



**issa**

INTERNATIONAL SOCIAL SECURITY ASSOCIATION  
ASSOCIATION INTERNATIONALE DE LA SÉCURITÉ SOCIALE  
ASOCIACIÓN INTERNACIONAL DE LA SEGURIDAD SOCIAL  
INTERNATIONALE VEREINIGUNG FÜR SOZIALE SICHERHEIT

## Technical Seminar on pensions

Paris, France, 1-2 October 2009

---

### **What are the prospects for the standard of living of retirees?**

The indexation of pensions in European Union and OECD countries

**Edward Whitehouse**

**Anna D'Addio**

**Rafal Chomik**

**Andrew Reilly**

**José Seisdedos**

Social Policy Division

Organization for Economic Co-operation and Development (OECD)

Paris

# What are the prospects for the standard of living of retirees?

## The indexation of pensions in European Union and OECD countries

Edward Whitehouse<sup>1</sup>

Anna D'Addio

Rafal Chomik

Andrew Reilly

José Seisdedos

Social Policy Division

Organization for Economic Co-operation and Development (OECD)

Paris

### Introduction

Pensioners are in a poor position to compensate for differences between the expected purchasing power of their pensions and what occurs in practice. It is often too late to change work and savings decisions they made earlier with a particular expectation of real retirement income. Unless protected by indexed pensions or annuities, older people's consumption levels and relative standards of living can be disproportionately affected.

Analysis of pension policy needs to consider the value of benefits not only at the time of retirement but also as it evolves during retirement in response to changes in prices and earnings. For example, both the sharp increases in (Organization for Economic Co-operation and Development (OECD) inflation in 2007-2008 and its recent drop to just above 0 per cent – risking deflation – pose questions about how pension systems should react.

This paper sets out current, national indexation policies and historical data on how pensions have been adjusted in practice. It examines different indexation policies: to prices, earnings or a mix of the two; the choice of the price index and progressive indexation (where smaller pensions are increased more rapidly than larger) are also analysed.

---

<sup>1</sup> This report was produced by the pensions team in the Social Policy Division of the OECD, led by Edward Whitehouse. Rafal Chomik and José Seisdedos contributed while on secondment to the OECD from the Department of Work and Pensions in the United Kingdom. Anna D'Addio and Andrew Reilly of the pensions team made substantial contributions. Martine Durand, John P. Martin, Mark Pearson and Monika Queisser of the OECD Secretariat provided useful comments on earlier drafts.

The team is extremely grateful to Delegates to the OECD Working Party on Social Policy and to the Indicators Sub-Group of the Social Policy Committee of the European Union for providing the underlying data that is central to the analysis.

The OECD Working Party also commented extensively on the work. Special thanks are due to Asees Ahuja (the Delegate from the European Commission), Olivier Bontout (France), Aaron Grech (United Kingdom), Yasuhiro Himeno (Japan), Sean Innis (Australia), Ilari Keso (Finland), Paul Morrin (Ireland) and Volker Schmitt (Germany).

*Edward Whitehouse, Anna D'Addio, Rafal Chomik, Andrew Reilly and José Seisdedos*

# 1. Indexing pensions

## 1.1. Why index?

The case for periodic adjustment of benefits is obvious. During periods of high inflation, the real value of the pension can rapidly be eroded. For example, the average real pension fell by 40 per cent in Hungary during the 1980s.<sup>2</sup> Even relatively low levels of inflation can have a major effect during retirement: the period after normal pension-eligibility age averages 18.3 years for men and 22.5 years for women in OECD countries. As an illustration, 2.5 per cent annual price increases over this expected retirement period would reduce the real value of pensions by 37 per cent for men and 43 per cent for women if benefits were not adjusted.

Indexation transfers the determination of benefit levels from the political arena to the realm of the law.<sup>3</sup> Weaver (1988) argues that this has an effect on the political agenda, both in ensuring benefits are protected and that increases are not overly generous. Moreover, as retirees become more significant electorally during periods of population ageing, this can prevent "budgetary capture", whereby older voters boost their own incomes at the expense of others.

Still, should such adjustments be carried out automatically? Political majorities will either support uprating, in which case it would be enacted anyway, or will oppose it and change the law. Moreover, politicians might be able to adjust other budgets that affect pensioners or to change the tax treatment of pensioners to undo the effects of automatic indexation. Why make it law?

Indexation makes the real value of benefits more certain, and so is part of the insurance contract of the pension system. Indexation is a fair balance that minimises political competition and intergenerational social conflict over pensions.

## 1.2. Why not index?

There are arguments that automatic indexation of pensions in payment is undesirable. The first concerns macroeconomic, particularly monetary, policy. Such concerns are longstanding: Wilson and Wilson (1982) report that Beveridge – author of a groundbreaking report on social insurance (Beveridge, 1942) – was opposed to automatic indexation. His argument was that indexation would create a class of people who had nothing to gain from anti-inflation policies and so would be unwilling to bear the cost. More recently, similar arguments lie behind outlawing of indexation in Argentina. They are also invoked in the debate over whether governments should issue indexed bonds or not.

Indexation might also limit flexibility in budgetary policy. In theory at least, automatic indexation might prevent the government from achieving a fair burden of the costs of fiscal retrenchment on different generations.

---

<sup>2</sup> Palacios and Rocha (1997).

<sup>3</sup> Other elements of the structure of pension systems are also designed to minimise political interference and to preserve a long-term intergenerational contract. For example, around half of OECD countries have automatic links with the life expectancy of different generations and either the level of benefits or the conditions to qualify for a pension. Whitehouse (2007) analyses the diverse ways in which pensions are linked to life expectancy.

## 2. National indexation policies

### 2.1. Indexing pensions in payment

For earnings-related public pension schemes, only Austria, Greece, and Lithuania of the 38 OECD and European Union (EU) countries, have discretionary adjustment of benefits. Price indexation of earnings-related pensions is found in twelve countries, wage indexation in four. Most of the remaining countries use a mix of price indices along with either earnings, social tax or GDP growth. A small number of countries supplement standard indexation policy with automatic mechanisms that intervene to stabilise the pension system by responding to economic and demographic changes (See section 4.2).

**Table 1. Current indexation policies for mandatory schemes in the EU and OECD**

Country	Scheme	Indexation*	Other/notes
Australia	Targeted	W	Maintains constant percentage of average wage
	Defined contribution	-	Individual choice
Austria	Earnings-related	D	
	Targeted	D	
Belgium	Social assistance	P	Price index excludes alcohol, cigarettes and fuel; increases only if inflation exceeds 2%
	Minimum pension	P	
	Earnings-related	P	
Bulgaria	Earnings-related	W/P	
	Minimum	D	
	Social assistance	D	
	Defined contribution	-	Annuitisation not required
Canada	Targeted	P	
	Basic	P	
	Earnings-related	P	
Cyprus	Basic	W/P	Indexation twice a year, in Jan by P and in July by W/P
	Supplementary	P	
Czech Republic	Basic	W/P	Adjustment to prices plus increases of at least one third of real wage growth
	Earnings-related	W/P	
	Minimum	P	
Denmark	Targeted	W	Less allocation to the reserve
	Basic	W	Less allocation to the reserve
	Defined contribution	-	Periodic bonuses; increase if financial condition allows
Estonia	Minimum	D	
	Basic	W/P	
	Earnings-related	W/P	
	Defined contribution	-	Choice of fixed or indexed annuities
Finland	Basic	P	In practice there have been additional increases
	Earnings-related	W/P	From 2010 increases will be adjusted on the basis of annuity calculations taking into account life expectancy
France	Targeted	W	
	Minimum	P	
	Earnings-related	P	
	Occupational	D	No automatic procedure. Requires agreement with social partners
Germany	Social assistance	D	
	Earnings-related	W	Wages net of pension contributions

Greece	Minimum	W	
	Targeted	D	
	Earnings-related	D	Lack of consistent practice
Hungary	Minimum	W/P	
	Earnings-related	W/P	
	Defined contribution	W/P	
Iceland	Basic	W	But reduced depending on budget. Increases with P at a minimum
	Targeted	W	
	Occupational	-	Depends on resources of fund. P at a minimum.
Ireland	Targeted	W	
	Basic pension	W	Recent increases in excess of W
Italy	Social assistance	D	
	Earnings-related	P	Increase between full and 75% price indexation depending on pension level
Japan	Basic	P	
	Earnings-related	P	
Korea	Targeted	P	
	Earnings-related	P	
Latvia	Minimum	P	
	Earnings-related	W/P	Pensions below a certain level increase by P
	Individual accounts	-	Can choose to annuitise or transfer to earnings related
Lithuania	Basic	D	
	Earnings-related	D	
	Social assistance	D	
Luxembourg	Social assistance	D	
	Basic	W	At least prices with extra increase related to earnings growth
	Minimum	W	
	Earnings-related	W	
	Occupational	W	No legal requirement but customary
Malta	Targeted	P	
	Earnings-related	P	
Mexico	Minimum	P	Equal to real value of minimum wage for 1997
	Defined contribution	-	Individual choice
Netherlands	Basic	W	Net minimum wage
	Occupational	W	No legal requirement but customary
New Zealand	Basic	P	
Norway	Targeted	W	
	Basic	W	
	Earnings-related	W/P	
	Defined contribution	-	Individual choice
Poland	Minimum	W/P	
	Earnings-related	P	From 2008 updated with P plus at least 20% W
	Defined contribution	P	Annuitised
Portugal	Targeted	D	Recently above prices
	Minimum	W	Minimum wage net of contributions
	Earnings-related	P	Larger increases on smaller pensions
Romania	Earnings-related	P	Expected P
Slovak Republic	Earnings-related	W/P	
	Defined contribution	-	Individual choice
Spain	Earnings-related	P	
	Minimum	P	

Slovenia	Earnings-related	W	
	Social assistance	-	
Sweden	Targeted	P	
	Earnings-related	W	Gross earnings less 'growth norm' of 1.6% and stability adjustment
	Occupational	W	
	Defined contribution	-	Individual choice
Switzerland	Targeted	W/P	
	Earnings related	W/P	
	Occupational	-	Discretionary
Turkey	Targeted	P	
	Minimum	P	
	Earnings-related	P	
United Kingdom	Targeted	P	Prices or more; up to wages if possible given fiscal situation
	Basic	P	
	Earnings-related	P	
United States	Targeted	P	
	Earnings-related	P	

*Source:* National authorities; US Social Security Administration.

*Note:* P is Prices, W is Wages, W/P is mixed indexation of wages and prices, D is discretionary indexation.

\* Based on legislation up to 2006. Some countries have since made alterations to indexation policy (e.g., Poland, Hungary, Estonia, and Norway).

## 2.2. Indexing pension-system parameters

Indexation is also relevant for a number of pension system parameters. In resource-tested and basic pension schemes, indexation policies have a much greater impact on individual retirement incomes than the treatment of earnings-related pensions in payment. This is because they affect not only the evolution of the value of the benefit *during* retirement but also the initial starting value *at the time of* retirement.

The United Kingdom's basic-pension scheme provides a good illustration. The basic pension's value has been linked to prices since 1981.<sup>4</sup> At that point, it was worth 24 per cent of average earnings. Today, it is worth just 15 per cent of average earnings.<sup>5</sup> If price indexation were to continue, then the basic pension for new entrants would be just 6.4 per cent of average earnings when they retire in 45 years' time.<sup>6</sup> This erosion in the value of the basic pension relative to living standards is why recent reform – greeted with cross-party consensus – will change basic pension indexation to earnings. This example illustrates that for basic and means-tested schemes the adjustment of the benefit levels to the point when they are first claimed is particularly important. In contrast, with earnings-related schemes the real value of new pensions increases as real earnings grow between the time that rights were earned and the pension is claimed. Sweden links its resource-tested schemes to prices (as in the United

<sup>4</sup> In practice, there have been discretionary increases above price inflation in the last eight years: see below.

<sup>5</sup> There are also complex effects of the indexation of the basic pension on the value of benefits under the earnings-related scheme: see Disney and Whitehouse (1991).

<sup>6</sup> This calculation uses the OECD's baseline real-earnings-growth assumption of 2 per cent per year.

Kingdom example). The implication, over the long periods involved in pension policy, is that these programmes will all but disappear.<sup>7</sup>

Basic pensions, resource-tested schemes and minimum pensions play an important role in many OECD countries (see Hoskins, Pearson and Whitehouse, 2008), where many adjust the value to changes in earnings to maintain a given replacement rate.

Indexation affects other parameters, such as ceilings on pensionable earnings. Most countries do not require high-income workers to contribute to the pension system on all earnings. A limit is set on the earnings used to calculate contribution liability and pension benefits. The average ceiling on public pensions for the 19 OECD countries (who have them) is worth 189 per cent of average earnings, and many have no formal adjustment. Ceilings have been increased relative to both prices and earnings to generate additional contribution revenues in a number of countries. For example, Hungary increased the ceiling from 225 per cent of average earnings in 2002 to 420 per cent in 2004 (OECD earnings measure). However, the short-term revenue boost brings with it additional future pension liability.

### 3. Indexation in practice

Looking at the history of benefit adjustments, there are examples where governments ignored automatic indexation. The question therefore becomes empirical rather than a case of setting out ostensible policies. How much did nominal pensions increase over time and how do these compare with price and wage inflation? This section examines the experience of 29 EU and OECD countries for which data was available. Commentary about historical indexation policy is included where possible but is not exhaustive.

Historical data were provided by national officials. Generally, the analysis focuses on the main earnings-related scheme. For countries with basic pensions (e.g., Canada, Ireland, Malta, Netherlands, New Zealand, and United Kingdom) or resource tested schemes (e.g., Australia) the time series is the nominal value of the benefit. For Czech and Slovak republics the nature of the data meant that the unweighted average pension in payment is used. All others are earnings-related pensions and the underlying data are the annual percentage increase in pensions.<sup>8</sup>

#### 3.1. Pensions relative to prices

The first set of charts (Figures 1 to 4) looks at changes in the real value of pensions. The changes in pension values have been deflated by the national consumer price index.<sup>9</sup> For ease of comparison these have been converted to an index fixed at 100 in 2006.

Importantly, this does not show the average pension received by retirees. The aim is to isolate the effect of indexation policies and practices on pensions from other factors: financial and economic conditions, the maturing of pension systems, pension reforms etc.

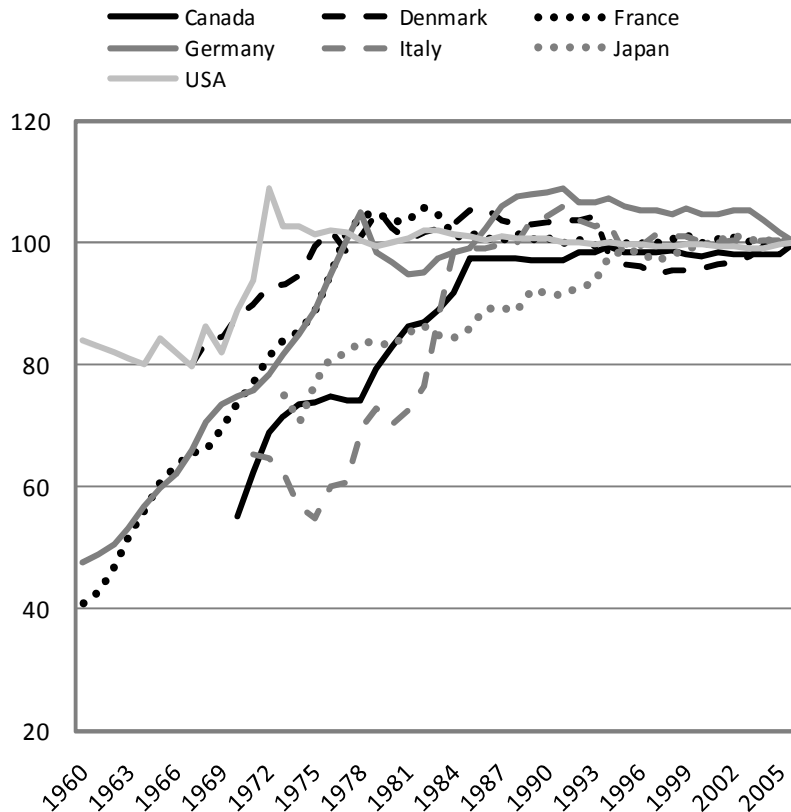
---

<sup>7</sup> For example, for new entrants, the minimum retirement income in 45 years time would be just 14 per cent of average earnings in Sweden. It is difficult to believe that it will be politically possible to pay such low incomes to poor, old people (see also the discussion in OECD, 2007, p. 27).

<sup>8</sup> Lump sum payments, such as those in Czech Republic in 2004, Romania in 1993 and 1996 or Slovenia in the 1970s, are not included.

<sup>9</sup> In many cases (see section 5 below), different indices of costs of living have been used to calculate benefits. Moreover, the timing of changes in benefits relative to the timing of changes in prices can also differ. This means that real changes in pension benefits might be shown in the chart even when countries adopted and implemented price indexation. However, these differences are small and will tend to cancel out over time.

**Figure 1. Real increases then stability of pension values**



Source: OECD analysis of national information on pension indexation; OECD Main Economic Indicators database.

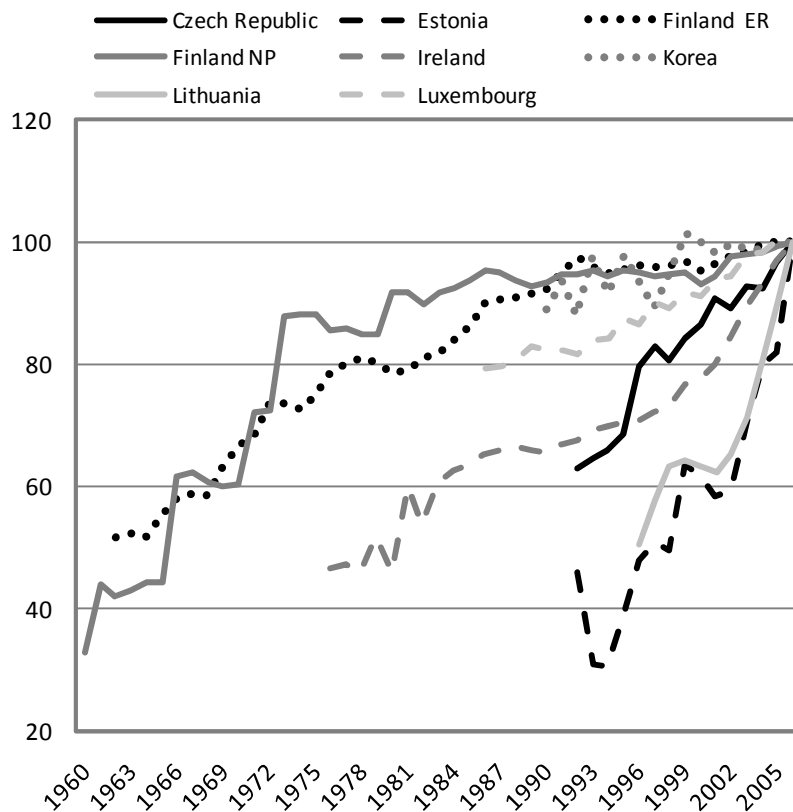
Figure 1 shows the results for seven countries that saw real increases in pensions in the early part of the period. This pattern reflects increasing fiscal pressures as pension systems became mature and governments sought to restraint budgets during a series of economic and fiscal constraints.

In France and Germany real pensions more than doubled between 1960 and 1978, and since then the real value of pensions has been broadly flat. In Germany, where pensions were linked to wages in 1957, this pattern is associated with the capping of benefit adjustments in the second half of the 1970s and early 1990s. In France the period of stable real values suggests indexation was not strictly followed, since it only changed from wages to prices in 1993 and real wage growth was positive.

Real pensions in the United States increased between 1967 and 1972 by 37 per cent. Formal indexation of pensions in payment to a measure of consumer prices was introduced by legislation in 1972-73, bringing the real increases in benefits during retirement to an end. Indexation in the United States was suspended altogether during 1984.

Real increases in Denmark also appear to have come to a halt at the end of the 1970s. In the other countries shown, increases in real pensions ended later: 1984 in Italy, 1986 in Canada, and 1994 in Japan. In Italy, for example, real pensions grew at a rate of 3.5 per cent a year between 1970 and 1984. But pensions were relatively stable in real terms thereafter, which included a period of six months in 1992 when the government suspended indexation.

**Figure 2. Continuous real increases of pension values**

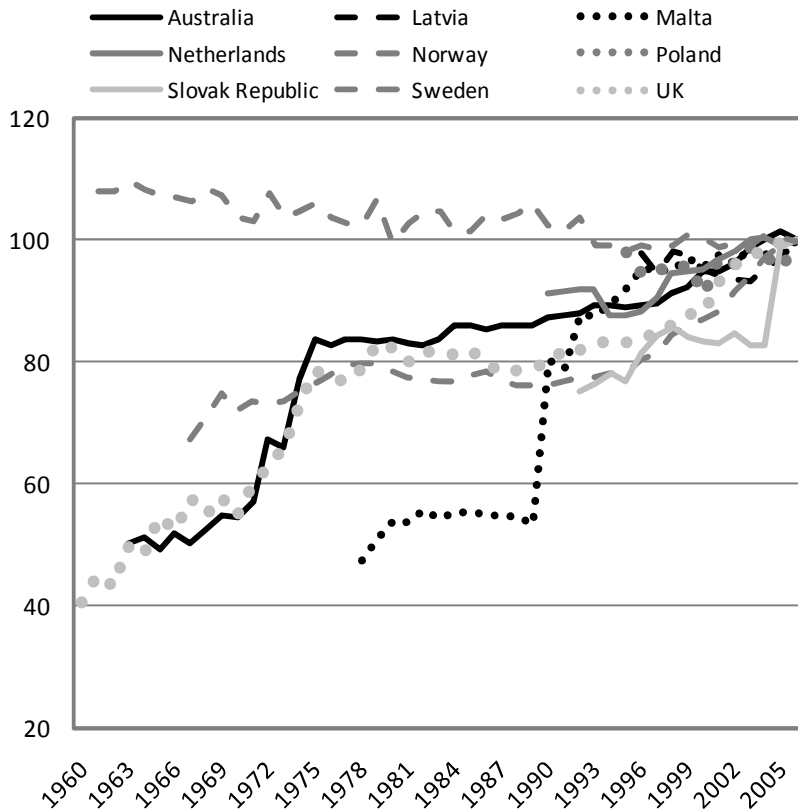


*Source:* OECD analysis of national information on pension indexation; OECD Main Economic Indicators database.

A common pattern of the real value of pensions over time is of a near-continuous increase (Figure 2). In Ireland the value more than doubled between the mid 1970s and 2006, an annual real growth rate of approximately 3 per cent. In the Czech Republic and Estonia, where pensions are partly indexed to prices and partly to wages, as well as Lithuania, where adjustments are discretionary, the real value of pensions increased for most of the years for which there is data; between 1996 and 2006, the average real increase was respectively 2.3 %, 8.2 % and 7.2 % per year. Korea recorded a small increase of 12.3 per cent over the 17 years of available data.

In Finland, the real value of the national pension (Labelled as NP) –combining basic and income-tested components – increased rapidly until the mid 1970s. Its growth over this period averaged 8.5 per cent a year, and 0.7 per cent since. In contrast, earnings-related pensions in Finland (Labelled as ER) saw a more consistent real growth, of 2.1 per cent a year in the 1960s, 1970s, and 1980s. However, since 1990, the real increase has been just 0.4 per cent a year. These trends are consistent with the indexation policy of the earnings-related scheme: by earnings until 1977, then by evenly weighting of wage and price changes until 1995, before moving to an index of 20 per cent wages and 80 per cent prices. However, the index increases were frozen in 1994 as a result of recessionary pressures.

**Figure 3. Mixed periods of stability and real increases in pension values**



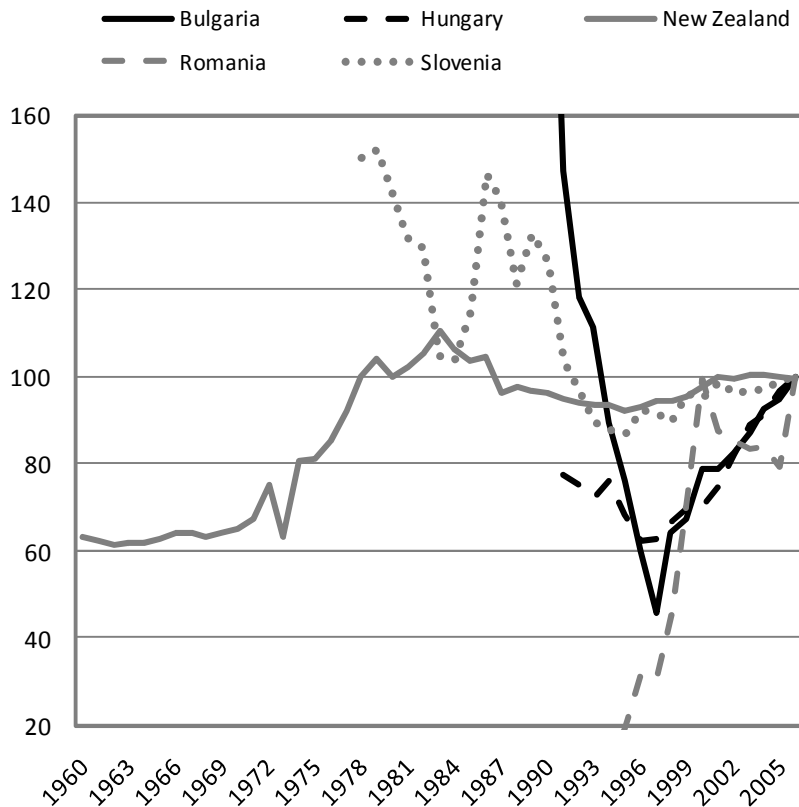
Source: OECD analysis of national information on pension indexation; OECD Main Economic Indicators database.

Figure 3 shows countries with different patterns of indexation over time which feature some period of stability. The pattern for Australia, Malta, Norway, and the United Kingdom is similar, with real increases in pensions until the mid 1970s (e.g., 4.5 per cent a year in the UK). Thereafter, real pension values were relatively constant. This was followed by a distinct pick-up in real pensions from the early 1990s. The growth in value in the latter period was more pronounced in Malta, with nearly a 10 per cent year on year increase between 1990 and 1996. In Malta, the steady real value of pensions in the 1980s was the result of the government at the time pursuing policies to control inflation and wages, while the increases in the early 1990s coincided with the government embarking on social welfare reforms. In the United Kingdom, the indexation of pensions to earnings has achieved totemic political significance, but this policy was only implemented between 1978 and 1981. Ironically, this was the one period in 50 years when real wages did not grow. Norway, which had a mixed indexation policy, saw real increases in pensions until the mid 1970s, then stability before increases since the mid 1990s. In Australia, the start of real pension stability is related to the introduction of price indexation in the mid 1970s, while the subsequent gentle increase is associated with a commitment to raise pensions in excess of prices until they reached a proportion of average earnings.

Another pattern seen in Figure 3 is of overall stability of real values. While the real value of pensions in Sweden has dropped 7 per cent over the 45 year period analysed, the year to year change in real pensions averaged 0.0 per cent. A small drop in the 1990s coincides with financial instability and may reflect budget savings that blunted indexation outcomes (Timonen, 2003).

The pattern for Latvia and Poland, though only for a short period that excludes the turbulence of their transition, has also been stable. For both these countries, which link their pensions to inflation, the average real growth of pension values over the decade to 2006 was 0.0 per cent. Over the same period, Netherlands, for which the data is also limited, recorded an average increase in real pension values of 0.6 per cent, while the Slovak republic saw a steady real level of pensions before a sharp increase of 20 per cent in the last two years.

**Figure 4. Mixed decreases and increases of pension value**



Source: OECD analysis of national information on pension indexation; OECD Main Economic Indicators database.

The final chart in this first series – Figure 4 – shows countries with mixed patterns. The former command economies in this chart experienced dramatic changes in the real value of pension benefits. Much of the drop in real values in these countries relates to the high inflation experienced during their transition to capitalist economies. In Hungary, real benefits dropped in the early 1990s by 4.1 per cent per year, losing nearly 20 per cent. This was associated with indexation to wages, the real value of which contracted in the early 1990s. The trend reversed in the late 1990s when real value of pensions rose by 60 per cent in the decade to 2006. This pattern is more pronounced for Bulgaria, where real pension value dropped by 82 per cent in the first part of the 1990s and has been rising since then. Indexation in Bulgaria was linked to prices in the early 2000s to be recently replaced with mixed indexation to prices and wages. In Slovenia, where pensions have been indexed to wages since 1974, the reduction in the real value of pensions between 1978 and 1995 was 2.6 per cent per year on average, which reversed to an average annual growth of 1.3 per cent over the following decade. Romania had a dramatic increase in the real value of pensions in the 1990s of 8.6 per cent per year on average. Despite a sharp drop after 2000, Romania recorded a constant level of real pensions for the period of 2000 and 2006 thanks to an increase over the last two years.

The pattern of real pensions in New Zealand shows rapid increases in the 1970s which came to an end in 1979. Real pension levels then fell during the 1980s and early 1990s, a time when pension increases were frozen. This was followed by a recovery in real pensions in the mid 1990s and stability since.

### **Box 1. Adjusting pension values with deflation or low inflation**

It can be politically difficult to increase benefits by small amounts when inflation is low. The retail-prices index used to uprate the basic pension in the United Kingdom showed an annual increase of 1.1 per cent in 1999. This meant a basic pension increase of 75 pence a week. The increase was dismissed as "derisory" by pensioner activists and trade unions. Yet the government responded by making permanent a £100 annual payment to pensioners (to pay for winter fuel) and introducing free television licences for over 75s.

Similarly, in Poland the 2002 inflation adjustment was just 0.5 per cent. Protesting pensioners sent the small number of zlotys increase, in cash, back to the social-insurance agency. Since then adjustments are made only when cumulative changes in inflation reach 5 per cent.

The most recent episode of deflation in an OECD country occurred in Japan during the period 1999-2001. Prices fell in successive years by 0.3 %, 0.7 % and 0.7 %. The government did not impose reductions in benefits possibly because of political difficulties but also on economic grounds, as a means of boosting household consumption. The overall increase in real pensions – because of deflation – over the period 1999-2001 was 1.7 per cent.

Adjusting pensions to reflect inflation but ignoring deflation has a "ratchet" effect – pensions can go up but never down – which might pose fiscal problems. To avoid such problems, Japan will in future reduce benefits to claw back this gain. A factor of 98.3 per cent (reflecting the overall 1.7 per cent price fall) will be applied to future pension levels. Furthermore, as deflation continued, policy changed. Prices fell by 0.9 per cent in 2002 and 0.3 per cent in both 2003 and 2005. Benefits were reduced in line with these falls in these years.

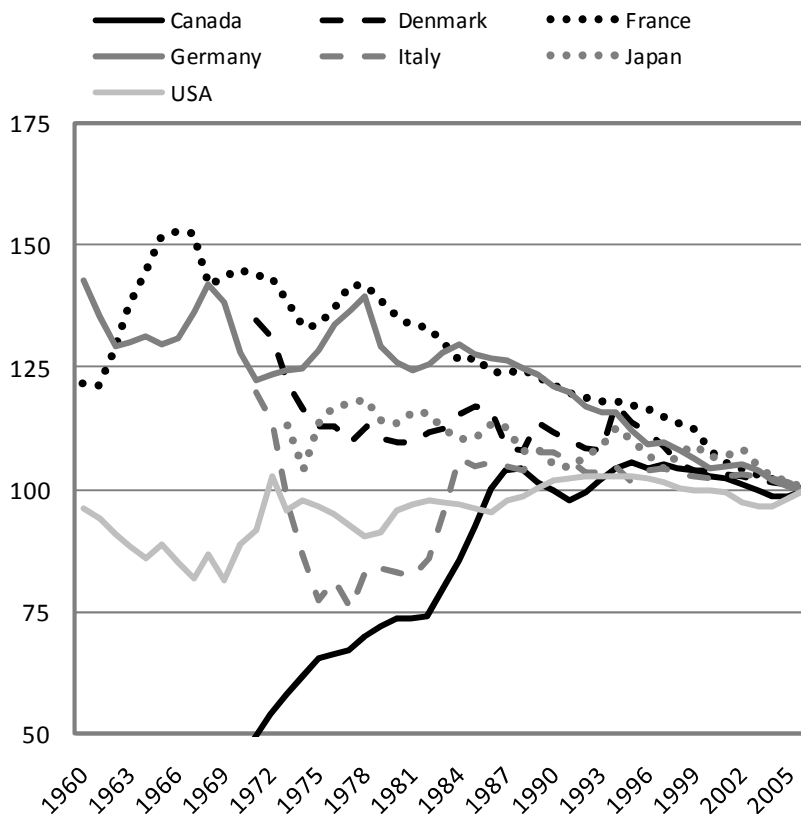
## **3.2. Pensions relative to average earnings**

The second benchmark used to evaluate national indexation policies over time is average earnings in the economy. This measure is useful for two reasons. First, the comparison with prices shows how pensions change relative to the cost of living. In contrast, the comparison with average earnings shows how pensions have developed relative to the standard of living of workers. Secondly, many countries had policies that linked pensions to changes in average earnings over at least some of the period under study.

The analysis groups countries into the same four sets as in the analysis relative to price inflation in Figures 1 to 4. However, major differences in real earnings growth between countries means that the patterns of pension values relative to wages are different from the real (price-adjusted) values.<sup>10</sup>

<sup>10</sup> Unfortunately, the OECD's database contains information on earnings growth for shorter periods than for price indices for some countries.

**Figure 5. Pensions relative to average earnings over time**



*Source:* OECD analysis of national information on pension indexation; OECD Main Economic Indicators database and national statistics offices.

Figure 5 shows the cases of the six countries that saw an increase in real pensions beginning in the early 1960s that came to an end around 1980.

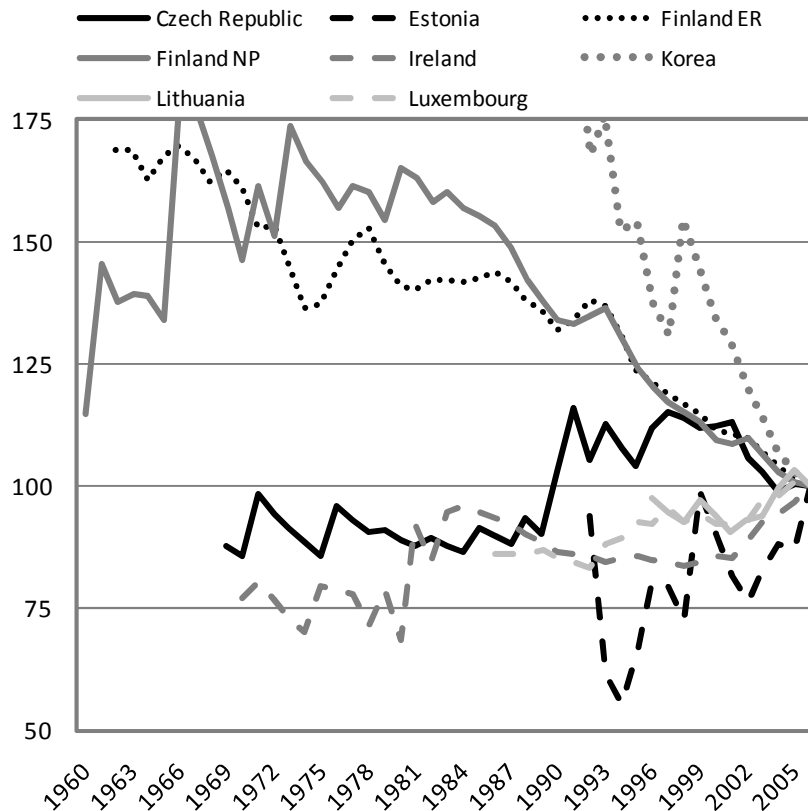
Italy saw a significant fall in pensions relative to earnings in the early 1970s related to very rapid growth in real earnings that averaged 10 per cent a year. The late 1970s and early 1980s saw a partial reversal, with an increase in pensions relative to earnings despite pensions being adjusted with both prices and wages during that period. Since 1985, pensions have fallen relative to earnings but the decline does not appear large because the price indexation since 1992 coincided with slow real earnings growth during this period.

The one-third increase in real pensions in the early 1960s in France was much more rapid than wage growth. In the 1970s pensions remained roughly constant relative to earnings. In Germany, pensions broadly kept pace with earnings growth through the 1960s and 1970s. However, both France and Germany saw declines since 1980, with pensions losing around 30 per cent of their value relative to earnings. This pattern is inconsistent with the official indexation policy, which linked pension benefits to wages throughout most of the period in both countries. Denmark and Japan saw consistent declines in pension relative to earnings, despite the Danish policy change in 1990 to index pensions to wages rather than prices.<sup>11</sup> The US, by contrast, has seen a stable relationship between pension and wages growth, largely due to constant real wages.

<sup>11</sup> Indexation of pensions and other social benefits is based upon wage increases less any allocation to the reserve.

In Canada, where indexation has been linked to prices, the pension increases in the 1970s and early 1980s were significantly faster than earnings growth. Since 1985, the pension has been flat relative to earnings, a similar pattern as found for the real pension value in Figure 1, because real earnings growth over this period has been very low.

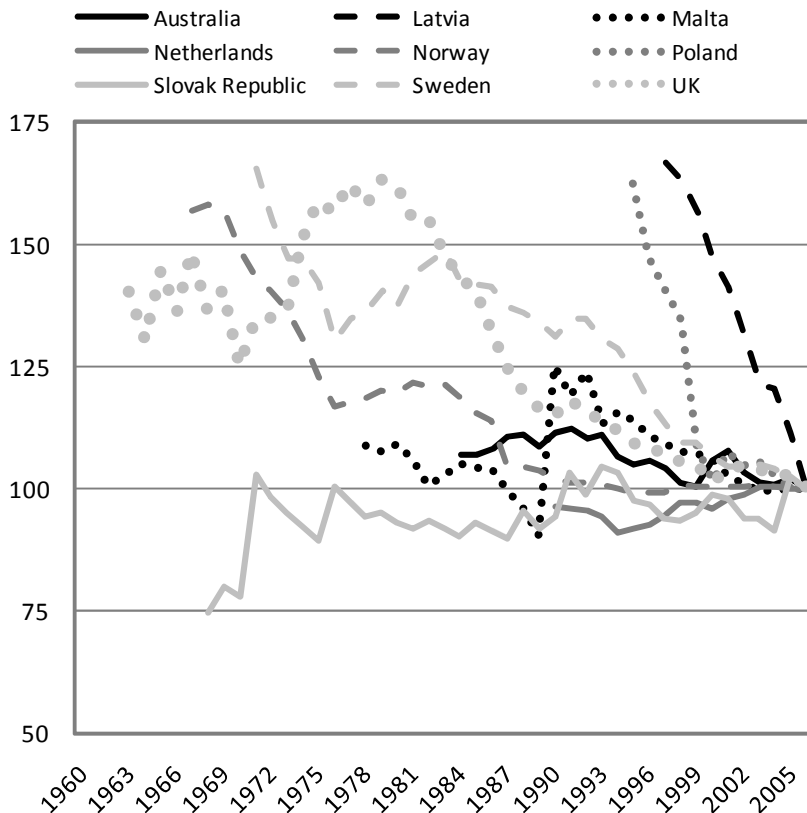
**Figure 6. Pensions relative to average earnings over time**



*Source:* OECD analysis of national information on pension indexation; OECD Main Economic Indicators database and national statistics offices.

The second set of countries was grouped together in Figure 2 because they saw near-continuous real increases in benefits. Figure 6 shows that benefits have increased slightly faster than earnings growth in Luxembourg, particularly since the 1990s. Estonia experienced a small rise in pensions relative to the growth in wages. The volatility in the pattern for Estonia reflects sporadic increases in benefits as these caught up with high levels of inflation. In Ireland, pensions fell slightly behind earnings in the late 1980s, a period of rapid wage growth. The last five years have seen increases faster than earnings as the government has set a target of large increases in the basic pension. Pensions have fallen relative to earnings in Finland since the mid 1970s by a total of around a third. Despite the lack of formal indexation rules in Lithuania, and in the Czech Republic before the 1990s, changes in pensions there have broadly followed the growth in average wages. Korea saw rapid growth in earnings over the past decade, averaging approximately 4 per cent a year, resulting in an erosion of benefits relative to earnings: halving in the last 15 years.

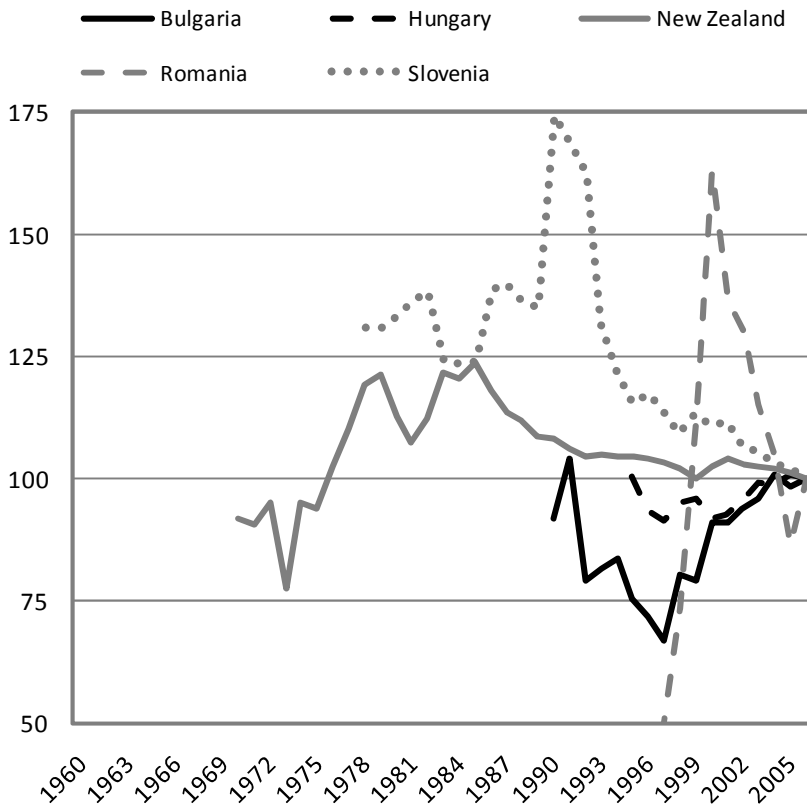
**Figure 7. Pensions relative to average earnings over time**



*Source:* OECD analysis of national information on pension indexation; OECD Main Economic Indicators database and national statistics offices.

Figure 7 shows that pensions fell rapidly relative to earnings in the United Kingdom in the 1980s due to a policy of price indexation of benefits and rapid growth in pay. The decline has slowed recently following discretionary real increases in benefits since the mid 1990s (as shown in Figure 3). The pattern in Sweden is similar, where benefits have fallen behind pay each year for most of the period. The exception – in the late 1970s and early 1980s – was a period of falling real wages. The steep decline in the value of pensions relative to wages in both Latvia and Poland is due to strong growth in earnings. For example, over the years analysed, wages rose by an average of 11 per cent per year in Latvia compared to pensions increases of 4.7 per cent. The pattern in Malta replicates the increase in the early 1990s observed for real values but here the value relative to wages has subsequently declined. This reflects stronger real wage growth in Malta throughout the 1990s. In Australia pensions have remained roughly constant relative to earnings over long periods. This reflects real increases in the benefit level. Norway, where pensions have mostly been linked to wages, shows a consistent decline in pensions relative to earnings until the mid-to-late 1980s, followed by a stable ratio.

**Figure 8. Pensions relative to average earnings over time: Hungary, Korea, Norway, Poland and Sweden**



*Source:* OECD analysis of national information on pension indexation; OECD Main Economic Indicators database and national statistics offices.

Countries in Figure 8 were grouped together because a number of them suffered declines in the real value of pensions, which mostly recovered. In Slovenia, the increase in pensions relative to wages just before 1990 reflects a drop in real earnings, while the recovery occurred with positive real earnings growth. This is despite a link to nominal average wage. In Bulgaria the initial decline is shallower than in Figure 4 because inflation was above wage growth, which in turn exceeded benefit increases. Bulgaria introduced price indexation in 2000 followed by a more recent change to mixed indexation, yet the average nominal growth in the level of pensions outpaced inflation as well as real and nominal wage growth, perhaps to make up for previous falls. The limited data for Hungary suggests that increases in pensions have broadly kept pace with earnings growth of approximately 4 per cent, in line with official indexation policy. In the late 1990s Romania, where benefit adjustments are discretionary, saw a sharp spike that increased pension values relative to wages. This was related to negative real wage growth during that period, which recovered in the early 2000s.

The pattern in New Zealand shows pensions growing significantly faster than wages in the 1970s. After a period of stability, relative pensions fell in the late 1980s and early 1990s and have remained fairly constant since then.

## 4. Should pensions be indexed to prices or earnings?

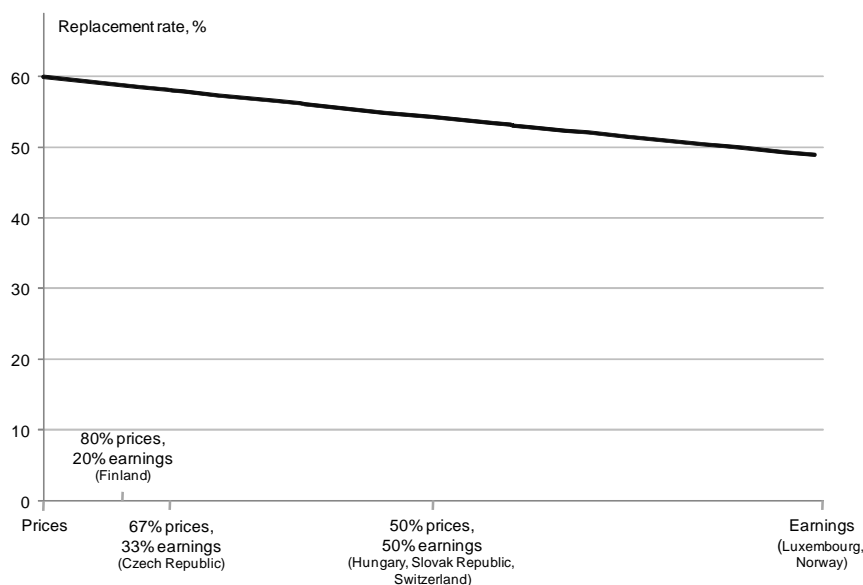
### 4.1. Microeconomic issues

A key policy question is whether the benchmark for assessing purchasing-power risk should be the cost of living (price changes) or standards of living (nominal earnings or household incomes changes). The latter is more expensive to government since earnings tend to grow faster than prices.

The indexation issue is best viewed as a trade-off: for a given pension budget, smaller increases in pensions during retirement mean a higher starting point for the benefit at the time of retirement (i.e. higher replacement) and vice versa. Gronchi and Aprile (1998) explain in more detail: "Without prejudicing the constraint of financial sustainability, a pension scheme may choose any one of an infinite number of pairs (combinations) of initial award and indexation rates".

The scale of the trade-off can be illustrated empirically using the OECD pension models (see OECD, 2005, 2007). The calculations show that providing an earnings-indexed pension costs around 23 per cent more than a price-indexed pension.<sup>12</sup> Figure 9 shows the result in terms of replacement rate. At the left-hand side, it is assumed that the replacement-rate target is 60 per cent with prices indexation. Moving to earnings indexation, overall pension costs would remain the same if the replacement rate were 48.5 per cent.

**Figure 9. Replacement rate under different indexation policies with constant costs**



Source: OECD pension models.

Which criteria should determine the choice between (i) a lower starting benefit and real increases (earnings indexation) or (ii) a higher initial pension and no real increase (price indexation)?

<sup>12</sup> Using OECD average mortality rates and the standard assumption of 2% annual growth in real earnings.

Most important is how much people want and need to spend at different ages during retirement. That is, the marginal utility of income falls with age as people can enjoy fewer activities than their younger selves. However, health expenditures may increase with age. Overall, the literature shows that consumption falls with age, but it's unclear if this reflects individual choice or income constraints.

A second issue is the rate of earnings growth. Increasing real pensions may be needed in the short or medium term to protect pensioner's relative living standards, particularly for transition countries with high real earnings growth. However, it is important that this policy does not become embedded in the long term. As these economies converge on the performance of the EU and OECD as a whole – with lower real earnings growth – a move to price indexation would be appropriate.

Thirdly, indexation policy has distributional consequences. Since people with lower incomes have a shorter life expectancy<sup>13</sup> more generous indexation procedures under a fixed budget can redistribute from poor to rich retirees.<sup>14</sup>

Finally, indexation affects individual choice. Assuming a given budget constraint, earnings indexation provides a lower starting replacement rate but faster benefit growth than price indexation. Under earnings indexation, a retiree would need to borrow to reach the price indexation replacement rate – a difficult strategy for retirees, who have greater liquidity constraints. Individuals under price indexation can easily save early in retirement to provide the increasing real consumption during retirement (matching earnings-indexed benefits). Thus, price indexation of pensions in payment provides more flexibility for individuals to follow preferred consumption.

## 4.2. Macroeconomic issues

Alternative indexation rules have been implemented as a way of stabilising the finances of pay-as-you-go pension systems and have important consequences for pension indexation in the wake of the financial and economic crisis.<sup>15</sup>

One example is the "balancing mechanism" used to adjust the notional-accounts in Sweden (see Settergren, 2001). The norm is to increase these pensions in payment by the increase in average earnings less 1.6 percentage points. However, a lower rate of pension increase is imposed if the finances of the scheme are unsustainable. The current crisis would suggest that cuts should be made. In practice, it is likely these will be postponed.

Germany also introduced a "sustainability adjustment" into its pension-point scheme. The value of which will be adjusted to reflect changes in the ratio of pensioners to contributors. Because Germany has a points system, these adjustments affect equally the value of pensions in payment (i.e., indexation policy) and the future pension rights of current workers (i.e. valorisation).<sup>16</sup> Projections show that this policy will reduce the real value of pensions in the long term by 18 per cent (OECD, 2007, p. 127)<sup>17</sup>. In 2008 and 2009 the government over-rode the requirement and increased pensions at a higher rate.

---

<sup>13</sup> See Whitehouse and Zaidi (2008) and Brown (2000).

<sup>14</sup> See Creedy, Disney and Whitehouse (1993) and Disney and Whitehouse (1993).

<sup>15</sup> See Valdés-Prieto (2000) and Robalino and Bodor (2008) for a detailed treatment of these issues.

<sup>16</sup> The adjustments in Germany are based on current values of variables while the Swedish adjustments are calculated using the present value of future flows.

<sup>17</sup> See Whitehouse (2007), Part II, and the references therein.

In the Netherlands, occupational pension plans can also adjust indexation and valorisation to help restore solvency. Most schemes base these on the earnings index<sup>18</sup>, yet a series of large plans have announced increases less than their stated policy.<sup>19</sup> The regulator has allowed pension funds longer to reach solvency, so indexation cuts might be delayed (see OECD, 2009).

Conditional indexation raises important issues of the sharing of risks – demographic and economic – between generations.<sup>20</sup> This reduction in uncertainty faced by taxpayers and contributors in the amount they must pay into the pension system<sup>21</sup> is an increase in the uncertainty of the real value of pensions received by retirees. Risk cannot be extinguished: instead, it should be allocated to the people best able to bear it. It seems reasonable to think that people of working age are better positioned to absorb negative economic shocks than retirees.

## 5. Which price index?

Indexation policy naturally requires an index.<sup>22</sup> Most countries use a version of the consumer price index (CPI) to adjust pensions in payment, which has the strength of simplicity. For pensions, the use of the CPI raises a number of issues.

First, what is the appropriate basket of goods and services? The disquiet about food and fuel prices in 2008 emphasised that older people spend proportionally more of their incomes on these goods. In the United Kingdom, for example, price inflation for pensioners in 2008 reached 7.4 per cent compared with 5.4 per cent for the population as a whole. There are also differences among pensioners. The inflation rate for the poorest, oldest pensioners was 9.0 per cent compared with 6.1 per cent for the youngest, richest retirees (Leicester, O’Dea and Oldfield, 2008).

Should pension adjustment reflect differences in expenditure baskets? Longer-term studies in the United Kingdom suggest that there are year-on-year differences in the index based on pensioner consumption, but no long-term difference with the overall index.<sup>23</sup> The appropriateness of the expenditure basket used is an issue requiring further research.

Some countries already use different versions of the CPI to adjust pensions. Some incorporate moral judgements. For example, Belgium excludes tobacco, alcohol and petrol and France excludes tobacco from the index. The United Kingdom uses an index that treats housing costs differently and excludes expenditures of the richest 10 per cent of the population.

Even if a more appropriate basket of goods and services is chosen, the second issue is whether the nature such an index is a good measure of changes in the cost of living. This complex yet

---

<sup>18</sup> See Bikker and Vlaar (2006).

<sup>19</sup> This reduction comes on top of indexation in the period 2003-06 that fell 3% behind wage growth and 2% behind price inflation as pension funds recovered from the 2000-02 stock-market crash (Dutch Central Bank, 2007).

<sup>20</sup> See Bohn (2001, 2002) on the risk-sharing properties of different indexation procedures.

<sup>21</sup> See Alho et al. (2005) for a formal treatment.

<sup>22</sup> See Deaton (1998), for index construction issues.

<sup>23</sup> See Crawford, 1994; Crawford and Smith, 2002; Crawford and Image, 2004.

important question is beyond the scope of this paper. However, see the Boskin Commission,<sup>24</sup> which identified an upward bias to CPI based on people switching goods, stores, and on the inaccurate accounting for new goods and changes in quality.

## 6. Whose pension benefits should be indexed?

Some countries have adopted procedures for "progressive indexation" of pension benefits. Austria, Greece, Italy and Portugal, for example, have or have had more generous indexation procedures for smaller pensions than for larger.<sup>25</sup> Take Greece as an example, where discretionary percentage increases are applied as seen in table 2.

**Table 2. Adjustments to pensions in Greece, 1999-2006**

Year	1999	2000	2001	2002	2003	2004	2005	2006
Inflation	2.6%	3.2%	3.4%	3.6%	3.0%	2.9%	3.5%	2.9%
Increases (bands)	3.9%	4.0%	5.5%	3.5%	4.0%	5.0%	4.0%	4.0%
	(<€ 733)	(all)	(<€ 352)	(<€ 400)	(<€ 500)	(<€ 500)	(all)	(all)
	3.4%		2.75%	1.5%	2.0%	3.0%		
	(>€ 733)		(<€ 587)	(<€ 620)	(<€ 1 000)	(>€ 1 000)		
			1.4%	0.75%	0.0%	0.0%		
			(<€ 880)	(<€ 910)	(>€ 1 000)	(>€ 1 000)		

Source: OECD (2005, 2007), national information.

Figure 10 shows the impact of these different indexation policies on the stock of pension wealth of men and women.<sup>26</sup> The analysis assumes that each year's policy was applied throughout retirement. As a benchmark, the charts also show pension wealth under a policy of pure price indexation. For men, this is just less than 15, so present value of a pension of EUR 10,000 is EUR 150,000. Because women live longer than men, pension wealth under price indexation is higher: just under 18.

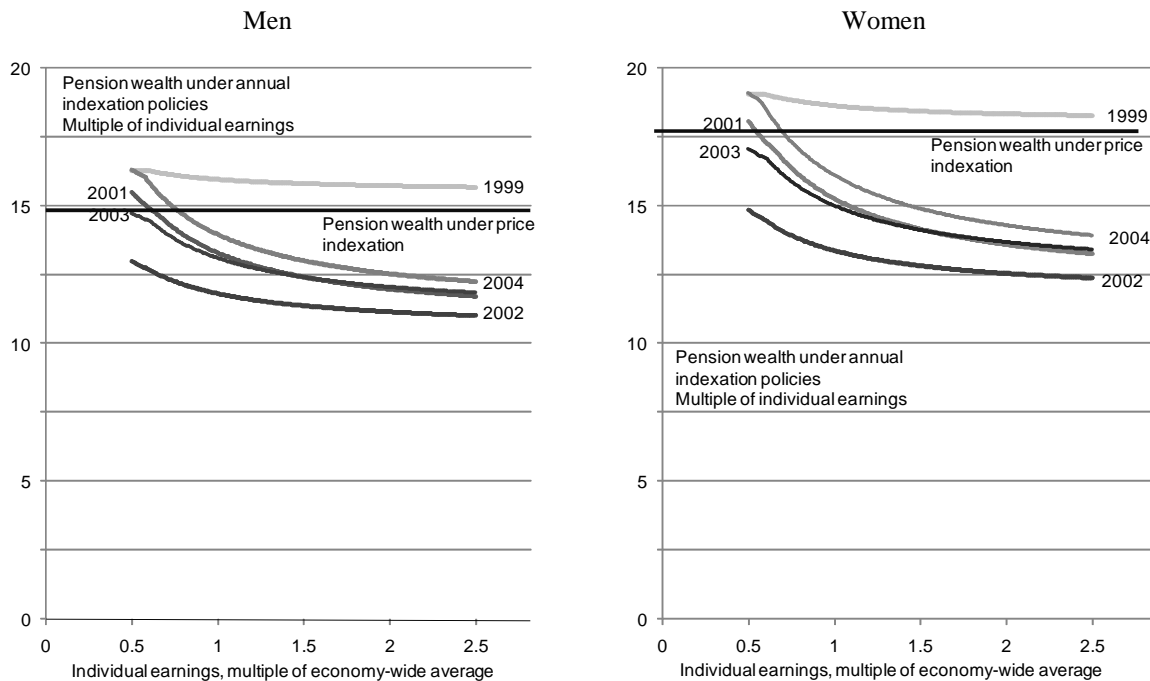
In 1999, there was only a small token difference: pension wealth for high earners (double average pay) was just 3.5 per cent less than that for people with low earnings (half of average). In the other four years, however, there were large differences in pension wealth by earnings. In 2001 and 2004, for example, pension wealth of high earners was 25 per cent less than for low earners. For 2002, the curve is flatter, but all pensions were increased by less than price inflation that year. The lowest pensions were increased by more than price inflation in 2003. But even for workers on half average earnings, the overall pension increase was around the same as price indexation for men and less for women. This is because the band over which these above-inflation increases were given was very narrow. Even in 2001 and 2004, earnings of more than 60 and 75 per cent of the average respectively would deliver pension increases of less than price inflation for men.

<sup>24</sup> It was formally called the "Advisory Commission to Study the Consumer Price Index in the United States", generally known for short as the Boskin Commission (after its chairman). See Gordon (2000, 2006) and Greenlees (2006) for responses to and analysis of the report's aftermath.

<sup>25</sup> These policies should not be confused with the proposal in the United States, championed by Posen, one of the members of the President's Commission to Strengthen Social Security. This proposal for "progressive indexation" relates to the adjustment of benefits before retirement, akin to what the OECD terms "valorisation" (and others have called "actualisation"). Here, the term indexation is used only to refer to the adjustment of benefits after retirement.

<sup>26</sup> See Queisser and Whitehouse, 2006 for details of these calculations.

**Figure 10. Pension wealth by individual earnings and sex under different indexation policies, Greece**



Source: OECD pension models.

## 7. Conclusions

### 7.1. Indexation policy and practice

The empirical investigation of the evolution of pension value relative to both prices and earnings has revealed some common patterns between countries, showing the maturing of pension systems in the EU and elsewhere, and the turbulence of transition of former command economies. Although it was possible to group countries by the pattern of their pension values, their policies were often very different. These policies – and changes in them over time – are not always apparent in the empirical analysis.<sup>27</sup> Indexation rules have sometimes been ignored.

Early cohorts and retirees in periods of economic expansion experienced a generous treatment. Large real increases in pensions may have been compensation for the fact that early cohorts had limited opportunities to build up pension earnings-related rights.

Fiscal constraints have often resulted in lower increases. The United States, for example, suspended indexation for 1984, Belgium for the three years 1983 to 1985, Spain, for the period 1983–88, and Italy for six months in 1992. Other common measures to alter indexation outcomes include delaying the adjustment or changing the index measure.<sup>28</sup>

<sup>27</sup> Similarly, Vording and Goudswaard (1997, 1998) show that over the long term, pension adjustments have been much the same between countries despite different formal procedures. However, they only looked at four countries: France, Germany, the Netherlands and the United Kingdom.

<sup>28</sup> Wartonick and Packard (1983).

Nevertheless, arguments for indexation are strong. Pensioners, above all, want to minimise the risk and uncertainty in the purchasing power of their incomes. Automatic indexation avoids political horse-trading and provides an intergenerational contract. In times of economic or fiscal pressure, it may be fair that pensioners bear some of the pain with reduced benefit adjustments. But that practice, although common in EU and OECD countries, does not remove the argument for automatic indexation as a norm.

## 7.2. Methods and measures of indexation

The paper also examined the options and arguments for indexation to prices or earnings and argued that the former is appropriate for most EU and OECD countries for distributional reasons and because of the greater flexibility it offers pensioners.

The rapid recent increase in food and fuel prices has hit pensioners particularly hard. However, literature shows evidence that price inflation faced by pensioners over time tends to be the same as the wider population.

The paper examined policies of "progressive indexation", where larger pensions are increased proportionally less than smaller pensions. The effect of these policies is to introduce a redistributive element to pension systems. However, the degree of redistribution is arbitrarily linked to the rate of inflation. Progressive indexation – when effective rather than "tokenist" – is a poor and arbitrary substitute for a progressive benefit formula or a two-tier pension system with redistributive and earnings-related elements.

## References

- Alho, J.M., S.E. Hougaard Jensen, J. Lassila and T. Valkonen (2005), "Controlling the effects of demographic risks: the role of pension indexation schemes", *Journal of Pension Economics and Finance*, vol. 4, pp. 139-153.
- Association of British Insurers (2005), *The Pensions Annuity Market: Developing a Middle Market*, February.
- Beveridge, W.H. (1942), *Social Insurance and Allied Services*, Cmnd 6404, His Majesty's Stationery Office, London.
- Bikker, J.A. and P.J.G. Vlaar (2006), "Conditional indexation in defined benefit pension plans", Working Paper no. 086/2006, De Nederlandsche Bank, Amsterdam.
- Bohn, H. (2001), "Social Security and Demographic Uncertainty: The Risk-Sharing Properties of Alternative Policies", in J. Campbell, and M. Feldstein (eds.), *Risk Aspects of Investment Based Social Security Reform*, University of Chicago Press, Chicago.
- Bohn, H. (2002), "Retirement Savings in an Ageing Society: A Case for Innovative Government Debt Management," in A. J. Auerbach, and H. Herrmann (eds.), *Ageing, Financial Markets and Monetary Policy*, Springer, Heidelberg.
- Boskin Commission [Advisory Commission to Study the Consumer Price Index] (1996), *Toward a More Accurate Measure of the Cost of Living*, final report to the Finance Committee, United States Senate, Washington, D.C., December.
- Brown, J.R. (2000), "Differential Mortality and the Value of Individual Account Retirement Annuities", Working Paper no. 7560, National Bureau of Economic Research, Cambridge, Mass.
- Crawford, I. (1994), "UK household cost-of-living indices, 1979-92", *Fiscal Studies*, vol. 15, no. 4, pp. 1-28.
- Crawford, I. and I. Image (2004), "The Retail Price Index and the Cost-of-Living Index: testing for consistency in theory and practice", *Fiscal Studies*, vol. 25, no. 1, pp. 79-91.

- Crawford, I. and Z. Smith (2002), *Distributional Aspects of Inflation*, Commentary no. 90, Institute for Fiscal Studies, London.
- Creedy, J., R.F. Disney, and E.R. Whitehouse (1993), "The Earnings-Related State Pension, Indexation and Lifetime Redistribution in the U.K.", *Review of Income and Wealth*, vol. 39, no. 3, pp. 257-78.
- D'Addio, A.C., J. Seisdedos and E.R. Whitehouse (2009), "Investment Risk and Pensions: Measuring Uncertainty in Returns", Social, Employment and Migration Working Paper no. 70, OECD, Paris.
- Deaton, A. (1998), "Getting Prices Right: What Should Be Done?" *Journal of Economic Perspectives*, Vol. 12, No. 1, pp. 37-46, Winter.
- Disney, R.F. and E.R. Whitehouse (1991), "How should pensions in the UK be indexed?" *Fiscal Studies*, Vol. 12, No. 3, pp. 47-61.
- Disney, R.F. and E.R. Whitehouse (1993), "Contracting-Out and Lifetime Redistribution in the UK State Pension System", *Oxford Bulletin of Economics and Statistics*, Vol. 55, No. 1, pp. 25-41.
- Gordon, R.J. (2000), "The Boskin Commission Report and its Aftermath", Working Paper No. 7759, National Bureau of Economic Research, Cambridge, Mass.
- Gordon, R.J. (2006), "The Boskin Commission Report: A Retrospective One Decade Later", Working Paper No. 12311, National Bureau of Economic Research, Cambridge, Mass.
- Greenlees, J.S. (2006), "The BLS Response to the Boskin Commission Report", *International Productivity Monitor*, Vol. 12, pp. 23-41, Spring.
- Gronchi, S. and R. Aprile (1998), "The 1995 Pension Reform: Equity, Sustainability and Indexation", *Labour*, Vol. 12, No. 1, pp. 67-100.
- Hoskins, D., M.A. Pearson and E.R. Whitehouse (2008), "Social Pensions in High-Income Countries", in R. Holzmann and N. Takayama (eds.), *Closing the Coverage Gap: The Role of Social Pensions*, World Bank, Washington, D.C., forthcoming.
- Johnson, R.W. (1999), "The Distributional Implications of Reductions in Social Security COLAs", Retirement Project Brief No. 5, Urban Institute, Washington, D.C.
- Leicester, A., C. O'Dea and Z. Oldfield (2008), "The Inflation Experience of Older Households", Commentary No. 106, Institute for Fiscal Studies, London.
- OECD (2005), *Pensions at a Glance: Public Policies across OECD Countries*, OECD, Paris.
- OECD (2007), *Pensions at a Glance: Public Policies across OECD Countries*, OECD, Paris.
- OECD (2009), *Pensions at a Glance: Public Policies across OECD Countries*, OECD, Paris.
- Palacios, R.J. and Rocha, R. (1997), "The Hungarian pension system in transition", Pension Reform Primer series, Social Protection Discussion Paper No. 9805, World Bank, Washington, D.C.
- Queisser, M. and E.R. Whitehouse (2006), "Neutral or Fair? Actuarial Concepts and Pension-System Design", Social, Employment and Migration Working Paper No. 40, OECD, Paris.
- Robalino, D.A. and A. Bodor (2008), "On the financial sustainability of earnings-related pension schemes with 'pay-as-you-go' financing and the role of government-indexed bonds", *Journal of Pension Economics and Finance*, forthcoming.
- Settergren, O. (2001), "The Automatic Balance Mechanism of the Swedish Pension System: A Non-Technical Introduction", mimeo., National Social Insurance Board, Stockholm.
- Timonen, V. (2003), "Restructuring the welfare state: globalization and social policy reform in Finland and Sweden" Edward Elgar Publishing.
- Valdés-Prieto, S. (2000), "The Financial Viability of Notional Account Pensions", *Scandinavian Journal of Economics*, Vol. 102, pp.395-417.

- Vording, H. and K.P. Goudswaard (1997). "Indexation of public pension benefits on a legal basis: some experiences in European countries", *International Social Security Review*, Vol. 50, No. 3, pp. 31-44.
- Vording, H. and K.P. Goudswaard (1998), "Legal Indexation of Social Security Benefits: an International Comparison of Systems and Their Effects", in T. Marmor and P. de Jong (eds.), *Ageing, Social Security and Affordability*, Edward Elgar, Aldershot.
- Wartonick, D. and M. Packard (1983), "Slowing down pension indexing: the foreign experience", *Social Security Bulletin*, Vol. 6, pp. 9-15.
- Weaver, R.K. (1988), *Automatic Government: The Politics of Indexation*, Brookings Institution, Washington, D.C.
- Whitehouse, E.R. (2007), "Life-expectancy risk and pensions: who bears the burden?" *Social, Employment and Migration Working Paper No. 60*, OECD, Paris.
- Whitehouse, E.R. and A. Zaidi (2008), "Socio-economic differences in mortality: implications for pension policy", *Social, Employment and Migration Working Paper No. 71*, OECD, Paris.
- Whitehouse, E.R., A.C. D'Addio and A. Reilly (2009), "Investment Risk and Pensions: Effects on Individual Retirement Incomes and Government Budgets", *Social, Employment and Migration Working Paper*, OECD, Paris, forthcoming.
- Wilson, T. and Wilson, D.J. (1982). "The Political Economy of the Welfare State", Allen and Unwin, London.