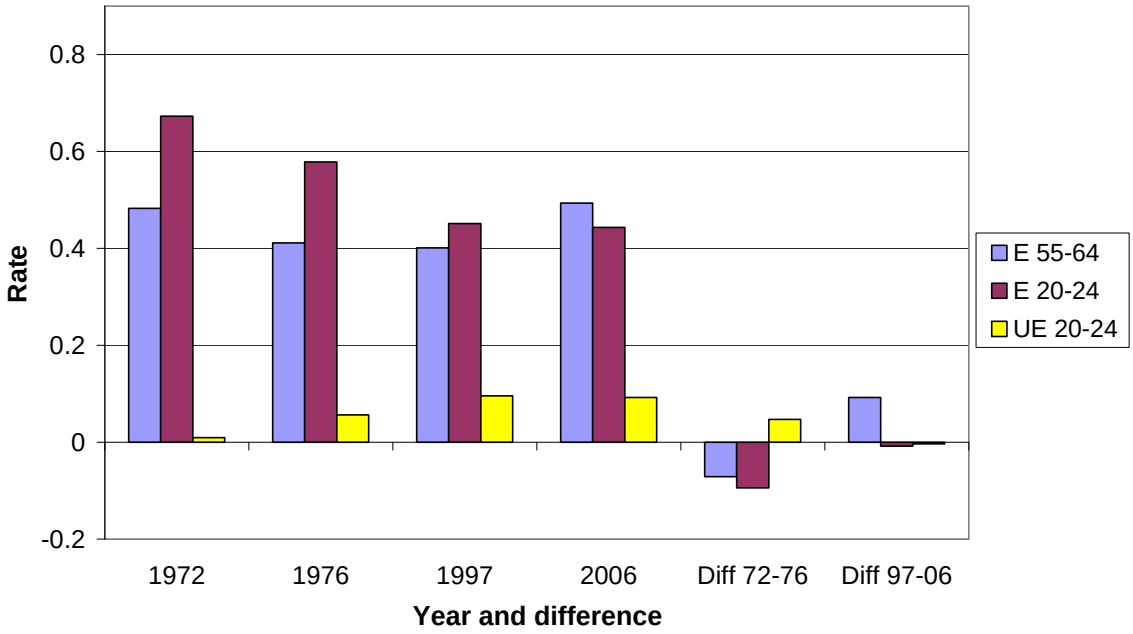
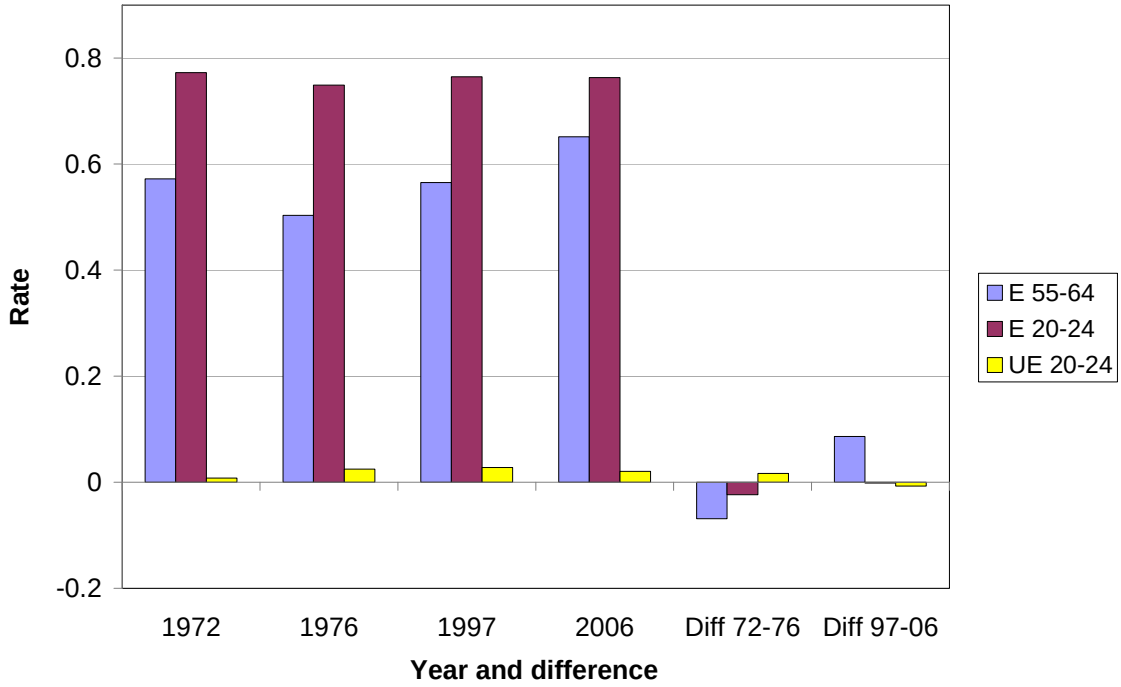


Figure 4-1b. Response to reforms in Germany, 1972 and 1998 to 2006, adjusted data



The experience in France provides another, but somewhat more complex, illustration. Prior to 1972, the French normal social security retirement age was 65 and early retirement provisions were uncommon. Beginning in the early 1970s there was a series of reforms that provided early retirement incentives, including more generous benefits and guaranteed income for persons age 60 and over who lost their jobs. The first of the series of reforms was encoded in the Loi Boulin of 1971. A further series of reforms was put in place between 1977 and 1983. In 1983, age 60 became the normal retirement age.

Prior to 1972, the youth employment rate was rising and the youth unemployment rate had increased only slightly. Thus it seems unlikely that the 1971 reform was prompted by youth employment concerns. By the time of the reforms beginning in 1977, however, the youth unemployment rate was rising and the youth employment rate had begun to fall. Even though it appears that the fall in youth employment and rise in youth unemployment were tied to the reforms in the early 1970s, some proponents of the 1977 and 1983 reforms used the, by then, deteriorating youth employment and unemployment trends to justify the reforms. That is, while the first of the series of reforms—that induced older persons to leave the labor force—could not have been justified by adverse trends in youth employment and unemployment, by the time of the later reforms in the series, after the youth trends had deteriorated on the heals of the early reforms, the deterioration was used to justify further inducement for older persons to retire. Thus, while the first of the long series reforms seem exogenous with

respect to youth employment, the exogeneity of the later reforms in the series is unclear.

In 1993, there was a reversal. The number of years of work required to earn full benefits was raised from 37.5 to 40 years and the rules for computing the replacement rate became less generous. If seems evident that the 1993 reform could not have been prompted by the continuing adverse trends in youth employment.

Here we consider the combined effects of the 1971 and subsequent reforms, using the period 1972 to 1993. (In the next section we compare reforms in France and the UK and use a somewhat different range of years.)

The results of these reforms can be seen in Figures 4-2a and 4-2b. Figure 4-2a, based on unadjusted data, shows that as the employment of older persons fell by about 21 percentage points between 1971 and 1993, the employment of youth also fell by approximately an equal percent. And the youth unemployment rate increased. In short, the series of reforms was very successful in inducing older persons to leave the labor force. But to the extent that the reforms were prompted by hope of providing more job opportunities for youth (only the later reforms in the series), they failed. There is no evidence that the reforms provided more jobs for youth.

On the other hand, when the employment of older persons increased between 1993 and 2005, the employment of youth also increased and the unemployment of youth declined. The adjusted employment series for France show substantially reduced fluctuations in the employment trends over time, as

can be seen by comparing the unadjusted and the adjusted series in Figure 2-1f. Nonetheless, the direction of the changes are the same when based on adjusted data, as shown in Figure 4-2b. Again, the results show no evidence of the boxed economy proposition.

Figure 4-2a. Response to reforms in France, 1971-1983 and 1993, unadjusted data

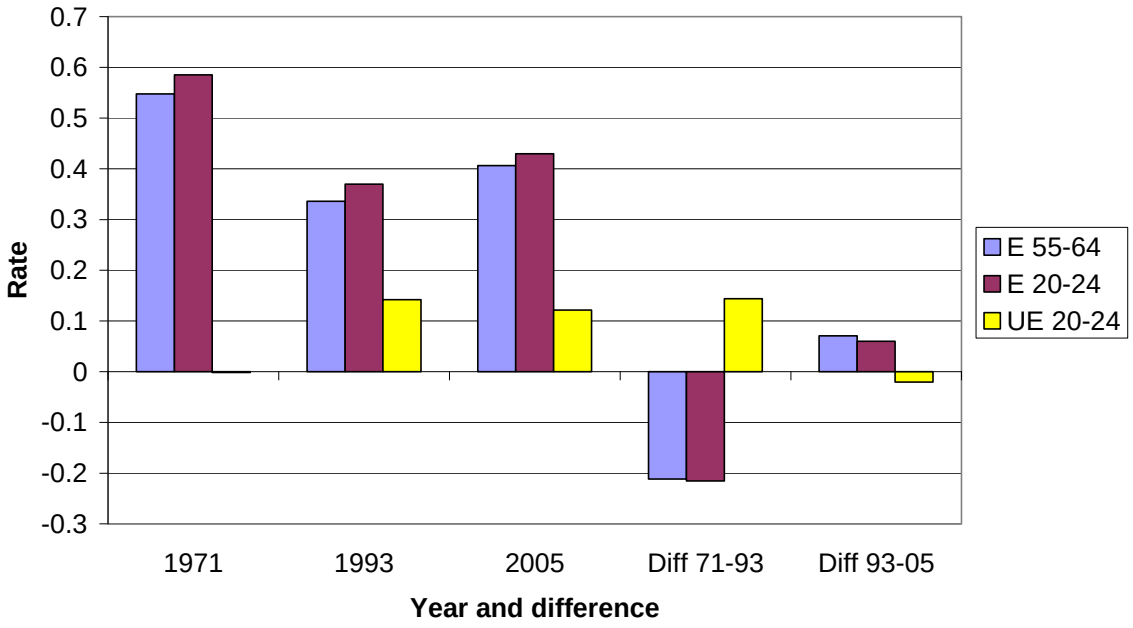
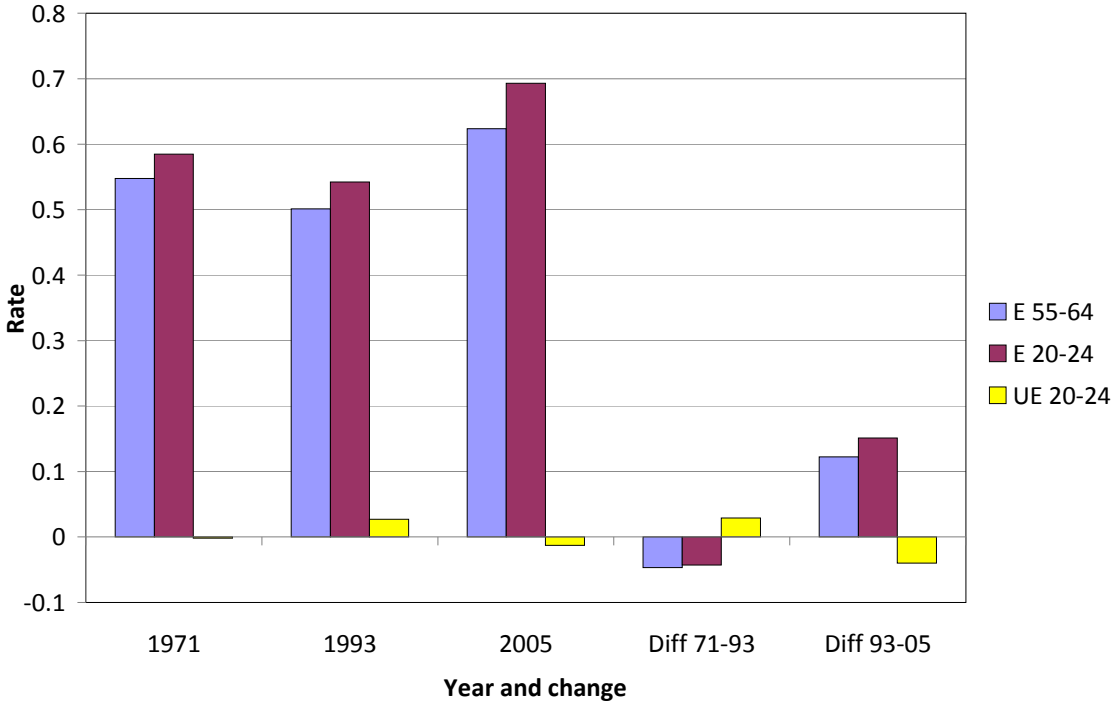


Figure 4-2b. Response to reforms in France, 1971-1983 and 1993, adjusted data



A reform in Denmark provides a very striking example. In 1979, the Post Employment Wage (PEW) program was introduced. It induced an almost immediate 28 percent drop in the labor force participation rate of men 61 to 65. Prior to the 1979 reform, the employment rate of youth had been increasing and the unemployment rate of youth had changed little since 1975. Thus it seems unlikely that the reform was prompted by a fall in the employment rate or an increase in the unemployment rate of youth. The response to this reform is shown in Figure 4-2a, based on unadjusted data. Between 1978 and 1983 the employment rate of men 61 to 65 fell by almost 23 percentage points, a decline of 35 percent. Over the same period the employment rate of all youth 20 to24 fell by about 4 percentage points and the unemployment rate of youth increased by about 4 percentage points. The results based on adjusted data are shown in

Figure 4-3b and tell the same story. Again, this "natural experiment" shows no evidence of the boxed economy proposition.

In short, each of these "natural experiments" is consistent one with the other, and none of them is consistent with the boxed economy proposition.

Figure 4-3a. Response to the 1979 reform in Denmark, unadjusted data

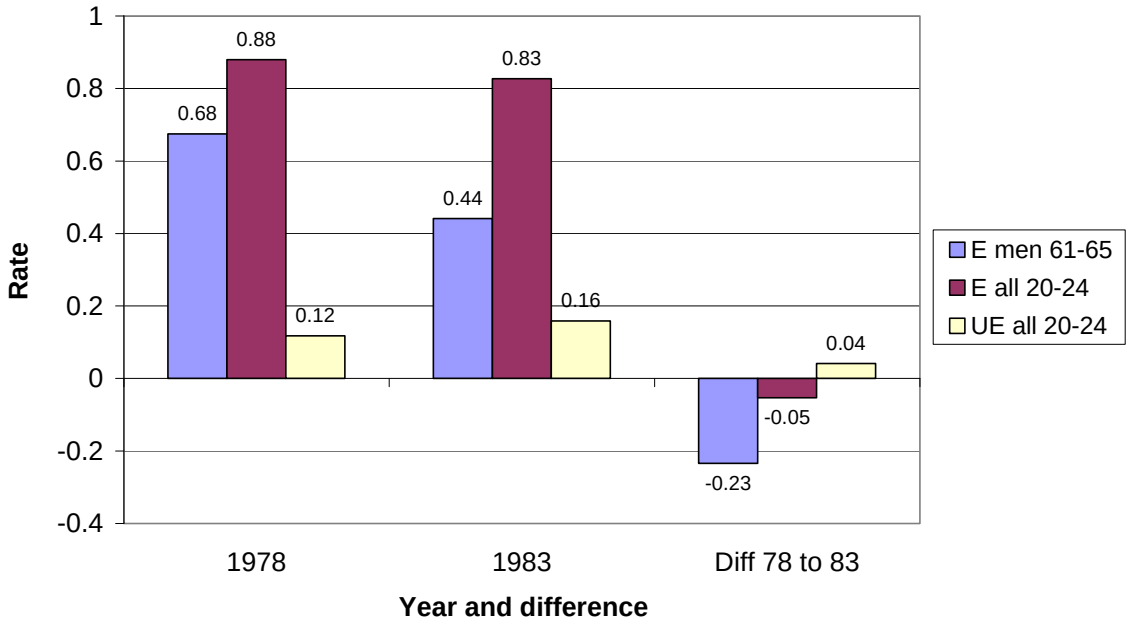
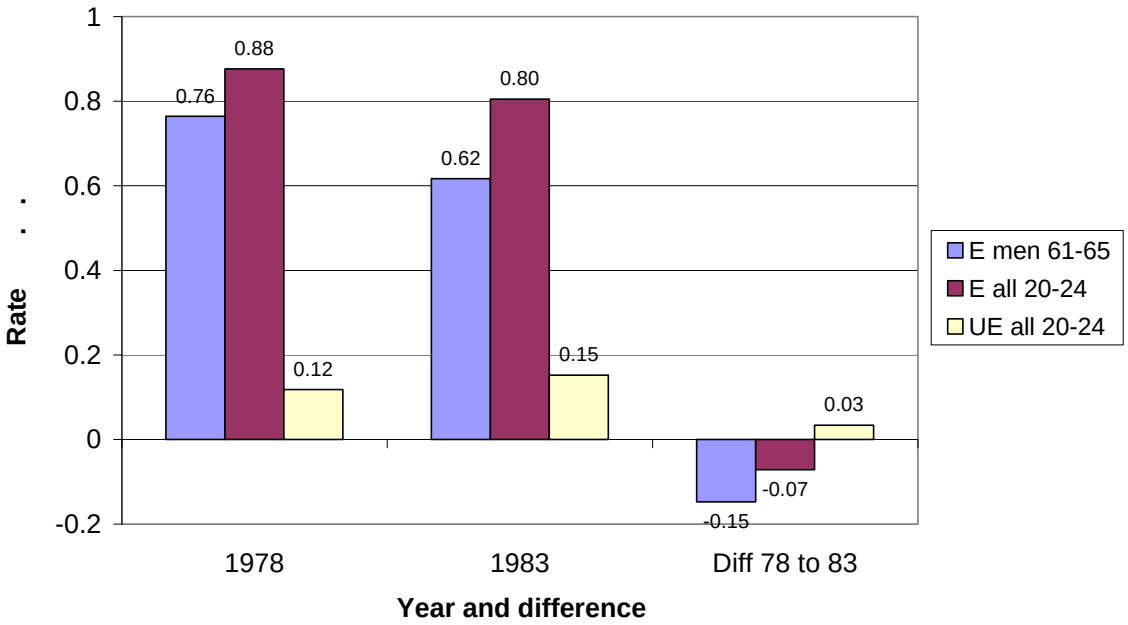


Figure 4-3b. Response to the 1979 reform in Denmark, adjusted data



5. Cross-Country Estimates of the Relationship between the Employment of the Old and the Young

The examples in the section above are “natural experiment” estimates of the effects of reforms in selected countries. The results in this section are based on cross-country comparisons.

Before considering comparisons across all countries, we begin by comparing the employment trends in two countries—the United Kingdom and in France—and then by comparing natural experiment estimates of the responses to reform in the two countries. These two countries provide an illustration of the effect of differences in reform on the employment of older persons and, in turn, on the consequent tie between the employment of older persons and the employment of youth.

Figure 5-1 is abstracted from Figure X in the United Kingdom chapter that shows trends for four age groups. Figure 5-1 shows employment trends for the 60 to 64 age group only. Between 1968 and 1983, the trends were similar in both countries. Prior to 1972, the French normal social security retirement age was 65 and early retirement provisions were uncommon. In the early 1970s “early retirement provisions” were introduced by way of guaranteed income for persons age 60 and over who lost their jobs. (Provisions to facilitate early retirement began with provisions in specific industries in the private sector in the late 1960s). In 1983, age 60 became the normal retirement age in France. In addition, guaranteed income was provided for persons age 57 and older who lost their jobs. The downward trend in the employment of the 60 to 64 age group was continuous over the whole 1968 to 1983 interval in France. The downward trend

in the United Kingdom began at the time of the 1975 SERPS reform and continued until the end of the interval. The downward trend was also facilitated by the 1977 Job Release Scheme.

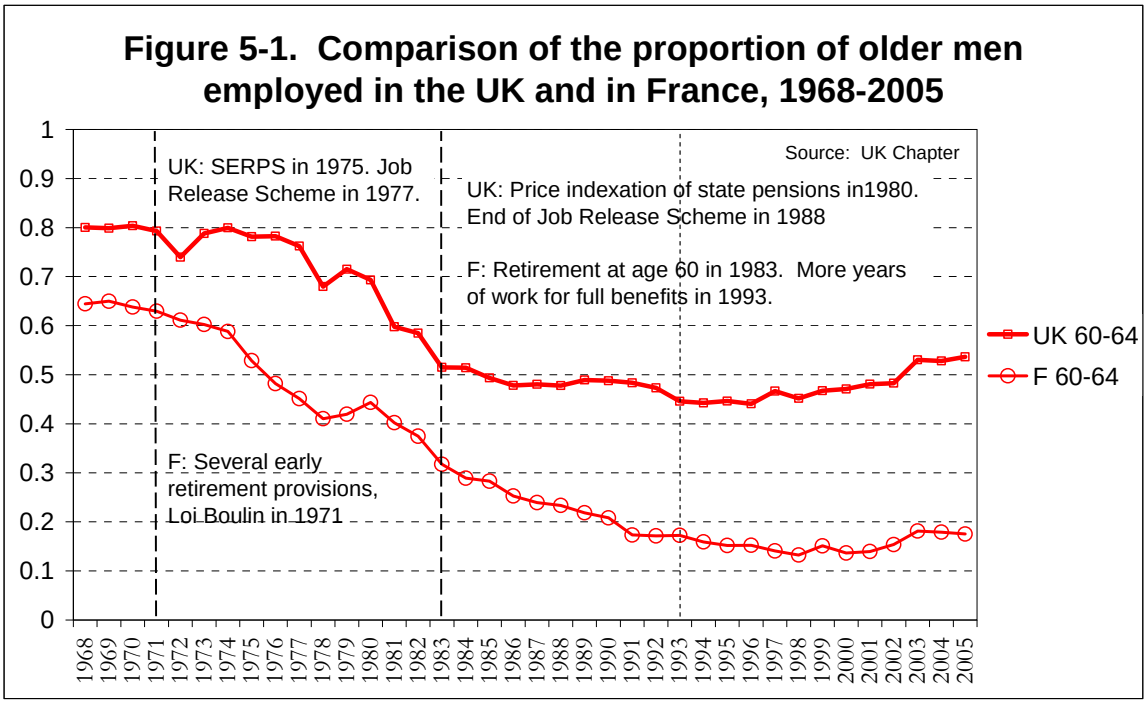
After 1983, however, there was a striking divergence in the trends in the two countries. With the 1983 reform establishing age 60 as the normal retirement age in France, the downward trend in the employment of older men in France continued and was long-lasting, continuing until 1998. The eventual reversal was facilitated by the 1993 reform that increased the number of years of work required to get full benefits and reduced the replacement rate. On the other hand, the downward trend in the United Kingdom changed abruptly. The Job Release Scheme was terminated in 1988. (In addition, private sector firms were converting from DB plans—which typically have large early retirement incentives—to DC plans without such incentives. But in the late 1980s most older workers were not yet affected by this shift.) The employment of men 60 to 64 turned upward in 1993. In essence, the difference between the post-1983 trends in France and the United Kingdom arises because the reforms in France remained in effect for many years while the reforms in the United Kingdom were short-lived.

To capture as closely as possible to differences in the reforms ongoing in the two countries in different time intervals, we show data for four time periods—1971, 1983, 1993, and 2005—and the corresponding three intervals.

In the years between 1968 and the early 1970s, there was little change in the employment or the unemployment of youth in either country. Thus it is

unlikely that the early reforms in either country were prompted by decline in the employment or increases in the unemployment of youth in either country (as emphasized for France in the prior section).

Figure 5-1. Comparison of the proportion of older men employed in the UK and in France, 1968-2005



Figures 5-2a and 5-2b and Figure 5-3a and 5-3b summarize the differences in the two countries, both with respect to the employment of older persons and with respect to the employment and unemployment of the young. The comparisons in these figures are based on men only in the 60 to 64 age group, but all youth in the 20 to 24 age group.

Consider first the results based on the unadjusted data in Figures 5-2. In the years between 1971 and 1983 the employment of older persons was declining in both countries. The employment of youth was also declining in both countries and the unemployment of youth was increasing in both countries. The

differences in all three trends are very similar in the two countries. But after 1983 when the employment trends of older persons diverged in the two countries the employment trends for young persons also diverged. In the UK, with only a small decline in the employment of older men between 1983 and 1993, there was little change in the employment and unemployment of youth during this period. Between 1993 and 2005, the employment of men increased substantially and there was an increase in the employment and a decrease in the unemployment of youth. On the other hand, in France, where the employment of the older group continued to decline, the employment of youth also declined substantially. The employment of men continued to decline in the UK until 1998 but then began to increase. By 2005 the employment of youth had increased substantially and the unemployment of youth had declined slightly.

The results based on the adjusted data are shown in Figures 5-3. The general pattern of change in both countries is the same as the pattern based on the unadjusted data. For both the UK and France, however, the trends in the adjusted data differ substantially from the trends in the unadjusted data, as shown in Figure 2-1f. The adjusted data, suggests, for example, that in both countries much of the fall in the employment of older men between 1971 and 1983 may be explained by macro shocks to the economies; the differences in the adjusted trends are smaller than the differences in the unadjusted trends in both countries. By 2005, the adjusted data show a substantial increase in the employment of older men in both countries and a corresponding increase in the employment and a decrease in the unemployment of youth in both countries.

Figure 5-2a. Comparison of employment trends in the UK and France, 1971 to 2005, unadjusted data, UK

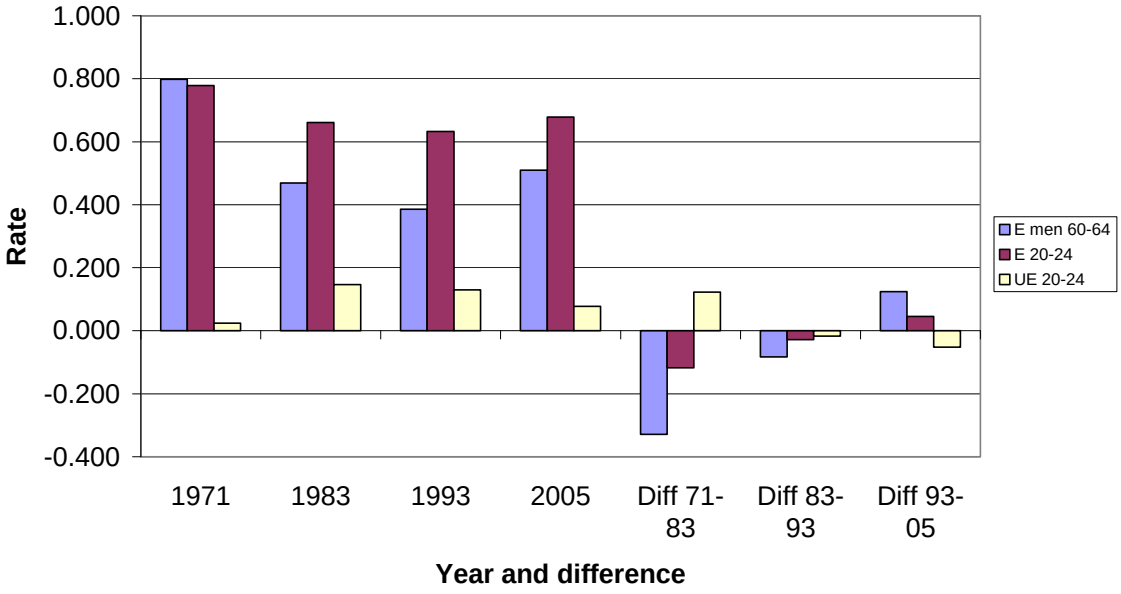


Figure 5-2b. Comparison of employment trends in the UK and France, 1971 to 2005, unadjusted data, France

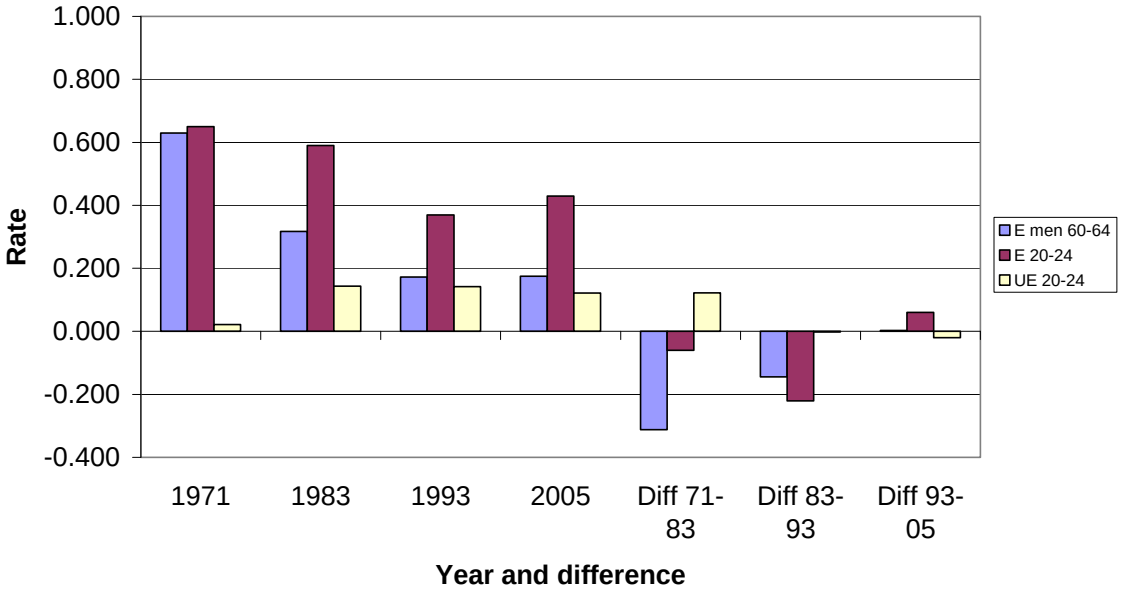


Figure 5-3a. Comparison of employment trends in the UK and France, 1971 to 2005, adjusted data, UK

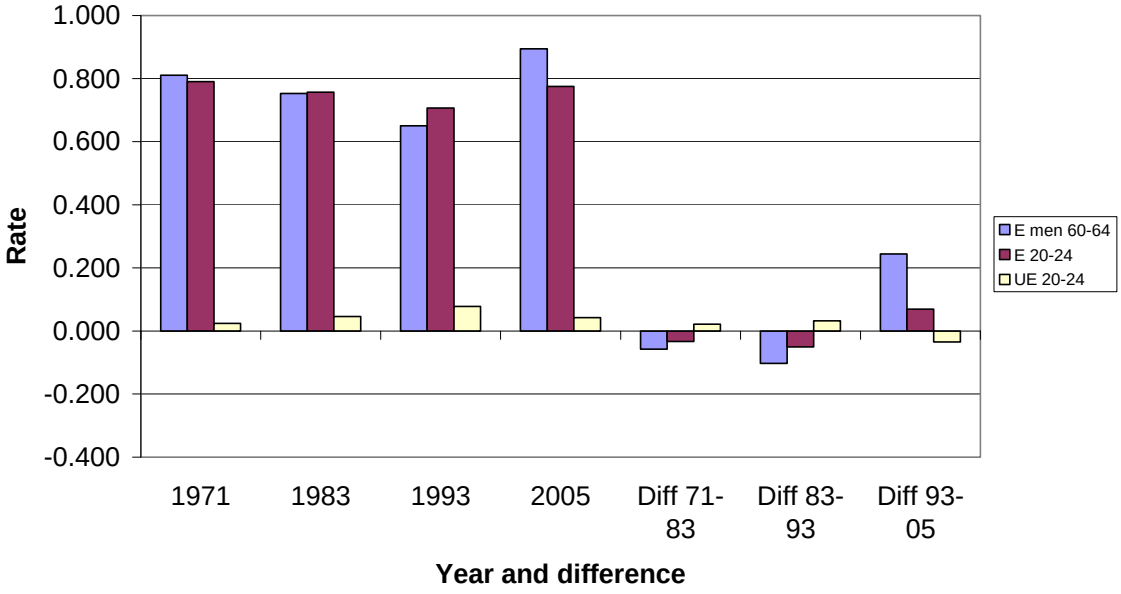
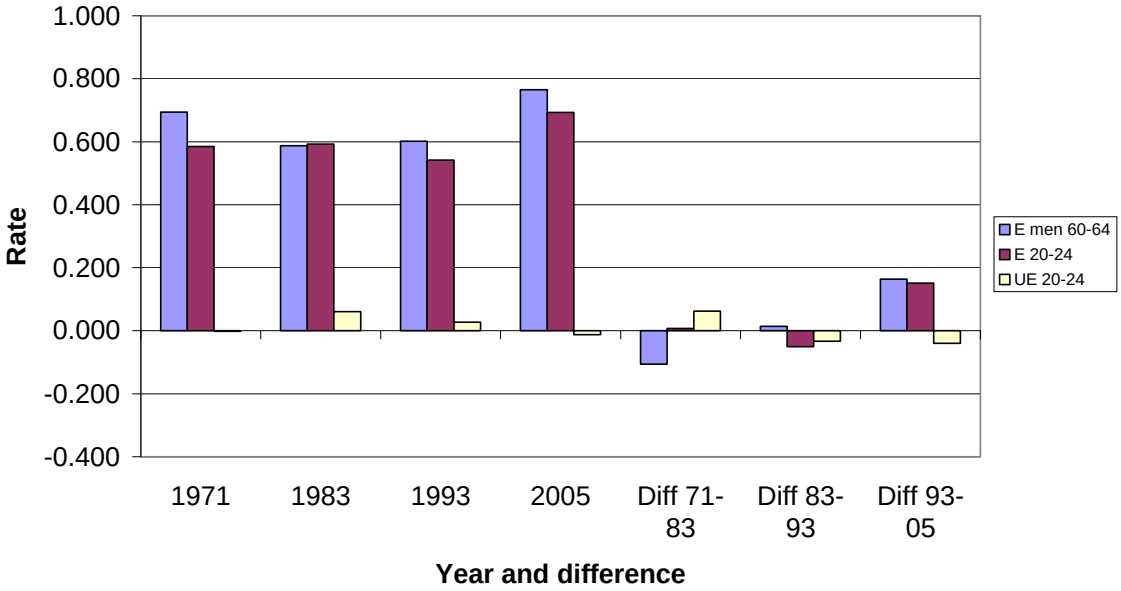


Figure 5-3b. Comparison of employment trends in the UK and France, 1971 to 2005, adjusted data, France



Like the country-specific examples above, this comparison shows natural experiment like estimates of the effect of the reforms in each country on the employment of older persons in each country, and the relationship between the employment of the old and the young in each country. The differences between in the employment trends in the two countries correspond closely to the differences in reform in the reforms in the countries. The findings are clearly inconsistent with the boxed economy proposition.

Now consider a comparison across all participating countries. In each of the 12 countries, the employment of persons 55 to 64 increased over the last 10 or 15 years.[4] This can be seen in Figures 2-1a to 2-1l in section 2. In most countries, the increase began between the mid 80s and the mid 90s, but the beginning date varied from country to country—between 1983 in the United States and 1999 in Italy. In many countries the increase can be ascribed to a particular reform that limited early retirement, as illustrated in some of the country-specific illustrations above. But even if a precipitating reform cannot be narrowly identified, it is implausible that a reform, or other event, that precipitated the increase in the employment of older persons was motivated by a desire to increase the employment—or reduce the unemployment—of youth. Thus, these increases provide a good natural experiment—not plagued by the endogeneity

[4] In prior phases of the project, we emphasized the dramatic decline in the labor force participation of men 60 to 64 between the 1960s and the mid 1990s (Gruber and Wise, 1999). We also emphasized the reversal to an increase in the labor force participation of men 60 to 64 in most of the countries beginning in the mid 1990s and noted that the increase could be attributed to specific reforms in many countries (Gruber and Wise, 2007). Here we focus on men and women combined and on a broader age interval, 55 to 64 for all persons, instead of 60 to 64 for men.

problem—to judge the effect of the increase in the employment of older persons on the employment of youth.

The results are presented in a series of figures. Most of the figures are based on adjusted data, although some comparison figures are shown for unadjusted data as well. Figure 5-4 shows the difference in the employment rate of older persons from the beginning of the upturn to the end of the data in each country, together with the difference in the employment and unemployment rate of youth. The countries are ordered by the increase in the employment of older persons, from least to greatest. It is apparent that a greater increase in the employment of older persons is not associated with a decrease in the employment of youth and is not associated with an increase in the unemployment of youth. On average across all countries the increase in the employment of older persons is 0.081 percentage points, the increase in the employment of youth is .047 percentage points and the decrease in the unemployment of youth is -0.026 percentage points.

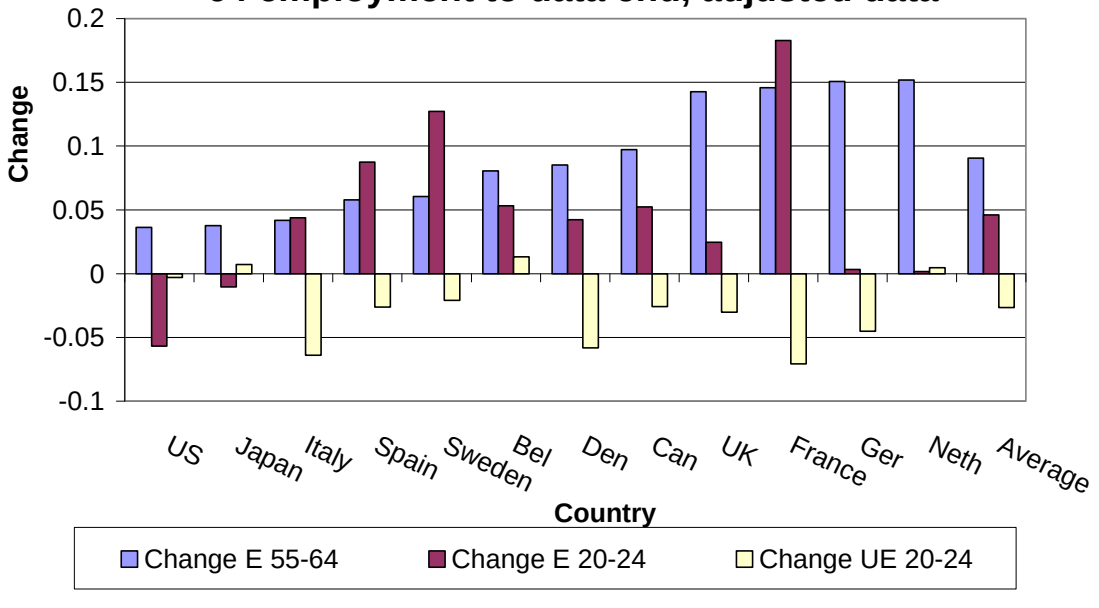
Figure 5-5 shows the fit of the relationship between the employment of older persons and the employment of youth. Figure 5-6 shows the fit of the relationship between the employment of older persons and the unemployment of youth. It is clear that if anything, the relationship to youth employment is slightly positive and the relationship to youth unemployment slightly negative. A boxed economy view would suggest exactly the opposite.

Figure 5-7 compares the six countries (in Figure 5-4) with the least increase to the six countries with the greatest increase in the employment of the

old. The six countries with the greatest increase in the employment of the old had the greatest increase in the employment of youth and the greatest decrease in the unemployment of youth.

Because the change in youth employment depends in part on when the upturn for older persons began, we have scaled the differences by the ratio of the value at the end of the period (the last observation in the data) to the value at the beginning of the upturn. Using this measure, the six countries with the least increase are compared to the six with the greatest increase in Figure 5-8. Based on this measure, there is essentially no difference between change in the employment and unemployment of youth in the two groups of countries.[5]

Figure 5-4. Change in the employment of persons 55-64 and in the employment and unemployment of persons 20-24, from beginning of last upturn in 55-64 employment to data end, adjusted data



[5] France is excluded from the average ratio for unemployment of youth because the adjusted unemployment rate for France declined from a positive to a negative value between the beginning and end of the period. Japan is excluded for the same reason.

Figure 5-5. Relationship between the increase in 55-64 employment and 20-24 employment, from beginning of last upturn in 55-64 employment to data end, adjusted data

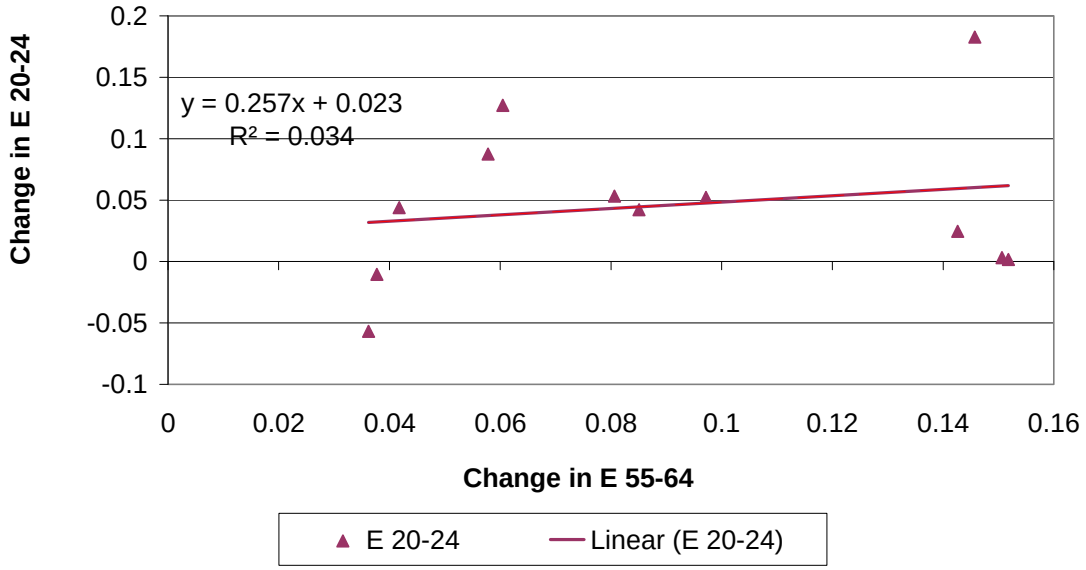


Figure 5-6. Relationship between the increase in 55-64 employment and 20-24 unemployment, from beginning of last upturn in 55-64 employment to data end, adjusted data

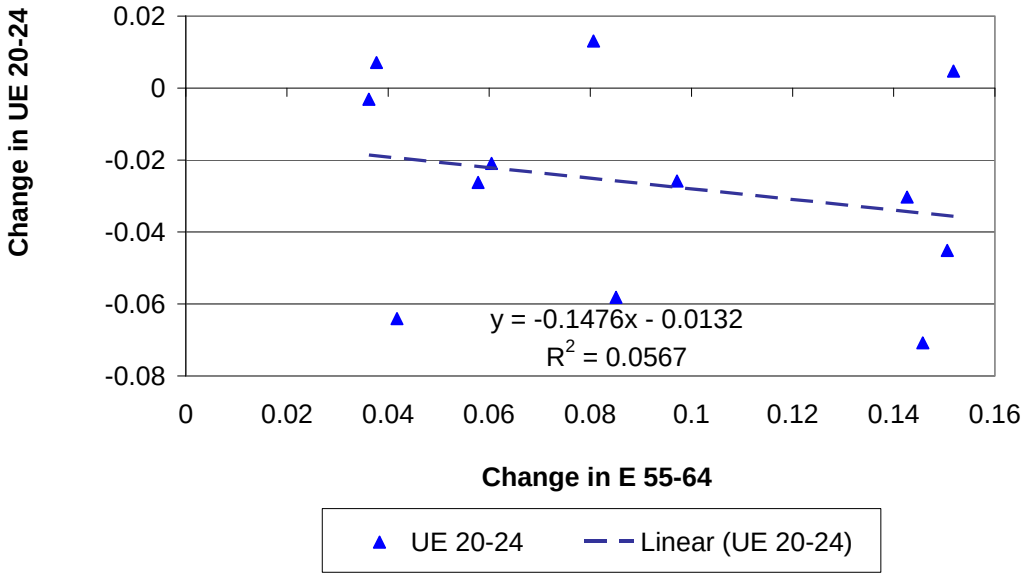


Figure 5-7. Comparison of the 6 countries with the least to the 6 with the greatest increase in the 55-64 employment, from beginning of last upturn in 55-64 employment, adjusted data--difference

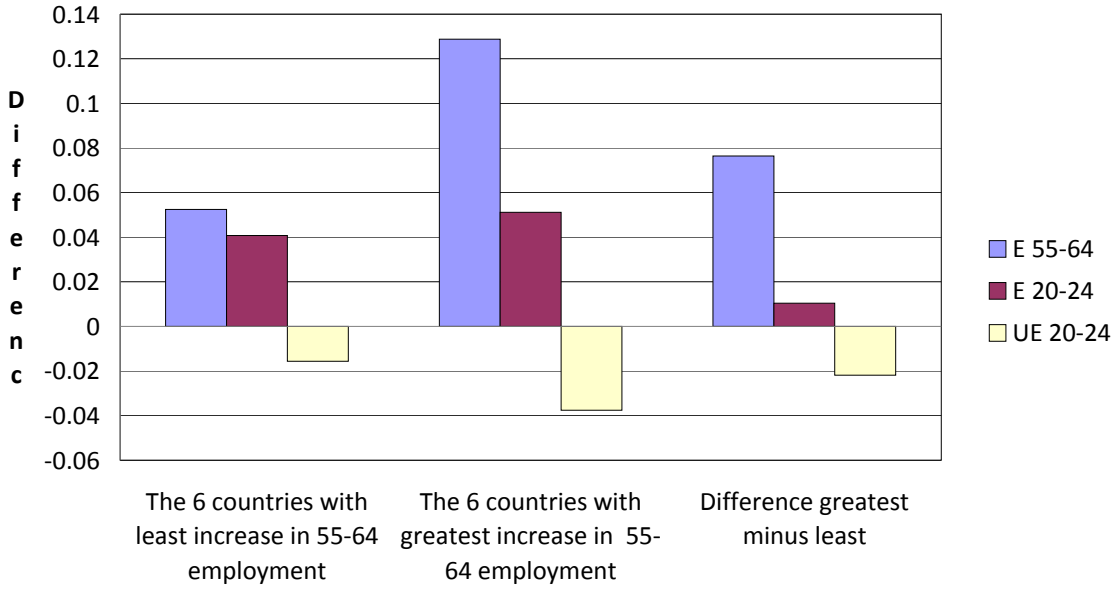


Figure 5-8. Comparison of the 6 countries with the least to the 6 with the greatest increase in the 55-64 employment, from beginning of last upturn in 55-64 employment to data end, adjusted data--ratio

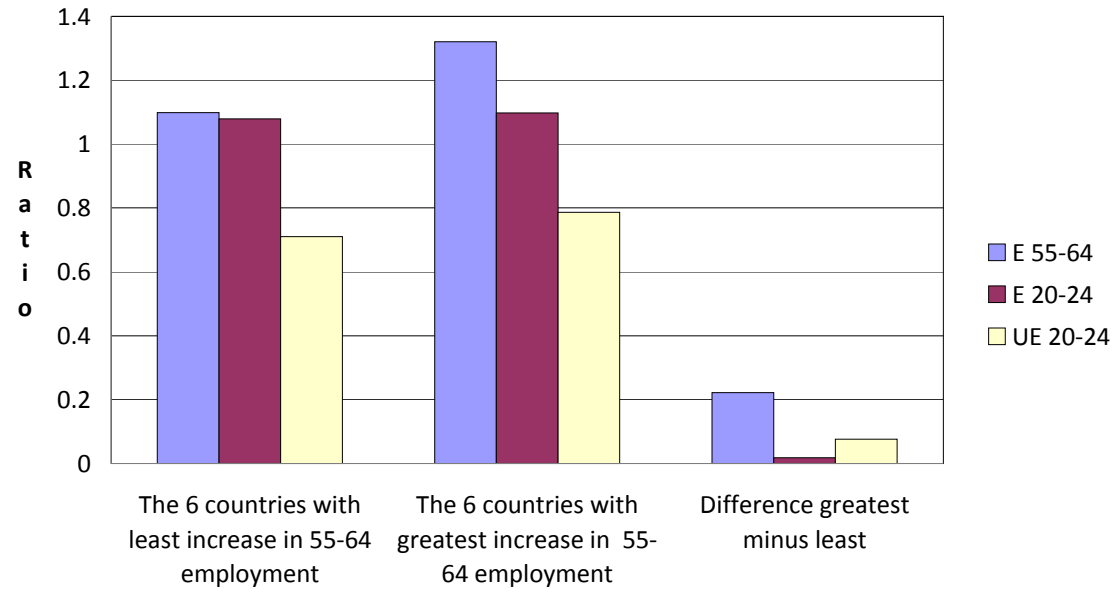


Figure 5-9. Comparison of the 6 countries with the least and the greatest increase in 55-64 employment, 1995 to 2003 in each country, adjusted data--difference 2003-1995

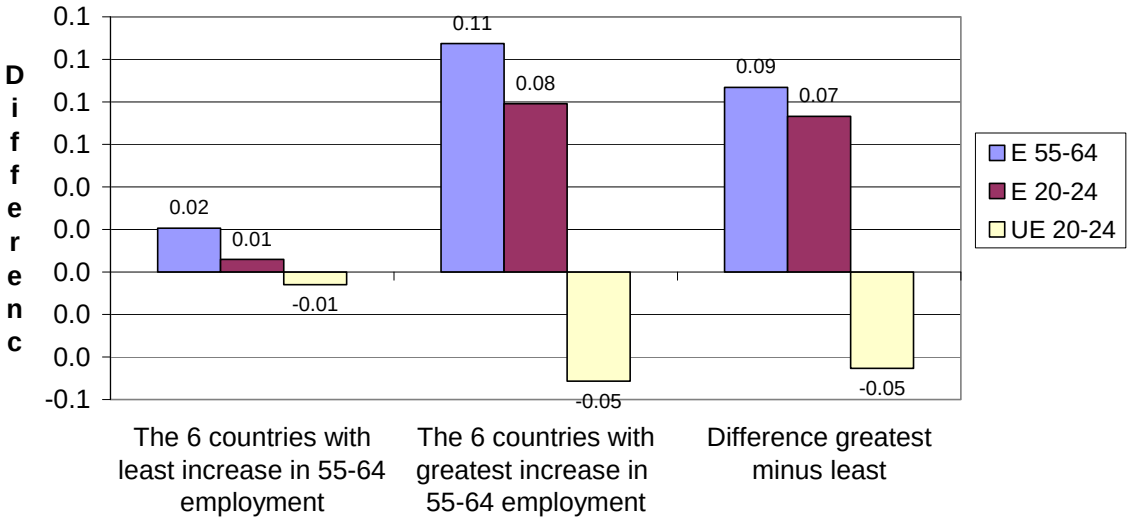
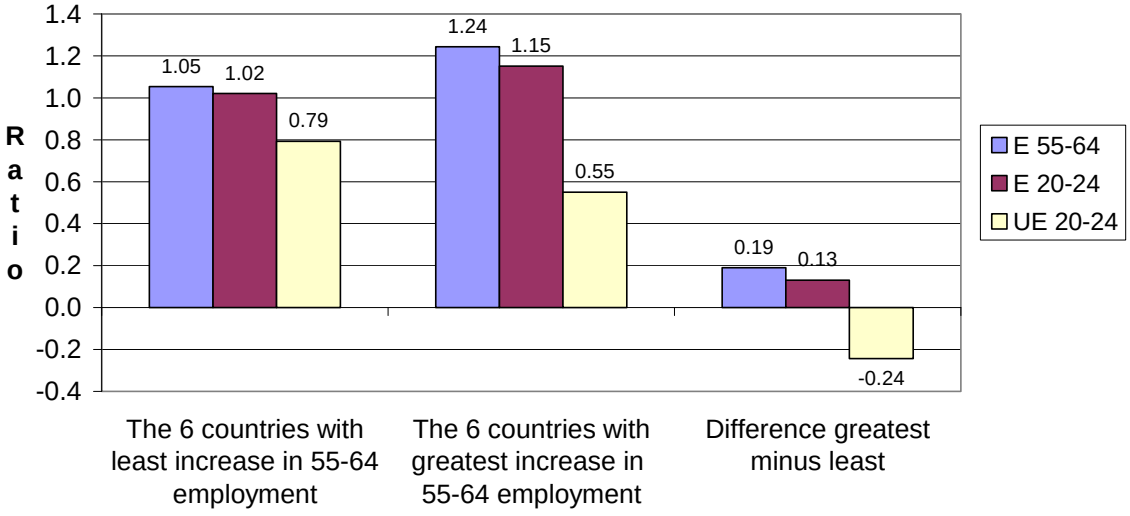


Figure Figure 5-10. Comparison of the 6 countries with the least and the greatest increase in 55-64 employment, 1995 to 2003 in each country, adjusted data--ratio 2003/1995



As a further check on the comparison, consider the change over the same time period for all countries—1995 to 2003. Again, the six countries with the least increase are compared with the six with the greatest increase in the employment of older workers. Figure 5-9 shows the results measured in differences and Figure 5-10 the results measured in ratios.[6] Both measures show that the six countries with the greatest increase in employment of the older group had a slightly greater increase in the employment of youth. Based on either measure, the difference in the unemployment of youth was close to zero. Based on the ratio measure (Figure 10), a one percent increase in the employment of older persons leads to a 0.51 percent increase in the employment of youth and a 0.06 percent decline in the unemployment of youth. Based on the difference measure (Figure 9), a one percentage point increase in the employment of older persons leads to a 0.173 percentage point increase in the employment of youth and a 0.036 percentage point increase in the unemployment of youth. (These estimates can be compared to panel regression estimates shown below.)

Thus we conclude that based on this comparison, there is no evidence that increasing the employment of older persons reduces the employment, or increases the unemployment, of youth.

The other side of the comparison of upturns across countries is the comparison of downturns. Most downturns were long-terms and occurred prior to the upturns discussed above, as can be seen in Figures 2-1a to 2-1l in section

[6] The ratio averages for youth unemployment exclude France, Germany, and Japan because the adjusted unemployment values for these countries go from positive values at the beginning of the period to negative values at the end of the period.

2. One country has two separate downturn intervals and we consider both. As shown above, many of the downturns were precipitated by specific reforms, or by a series of reforms. In this case, we compare the countries with the greatest decreases with the countries with the smallest decreases. We show results based on the ratio measure only. The results are shown in Figures 5-11 and 5-12 for unadjusted and adjusted data respectively. The figures show the averages over the 6 countries with the smallest decreases in the employment of older persons and the average over the 7 “countries” with the greatest decreases—the 7 instead of 6 to indicate that one country had two separate downward intervals.

Both figures show that the countries with the greatest decline in the employment of the older age group have the greatest decline in the employment of the young as well. The differences are somewhat smaller when based on the adjusted data.

Like the results above, these comparisons show no evidence that reductions in the employment of older persons provides more job opportunities for the young. The results are inconsistent with the boxed economy proposition.

Figure 5-11. Comparison of countries with the greates and least declines in E 55-64, ratio--unadjusted data

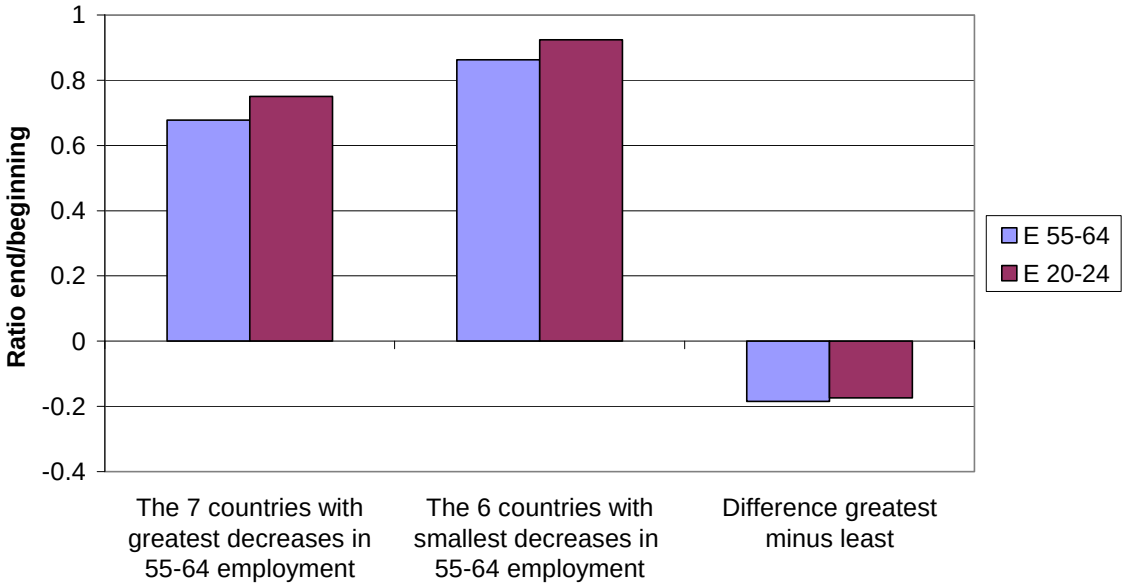
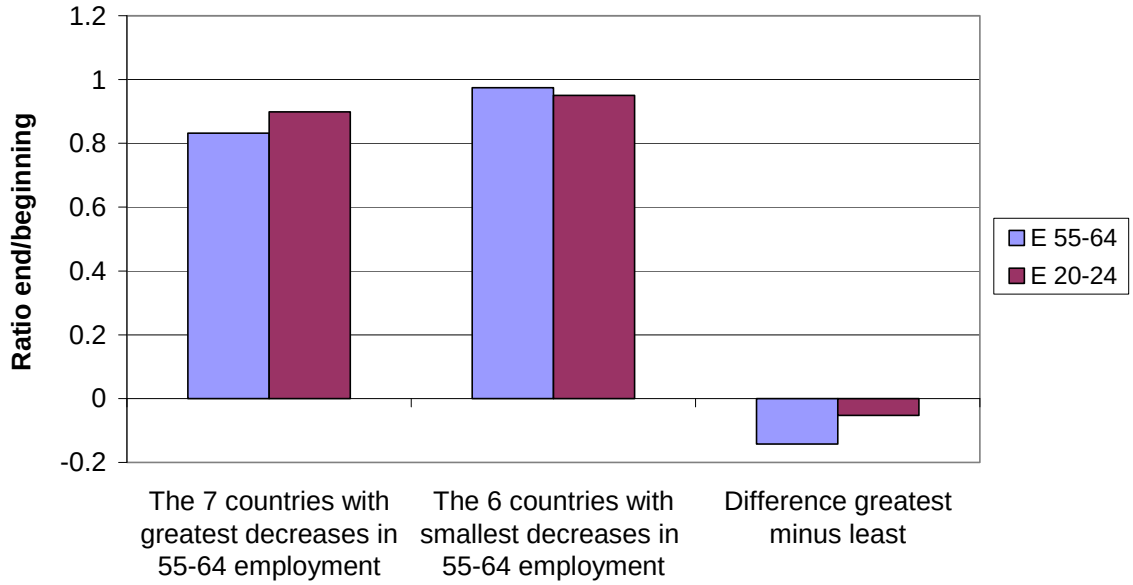


Figure 5-12. Comparison of countries with the least and greatest declines in E 55-64, ratio--adjusted data



6. Panel Regression Estimates

Perhaps the most common way to summarize data series across many countries is by way of panel regression estimation. The panel estimates allow control for country-specific attributes that affect the employment and the unemployment of the young, but that are not included as covariates in the analysis. Although this method presents a concise estimate of results, it is subject to several limitations. First, taken on its own, this method masks the results of "natural experiments" like those discussed above. Second, in the simple specification we have used, the effect of covariates is presumed to be the same in all countries. The results based on adjusted data, presented above, allow the effects of the covariates on each of the employment time series to vary from country to country. It is clear that the effect of the covariates differs from country to country. Third, judging by the "natural experiment" segments in the data, it seems evident that the most relevant year intervals for comparison—whether differences, or percent changes, or another measure—are not common to all countries.

We present panel estimates based on several different specifications. The method followed is set out in detail in the appendix. The key right-hand variable is the employment rate of persons 55 to 64. We also control directly for GDP, the growth in GDP, and the proportion of the economy in manufacturing. In addition we include country-specific effects, which control for country-specific attributes that, in addition to the covariates, affect the employment and the

unemployment of youth. We also include year effects that capture attributes that are common to all countries in a given year.

The results are shown in Table 6-1. The table shows the estimated effect of the employment of persons 55 to 64 on the unemployment and the employment of youth 20 to 24, and on the unemployment and employment of prime-age persons 25 to 54. The table also shows the estimated effect of the employment of older persons on the proportion of youth in school. Estimates are reported for several specifications: The first is “levels,” which means that levels of employment and unemployment rates are regressed on contemporaneous levels of the explanatory variables, including the employment rate of persons 55 to 64. The second is “3-year lag,” which means that the employment and unemployment rates of youth and prime-age persons in a given year are regressed on the employment of older persons three years earlier. (The other covariates are measured in the same year as the youth and prime-age employment and unemployment rates.) The third is “5-year difference,” which means that we consider, for example, the difference between youth unemployment in a given year to youth unemployment 5 years earlier. We relate this difference to the comparable 5-year differences in employment of older persons, and 5-year difference in the other explanatory variables. The fourth specification is “5-year log difference,” which is the same as the third specification but the logarithm of unemployment, for example, in a given year is compared to the logarithm of unemployment 5 years earlier. In this case, the

estimates represent the percent difference in the unemployment of youth associated with a percent difference in the employment of older persons.

Estimates are shown with and without controlling for the covariates—GDP per capita, growth in GDP, and the manufacturing proportion.

The key result is that in each specification, but one, an increase in the employment of older persons is estimated to decrease the unemployment rate of youth (and prime age persons) and to increase the employment rate of youth (and prime-age persons). Each estimate is statistically different from zero. The only estimate that does not follow this pattern is the estimated effect of employment of older persons on the unemployment rate of youth in the "3 year lag on elderly" specification, with controls. And in this case, the estimated effect is not statistically different from zero.

More precisely, with respect to the unemployment of youth the estimates for youth suggest this: With controls, a one percentage point increase in the employment of older persons changes the unemployment rate of youth between +0.11 and -0.23 percentage points. Without controls the decrease is between 0.09 and 0.44 percentage points. For the log difference specification with controls, a one percent increase in the employment of older persons is associated with a 0.91 percent decrease in the unemployment rate of youth. Without controls the decrease is 1.87 percent.

With respect to the employment of youth: With controls, a one percentage point increase in the employment of older persons increases the employment rate of youth between 0.54 and 0.91 percentage points. Without controls the

increase is between 0.32 and 0.84 percentage points. For the log difference specification with controls, a one percent increase in the employment of older persons is associated with a 0.49 percent increase in the unemployment rate of youth. Without controls the increase is 0.61 percent Comparable estimates for prime-age persons can be seen in the table.

The estimates for each specification also indicate that an increase in the employment of older persons is associated with a decrease in the schooling of youth. And each of these estimates is significantly different from zero. Across all specifications, a one percentage point increase in the employment of older persons reduces the proportion of youth in school by between 0.17 and 0.70 percentage points. A one percent increase in the employment of older persons is associated with about a 0.70 percent reduction in the proportion of youth 20 to 24 in school. This result is consistent with finding elsewhere that the greater the employment rate of youth (or the greater the opportunity for employment) the lower school attendance will be.

In short, the panel regression results are consistent with the "natural experiment" results as well as the results based on increasing and decreasing employment intervals for older persons. The findings provide no support for the boxed economy proposition. Indeed, the weight of the evidence suggests that increasing the employment of older persons provides more job opportunities for younger persons and reduces the unemployment rate of younger persons. The positive relationship is of course not consistent with the boxed economy

proposition. We have not, however, emphasized the possible mechanisms—such as lower earnings tax rates—that could produce the positive relationship.

Table 6-1. Panel estimates of the effect of the LFP of persons 55 to 64 on the unemployment rate, employment rate, and schooling of younger persons

Specification	Youth 20 to 24			Prime Age 25 to 54	
	UE	EMP	SCH	UE	EMP
No Controls					
Levels	-0.367 (0.039)	0.663 (0.076)	-0.451 (0.073)	-0.267 (0.019)	0.279 (0.042)
3-year lag on elderly employment	-0.092 (0.044)	0.321 (0.084)	-0.391 (0.073)	-0.158 (0.023)	0.065 (0.046)
5-year difference	-0.437 (0.062)	0.835 (0.078)	-0.285 (0.053)	-0.282 (0.030)	0.466 (0.037)
5-year log difference	-1.868 (0.268)	0.611 (0.063)	-0.721 (0.160)	-2.186 (0.253)	0.238 (0.021)
With Controls					
Levels	-0.232 (0.055)	0.912 (0.090)	-0.911 (0.094)	-0.191 (0.027)	0.416 (0.053)
3-year lag on elderly employment	0.110 (0.056)	0.541 (0.098)	-0.804 (0.089)	-0.056 (0.029)	0.136 (0.057)
5-year difference	-0.193 (0.081)	0.573 (0.094)	-0.179 (0.072)	-0.115 (0.039)	0.288 (0.044)
5-year log difference	-0.905 (0.329)	0.486 (0.090)	-0.619 (0.240)	-0.960 (0.260)	0.144 (0.028)

Reported is the coefficient on elderly employment

Controls include gdp per capita, growth in gdp per capita, and manf share. Each specification also includes country fixed effects and year fixed effects.

Levels regression means that we regress levels on levels.

3-year lag means that we regress the dependent variable on a 3 year lag of elderly employment

5-year difference means that we take 5th differences for the RHS and the LHS variables.

5-year log difference means that we take the log of each X and Y variable, then take 5 year differences.

7. Summary and Conclusions

In this volume, we direct attention to the oft-claimed proposition that incentives to induce older persons to retire—inherent in the provisions of social security systems—were prompted by youth unemployment. And that if the incentives to retire were removed, and older persons stayed longer in the labor force, the job opportunities of youth would be reduced. We find no evidence to support this boxed economy proposition. We find no evidence that increasing the labor force participation of older persons reduces the job opportunities of young persons. Indeed the evidence suggests that greater labor force participation of older persons is associated with greater youth employment and with reduced youth unemployment.

The results shown in this summary are based on data from the individual country papers. Some of the data in the papers was borrowed to use in natural experiment illustrations. The data from all of the country papers was also pooled to obtain estimates based on the collective information from all of the countries combined. We began the introduction by showing that the enormous waves of women entering the labor force over the past several decades varied substantially across countries and were unrelated to the small changes in the labor force participation of men across countries.

We ask whether the economic world might be different for young versus old employees. We presented results based on several different methods of inference. A striking feature of the results is the strong similarity of the findings based on these quite different methods of estimation. First we show that the tax

force to retire—that is very strongly related to the proportion of older persons out of the labor, as shown in the first phase of the project—is slightly positively related to the unemployment of youth and slightly negatively related to the employment rate of youth. Second, we show within-country "natural experiments" that demonstrate the relationship between within-country reforms and the consequent changes in the employment of the old on the one hand and changes in the employment of the young on the other hand. In each case, decreases in the employment of the old are associated with decreases in the employment of the young and increases in the unemployment of the young. Third, we show cross-country comparisons based on various comparison methods. For example, we show that the labor force participation of older persons began to increase sometime during the last 10 or 15 years and that the countries with the greatest increase in the employment of older persons had the greatest increase in the employment of the young and the greatest decline in the unemployment of the young. Fourth, we show more formal estimates based on panel regression analysis, based on various specifications. Like the results based on the other methods, the findings based on formal regression analysis show that when the employment of older persons is increased the employment of the young is increased and the unemployment of the young is decreased.

We emphasize that the results are made possible by the wealth of experiences across the countries that provides considerable policy variation including exogenous variation that is not induced by high youth unemployment and that better enables us to establish the causal effect of increased older-

worker employment on youth employment. Thus we believe that the results reported in this phase of the project, as well as in the previous phases, provides a strong rational for international comparisons.

In short, the overwhelming weight of the evidence, as well as the evidence from each of the several different methods of estimation, is contrary to the boxed economy proposition. We find no evidence that increasing the employment of older persons will reduce the employment opportunities of youth and no evidence that increasing the employment of older persons will increase the unemployment of youth.

Appendix

Adjusted Data

We want to adjust the employment series for macro changes that may affect each of the employment series. The variables we use to make the adjustment are GDP per capita, growth in GDP, and the percent of the economy in manufacturing. This is the procedure we follow: Suppose the employment series is Y and the adjuster variables are $X_1, X_2, and\ X_3$. Then for <u>each series</u> in <u>each country</u> we estimate

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_1 X_{1t} + \beta_1 X_{1t} + \varepsilon_t$$

and obtain the estimated values $\hat{\beta}_1, \hat{\beta}_2, and\ \hat{\beta}_3$. We let the first year, Y_1, of each employment series be the base. Then each subsequent year is adjusted based on the change in the X variables between period 1 and period t. The adjusted value of Y in period t is given by

$$Y(A)_t = Y_t + \hat{\beta}_1(X_{1t} - X_{11}) + \hat{\beta}_2(X_{2t} - X_{21}) + \hat{\beta}_3(X_{3t} - X_{31})$$

Panel Estimates

We follow a standard panel estimation procedure, with

$$Y_{(20-24)it} = \beta_0 + \beta_1(E_{55-64})_{it} + \beta_2 X_{it} + c_i + y_t + u_{it}$$

where i indexes countries and t indexes years, Y is youth employment or youth unemployment, or prime age employment or unemployment, or schooling, X represents the covariates, the c_i are country fixed effects, and the y_t are year effects.

As explained in the text, we estimate several different specifications of this general model.

Incentive to Leave the Labor Force

The text presents the results of several different ways to asses the effect of the employment of older persons on the employment of youth. In principle, this approach provides an all-inclusive estimate of the relationship between the employment rates of the two groups. In particular, in addition to the strong relationship between the provisions of social security programs and the labor force participation of older workers—which has been demonstrated in earlier phases of the project—the employment of older workers depends on other economic influences as well. For example, macro economic shocks to the economy can affect the employment of older persons, as can be seen in the comparison of the unadjusted and adjusted employment trends in each of the countries.

Much public discussion, however, is focused on the need for the incentives to induce older persons to retire so that the job prospects for younger people will be improved. This is often used both as an explanation for the introduction the incentive in the first place and, now, as a reason for not removing the incentives. Thus we believe it would be useful to present evidence on the direct relationship between the incentives for older persons to leave the labor force and the employment of youth. We approached this question by calculating a time series index of the average incentives faced by persons who were retired in each year.

The index, as well as potential estimation methods, is described below. In practice, however, the approach was not replicable across countries. There are several possible reasons for this. One reason is that it is unclear whether an accurate measure of the incentives faced by all persons retired in a year can be obtained. A second reason is that even if an accurate average can be calculated, the average may not be sufficient, it is the broad range of incentives faced by individuals that matters. The extremes may be more important than the average, for example. We have shown in earlier phases of the project that the incentives faced by individuals matter.

The incentive faced by persons of age a in year y is given by

$$I(a,y) = \left\{ W(a,y) + \alpha \left[W(a,y) - PV(a,y) \right] \right\} q(a,y)$$

Here, $W(a,y)$ is the social security wealth (the present discounted value of future benefits) that a person would receive at age a in year y and $q(a,y)$ is a weight explained below. And $\left[W(a,y) - PV(a,y) \right]$ is the gain that could be obtained if a person delayed retirement to the age at which benefits would be at their "peak value" $PV(a,y)$.

Persons who are retired in a given year are different ages and the incentive they faced when approaching retirement depends on the persons age at that time. So to get the average incentive, we must average over the ages of persons retired in year y. Here we assume, for illustration, that the possible ages are from 55 to 59. The youngest age 55 is assumed to be the earliest age that any benefits are available. Now the average for year y is obtained by weighting each age by the proportion of persons that age.

$$\bar{I}(y) = \sum_{a=55}^{a=59} \left[\frac{P(a,y)}{\sum_{a=55}^{59} P(a,y)} \right] \left[I(a,y) \right]$$

But we don't know at what age a person retired. A person who is 59, for example, could have retired at 55, 56, 57, 58, or 59. A person who is 55 must have retired at 55. Thus we must consider the incentive the person would have faced at each of the possible ages the persons could have retired. If the person is 55, there is only one term in the second bracket. If the person is 59, there are five terms.

If the weight given to age a in year y is $q(a,y)$, then the average can be written as

$$\bar{I}(y) = \sum_{a=55}^{a=59} \left[\frac{P(a,y)}{\sum_{a=55}^{59} P(a,y)} \right] \left[\sum_{t=0}^{a-55} I(a-t,y-t) \frac{q(a-t,y-t)}{\sum_{t=0}^{a-55} q(a-t,y-t)} \right]$$

If accurate, this could be interpreted as "the tax force to retire" that was faced by persons who were observed to be retired in year y, the term we used to describe the incentive to retire faced by persons between the early retirement age and age 69 in Phase one of the project and as used in section 3 in this introduction.

Now we need to determine an appropriate way to approximate the relative weight to give to each possible age of retirement. We assume that the weight is proportional to the proportion of persons in the labor force in the year before the retirement age. That is, the assumption is that the likelihood that a person faced a particular incentive depends on the proportion of persons in the labor force the year before the person attained that age. If, for example, as the LFP was declining over the years the person aged from 55 to 59, we assume that the

person was most likely to face the incentive appropriate to 55, less likely to face the incentive appropriate to 56, and so forth. Now we have

$$q(a-t, y-t) = LFP(a-t, y-t-1)$$

And

$$\overline{I(y)} = \sum_{a=55}^{a=59} \left[\frac{P(a,y)}{\sum_{a=55}^{59} P(a,y)} \right] \left[\sum_{t=0}^{a-55} I(a-t, y-t) \frac{LFP(a-t, y-t-1)}{\sum_{t=0}^{a-55} LFP(a-t, y-t-1)} \right]$$

where

$$I(a-t, y-t) = \left\{ 1 \cdot W(a-t, y-t) + \alpha \cdot \left[W(a-t, y-t) - PV(a-t, y-t) \right] \right\}$$

To estimate $\overline{I(y)}$ we need to determine α, that is we need to determine the relative weight given to the two components of the index. Suppose we set the weight on $W(a-t, y-t)$ equal to 1, as set out in the equation above. Then we need only determine the relative weight α on $\left[W(a-t, y-t) - PV(a-t, y-t) \right]$. There are at least two ways to do this. One way is to regress the proportion of older persons in the labor in a year on the index $\overline{I(y)}$, where the index value is based on different values of α, and then choose the α that maximizes the regression r-squared value.

Estimation can also be based on independently estimated averages of the two components of the index I. The two components are ….

$$\overline{W}(y) = \sum_{a=55}^{a=59} \left[\frac{P(a,y)}{\sum_{a=55}^{59} P(a,y)} \right] \left[\frac{\sum_{t=0}^{a-55} W(a-t, y-t) \cdot LFP(a-t, y-t-1)}{\sum_{t=0}^{a-55} LFP(a-t, y-t-1)} \right]$$

$$\overline{[W-PV]}(y)=\sum_{a=55}^{a=59}\left[\frac{P(a,y)}{\sum_{a=55}^{59}P(a,y)}\right]\left[\frac{\sum_{t=0}^{a-55}[W(a-t,y-t)-PV(a-t,y-t)]\cdot LFP(a-t,y-t-1)}{\sum_{t=0}^{a-55}LFP(a-t,y-t-1)}\right]$$

Notice that these means are obtained by calculating the measures at the individual age-year levels and then averaging over the individual age-year measures. In this case, the value of α is determined by a time series regression of the labor force participation of older workers on these two components, setting the coefficient on $\overline{W}(y)$ equal to 1 and estimating the α coefficient on $\overline{[W-PV]}(y)$.