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in the OECD

Tryggvi Thor Herbertsson and J. Michael Orszag

Address:	Tryggvi Thor Herbertsson
	Department of Economics and IoES
	University of Iceland
	Oddi at Sturlugata, 101 Reykjavik
	Iceland
Email:	tthh@hi.is
Address:	J. Michael Orszag
	Department of Economics
	Birkbeck College, University of London
	7–15 Gresse Street, London W1P 2LL
	United Kingdom
Email:	jmo@ricardo.econ.bbk.ac.uk

The Costs of Early Retirement

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Tryggvi Thor Herbertsson
Institute of Economic Studies, University of Iceland and
Centre for Pensions and Social Insurance

J. Michael Orszag
Birkbeck College, University of London and
Centre for Pensions and Social Insurance

Abstract

Despite substantial increases in longevity, the age of retirement in the industrialized countries has steadily fallen throughout most of the 20th century. In 13 OECD countries, the employment-population ratio of 55-64 year-old males fell by an average of more than 12 percentage points between 1979 and 1998. Similarly, labor force participation rates for those 65 and above have fallen significantly. The economic cost of the low labor market participation, in terms of lost output, benefit payments, and lower tax base is substantial. However, part of the cost of low labor market participation is cyclical or structural and hence separate from the costs of early retirement. This paper develops a simple framework to assess the specific costs of early retirement and applies it using data from the OECD countries.

Keywords: Early retirement, labor supply/demand, foregone output

JEL classification: H55, J14, J21, J26

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[*] Correspondence address Herbertsson: Institute of Economic Studies, University of Iceland, Aragotu 14, IS-101 Reykjavik, Iceland, tel.: +354 525 4535, fax: +354 525 4096, e-mail: tthh@hi.is , Orszag: Birkbeck College, Department of Economics. 7-15 Gresse Street, London W1P 2LL, United Kingdom, tel.: +44-207-631-6427, fax: +44-207-631-6416, e-mail: jmo@ricardo.econ.bbk.ac.uk.

1. Introduction

The trend in most industrialized countries is toward older workers' decreasing labor market participation. The steady withdrawal of workers from the workforce at a younger age suggests that retirement income is gradually increasing, and/or that older workers are increasingly being forced out of the labor market. Unlike his 18th century colleague, the average worker today has accumulated substantial wealth during his working life. Moreover, incentives built into national social insurance systems often encourage him to retire early. As noted in Costa (1998), the modern worker cannot only afford to retire early but is also willing to do so since recreational opportunities have increased, and the relative prices of leisure activities have decreased.

Despite substantial increases in longevity in OECD countries, the age of retirement has steadily fallen throughout most of the 20th century. In 13 OECD countries, the average labor force participation of 55-64 year-old males fell by more than 12 percentage points between 1979 and 1998. The participation rate increased by approximately 5 percentage point for females, resulting in an overall average drop in OECD labor force participation of almost 3 percentage points. Despite the common trend toward earlier retirement, however, labor market participation rates differ significantly across countries, as illustrated in Figure 1.[1]

As can be seen from the figure, participation rates differ vastly from country to country, Iceland has far the highest labor force participation and Hungary the lowest. Moreover, the development of the participation rate is quite different between countries, i.e., the rates have stayed almost unchanged over the last twenty years in Japan, while they have fallen by almost 29 percentage point in France. Furthermore, the dispersion of the rates increased dramatically in the '80s and the '90s. This divergence illustrates that participation depends on a wide variety of country-specific factors. The structure of labor markets and employment opportunities is particularly important. Indeed, one of the more important policy challenges is that early retirement has become commonplace in some

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[1] The decline in labor force participation has reversed a bit in the past few years. However, as Costa (1999) points out, this is not unprecedented and is not necessarily part of a long-run trend.

countries, while life expectancy at age 65 has risen sharply. This combination of earlier retirement and longer life expectancy results in much longer retirement.
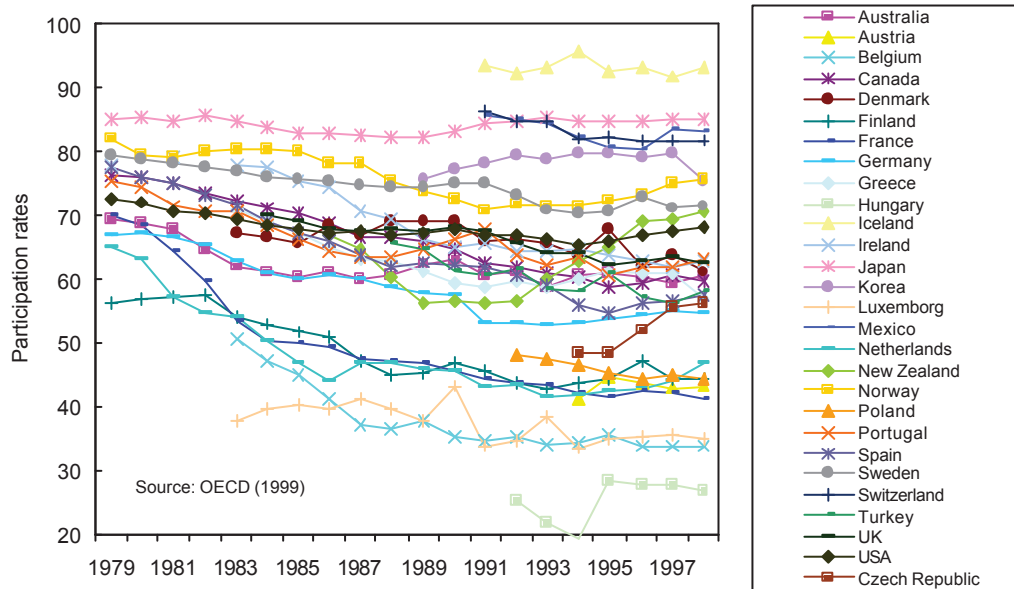

Figure 1. *Labor force participation rates for men 55-64 in the OECD*

This withdrawal of older workers from the labor force causes a variety of economic challenges, including an increase in unused production capacity in the economy, a lower tax base, and an increased burden on pension and fiscal systems. It is therefore of critical importance to design pension systems providing appropriate incentives for delaying retirement.

The causes of high levels of early retirement are less well understood. The body of research on early retirement has focused on the supply side of the labor market and the incentives therein. Incentives such as wealth, accrual rates, earnings tests, taxes, etc., play a crucial role in determining the labor supply of older workers. Boskin (1977) was one of the first to pay close attention to the effects of incentives on early retirement. Other subsequent work includes Quinn *et al.* (1990). Indeed, incentives are the focus of a huge body of US literature that includes papers by Stock and Wise (1990) and Fields and Mitchell (1984). Empirical work in Europe has also examined early retirement using an

incentive-based approach; examples include Börsch-Supan (1992) for Germany and Meghir and Whitehouse (1992) for the UK.

There are a number of comprehensive studies on incentives and early retirement. These include work by the OECD (1995a, 1995b), which focuses on incentives created on both the supply and the demand side of the labor market, an EU project published in the *European Economy*, and an NBER book edited by Gruber and Wise (1999). The methodology in each of these cases was slightly different. The EU study focuses on replacement rates for different routes out of the labor market, whereas the Gruber/Wise project highlights the concept of pension wealth or accumulated pension assets. The Gruber/Wise approach is notable because it includes comparisons across a large number of countries using the same methodology. Its findings have spurred much policy and academic interest. However, the Gruber/Wise study offers only limited insight into the relevant pension systems because it did not generally incorporate the impact of private benefits. Private benefits, particularly individual accounts with tax advantages may be important to take into account when considering incentives for early retirement, especially since individual accounts are sometimes used to fund early retirement.

In addition, the UK Cabinet Office (2000) finds that at most one-third of early retirees in the age range between 50 and the official state pension retirement age in the UK retire voluntarily, and that only about 12 per cent have planned for the retirement. Also, the one European country not witnessing a substantial increase in early retirement in the 1980s was Iceland, and it did not experience a labor demand shock, Herbertsson *et al.* (2000), and Herbertsson (2001).

Regardless of the causes, the withdrawal of older workers from the labor force causes an increase in unused production capacity, a reduced tax base, and an increased burden on pension and fiscal systems. If the trend toward earlier retirement were to continue far into the future, it would thus pose even larger fiscal threats to pension systems, especially those that do not include a penalty for early retirement. Furthermore, given the fact that incentives do not in themselves seem to provide a good indication of the severity of the

early retirement problem, it is useful to derive others. Gruber and Wise (1999), for instance, have a measure of *unused productive capacity* capturing the extent to which older workers are not working. In this paper, we develop a simple framework, taking into account wages and also incorporating the effects of increased employment on wages. The next section puts forth a framework to assess the costs associated with the low labor force participation of older workers, while Section 3 utilizes the framework to estimate the cost of early retirement in the OECD. Section 4 concludes.

2. A Cost Assessment Model

In this section, we present a simple model allowing us to assess the share of potential GDP lost due to early retirement. While simple, this model does take into account the effects on equilibrium wages of high taxes to fund early retirement programs.

There are two types of workers: older workers and other workers. We define:

w_o - wage of older workers

w_m - wage of other workers

P_o - population of older workers

P_m - population of other workers

E_o - employment rate of older workers

E_m - employment rate of other workers

Total wage income is hence:

$$Y = w_o E_o P_o + w_m E_m P_m \qquad (1)$$

where Y is actual wage income. To simplify the analysis, we assume no capital income so that Y is also gross national product. To assess the cost of early retirement, it is necessary to assess what the employment rate would be in the absence of early retirement where the employment rate is $\widehat{E}_o$ instead of E_o, and where the employment rate of other workers has

not changed from E_m, i.e., an increased labor supply of older workers following a decrease in early-retirement does not affect labor supply or labor demand for other workers. We envisage this change in labor force participation occurring in an atmosphere of more general macroeconomic change in which both wages and benefits are changed. Potential output, $\widehat{Y}$, is then given by:

$$\widehat{Y} = \widehat{w}_o \widehat{E}_o P_o + \widehat{w}_m E_m P_m \tag{2}$$

where $\widehat{w}_o$ is the new average wage for older workers, and $\widehat{w}_m$ is the new average wage for other workers. The ratio of actual output (1) to potential output (2) is less than 1.0 to the extent that early retirement induces systemic inefficiencies. For example, if the ratio of actual to potential output is 0.90, early retirement has induced a 10 per cent output gap.

Using (1) and (2), we can express the output gap as:

$$GAP = 1 - \frac{w_o E_o P_o + w_m E_m P_m}{\widehat{w}_o \widehat{E}_o P_o + \widehat{w}_m E_m P_m} \tag{3}$$

or:

$$GAP = 1 - \frac{\dfrac{w_o E_o P_o}{w_m E_m P_m} + 1}{\dfrac{\widehat{w}_o \widehat{E}_o P_o}{w_m E_m P_m} + \dfrac{\widehat{w}_m}{w_m}} \tag{4}$$

Before exploring (4) in detail, it is useful to understand a simplified version. A simplification of (4) can be achieved by assuming that $\widehat{E}_o = E_m$, so that employment rates of all workers are equalized. Furthermore, we assume that the wages of all workers are equal, and that the change in labor force participation does not change wages. We can then write the output gap as:

$$GAP = 1 - \frac{\dfrac{E_o P_o}{E_m P_m} + 1}{\dfrac{P_o}{P_m} + 1} \qquad (4')$$

The output gap depends only on the ratio of old employees to other employees and the ratio of old population to other population.

Suppose that the ratio of wages of older workers to other workers is k, e.g., $k = w_o / w_m$. Then, if we make the following additional assumptions that, as a result of the change in labor force participation, this ratio does not change, we obtain:

$$GAP = 1 - \frac{1}{1 + \mu} \frac{k \dfrac{E_o P_o}{E_m P_m} + 1}{k \dfrac{\widehat{E}_o P_o}{E_m P_m} + 1} \qquad (5)$$

where μ is the rate of growth in wages following increased labor supply (reduction in early retirement). We note that equation (5) is a seven-parameter model. In particular, estimates of the gap depend on five direct observables (E_m, E_o, P_m, P_o, and k) and two other variables ($\widehat{E}_o$ and μ). We have already noted the possibility of closing the model for $\widehat{E}_o$ by assuming that $\widehat{E}_o = E_m$, so that employment rates of all workers are equalized. However, it may also be useful to adjust $\widehat{E}_o$ to be somewhat below E_m to account for higher incidence rates of disability at older ages.

One possibility for μ is simply to assume that changes in wages are very slow as a result of reform and therefore the effect of changes in wages can in effect be ignored. However, an alternative approach is to distribute savings in benefit payouts to all workers in proportion to their current wages. An example where this would happen is if proportional payroll taxes were cut equally for all workers. We let Δb be the savings. Then we can write:

$$\widehat{w}_o = w_o \left(1 + \frac{\Delta b}{w_o \left[\frac{1}{k} E_m P_m + \widehat{E}_o P_o \right]} \right) = w_o \left(1 + \frac{\Delta b}{\overline{\overline{Y}}} \right) \tag{6}$$

where $\overline{Y}$ is the level of output where labor participation rates have adjusted to their new levels, but wages have not. We hence find that:

$$\mu = \frac{\Delta b}{\overline{\overline{Y}}} = \frac{\Delta b}{Y} \frac{Y}{\overline{\overline{Y}}} = \frac{\Delta b}{Y} \frac{k \dfrac{E_o P_o}{E_m P_m} + 1}{k \dfrac{\widehat{E}_o P_o}{E_m P_m} + 1} \tag{7}$$

which depends only on observables and the change in benefit expenditure relative to the initial level of output (or the percentage of GDP to be saved on benefit expenditure as a result of lower labor force participation).

Omission of capital is obviously a weakness in our model. To investigate the effect of this omission, we consider a Cobb-Douglas production function:

$$Q = A(E_m P_m + k E_o P_o)^\alpha K^{1-\alpha} \tag{8}$$

If we consider the effect of reform, then output after the reform is:

$$\widehat{Q} = A(E_m P_m + k \widehat{E}_o P_o)^\alpha K^{1-\alpha} \tag{9}$$

Assuming capital does not change as a result of the reform, then the ratio of output before vs. after the reform is:

$$\frac{(E_m P_m + k E_o P_o)^\alpha}{(E_m P_m + k \widehat{E}_o P_o)^\alpha} \tag{10}$$

or:

$$\frac{w_m^{-\alpha} (w_m E_m P_m + w_m k E_o P_o)^\alpha}{w_m^{-\alpha} (1 + \mu)^{-\alpha} (w_m (1+\mu) E_m P_m + k w_m (1+\mu) \widehat{E}_o P_o)^\alpha} \tag{11}$$

which simplifies to:

$$\frac{Y^{\alpha}}{(1+\mu)^{-\alpha}\,\widehat{Y}^{\alpha}} \tag{12}$$

so that the output gap including a fixed stock of capital is related to the gap without including capital. The difference of course is the labor share α. With, for instance, a labor share of 0.80 and a ratio of actual to potential output (excluding capital) of 0.90, the output gap is 8 per cent instead of 10 per cent.

3. The Costs of Early Retirement

To assess the economic costs of early-retirement in countries reporting to the OECD, we use equations (5) and (7) and data on:

- Employment rates of older workers, defined here as workers between 55-64,

- Employment rates of other workers, defined here as workers between 25-54,

- The number of people in the age group 55-64,

- The number of people in the age group 25-54,

- Average wages of 55-64 year-old workers,

- Average wages of 25-54 year-old workers,

- Government expenditures on pension benefits of 55-64 year olds,

- Assumptions about what the employment rates of workers aged 55-64 would be in the absence of early retirement.

For data on population we use United Nations (1998)[2] and on labor markets OECD (1999). For a baseline calculation, we assume no wage effects from reform $\mu = 1$, equal wages for all workers, $k = 1$, and no differences in labor force participation after reform $\widehat{E}_o = E_m$. For these calculations, Table 1 shows results for the OECD countries over the last two decades. The OECD fraction of output lost to early retirement was over 6 per cent in 1998. Continental and Eastern Europe tend to have higher costs than the rest of the OECD, but Iceland has particularly small costs.

**Table 1. Costs of early retirement in OECD countries
as a share of potential GDP**

	1980	1990	1998
Hungary	-	-	15.9%
Belgium	-	15.2%	13.5%
Luxemburg	-	12.5%	13.0%
Austria	-	-	12.3%
Germany	7.7%	9.5%	10.9%
Greece	-	10.4%	10.5%
Czech Republic	-	-	10.5%
France	6.2%	11.2%	10.5%
Netherlands	8.1%	10.5%	10.1%
Poland	-	-	10.1%
Finland	8.2%	9.6%	9.7%
Spain	4.8%	9.7%	9.2%
Portugal	6.0%	9.1%	7.7%
Denmark	-	6.9%	7.7%
UK	-	7.5%	7.6%
Ireland	-	6.9%	7.4%
Australia	7.5%	7.5%	6.9%
Canada	5.5%	6.7%	6.7%
Sweden	5.9%	4.7%	4.8%
USA	5.8%	5.4%	4.7%
New Zealand	-	7.9%	4.7%
Turkey	-	5.0%	4.2%
Japan	2.9%	4.3%	4.2%
Norway	5.0%	4.9%	3.9%
Switzerland	-	-	2.9%
Korea	-	2.2%	2.7%
Mexico	-	-	2.6%
Iceland	-	-	0.5%
OECD Average	**5.8%**	**6.7%**	**6.3%**

Figure 2 plots the OECD average costs of early retirement, which peaked at about 7.5 per cent of potential output in the mid 1980s.

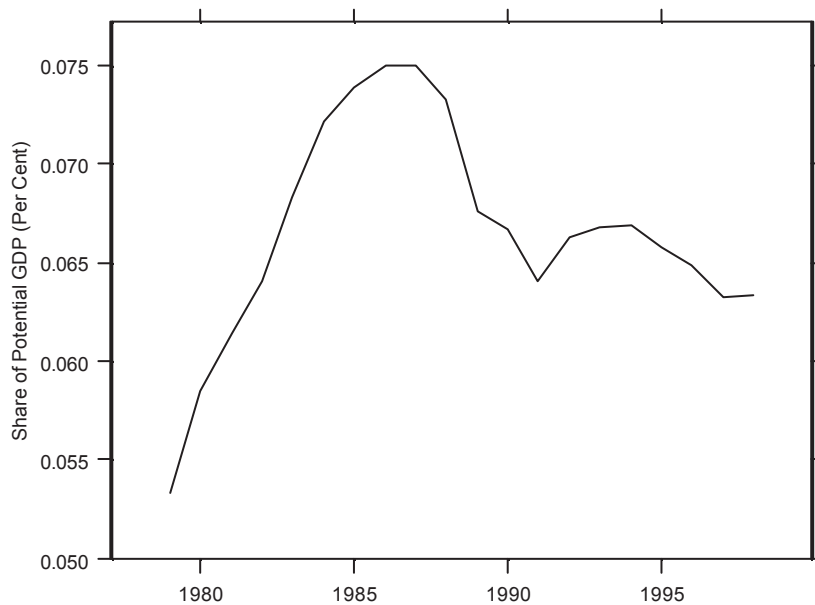[2] We use the medium variant for the population projections.

Figure 2. *Costs of Early Retirement in the OECD*, 1979-1998

These are estimates, and indeed our own analysis suggests the need for qualification. The first qualification is in the parameter $\widehat{E}_o$, which we assumed to equal E_m. However, this assumption may not be reasonable because, in the absence of early retirement, the participation rates of older workers will be lower than those of younger workers (to account for higher rates of disability incidence in the older age group). Disability statistics are quite difficult to interpret, but a 10 per cent lower participation rate is a reasonable, if not high, figure. For example, in Iceland where early retirement is almost nonexistent, 90.9 per cent of 25-54 year-old males participated on average in the labor force in 1990s, compared with 87 per cent of the age group 55-64. The difference is only 3.9 per cent, see Herbertsson (2001).

Using a 10 per cent lower participation rate, Figure 3 shows the costs of early retirement in the OECD, assuming a 10-percentage-point lower participation rate for older workers.
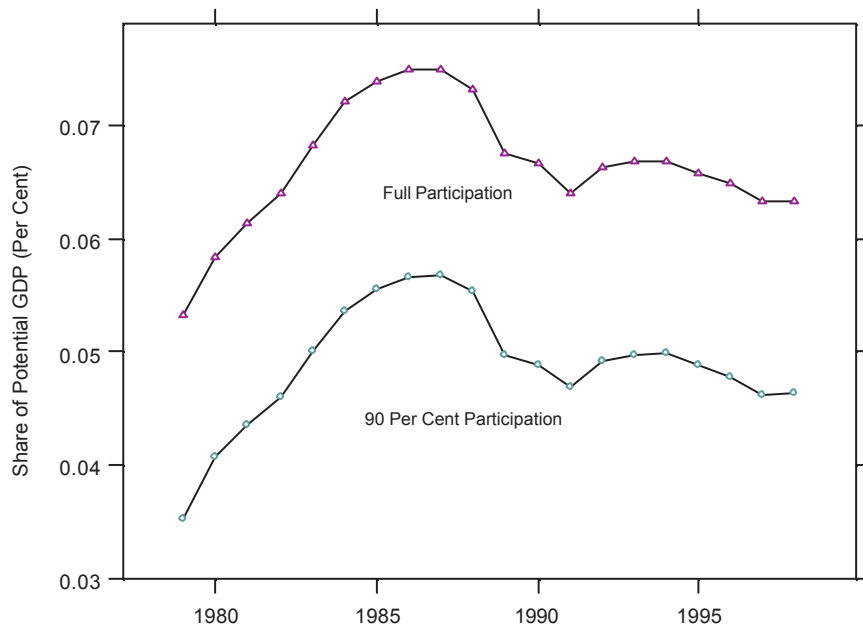
Figure 3. *Costs of Early Retirement with a 10-percentage-point Lower Participation* Rate
of Older Workers to Account for Disability

The effect of using a lower participation rate is significant, and, indeed, the costs fall by almost 25 per cent. The reason for this is that a 10-percentage-point lower participation rate of older workers is indeed a significant drop relative to overall participation.

The other issue with the analysis is that we have looked at males and females together instead of separately. For men, the gap is much smaller than for women, as shown in Figure 4.
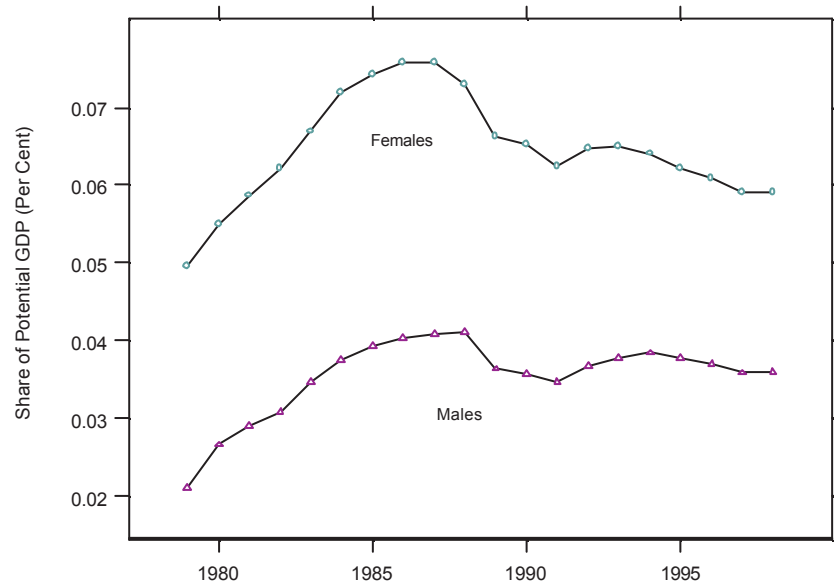
Figure 4. *Costs of Early Retirement of Males and Females with a 10-percentage-point Lower Participation Rate of Older Workers.*

For example, in 1998, assuming a participation rate for older workers after a reform of 90 per cent that of younger workers, the cost of early retirement for men was 3.6 per cent of potential GDP, whereas for women it was 5.9 per cent. If there is a natural barrier to the labor force participation of older workers, then the cost figures we have derived may be overestimated. On the other hand, the participation rates resulting from a policy for women are tied to the potential participation rates of younger women, which may be low relative to those at older ages due to childrearing and other factors.

On the other hand, there are a number of important factors leading to a higher gap. First is the equilibrium effect through wages. The effect through wages depends on the savings in benefit expenditures. For example, a 1 per cent savings due to benefit expenditure costs feeds through (using (7)) to a higher output and raises the cost of early retirement in 1998, for instance, from 6.3 per cent in the absence of wage effects to 7.2 per cent. These

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savings thus have a significant effect on work incentives and productivity and hence output.

Another significant factor leading to a higher gap is the fact that the baseline for older workers is employment of younger workers. Younger workers may not be experiencing full employment, and, indeed, at least theoretically, older workers could have higher participation rates than younger workers. This consideration suggests that perhaps during recessions our cost estimates are too small. But, we do not believe this to be a weakness of the analysis – on the contrary. The cost of recessions is a separate issue, and we focus here only on the cost of having low labor force participation of older workers relative to younger workers.

4. Conclusions

In this paper, we have examined the cost of early retirement in the OECD using a simple equilibrium model. Our experiments suggest, though, that the cost of early retirement is not wildly sensitive to reasonable variations in assumptions. Our analysis suggests a cost estimate of early retirement policies of 5-7 per cent of potential annual OECD output, with higher figures in the EU. This cost rose rapidly after the 1970s, peaked in the mid-1980s and has declined since but is still not at the 1970s' level. Our calculations separate out the cost of recessions by using relative labor participation as a benchmark. The total output gap due to lack of full labor force utilization is considerably higher, as was noted in Gruber and Wise (1999). While these calculations measure the cost of early retirement and the potential gains from successful reforms, they do not suggest specific reforms, and the micromodelling of the gains from specific reforms is clearly outside the scope of our analysis.

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