



TRYGGVI THOR HERBERTSSON

Why Icelanders Do Not Retire Early

I Sverige lämnar allt fler arbetsmarknaden runt 60 år. Många varken orkar eller vill arbeta kvar till pensionsåldern. Arbetsgivarna vill heller inte ha kvar eller anställa äldre, visar undersökningar som Pensionsforum låtit göra.

Om pensionerna och övrig välfärd ska klaras på sikt måste friska och arbetsföra människor ges möjligheten att vilja och kunna fortsätta arbeta några år till. Kanske inte på heltid eller med samma arbetsuppgifter som tidigare utan med andra uppdrag, nya arbetsgivare eller som egenföretagare.

Pensionsforum har i en rad skrifter belyst den demografiska utvecklingen i Sverige – och i övriga Europa – med allt fler äldre och färre yrkesverksamma. Vi har med våra rapporter och konferenser understrukt behovet av förändrade attityder, förbättrade arbetsorganisationer, kompetensutveckling även för medelålders medarbetare, ändrade regelverk, kollektivavtal, lönestrukturer och pensionsavtal för att den mest erfarna arbetskraften ska finnas kvar på arbetsmarknaden.

Denna nya rapport *”Why Icelanders Do Not Retire Early”* av forskaren Tryggvi Thor Herbertsson beskriver pensionsvillkoren och arbetsmarknadssituationen för äldre på Island. Där arbetar flertalet fram till den obligatoriska pensionsåldern som är 67 år. Offentliganställda kan sluta vid 65 års ålder men då med lägre pension. Förtida pensioner eller avtalspension som blir allt vanligare i Sverige förekommer knappast alls på Island. En förklaring är att arbetskraften i alla åldrar behövs på Island.

”Why Icelanders Do Not Retire Early” är Pensionsforums sjätte skrift kring temat arbetsmarknaden för 50+ eller hur den mest erfarna arbetskraften borde finnas kvar i arbetslivet. Ansvarig för projektet är professor Magnus Henrekson, nationalekonom och ledamot i Pensionsforums styrelse.

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Ann Lindgren

Verkställande direktör

Pensionsforum

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EXECUTIVE SUMMARY

The trend in most industrialized countries is toward decreasing labor market participation of older workers. The steady withdrawal of workers from the workforce at a younger age suggests that retirement income is gradually increasing, or that older workers are increasingly being forced out of the labor market. Consequently, the huge increases in early retirement in industrialized countries in the last century can be explained by labor supply decisions of workers on the one hand and labor demand decisions of employers on the other, taking due account of demographic conditions.

Unlike his nineteenth-century predecessor, 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. The modern worker can not 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.

The motive for this report is the high labor force participation of older workers in Iceland, compared with other industrialized countries, and consequently the low rates of inactivity and early retirement observed. This report is divided into three main parts. The first assesses the economic costs arising from early retirement in terms of forgone economic output in the Nordic countries and the OECD. Furthermore, it reviews alternative theories on why people

leave the labor market before the official retirement age. The second part discusses the Icelandic pension system in order to identify potential incentive structures that may discourage early retirement. The third part utilizes the theories from the first part to substantiate an explanation for the low early retirement rates observed in Iceland.

The main conclusions of the report are:

- The withdrawal of older workers from the labor force creates a variety of economic challenges, including an increase in unused production capacity. Costs due to early retirement measured in terms of foregone output, averaged 6.3 percent of potential gross domestic product in the OECD countries in 1998. The costs, which vary greatly from country to country, are highest in Hungary (15.9 percent of potential output) and lowest in Iceland (0.5 percent), with costs amounting to 4.8 percent of potential GDP in Sweden.
- The Icelandic pension system consists of three pillars: basic benefits and an income-tested supplement provided by pay-as-you-go financing, a fully funded compulsory occupational pension system, and voluntary individual accounts with tax advantages.
- The official retirement age is 67 years although public sector employees can retire at the age of 65 with reduced benefits. If an employee retires before 67, the retirement benefits are adjusted downwards by 0.5 percent for each month, see table.

Benefit rules in the Icelandic pension system

	Occupational funds	Public sector A	Public sector B
Retirement age	67	65	65
Accrual of benefits p.a.	1.4–1.8% of total wages	1.9% of total wages	25 of fixed salaries (for 32 years), 1% to 65 and 2% >65
Indexation	CPI	CPI	Government wages
Early/late retirement	±7.2–9.6% p.a.	±6% p.a.	NA

- Generally speaking, no formal vehicle exists today in the Icelandic pension system for early retirement before the age of 65, except for seamen who can collect benefits from the age of 60, and for members of the old public sector pension scheme (Department B), who have the option to retire when the sum of their age and years of service equals 95.
- However, the arrangement in Department B of the public workers pension fund creates disincentives for workers to leave the labor market as the replacement rate is based on base rather than total salary, resulting in a drop in income at retirement.
- The recent establishment of an individual accounts system in Iceland might encourage early retirement when the system has matured, as withdrawal is possible from the age of 60 until the official retirement age.

- Disability benefits create disincentives to work and, as a consequence, misuse is common, especially for low-income workers who often use disability programs as a vehicle for early retirement. Disability programs have also been used as a substitute for early retirement pensions and as a youth-unemployment reduction mechanism in Europe. This, however, does not apply to Iceland, as unemployment has been low.
- The number of disability pensioners varies greatly between the Nordic countries. The difference is only moderate in the 16–49 age group, but after that, the differences become striking. For example, 3.5 times as many people are disabled in Finland than in Iceland in the 60–64 age group and 2.5 times as many in Sweden. It is hard to believe that the differences in disability are real, since the population in the Nordic countries is relatively homogeneous, life expectancies are not that different, and economic conditions, aside from unemployment, similar.
- It seems that the hypothesis that people retire early through disability schemes applies very well to Finland, Norway, and Sweden but less so to Denmark and Iceland. This can be explained by the relatively generous disability benefits in Finland, Norway, and Sweden compared with Denmark and Iceland.
- The single most important factor for low levels of early retirement in Iceland is low unemployment in the past. On the other hand, rising unemployment in Europe led to the development of many of the current early retirement programs in the 1970s and '80s.

- Favorable demographic conditions may have contributed to the high labor force participation rates of older workers in Iceland: First, the younger the population, the fewer the people leaving the labor market due to disability, since morbidity rates increase with age. Second, the larger the fraction of a given population at early retirement age, the greater the political pressure to implement early retirement programs paid for by the public. Third, the greater the pool of people at early retirement age, the higher the probability of leaving the labor market in order to engage with other retirees in recreational activities.
- In the past, the relatively small pension and private wealth accumulated in Iceland has discouraged retirement before the official retirement age.
- Current labor market regulations neither discriminate for or against older workers. However, according to current labor contracts employers can make workers redundant at the age of 70. Until the age of 53 workers can be made redundant at 3 months' notice; at the age of 54 the notice is 4 months, 5 months at the age of 60, and finally 6 months at the age of 63.
- No formal regulations exist on the Icelandic labor market that make it possible for workers to take on less strenuous or part-time jobs as they get older. Few firms have formal arrangements and it is entirely up to the employer and the employee to make such arrangements.

- Hence, Icelandic males do not move into part-time work or self-employment to the same extent as workers in continental Europe, as they get closer to the official retirement age. On the other hand, part time work among Icelandic females seems to increase after the age of 55.

Although the current situation is favorable in Iceland, early retirement will most likely increase in the future as the population grows older. However, the attitude of the Icelanders towards work is different from that of workers in the other Nordic countries. The Icelanders not only work until later in life but they also work longer days. In this respect Icelanders bear more resemblance to Americans than to their neighbors in the Nordic countries.

INTRODUCTION

On the whole, labor force participation of older workers is declining in the industrialized countries, and in response to high unemployment, many countries expanded early retirement schemes in the 1980s. In the Nordic countries, substantial decreases in labor market participation have in particular occurred in Finland and, more recently, in Norway. Despite the common trend toward earlier retirement, however, labor market participation rates differ significantly across countries. This divergence indicates that participation depends on a wide variety of factors. Older workers in Iceland have among the highest participation rates in the world. Participation rates are also relatively high in Norway, despite the recent decline. However, Denmark and Finland have experienced low and falling participation rates, although there is some evidence that these rates may now be leveling out.

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 countries and life expectancy has risen sharply. This combination of earlier retirement and longer life expectancy results in a much longer span of inactivity. Regardless of its causes, the withdrawal of older workers from the labor force leads to an increase in unused production capacity, a reduced tax base, and a heavier load

on pension and fiscal systems. If the trend toward earlier retirement were to continue far into the future, it would pose even larger fiscal threats to pension systems, especially those that do not include a penalty for early retirement.

Another problem related to that of early retirement is disability. While mortality rates have been falling in the industrialized countries, morbidity, the inception rate of disability, has declined more slowly. Because morbidity increases with age, the net effect of slow improvements in morbidity and an aging population has been a rise in the disabled population, which is likely to increase even further in the next thirty years. Disability benefits are often more generous than ordinary retirement benefits, further increasing the number of applicants as well as claimants of disability benefits.

The trend toward earlier retirement and the related issue of disability raise substantial policy challenges. Despite the political unpopularity of reforming early retirement systems, several countries have already taken steps to tighten eligibility rules and strengthen incentives to retire later. However, even these additional incentives are often weak or clash with supplementary pension provision. Furthermore, in most countries, few incentives exist to retire late, as reflected in low labor force participation after the formal retirement age.

The preparation of this report was indeed motivated by the very high labor force participation of older workers in Iceland, compared with other industrialized countries, and consequently the low rates of inactivity and early retirement. Table 1 provides relevant background about Iceland and, for comparison, the other Nordic

Table 1. Some descriptive statistics for the Nordic countries

	Denmark	Finland	Iceland	Norway	Sweden
GDP per capita, 1999 (PPP adjusted USD)	27,073	22,723	26,338	28,133	23,017
Population, 1998 (1 000)	5,295	4,954	274	4,418	8,850
Public pension spending/GDP ratio, 1998*	8.8	5.7	3.3	7.8	10.7
Dependency ratio, 1998 (65+/20–64)	24.3	21.4	20.5	26.7	30.1
Transfer ratio (expenditures/dependency ratio)	0.36	0.27	0.16	0.29	0.36
Labor force participation, 1998 (males 55–64)	61.1	44.5	93.3	75.8	71.4
Labor force participation, 1998 (females 55–64)	44.2	39.7	83.0	60.8	63.6
Mean retirement age males, 1995	62.7	59.0	69.5	63.8	63.3
Mean retirement age females, 1995	59.4	58.9	66.0	62.0	62.1
Unemployment, 2000	4.7	9.8	1.7	3.5	5.9
Health expenditures/GDP ratio, 1997	6.4	7.6	8.1	8.0	7.6
Life expectancy – males, 1997	73.3	73.4	76.4	75.5	76.7
Life expectancy – females, 1997	78.4	80.5	81.3	81.0	81.8
Total fertility rate, 1997	1.752	1.746	2.040	1.857	1.532
Infant mortality rate, 1997 (per 1,000 live births)	5.6	3.9	5.5	4.1	3.6
Hospital beds, 1997 (per 100,000 inhabitants)	464	790	910	398	387
Morbidity, 1997 (per 1,000 inhabitants)**	190	208	178	148	162
Deaths, 1997 (per 100,000 inhabitants (EPS))	821	738	677	701	623
Gross savings ratio, 1998 (pct of GDP)	19.9	25.1	15.1	27.1	20.1

Notes: *Defined as spending on old age, early retirement, and disability pension within the Social Security system.

**Discharges from somatic wards.

Source: Nordic Medico Statistical Committee, OECD, the National Economic Institute in Iceland, Blöndal and Scarpetta (1998), Ólafsson (1999), Herbertrsson et al. (2000), and author's research.

countries. Along some dimensions, such as life expectancy at birth, the Nordic countries are quite similar. However, along others, such as the labor force participation of older workers, they differ substantially.

This report is divided into three main parts. The first assesses the economic costs arising from early retirement in terms of foregone economic output in the Nordic countries and the OECD. Furthermore, it reviews alternative theories as to why people leave the labor market before the official retirement age. The second part discusses the Icelandic pension system in order to identify potential incentive structures that may discourage early retirement. The third part utilizes the theories from the first part to substantiate an explanation for the low early retirement rates observed in Iceland.

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Tryggvi Thor Herbertsson

Institute of Economic Studies, University of Iceland

THE ECONOMICS OF EARLY RETIREMENT

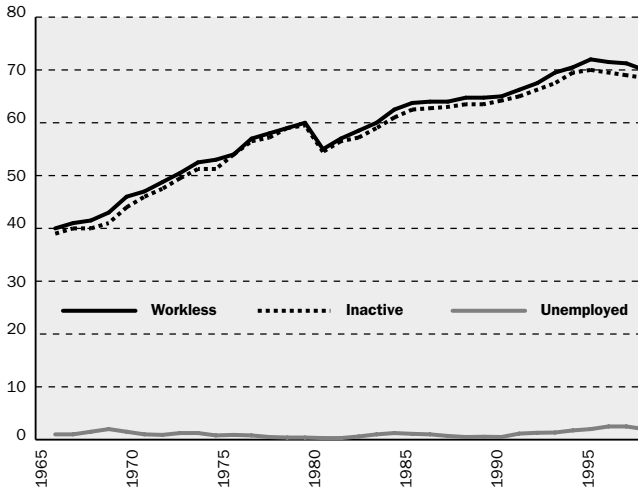
2.1 Introduction

The trend in most industrialized countries is toward decreasing labor market participation of older workers. This withdrawal of workers from the labor force at a younger age suggests that retirement income is gradually increasing, or that older workers are increasingly being forced out of the labor market. Consequently, the huge increases in early retirement in industrialized countries in the last century can be explained by labor supply decisions of workers on the one hand and labor demand decisions of employers on the other, taking due account of demographic conditions.

Unlike his nineteenth century predecessor, 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. The modern worker can not 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.

Although private wealth has increased, and public retirement systems have advanced, not all workers retire voluntarily. In the U.K. only one-third of early retirees between the age of 50 and the official state pension retirement age appear to retire voluntarily, and

Figure 1. Trends in the inactivity of males 55+ in the Nordic countries 1965–1998, percent of population, (weighted average)

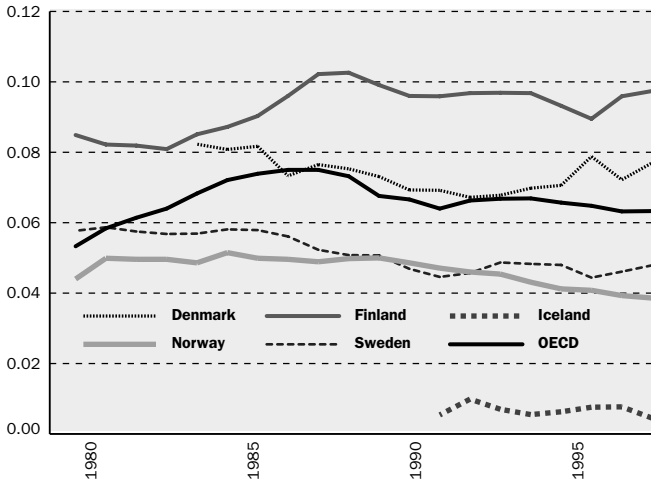


only about 12 percent have made plans for retirement (see U.K. Cabinet Office, 2000). In the Nordic countries the situation is different. But regardless of whether early retirement can be traced to the labor supply or the labor demand side of the labor market, it constitutes a withdrawal of resources from production, a lowered tax base, and an increased burden on pension and fiscal systems.

2.2 Costs of early retirement

In 17 OECD countries, for which data are available, the proportion of the 55–64 age cohort of employed males fell by an average of more than 10 percentage points between 1980 and 1996.¹ For

Figure 2. Costs of early retirement of 55–64 year-olds as a share of potential GDP in the Nordic countries and the OECD, 1979–1998



the Nordic countries this trend is illustrated in Figure 1, which shows the increasing inactivity of those 55 years and older over the last four decades.²

To assess the cost of early retirement of 55–64 year-olds in the five Nordic countries and the OECD, Herbertsson and Orszag (2001) developed a simple framework incorporating equilibrium effects (see Appendix for the model). Figure 2 depicts the fraction of output lost in the countries in the period 1979–1998.

¹ Disney and Whitehouse (1999).

² 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-term trend.

The calculations are corrected for business cycles by using relative labor participation as a benchmark. The total output gap due to a lack of full labor force utilization is considerably higher due to unemployment, as was indeed noted in Gruber and Wise (1999). The analysis suggests a cost of early retirement of 5–7 percent annually of potential GDP in the OECD. For the EU the figures are even higher. The exercise is not very sensitive to reasonable variations in assumptions. The costs rose rapidly in the OECD after the 1970s, peaked in the mid-1980s, and have declined since, although they are still above the level of the 1970s. As we can see from the figure, the average costs in both Finland and Denmark are higher than in the OECD on average. The costs have been falling in Sweden throughout the sample period although they seem to have been increasing after the middle of the '90s. In Iceland the costs are almost nonexistent. The difference can be traced to labor force participation in the countries (see Table 1).

Although some decline in labor market participation is a common trend across the Nordic countries, there are substantial differences among the countries in labor market participation and its rate of decline. In particular, Iceland's labor market participation for older workers rivals Japan's as the highest in the world. Despite the recent decline in Norway, its old age labor market participation is still quite high, and is roughly equal to the U.S. level. On the other hand, there are clear signs of both rapid decline and low levels of participation in Denmark and Finland. As Herbertsson *et al.* (2000) observe, many schemes exist for early retirement in Denmark and Finland, while in Sweden there are relatively few. Sweden

is an intermediate case, in that its rates of labor market participation for older workers declined significantly in the '60s and '70s but have remained steady since the mid-'90s.

These differences are important for policy makers to the extent that they are rooted in economic policy and structure rather than in cultural and environmental factors. However, deriving causal relationships is difficult because, in many countries, early retirement schemes were expanded in the 1980s as a way of reducing high youth unemployment. It is therefore difficult to discern whether the increase in early retirement resulted from the retirement schemes that were put in place or were simply a consequence of high unemployment. Indeed, one of the key themes here is the examination of labor demand as well as labor supply in policy assessment.³

While the calculations measure the cost of early retirement and the potential gains from successful reforms, they do not suggest specific reforms. The micromodelling of the gains from specific reforms is clearly beyond the scope of this report. However, in light of the costs associated with early retirement, it is useful to summarize alternative theories as to why people retire early.

2.3 Labor supply

The body of research on early retirement has focused on the supply side of the labor market and especially on such incentives as wealth,

³ As one simplistic example of the difficulty of using an exclusively labor-supply approach in a cross-country setting, Iceland in 1989 had uniformly higher replacement rates of net income than Finland for early retirement schemes and yet had much higher levels of labor market participation, OECD (1995) p. 92.

accrual rates, earnings tests, and taxes. Boskin (1977) was one of the first to pay close attention to the effects of incentives on early retirement. Subsequent work includes Quinn *et al.* (1990). Indeed, incentives are the focus of a huge body of U.S. 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 U.K.

Comprehensive studies on early retirement focusing on incentives created on both the supply and the demand side of the labor market include work by the OECD (1995a, 1995b) as well as an EU project published in the *European Economy*, and an NBER book edited by Gruber and Wise (1999). The methodology in each of these studies is 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 and it has spurred much policy and academic interest. Unfortunately, however, this approach was applied only to Sweden among the Nordic countries. Sweden has less early retirement and less unused labor capacity than most other countries in the study and lower implicit taxes on work near retirement than other European countries. In addition, the Gruber/Wise study offers only limited insight into the pension systems because it does not incorporate the impact of private bene-

fits, such as the new PPM system in Sweden or individual accounts with tax advantages in Iceland, which may be important for considering incentives for early retirement.

Replacement rates. While the studies mentioned above accurately characterize the incentive issues and the structure of early retirement benefits, causal explanation is lacking. It is on the whole difficult to find evidence that can link microeconomic labor supply responses to the incentives in question, and it may well be that weak incentives to continue working are a policy response to labor demand shocks. For example, Blöndahl and Scarpetta (1998) find no clear relationship between high replacement rates and early retirement.

Johnson (2000) has had greater success in his findings. He reports that historical data from 13 industrialized countries show some fall in labor force participation of male workers aged 60–64 after pensions were extended to that age group. He estimates that the growth of old-age insurance explains about 11 percent of the reduction in labor force participation of males aged 60–64 since 1920, and he concludes by stating that greater private wealth probably explains most of the remainder.

Wealth. Costa (1998) reports that more private wealth, such as increased home ownership, is the major explanation for the long downward trend in the labor force participation of older-age male workers. Increased female labor force participation might also contribute to a more widespread early retirement of males, as higher female participation adds to household wealth. Costa surveyed a number of studies on early retirement in the U.S., and reported that labor force participation was affected by income (wealth) from dis-

ability, old age and survivors pensions and as well as from private assets. His conclusion, however, is that the effect from a dollar in private pension on retirement is different from the effect of a dollar in social security wealth, which in turn is different from the effect of a dollar in asset holdings. Furthermore, Costa reports that the responsiveness of retirement to income has been falling in the last century.

Disability and unemployment benefits. The importance of disability in explaining changes in labor market participation is controversial.⁴ In the U.S. literature, many researchers have argued that while disability benefits have led to decreased labor market participation, the primary explanation lies elsewhere. Bound and Waidmann (1992) use data on self-reported disability to conclude that only about a third of the drop in labor force participation in the U.S. is due to enhanced disability benefits. Bound (1989) also casts doubt on how strong the disincentive effects of disability insurance are by observing that the labor market behavior of rejected applicants is apparently not that different from that of approved ones.

The literature on Europe, on the other hand, often finds stronger disincentive effects from disability insurance than found in the U.S. This difference may not be surprising, given that disability systems are often more generous in Europe than in the United States.

Morbidity increases with longevity. Consequently, the average labor supply of older-age participants might decrease as a greater proportion of each generation reaches a higher age. This could result in increased pressure on disability and early retirement programs.

⁴ Aarts and DeJong (1999) examine broad issues of disability within a multipillar framework.

Wealth effects and, consequently, early retirement can be created by disability pensions and special unemployment benefits for the old, especially for low-income households. Moreover, disability benefits are often substitutes for early retirement pensions as a youth-unemployment reduction mechanism. If this were the case, a relationship ought to be found between non-employment benefits, such as disability and unemployment benefits, and unemployment. However, Blöndahl and Scarpetta (1998) could not find any such relationship when comparing disability and unemployment benefits with unemployment in OECD countries, either in total or in elderly male unemployment.

The first two columns of Table 2 report generosity indicators of disability and unemployment schemes for older workers in the OECD countries. The third and the fourth column report total male unemployment and unemployment among older male workers. If there is a direct relationship between non-employment benefits and unemployment, countries with high generosity indicators should have higher older worker unemployment rates than countries with relatively less generous benefits, i.e., there should be a correlation between the two.

Table 2. Generosity indicators of non-employment benefits for older workers and male unemployment in Europe in 1995, ordered by elderly unemployment, percent

	Disability schemes	Unemployment schemes	Unemployment male total	Unemployment male 55-64
Luxembourg	0.53	0.78	0.02	–
Switzerland	0.43	0.11	0.04	0.02
Netherlands	0.70	0.53	0.06	0.03
Norway	0.57	0.17	0.05	0.04
Iceland	0.39	0.42	0.05	0.04
Austria	0.68	0.49	0.05	0.04
Italy	0.36	0.50	0.09	0.05
Portugal	0.72	0.62	0.07	0.05
Sweden	0.70	0.14	0.08	0.06
Denmark	0.39	0.72	0.06	0.07
Belgium	0.29	0.20	0.04	0.07
Ireland	0.32	0.24	0.12	0.08
France	0.25	0.23	0.10	0.08
United Kingdom	0.28	0.17	0.10	0.10
Germany	0.44	0.39	0.07	0.10
Spain	0.72	0.37	0.18	0.13
Finland	0.60	0.64	0.17	0.25

Source: Herberichson and Orszag (2000), Blöndal and Scarpetta (1998) and OECD (1997)

Table 3. Rank correlations between generosity of non-employment benefits and unemployment in the OECD, 1995

	Disability schemes	Unemployment schemes	Unemployment males total	Unemployment males 55–64
Disability schemes	1.00			
Unemployment schemes	0.29	1.00		
Unemployment total	0.01	-0.07	1.00	
Unemployment 55–64	-0.18	-0.09	0.77	1.00

Source: Blöndal and Scarpetta (1998), OECD (1997), and author's calculations

Table 3 reports the Spearman rank correlations between the variables in Table 2, confirming the findings of Blöndahl and Scarpetta: no significant correlation exists between their generosity index for disability or unemployment benefits and unemployment. However, a study from Canada arrived at a different conclusion. Campolieti (2001) estimated the effect of more generous disability pensions in Canada on labor force participation rates of 45–64 year-old males in a regression analysis. Under reasonable assumptions, Campolieti found that a 10 percent increase in disability benefits implies a 0.2–0.9 percentage point decline in the participation rates of older males.

Recessions. Economic downturns affect early retirement since the probability of becoming unemployed rises during recessions. Consequently, people near retirement age are more willing to leave the labor force and go into early retirement. Lower real wages dur-

ing recessions can also contribute to early retirement since the opportunity cost of retiring, measured in foregone wages, becomes lower. A fall in asset prices during recessions works in the opposite direction, as people might postpone their retirement when private wealth decreases.

DB vs. DC schemes. Workers in public defined-benefit plans may have an incentive to retire earlier than workers in defined contribution plans if the early retirement penalties are light, as they typically are. The exact effects depend on the type of salary scheme forming the basis for the contributions and on the age-earning profiles. It would be expected that in systems with high replacement ratios, workers would be tempted to retire early. However, as mentioned above, not all empirical studies have been successful in confirming this relationship. This can be explained in part by the fact that, in some countries, workers retiring early are penalized by actuarial adjustments. On the other hand, accrual rates at older ages seem to have a significant impact on the retirement decision.

Taxes. When the income-tax system is progressive, the difference between earned income and on income from pensions favors early retirement. Also, if taxes (including payroll taxes) on earned income are higher than taxes on pension benefits, an incentive for early retirement is created.

Increased recreation opportunities. It is well established that labor supply decisions depend on the preference for leisure, which usually becomes stronger with higher income and advanced age. Consequently, as private wealth increases, the preference for leisure becomes an important motivation for leaving the labor force. Not

only can a greater number of older workers afford to retire early, but it has also become more socially acceptable to do so. Costa (1998) reports that the expenditure elasticity for recreation has declined in the U.S. since the turn of the century, speculating that this decline was in part driven by an increased demand for leisure, fuelled by rising incomes and by the increase in the variety of low-cost, leisure-time activities.

Changing age structures. Because of the broad dissemination of medical knowledge and declining fertility, the population of industrialized countries is constantly growing older. Increased longevity contributes to a fall in the relative supply of healthy workers. As life expectancy increases, more disabled people will survive to advance age, and a larger fraction of the population will be disabled. For this reason inactivity will rise with changing age structures.

Transitional effects. In a society based on farming, no hand is idle. As people grow old, they simply contribute less work on the farm - the children take over. However, since the industrial revolution, agriculture has constantly become a smaller part of the economy, and “new” industries have operated in a different way. Therefore, an increased number of people went into retirement, as the extended family was dissolved and older farmers moved into towns to make room for their children. This contributed to early retirement, although the effect has probably been very small in recent decades.

Social effects. For centuries life was more or less based on providing for oneself and one’s family. During the last century, however, the state has played a larger role in supporting families that, for some reason, could not provide for themselves. After World War II

people also saw the maturing of the welfare state. Social contracts, such as pay-as-you-go systems, were made, and safety nets strengthened. During this transition period it may have become more socially acceptable to collect benefits and accept early retirement. Thus, the great fall in male participation rates observed in the '70s and '80s might simply constitute a tipping point in social values.⁵

2.4 Labor demand

We have now spelled out various explanations for early retirement that can be traced to the supply side of the labor market. Most of the explanations revolve around planned (voluntary) retirement decisions. However, early retirement can also be traced to the demand side of the market and to involuntary retirement. As can be seen from Table 4, over half of all inactive people retire involuntarily in the U.K., according to a recent survey. Furthermore, only about 12 percent of inactive people between the age of 50 and official retirement age have planned for their retirement (U.K. Cabinet Office, 2000).

A worker entering the labor market at a young age initially has a high probability of entering the unemployment pool, but the probability falls as the worker gets older, takes on family responsibilities, and loses parental support. This becomes more pronounced as the number of children increases and the income of the spouse decreases. However, with the passage of time, this is reversed as the children leave home and accumulated savings and pension rights create

⁵ See Gladwell (2000) for a discussion on tipping points.

Table 4. Labor force status of inactive people between age 50 and state pension age in the U.K.

	% of total
Voluntary inactive	0.32
Retired	0.18
Looking after family	0.14
Involuntary inactive	0.54
Long-term sick or disabled	0.44
Looking for work	0.10
Other reasons for inactiveness	0.15
Don't need job	0.05
Other	0.10

Source: U.K. Cabinet Office (2000)

a cushion in case of dismissal or voluntary quitting. This development eventually leads to retirement from the labor market. Thus a typical worker may begin and end his labor-market participation by depending on non-wage income in different forms.

Age-structure. Job security rises with increased tenure and hence, ceteris paribus, with age. Herbertsson, Phelps, and Zoega (2001) report that the unemployment rate of the young, 15–24 year-olds, was higher than that of the older generations in all of the OECD economies in 1998, except in Germany, where unemployment of the age group 55+ is higher than in the youngest age groups. As Lazear (1979) points out, if firms offer wages commensurate with seniority rather than marginal product, they should be more likely

to encourage older workers to retire early or even lay them off before younger workers. Since it is more difficult to dismiss an older than younger worker, the sensitivity of employment to shocks could be a decreasing function of the size of the older cohorts in an economy. The age structure and the institutional framework may interact in such way that the protection against dismissal increases with age. However, firms may opt for early retirement instead of dismissals. Thus corporate restructuring would show up in lower labor-force participation instead of unemployment. Furthermore, a transitory shock is more likely to lead to the dismissal of an older worker because of his shorter expected post-depression tenure. Thus, the level of labor hoarding may be smaller for older than for younger workers due to their shorter remaining work life. This would make the sensitivity to shocks greater.

Older workers may find it more difficult to find another job, as their remaining tenure is shorter. They may also be more resistant to real wage adjustments because their accumulated wealth reduces their dependence on employment. Thus, real-wage cuts may become less likely, as the proportion of older workers is higher and these workers therefore are more likely to become unemployed for the long term. As a result, the higher the proportion of older workers in the labor force, the more likely a transitory shock is to have a persistent effect on employment and push people into early retirement.

Transitional effects. Older workers who started their career in a growing industry might find themselves in a declining industry as they near the age of retirement. If older workers were laid off, they

would also find themselves competing with better-educated and younger workers for jobs in new and growing industries. As the average unemployment spell rises for all workers, this might encourage older workers to go into early retirement rather than continue their search for new jobs – the discouraged worker effect. Many countries have reacted to this problem by designing programs that transfer older workers from long-term unemployment into retirement.

A related issue, which arises in the context of private occupationally defined benefit schemes, is that older workers can be quite expensive in terms of their pension costs. Therefore, early retirements are a particularly effective manner of cutting business costs for firms. Firms do not bear the external costs to the public system of any extra benefit costs and lost tax revenue to the government associated with early retirement, thereby compounding the early retirement problem. As noted in Orszag and Snower (1999), because firms do not internalize the costs of forcing early retirement, more people retire early – leading to higher costs for the state – than if firms were forced to bear the cost burden themselves.

The next section discusses the Icelandic pension system in detail to identify any potential systemic incentive structures that may encourage early retirement.

THE ICELANDIC PENSION SYSTEM AT A GLANCE

3.1 Introduction

The pension system in Iceland is chiefly characterized by the operation of occupational pension funds. These funds became general in 1969 and mandatory a few years later. This resulted from general wage settlements after tri-party negotiations between labor unions, the federation of employers, and the state. Under the agreement, every wage earner working in the private sector is obliged to contribute 10 percent of his wages to an occupational fund of his choice, or as in most cases, a fund predetermined by his trade union. However, more than half of the burden is carried by the respective employer, who contributes a minimum of 6 percent of the total contribution. State employees have a similar, but more generous arrangement. Despite the prevalence of the occupational funds, two other pillars also support the pension system. These are a tax-financed, pay-as-you-go social security system and a voluntary savings scheme with tax incentives, solely operated within the private sector. The importance of the former is likely to diminish in the near future since the general public pensions are mainly aimed at the lowest income earners, and the mandatory nature of the occupational funds makes it unlikely that anyone will reach retirement age without owning a significant balance in private funds. On

the other hand, the appearance of the voluntary savings funds with tax incentives is relatively recent, since legislation granting this privilege only went into effect January 1, 1999. However, it is estimated that about a quarter of wage earners are already paying into such schemes.

The age distribution among the Icelandic population is relatively favorable, and the number of retirees compared with the working age population is currently low and is estimated to remain so for the next few decades. The asset-building nature of the current pension system therefore makes it unlikely that a higher dependency ratio will result in a fund shortage or higher taxes needed to finance retirement schemes in the future. The public pension system still pays a higher total in pensions than the occupational pension funds. In 1999 its annual payments totaled 3.3 percent of Iceland's GDP compared with 2.7 percent from the funds. However, the outlays of the occupational pension funds will soon outpace that of the public system. It has been estimated that total pension payments in 2030 will amount to approximately 15 percent of GDP, with 10.5 percent coming from the funds and the remainder from the public system.

3.2 Social Security

3.2.1 Basic pension

The Icelandic social security system was founded in 1936 with the main goal of ensuring the livelihood of those unable to work because of old age or disability. In order to enjoy full benefits, individuals must have lived in the country for at least 40 years. The sys-

tem provides basic old-age pension benefits, supplementary means-tested pensions, as well as disability, sickness, maternity, and survivor benefits. Furthermore, there is a special system for unemployment benefits, and the municipalities provide housing benefits and poverty assistance.

The pension payments consist of basic flat rate payments and supplementary additions to single or low-income people. The basic pension is relatively low or roughly 13 percent of the average earnings of unskilled workers and the main transfers are through the supplementary payment that are means-tested with a reduction rate of 45 percent after a certain income threshold. Married persons receive 90 percent of what single individuals receive. The supplementary payments are also means-tested. If the only income that a single person receives is from the social security system, there is a special household allowance for single persons, which is reduced if the individual has other income.

It should be noted that income received before retirement does not affect the public pension in any way, and there is thus considerable redistribution built into the system. However, the maximum total payment a retiree can receive through the public system is roughly equal to the minimum wage, which amounts to about 52 percent of the average earnings of unskilled workers. Benefits are indexed to the wages of government employees.

3.2.2 Disability and early retirement

Pensions are payable from the age of 67, and the system therefore does not allow for the possibility of early retirement, with the

Table 5. Social security expenditure by benefit category 1995–1999

	1995	1996	1997	1998	1999
Total expenditure:	28,540	29,876	30,166	33,021	36,163
As a fraction of GDP (%)	6.3	6.2	5.7	5.7	5.8
Pensions, total:	13,233	13,881	14,786	16,063	17,534
Basic retirement pension	3,349	3,515	3,824	4,193	4,639
Basic disability pension	1,124	1,226	1,347	1,475	1,694
Income supplement of retirement pensioners	5,094	5,270	5,469	5,846	6,218
Income supplement of disability pensioners	1,637	1,746	1,860	2,008	2,311
Disability allowance	207	189	196	227	216
Child pension	636	690	774	843	920
Maternity benefits	1,172	1,224	1,285	1,434	1,478
Other	14	20	31	37	58
Social assistance benefits and allowances:	3,859	3,703	4,019	4,551	4,910
Single parent allowance	284	153	168	193	204
Benefits and allowance for carers of sick and disabled children	342	375	400	541	612
Spouse's benefits	29	30	29	28	30
Window's/widower's benefits	81	72	71	70	63
Rehabilitation pension	70	103	134	145	179
Child pension/education	54	43	46	54	57
Household supplement	886	922	1,194	1,448	1,556
Additional household supplement	159	146	135	139	139
Additional pension supplement	1,830	1,786	1,751	1,832	1,958
Car purchasing grants	125	74	91	100	112
Occupation injury insurance:	512	464	445	480	468
Health insurance	10,935	11,828	10,917	11,926	13,251

Note: Administration costs, contribution to reserve fund, etc. not included. Million ISK
Source: Statistics Iceland and State Social Security Institute

exception of seamen who have the option of claiming payments from the age of 60. Fishermen in Iceland thus enjoy privileges similar to those of military personnel in other countries, since their work is considered both hazardous and physically exhausting. On the other hand, no incentive is given for retirement postponed after the age of 67 since the payments are not affected by a longer working life.

Individuals that are at least 75 percent disabled are eligible for disability benefits. The system of disability payments operates in a very similar manner to that of the pensions system, i.e. with a minimum flat rate payment accompanied by means-tested supplementary allowances. The main difference is that since January 2001 the income received by a spouse is not income-tested.

Table 5 presents all social security expenditures in Iceland in 1995–99 by type of benefits.

3.3 Occupational funds

3.3.1 Foundation and scope

Although pension schemes first became widespread in the early 1970s, various pension schemes existed before that. The VR fund, currently the biggest fund, was formed in 1956, and various schemes for craftsmen were set up in the early '60s. As of now, there are 33 occupational pension funds that are open and operated without an employer guarantee. Their size differs greatly. A few large funds own the lion's share of the assets, the two biggest ones together over a quarter of total assets. The funds are managed jointly by the labor union involved and the federation of employers, and their number has decreased through mergers in the last two decades. This is partly

because of conglomeration, while considerations of savings in operational costs and risk diversification have also played a role. The funds are highly regulated by the government, which specifies the members' pension rights. According to law, all wage earners and self-employed persons are obliged to belong to a pension fund, which operates either according to law or special approval by the Ministry of Finance.

3.3.2 Benefits

The funds differ in how much they will adjust contributions in response to differences in investment returns, mortality, and expenses. Contributions and accumulations are tax exempt, while benefits are subject to taxation in the same way as earned income. Benefits accrue according to a point system, whereby the number of points earned is the annual wage relative to a reference wage. Under new legislation, ratified in 1998, funds must have index-linked benefits, paying at least 56 percent of average earnings for those working and contributing for at least 40 years.⁶ This corresponds to an accrual in terms of points of 1.1 when retiring at the age of 67 (and 1.4 when retiring at the age of 70). Valuations are assessed at 3.5 percent real discount rates, while actual returns tend to exceed this level.⁷ The

⁶ When the minimum funding requirements are met, the pension fund either increases the replacement ratio or allows its members to put the excess contribution into an individual account. All the occupational pension funds have opted for the former. The biggest fund has, for example, raised the replacement ratio to approximately 66 percent. On the other hand, approximately 4–5 percent of the total assets of pension funds have been placed into individual accounts by members of non-occupational funds, i.e., funds designed for the self-employed, etc.

⁷ In the period 1991–1994, the average net real return on the total assets of the occupational pension funds in Iceland was 6.65 percent and 7.4 percent in the period 1995–1998, Gudmundsson (2001).

resulting surpluses of many of the funds may mean that benefits will be adjusted in the future. On the other hand, even the largest fund is working on the basis of a benefit level 15 percent over the minimum, so there is a considerable solvency margin even with 3.5 percent valuations.

The pensions are paid as a lifetime annuity by the pension funds. The definition of the reference wage is important for determining the actual replacement ratio. For example, if the reference wage is indexed to the consumer price index, and there is real wage growth, the replacement rate relative to final salary is considerably lower than that relative to revalued earnings. For example, a 2 percent real wage growth reduces the replacement rate of a 40-year pension with an accrual of 1.4 from 56 percent to 39 percent, and a 3 percent real wage growth reduces it to 33 percent. Use of a reference wage indexed to the consumer price index also has important distributional and incentive implications; later years effectively earn more rapid accruals, improving incentives for workers to keep working, but also meaning that the contributions of younger workers are, to some extent, subsidizing those of older workers. However, it should be emphasized that there is a direct relation between future returns on the funds and future benefits, with 56 percent replacement as the minimum replacement ratio. The contribution received by the fund can be split into two parts. One part goes to generating pension rights. The second part can go to generating additional pension rights, e.g., through individual accounts, or other defined contribution schemes, although the current practice is to adjust the benefits upwards.

3.3.3 Disability

As of July 1, 1999, all occupational funds must satisfy a number of benefit conditions by law, including payment of a disability pension, and pension payments to surviving spouses and children. Individuals receive benefits in accordance with their degree of disability and the amount of pension they would have received at normal retirement, using the last three years as a base reference. Pension funds with fewer than 800 contributing members must insure themselves against claims of disability benefits. The costs of this have been a factor in the recent consolidation among pension funds, with only limited use of insurance by smaller funds.

The general rule in Iceland is that pension rights accrue linearly. However, in four pension schemes, accrual is non-linear, such that young contributors earn more rights than old ones. One of the funds offers only non-linear accrual, but the others offer both linear and non-linear accrual. Actuarial reductions apply for early retirement. A typical scheme would reduce benefits by 0.6 percent per month for early retirement after age 65 but before the normal age of 67. Benefits would increase by the same rate for late retirement up to the age of 70.

3.4 Public sector pensions

The public sector workers' occupational scheme was historically only partially funded and based on final salary. That scheme is now closed to new members, and a new career-revalued scheme has been started for new entrants to the public sector.⁸ These two different plans are usually referred to as Department A, which signifies the new scheme, and Department B, which signifies the old scheme.

Department A is a contributory fund, under which the employee pays a premium of 4 percent of total salary (i.e., fixed salary and overtime pay), and the government contributes 11.5 percent. The department is fully funded, and the government's share is adjusted annually, based on actuarial estimates. While employed by the government, the employee is required to pay the contribution until the age of retirement.

Department B is a contributory fund to which the employee pays a premium of 4 percent of fixed salary (excluding overtime pay), and the government's initial contribution is 6 percent, for a total of 10 percent. Retirement payments are based on the nominal pay level at the time of retirement. Because of severe inflation in previous decades the pension assets were in 1998 only sufficient to pay an estimated 19 percent of the total present value of future retirement and other benefits. The remaining 81 percent will be financed by the government and other contributing agencies. Since 1998, the state budget in Iceland is presented on an accrual basis. For increased fiscal transparency, the state budget shows all pension liabilities of the government sector.

3.4.1 Benefits

Employees belonging to Department A have the right to receive retirement payments between the ages of 65 and 70. If an employee

⁸ When the new scheme for the public sector was set up, individuals were given the option of switching into the career-revalued scheme, and many younger workers did so. Herbertsson, Orszag, and Svavarsson (2000) give a detailed analysis of the switching behavior and other aspects of the Icelandic public sector pension reforms.

retires before 67, the retirement pay is adjusted downwards by 0.5 percent for each month. Conversely, if an employee postpones retirement, the retirement pay is adjusted upwards by 0.5 percent for each month until the age of 70. The retirement payments to members in Department B are based on the final pay for each member, regardless of the amounts contributed to the fund for the respective employee. For each year of employment, an employee accrues a right to pension payments, which are equal to 2 percent of final pay. The employee contributes a premium to the fund for a maximum period of 32 years, but the government pays the total premium of 10 percent until the employee retires. Additionally, the employee accrues a 1 percent pension right for each year until the age of 65, after completing the premium payments for 32 years, and also accrues an additional 2 percent pension right for each year between the ages of 65 and 70.

The retirement pension payments are adjusted for price changes and can be linked either to average pay increases for government employees or subsequent changes in salaries for the position held by the respective employee. Members of Department B have the option to retire when the sum of their age and years of service equals 95 years.

3.4.2 Disability and other payments

If a member suffers a 40 percent disability or more, he or she is entitled to disability payments. In order to receive disability payments, a member must have been employed by the government for a certain period of time, and the payments are based on the accrued

pension rights in addition to rights that would have accrued to the member had he/she not suffered the disability. The right to receive disability payments is also dependent on a cut in income. The surviving spouse of a member of Department A receives a survivor payment. Additionally, the surviving spouse receives child support payments for each child until they are 22 years of age.

Members of Department B have a right to disability payments, which are a function of accrued pension rights. If a member's disability is 10 percent or more, he/she has a right to disability payments, and the amount paid is dependent on accrued pension rights, unless the disability was incurred in the government's employ, in which case the disability payments are also a function of the period the member would have worked for the government, assuming no disability. The surviving spouse of a member of Department B receives a survivor payment. Additionally, the surviving spouse receives child support payments for each child until they are 18 years of age.

3.5 Voluntary private pensions

Since January 1, 1999, all employed persons in Iceland, aged 16 to 70, have been accorded the right to establish individual retirement accounts, either with the pension fund to which they pay their compulsory minimum premium or with any other qualified financial institution.⁹ Initially an individual could save 2 percent of his before-

⁹ A number of pension funds were allowed to receive payments into individual retirement accounts before January 1, 1999, but there were no tax benefits from doing so until after January 1, 1999.

tax income in an account, matched by a 0.2 percent contribution from his employer. The results of wage settlements in January 2000 between the Confederation of Icelandic Employers and the largest labor unions in Iceland (VR) resulted in increased contributions from employers to individual accounts. The contributions will increase gradually according to the settlement, from 0.2 percent in 1999 to 0.5 percent in 2001, 1.5 percent in 2002, and finally to 2 percent in 2003. This feature was subsequently included in a number of wage settlement contracts signed in 2000. This will give a gross contribution rate of 4 percent of the payroll to the individual account, and under reasonable assumptions, this might increase the replacement ratio to as much as 12 percent of final salary.

Once the individual has reached 60 years of age, payment of his savings and interest may commence in the form of equal installments over a period of not less than seven years, or the length of time remaining until he reaches the age of 67 years. Should the individual die before the deposit is fully paid out, it will become the property of his estate. Hence, an individual retiring after the age of 67 receives a lump sum and an individual retiring before then receives a level temporary annuity, which is guaranteed until age 67. As of April 1999, 33 financial providers were licensed to offer individual account schemes in Iceland. Of these providers, two are insurance companies, 21 are occupational pension funds, and 10 are traditional financial institutions.¹⁰ The take-up of individual accounts was relatively slow in the initial stages, but a recent survey indicates that the coverage is 22.7 percent.¹¹ When the system has fully matured, it might promote early retirement in Iceland.

The next section attempts to explain why formal early retirement programs do not exist in Iceland, and why Icelanders do not use informal vehicles, such as disability programs, to retire early.

¹⁰ There are, however, a number of providers, especially in the financial sector, running different fund schemes, therefore having permission for each and every one of those schemes (within each scheme, there can be different investment strategies)—e.g., Kaupthing is running two schemes and is therefore counted twice. Kaupthing also oversees an occupational pension fund (Lífeyrissjóður íslenskra stjórnunarstarfsmanna at the Keflavik Airfield), but this is considered an occupational pension fund.

¹¹ This is based on a telephone survey of the Social Science Institute at the University of Iceland in April 2000. The survey covered individuals aged 18–75.

RETIREMENT IN ICELAND

4.1 Introduction

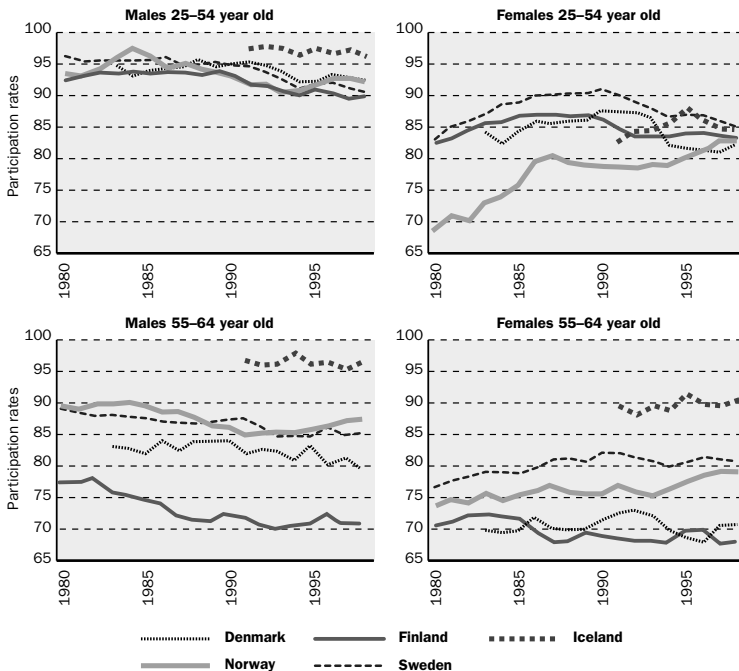
The motivation for this report is the very high labor force participation of older workers in Iceland, compared with other industrialized countries, and hence the low rates of inactivity and early retirement observed. This section utilizes the theories from Section 2 to substantiate an explanation for the low early retirement rates observed in Iceland. Figure 3 depicts the participation rates for males and females in their prime years and at older ages in the five Nordic countries in the '80s and '90s.

It can be seen from the figure that not only are participation rates high for older males and females in Iceland, but the rates are also considerably higher for Icelandic males in their prime than in the other Nordic countries (the rates are almost 5 percentage points higher in Iceland than the average rate for the other four countries). This report, however, does not try to shed light on these differences. Instead it focuses on the older cohorts.

4.2 Demographics

The age structure of a country can affect early retirement, through both the supply and demand side of the labor market, as illustrated in Section 2. Figure 4 shows the development of the old-age dependency ratio in the Nordic countries from 1950 to 1995 and projections to 2050 made by the UN Population Department.

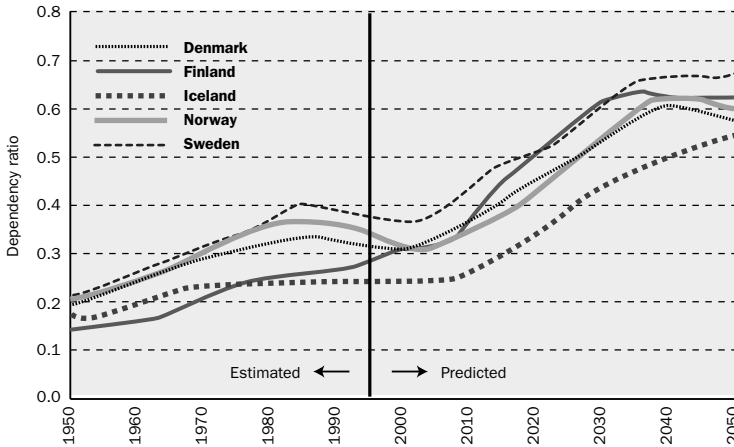
Figure 3. Labor force participation of males and females in the Nordic Countries 1980–1998



Source: OECD

The figure shows that the old-age dependency profile was relatively flat in Iceland from the '60s to the '80s, while in the other Nordic countries the ratio rose rapidly. The increase was more than 13 percentage points in Sweden, where the increase was greatest, compared with approximately 4 percentage points in Iceland, which had the lowest increase. Projections show that in upcoming years, the number of retired people compared with the workforce

Figure 4. Old-age dependency ratio (65+ /25–64) in the Nordic countries 1950–2050



Source: United Nations

(the dependency ratio) is going to rise rapidly until around the year 2040. This development, which is taking place in most developed countries, has motivated pension reforms, as traditional pay-as-you-go schemes are usually not sustainable under this kind of demographic development.

Early retirement is closely connected to the age distribution. As more people reach the age of early retirement, defined here as the ages between 55 and 64, a greater proportion are willing to retire early. This is not only because of higher rates of disability, wealth effects, and unemployment, but also because in most leisure activities, one needs a companion. The greater the pool of potential

Table 6. Proportion of population at early retirement age, percent

	Denmark	Finland	Iceland	Norway	Sweden
1950	9.27	7.61	6.99	9.31	10.08
1960	10.52	8.87	7.95	10.72	11.46
1970	11.18	10.44	7.57	11.21	12.25
1980	10.65	9.78	7.95	11.42	11.78
1990	9.73	10.18	8.15	9.04	9.87
2000	11.60	10.74	7.86	9.70	11.66

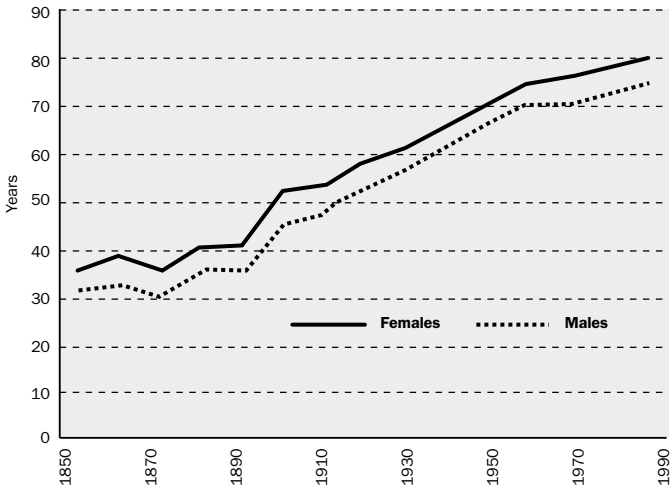
Source: UN and author's calculation

companions, the higher the probability of early retirement – you do not want to be the only one retiring early.¹² Furthermore, the larger the fraction of people at an early retirement age relative to the total population, the greater the political pressure on implementation of early retirement schemes paid for by the public – as the potential early retirees become a stronger force in the political process. Table 6 shows the fraction of people of early retirement ages in the Nordic countries over the last fifty years.

The table shows that the early-retirement cohort increased by 2–3 percentage points in the '50s and the '60s in all Nordic countries, except Iceland, where the increase was only about 0.5 percentage points. The increased number of older workers might well have contributed to the development of more generous early retirement

¹² See Hurd (1988) and Johnson and Favreault (2001) for a discussion of the joint retirement decisions of husbands and wives.

Figure 5. Life expectancy at birth in Iceland, 1850–1990



Source: Statistics Iceland

schemes in the '70s and the '80s in Scandinavia, as well as to the rise in long-term unemployment, while the increase was not large enough in Iceland to put political pressure on developing such schemes. However, as can be seen from Figure 4, the demographic structure of the Icelandic population will converge with that of the other Nordic countries in the upcoming decades. It is interesting in this respect to examine the development of the determinants of the age structure in Iceland – mortality, fertility, and external migration.

4.2.1 Mortality

Mortality rates have been falling constantly in Iceland since the last part of the 18th century and life expectancy ranks by now among

the highest in the world. Figure 5 shows life expectancy at birth for both sexes in the last 150 years.

Life expectancy at birth in Iceland has been improving at a fairly constant rate in the last century. This development was driven early on by decreasing child mortality, while advances in geriatrics have been the most important factor in recent years. However, it is not likely that the latter can advance much farther for biological reasons and the pace of improvement seems to have been slowing down during the last few decades.

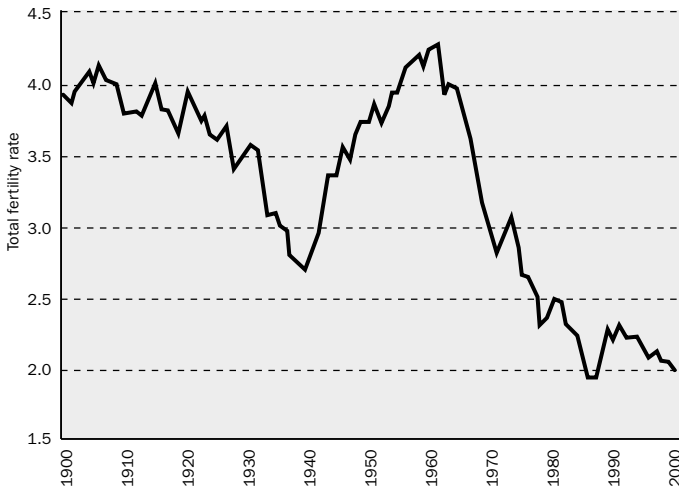
4.2.2 Fertility

The secular decline in fertility rates in industrialized countries has been traced to factors such as increased longevity, lower rates of child mortality and better education, as well as to various economic factors.¹³

Figure 6 depicts the development of the total fertility rate (number of births per woman) in Iceland over the last century, which has been falling in Iceland since the baby-boom decades, as in other developed countries. Today the fertility rate is close to the population's rate of reproduction, and population growth is therefore likely to halt in the near future, assuming slow improvements in mortality rates and a low level of external migration. However, declining fertility rates may simply be a result of a transition in fertility – women beginning to have children at an older age than before.

¹³ For a summary of the literature on the secular decline in fertility rates, see Easterlin (1989) and references therein.

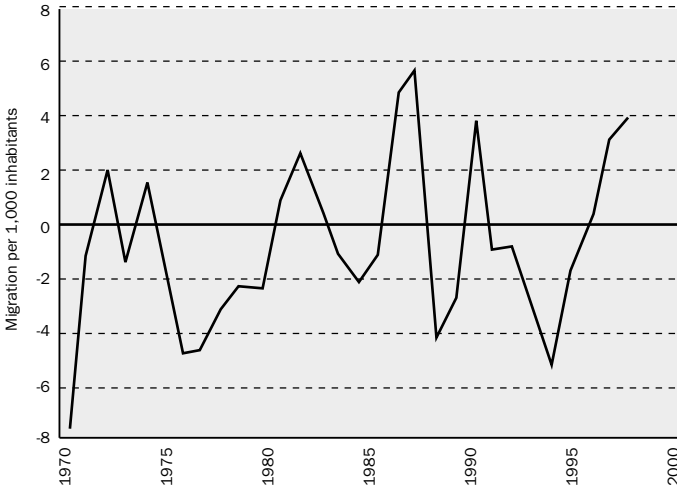
Figure 6. Total fertility rate in Iceland, 1900–1999



Source: Statistics Iceland

Herbertsson, Orszag, and Orszag (1999) outline a model to show that transitional fertility rates can dip below their steady state values as women delay childbearing due, for example, to higher education or heavier work commitments. The dynamics are complicated because even in a new steady state – which may never be obtained – the fertility rate could be lower than in the previous steady state. The intuition for this effect is that the population at the new, older, childbearing age is smaller than at the younger age at which women traditionally had babies (because of an increasing probability of death as age increases). The same rate of birth (that is, living women have the same number of children as they did at younger ages) from this new lower population will therefore result in a smaller number of newborn babies.

Figure 7. Net external migration in Iceland, 1970–1999



Source: Statistics Iceland

4.2.3 Migration

The third major factor in determining the number of inhabitants and age structure of a country is external migration. The settlement of Iceland was the result of massive migration from Norway and the British Isles in the period 874–930. Since then, external migration has been small in Iceland, although this could easily change in the future.

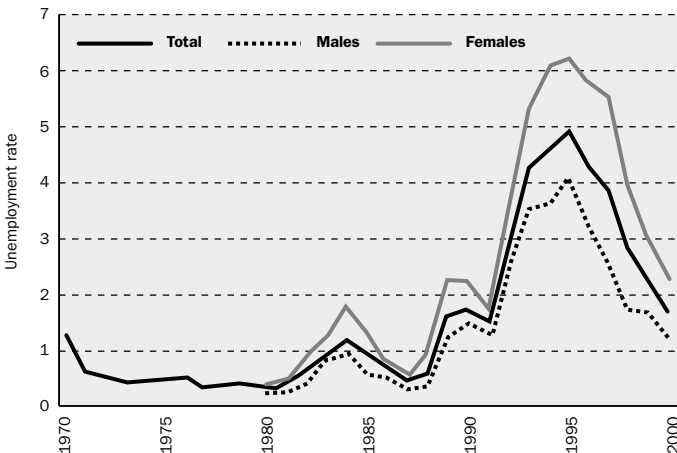
Figure 7 shows that external migration in Iceland 1970–2000 has not been a major factor in determining the population of the country. However, more people have been moving away from Iceland than entered during this period. In the period 1970–1999, approximately 4,500 more people moved out of the country than entered.

4.3 Unemployment

Long-term unemployment, as experienced on the European continent, has not been a problem in Iceland since the 1930s. Although demand shocks in the labor market have been common, labor shortages have been the norm, resulting in overheating of the economy and inflation.

The Icelandic economy went through radical changes in the '90s, partly as a result of economy-wide liberalization and partly because of economic stagnation from the late '80s until the middle of the '90s. During the early '90s unemployment rates began to rise, and at the end of the recession in 1995 unemployment figures were at an unusually high level, 5 percent, which has since decreased (cf. Figure 8).

Figure 8. Unemployment in Iceland 1970–2000

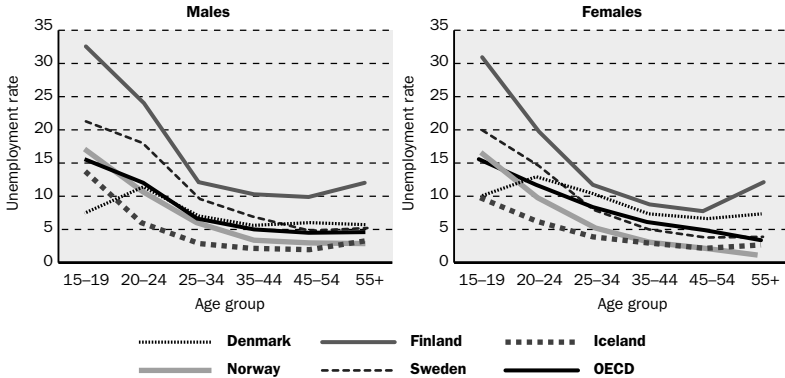


Source: National Economic Institute

Due to relatively low unemployment, the lump-of-labor hypothesis – that led to the development of many of the early retirement schemes in Europe, and consequently a decrease in the labor force participation of older workers – has never been an issue in Iceland. However, in late 1999 Parliament passed a resolution whereby the government is urged to appoint a committee to examine ways to introduce and enhance flexible retirement. The main motivation behind the resolution was the discontent over involuntary retirement of public sector workers who enjoyed good health and a desire to continue to work beyond the current age limit of 70. As the committee set off union representatives emphasized the need for early retirement, and requested that the focus of the committee should thus be on exploring ways to make such changes economically viable for their members by way of increasing pensions. Only time will show what direction the committee's work will take, and, in particular whether the first proposal for an early retirement scheme for Iceland is in the making.

Figure 9 shows the average cohort unemployment in the Nordic countries and the OECD in the 1990s. As can be seen from the figure, the shape of the unemployment profiles is similar in all the countries except Finland. As the workers enter the labor force at young ages, there is a higher probability of being unemployed than at older ages. It is a well-known fact that job security follows tenure and hence age. Since it is more difficult to dismiss older workers, the sensitivity of employment to shocks could be a decreasing function of the size of older cohorts. The age structure and the institutional framework may interact in such a way that employment-pro-

Figure 9. Average cohort unemployment in the Nordic countries and the OECD, 1990–1998



Source: OECD

tection legislation may be more effective as the average age of workers increases. However, as can be seen from the figure, the probability of being unemployed is higher in the oldest cohort in Finland than in some of the younger cohorts. If one keeps in mind that unemployment in Finland was high in the 1990s, and early retirement was common, this is understandable. Unemployment benefits for older workers were used as a youth-unemployment reduction mechanism.

To further investigate the effects of unemployment and age structure on the labor force participation of workers at early retirement ages, panel regressions were conducted, using available data from all OECD countries. Table 7 shows the results.

Table 7. Labor force participation and unemployment

	Dependent variable: participation rate, males 55–64				
	(1)	(2)	(3)	(4)	(5)
Unemployment, males 16–24	-0.30 (6.37)	-	-	-	-
Unemployment, males 55–64	-	-0.51 (5.65)	-	-	-
Total male unemployment	-	-	-0.60 (6.56)	-	-0.55 (5.98)
Dependency ratio 65+/25–64	-	-	-	-0.71 (4.13)	-0.58 (3.54)
R ²	0.93	0.92	0.92	0.92	0.92

Note: Unbalanced panel of OECD countries, 1979–1998. Estimation method fixed effects.

The first regression tests the “early-retirement as a youth-unemployment reduction mechanism” hypothesis, the second and the third the “discouraged worker effect” hypothesis, the fourth the “older worker as a pressure group” hypothesis, and the fifth a mixture of the latter two.

It is apparent from the table that there is a strong relationship between youth unemployment and the labor force participation of older workers. The negative sign in the first regression indicates that as more young males are unemployed more older workers leave

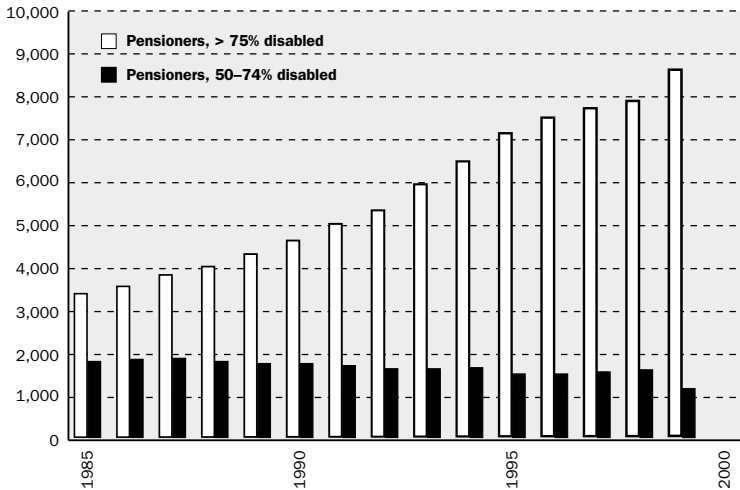
the labor force. According to our point estimate, a 5 percentage point rise in youth unemployment would reduce the labor force participation of older workers by 1.5 percentage points. Similarly, the discouraged worker effect seems to be strong. Regressions (2) and (3) indicate that a 5 percentage point increase in elderly unemployment results in a 2.5 percentage point reduction in the participation rate, *ceteris paribus*, and a 3 percentage point reduction when total unemployment is used as a regressor. Regression (4) supports the hypothesis that older workers organize when there are relatively many of them. A rise in the dependency ratio of 5 percentage points, which would of course take many years, would, according to our point estimate, reduce the participation rate by 3.5 percentage points.

Although the relationship between the labor force participation of older workers and unemployment is strong, unemployment has hardly been a problem in Iceland. As a consequence, less focus has been put on developing early retirement programs in Iceland than on the continent, and, accordingly, incentives for leaving the labor force due to the design of the retirement system are almost non-existent.

4.4 Disability

Disability benefits create disincentives to work and, as a result, misuse is common, especially for low-income workers who often use disability programs as a vehicle for early retirement. Disability programs have also been used as a substitute for early retirement pensions and as a youth-unemployment reduction mechanism, as dis-

**Figure 10. Number of disability pensioners in Iceland
1985–1999**

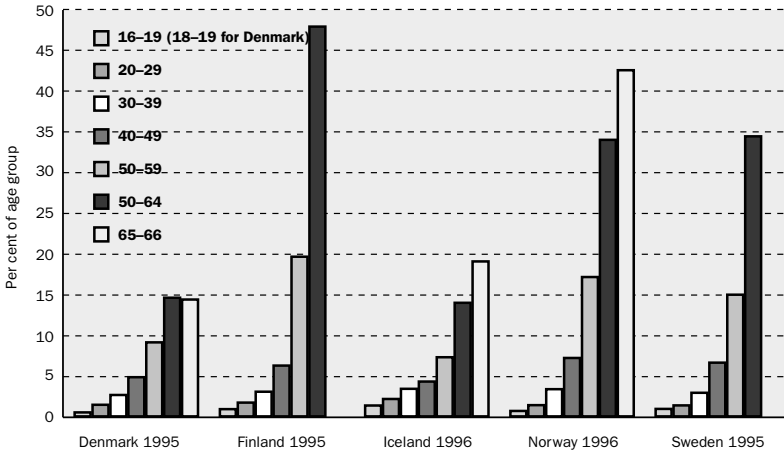


Source: Social Insurance Institute

cussed in Section 2. This, however, does not apply to Iceland, as unemployment has not been an issue. Figure 10 shows the number of disability pensioners 1985–1999.

The figure shows that the number of disability pensioners has almost tripled in the last fifteen years, indicating that disability pensions might be used for early retirement. However, when the figures are normalized by population levels, one finds that the number of pensioners receiving full pensions has risen from 1.4 percent of the total population to about 3 percent. Part of the increase can be explained by a change in the regulations for regis-

Figure 11. Percent of age group with more than 75 percent disability pension in the Nordic countries



Source: Thorlacius *et al.* (1998)

tration of disability pensioners – a greater part of disabled people enjoy full benefits today than in the ‘80s (88 percent in 1999, compared with 65 percent in 1985). The remainder of the increase can probably be explained by changing demographic structures, as older populations have a higher ratio of disabled people. Figure 11 shows the rate of disability incidents by cohorts in the Nordic countries.

It is apparent from the figure that disability incidence rises with age. The figure also depicts a huge difference in disability incidence between the Nordic countries. The difference between the countries is only moderate in the age group of 16-49, but after that, the

differences become striking. For example, 3.5 times more people are disabled in Finland than in Iceland in the age group 60–64 and 2.5 times more in Sweden. It is hard to believe that the differences in disability are real since the population in the Nordic countries is relatively homogeneous, life expectancies are not that different, and economic conditions, aside from unemployment, similar. It seems that the hypothesis that people retire early through disability schemes applies very well to Finland, Norway, and Sweden but less so to Denmark and Iceland. This can most likely be explained by the relatively generous disability benefits in Finland, Norway, and Sweden as compared with the two other Nordic countries (see Table 2 of Section 2).

4.5 Wealth

At the turn of the last century, Iceland was one of the poorest countries in Europe. The economy was based on agriculture and fishing, and the capital stock was very small compared with other industrialized countries. Output per capita was only half of the Western European average (see Table 8). The average Icelander lived on a subsistence level and worked as long as health permitted. The extended family provided for the old during retirement in most cases, although official old-age poverty assistance was available. However, this all changed during World War II.

The occupation of Iceland during the war, first by Britain and then by the U.S., and increased fishing practically flooded the country with money. Infrastructure was put in place, and people flocked to the capital to work in relatively high-paying jobs for the

Table 8. GDP per capita, 1990 Geary-Khamis dollars

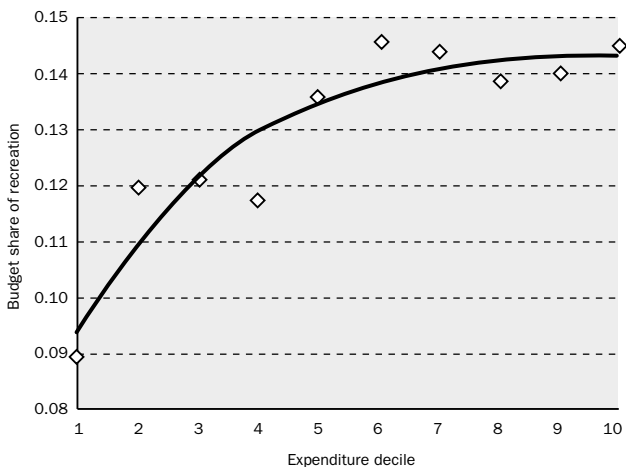
	Denmark	Finland	Iceland	Norway	Sweden	W-Europe
1870	1,927	1,107	1,000	1,303	1,664	2,012
1913	3,764	2,050	2,054	2,275	3,096	3,506
1929	4,883	2,639	2,507	3,158	3,869	4,388
1938	5,544	3,486	2,868	3,945	4,725	4,716
1945	4,874	3,350	5,298	3,665	5,568	4,062
1950	6,683	4,131	5,434	4,969	6,738	5,483

Source: Maddison (1995) Table D-1a and Jónsson (1999) p. 176.

occupying forces. The average Icelander started to accumulate wealth, first housing, but later financial wealth, such as stocks and bonds.

Although poverty assistance and later social security benefits have been available for Icelanders at the official retirement age, the social security wealth has been too small to create incentives for early retirement. Furthermore, as pension schemes in the private sector only became common in the early '70s, the first workers with full pension benefits will become pensioners in about 2010 (retired public sector workers have, however, enjoyed full benefits for a number of years). As the pension system is relatively recent, pension wealth has not motivated people to leave the labor force. This, however, might change in the near future when the pension system matures.

Figure 12. Budget share of recreation and expenditure deciles calculated from the Icelandic 1995 household survey (using a polynomial of order 4)



Source: Statistics Iceland

Although the average Icelander could have retired early in the past, he would have practically had to live on a subsistence level. However, wishing to retire, one would have to have something to look forward to, such as recreation, and recreational goods require income, either from pensions or wealth.

The relation between income/expenditures and budget share are given by Engel curves. Figure 12 shows Engel curves for total expenditure deciles and the budget share of recreation in the Icelandic consumer survey in 1995.

The figure depicts the relationship between consumption expen-

ditures and recreation. It is apparent that households with low expenditures (income) spend less on recreation than households with high expenditures (income). The figure reflects the simple fact that recreational pursuits require money. Since non-employment income for early retirees has been low in Iceland, both due to the absence of early retirement programs and low household wealth, few have left the labor force. Finally, until recent years recreational opportunities for older people have been scarce in Iceland.

4.6 Labor market for older workers

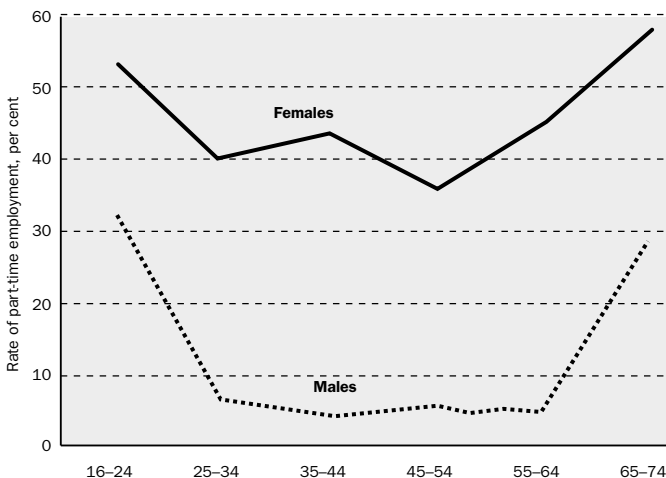
There is substantial evidence in OECD countries that workers move into bridge jobs and self-employment before entering retirement, with many decisions driven by health considerations.¹⁴ Part-time employment generally implies flexibility. But one of the costs associated with part-time work in many OECD countries is that individuals need to switch jobs frequently, and these frequent shifts often involve lower average wages¹⁵ and some older workers may have difficulties adjusting to these frequent changes, reducing their ability to work part-time (cf OECD, 1995).

No formal rules exist on the Icelandic labor market that make it possible for workers to take on less strenuous or part-time jobs as they get older. Few firms have formal arrangements and it is entirely up to the employer and the employee to make such arrange-

¹⁴ See Bazzoli (1985) and Anderson and Burkhauser (1985).

¹⁵ Evidence from Canada is to be found in Ross and Shillington (1991), U.S. evidence in Gustman and Steinmeir (1985), Quinn, Burkhauser, and Myers (1990), Ruhm (1990), and Shapiro and Sandell (1987).

Figure 13. Rate of part-time employment by age groups, 2000



ments. Possibly as a consequence, part-time work prior to the official retirement age is not more common among older male workers than among younger male workers (see Figure 13). This is in contrast with female workers who seem to move more often into part-time employment after the age of 55. It has been suggested by the largest union that male workers worked full time until they had accrued maximum possible pension rights, i.e., to the age of 70, and then moved to part-time jobs.

According to current labor contracts in Iceland employers can make workers redundant at the age of 70. Until the age of 53 workers can be made redundant at 3 months' notice, at the age of 54 the

Table 9. Proportion of workers who are self-employed in 1989/1990

	Males 60-64	Males all ages	Females 60-64	Females all ages
Belgium	50.8	19.2	40.3	10.8
France	46.1	17.0	30.5	7.2
Germany	29.4	11.3	16.0	5.4
Iceland*	30.5	25.0	12.0	11.2
Italy	51.9	28.3	35.6	16.5
Norway	18.6	12.6	4.3	4.8
Portugal	51.6	25.7	60.8	25.9
UK	39.1	17.8	9.7	7.4
Average:	39.8	19.6	26.2	11.2

* 1991.

Source: OECD (1995), pp. 34 – 35 and Statistics Iceland.

notice is 4 months, 5 months at the age of 60, and finally 6 months at the age of 63.

Self-employment is also important for the elderly. Older workers are more likely than others to be self-employed (see Table 9).¹⁶

As can be seen from the table, older workers seem to move into self-employment as the retirement age approaches. However, there is a difference between the two Nordic countries reported in the table and the other countries. Self-employment among older workers is only slightly higher than for the population as a whole, indicating that it is not as common for the Norwegian and the

¹⁶ See Casey and Laczko (1991).

Icelandic populations to enter bridge jobs at older ages, using self-employment as do other Europeans.

The conclusion is that Icelandic males do not generally move into part-time work or self-employment as they get closer to the official retirement age. On the other hand, part-time work among Icelandic females seems to be more common after the age of 55.

CONCLUSIONS

The withdrawal of older workers from the labor force creates a variety of economic challenges, including an increase in unused idle production capacity. Costs due to early retirement measured in terms of foregone output averaged 6.3 percent of potential gross domestic product in the OECD in 1998. The costs, which vary greatly from country to country, are highest in Hungary (15.9 percent of potential output) and lowest in Iceland (0.5 percent). Sweden has costs amounting to 4.8 percent of potential GDP. These differences send an important message to policy makers to the extent that their causes are rooted in economic policy and structure rather than in cultural and environmental factors. Section 2 attempts to summarize and discuss alternative theories as to why people retire early, in order to understand the roots of this behavior better.

Section 3 discusses the Icelandic pension system in detail to identify any potential systemic incentive structures that may encourage early retirement. The Icelandic pension system consists of three pillars: basic benefits and an income-tested supplement provided by pay-as-you-go financing, a fully funded compulsory occupational pensions system, and voluntary individual accounts with tax advantages. The official retirement age is 67 years although public sector employees can retire at the age of 65, albeit with reduced benefits. If

Benefit rules in the Icelandic pension system

	Occupational funds	Public sector A	Public sector B
Retirement age	67	65	65
Accrual of benefits p.a.	1,4–1,8% of total wages	1,9% of total wages	2% of fixed salaries (for 32 years), 1 % to 65 and 2% 65
Indexation	CPI	CPI	Government wages
Early/late retirement adjustments	±7,2–9,6% p.a.	±6% p.a.	NA

Source: Gudmundsson (2001)

an employee retires before 67, the retirement benefits are adjusted downwards by 0.5 percent for each month, (see Table below). The use of a reference wage in the occupational pension system, which is indexed to the consumer price index, has important distributional and incentive implications; later years of employment effectively earn more rapid accruals, improving incentives for workers to keep on working. Moreover, the contributions of younger workers are, to some extent, subsidizing those of older workers.

Generally speaking, no formal vehicle exists today for early retirement before the age of 65 in the Icelandic pension system, except for seamen, who can collect benefits from the age of 60, and for members of the old public sector pension scheme (Department B),

who have the option to retire when the sum of their age and years of service equals 95 years. However, the arrangement in Department B of the public worker pension fund – the replacement rate is based on the base wage rather than the total wage, resulting in a huge drop in income when people retire – creates disincentives for workers to leave the labor market. The recent establishment of an individual accounts system might encourage early retirement when the system has matured, as withdrawal is possible from the age of 60 until the official retirement age.

Section 4 attempts to explain why formal early retirement programs do not exist in Iceland, and why Icelanders do not use informal vehicles, such as disability programs, to retire early. The general conclusion is that the single most important factor for low levels of early retirement in Iceland is low unemployment in the past, while a rising unemployment rate in Europe was the main causal factor behind many of the current early retirement programs in the '70s and '80s. Favorable demographic conditions may also have contributed to the high labor force participation rates of older workers in Iceland: First, it is a fact that morbidity rates increase with age and thus a relatively youthful population has fewer people leaving the labor market due to disability. Second, the larger the fraction of a given population is at early retirement age, the greater the political pressure to implement early retirement programs paid for by the public. Third, the greater the pool of people at early retirement age, the higher the probability of leaving the labor market – a person needs someone else to retire with in order to engage in recreational activities. Furthermore, in the past, workers in

Iceland at early retirement ages have accumulated relatively little pension and social security wealth, and thus have not had the capital to create incentive for early retirement.

Finally, current labor market regulations neither discriminate for or against older workers. However, according to current labor contracts, employers can make workers redundant at the age of 70. Until the age of 53 workers can be made redundant at 3 months' notice, at the age of 54 the notice is 4 months, 5 months at the age of 60, and finally 6 months at the age of 63. No formal regulations exist on the Icelandic labor market that make it possible for workers to take on less strenuous or part-time jobs as they get older. Few firms have formal arrangements and it is entirely up to the employer and the employee to make such arrangements. As a consequence, Icelandic males generally do not move into part-time work or self employment as they get closer to the official retirement age. On the other hand, part-time work among Icelandic females seems to be more common after the age of 55.

Although the current situation is favorable in Iceland, early retirement will most likely increase in the future. However, the attitude of Icelanders towards work is different from that of workers in the other Nordic countries. Icelanders not only work until later in life but they also work longer days. In this respect Icelanders bear more resemblance to Americans than to their neighbors in the Nordic countries.

REFERENCES

- Anderson, K. and R. Burkhauser (1985), "The Retirement-Health Nexus: A New Measure of an Old Puzzle," *Journal of Human Resources* 20, No. 3, pp. 315–330.
- Bazzoli, G. (1985), "The Early Retirement Decision: New Empirical Evidence on the Influence of Health," *Journal of Human Resources* 20, No. 2, pp. 214–234.
- Bound, J. (1989), "The Health and Earnings of Rejected Disability Insurance Applicants," *American Economic Review* 79, No. 3, pp. 482–503.
- Bound, J. and T. Waidmann (1992), "Disability Transfers, Self-Reported Health, and the Labor Force Attachment of Older Men: Evidence from the Historical Record," *Quarterly Journal of Economics* 107, No. 4, pp. 1393–1419.
- Aarts, L. and P. DeJong (1999), "Disability within a Multipillar Framework," paper presented at World Bank Conference: New Ideas About Old Age Security, September 14–15, Washington DC.
- Blöndahl, S. and S. Scarpetta (1998), "The Retirement Decision in the OECD Countries," Economics Department Working Paper No. 202, OECD, Paris.
- Börsch-Supan, A. (1992), "Population Aging, Social Security Design, and Early Retirement," *Journal of Institutional and Theoretical Economics* 148, pp. 533–557.

- Boskin, M. J. (1977), "Social Security and Retirement Decisions," *Economic Inquiry* 15, No. 1, pp. 1–25.
- Campolieti, M. (2001), "The Canada/Quebec Pension Plan Disability Program and the Labor Force Participation of Older Men," *Economics Letters* 70, pp. 421–426.
- Casey, B. and F. Laczko (1991), "Older Worker Employment: Change and Continuity in the 1980s," in Gilber, G.N. and R. Burrows (eds.), *Fordism and Flexibility: Social Division and Social Change*, Macmillan, 1990.
- Costa, D. L. (1998), *The Evolution of Retirement: An American History, 1980–1990*, The University of Chicago Press, Chicago.
- Costa, D. L. (1999), "Has the Trend Towards Early Retirement Reversed?" First Annual Joint Conference for the Retirement Research Consortium, Reprint: 99.
- Disney, R. and E.R. Whitehouse (1999), "Pension Plans and Retirement Incentives," SP Discussion Paper No. 9924, World Bank, August.
- Easterlin, R.A. (1989), "Fertility," in *The New Palgrave: Social Economics*, p. 77–89, W.W. Norton, New York.
- Fields, G.S. and O. Mitchell (1984), "The Effects of Social Security Reforms on Retirement Ages and Retirement Incomes," *Journal of Public Economics*, Winter.
- Gladwell, M. (2000), *The Tipping Point: How Little Things Can Make a Big Difference*, Little Brown & Company.
- Gruber, J. and D. Wise (1999), *Social Security and Retirement Around the World*, NBER Volume, University of Chicago Press, Chicago.

Gudmundsson, M. (2001), "The Icelandic Pension System," National Association of Icelandic Pension Funds, downloadable at <http://www.ll.is/e/index.html>.

Gustman, A. and T.L. Steinmeir (1985), "The Effect of Partial Retirement on the Wage Profiles of Older Workers," *Industrial Relations* 24, No. 2, pp. 257–265.

Herbertsson, T.T., J.M. Orszag, and P. Orszag (1999), "Population Dynamics and Convergence in Fertility Rates," Birkbeck College Working Paper No. 21/99.

Herbertsson, T.T., J.M. Orszag, and P. Orszag (2000), *Retirement in the Nordic Countries: Prospects and Proposals for Reform*, a report to the Nordic Council of Ministers (ECOFIN), TemaNord No. 2000:548, Nordic Council of Ministers, Copenhagen, downloadable at <http://www.sbggo.com>.

Herbertsson, T.T. and J.M. Orszag (2000), "Policy Options and Issues in Reforming European Supplementary Pension Systems," *Journal of Pensions Management* (forthcoming), also: CPSI Research Report 2000-34, downloadable at <http://www.pensions-research.org/papers>.

Herbertsson, T.T., J.M. Orszag, and S. Svavarsson (2000), "Reassessing Iceland's Public Pension Liabilities," in M. Gudmundsson, T.T. Herbertsson, and G. Zoega (eds.) *Macroeconomic Policy: Small Open Economy in an Era of Global Integration*, University of Iceland Press, Reykjavik.

Herbertsson, T.T. and J.M. Orszag (2001), "The Cost of Early Retirement in the OECD," IoES Working Paper Series No. W01:02, downloadable at: www.ioes.is.

- Herbertsson, T.T., E. Phelps, and G. Zoega (2001), “Age Distribution and Unemployment,” work in progress.
- Hurd, M.D. (1988), “The Joint Retirement Decision of Husbands and Wives,” NBER Working Paper No. 2803.
- Johnson, R. (2000), “The Effect of Old-age Insurance on Male Retirement: Evidence from Historical Cross-country Data,” Federal Reserve Bank of Kansas City, Research Working Paper No. 00-09, December.
- Johnson, R. and M.M. Favreault (2001), “Retiring Together or Retiring Alone: The Impact of Spousal Employment and Disability on Retirement Decisions,” CRR Working Paper No. 2001-01, Center for Retirement Research at Boston College.
- Jónsson, G. (1999), *Hagvöxtur og idnvæðing, þróun landsframléidslu á Íslandi 1870–1945*, Occasional Report No. 3, National Economic Institute, Reykjavik
- Lazear, E. P. (1979), “Why is There Mandatory Retirement?” *Journal of Political Economy* 87, No. 6, pp. 1261–1284.
- Maddison, A. (1995), *Monitoring the World Economy, 1920–1992*, Development Centre Studies, OECD, Paris.
- Meghir, C.H.D. and Whitehouse E.R. (1996), “The Evolution of Wages in the UK: Evidence from Micro Data,” *Journal of Labor Economics*.
- OECD (1995a), *The Labor Market and Older Workers*, OECD, Paris.
- OECD (1995b), *The Transition from Work to Retirement*, Social Policy Studies, OECD, Paris.
- OECD (1997), *Labor Force Statistics 1976–1996*, OECD, Paris.

- OECD (1999), *Labor Force Statistics 1978–1998*, OECD, Paris.
- Orszag, J.M. and D. Snower (1999), “Pensions Taxes versus Early Retirement Rights,” Working Paper 1999-22, <http://www.pensions-research.org/papers>, November.
- Quinn, J.F., R.V. Burkhauser, and D.A. Myers (1990), *Passing the Torch: The Influence of Economic Incentives on Work and Retirement*, Upjohn Institute for Employment Research.
- Ross, D.P. and R. Shillington (1991), *FLUX: Two Years in the Life of the Canadian Labour Market*, Statistics Canada, Ottawa.
- Ruhm, C.J. (1990), “Career Jobs, Bridge Employment and Retirement,” in P. Doeringer, *Bridges to Retirement in a Changing Labor Market*, ILR Press, Ithica.
- Stock, J and D. Wise (1990), “Pensions, the Option Value of Work and Retirement,” *Econometrica* 58, pp. 1151–1180.
- Shapiro, D. and S.H. Sandell (1990), “The Reduced Pay of Older Job Losers: Age Discrimination and Other Explanations,” in S.H. Sandell (ed.), *The Problem Isn't Age: Work and Older Americans*, Praeger, New York.
- Thorlacius, S., S. Stefánsson, and S. Ólafsson (1998), “Umfang og edli örorku á Íslandi árið 1996,” *Læknaþladid* 84, pp. 629–635.
- UK Cabinet Office (2000), *Winning the Generation Game*, April, Performance and Innovation Unit, London.
- United Nations (1998), *World Population Prospects, 1950–2050*, United Nations.

APPENDIX

This appendix presents a simple model enabling us to assess the share of potential GDP lost due to early retirement. While simple, this model does take into account general equilibrium effects of high taxes to fund early retirement programs.

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

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

where Y is actual wage income. To simplify the analysis, no capital income is assumed, 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., the 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 the 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:

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

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 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 percent output gap.

Using (1) and (2), the output gap can be expressed as:

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

or:

$$GAP=1-\frac{\frac{w_o E_o P_o}{w_m E_m P_m}+1}{\frac{\widehat{w}_o \widehat{E}_o \widehat{P}_o}{w_m E_m P_m}+\frac{\widehat{w}_m}{w_m}} \quad (4)$$

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, if the wages of all workers are assumed to be equal, and the change in labor force participation is assumed not to change wages, then the output gap can be written as:

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

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, the following additional assumption is made, that as a result of the change in labor force participation this ratio does not change, and we obtain:

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

where μ is the rate of growth in wages. 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). It has already been noted that the possibility of closing the model for \widehat{E}_o by assuming that $\widehat{E}_o=E_m$, so that the 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 the effect of changes in wages can therefore be ignored. However, an alternative approach is to distribute savings in benefit payouts to all workers in proportion to their current wages. This would happen, for example, if proportional payroll taxes were cut equally for all workers. Let Δb be the savings. Then we can write:

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

where \bar{Y} is the level of output where labor participation rates have adjusted to their new levels, but wages have not. Hence:

$$\mu = \frac{\Delta b}{\bar{Y}} = \frac{\Delta b}{Y} \frac{Y}{\bar{Y}} = \frac{\Delta b}{Y} \frac{k \frac{E_o P_o}{E_m P_m} + 1}{k \frac{\widehat{E}_o P_o}{E_m P_m} + 1} \quad (7)$$

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).

The seven-parameter model that is outlined here is applied in the main text to analyze the cost of early retirement in the OECD and Nordic countries. To assess the economic costs of early retirement, equations (5) and (7) are used 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,
- Number of people in the age group 55–64,

- Number of people in the age group 25–54,
- Average wages of workers aged 55–64,
- Average wages of workers aged 25–54,
- 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)¹⁷ 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, $\widehat{E}_o = E_m$.

¹⁷ The medium variant for the population projections is used here.

Pensionsforum är en förening som har till uppgift att följa det nya pensionssystemets konsekvenser för individer och samhälle, hur det förhåller sig till andra länder, arbetsmarknaden för äldre samt att analysera olika möjligheter att finansiera och organisera den framtida äldrevården.

Styrelsen består av Kjell-Olof Feldt, ordf, Tommy Möller, vice ordf, statsvetare, docent, Magnus Henrekson, nationalekonom, professor, Joakim Palme, sociolog, docent samt Gullan Lindblad, fd riksdagsledamot. Verkställande direktör är Ann Lindgren.

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Pensionsforum

103 29 Stockholm

Besöksadress: Blasieholmsgatan 4A

Tel: 08-762 78 48 • Fax: 08-762 78 47

E-post: ann.lindgren@pensionsforum.nu

www.pensionsforum.nu

I Sverige lämnar allt fler arbetslivet före den faktiska pensions-åldern. Pensionsforum har i ett flertal skrifter beskrivit denna utveckling i Sverige och pekat på möjliga förändringar av regelverk och avtal så att människor både vill, kan och får möjlighet att fortsätta arbeta lite längre.

Hur är då villkoren och attityderna till de äldre – eller den mest erfarna arbetskraften – i andra länder? Pensionsforum har i en tidigare skrift belyst den amerikanska arbetsmarknaden och hur en växande grupp amerikaner vill – och även av ekonomiska skäl måste – fortsätta finnas kvar i arbetslivet.

I denna rapport belyser den isländske forskaren Tryggvi Thor Herbertsson varför islänningar arbetar så mycket längre än vad man gör i övriga nordiska länder samt Europa.

Dr Tryggvi Thor Herbertsson är chef för the Institute of Economic Studies samt biträdande professor vid Islands universitet. Hans huvudsakliga forskning rör ekonomisk tillväxt, pensioner och socialförsäkringssystem.

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