# Working Longer or Shorter:

# New Face of Retirement in OECD countries

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## Abstract

This paper focuses on analyzing the participation, employment, and unemployment levels among elderly population and comparing the early retirement trends in 16 OECD countries. In addition, it aims to show the key role of policy tools in reversing the early retirement trend and offsetting the negative impact on the economy of population ageing.

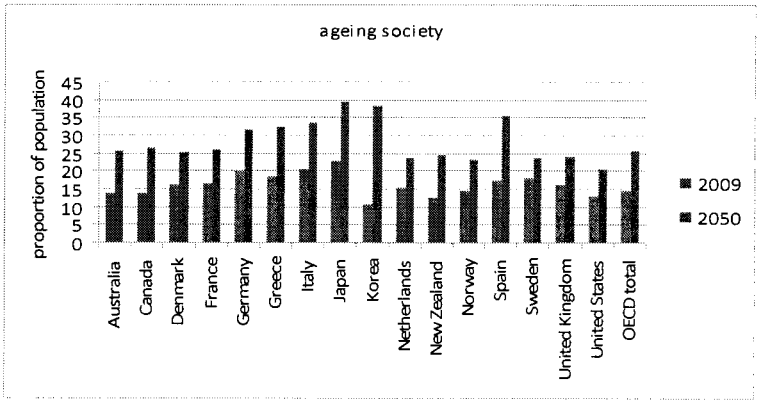


Key words: ageing society, early retirement, policy reversal

# Part I Introduction

All OECD (Organization for Economic Cooperation and Development) countries are experiencing population ageing as a result of both longer life expectancies and lower birth rates.

Graph 1: Population aged 65 and over as a percentage of total population in 16 OECD countries and OECD total




Data source: OECD Website

The graph above shows the percentage of population aged 65 years and over in 16 OECD countries and the OECD total for the year 2009 and a projection for the year 2050. From the graph, it is apparent that the share of the population aged 65 years and over will have more than doubled by 2050 in all 16 OECD countries. The ratio of the population aged 65 years and over to the total population in Japan, Italy, Spain, Germany, Greece, and Korea will be higher than 30% by 2050 (Germany: 31.5%, Greece: 32.5%, Italy: 33.7%, Japan: 39.6%, Korea: 38.2%, Spain: 35.7%).

The increase in the share of elderly persons in the population will lead to an increase in

the number of workers retiring each year. "If there is no change in work and retirement patterns, the ratio of older inactive persons per worker will almost double from around 38% in the OECD area in 2000 to just over 70% in 2050. In Europe, this ratio could rise to almost one older inactive person for every worker over the same period" (OECD 2006). If people continue the early retirement trend as in the 1990s into the next few decades, the large increase in the number of retirees per worker will place a heavy burden on public finances in most OECD countries. This is because the government pays for most of the cost of early retirement benefits, which works in the interests of both the firms and the workers. It also leads to higher taxes, however, can also undermine the efficiency of labor markets. Moreover, the phenomena of population ageing and early retirement will slow down the labor force growth. In Germany, Japan, and Italy, the population aged 20 to 64 years is not only projected to decline relative to total population, but also in absolute terms. Most European countries will follow this pattern within the next decade. All these developments are likely to lead to a great decline in labor force growth, and subsequently to a slowdown of the overall economic growth.

A key factor in meeting these economic challenges is to increase labor force participation among older people. If the older workers could work longer, it would boost labor force growth and help offset the negative impact of population ageing on economic growth. It would reduce the burden on public finances through the reduced pension expenditures and the increased tax revenues. It would also give employers more time to train new entrants to replace retiring workers, especially for skilled workers.

If we want to increase the labor force participation rate among older people, the analysis of people's retirement decisions is relevant. The decision to go into retirement can be analyzed by appealing to the theory of labor supply. I apply the conventional neo-classical income-leisure framework to the retirement decision. Wealth is one of the determinants of retirement. The early retirement decision is positively related to one's wealth. The impact of wealth reflects a pure income effect: with more wealth one can buy more normal goods (including leisure because leisure is also a normal good). The impact of expected earnings reflects the opposing influences of income and substitution effects. On one hand, an increase in expected earnings raises the opportunity cost of retirement. This has a substitution effect reducing the demand for retirement leisure. On the other hand, an increase in expected earnings means an increase in expected wealth. Just like the wealth from non-labor sources, the increased expected wealth will lead to higher demand for retirement leisure.

In the second part of the paper, I will introduce Ebbinghaus's book, which focuses on the early retirement problem in Europe, Japan, and the United States. In contrast to the research of other economists that focus merely on the microeconomic perspective, Ebbinghaus's research focuses on the macro-institutional configurations. This is the main reason why I introduce his book in my paper. I mainly review the comparison of early exit trends across countries in his book, since the methods he used in this part are utilized in my own paper with more recent data. In the third part of the paper, I conduct an empirical analysis. Based on the data on labor force participation, unemployment, and employment

rates among older workers across 16 OECD countries, I demonstrate the trend toward early exit from employment among older workers. From these aggregated data, I demonstrate early retirement patterns among older workers from 1985 to 2007. Moreover, I use employment rates to calculate the rates of withdrawal from employment—i.e. the exit rate from employment. Through exit rates from employment, I trace the early retirement trends in different countries. In a multivariate framework, I examine if there exists a relationship between the early exit rate and unemployment. I also examine if there exits a relationship between the early exit rate and changes in GDP. In the fourth part of the paper, I will explain the role of public policy in reversing the trends toward early exit from employment. I address a number of questions, such as how to improve the work incentives among older people, how to encourage employers to hire and retain older workers, and how to strengthen the employability of older people.

## Part Ⅱ Literature review

In his book "Reforming Early Retirement in Europe, Japan, and the USA", Bernhard Ebbinghaus argues that early exit from employment emerged as a social practice for two main reasons: as a consequence of the expansion of social rights—i.e. the rights arising from social contract (social contract: people give up some rights to a government in order to receive or maintain social order), and as a policy to facilitate economic restructuring and to reduce unemployment. He also argues that early retirement arises from another factor: the social partners (employer associations and trade unions in the political and

economic area, and management and worker representatives at firm level) play an important role in facilitating and using early exit from employment. This is because using early exit from employment advances social partners' interests.

By analyzing the behavior of social partners, the author emphasizes the crucial role of the social partners at the national and the firm level in mediating between the 'pull' and 'push' factors of policies and institutions. The author argues that the social partners not only regulate wages, employment conditions, and workplace relations through collective bargaining, they also influence social policymaking through their political channels and involvement in social insurance or occupational welfare programs. According to the 'pull' perspective, private pre-retirement pathways provided by social partners seem to be an incentive for older workers to retire early. According to the 'push' perspective, social partners have production-related interests in fostering early retirement, and are thus willing to finance the benefits for early retirement. The opportunities offered by protection systems and constraints of production systems will not develop without continuous action by social partners in the national policy and bargaining arenas.

There are two main objectives of Ebbinghaus's study. First, he tries to achieve a better understanding of long-term trends toward early exit from employment since the mid-1960s. He provides an institutional explanation of the cross-national variations in early retirement patterns across ten selected OECD countries. His analysis focuses on the macro-institutional configurations instead of merely on the microeconomic perspective.

He treats the opportunities and alternatives for early exit from employment at both the national and the firm level. Second, he addresses two basic issues with relevance to policymaking: the reasons why the social partners in some countries are more likely to use early exit from employment, and the conditions which are feasible for the social partners to reverse this social practice.

Ebbinghaus's first research question asks why there are cross-national differences in early exit trends and patterns. He describes the cross-national trends and variations in early exit from employment. Retirement usually involves receiving pension income that continues past the normal retirement age, and retirement also means exit from employment. In Ebbinghaus's study, he focuses on the point that early retirement is seen as the early withdrawal from employment (before 65 years which is the most common retirement age across the OECD countries). He analyzes the trend toward early exit from employment over time by examining time-series data covering almost thirty years, and he studies cross-national differences in the scope of early exit across ten countries (eight European countries, Japan and US).

He compares labor force participation rates, unemployment rates, employment rates, as well as part-time employment rates over time and cross-nationally for men and women in the age groups prior to 65 years. The data shows that a considerable share of elderly men (aged 65 years and over) was still working in the mid-1960s: particularly in Japan (56%), Ireland (48%), Sweden (35%), and Denmark (32%). These participation rates were lower

in France (27%), the US (26%), Britain (23%), Germany (23%), and Italy (17%). Compared to men, women had a much lower participation rate at ages over 65 years (less than 8%) during the mid-1960s. During the 1970s, Japan stood out as the country with the longest working life. Almost 40% of Japanese elderly men (aged 65 years and over) still worked during the 1970s. Besides Japan, a still significant activity rate for elderly men were observed in the US, Ireland, and Sweden in the 1970s. But most of those elderly workers reduced the hours they worked. On the whole, men aged 65 years and over have experienced a decline in participation rates during the 1970s.

A similar long-term decline occurred among women aged 65 years and over during the 1970s. American and Japanese women were again the exception, with participation rates of 10% and 15% respectively. This may be due to the self-employed or family members working in agriculture and other family enterprises. Compared to Japan and the US, participation rates for women aged 65 years and over were under 5% in the European countries during the 1970s.

Then Ebbinghaus finds that the trend toward early exit from employment is partly observable in the declining labor force participation rates for the people under age 65 years (aged 55 to 64 years), and that Japan is the country least affected by this trend. Participation rates dropped very dramatically in the early 1970s in Germany and in France. But the early retirement among female workers is more difficult to trace due to the changes in participation rates, because two processes tend to cancel each other out.

Ebbinghaus thinks that on one hand, women tend to have a higher participation rate because women among this age group increasingly stay in employment after raising children. On the other hand, each subsequent cohort of women also tends to retire earlier than men. The time-series of participation rates for women only show the net effect of two trends.

After analyzing the participation rate, Ebbinghaus turns his attention to the variation of unemployment rates and employment rates among ten countries. Ebbinghaus says that unemployment has become a 'bridging pension' until pre-retirement or statutory pensions are available. When such an unemployment pathway exists, companies that need restructuring will single out older workers for voluntary dismissal, and the dismissed workers may seek other pre-retirement benefits. For these reasons, unemployment rate may not reveal the actual degree of involuntary unemployment among older workers.

In Ebbinghaus's research, the official unemployment rate among older men aged 55 to 64 years was relatively low (less than 4%) with the exception of the U.K. and Ireland before the first oil shock in 1973. During the early 1980s, only after second oil shock, unemployment among older workers became a major problem in almost all countries. During the 1990s, older men in Germany and Japan had unemployment rates 50% higher than the overall rates, and the French, Danish, British, and Swedish older age groups exhibited unemployment rates among men which were close to the overall rates. In the other countries such as the Netherlands, Italy, and the US, the risk of unemployment

among men was lower in the older age groups. Moreover, Ebbinghaus says that these may be partly due to the availability of other more generous exit routes or the limited duration of unemployment benefits. This means that the older laid-off workers withdrew from the labor force, since they have a very low probability of finding a new job.

Until the late 1970s, for older women, unemployment rates remained below the level of their male colleagues in most countries, except in France and the US. Since then, women had been exposed to unemployment risks to a similar degree as men, except in Japan (lower by two-thirds), Italy (lower by a fifth) and the UK (lower by half) due to lower statutory pension ages for women in these three countries. Unlike men, women were exposed to a higher risk of unemployment in France, Denmark, and the Netherlands. In addition, the unemployment rates of women aged 55 to 59 years were particularly high in Germany. For most unemployed older men and women, receiving long-term unemployment benefits was a bridge to retirement.

In Ebbinghaus's research, the subsequent analysis of early exit from employment is based on the employment rate (i.e. the ratio of the employed to the working age population. Employed persons are defined as those aged 15 years or over who report that they have worked in gainful employment for at least one hour in the previous week.). The most significant decline in employment rates occurred among men in the age group 60 to 64 years except in Italy, since Italy already had low employment rates for men (around 50%). All other countries experienced a long-term decline in men's employment rates in the

1960s, and the drop was most pronounced for Germany, France, and the Netherlands during the 1970s. Japan stood out with a more gradual decline during the mid-1980s. Although Japan experienced a drop in employment rates for older men, the employment rates of older men in Japan were still higher than those in other countries. In 2003, the employment rate of Japanese men aged 60 to 64 years was 64.6%, which was the highest among 10 countries.

For the younger age group of men (55-59 years), all societies had high employment rates during the 1960s, except for the United States (85%), France (80%), and Italy (only 75%). All countries experienced a decline in employment rates of men in this age group during the 1970s. The employment rate for men aged 55 to 59 years dropped rapidly after 1985, except in the Netherlands, Japan, and Denmark. Ebbinghaus pays less attention to employment rates of women relative to men, since he finds that analyzing early retirement among women based on employment rates produces the same shortcoming as previously discussed for participation rates.

After analyzing the labor force participation rates, unemployment rates, and employment rates, Ebbinghaus focuses on the analysis of the trend toward early exit from employment. The first step of this analysis is to measure the early exit from employment. Two measures were calculated for Ebbinghaus's study. First, there is the absolute exit rate (the cohort-adjusted withdrawal as proportion of the age group's population): the difference between the five-year age group's employment rate and the same birth-cohort's

employment rate five years earlier. Second, there is the relative exit rate: the cohort-adjusted withdrawal rate (the absolute exit rate) as proportion of the same birth-cohort's employment rate five years earlier (the equations will be showed in the section 2.2). The absolute exit rates give an indication of the incidence of early retirement within an age group's population whatever their previous employment status. The relative exit rates show the likelihood of early retirement among those that were previously employed. The subsequent analysis mainly focuses on relative exit rates, because they are the best indicator of likelihood of early exit from employment.

After measuring the early exit rate, Ebbinghaus first analyzes the trend toward early exit for men in the age group 60-64 years. Germany, the Netherlands, France, and Italy showed the trend of rapidly increasing early exit in the 1970s, while the trends in other six countries were more gradual and remained at a lower exit level. In addition, the absolute exit rates of the age group 60-64 years are lower than the relative exit measure, which shows the propensity of those previously (aged 55-59) employed to leave work upon reaching ages 60 to 64 years. During the 1970s, Germany, the Netherlands, and France witnessed acceleration in the relative exit from employment (with annual growth rates of 8-9%). Italy had a more gradual annual increase due to an already high level of early exit in 1970. By the 1980s, more than 40% of older workers in the age group 60-64 years retired early in the Continental European countries. Compared to Continental European countries, six other countries (Sweden, Denmark, UK, Ireland, US, and Japan) on average experienced less dramatic increase in early exit rates among men aged 60-64 years.

Moreover, the early exit trends in these countries went through more pronounced cyclical ups-and-downs. During the period of 1970-1985, growth in early exit was slower, except for Denmark and Britain, which showed fast growth rates in early exit (with annual growth rates around 7-8%).

In contrast to the analysis of employment rates, the analysis of cohort-adjusted exit rates show a very similar increase in early retirement for women aged 60 to 64 years in Continental Europe, except for Italy, which maintained a medium level of early retirement until the early 1990s. Generally, all four Continental European countries show parallel trends for men and women, with only a few exceptions. First, Germany's exit rates among women exceed those for men. Second, the gap between men and women in Italy has increased since the 1980s, which due to the difference in normal retirement age. Third, women in France are less prone to retire early in the age group 60 to 64 years, and the high part-time employment rates may explain this trend. In 1999, the part-time employment rate of French women in this age group was 47.9%, while the rate was only 13% for French men. Finally, the absolute rates diverge more significantly than relative rates, since female employment rates are lower and vary among these countries.

The early retirement patterns for women aged 60-64 years are very similar in Sweden, the US, and Japan, which exhibited cyclical ups-and-downs around a low rate of early exit (20-35%) in the 1980s. In the early 1990s, female exit rates increased in Sweden and Japan due to more adverse labor market conditions. British women tend to exit from

employment at rates comparable to Continental Europe, given the statutory female pension age of 60. In addition, the disability pensions induced Danish women aged 60 to 64 years to withdraw from employment long before the normal pension age of 67 years.

Since early retirement has not been limited to the age group 60-64 years, the author also calculates cohort-adjusted exit rates for age group 55-59 years from the late 1970s onwards. The four Continental European countries (Germany, the Netherlands, France, and Italy) are again leading in early exit among men aged 55-59 years. French men led the pre-60 retirement trend in the 1980s, and then Italian men followed in the 1990s. During the 1990s, the relative exit rate of men in Germany declined to the French and Italian level. Men in Sweden, Denmark, the UK, and Ireland show lower tendencies to exit from work before 60 years old (exit rate lower than 20%).

In comparison, the exit rate of age group 55-59 years is more important among women due to earlier statutory retirement ages. In Continental Europe, exit before 60 years is common among women. In France, every third French women aged 55 to 59 years who had been in employment left work. Italian women are more prone to leave before 60 years old due to a statutory pension age that is five years earlier than for men. Over the last two decades (from 1985 to 1999), relative exit rates in the age group 55-59 years were higher for women than for men in the UK, Denmark, Sweden, and Japan. The data which the author cites are 19.7% (women) vs. 15.5% (men) for UK, 14.8% vs. 9.6% for Denmark, 12.6% vs. 10.8% for Sweden, and 13% vs. 5% for Japan. For the US and Ireland, the

relative exit rates are similar between men and women.

The analysis of cross-national differences in early exit from employment in Ebbinghaus's study reveals two different early retirement trends. First, Continental European countries' main trends toward early retirement show S-shaped curves with the fast growth in the 1970s and the early 1980s. Second, early exit rates in the other countries grew less rapidly and continued fluctuating during the 1980s and 1990s. As discussed in Ebbinghaus's book, there is substantial evidence for welfare regime-induced early retirement patterns. The Continental European welfare states have provided a multitude of early retirement pathways. Examples of this include early statutory retirement ages, flexible seniority pensions, special retirement programs, and long-term unemployment benefits. In comparison, societies with lower degrees of social protection (Japan and the US) provide fewer and more restricted early retirement pathways. There exists a correlation between the availability of early retirement pathways and the trends toward early retirement.

Finally, Ebbinghaus combines 'pull' and 'push' perspectives to analyze the rise of early retirement trends and cross-national differences in early retirement patterns. According to the 'pull' perspective, social transfer programs provide incentives and opportunities to retire before statutory pension age. There are multiple exit pathways that allow older workers to retire early: flexible old age pensions, disability pensions, special pre-retirement schemes, and long-term unemployment. In addition, different welfare systems provide varying opportunities of income support for early retirement, and this

partly explains cross-national differences in early retirement patterns. According to the 'push' perspective, there exist economic forces that influence the labor demand side. The economic conditions under which the firm operates will in turn influence the management's human resource strategy. The firm's demographic composition or production method can put additional pressure on management to utilize the early retirement pathways.

In this literature review, I mainly focus on the part 'comparing early exit regimes' in Ebbinghaus's book, because I will use the same method to analyze the early exit trend. But in my analysis, I will include more than 10 countries, and set up a simple empirical model which will show how GDP, unemployment and the selected control variables affect the relative exit rate in a point of departure.

## Part Ⅲ Data analysis

### 1. Data description

I use quantitative longitudinal data on employment changes as indicators of early exit from employment. I collected the aggregate labor force data mainly from the OECD labor force statistics to compare early exit patterns over time and across the sixteen countries, as well as the OECD total. The sixteen countries are Australia, Canada, Denmark, France, Germany, Greece, Italy, Japan, Korea, the Netherlands, New Zealand, Norway, Spain, Sweden, the UK, and the US. There are three variables of data which I collected for my

study: the labor force participation rate, the unemployment rate, and the employment rate. All of the data are classified by gender and three age groups. The three age groups are 55-59 years old, 60-64 years old, and 65 years and over. The data interval is from 1985 to 2007, except for New Zealand (1986-2007), since the data in 1985 for New Zealand are missing. The data are annual frequency data and expressed as percentages.

The objectives for the following empirical study are to achieve a better understanding of long-term trends and patterns in early retirement, and to provide an institutional explanation of the cross-national variations in early retirement patterns across the 16 OECD countries. In section 2.1, I first analyze the decline in activity among older workers at a statutory pension age around 65 years. Then I compare participation rates, employment rates, and unemployment rates for men and women in the age groups younger than 65 years across the 16 OECD countries. In section 2.2, cross-national variations of early retirement trends are examined using several indicators on changes in employment rates for older workers, including cohort-adjusted measures of exit rates. Moreover, the underlying forces that are causing the rise of early retirement and the cross-national variations in early retirement patterns will be discussed in the section 2.3.

## 2. Data analysis

### 2.1 The inactivity level among older workers

#### A. Normal pension age (65 years and over)

In order to know the inactivity level of people at normal pension age, I first examine the participation rate of men aged 65 years and over. The participation rates were higher in 2007 than those two decades ago among all the 16 countries, except for Denmark, France, Greece, Italy, Japan, Norway, and Spain. Since the trends in the participation rate are fluctuating in some countries, comparing the rates in 2007 with those in 1985 are not enough to draw conclusions about the variation of participation rate during more than two decades. For the reason above, I divide the 22 year interval into two time periods (from 1985 to 1995 and 1995 to 2007) and calculate the annual growth rates of participation rates during the two periods. The results that I obtained are listed in the following table:

Table 1 Annual growth rates of participation rates (men 65+) (%)

| Men (65+) | AU | CA | DE | FR | GE | GR | IT | JA |
|---|---|---|---|---|---|---|---|---|
| 1985-1995 | 0.54 | -1.67 | -9.82 | -7.1 | -1.87 | -2.45 | -2.67 | 0.1 |
| 1995-2007 | 2.75 | 2.24 | 5.24 | -1.79 | 1.97 | -3.88 | -0.45 | -1.88 |
| OECD | KO | NE | NZ | NO | SP | SW | UK | US |
| 0.68 | -0.77 | 4.47 | -4.03 | -5.31 | -6.86 | 2.21 | -0.4 | 0.6 |
| 0.22 | 0.39 | 3.32 | 5.9 | 1.83 | 0.65 | 0.72 | 1.82 | 1.71 |

Source: own calculation, see Appendix notes

Almost all the countries have negative annual growth rates of participation rates among men aged 65 years and over in the first period (1985-1995), except for Australia, Japan, the Netherlands, Sweden, and the US. In comparison, in the second period, there are only four countries (France, Greece, Italy, and Japan) have negative annual growth rates of participation rates among men in the same age group. In Denmark, the participation rates for men in this age group fluctuated around a mean level of 12% during the period of 1985-1992. In 1994, Denmark experienced a great drop in participation rates among men aged 65 years and over (from 10.67% in 1993 to 3.76%), but then the participation rates

slowly increased. In 2007, the participation rate among men aged 65 years and over in Denmark was 8.64%. Although it was still lower than that of two decades ago, it is a rising trend. Just as in the case of Denmark, Norway experienced a decline in the participation rate among men aged 65 and over during the period of 1991-1996 (it was 12.94% in 1996, just half the level in 1985). Spain experienced a decline in the participation rate among men in this age group during the period of 1994-2004 (<3%). Japanese men in this aged group experienced a decline in participation rate in 2003 (the first time it dropped below 30%). France and Italy experienced a greater decline in the participation rate among men aged 65 years and over in the first period than in the second period, but Greece exhibited the opposite pattern. This may be due to the policy reform in pension age. Until the reforms of the 1990s, most Italian men could retire at age 60 years. In France, the newly elected Socialist government lowered the pension age from 65 to 60 in April 1983.

For the other nine countries in which participation rates were higher in 2007 than they were 22 years ago, calculating the growth rate of two periods also provide different information. Canada, Germany, Korea, New Zealand, and the UK have negative annual growth rates of participation rates among men aged 65 years and over in the first period and positive rates in the second period. Australia and the US have faster growth rate of participation rates among men aged 65 years and over in second period, which just contrary to the Netherlands and Sweden. We can find that most countries have faster growth rates of participation rate in the second period, and this may be due to the policy

reforms in that period. For example, the Barcelona target of March 2002 seeks to postpone withdrawal from the labor force by five years.

Compared to men aged 65 years and over, women aged 65 years and over have greater fluctuations in participation rates in most countries. The table below shows the annual growth rates of women's participation rates for two periods:

Table 1 Annual growth rates of participation rates (women 65+) (%)

| Women(65+) | AU | CA | DE | FR | GE | GR | IT | JA |
|---|---|---|---|---|---|---|---|---|
| 1985-1995 | 2.01 | -1.9 | -11.5 | -5.9 | -3.84 | -3.7 | -1.57 | 0.06 |
| 1995-2007 | 5.5 | 4.25 | 9.4 | -2 | 3.98 | -3.82 | -3.03 | -1.52 |
| OECD | KO | NE | NZ | NO | SP | SW | UK | US |
| 0.89 | 0.47 | 3.47 | -4.11 | -4.01 | -4.76 | 6.14 | 0.5 | 1.97 |
| 1.2 | 1.23 | 9.48 | 10.34 | 2.48 | -1.98 | 3.12 | 2.9 | 3.03 |

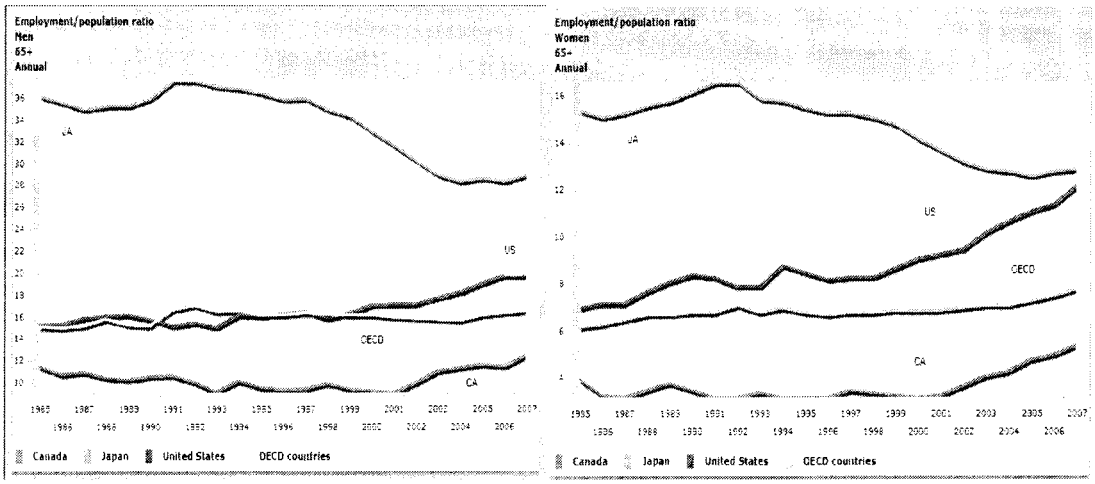
Source: own calculation, see Appendix notes

Denmark and New Zealand show the largest fluctuations of women's participation rates among all the countries. In 1994, the participation rate of Danish women aged 65 years and over dropped from 3.66% to 1.05%, and then rose to the level above 3% in 2001. A very similar pattern happened in New Zealand in 1992. On the whole, if we just draw the conclusion from data itself, women still have a much lower participation rate than men in this age group, which may be due to an earlier pension age and different labor supply patterns.

After analyzing the participation rate of men and women aged 65 and over, I turn to the second step: a summary of the employment status of men and women aged 65 and over. This time I use line graphs to show the variation of the employment trend. First, I place

Canada, Japan, the U.S. and the OECD total into one group, since Canada, Japan, and the US all have relatively lower degrees of social protection. The employment to population ratio for both Japanese men and women aged 65 years and over are by far the highest in this group. The employment to population ratio of Japanese men reached a peak in 1991 (37.56%), and then slowly declined. In 2004, the employment to population ratio of Japanese men reached a trough. The employment to population ratio of Japanese women fluctuated around a level of 15% and reached a peak in 1991 (16.61%) as well. After 1991, the employment to population ratio of Japanese women aged 65 years and over gradually declined, since the labor market in Japan was depressed during the 1990s. The employment to population ratio of Canadian men and women are lowest in this group (the employment to population ratio fluctuated within the range 9-12% for men and 3-5% for women), but showed an upward trend after 2001, which corresponded to strong labor market conditions. The employment to population ratio shows a much more obvious upward trend for women than for men in the United States during the same period.

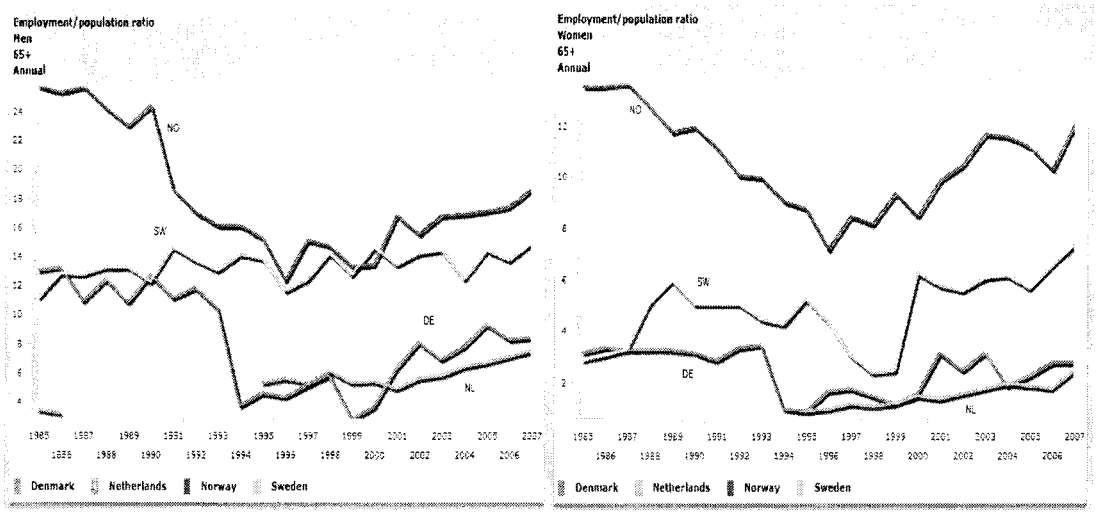
Graph 2 Evolution of employment to population ratios in Canada, Japan, US, and OECD total for men (left) and women (right) aged 65+




Source: OECD web site

I place Denmark, the Netherlands, Norway, and Sweden in the second group. This is because Denmark, Norway, and Sweden are all Nordic countries, and the Netherlands is geographically close to them. Denmark experienced a sudden drop in the employment to population ratio in 1994 (from 10.5% in 1993 to 3.76% in 1994 for men and from 3.53% to 1.03% for women), and then followed an upward trend (in 2007, the employment rate rose to 8.5% for men and to 2.75% for women). The Netherlands has a relatively low employment to population ratio for both men and women compared to other three countries in this group. Since the data from 1987 to 1994 for the Netherlands are missing, we can not see a continually employment to population ratio trend of the Netherlands. Moreover, the employment to population ratio trends after 1994 are flatter than those of other three countries. In Norway, the employment to population ratio followed a downward trend before 1996 and an upward trend after 1996 for both men and women. The employment to population ratio reached the trough in 1996 in Norway (12.35% for men and 7.18% for women). Sweden has an intermediate level of the employment to population ratio among the four countries (lower than Norway, but higher than Denmark and the Netherlands). In addition, Swedish women have greater fluctuations in employment to population ratios than their men colleagues have.

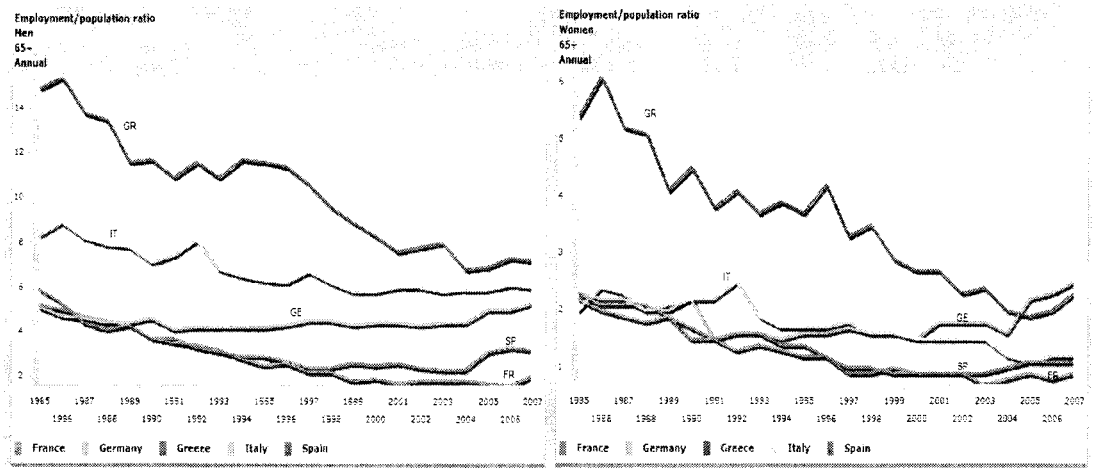
Graph 3 Evolution of employment to population ratios in Denmark, Netherlands, Norway and Sweden for men (left) and women (right) aged 65+




Source: OECD web site

Now I pay attention to the third group—France, Germany, Greece, Italy, and Spain. In contrast to the other two groups I treated above, employment to population ratios of all the countries in this group followed downward trends except in Germany, and this is the reason why I grouped them together. The employment to population ratio trend is smooth and flat for men in Germany. The employment to population ratio among women aged 65 years and over in Germany obviously increased after 2004. France has the lowest employment to population ratio among the five countries. Spain has a very similar trend as France. Moreover, fluctuations in the employment to population ratio are more remarkable for women than for men in these five countries.

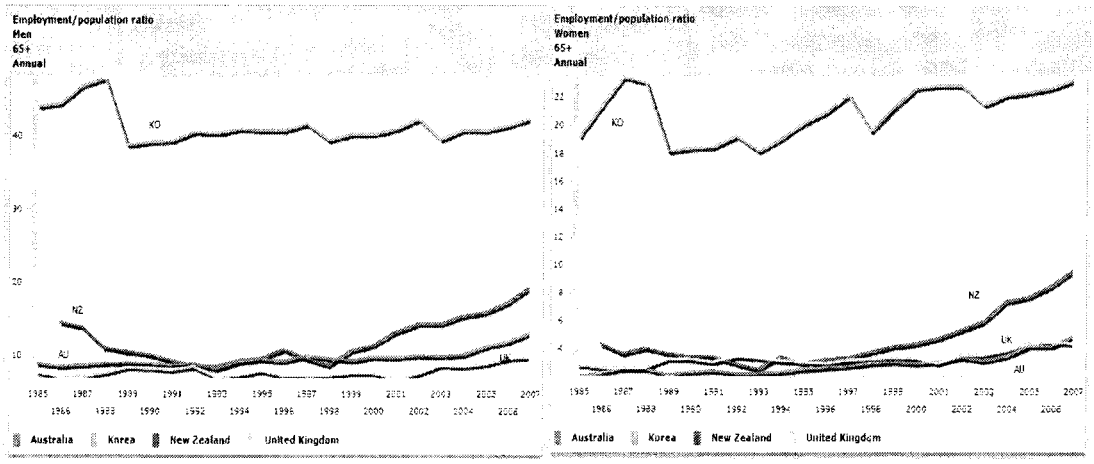
Graph 4 Evolution of employment to population ratios in France, Germany, Greece, Italy, and Spain for men (left) and women (right) aged 65+




Source: OECD web site

Finally, the remaining four countries—Australia, Korea, New Zealand, and the UK are grouped together. Korea has a much higher employment to population ratio than other three countries have in this group, and employment to population ratios among Australia, New Zealand, and the UK are very close. In 1989, Korea experienced a sharp decline in the employment to population ratio for both men and women aged 65 years and over (around 10% drop for men and 5% drop for women). After 1998, the employment trends of men and women in New Zealand showed an upturn.

Graph 5 Evolution of employment to population ratios in Australia, Korea, New Zealand, and UK for men (left) and women (right) aged 65+




Source: OECD web site

After analyzing the employment status of people at normal pension age (65 years and over) across 16 countries and the OECD total, we can not find an exact regularity of variation in the employment to population ratio during more than two decades. This may be due to a small difference in regular retirement age across countries. Moreover, the macro economic climate may lead to different labor market conditions in different countries. Last but not the least, the different social values let people in different countries have different attitudes toward retirement. For example, Japanese men and Korean men think that working hard until they are no longer physically capable of doing so is one way to show their responsibility to the family and society.

**B. Analysis of labor market variables during pre-retirement age**

In this part, I focus on the employment status, the unemployment status, and the participation status of two age groups (55-59 years and 60-64 years), and use the same method as for the analysis of the 65 and older age group. I also calculate the annual growth rates of employment, unemployment, and participation rates of two time periods (1985-1995 and 1995-2007). I will start from the analysis of participation rates, as usual.

For the age group 60-64 years of men, the participation rate for all of the OECD countries fluctuated around a level of 50% within a small margin. I thus take a value of 50% as the average participation rate of men in the selected 16 countries and also use it as a benchmark in comparison across countries. Japan, Korea, Norway, and Sweden are the countries with the highest labor force participation rates. Japanese men have participation

rates above 70% in every year since 1985, and reached 75% from 1992 to 1994 in the age group of 60-64 years. After 1995, Japanese men experienced a small decline in the participation rate, but at the end of 2007, the participation rate of Japanese men returned to its highest values (74.45%). During the first period (1985-1995), the participation rate of Korean men was increasing (with an annual growth rate at 1.16%) and rose above 70% in 1994 (71.75%). The participation rate of Korean men reached a peak value (73.73%) in 1995 and remained above 70% until 1997. But after 1997, their economy suffered a depression for a few years, which lead to a decrease in the partcipation rate. Norway had a very high participation rate among men aged 60-64 years at the beginning of the period (71-72% from 1985-1987) and then showed a downward trend. The participation rate of Swedish men aged 60-64 years fluctuated above 60% from 1985 to 1992 and then declined until 2001, since their economy entered a steep recession in 1992. After 2001, the participation rate of Swedish men aged 60-64 years was gradually increasing with a growth rate at 1.41%.

France, Germany, Italy, and the Netherlands are in the group with the lowest participation rates (around or less than 30%) among men aged 60-64 years. In France, the participation rates of men aged 60-64 years even fell to 14.8% in 2004, and have remained under 20% since the beginning of 1990s. The data tell us that fewer than one-fifth of men aged 60-64 years in France remained in the labor force. Germany had a negative growth rate of the participation rate in the first period (1985-1995), and reached the lowest participation rate in 1995 (28.38%). In the second period (1995-2007), Germany experienced an increase

(annual growth rate at 3.97%) in participation rate of men aged 60-64 years. The Netherlands also had a high growth rate in the participation rate during the second period (6.02%). Italy experienced a faster decline in participation rate in the first period than in the second period. All the other countries are grouped in the intermediate category. They all have the participation rates close to the average participation rate for all the OECD countries, except for New Zealand. New Zealand had a relatively low participation rate at the beginning of the 1990s, but experienced a fast growth in the participation rate. In 2007, the participation rate of men aged 60-64 years reached 76.33% in New Zealand. As discussed in part A of the section 2.1, policy reforms may be the reason for the growth in participation rates in the second period (1995-2007) in most OECD countries.

Again, Japan, Korea, Norway, and Sweden have high levels of participation rates for women in the age group 60-64 years. France, Germany, Italy, and the Netherlands have a relatively low participation rate for women aged 60-64 years compared to other countries. But in contrast to the case for men, women in Germany and the Netherlands exhibited the upward trend of participation rate in this age group since 1985, and have exhibited fast annual growth in the participation rate. From 1995 to 2007, the annual growth rate was 8.56% in Germany and 9.04% in the Netherlands. Moreover, except for France, Italy, Greece, Japan, and Korea, all the countries show clearly upward trends in the participation rate among women in the age group 60-64 years. The participation rate trends for women aged 60-64 years in Japan and Korea are flat, since the participation rates in these two countries began with high values.

Only France and Italy show obviously downward trends of men's participation rate in the age group 55-59 years. Japanese men aged 55-59 years always exhibit a high participation rates (>90%). Canada and the United States experienced a decline in participation rates of men aged 55-59 years from the mid-1980s to the mid-1990s, and the participation rate gradually increased after 1995. In fact, except for Japan and Korea, all the countries exhibited a downturn of men's participation rates during the first period (1985-1995). In the second period (1995-2007), all the countries, except for Japan, Korea, and France, had positive annual growth rates of men's participation rates in the age group 55-59 years—almost contrary to the situation in the first period.

It is easier to find a pattern in regards to the participation rate of women aged 55-59 years. All 16 countries follow upward trends in women's participation rates, albeit to different degrees. The range from 40% to 50% seems to be the average participation rate for women aged 55-59 years, but countries such as Sweden and Denmark have substantially high participation rates among women in this age group (Sweden: 80.2% in 2007, Demark: 78.8% in 2007). In contrast to the case for French men, French women have relatively high participation rates in this age group among the 16 countries. Moreover, Japanese women exhibit lower participation rates than their male counterparts.

After analyzing the participation rates of two age groups for men and women, I will pay attention to the employment rates of two age groups. A great decline in the employment

rate occurred among men in the age group 60-64 years compared to the group that is 5 years younger. In the age group 55-59 years, most countries have employment rates of men that are above 70%. But in the age group 60-64 years, employment rates of men within the range 50-55% can be viewed as a relatively high rate. Only three countries – Japan, Korea, and Norway—exhibit employment rates of men aged 60-64 years above 60%. But Norway experienced a decline in employment rates of men aged 60-64 years at the beginning of the 2000s (<60%). Contrary to Norway, both New Zealand and Sweden exhibited an increase in the employment rate of men aged 60-64 years during the 2000s. In 2007, the employment rate of men aged 60-64 years even increased to 75.39% in New Zealand, which was higher than that in Japan. The employment rate of Swedish men aged 60-64 years also reached 64.43% in 2007. Canada had a noticeable drop in men's employment rate in this age group during the first period (1985-1995), as shown by the annual growth rate of employment rate at -2.31%, and this may be due to a severe recession in the period of 1991-1992. Similarly, the employment rates of men aged 60-64 years in France, Italy, Spain, and the Netherlands also declined significantly during the first period. In addition, France and the Netherlands had the lowest employment rates of men in this age group among all the 16 countries (less than 20% since 1991 in France, while in the Netherlands, it fluctuated within the range 20-30%). The United States has a relatively smooth and flat employment trend for men aged 60-64 years, with ups and downs within a range of 1% point, and displays an upward trend overall.

The differences in the employment rate among men in the age group 55-59 years across

countries are not quite distinct as in the case of the age group 60-64 years. French men again have the lowest employment rates in the age group 55-59 years (only 58.58% in 2007 compared to 62.12% on average), and Japanese men have highest employment rates in this age group (89.85% in 2007, 90.14% on average). Except for Japan and Korea, all the countries experienced a decline in the employment rate of men aged 55-59 years in the first period (1985-1995). In addition, Canada, France, Greece, Italy, Norway, Sweden, the UK, and the US had lower employment rates in 2007 than they had in 1985.

Japan, Korea, Norway, Sweden, and the US have relatively high employment rates among women aged 60-64 years (In 2007, Japan: 41% Korea: 43% Norway: 53% Sweden: 56.38% US: 46.6%). Germany, New Zealand, and the Netherlands experienced fast growth in employment rates among women aged 60-64 years (during 1995-2007, the annual growth rate 8.14% in Germany, 8.7% in the Netherlands, and 7.13% in New Zealand). Italy has the lowest employment rates of women in this age group among the 16 countries, with employment rates fluctuating around 9-10%. All the countries experienced an increase in the employment rates of women aged 55-59 years. In contrast to the case for French men, French women have relatively high employment rates among the 16 countries in this age group. New Zealand and the Netherlands again experienced fast growth in employment rate among women aged 55-59 years.

The last step of this part is to show the unemployment status of the pre-retirement age group across countries. In the 1980s, Australia, Canada, Japan, Spain, and the UK all had

relatively high unemployment rates among men aged 60-64 years compared to other countries. For example, in 1985, the unemployment rate among men aged 60-64 years was 7.5% in Australia, 9.4% in Canada, 7.0% in Japan, 11.3% in Spain, and 10.2% in the UK. In comparison, Greece, Italy, Korea, New Zealand, and Norway had unemployment rates of men under 2% in the age group 60-64 years during the same period. In the 1990s, most countries experienced a large increase in unemployment rates of men aged 60-64 years. In Australia, the unemployment rate of men aged 60-64 years was 8.3% in 1990, then increased to 15.7% in 1993, and slowly fell below 10% after 1993. Canada, the US, Spain, Sweden, and the UK also followed the similar pattern as Australia during the 1990s. The unemployment rate of Canadian men aged 60-64 years reached its highest point (10.24%) in 1992. The unemployment rate among men aged 60-64 years in Spain and Sweden reached the peak in 1995 (9.81%) and 1996 (11.86%). The unemployment rate among men in the US reached the peak in 1992 (5.93%) in the same age group. Germany and Japan kept the upward trends of unemployment rates among men aged 60-64 years during the 1990s. In the 2000s, all the countries experienced a decline in unemployment rate among men in this age group. In addition, the unemployment rate of men aged 60-64 years was at a low level across the 16 countries in 2007, except for Germany, which had an unemployment rate of men at 8.95% in 2007.

In the age group 55-59 years, Canada, France, Germany, Spain, and the UK have relatively high unemployment rates of men among the 16 countries. Norway has the lowest unemployment rate of men aged 55-59 years among the 16 countries. In 1985, the

unemployment rate of Canadian men aged 55-59 years was 8.4%, then it slowly declined, but at the beginning of the 1990s, the unemployment rate again increased (around 10%). In the 2000s, the unemployment rate of Canadian men aged 55-59 years followed the downward trend. Spanish men had an unemployment rate above 10% from 1985 to 1999 (except for 1990 and 1991) in this age group. In the 2000s, the unemployment rate of Spanish men aged 55-59 years was half of the level before the 2000s. On the whole, unlike the employment rate and the participation rate, the unemployment rates of men in two different age groups are relatively close.

In the age group 60-64 years, Germany and Spain have higher unemployment rates among women than other countries have. Both Germany and Spain had high annual growth rates of unemployment rates among women aged 60-64 years in the first period (1985-2007). At the beginning of the 1990s, Canadian women also had a high unemployment rate in this age group (above 8% and reached 9.22% in 1993), but the rate declined to less than 6% during the 2000s. On the whole, the unemployment rate of women aged 60-64 years is much lower than that of men. This may be partly due to the lower labor force participation rates among women in this age group.

Compared to unemployment rates of women aged 60-64 years, unemployment rates of women aged 55-59 years are much higher. In the mid-1980s, unemployment rates of women aged 55-59 years in Canada, Denmark, France, and Germany were all above 7%. In the 1990s, all of the countries experienced an increase in unemployment rate among

women aged 55-59 years. The unemployment rates of women in Germany even rose to 19.06% in 1997. In the 2000s, all the countries experienced the downward trends of unemployment rate among women in the age group 55-59 years, but the unemployment rates of women in Germany were still above 10%.

### 2.2 Patterns in early retirement

In this part of my paper, the first step is to calculate the absolute and relative exit rates of different age groups. The formulas for calculating them are as follows:

Absolute exit rates for age group 60-64 and 55-59:

$$EX_{t0}^{60-64} = ER_{t0}^{60-64} - ER_{t-5}^{55-59}$$ ①

$$EX_{t0}^{55-59} = ER_{t0}^{55-59} - ER_{t-5}^{50-54}$$

Relative exit rates for age group 60-64 and 55-59:

$$EX_{t0}^{60-64}\% = (ER_{t0}^{60-64} - ER_{t-5}^{55-59}) / ER_{t-5}^{55-59} * 100$$ ②

$$EX_{t0}^{55-59}\% = (ER_{t0}^{55-59} - ER_{t-5}^{50-54}) / ER_{t-5}^{50-54} * 100$$

In those formulas, 'EX' stands for the exit rate from employment, and 'ER' stands for the employment to population ratio. The results show us that except for four countries—Denmark, France, Japan, and Korea, all other countries have negative annual growth rates of absolute and relative exit rates among men aged 60-64 years from 1990 to 2007. This means that fewer men in the age group 60-64 years exit from employment now than almost two decades ago. Although Japan and Korea have positive annual growth

① Ebbinghaus "Reforming Early Retirement in Europe, Japan and the USA" 2006 Appendix Note
② Ebbinghaus (2006)

rates of exit rates from employment, the exit rates of men aged 60-64 years are lower than those of most countries. Women in this age group have lower absolute exit rates and higher relative exit rates than men have. In addition, more than four countries have positive annual growth rates of exit rates among women aged 60-64 years. Germany and France have especially high relative exit rates of women aged 60-64 years among the 16 countries. In the age group 55-59 years, both men and women have lower exit rates compared to the exit rates in the age group 60-64 years. There are five countries—Denmark, France, Italy, Korea, and Spain—which have positive annual growth rates of exit rates among men aged 55-59 years. France and Germany have much higher exit rates than other countries have (above 20% for both absolute and relative exit rates). In addition, there are fewer countries that have positive annual growth rates of exit rates among women in the age group 55-59 years than those in the age group 60-64 years. All the data results of this part are based on the appendix tables 1-4.

After calculating the exit rates, I will begin the second step of this part—analyzing the relationship between relative exit rates of two age groups, the relationship between relative exit rates and unemployment rates, and the relationship between relative exit rates and the change of GDP. The model for the multivariate analysis is set up as follows:

$$EX_t^{60\sim64} = B_1 + B_2 EX_{t-5}^{55-59} + B_3 UR_t + B_4 G\hat{D}P_{t-1} + \varepsilon_t$$

The dependent variable is relative exit rate of age group 60-64 years. There are three independent variables: the relative exit rate of age group 55-59 years (lagged 5 periods), the unemployment rate, and the change of GDP which is lagged one period. The exit rate

of age group 55-59 years lagged five periods can be viewed as control variable, because I want to show the cohort effect of exit from employment—people aged 60-64 years now were in the age group 55-59 years five years ago. There are 11 observations included in my regression. After correcting for the autocorrelated disturbances, and using the generalised least squares regression, I obtain the regression results which are presented in the appendix tables 11-14.

I expect to obtain negative sign for $B_2$ and positive sign for $B_3$. If more people in one age group exit from employment five years ago, fewer people in this age group will be left in the labor force now, and the exit rate will be lower now than that of five years ago, all other things equal. For this reason, we may expect a negative relationship between the exit rates of age group 60-64 years now and the exit rates of age group 55-59 years lagged five periods. I expect the sign for $B_3$ to be positive, because when the unemployment rate increases, the exit rate of older workers will also increase. Under slack labor market conditions, letting older workers retire earlier is one way for government to reduce the unemployment rate. The sign for $B_4$ is hard to presume, since two different effects are mixed. On one hand, when GDP is increasing, macroeconomic conditions are favorable, and there are more chances for older workers to find a job, and thus the exit rates may be decreasing. On the other hand, aggregate incomes are higher, and perhaps older workers can afford more leisure as leisure is a normal good, which would work to increase the exit rate. According to the theory, the net effect of change in GDP on the exit rate is ambiguous, so I turn to the empirical analysis for validation.

I estimated regression equations for men and women separately. First, I discuss the regression results for men. I do not obtain the expected results for all countries' equations. The results show negative and significant relationship between unemployment rate and the relative exit rate of men aged 60-64 years in Germany. Moreover, the coefficient of unemployment rate in the United States is not significant, although it has a correct sign. In some cases, older unemployment persons who received pre-retirement benefits were excluded from unemployment statistics, since they are no longer considered to be seeking a job. This may be the reason why I do not obtain the positive and significant coefficient on the UR variable for all countries. The results I obtained for the coefficient of exit rate among men aged 55-59 years are far from satisfactory; only Germany, Italy, Japan, and Norway have the negative and significant results. In addition, most times I do not obtain significant results for the coefficient of change in GDP. France, Germany, and the US have negative and significant coefficients of unemployment for women. Moreover, the R-squared values are lower in the regression for women. The regression results mentioned above can be found in the appendix table 11 (for men) and 13 (for women).

The results I obtained are often not in accordance with expectations, and this may be due to the different official retirement age across countries. For example, most people aged 60-64 years are no longer in the labor force in France. In addition, since women usually have an earlier retirement age than men have, the regression results are less precise for women. Moreover, only 11 observations and 7 degrees of freedom may also be part of the

problem. For the reason of much earlier retirement ages in some countries, I use the relative exit rates of age group 55-59 years instead of the relative exit rate of the age group 60-64 years as the dependent variable, and the relative exit rates of age group 50-54 years lagged five periods as the control variable, and estimate the regression again. This time I obtained stronger results than I obtained previously. There are seven countries for which I obtain the negative and significant coefficients of the control variable for the regression of both men and women. For the regression results I obtained for men, there are only four countries (France, Germany, the Netherlands, and the US) that do not have positive and significant coefficients on the UR variable. Again, the regression results are less precise for women. In addition, the R-squared values are still lower in the regression for women.

### 2.3 The protection-pull factors

Early retirement has been studied in the social sciences from two main perspectives—protection-oriented studies of 'pull' factors that affect the labor supply, and the production-oriented studies of 'push' factors that affect the labor demand. In this paper, I focus on the 'pull' factors that affect people's retirement decisions. According to the 'pull' perspective, differences in early retirement pathways of the welfare systems explain the rise in early exit from employment and the cross-national variations. The public and semi-public exit pathways provide income support for withdrawal from employment before age 65 years. One of those pathways is early statutory pensions that providing benefits before age 65 years. Countries such as Denmark, Sweden, Japan, and the US

have relative low early exit rates for men. This may be due to a statutory pension age of 65 years (or even later). Among the European countries, France and Italy have an early statutory retirement age, which partly explains the high early exit rates before age 65 years. In the case for women, there is more evidences of a reduction in labor supply through the lower statutory retirement age. As a result, women in the age groups prior to 65 years old have lower participation rates and employment rates than men have. In Italy, the UK, and Japan, women are given rights to draw pensions earlier than men. But higher relative exit rates for women can also be found in some countries that have no gender gap in pension rules. The earlier statutory pension age for women is not the only reason for low participation rates and employment rates among women. It is always more complicated to analyze the labor supply behavior of women.

Unemployment insurance is another important pathway to early retirement. The long-term unemployment benefits for older workers make it possible to bridge the time from dismissal or layoff to the normal pension age. For instance, long-term unemployment insurance is a common practice in workplace agreements on voluntary dismissal in Germany. German pre-retirement pensions have provided unemployment benefits for jobless older workers aged 60-64 years since 1957. In the late-1980s, the long-term unemployment benefits were extended to 32 months. The high level of unemployment benefits may lead to high unemployment rates among older workers in Germany. The unemployment rate was around 8% for male workers aged 55-59 years in the late 1980s and above 14% in the late 1990s in Germany. Similarly, Sweden has high unemployment

rates among older workers. Sweden's long-term unemployed older workers can receive unemployment benefits for one year and nine months since 1974. All of these facts may partly explain the positive relationship between unemployment rates and early exit rates in Germany and Sweden which I obtained in the empirical model in section 2.2.

## Part Ⅳ Policy reform: Reversing the early retirement trend

Population aging is a problem in most OECD countries, and early retirement will exacerbate the problem. If people continue to retire early, labor force growth will slow down, which will further reduce the rate of economic growth. Although the trend toward early retirement was reversed in many countries in recent years, encouraging the labor force to extend their working lives is still an important task for the governments in all the OECD countries. Several policies can be introduced to encourage older workers to stay in the labor force longer:

First, raising the normal retirement age for the receipt of a public pension is the most common policy recommendation. In 1983, the United States passed legislation to raise the normal retirement age (from 65 to 66 by 2009 and to 67 by 2025), but the later efforts by Congress to further increase the retirement age failed.[①] The 1995 Dini pension reform in Italy raised the 'minimum' retirement age from 53 to 54 years step by step until 1998, and then to 57 by 2004. The normal retirement age was already at 65 years or higher in

[①] Chen Y.-P (1996) "Gradual Retirement in the United States: Macro Issues and Policies" pp 171-172

Sweden, Denmark, Britain (only for men), and the Netherlands. During the 1990s, the mandatory retirement age was raised to 67 in Sweden. The official pension age remained at 67 years in Denmark until 2004. In 2004, the normal retirement age was lowered to 65 years in Denmark. Almost all countries with official retirement age below 65 years began to increase the retirement age step by step, except for France. The 1993 Balladur-Veil pension reform in France only extended the minimum contribution period from 37.5 to 40 years. This reform implies that retirement at 60 years old is still possible if one has reached the minimum contribution years.[①]In addition, more and more countries began to remove the gender gaps of official retirement age, since women usually live longer. The longer life expectancies will increase the pension expenditures, which will become a heavy burden on public finances. In the Netherlands, Sweden, Denmark, and the US, the statutory pension age are already the same for men and women.[②]

Second, increasing the flexibility of pensions with respect to earnings is also one way to encourage older workers to work longer. For instance, the OECD reports put forward the policy recommendation in 2005 that Canada can allow older workers to combine pension income with salaries by: a. abolishing the stop-work clause in the CPP (Canada Pension Plan)—"under current rules, workers aged 60 to 64 must stop working a month before the first pension payment. This should be abolished so that individuals can work and draw a pension" [③] b. Reviewing the income tax and private pension system—"income tax rules require a pension sponsor to start paying out benefits by the end of the year in which

① Reday-Mulvey, G. (1996) "Gradual retirement in France"
② SSA/ISSA 2003,2004a, 2004b Social Security Programs throughout the World
③ OECD Reports (2005) "Canadians must have more opportunity to extend their working lives, says OECD"

employee turns 69 to ensure that the plan complies with the Income Tax Act (ITA)..... The ITA permits deferral of benefits until then, but the Act does not permit an individual to continue accruing benefits in a defined benefit pension plan while receiving benefits from that plan, so it is not possible to receive a partial pension while continuing to work. "[①]

In addition, in some countries, pensions are subjected to either an earning test or means test on pension benefits, which may discourage work after the age of entitlement for a pension (OECD 2006). In the UK, the potential coverage of pensioners who will be affected by means-tested benefits is set to increase significantly, which could reduce work incentives.[②] "A means test for the public pension also applies in Australia to non-pension income, and less than 18% of Australians are working in the age group 65-69 years compared with 30% in the United States, where there is no earnings or means test for pensioners after the full-retirement age" (OECD, 2006). An earnings test may have a negative impact on employment of older workers—discourage some older workers from continuing to work. If governments allow flexibility in combining income from work and pensions, older workers will be encouraged to work longer. Allowing older workers to combine pension with work income can also be viewed as gradual retirement. It is helpful in reversing the trend of costly pension expenditure and making an active society.

Third, protecting older workers is also necessary when helping older workers extend their

[①] Monica Townson (2006) "Growing Older, Working Longer" pp 147-148
[②] UK country report (OECD, 2004d), over 50% of the IK population aged 65 and over are currently eligible for the means-tested Pension Credit and this could rise to closeto 75% by 2005

working lives. For example, greater attention should be placed on age discrimination. There are some evidence that employers hold rather stereotypical views about the strengths and weakness of older workers. For example, 50% of all employers in a 2001 survey in Sweden considered older workers to have less relevant skills than younger workers and to be more rigid and inflexible with respect to changes in the workplace. In addition, 70% of the employers in this survey reported that they never or rarely hired older workers.[①] In the United States, age discrimination persists despite legislation. Employers revealed in a 1998 survey that while older workers were often seen as being more loyal and committed than younger workers, they were also seen as being less flexible, less willing to participate in training, and less likely to have up-to-date skills.[②] Usually, age discrimination is dealt with by human rights legislation, but human rights laws in some area prohibit age discrimination only between ages 18 and 64 years. The workers aged 65 and over have no legal weapons to fight against the age discrimination in the workplace.

Besides reducing age discrimination, increasing the employment services for the older people is also one way to induce older workers to work longer. In Japan, there exists a lot of governmental and non-governmental organizations which will offer employment programs for older people and help older job seekers to find a job. This may be part of the reason why Japan has high participation rates and employment rates among the older population. Moreover, improvements in life-long education and training for older workers

① OECD 2003a Ageing and Employment Policies: Sweden OECD, Paris
② OECD 2005b Ageing and Employment Policies: United States OECD, Paris

can increase the productivity of older workers and encourage them to work longer. In addition, improving working conditions is also very important. A poor working condition is one factor that may push older workers into early retirement. According to a European survey on working conditions, 43% of men and 26% of women aged 50-64 years are exposed to physically unpleasant working conditions during at least half of the work time. (OECD 2006)

## Part V Conclusion

Early retirement is a significant trend common to all developed countries since the mid-1980s. Consequently, the costly practice of early exit from employment—higher social expenditure and lower employment activity—poses a challenge to today's welfare systems. Through the quantitative analysis, I can find cross-national differences in early exit patterns. This can be explained by the differences in early retirement pathways of the welfare systems. In Asian countries such as Japan and Korea, the labor force participation and employment rates among older workers remain relatively high, even while other OECD countries are experiencing a significant decline in participation and employment rates among older workers. The early exit trend is most obvious in European countries such as France, Italy, and Germany, especially during the 1990s. North American countries—Canada and the United States—have mid-range levels of employment rates and participation rates relative to the 16 OECD countries. But Canada and the United States are better placed to meet the challenges of population ageing, since population in

both countries are not expected to age as rapidly or as extensively as in Japan and many European countries. Moreover, the employment rates and early exit rates also show a reversing trend towards early retirement in the 2000s in some OECD countries, especially in Australia, Canada, and New Zealand. In addition, through the multivariate analysis, I determined that unemployment has a positive effect on the early retirement trend.

Data analysis is only a method which helps us diagnose a policy challenge. Developing effective policy will play a key role in solving the problem, so I listed several widely used policies which are helpful in reversing the early retirement trend. These major reform policies include: raising the statutory-pension age, phasing in retirement, and strengthening the protection afforded to older workers. These policies have already been used in some OECD countries. We can believe that the policy reform can help us reverse the early exit trend and offset the negative effect of population ageing.

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1SSA/ISSA 2003, 2004a, 2004b Social Security Programs throughout the World

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# Appendix

Table 1

Absolute and relative exit rates, men aged 60-64,1990-2007

| | 1990 | 1995 | 2000 | 2005 | 2007 | Δ1990-2007 |
|---|---|---|---|---|---|---|
| **absolute exit** | | | | | | |
| Australia | 25.44 | 28.26 | 22.69 | 16.14 | 14.32 | -3.32 |
| Canada | 26.07 | 31.45 | 22.44 | 17.78 | 17.02 | -2.48 |
| Denmark | 28.83 | 34.16 | 39.39 | 32.36 | 34.33 | 1.03 |
| France | 40.47 | 46.49 | 45.73 | 45.54 | 48.14 | 1.03 |
| Germany | 38.79 | 43.61 | 36.31 | 30.4 | 27.53 | -2 |
| Greece | 28.77 | 24.61 | 27.75 | 25.58 | 25.78 | -0.64 |
| Italy | 33.05 | 36.72 | 27.9 | 23.89 | 24.19 | -1.82 |
| Japan | 17.61 | 20.67 | 26.42 | 24.04 | 18.05 | 0.15 |
| Korea | 9.058 | 9.423 | 21.24 | 9.743 | 10.87 | 1.08 |
| Netherlands | 37.67 | 42.97 | 32.65 | 39.66 | 35.28 | -0.38 |
| New Zealand | -- | 28.19 | 21.04 | 7.955 | 7.489 | -10.5* |
| Norway | 26.01 | 19.43 | 19.28 | 20.6 | 18.09 | -2.11 |
| Spain | 25.14 | 33.15 | 21.17 | 22.61 | 24.87 | -0.06 |
| Sweden | 22.77 | 35.14 | 24.49 | 18.68 | 16.62 | -1.83 |
| United Kingdom | 25.4 | 29.78 | 18.82 | 17.04 | 15.67 | -2.8 |
| United States | 22.55 | 25.46 | 21.07 | 19.04 | 17.42 | -1.51 |
| Europe | 30.93 | 35.49 | 29.74 | 27.12 | 26.23 | -0.97 |
| OECD countries | 25.99 | 29.31 | 25.69 | 22.8 | 20.89 | -1.28 |
| **relative exit** | | | | | | |
| Australia | 35.4 | 39.75 | 33.9 | 23.5 | 20.7 | -3.11 |
| Canada | 35.39 | 44.05 | 34.15 | 25.92 | 24.93 | -2.04 |
| Denmark | 37.12 | 41.83 | 51.04 | 40.61 | 42.41 | 0.79 |
| France | 64.66 | 73.85 | 75.64 | 75.33 | 74.31 | 0.82 |
| Germany | 54.85 | 62.38 | 56.75 | 45.83 | 40.04 | -1.83 |
| Greece | 38.75 | 34.79 | 38.75 | 36.94 | 37.7 | -0.16 |
| Italy | 48.28 | 54.8 | 48.19 | 46.36 | 45.55 | -0.34 |
| Japan | 20.29 | 22.98 | 28.88 | 26.72 | 20.32 | 0.01 |
| Korea | 11.97 | 11.44 | 25.65 | 13.07 | 13.87 | 0.87 |
| Netherlands | 62.43 | 67.67 | 55.04 | 57.78 | 47.42 | -1.6 |
| New Zealand | -- | 37.99 | 26.95 | 10.26 | 9.036 | -11.3* |
| Norway | 29.52 | 24.36 | 24.45 | 24.77 | 22.02 | -1.71 |
| Spain | 36.58 | 47.49 | 34.61 | 32.87 | 35.27 | -0.21 |
| Sweden | 26.66 | 40.67 | 32.18 | 23.43 | 20.51 | -1.53 |

| | | | | | | |
|---|---|---|---|---|---|---|
| United Kingdom | 33.98 | 39.75 | 28.45 | 24.08 | 21.5 | -2.66 |
| United States | 29.62 | 33.17 | 28.25 | 25.3 | 23.31 | -1.4 |
| Europe | 44.65 | 51.98 | 47.77 | 42.91 | 40.5 | -0.57 |
| OECD countries | 34.85 | 39.11 | 36.22 | 31.72 | 28.89 | -1.1 |

*New Zealand's data for 1985 is missing, so the growth rate is from 1995-2007

Table 2

Absolute and relative exit rates, women aged 60-64,1990-2007

| | 1990 | 1995 | 2000 | 2005 | 2007 | Δ1990-2007 |
|---|---|---|---|---|---|---|
| **absolute exit** | | | | | | |
| Australia | 11.23 | 16.56 | 16.57 | 15.07 | 14.03 | 1.32 |
| Canada | 15.88 | 20.77 | 18.49 | 17.14 | 12.93 | -1.20 |
| Denmark | 27.42 | 37.55 | 28.11 | 38.04 | 37.64 | 1.88 |
| France | 23.11 | 27.48 | 31.99 | 34.32 | 35.39 | 2.54 |
| Germany | 23.88 | 25.45 | 27.44 | 26.33 | 25.69 | 0.43 |
| Greece | 9.91 | 8.11 | 7.92 | 9.66 | 8.35 | -1.00 |
| Italy | 9.64 | 12.64 | 11.37 | 13.91 | 15.71 | 2.91 |
| Japan | 10.89 | 14.48 | 18.19 | 18.00 | 15.20 | 1.98 |
| Korea | 3.76 | 8.45 | 8.41 | 7.42 | 6.03 | 2.82 |
| Netherlands | 9.54 | 15.67 | 15.81 | 20.61 | 20.00 | 4.45 |
| New Zealand | -- | 19.52 | 18.76 | 8.72 | 7.79 | -7.37* |
| Norway | 15.03 | 13.94 | 16.28 | 19.43 | 19.86 | 1.65 |
| Spain | 6.77 | 6.68 | 6.22 | 5.66 | 6.20 | -0.52 |
| Sweden | 20.65 | 33.12 | 28.08 | 20.95 | 20.30 | -0.10 |
| United Kingdom | 26.82 | 27.31 | 27.73 | 25.58 | 25.41 | -0.32 |
| United States | 13.35 | 17.05 | 18.21 | 15.58 | 15.00 | 0.69 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Europe | 17.44 | 19.16 | 19.74 | 19.62 | 20.23 | 0.88 |
| OECD countries | 15.08 | 18.60 | 17.82 | 17.06 | 16.45 | 0.51 |
| **relative exit** | | | | | | |
| Australia | 41.50 | 50.67 | 43.69 | 33.13 | 28.68 | -2.15 |
| Canada | 40.87 | 48.71 | 41.96 | 34.17 | 25.22 | -2.80 |
| Denmark | 50.43 | 65.20 | 54.62 | 59.16 | 53.93 | 0.40 |
| France | 58.94 | 66.28 | 71.37 | 72.69 | 70.55 | 1.06 |
| Germany | 70.89 | 72.34 | 68.70 | 55.96 | 50.80 | -1.94 |
| Greece | 33.41 | 28.96 | 28.51 | 32.52 | 29.21 | -0.79 |
| Italy | 49.45 | 62.60 | 59.36 | 60.50 | 59.79 | 1.12 |
| Japan | 21.84 | 27.23 | 32.49 | 31.60 | 27.03 | 1.26 |
| Korea | 7.97 | 15.58 | 15.61 | 14.76 | 12.24 | 2.55 |
| Netherlands | 54.95 | 65.61 | 58.60 | 54.40 | 47.21 | -0.89 |
| New Zealand | -- | 45.86 | 36.68 | 15.06 | 12.87 | -10.04* |
| Norway | 24.82 | 22.90 | 25.16 | 27.37 | 27.11 | 0.52 |
| Spain | 31.02 | 32.16 | 29.15 | 22.89 | 22.57 | -1.85 |
| Sweden | 28.41 | 42.55 | 38.40 | 27.58 | 26.31 | -0.45 |
| United Kingdom | 55.21 | 52.67 | 52.25 | 45.77 | 43.76 | -1.36 |
| United States | 27.84 | 31.78 | 31.74 | 26.03 | 24.36 | -0.78 |
| Europe | 52.02 | 55.87 | 55.83 | 50.42 | 48.55 | -0.41 |
| OECD countries | 36.90 | 42.80 | 40.84 | 36.15 | 33.59 | -0.55 |

*New Zealand's data for 1985 is missing, so the growth rate is from 1995-2007

Table 3

Absolute and relative exit rates, men aged 55-59,1990-2007

| | 1990 | 1995 | 2000 | 2005 | 2007 | Δ1990-2007 |
|---|---|---|---|---|---|---|
| **absolute exit** | | | | | | |
| Australia | 11.54 | 17.16 | 12.25 | 8.69 | 6.50 | -3.32 |
| Canada | 10.62 | 17.44 | 11.91 | 9.57 | 8.90 | -1.03 |
| Denmark | 2.93 | 7.21 | 4.85 | 1.13 | 3.04 | 0.23 |
| France | 23.05 | 24.75 | 23.50 | 25.79 | 26.52 | 0.83 |
| Germany | 18.02 | 21.58 | 18.78 | 11.93 | 7.60 | -4.95 |
| Greece | 15.48 | 14.40 | 15.78 | 13.82 | 11.61 | -1.68 |
| Italy | 20.77 | 27.60 | 25.52 | 24.50 | 23.33 | 0.69 |
| Japan | 3.68 | 3.78 | 5.49 | 3.42 | 2.10 | -3.24 |
| Korea | 3.09 | 6.25 | 15.59 | 7.98 | 5.94 | 3.92 |
| Netherlands | 10.97 | 20.83 | 14.06 | 11.95 | 7.22 | -2.43 |
| New Zealand | -- | 7.49 | 9.14 | 2.83 | 1.57 | -12.18* |
| Norway | 10.65 | 6.44 | 3.79 | 6.70 | 4.10 | -5.46 |
| Spain | 8.45 | 21.17 | 8.85 | 11.53 | 9.92 | 0.95 |
| Sweden | 6.08 | 16.23 | 5.89 | 3.90 | 3.89 | -2.59 |
| United Kingdom | 8.88 | 18.12 | 9.35 | 6.73 | 8.16 | -0.50 |
| United States | 7.82 | 11.38 | 8.10 | 9.64 | 7.67 | -0.12 |
| Europe | 16.63 | 21.29 | 17.32 | 15.42 | 13.13 | -1.38 |
| OECD countries | 11.46 | 15.51 | 12.20 | 11.06 | 9.11 | -1.34 |
| **relative exit** | | | | | | |
| Australia | 13.96 | 20.40 | 15.13 | 10.70 | 7.96 | -3.25 |
| Canada | 12.94 | 20.97 | 14.80 | 11.69 | 10.79 | -1.06 |
| Denmark | 3.46 | 8.55 | 5.74 | 1.35 | 3.54 | 0.13 |
| France | 26.80 | 29.05 | 27.99 | 30.35 | 31.17 | 0.89 |
| Germany | 20.49 | 25.22 | 22.06 | 14.28 | 9.24 | -4.58 |
| Greece | 17.95 | 16.74 | 18.56 | 16.34 | 13.71 | -1.58 |
| Italy | 23.66 | 32.27 | 33.13 | 30.62 | 28.34 | 1.07 |
| Japan | 3.93 | 3.97 | 5.75 | 3.68 | 2.28 | -3.13 |
| Korea | 3.61 | 7.02 | 17.30 | 9.28 | 6.87 | 3.85 |
| Netherlands | 14.72 | 25.99 | 16.99 | 13.86 | 8.38 | -3.26 |
| New Zealand | -- | 8.75 | 10.54 | 3.22 | 1.81 | -12.31* |
| Norway | 11.78 | 7.55 | 4.36 | 7.62 | 4.72 | -5.24 |
| Spain | 10.80 | 25.72 | 11.40 | 13.92 | 11.98 | 0.61 |
| Sweden | 6.57 | 17.58 | 6.88 | 4.54 | 4.54 | -2.16 |
| United Kingdom | 10.60 | 21.50 | 11.67 | 8.23 | 9.91 | -0.39 |
| United States | 9.25 | 13.24 | 9.72 | 11.39 | 9.25 | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Europe | 19.59 | 25.49 | 21.50 | 19.25 | 16.59 | -0.97 |
| OECD countries | 13.27 | 17.95 | 14.52 | 13.18 | 10.97 | -1.11 |

*New Zealand's data for 1985 is missing, so the growth rate is from 1995-2007

Table 4

Absolute and relative exit rates, women aged 55-59, 1990-2007

| | 1990 | 1995 | 2000 | 2005 | 2007 | Δ1990-2007 |
|---|---|---|---|---|---|---|
| **absolute exit** | | | | | | |
| Australia | 9.26 | 14.11 | 13.23 | 10.41 | 8.55 | -0.47 |
| Canada | 8.64 | 13.64 | 11.28 | 9.93 | 10.15 | 0.95 |
| Denmark | 8.34 | 21.44 | 3.63 | 3.11 | 6.15 | -1.78 |
| France | 12.11 | 12.29 | 15.67 | 16.07 | 16.04 | 1.67 |
| Germany | 10.98 | 11.20 | 13.11 | 9.60 | 8.28 | -1.65 |
| Greece | 10.39 | 8.48 | 6.86 | 8.20 | 8.98 | -0.86 |
| Italy | 11.76 | 14.05 | 11.62 | 8.10 | 9.41 | -1.31 |
| Japan | 6.82 | 8.58 | 8.83 | 7.69 | 5.95 | -0.80 |
| Korea | -1.93 | 5.91 | 8.28 | 5.98 | 7.12 | -207.97 |
| Netherlands | 3.46 | 8.40 | 8.09 | 8.94 | 4.66 | 1.76 |
| New Zealand | -- | 14.32 | 12.74 | 0.12 | 2.21 | -14.43* |
| Norway | 11.47 | 7.75 | 4.11 | 8.77 | 5.51 | -4.22 |
| Spain | 2.09 | 4.29 | 3.48 | 0.67 | 0.30 | -10.80 |
| Sweden | 6.36 | 14.26 | 8.75 | 6.24 | 6.25 | -0.10 |
| United Kingdom | 9.32 | 11.85 | 11.29 | 8.16 | 8.01 | -0.89 |
| United States | 4.40 | 7.39 | 8.78 | 9.06 | 6.63 | 2.44 |
| Europe | 9.63 | 11.23 | 13.86 | 11.84 | 11.43 | 1.01 |
| OECD countries | 7.81 | 11.68 | 10.70 | 9.64 | 8.40 | 0.43 |
| **relative exit** | | | | | | |
| Australia | 22.08 | 27.12 | 22.53 | 16.36 | 12.85 | -3.13 |
| Canada | 16.85 | 23.63 | 18.35 | 14.78 | 14.31 | -0.96 |
| Denmark | 12.65 | 29.40 | 5.34 | 3.98 | 7.69 | -2.89 |
| France | 22.60 | 21.53 | 24.91 | 23.84 | 23.44 | 0.21 |
| Germany | 23.78 | 21.90 | 21.78 | 14.78 | 12.31 | -3.80 |
| Greece | 27.06 | 23.38 | 18.77 | 20.81 | 21.36 | -1.38 |
| Italy | 36.80 | 42.30 | 33.58 | 20.64 | 21.76 | -3.04 |
| Japan | 11.37 | 13.29 | 13.42 | 11.64 | 9.10 | -1.30 |
| Korea | -3.70 | 9.89 | 14.13 | 11.05 | 12.46 | -207.41 |
| Netherlands | 12.65 | 23.74 | 17.61 | 15.89 | 7.85 | -2.77 |
| New Zealand | -- | 21.87 | 18.04 | 0.17 | 2.98 | -15.31* |
| Norway | 15.86 | 10.70 | 5.48 | 11.04 | 6.93 | -4.75 |
| Spain | 9.15 | 16.75 | 12.34 | 1.88 | 0.78 | -13.48 |
| Sweden | 7.55 | 16.32 | 10.33 | 7.47 | 7.44 | -0.09 |

| | | | | | | |
|---|---|---|---|---|---|---|
| United Kingdom | 15.23 | 18.26 | 16.80 | 11.58 | 11.13 | -1.83 |
| United States | 7.57 | 11.41 | 12.80 | 12.50 | 9.31 | 1.22 |
| Europe | 21.92 | 24.10 | 26.25 | 20.96 | 19.72 | -0.62 |
| OECD countries | 15.24 | 21.13 | 18.48 | 15.73 | 13.60 | -0.67 |

*New Zealand's data for 1985 is missing, so the growth rate is from 1995-2007

Table 5

| annual growth rate of employment rate for men | | | | | | |
|---|---|---|---|---|---|---|
| | Annual growth rate from 1985-1995(%) | | | Annual growth rate from 1995-2007(%) | | |
| | 50-54 | 55-59 | 60-64 | 50-54 | 55-59 | 60-64 |
| Australia | -0.21 | -0.71 | 0.56 | 0.31 | 0.97 | 2.09 |
| Canada | -0.19 | -1.13 | -2.31 | 0.33 | 0.94 | 2.1 |
| Denmark | -0.01 | -0.06 | 0.43 | 0.26 | 0.6 | -0.16 |
| France | -0.24 | -0.35 | -5.63 | 0.15 | -0.26 | 0.09 |
| Germany | -0.33 | -1 | -1.83 | -0.1 | 1.29 | 3.81 |
| Greece | -0.14 | -0.36 | -1.49 | 0.22 | 0.17 | -0.66 |
| Italy | -1.3 | -1.66 | -2.29 | 1.08 | 0.16 | -0.39 |
| Japan | 0.195 | 0.53 | 0.28 | -0.23 | -0.15 | 0.18 |
| Korea | 0.528 | 0.905 | 1.09 | -0.24 | -0.24 | -0.65 |
| Netherlands | 1.054 | -0.17 | -2.58 | 0.28 | 2.41 | 5.52 |
| New Zealand | -0.58 | -0.86 | 0.37 | 0.26 | 0.76 | 4.2 |
| Norway | -0.39 | -1.1 | -1.53 | -0.02 | 0.41 | 0.5 |
| Spain | -0.08 | -1.16 | -2.7 | 0.71 | 1.47 | 1.85 |
| Sweden | -0.77 | -1.14 | -1.88 | 0.14 | 0.61 | 1.92 |
| U.K. | -0.45 | -1.22 | -0.97 | 0.49 | 0.96 | 1.99 |
| U.S. | -0.15 | -0.2 | -0.37 | 0.04 | 0.08 | 0.93 |
| Europe | -0.53 | -1.06 | -1.98 | 0.07 | 0.49 | 1.36 |
| OECD | -0.27 | -0.5 | -0.58 | 0.01 | 0.34 | 1 |

Table 6

| annual growth rate of employment rate for women | | | | | | |
|---|---|---|---|---|---|---|
| | Annual growth rate from 1985-1995(%) | | | Annual growth rate from 1995-2007(%) | | |
| | 50-54 | 55-59 | 60-64 | 50-54 | 55-59 | 60-64 |
| Australia | 3.43 | 3.43 | 3.29 | 1.72 | 3.60 | 6.65 |
| Canada | 1.83 | 1.27 | -0.25 | 1.82 | 2.71 | 4.79 |
| Denmark | 0.30 | -0.55 | -2.30 | 1.57 | 3.05 | 4.02 |
| France | 1.62 | 1.34 | -2.28 | 1.42 | 1.31 | 0.46 |
| Germany | 2.69 | 1.72 | -0.05 | 1.58 | 3.29 | 8.14 |
| Greece | -0.49 | -0.65 | -0.67 | 2.44 | 1.46 | 0.14 |
| Italy | 0.80 | -0.18 | -2.80 | 3.71 | 4.85 | 2.83 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Japan | 0.92 | 1.16 | 0.22 | 0.40 | 0.51 | 0.49 |
| Korea | 1.14 | 1.35 | 0.97 | -0.02 | -0.62 | -0.48 |
| Netherlands | 5.33 | 4.51 | 2.88 | 3.61 | 6.06 | 8.70 |
| New Zealand | 2.02 | 1.55 | 1.40 | 0.92 | 2.87 | 7.13 |
| Norway | 0.37 | 0.66 | 0.27 | 0.53 | 1.12 | 1.08 |
| Spain | 2.12 | -0.23 | -0.97 | 5.42 | 4.96 | 3.48 |
| Sweden | 0.06 | 0.06 | 0.34 | -0.17 | 0.51 | 2.02 |
| U.K. | 0.94 | 0.89 | 3.37 | 0.98 | 1.57 | 2.41 |
| U.S. | 1.69 | 1.81 | 1.28 | 0.45 | 0.99 | 2.03 |
| Europe | 1.85 | 0.53 | -0.02 | 1.46 | 2.32 | 2.94 |
| OECD | 1.23 | 0.65 | 0.40 | 1.03 | 1.70 | 2.27 |

Table 7

| annual growth rate of unemployment rate for men | | | | | | |
|---|---|---|---|---|---|---|
| | Annual growth rate from 1985-1995(%) | | | Annual growth rate from 1995-2007(%) | | |
| | 50-54 | 55-59 | 60-64 | 50-54 | 55-59 | 60-64 |
| Australia | 1.13 | 3.64 | 1.12 | -5.97 | -10.04 | -8.35 |
| Canada | -0.08 | 0.49 | -1.68 | -3.59 | -4.32 | -3.55 |
| Denmark | -0.69 | 0.21 | 6.15 | -7.76 | -5.38 | -5.88 |
| France | 2.87 | 1.15 | -3.20 | -2.84 | -3.77 | 3.67 |
| Germany | 1.90 | 3.41 | 3.92 | 2.19 | -1.19 | 1.71 |
| Greece | 1.80 | 4.28 | 4.48 | -3.66 | -2.26 | -1.25 |
| Italy | 4.84 | 7.88 | 11.99 | -4.51 | -4.20 | -0.96 |
| Japan | -0.04 | -3.46 | 0.62 | 4.31 | 2.03 | -3.36 |
| Korea | -7.99 | -5.00 | 12.99 | 5.59 | 5.93 | 8.87 |
| Netherlands | -7.99 | -6.72 | -- | -3.73 | 1.26 | 11.34 |
| New Zealand | 6.41 | 9.74 | 11.09 | -8.20 | -6.94 | -6.49 |
| Norway | 9.08 | 10.25 | 10.28 | -5.66 | -8.88 | -7.50 |
| Spain | -0.47 | 1.37 | -1.43 | -7.25 | -8.54 | -5.73 |
| Sweden | 12.65 | 13.31 | 7.60 | -4.68 | -6.04 | -6.10 |
| U.K. | 1.01 | 0.94 | -0.33 | -7.80 | -6.49 | -8.31 |
| U.S. | -2.55 | -1.90 | -2.07 | -0.98 | -1.01 | -0.78 |
| Europe | 0.72 | 1.86 | -0.12 | -1.69 | -3.12 | -1.68 |
| OECD | 0.18 | 0.53 | -0.61 | -1.48 | -2.61 | -2.40 |

Table 8

| annual growth rate of unemployment rate for women | | | | | | |
|---|---|---|---|---|---|---|
| | Annual growth rate from 1985-1995(%) | | | Annual growth rate from 1995-2007(%) | | |
| | 50-54 | 55-59 | 60-64 | 50-54 | 55-59 | 60-64 |
| Australia | 0.79 | 1.44 | 1.01 | -3.40 | -4.86 | 2.02 |
| Canada | -1.58 | 0.53 | -0.69 | -4.82 | -4.73 | -2.45 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Denmark | -2.60 | 4.56 | 4.77 | -9.15 | -4.22 | -9.04 |
| France | 3.37 | -0.43 | -7.49 | -4.02 | -3.13 | 0.21 |
| Germany | 6.09 | 7.64 | 5.65 | -1.75 | -1.95 | 5.28 |
| Greece | 4.17 | 7.68 | 8.92 | 1.06 | 3.28 | 1.20 |
| Italy | 2.75 | 7.21 | 8.29 | -4.61 | -5.92 | -5.02 |
| Japan | 1.94 | -2.27 | 4.25 | 1.69 | 1.79 | 0.46 |
| Korea | 4.77 | 6.99 | -- | 14.12 | 7.13 | 15.79 |
| Netherlands | -0.34 | -0.91 | -- | -3.79 | -2.22 | -- |
| New Zealand | 2.48 | 5.06 | -- | -5.32 | -5.49 | -6.12 |
| Norway | 5.49 | 2.34 | -- | -6.88 | -6.89 | -5.66 |
| Spain | 10.73 | 7.63 | 10.74 | -5.48 | -4.51 | -0.78 |
| Sweden | 9.96 | 10.13 | 0.09 | -1.72 | -5.62 | -5.41 |
| U.K. | -2.56 | -3.10 | -14.16 | -4.46 | -5.81 | 2.44 |
| U.S. | -4.18 | -2.80 | 0.25 | 0.28 | -1.16 | -2.32 |
| Europe | 2.99 | 3.35 | -2.08 | -2.22 | -2.78 | 1.74 |
| OECD | 1.46 | 1.48 | -1.08 | -1.54 | -2.41 | 0.10 |

Table 9

| annual growth rate of participation rate for men | | | | | | |
|---|---|---|---|---|---|---|
| | Annual growth rate from 1985-1995(%) | | | Annual growth rate from 1995-2007(%) | | |
| | 50-54 | 55-59 | 60-64 | 50-54 | 55-59 | 60-64 |
| Australia | -0.14 | -0.39 | 0.66 | 0.02 | 0.35 | 1.60 |
| Canada | -0.19 | -1.09 | -2.47 | 0.10 | 0.61 | 1.85 |
| Denmark | -0.05 | -0.05 | 0.74 | -0.03 | 0.30 | -0.45 |
| France | -0.04 | -0.25 | -5.75 | -0.04 | -0.55 | 0.24 |
| Germany | -0.21 | -0.63 | -1.59 | 0.07 | 1.15 | 3.97 |
| Greece | -0.08 | -0.21 | -1.40 | 0.10 | 0.08 | -0/69 |
| Italy | -1.16 | -1.44 | -2.08 | 0.95 | 0.01 | -0.41 |
| Japan | 0.19 | 0.41 | 0.33 | -0.13 | -0.08 | -0.05 |
| Korea | 0.36 | 0.82 | 1.16 | -0.14 | -0.13 | -0.50 |
| Netherlands | 0.48 | -0.53 | -2.98 | 0.15 | 2.46 | 6.02 |
| New Zealand | -0.37 | -0.61 | 0.56 | 0.02 | 0.55 | 4.06 |
| Norway | -0.22 | -0.92 | -1.31 | -0.14 | 0.24 | 0.32 |
| Spain | -0.14 | -0.95 | -2.86 | 0.09 | 0.59 | 1.39 |
| Sweden | -0.32 | -0.55 | -1.29 | -0.10 | 0.24 | 1.41 |
| U.K. | -0.45 | -1.12 | -1.01 | 0.05 | 0.44 | 1.41 |
| U.S. | -0.25 | -0.2 | -0.45 | 0.01 | 0.04 | 0.90 |
| Europe | -0.48 | -0.91 | -1.99 | -0.04 | 0.25 | 1.26 |
| OECD | -0.26 | -0.47 | -0.61 | -0.06 | 0.20 | 0.88 |

Table 10

| annual growth rate of participation rate for women | | | | | | |
|---|---|---|---|---|---|---|
| | Annual growth rate from 1985-1995(%) | | | Annual growth rate from 1995-2007(%) | | |
| | 50-54 | 55-59 | 60-64 | 50-54 | 55-59 | 60-64 |
| Australia | 3.46 | 3.50 | 3.31 | 1.59 | 3.40 | 6.70 |
| Canada | 1.69 | 1.32 | -0.30 | 1.53 | 2.36 | 4.63 |
| Denmark | 0.10 | -0.13 | -2.01 | 1.19 | 2.65 | 3.56 |
| France | 1.93 | 1.31 | -2.63 | 1.06 | 1.09 | 0.47 |
| Germany | 3.21 | 2.62 | 0.17 | 1.39 | 2.98 | 8.56 |
| Greece | -0.27 | -0.44 | -0.58 | 2.52 | 1.62 | 0.16 |
| Italy | 0.94 | 0.05 | -2.60 | 3.49 | 4.64 | 2.68 |
| Japan | 0.96 | 1.12 | 0.31 | 0.44 | 0.54 | 0.50 |
| Korea | 1.15 | 1.38 | 0.96 | 0.08 | -0.56 | -0.37 |
| Netherlands | 5.32 | 4.46 | 2.61 | 3.39 | 5.96 | 9.04 |
| New Zealand | 2.09 | 1.66 | 1.45 | 0.78 | 2.75 | 7.01 |
| Norway | 0.48 | 0.70 | 0.44 | 0.41 | 1.02 | 1.01 |
| Spain | 3.41 | 0.60 | -0.47 | 4.56 | 4.37 | 3.42 |
| Sweden | 0.31 | 0.46 | 0.35 | -0.24 | 0.23 | 1.67 |
| U.K. | 0.79 | 0.70 | 2.82 | 0.80 | 1.35 | 2.45 |
| U.S. | 1.52 | 1.69 | 1.29 | 0.46 | 0.95 | 1.95 |
| Europe | 2.07 | -.79 | -0.11 | 1.29 | 2.10 | 3.01 |
| OECD | 1.30 | 0.73 | 0.36 | 0.95 | 1.58 | 2.27 |

Table 11 OLS regression results (dependent variable: exit rate of age group 60-64 for men)

| men | Coeff of UR | Coeff of △GDP | Coeff of exit5559 | R squared | F-stat |
|---|---|---|---|---|---|
| Australia | 3.68 (0.82)* | 1.83 (1.06) | -0.19 (0.43) | 0.88 | 17.39 |
| Canada | 5.39 (0.83)* | 2.04 (0.56)* | 0.67 (0.22)* | 0.91 | 24.92 |
| Denmark | -0.62 (3.66) | 0.55 (0.98) | 0.57 (0.67) | 0.17 | 0.48 |
| France | -0.10 (0.44) | -0.17 (0.21) | 0.06 (0.15) | 0.12 | 0.31 |
| Germany | -3.44 (0.79)* | -4.25 (1.17)* | -0.91 (0.32)* | 0.87 | 15.41 |
| Greece | 2.28 (0.85)* | 0.58 (0.27)* | 0.15 (0.15) | 0.65 | 4.27 |
| Italy | 0.26 (0.43) | 0.50 (0.14)* | -0.77 (0.10)* | 0.97 | 77.40 |
| Japan | 2.92 (0.27)* | 0.13 (0.09) | -0.67 (0.13)* | 0.95 | 41.54 |
| Korea | 2.31 (1.03)* | 0.15 (0.36) | -0.21 (0.25) | 0.55 | 2.86 |
| Netherlands | 8.75 (1.81)* | 1.97 (0.52)* | 1.02 (0.31)* | 0.78 | 8.41 |
| New Zealand | 4.13 (0.65)* | 0.43 (0.56) | 0.59 (0.15)* | 0.93 | 32.26 |
| Norway | -1.66 (1.05) | 0.00 (0.09) | -0.70 (0.17)* | 0.73 | 6.38 |
| Spain | 1.59 (0.27)* | -0.34 (0.63) | 0.05 (0.13) | 0.85 | 12.87 |

| | | | | | |
|---|---|---|---|---|---|
| Sweden | 3.20 (0.23)* | 0.16 (0.18). | 1.11 (0.09)* | 0.98 | 91.77 |
| U.K. | 3.27 (0.47)* | 0.30 (0.40) | 0.17 (0.14) | 0.88 | 17.58 |
| U.S. | 1.19 (2.25) | -0.75 (0.82) | 0.60 (0.59) | 0.45 | 1.89 |
| OECD | 2.11 (3.56) | -0.26 (1.07) | 0.39 (0.60) | 0.13 | 0.33 |
| Pool | 0.80 (0.44)* | -0.23 (0.32) | 1.14 (0.11)* | 0.47 | 50.37 |

*significant at 10%level

Table 12 OLS regression results (dependent variable: exit rate of age group 55-59 for men)

| men | Coeff of UR | Coeff of △GDP | Coeff of exit5054 | R squared | F-stat |
|---|---|---|---|---|---|
| Australia | 1.45 (0.56)* | 0.01 (0.62) | 0.38 (0.36) | 0.91 | 24.12 |
| Canada | 2.80 (0.79)* | 0.83 (0.38)* | 0.22 (0.15) | 0.89 | 19.65 |
| Denmark | 3.28 (1.50)* | 0.18 (0.37) | 0.73 (0.26)* | 0.60 | 3.51 |
| France | 0.17 (0.78) | -0.02 (0.34) | -0.88 (0.30)* | 0.57 | 3.06 |
| Germany | -0.58 (0.77) | -4.46 (0.96)* | -0.92 (0.38) | 0.85 | 13.07 |
| Greece | 1.98 (0.44)* | -0.01 (0.16) | -1.04 (0.28)* | 0.85 | 12.98 |
| Italy | 2.34 (0.25)* | 0.24 (0.14) | -0.33 (0.09)* | 0.93 | 33.46 |
| Japan | 1.91 (0.13)* | 0.05 (0.04) | -0.59 (0.06)* | 0.98 | 109.36 |
| Korea | 1.76 (0.81)* | 0.21 (0.25) | -0.38 (0.30) | 0.64 | 4.08 |
| Netherlands | 2.77 (1.55) | -0.53 (0.58) | 1.86 (0.49)* | 0.68 | 5.02 |
| New Zealand | 2.08 (0.55)* | 0.44 (0.41) | -0.49 (0.27) | 0.76 | 7.40 |
| Norway | 1.46 (0.51)* | 0.10 (0.05) | -0.56 (0.09)* | 0.92 | 28.09 |
| Spain | 1.00 (0.23)* | -0.23 (0.33) | -0.25 (0.10)* | 0.80 | 9.51 |
| Sweden | 1.69 (0.27)* | -0.05 (0.17) | 0.25 (0.10)* | 0.87 | 15.68 |
| U.K. | 2.06 (0.44)* | 0.08 (0.22) | -0.03 (0.10) | 0.79 | 8.52 |
| U.S. | -0.04 (0.37) | -0.09 (0.15) | -0.84 (0.13)* | 0.96 | 60.56 |
| OECD | 2.57 (1.08)* | 0.18 (0.40) | 0.70 (0.35)* | 0.57 | 3.05 |
| Pool | 1.70 (0.26)* | -0.16 (0.19) | 0.68 (0.14)* | 0.37 | 33.60 |

*significant at 10%level

Table 13 OLS regression results (dependent variable: exit rate of age group 60-64 for women)

| women | Coeff of UR | Coeff of △GDP | Coeff of exit5559 | R squared | F-stat |
|---|---|---|---|---|---|
| Australia | 4.61 (1.47)* | 1.02 (1.93) | 0.65 (0.49) | 0.78 | 8.43 |
| Canada | 7.92 (1.31)* | 2.02 (0.86)* | 0.69 (0.33)* | 0.85 | 13.17 |
| Denmark | 4.76 (2.47)* | 0.47 (1.02) | 0.01 (0.22) | 0.37 | 1.37 |
| France | -1.67 (0.42)* | -0.39 (0.28) | 0.01 (0.44) | 0.72 | 5.87 |
| Germany | -3.39 (1.47)* | -5.87 (1.31)* | -0.89 (0.45)* | 0.78 | 8.11 |
| Greece | 1.04 (0.63) | -0.11 (0.50)* | -0.65 (0.18)* | 0.79 | 8.69 |
| Italy | 0.23 (0.31) | 0.51 (0.29) | -0.35 (0.18)* | 0.43 | 1.74 |
| Japan | 3.39 (0.68)* | 0.23 (0.13) | -0.02 (0.21) | 0.89 | 18.62 |
| Korea | 0.67 (0.35) | 0.16 (0.09) | 0.00 (0.10) | 0.41 | 1.59 |
| Netherlands | 2.21 (0.95)* | 0.78 (0.61) | 0.83 (0.33)* | 0.68 | 5.01 |

| | | | | | |
|---|---|---|---|---|---|
| New Zealand | 5.22 (2.45)* | 1.36 (1.23) | 0.37 (0.50) | 0.73 | 6.23 |
| Norway | -0.22 (0.90) | 0.21 (0.08)* | -0.42 (0.10)* | 0.78 | 8.16 |
| Spain | 0.81 (0.10)* | 0.35 (0.35) | 0.11 (0.12) | 0.91 | 24.29 |
| Sweden | 3.60 (0.83)* | -0.09 (0.59) | 2.16 (0.53)* | 0.78 | 8.22 |
| U.K. | 3.25 (2.07) | 0.50 (0.77) | 0.19 (0.64) | 0.33 | 1.13 |
| U.S. | -4.28 (1.44)* | 0.15 (0.98) | -1.90 (0.69)* | 0.74 | 6.55 |
| OECD | 3.10 (2.17) | 0.06 (0.80) | 0.36 (0.51) | 0.29 | 0.97 |
| Pool | -0.20 (0.27) | -0.51 (0.41) | 1.09 (0.14)* | 0.29 | 23.52 |

*significant at 10%level

Table 14 OLS regression results (dependent variable: exit rate of age group 55-59 for women)

| women | Coeff of UR | Coeff of △GDP | Coeff of exit5054 | R squared | F-stat |
|---|---|---|---|---|---|
| Australia | 4.28 (0.87)* | 2.35 (1.18)* | 0.02 (0.42) | 0.86 | 13.87 |
| Canada | 5.02 (0.98)* | 1.24 (0.56)* | 0.11 (0.20) | 0.83 | 11.48 |
| Denmark | 5.39 (3.41) | 1.00 (1.12) | -0.40 (0.38) | 0.34 | 1.22 |
| France | 0.33 (0.33) | -0.23 (0.21) | -0.49 (0.33) | 0.31 | 1.06 |
| Germany | -1.12 (1.00) | -3.12 (0.81)* | -0.50 (0.17)* | 0.86 | 14.54 |
| Greece | 1.35 (0.66)* | -0.27 (0.69) | -0.52 (0.40) | 0.41 | 1.62 |
| Italy | 3.10 (0.28)* | 0.52 (0.27)* | -0.70 (0.17)* | 0.95 | 46.44 |
| Japan | 3.65 (0.78)* | 0.00 (0.16) | -0.68 (0.17)* | 0.84 | 11.94 |
| Korea | 0.73 (0.68) | 0.00 (0.15) | -0.42 (0.23) | 0.36 | 1.32 |
| Netherlands | 2.23 (1.04)* | -0.03 (0.50) | 0.77 (0.29)* | 0.70 | 5.40 |
| New Zealand | 6.52 (1.17)* | 0.96 (0.76) | -0.88 (0.31)* | 0.82 | 10.80 |
| Norway | 0.80 (1.14) | 0.03 (0.10) | -0.43 (0.12)* | 0.69 | 5.15 |
| Spain | 1.59 (0.24)* | 0.51 (0.64) | -0.55 (0.23)* | 0.87 | 15.69 |
| Sweden | 1.08 (0.27)* | 0.14 (0.18) | 0.46 (0.16)* | 0.74 | 6.65 |
| U.K. | 6.97 (1.44)* | 0.94 (0.45)* | 1.67 (0.68)* | 0.81 | 9.99 |
| U.S. | -3.02 (1.72) | -0.35 (0.50) | -1.49 (0.59)* | 0.55 | 2.85 |
| OECD | 3.55 (1.77)* | 0.08 (0.82) | -0.18 (0.57) | 0.49 | 2.29 |
| Pool | 0.82 (0.12)* | -0.23 (0.18) | 0.18 (0.11)* | 0.25 | 18.74 |

*significant at 10%level

## Appendix Notes

Formula for calculating annual growth rate (%):

$$(X_{t_{0+n}} - X_{t_0}) / X_{t_0} = (((X_{t_{0+n}} / X_{t_0})^{1/n}) - 1) * 100$$

When calculating the annual growth rate from 1985 to 1995: n=1995-1985=10

When calculating the annual growth rate from 1995 to 2007: n=2007-1995=12