Retirement in the Nordic Countries
Prospects and Proposals for Reform

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Executive Summary

At the meeting of the Nordic Council of Ministers (Ministers of Finance and Economic Affairs) in November 1998, the Icelandic minister proposed, as part of the Icelandic chairmanship, that a study concerning the status and future prospects of financing the pension systems in the Nordic countries should be carried out. In May 1999, the Nordic Council of Ministers commissioned the Institute of Economic Studies at the University of Iceland, in conjunction with Sebago Associates Inc., to carry out the study. This document reports the findings. The study was carried out by Tryggvi Thor Herbertsson, Director of the Institute of Economic Studies, Professor J. Michael Orszag, Birkbeck College, University of London, and Peter R. Orszag, President of Sebago Associates, Inc.

Overview

- Pensions have a long history in the Nordic economies, with the first old-age pension laws passed in 1891 in Denmark. During this long history, the pension systems have evolved significantly. The generic Nordic pension system now combines a public, means-tested minimum benefit; a public earnings-related component; and occupational-based private pension coverage. Chapter 3 of the report includes a detailed description of each country's pension system.
- The Nordic countries have recently been taking important steps to reform their pension systems. But further reform is needed in many of the countries, if only to ensure that pension costs are sustainable in the future. In 1998, pension spending amounted to 8.8 per cent of GDP in Denmark, 5.7 per cent in Finland, 3.3 per cent in Iceland, 7.8 per cent in Norway, and 10.7 per cent in Sweden. Demographic trends will increase pension costs significantly over time. Although the results vary somewhat from country to country, the trend is unambiguous: the elderly proportion in the population will exceed 15 per cent by 2030 in all the Nordic countries.
- The two most important areas for pension reform are (1) addressing the increasing tendency for early retirement and (2) increasing the degree of prefunding. Both of these topics are examined in separate chapters in the report.

Early retirement

- Especially in Denmark and Finland the number of early retired are high. The economic costs of early retirement are substantial: the report estimates that output losses from early retirement are over 3 per cent of GDP in all the Nordic countries except Iceland. Although the output losses from early retirement are smaller in the Nordic countries than in the average EU country, the costs are still significant. The withdrawal of older workers from the labor force causes an increase in unused production capacity, a reduced tax base, and an increased burden on pension and

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

- The trend toward earlier retirement raises substantial policy challenges. Despite the political unpopularity of reforming early retirement systems, several of the Nordic countries have already taken steps to tighten eligibility rules and strengthen incentives to retire later. But even these additional incentives are often too weak. Furthermore, in some of the Nordic countries, few incentives exist to retire late, as reflected in low labor force participation rates after the formal retirement age in most of the countries. Chapter 4 of this report discusses possible policies to address the early retirement problem.

Prefunding

- Prefunding entails raising national saving in order to ease the future burden of pension obligations. The fundamental benefit of prefunding is that it forces current workers to forgo consumption today in order to ease the future burden of providing for their retirement income. By raising national saving, prefunding increases future gross domestic product (if the increase in national saving is absorbed through higher domestic investment) or future receipts from abroad (if the increase in national saving is absorbed through higher net lending to foreigners, or equivalently a larger current account balance). Regardless, the burden imposed on future domestic workers in providing a given level of retirement income to today's current workers is reduced.
- Long-term demographic and economic forecasts are inherently uncertain, which makes it difficult to ascertain in advance precisely how much prefunding should be done. For example, if death rates do not decline as anticipated, if fertility increases more quickly than anticipated, or if large net migration occurs, the pension problem may not be as large as implied by baseline forecasts. The growing literature on "investment under uncertainty" suggests that in the face of substantial uncertainty, basing decisions on central estimates (without incorporating the uncertainty) may be grossly misleading. The report argues that given this uncertainty, the prefunding should be undertaken to the degree possible in a manner that can be "dialed up or dialed down" flexibly in response to new information.
- The report also emphasizes that "prefunding" is distinct from "privatization." Indeed, the Nordic countries offer vivid examples of both public and private approaches to prefunding. Chapter 5 discusses some of the tradeoffs between public and private systems for prefunding.

Policy recommendations

- The report includes a set of specific policy recommendations. One common theme in the recommendations is the benefit of additional cross-Nordic cooperation. To be sure, a common Nordic welfare model is incompatible with current national objectives. But opportunities remain for the Nordic countries to retain independent initiatives while still gaining from the cross-Nordic pension initiatives we propose.

Such leadership from the Nordic countries in harmonizing disparate systems will not only improve the economic performance of the Nordic countries but also provide common leadership for the European Union as it grapples with the difficulty of harmonizing supplementary pensions systems with radically different objectives and implementation rules.

- The recommendations include:

1. The Nordic Council should fund a common Nordic actuarial office to collect data and make forecasts for Nordic demographics.
2. Early retirement ages should be indexed to economic and demographic conditions. As economic conditions improve and mortality decreases, minimum early retirement ages should be increased.
3. The other Nordic countries should examine in detail the Danish experience with the FlexJob program for applicability to their own experiences.
4. The tax treatment of early withdrawal and early retirement should be examined with a view to charging pension funds for the cost to the government of workers retiring early and not contributing taxes in the future.
5. Iceland should be encouraged to report on any special features of its labor market and pension system contributing to the country's remarkably high participation of older individuals in the labor market.
6. The Nordic countries should increase the degree of prefunding of their pension systems.
7. The Nordic countries should agree on a common set of transparency standards for with-profits insurance funds.
8. The Nordic countries should agree on a common implementation of the EU Insurance Intermediaries Directive to facilitate cross-border sales of private pensions.
9. The Nordic ministers should study the possibility of allowing countries to invest in each other's public trust funds or pension systems, where relevant.
10. The other Nordic countries should study the Finnish buffer reserve system to see how it could be adapted to their specific circumstances.

- These recommendations would help to prepare the Nordic pension systems for the coming demographic challenge. By increasing the degree of prefunding in their pension systems, discouraging early retirement, bolstering private pension provision, and taking advantage of the various benefits (including economies of scale and scope) from increased harmonization across the Nordic countries, policy-makers in the Nordic economies could do much to prepare their economies for the retirement of the baby boomers and ageing populations.

Sammanfattning

Vid Nordiska ministerrådets möte (finansministrarna) i november 1998 föreslog Islands minister, som en del av det isländska ordförandeskapet, att en studie över status och framtidsutsikter for de nordiska ländernas pensionssystem skulle genomföras. I maj 1999 gav Nordiska ministerrådet Institute of Economic Studies vid Islands universitet i uppdrag att i samarbete med Sebago Associates Inc. genomföra studien. Detta dokument är en rapport över resultaten. Studien utfördes av Tryggvi Thor Herbertsson, rektor för Institute of Economic Studies, Professor J Michael Orszag, Birkbeck College, Londons universitet och Peter R. Orszag, VD för Sebago Associates, Inc.

Översikt

- Pensioner har en lång historia i de nordiska ekonomierna och de första lagarna om ålderspension antogs 1891 i Danmark. Men under denna långa historia har pensionssystemen genomgått en betydande utveckling. Det allmänna nordiska pensionssystemet är nu en kombination av en allmän, behovsprövad minimiförmån; en allmän inkomstrelaterad komponent och ett yrkesbaserat privat pensionsskydd. I avsnitt 3 i rapporten finns en detaljerad beskrivning av pensionssystemen i respektive land.
- De nordiska länderna har nyligen vidtagit viktiga steg för att reformera sina pensionssystem. Det krävs dock ytterligare reformer i många av länderna, om så bara för att se till att pensionskostnaderna blir rimliga i framtiden. 1998 uppgick pensionsutgifterna till 8,8 procent av BNP i Danmark, 5,7 procent i Finland, 3,3 procent i Island, 7,8 procent i Norge och 10,7 procent i Sverige. Demografiska trender kommer att öka pensionskostnaderna avsevärt med tiden. Trots att resultaten varierar något från land till land är trenden entydig: andelen äldre i befolkningen kommer att överskrida 15 procent vid år 2030 i alla nordiska länder.
- De två viktigaste områdena för en pensionsreform är (1) att ta itu med frågan om den ökande tendensen till förtidspensionering och (2) att öka graden av förskottsfinansiering. Båda ämnena undersöks i separata avsnitt i rapporten.

Förtidspension

- Särskilt i Danmark och Finland är antalet förtidspensioneringar stort. De ekonomiska kostnaderna för förtidspensionering är betydande: i rapporten uppskattas att produktionsförlusten genom förtidspensionering är över tre procent av BNP i alla nordiska länder utom Island. Trots att produktionsförlusterna genom förtidspensionering är lägre än i det genomsnittliga EU-landet är kostnaderna ändå betydande. Att avlägsna äldre arbetare från arbetskraften orsakar en ökning av den outnyttjade produktionskapaciteten, ett minskat skatteunderlag och en ökad börda på

pensions- och skattesystemen. Om trenden mot tidigare pensionering skulle fortsätta längre fram skulle det utgöra ett ännu större finansiellt hot mot de nordiska pensionssystemen, i synnerhet de som saknar påföljder för tidig pensionering.

- Trenden mot allt tidigare pensionering ger upphov till stora politiska utmaningar. Trots att det inte är politiskt gynnsamt att reformera systemen för förtidspensioner har flera av de nordiska länderna redan vidtagit steg för att strama till kvalifikationsreglerna och stärka motivationen för att gå i pension senare. Men ändå är dessa ytterligare stimulansåtgärder ofta otillräckliga. Dessutom finns det i vissa nordiska länder få anledningar att pensionera sig sent, vilket återspeglas i hur arbetskraften fördelar sig efter den formella pensionsåldern i de flesta länder. I avsnitt 4 i denna rapport diskuteras möjliga sätt att hantera problemet med förtidspensioner.

Förskottsfinansiering

- Förskottsfinansiering innebär att öka landets sparande för att lätta på den framtida bördan av pensionsförpliktelserna. Den grundläggande fördelen med förskottsfinansiering är att den tvingar den nuvarande arbetskraften att avstå från konsumtion i dag till förmån för att lätta den framtida försörjningsbördan för deras pensionsinkomst. Genom att öka landets sparande ökar förskottsfinansieringen framtida BNP (om ökningen av sparandet absorberas genom högre inhemska investeringar) eller framtida intäkter från utlandet (om ökningen i landets sparande absorberas av högre nettoutlåning till utlänningar, eller likaledes en större betalningsbalans). I vilket fall som helst minskas den börda som åläggs framtida inhemska arbetare när det gäller att tillhandahålla en given nivå av pensionsinkomster till dagens arbetare.
- Långsiktiga demografiska och ekonomiska prognoser är av naturen osäkra vilket gör det svårt att i förväg fastställa exakt hur mycket förskottsfinansiering som bör göras. Om exempelvis dödstalen inte sjunker som förväntat, om födelsetalen ökar snabbare än förväntat eller om en stor nettomigration inträffar kanske pensionsproblemet inte längre är så stort som jämförande prognoser antyder. I den växande litteraturen om ”osäkra investeringar” föreslås att det med tanke på den avsevärda osäkerheten kan vara kraftigt missledande att grunda beslut på centrala beräkningar (utan att ta hänsyn till osäkerheten). Med tanke på denna osäkerhet förordas i rapporten att förskottsfinansiering ska ske på ett sådant sätt att den kan ”skalas upp eller ned” i enlighet med ny information som blir tillgänglig.
- I rapporten betonar man att ”förskottsfinansiering” skiljer sig från ”privatisering”. I de nordiska länderna finns också talrika exempel på både allmänna och privata metoder för förskottsfinansiering. I avsnitt 5 diskuteras vissa av avvägningarna mellan allmänna och privata system för förskottsfinansiering.

Policyrekommendationer

- I rapporten finns ett antal specifika policyrekommendationer. Ett gemensamt tema för rekommendationerna är fördelarna med ett ökat tvärnordiskt samarbete. En gemensam nordisk välfärdsmodell är visserligen oförenlig med gällande nationella

mål. Men det finns möjligheter för de nordiska länderna att bibehålla oberoende initiativ samtidigt som man drar fördel av de tvärnordiska pensionsinitiativ som vi föreslår. Ett sådant ledarskap från de nordiska länderna när det gäller att sammanföra olika system kommer inte bara att förbättra ekonomin i de nordiska länderna utan kommer även att erbjuda ett gemensamt ledarskap för EU i dess svåra kamp att bringa tilläggspensionssystem med radikalt olika mål och implementeringsregler i samklang.

- Rekommendationerna innefattar:

  1. Nordiska rådet borde finansiera ett gemensamt försäkringstekniskt ämbete som ska samla data och göra prognoser för den nordiska demografin.
  2. Förtidspension bör indexregleras mot ekonomiska och demografiska förhållanden. I takt med att de ekonomiska villkoren förbättras och dödligheten sjunker bör minimiåldern för förtidspensionering ökas.
  3. De övriga nordiska länderna bör detaljstudera om det danska experimentet med FlexJob-programmet är tillämpligt för deras egna förhållanden.
  4. Skattebehandlingen av tidig avgång och förtidspensionering bör undersökas i syfte att belasta pensionsmedel för statens kostnader för att arbetare går i pension tidigt och inte bidrar med skatter i framtiden.
  5. Island bör uppmanas att rapportera om de speciella egenskaper hos dess arbetsmarknad och pensionssystem som resulterar i att äldre är en del av arbetsmarknaden i anmärkningsvärt hög grad.
  6. De nordiska länderna bör öka andelen förskottsfinansiering av sina pensionssystem.
  7. De nordiska länderna bör komma överens om en gemensam genomsynlighetsstandard för återbäringsgivande försäkringsfonder.
  8. De nordiska länderna bör komma överens om ett gemensamt genomförande av EU:s direktiv om försäkringsmäklare för att förenkla försäljning av privata pensioner över gränserna.
  9. De nordiska ministrarna bör studera möjligheten att tillåta länder att investera i varandras allmänna stiftelser eller pensionssystem där sådan möjlighet finns.
  10. De nordiska länderna bör studera det finska buffertreservsystemet för att se om det kan anpassas till deras specifika omständigheter.

- Dessa rekommendationer skulle hjälpa till att förbereda det nordiska pensionssystemet för den kommande demografiska utmaningen. Genom att öka graden av förskottsfinansiering i pensionssystemen, motverka förtidspensionering, stödja privata pensionsreserver och dra fördel av olika förmåner (däribland stora och omfattande besparingar) av ökad harmonisering över de nordiska länderna kan de politiska makthavarna i de nordiska ekonomierna göra mycket för förbereda sina ekonomier inför pensioneringen av stora barnkullar och den åldrande befolkningen.

Käännös raportin tiivistelmästä

Tiivistelmä

Pohjoismaiden ministerineuvoston (talousministerien) kokouksessa marraskuussa 1998 Islannin ministeri ehdotti osana Islannin puheenjohtajakauden ohjelmaa, että pantaisiin toimeen tutkimus Pohjoismaiden eläkejärjestelmien rahoituksen tilasta ja tulevaisuuden näkymistä. Toukokuussa 1999 Pohjoismaiden ministerineuvosto valtuutti Islannin yliopiston taloustieteen instituutin yhdessä Sebago Associates Inc.:n kanssa suorittamaan tutkimuksen. Tämä asiakirja on raportti tuloksista. Tutkimuksen suorittivat taloustieteen instituutin johtaja Tryggvi Thor Herbertsson, professori J. Michael Orszag Birkbeck Collegesta Lontoon yliopistosta ja Sebago Asssociates Inc.:n johtaja Peter R. Orszag.

Katsaus

- Eläkkeillä on pitkä historia Pohjoismaiden taloudessa, sillä ensimmäiset vanhuuseläkelait säädettiin Tanskassa vuonna 1891. Mutta tämän pitkän historiansa aikana eläkejärjestelmät ovat kehittyneet merkittävästi. Nykyään tyypillinen pohjoismainen eläkejärjestelmä yhdistää julkiset, tarveharkintaan perustuvat vähimmäisetuisuudet, julkisen ansiosidonnaisen osan sekä ammattialakohtaisen yksityisen eläkkeen. Raportin 3. luku sisältää yksityiskohtaisen kuvauksen jokaisen maan eläkejärjestelmästä.

- Pohjoismaat ovat hiljattain ottaneet tärkeitä askelia eläkejärjestelmiensä uudistamiseksi. Mutta lisäuudistuksia tarvitaan monissa niissä maissa, vaikka vain taataksemme sen, että eläkekulut ovat hoidettavissa tulevaisuudessa. Vuonna 1998 julkinen eläkemenorasitus nousi 8,8 prosenttiin BKT:sta Tanskassa, 5,7 prosenttiin Suomessa, 3,3 prosenttiin Islannissa, 7,8 prosenttiin Norjassa ja 10,7 prosenttiin Ruotsissa. Väestönkehitys nostaa ajan myötä eläkemenoja merkittävästi. Vaikka tulokset vaihtelevat jonkin verran eri maissa, suuntaus on yksiselitteinen: vanhuusväestön osuus ylittää 15 prosentin rajan vuoteen 2030 mennessä jokaisessa Pohjoismaassa.

- Kaksi tärkeintä eläkeuudistuksen aluetta ovat (1) selviytyminen kasvavasta suuntauksesta vetäytyä aikaisin eläkkeelle ja (2) rahastointiasteen nostaminen. Molempia näistä aiheista tutkitaan raportin erillisissä luvuissa.

Varhaiseläke

- Varhainen eläkkeelle siirtyminen on merkittävä ongelma joissain Pohjoismaissa, erityisesti Tanskassa ja Suomessa. Varhaisen eläkkeelle siirtymisen taloudelliset kustannukset ovat huomattavia: raportissa arvioidaan, että varhaisen eläkkeelle siirtymisen aiheuttamat tuotannon menetykset ovat jo yli 3 prosenttia BKT:sta jokaisessa Pohjoismaassa paitsi Islannissa. Vaikka varhaisen eläkkeelle siirtymisen aiheuttamat tuotannon menetykset ovat pienempiä Pohjoismaissa kuin keskiverto EU-maassa, kulut ovat silti merkittävät. Vanhempien työntekijöiden vetäytyminen työvoimasta aiheuttaa kasvua käyttämättömässä tuotantokapasiteetissa, pienentää veropohjaa ja kasvattaa taakkaa, joka kohdistuu eläke- ja verojärjestelmiin. Jos suuntaus varhaiseläkkeelle siirtymisestä jatkuisi pitemmälle tulevaisuuteen, siitä koituisi vielä suurempia rahoitukseen liittyviä uhkia pohjoismaisille eläkejärjestelmille, erityisesti niille, joihin ei sisälly seuraamuksia varhaiseläkkeelle siirtymisestä.

- Varhaiseläkkeelle siirtymissuuntaus synnyttää huomattavia eläkepolitiikkaan liittyviä haasteita. Varhaiseläkejärjestelmien uudistamisen poliittisesta epäsuosiosta huolimatta moni Pohjoismaa on jo ottanut askelia eläkkeellesiirtymissääntöjen tiukentamiseksi ja myöhemmän eläkkeelle siirtymisen kannustamiseksi. Mutta nämä lisäkannustimet ovat yleensä liian heikkoja. Sen lisäksi joissakin Pohjoismaissa vain vähän kannustimia siirtyä eläkkeelle myöhemmin, mikä käy ilmi alhaisista työvoimaluvuista lakisääteisen eläkeiän jälkeen useimmissa maissa. Raportin 4. luku esittelee mahdollisia keinoja varhaiselle eläkkeelle siirtymiseen liittyvän ongelman hoitamiseksi.

Rahastointi

- Rahastointi merkitsee kansantalouden säästöjen lisäämistä, jotta helpotettaisiin tulevien eläkkeenmaksuvelvoitteitten aiheuttamaa taakkaa. Rahastoinnin hyötynä on se, että työntekijät pakotetaan luopumaan kulutuksesta nyt, jotta sen kautta helpotettaisiin heidän eläkkeensä maksamista tulevaisuudessa. Kansantalouden säästöjen lisäämisen kautta rahastointi kasvattaa tulevaa BKT:tä (jos kansantalouden säästöjen kasvu heijastuu suurempina kotimaisina investointeina) tai tulevia tuloja ulkomailta (jos kansantalouden säästöjen kasvu heijastuu korkeampana nettolainanantona ulkomaille tai vastaavasti suurempana vaihtotaseen ylijäämänä). Niin tai näin, tulevaisuuden kotimaisten työntekijöiden päälle sälytetty taakka huolehtia eläkeansiosta tietyn tasoisesti nykyisten työntekijöitten osalta kevenee.

- Pitkän ajan väestö- ja taloudelliset ennusteet ovat luonnostaan epävarmoja, mikä tekee rahastoinnin määrän arvioimisen hankalaksi etukäteen. Esimerkiksi jos kuolleisuus ei alene odotetusti, jos syntyvyys lisääntyy odotettua nopeammin tai jos nettomaahanmuutto kasvaa, eläkeongelmat eivät ehkä ole niin suuria kuin perusennustukset antavat olettaa. Yhä useammin kirjoitetaan ”investoinneista epävarmuuden vallitessa”, mikä antaa syyn olettaa, että huomattavan epävarmoissa

tilanteissa päätösten perustuminen piste-ennusteisiin (ilman että epävarmuutta otetaan huomioon) voi olla suuresti harhaanjohtavia. Raportti esittää, että kun tämä epävarmuus otetaan huomioon, rahastointi pitäisi toteuttaa niin laajalti kuin mahdollista tavalla, joka mahdollistaa sen nostamisen tai laskemisen joustavasti uusien tietojen perusteella.

- Raportti myös korostaa sitä, että rahastointi on eri asia kuin yksityistäminen. Itse asiassa Pohjoismaat tarjoavat eläviä esimerkkejä sekä julkisesta että yksityisestä lähestymistavasta rahastointiin. Luku 5 käsittelee joitakin eroja rahastoinnin julkisen ja yksityisen järjestelmän välillä.

Eläkepoliittiset suositukset

Raportti sisältää joukon erityisiä eläkepoliittisia suosituksia. Yksi yleinen teema suosituksissa on poikkipohjoismaisen yhteistyön tuoma hyöty. Täysin yhteinen pohjoismainen hyvinvointimalli ei sovi yhteen nykyisten kansallisten tavoitteitten kanssa. Mutta Pohjoismailla on edelleen mahdollisuuksia jatkaa itsenäisiä aloitteita samalla, kun ne hyötyvät ehdottamistamme poikkipohjoismaisista eläkealoitteista. Tämänkaltainen toiminta Pohjoismaissa keskenään erilaisten järjestelmien yhteensovittamiseksi ei pelkästään paranna Pohjoismaiden taloudellista suorituskykyä, vaan myös antaa mahdollisuuden vaikuttaa Euroopan unioniin, kun se painiskelee vaikeuksissa saattaa täydentävä eläkejärjestelmä sopusointuun radikaalisti erilaisten tavoitteitten ja täytäntöönpanosääntöjen kanssa.

- Suositukset sisältävät:
  1. Pohjoismaiden neuvoston tulee perustaa yhteispohjoismainen aktuaaritoimisto suorittamaan tiedonkeräystä ja ennusteiden laadintaa pohjoismaista väestötutkimusta varten.
  2. Varhaiseläkeiät tulee sitoa indeksiin taloudellisten ja väestötieteellisten olosuhteitten perusteella. Kun taloudelliset olosuhteet paranevat ja kuolleisuus laskee, vähimmäisvarhaiseläkeikiä tulee nostaa.
  3. Muiden Pohjoismaiden tulee tutustua yksityiskohtaisesti tanskalaiseen FlexJob ohjelmaan nähdäkseen, soveltuuko se heidän omiin olosuhteisiinsa.
  4. Aikaisen työelämästä vetäytymisen ja varhaiseläkkeen verokohtelua tulee tarkastella siinä mielessä, että eläkerahastot velvoitetaan korvaamaan valtiolle ne kustannukset, jotka aiheutuvat siitä, että työntekijät jäävät varhain eläkkeelle eivätkä osallistu verojen maksuun tulevaisuudessa.
  5. Islantia tulee rohkaista raportoimaan työmarkkinoiden ja eläkejärjestelmän erikoispiirteistä, jotka johtavat siihen, että huomattavan suuret määrät ikääntyneitä työntekijöitä osallistuu työmarkkinoille.
  6. Pohjoismaiden tulee nostaa eläkejärjestelmien rahastoinnin astetta.
  7. Pohjoismaiden tulee sopia yhteisistä avoimmuusstandardeista with-profits -rahastojen osalta.

8. Pohjoismaiden tulee sopia yleisestä EU:n vakuutuksen välittäjiä koskevan direktiivin täytäntöönpanosta helpottaakseen yksityisten eläkkeiden myymistä rajan yli.
9. Pohjoismaiden ministereiden tulee tutkia mahdollisuutta sallia näiden maiden sijoitukset toistensa julkisiin säätiöihin tai eläkejärjestelmiin, missä se tulee kysymykseen.
10. Muiden Pohjoismaiden tulee tutustua suomalaiseen puskurirahastointijärjestelmään nähdäkseen, miten se olisi sovellettavisssa niiden erityisiin olosuhteisiin.

- Nämä suositukset auttaisivat pohjoismaisten eläkejärjestelmien valmistamisessa tulevaan väestökehitykseen liittyvään haasteeseen. Nostamalla eläkejärjestelmien rahastoinnin astetta, rajoittamalla varhaista eläkkeelle siirtymistä, tukemalla yksityiseläkemahdollisuutta ja käyttämällä hyväksi eri hyödyt (esim. skaalaetujen tuoman säästön) kasvaneesta pohjoismaisten järjestelmien yhteensovittamisesta, eläkepolitiikasta vastaavat pohjoismaisissa talouksissa voisivat tehdä paljon valmistaakseen talouksiaan suurten ikäluokkien ja ikääntyvän väestön eläkkeelle jäämiseen.

(Käännös Pertti Felin)

Ágrip

Á fundi fjármálaráðherra Norðurlanda í nóvember 1998 lagði fjármálaráðherra Íslands til að Norræna ráðherranefndin léti gera úttekt á stöðu og framtíð lífeyrissjóðakerfanna á Norðurlöndum. Í maí 1999 gerðu Norræna ráðherranefndin og Hagfræðistofnun Háskóla Íslands, í samvinnu við Sebago Associates Inc., með sér samning um að stofnunin gerði úttektina og er skýrsla þessi afrakstur þeirrar vinnu. Skýrsluna unnu dr. Tryggvi Þór Herbertsson, forstöðumaður Hagfræðistofnunar Háskóla Íslands, dr. J. Michael Orszag, dósent við Birkbeck College, University of London og dr. Peter R. Orszag, forstjóri Sebago Associates Inc.

Yfirlit

- Ellilífeyrir á sér langa sögu á Norðurlöndum, en fyrstu lög um lífeyri voru sett í Danmörku árið 1891. Frá því að þau voru sett hefur orðið mikil breyting á. Að grunni til samanstendur eftirlaunakerfið á Norðurlöndum af grunnlífeyri, sem oft er tekjutengdur, tekjutengdum viðbótarlífeyri og starfstengdum lífeyri. Í 3. kafla skýrslunnar er ítarlega lýst lífeyrissjóðakerfum landanna fimm.
- Þótt flest norrænu landanna hafi á undanförnum árum umbylt lífeyriskerfum sínum til að mæta breyttri aldurssamsetningu er frekari aðgerða þó þörf til að kerfin verði sjálfbær. Árið 1998 voru útgjöld hins opinbera til greiðslu elli- og örorkulífeyris 8,8% af VLF í Danmörku, 5.7% í Finlandi, 3,3% á Íslandi, 7,8% í Noregi og 10,7% í Svíþjóð. Mishá framlög endurspegla mismunandi aldurssamsetningu og fyrirkomulag lífeyriskerfa landanna, en íslenska kefið er t.d. að mestum hluta utan hins opinbera. Yfir 15% íbúa á Norðurlöndum verða á eftirlaunaaldri árið 2030, sem mun leiða til hækkunar þessara útgjalda í framtíðinni.
- Tvö mikilvægustu viðfangsefnin við endurbætur lífeyriskerfanna verða (1) snemmtekinn lífeyrir og (2) aukin sjóðssöfnun til að standa undir lífeyri. Bæði þessi efni eru rakin ítarlega í tveim aðskildum köflum í skýrslunni.

Snemmtekinn lífeyrir

- Snemmtekinn lífeyrir er verulegt vandamál sums staðar á Norðurlöndum, sérstaklega í Danmörku og Finnlandi. Hvarf eldri starfsmanna úr mannaflanum leiðir til vannýttrar framleiðslugetu í þjóðfélaginu, minni skattgrunns og þrýstings á fjármál hins opinbera. Kostnaður vegna þessa er verulegur og í skýrslunni er framleiðslutap vegna snemmtekinna eftirlauna talin vera meiri en 3% af VLF alls staðar á Norðurlöndum nema á Íslandi þar sem hann nemur minna en einu prósenti. Ef ekkert verður að gert mun snemmtekinn lífeyrir leiða til aukins þrýstings á lífeyriskerfi landanna, sérstaklega í löndum sem ekki beita gagnaðgerðum.

- Þróunin í átt til snemmtekins lífeyris kallar á aðgerðir. Þrátt fyrir óvinsældir þess að breyta reglum um töku lífeyris hafa nokkur norræn ríki þegar stigið skref í þá átt og minnkað þannig hvatann til að hverfa af vinnumarkaði. Þó virðist sem ekki sé nóg að gert. Sums staðar á Norðurlöndum, t.d. á Íslandi, eru litlir hvatar til að setjast snemma í helgan stein eins og berlega kemur fram í mikilli vinnumarkaðsþáttöku. Enn fremur eru litlir hvatar á Norðurlöndum til að halda áfram að vinna eftir að ellilífeyrisaldri hefur verið náð. Í 4. kafla er fjallað ítarlega um snemmtekinn lífeyri og aðgerðir til að sporna við honum.

Sjóðssöfnun

- Sjóðssöfnun eykur þjóðhagslegan sparnað og auðveldar fjármögnun lífeyrisskuldbindinga. Meginkostur sjóðssöfnunar er sá að hún þvingar starfsfólk til að minnka neyslu sína nú til að standa undir neyslu á eftirlaunaárunum. Með því að auka þjóðhagslegan sparnað eykst landsframleiðslan í kjölfar aukinna fjárfestinga (ef sparnaðurinn er notaður til fjárfestinga í hagkerfinu) og/eða eignir erlendis aukast (ef sparnaðurinn er notaður til lánveitinga erlendis). Hvort heldur sem er þá er byrðum vegna aukinna lífeyrisgreiðslna létt af kynslóðum framtíðarinnar.
- Langtímaspár um aldursþróun og hagstærðir eru undirorpnar mikilli óvissu sem gerir það erfitt að ákvarða fyrir fram hve mikil sjóðssöfnun á að vera. Sem dæmi má nefna að ef dánarlíkur og barneignir minnka ekki jafnmikið og núverandi spár gera ráð fyrir, verður lítil sjóðssöfnun ekki jafnmikið vandamál á Norðurlöndum og nú er spáð. Reyndar er ein helsta niðurstaða hagfræðinnar um *fjárfestingu við óvissu* að ákvarðanir, sem ekki gera ráð fyrir óvissu um framtíðina, geti leitt til rangrar niðurstöðu. Í skýrslunni er því haldið fram að reglur um sjóðssöfnun beri að vera svo sveigjanlegar að auðvelt og fljótlegt sé að breyta forsendum þegar nýjar upplýsingar berast.
- Í skýrslunni er skýrt greint á milli *sjóðssöfnunar* og *einkavæðingar* lífeyrissjóða. Reyndar eru dæmi þess á Norðurlöndum að sjóðssöfnun sé á höndum hins opinbera sem og einkaaðila. Í 5. kafla er fjallað um kosti og galla þess að sjóðssöfnun sé í höndum einkaaðila og hins opinbera.

Tillögur að aðgerðum

- Í skýrslunni eru ráðleggingar til norrænna ríkja sem byggjast á kostum norræns samstarfs en undirstrika einnig að eitt norrænt velferðarlíkan samrýmist ekki markmiðum einstakra ríkja, til þess eru þau of ólík. Samstarf og samræming á milli norrænu ríkjanna á sviði lífeyrismála eykur ekki aðeins hagkvæmni innan landanna heldur getur það leitt til þess að löndin geta orðið í fararbroddi innan Evrópusambandsins í þessum málum, en um þessar mundir glímir sambandið við þá þraut að samræma reglur um viðbótalífeyri innan sambandsríkjanna.

- Ráðleggingar skýrslunnar eru m.a.:

    1. Norðurlönd ættu að fjármagna sameiginlega tryggingafræðilega stofnun sem safnaði gögnum og gerði spár um mannfjöldaþróun til að minnka óvissu sem frekast er unnt.
    2. Snemmtekinn lífeyri ætti að tengja þróun þjóðhagsstærða og aldurssamsetningar. Þegar þróun þjóðhagsstærða er hagstæð og dánarlíkur minnka ætti að hækka eftirlaunaaldur.
    3. Hin norrænu löndin ættu að skoða vel árangurinn af FlexJob áætluninni í Danmörku með hugsanlegt fordæmi til lausnar snemmtekins lífeyris í huga.
    4. Skattalega meðferð snemmtekins lífeyris ætti að skoða með það í huga að láta lífeyrissjóði standa undir kostnaði vegna hans, m.a. vegna minni skattekna sem annars fellur á hið opinbera.
    5. Gera ætti úttekt á skipulagi vinnumarkaðarins á Íslandi til að kanna ástæður mikillar atvinnuþáttöku eldri starfsmanna og hvað hin norrænu löndin geta lært af því.
    6. Norðurlönd ættu að hvetja til aukinnar sjóðssöfnunar.
    7. Norðurlönd ættu að innleiða *Insurance Intermediaries Directive* Evrópusambandsins á samræmdan hátt til að auðvelda sölu tryggingavara ætluðum til að hækka ellilífeyri á svæðinu.
    8. Norðurlönd ættu að samræma reglur um gagnsæi tryggingasjóða sem miða að lífeyrissparnaði.
    9. Norðurlönd ættu að skoða kostina af því að fjárfesta í opinberum sjóðum hvers annars.
    10. Hin norrænu löndin ættu að skoða kerfi það sem notað er í opinbera lífeyriskefinu í Finnlandi til að mæta efnahagssveiflum.

- Ef farið yrði eftir þessum ráðleggingum myndi það hjálpa til við þá glímu sem óhjákvæmilega er fram undan. Með því að auka sjóðssöfnun, letja starfsmenn til að setjast í helgan stein, hvetja til frjáls lífeyrissparnaðar og nota kosti aukinnar norrænnar samvinnu (meðal annars með hagkvæmni stærðarinnar) getur hið opinbera í einstökum löndum létt þær byrðar sem löndin þurfa að bera í framtíðinni vegna breyttrar aldurssamsetningar.

Chapter 1
Introduction

Across the Nordic countries, governments have begun reforming their pension systems to meet the coming demographic challenges. Those challenges are significant: in general, Nordic populations are already older, and public pension systems more generous than in many other industrialized economies. The result is that public pension spending in 1998 amounted to 8.8 per cent of GDP in Denmark, 5.7 per cent in Finland, 3.3 per cent in Iceland, 7.8 per cent in Norway, and 10.7 per cent in Sweden.[1] (In the United States, by contrast, such public pension spending amounts to under 4.5 per cent of GDP.) Demographic trends will put even more pressure on the Nordic pension systems over time.

Public pensions in the Nordic economies have a long history, with the first old-age pension laws passed in 1891 in Denmark, 1909 in Iceland, and 1913 in Sweden. Finland and Norway adopted old-age pensions somewhat later, in the 1930s and 1940s. The systems in all five countries have evolved since their inception. The generic Nordic pension system now combines a public, minimum benefit (often means-tested); a public earnings-related component; and occupational-based private pension coverage.

Table 1.1 provides other relevant background about the Nordic countries. Along some dimensions, such as male life expectancy at birth, the Nordic countries are quite similar. But along others, such as the labor force participation rates of older workers, they differ substantially. In examining the Nordic pension systems, this report therefore pays particular attention to both the similarities and the differences across the countries.

[1] Public pension spending is defined here as spending on old age, early retirement, and disability pension within the Social Security system. Public sector pension expenditure is not included.

Table 1.1. Some descriptive statistics for the Nordic countries

	Denmark	Finland	Iceland	Norway	Sweden
GDP per capita, 1997 (PPP ajusted USD)	25,514	20,488	24,898	26,771	20,238
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
Labour force participation, 1996 (males 55-64)	62.1	48.8	92.9	73.2	72.2
Unemployment, 1998	5.1	11.4	2.8	3.3	6.5
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
Morbitity, 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 (ptc of GDP)	17.6	19.6	15.6	29.9	16.6
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

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 (56:1999), OECD, the National Economic Institute in Iceland, Blöndal and Scarpetta (1998), Ólafsson (1999), and authors research.

Since the primary purpose of the report is to examine policy responses to the expected increase in Nordic pension costs, this Introduction focuses on the causes and scale of this expected increase, along with the benefits of prefunding as a means of reducing the burden of future pensions.[2] The rest of the report examines the economics of pensions, the detailed institutional structure of the Nordic pension systems, the causes of early retirement, ways to increase prefunding of pensions, and policy recommendations.

The central determinants of old-age retirement system costs fall into three main categories: demographics, economics, and law. Demographic considerations encompass fertility, mortality, and migration. Economic considerations include productivity growth and asset returns, as well as the structure of labor markets and economic opportunity. Legal considerations include the rules governing public pension benefits, early retirement rules, and taxes and regulation of pension markets.

Demography

The five Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) face demographic prospects that are somewhat more daunting than their European neighbors, raising concerns about the future cost of funding pensions in the Nordic countries. In

[2] Prefunding means raising national saving rates now, to ease the future burden of meeting pension obligations.

Figure 1, we plot the historical proportion of population in the Nordic countries over age 65 as a proportion of the whole population and compare it with the European Economic Area (which includes the countries of the European Union, Iceland, and Norway).

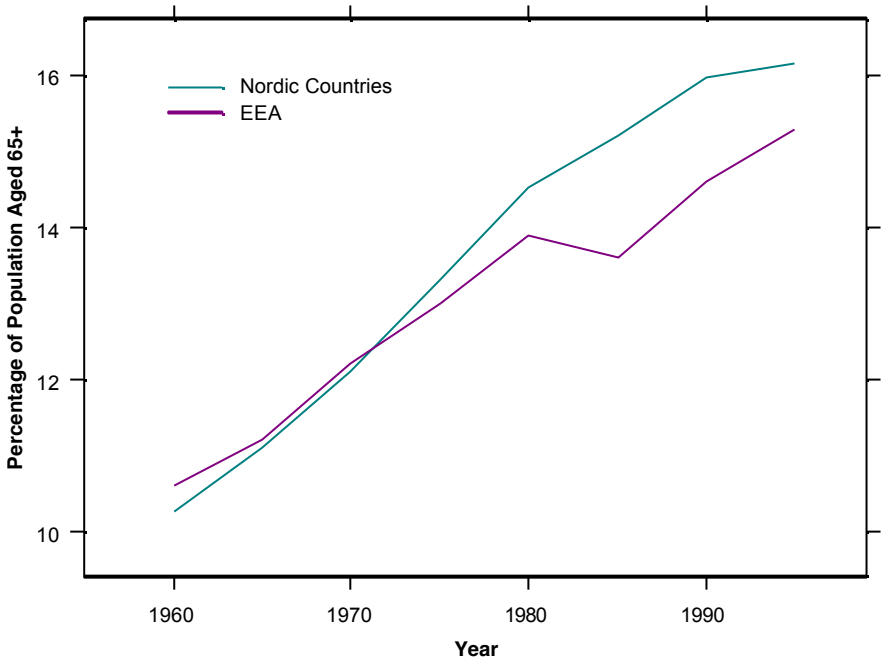

Figure 1.1. *Proportion of the population over age 65 in the Nordic countries and in the European Economic Area*

As the figure shows, the Nordic countries already have a population older than the rest of Europe. They also have populations older than many non-European industrialized economies, with the exception of Japan. (Those aged 65 or over account for 13 per cent of the total population in Australia and the United States, and 12 per cent in New Zealand.[3]) This discrepancy is expected to persist into the future. The Nordic countries have relatively low mortality rates, relatively high fertility rates, and generally below-average net migration. The first and last considerations would suggest further divergence from the EEA average, whereas the second would suggest convergence. In practice, these effects may roughly cancel out. (For example, the weighted average of the Nordic net per cent population change is close to that of the UK in 1995 and remains close to UK forecasts through 2030.)

In Figure 2, we plot the percentage of the population, aged 65 and above, for each of the Nordic countries individually. The figure highlights the demographic challenge. For example, in Finland, the proportion of population, aged 65 and over, is due to reach over 25 per cent by 2030. Although the results vary somewhat from country to country, the trend is

[3] U.S. Social Security Administration, *Social Security Programs Around the World 1999*, Table 2.

unambiguous: the elderly proportion of the population will exceed 15 per cent by 2030 in all the Nordic countries.

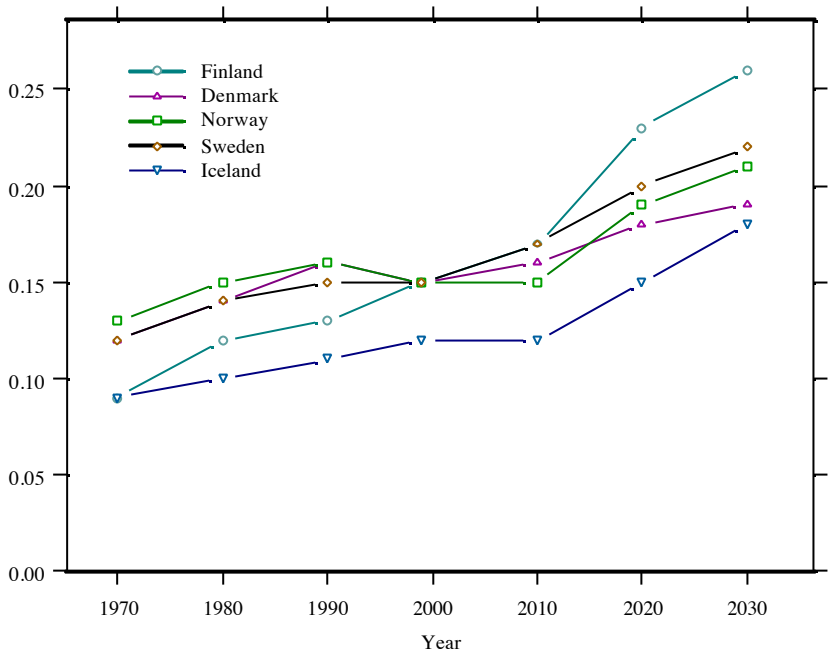

Figure 1.2. *Proportion of population, aged* 65 *and over*

An historical perspective on ageing populations is provided by Figure 3, which shows the proportion of people over age 65 in Sweden, using historical data since 1860 and population projections to 2100. In 1860, the proportion over age 65 in Sweden was roughly 5 per cent. Over the hundred years following 1860, the proportion roughly doubled to approximately 10 per cent. But over the hundred years from 1960 to 2060, the proportion is projected to more than double and then level off at roughly 25 per cent of the population. To be sure, significant uncertainty surrounds these Swedish projections, like any long-run demographic projections. The proportion over 65 could continue to rise after 2060 with low fertility and low mortality or could alternatively decrease if fertility and mortality rates turn out to be higher than currently expected. But in terms of central forecasts, a rise to 2060 and a subsequent smoothing out are common among the Nordic countries.

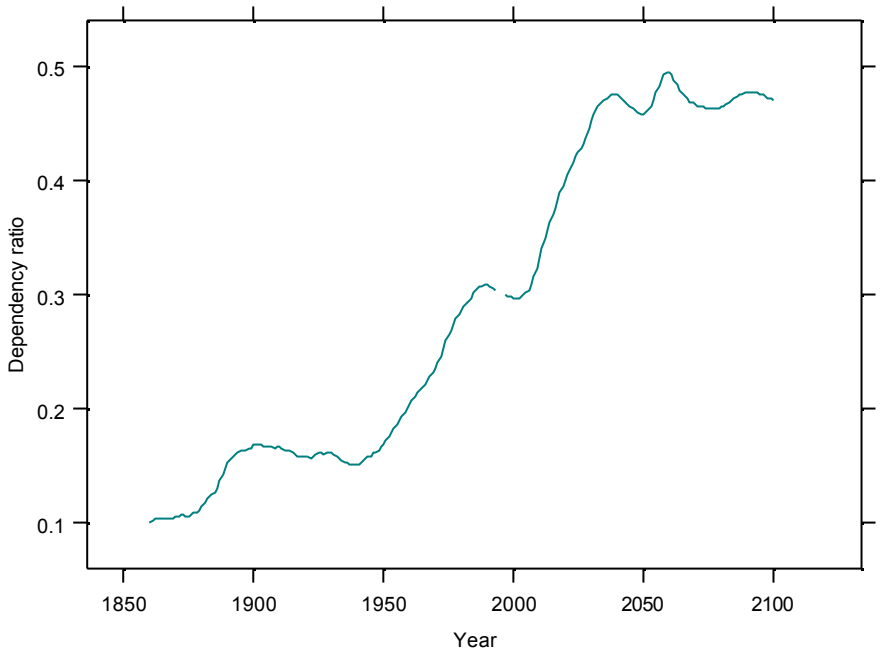

Figure 1.3. *Old-age dependency ratio* (65+ over 20-64) *in Sweden* 1860-2100

If correct, these demographic projections suggest that the increased costs of existing pension programs in the Nordic countries is a permanent problem rather than merely a transitional problem that will disappear after 2050. This distinction is important, because it may change the nature of the appropriate policy response. For example, if the costs of an ageing population were a transitional problem, one potential solution would be to build up a *temporary* prefunded buffer reserve by increasing national saving through a trust fund (as Norway and Sweden have in effect done).

If the problem were merely temporary, such a buffer reserve could be accumulated in the run-up to the retirement of the baby boomers, and then decumulated to finance their retirement incomes. No major structural changes in the pension systems would necessarily be required. However, if the increased costs were likely to persist because of permanent mortality improvements and declines in fertility, as current projections suggest, such a temporary financing approach would not be sufficient. Deeper structural changes would also be required. In effect, the implications of a temporary versus permanent demographic challenge are similar to the traditional distinction between liquidity and solvency. Problems with the former require a temporary financing solution; problems with the latter require permanent adjustments. Similarly, a temporary demographic challenge requires only a temporary financing solution; a permanent demographic challenge requires more.

Economics

Economic issues also pose challenges for the Nordic pension systems. 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, while life expectancy at age 65 has risen sharply (especially in Finland). This combination of earlier retirement and longer life expectancy results in much longer retirement.

In response to high unemployment, the Nordic countries expanded early retirement schemes in the 1980s. Particularly substantial decreases in labor market participation have occurred in Finland and, more recently, in Norway. Despite the common trend toward earlier retirement, however, labor market participation rates differ significantly across the Nordic countries. This divergence illustrates that participation depends on a wide variety of factors. For example, 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. But Denmark and Finland have experienced low and falling participation rates, although there is some evidence that participation rates may now be leveling out. Chapter 4 explores the causes of early retirement. It emphasizes that the incentives for early retirement are not restricted to the pension system *per se*. For example, a progressive income tax system may also provide an incentive for early retirement.

Regardless of the causes, the withdrawal of older workers from the labor force causes an increase in unused production capacity, a reduced tax base, and an increased burden on pension and fiscal systems. If the trend toward earlier retirement were to continue far into the future, it would thus pose even larger fiscal threats to Nordic 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 fallen in the Nordic countries, the rates of improvement in morbidity (i.e., the inception rate of disability) have been slower. Because morbidity increases as age increases, and because the population has been aging, the net effect of slow improvements in morbidity and aging populations has been a rise in the disabled population, which is likely to increase yet further for demographic reasons in the next thirty years. Disability benefits are often more generous than ordinary retirement benefits, further increasing the numbers of applicants for -- and all too often 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 of the Nordic countries have already taken steps to tighten eligibility rules and strengthen incentives to retire later. But even these additional incentives are often very weak or clash with supplementary pension provision. Furthermore, in some of the Nordic countries, few incentives exist to retire late, as reflected in low labor force participation rates after the formal retirement age in most of the countries. Chapter 4 discusses possible policies to address the early retirement problem.

A final economic issue is prefunding, which is discussed later in this Introduction and then in more detail in Chapter 5.

Legal structure

The third component of pension costs reflects legal considerations, which interact with economic considerations in important ways. For example, the structure of legal rules can affect labor market incentives and the efficacy of targeted means-tested benefits.

Supplementary (or voluntary) pensions are perhaps one of the core policy areas involving both legal and economic considerations. With long-term strains on public pension systems, supplementary pensions are an important mechanism through which individuals can save for retirement. However, in most of the Nordic countries, the retail financial markets feature regulations that explicitly or implicitly preserve the market power of domestic companies in pension provision. For example, most private pensions in the Nordic countries operate as with-profits funds. Such funds are not transparent to the consumer and rules differ across countries, preserving incumbent advantages and raising costs to the consumer. The consumer costs that result from these inefficient regulations are often staggering. Insurer expense ratios for individual products in countries, such as Norway and Finland, may be as high as 3 per cent of assets under management, whereas best-practice financial management (such as practiced by the ATP fund in Denmark) results in costs of under 0.10 per cent -- a difference of close to 300 basis points.

High charges do not ordinarily reflect profits to the insurance companies providing pensions in the Nordic countries. Instead, they are often the result of inefficient tax regulations, which raise costs for consumers. An example in Finland is the annual headroom check on individual pension contributions. Any individual contributing more than FIM 15,000 (€2,523) in a year must pay for a review of his or her pension assets. The total cost of these tax checks may be over FIM 1,000 (€168). Thus, it is not surprising that there is a very sharp drop off in contributions at FIM 15,000 (€2,523) per year.

While many rules and practices in the Nordic countries are inefficient and counterproductive, many other practices are pioneering and potentially beneficial for other Nordic countries. For example, the Finnish Central Pension Security Institute (CPSI) succeeds in administering (together with private sector pension institutions) a tremendously complex mandatory private earnings-related system at relatively low cost. Denmark's FlexJob plan provides lessons on how to encourage individuals to work through government subsidies. Finland's experience-rated costs provide lessons on how to provide appropriate incentives for employers. Norway's petroleum fund provides a striking example of a low-cost and effective public investment fund. Iceland's new individual accounts have thus far resulted in high levels of competition and remarkably low consumer costs.

While the forms of welfare provision in the Nordic countries differ significantly, the countries share a common demographic and cultural heritage. There are therefore a variety of ways in which the Nordic countries could cooperate on pension provision. For example, harmonization of tax rules and regulatory rules for supplementary pensions would encourage the development of cross-border Nordic pension providers, which would then have the scale and capital to compete effectively with the emerging European insurance giants.

Harmonization could be beneficial in areas beyond just tax rules and regulation. For example, a central Nordic actuarial service could develop common forecasts and develop more comprehensive data for better pricing of disability insurance and other private products in the countries. Both Sweden and Denmark have private companies that pool insurance data and handle underwriting for private providers; the essential demographic correlations and similarities between Nordic countries suggest gains from a pooled service. Furthermore, a common Nordic investment fund could allow public pension systems in Nordic countries to invest in assets in other Nordic countries and hence share risks. Indeed, the Nordic countries could even consider sharing demographic risk by exchanging claims on each other's pay-as-you-go public pension systems.

Benefits of prefunding and the distinction between prefunding and privatization

One common theme throughout this report is the benefits provided by prefunding, which entails raising national saving in order to ease the future burden of pension obligations. Such prefunding can be undertaken through either a public trust fund or through private retirement accounts. The fundamental benefit of prefunding is that it forces current workers to forgo consumption today in order to ease the future burden of providing for their retirement income. By raising national saving, prefunding increases future gross domestic product (if the increase in national saving is absorbed through higher domestic investment) or future receipts from abroad (if the increase in national saving is absorbed through higher net lending to foreigners, or, equivalently, a larger current account balance). Either way, the burden imposed on future domestic workers in providing a given level of retirement income to today's current workers is reduced.

It is important to emphasize, however, that "prefunding" is distinct from "privatization." Four aspects of a pension system should be distinguished:

- *Privatization*. Privatization means replacement of a publicly run pension system with a privately managed one.
- *Prefunding*. Prefunding means an accumulation of assets against future pension payments. In its broadest sense, it means raising national saving now in anticipation of future pension payments.
- *Diversification*. Diversification involves allowing investments in a variety of assets, rather than government bonds alone.
- *Defined benefit versus defined contribution*. Defined benefit plans assign accrual risk to the sponsor; conditional on a worker's earnings history, retirement benefits are supposedly deterministic (though they may depend on non-accrual factors affecting the earnings history, such as productivity increases). Defined contribution plans, on the other hand, assign accrual risk to the individual worker; even conditional on an earnings history, retirement benefits depend on the efficacy with which contributions were financially managed.

Various combinations of these four elements are possible. For example, privatization is possible without prefunding (that is, without any increase in national saving). For

example, consider a pay-as-you-go pension system in which each individual's benefits are directly tied to contributions. Each individual has an account, showing contributions at each date. These contributions are then translated into benefits using actuarial tables. Now, assume the government decides to transfer to each account the full value of the cumulative contributions. The social security system is thus "privatized." But to finance the contributions, the government borrows from the public. National saving is therefore constant: all that has happened is that the government has altered the form of the debt. Such a switch should not have any real effects on the macroeconomy. To be sure, the implicit debt under the old system has become explicit. But in and of itself, this has no economic ramifications.

Conversely, broad prefunding can be accomplished without privatization. In particular, the government can accumulate assets in anticipation of future benefit payments due under the public defined benefit plan. Interestingly, those arguing that a public system cannot prefund have often pointed to the United States as their example of a country that has failed to do so. And yet over the past year or two, despite the lack of agreement on almost everything else, policy-makers in the United States have largely agreed to protect Social Security surpluses from the demands of the rest of the budget -- in other words, to ensure broad prefunding.

The report's support for prefunding should therefore not necessarily be interpreted as support for private accounts within the pension system. The relative costs and benefits of public and private approaches to prefunding are discussed in more detail in Chapter 5.

Outline of the report

This report analyses the Nordic pension systems and the associated policy issues in some detail. To provide appropriate background, Chapter 2 reviews an economic framework for evaluating pensions and includes a discussion of theoretical considerations. It explores differences between the rate of return on a pay-as-you-go pension system and a prefunded system and highlights some of the misunderstandings that often arise in a discussion of these rates of return.

Chapter 2 also discusses the various tax incentives that could be provided for pension savings, and presents methods of computing the tax advantages associated with different systems. Other sections of the chapter present metrics for measuring risk, administrative costs, redistribution, incentives, and insurance in different pension systems. The chapter thus provides the requisite background for evaluating potential reforms to pension systems.

Chapter 3 examines the detailed institutional features of each of the Nordic pension systems. For each country, an overview is followed by a description of the public pension system, including contribution rates, benefits at normal retirement age, benefits at early retirement, benefits at late retirement, and special features. The pension system for public sector employees in each country is then described, followed by an examination of the occupational pension system and individual private pensions. A final section explores complementary products, including life insurance and other savings vehicles.

Chapter 4 explores the evidence on the recent declines in labor market participation among older workers. It discusses the role played by labor supply incentives, including actuarial reductions (if any) for early retirement within the pension system and the generosity of the pension system. It also examines alternative explanations for the increase in early retirement. For example, one such explanation is a lagged effect from World War II since those nearing retirement age in the 1980s were of prime fighting age in the 1940s and were particularly susceptible to injuries and disability because of the war. Interestingly, Sweden, which did not participate in the war, has not seen an uptick in early retirement as in other European countries.

Chapter 4 also discusses the possible role played by demand for older workers in explaining retirement trends. For example, laws against mandatory retirement or age discrimination can tilt labor demand and thereby affect retirement behavior. (For example, Sweden, which has not experienced an increase in early retirement, has employment protection legislation for older workers.) Chapter 4 then turns its attention to part-time employment and self-employment, arguing that standard labor supply models do not take these activities into account. And part-time employment can be significant among older workers: in Sweden, for example, part-time employment in 1989-1990 was 30.5 per cent of the labor force, relative to 7.3 per cent for the whole population. The chapter then discusses the role of disability insurance on labor market participation, which is controversial. (Interestingly, with the exception of Norway and Iceland, disability incidence appears to be on the decline in the Nordic countries. Finland and Sweden have experienced particularly sharp declines.) Chapter 4 concludes with an extensive discussion of policy options for addressing the early retirement challenge.

Chapter 5 discusses the economics and political economy of prefunding. It begins with a discussion of the economics of prefunding, including the benefits provided by such prefunding. It then analyzes the impact of demographic and economic uncertainty on the optimal method of prefunding. The vast majority of analyses of prefunding do not reflect the substantial uncertainty inherent in demographic forecasts. For example, if death rates do not decline as anticipated, if fertility increases more quickly than anticipated, or if large net migration occurs, the pension problem may not be as large as implied by baseline forecasts. The growing literature on "investment under uncertainty" suggests that in the face of substantial uncertainty, basing decisions on central estimates (without incorporating the uncertainty) may be grossly misleading. The chapter emphasizes that given this uncertainty, prefunding should be undertaken to the degree possible in a manner that can be "dialed up or dialed down" flexibly in response to new information.

Chapter 5 also discusses ways to encourage private prefunded pensions, providing seven specific policy initiatives for fostering private provision, including reducing administrative costs, bolstering consumer protection, ensuring pension portability, improving solvency regulation, tightening investment regulation, harmonizing taxation, and reducing overall insularity. Finally, the chapter examines the use of public trust funds to prefund pension systems. In this context, it mentions an innovative possibility: allowing countries to invest in each other's public trust funds.

Chapter 6 discusses our policy recommendations. These recommendations include:

General

- The Nordic Council should fund a common Nordic actuarial office to collect data and make forecasts for Nordic demographics.

Encouraging Labor Market Participation of Older Workers

- Early retirement ages should be indexed to economic and demographic conditions. As economic conditions improve and mortality decreases, minimum early retirement ages should be increased.
- The other Nordic countries should examine in detail the Danish experience with the FlexJob program for applicability to their own experiences.
- The tax treatment of early withdrawal and early retirement should be examined with a view to charging pension funds for the cost to the government of workers retiring early and not contributing taxes in the future.
- Iceland should be encouraged to report any special features of its labor market and pension system contributing to the remarkably high participation of its older individuals in the labor market.

Pre-funding Pension Liabilities

- The Nordic countries should increase the degree of prefunding of their pension systems.
- The Nordic countries should agree on a common set of transparency standards for with-profits insurance funds.
- The Nordic countries should agree on a common implementation of the EU Insurance Intermediaries Directive to facilitate cross-border sales of private pensions.
- The Nordic ministers should study the possibility of allowing countries to invest in each other's public trust funds or pension systems, where relevant.
- The other Nordic countries should study the Finnish buffer reserve system to see how it could be adapted to their specific circumstances.

One common theme in these recommendations is the benefit of additional cross-Nordic cooperation. While a common Nordic welfare model seems incompatible with current national objectives, other common aspects of the Nordic countries provide opportunities for all the countries to retain independent initiatives while still gaining from the cross-Nordic pension initiatives we propose in this report. Such leadership from the Nordic countries in harmonizing disparate systems will not only improve the economic performance of the Nordic countries but also provide common leadership for the European Union as it grapples with the difficulty of harmonizing supplementary pensions systems with radically different objectives and implementation rules.

Summary
The coming demographic shift in the Nordic countries will put increasing pressure on pension systems, which in turn may put increasing pressure on fiscal and other public policies. This report is intended to document the extent of the challenge facing the Nordic countries, and to explore potential responses, including innovative policy measures that have not yet been fully analyzed within the policy community.

By increasing the degree of prefunding in their pension systems, discouraging early retirement, bolstering private pension provision, and taking advantage of the various benefits (including economies of scale and scope) from increased harmonization across the Nordic countries, policy-makers in the Nordic economies could do much to reduce the burdens associated with the retirement of the baby boomers and ageing populations.

Chapter 2
The Economics of Pensions

2.1 Introduction

A simplistic perspective on "pensions" views them simply as a savings instrument exclusively for retirement. In the absence of tax advantages, the illiquidity of accumulated pension assets before retirementand the inflexibility of payments during retirement would make such pension investments unattractive relative to other savings mechanisms. In this view of the world, tax advantages and/or compulsory contributions are hence essential for the growth of pensions.[4] This view of pensions as savings also naturally lends itself to pension systems that mimic other savings instruments; ultimate benefits depend primarily, or perhaps even exclusively on contributions and financial performance. Chile, Argentina, and Australia are examples of countries that have opted for pension systems of this type.

The view of pensions as primarily providing savings for retirement, however, obscures other important motivations and rationales for them. State pension systems were originally designed to prevent destitution in old age. Such systems were based more on providing redistribution to the poor and insurance against longevity than on providing retirement income independent of need. Indeed, most pension systems involve at least some redistribution to the poor and some insurance against longevity or other risks, such as death in service and disability. In designing pension systems, one may therefore have to balance the redistribution and insurance objective against the pure retirement income objective. A related issue in pension systems design is labor market incentives. For example, final salary defined benefit schemes reward those with steeper career wage profiles and longer service at the expense of employees with steady earnings and shorter service. Finally, risk to the individual is also an important consideration, especially since such risks may interact with old age poverty. Indeed, even in the cited examples of Chile, Argentina, and Australia, there are important safety nets and guarantees to provide adequate income in old age for those contributing to the system.

A further potential issue with the savings model of pensions is that most state pension funding is on an unfunded or pay-as-you-go basis, under which pensions for the retired generation are paid for by taxes collected from the younger generation. Such a pay-as-you-go system is fundamentally based on a social contract. From an individual's point of view, the unfunded nature of the obligations is not that important, assuming the security of

[4] It is unclear, however, why pensions would be socially beneficial if individuals were fully rational, if the only role of pensions were as a savings mechanism, and if individuals would not choose to invest in pensions absent government involvement.

benefits is not affected. Yet the individual's rate of return under the pay-as-you-go system, as explained below, will depend on different factors than under a funded system,and the political economy of the different pension schemes may also affect the reliability of benefits.

Indeed, the plethora of goals of pension systems led the World Bank to advocate a multipillar pension model. US pension specialist Carolyn Weaver writes that the World Bank's *Averting the Old Age Crisis* advocated "a three-tier model in which the role of public pensions would focus on a minimal poverty reduction role, complemented by a fully-funded, mandatory defined-contribution savings second tier … and a third tier of voluntary savings" (Weaver 1998).

In this chapter, we will present an integrated view of pension economics allowing us to present metrics to help conceptualize the levels of savings (returns), risk, insurance, redistribution, and incentives in different pension systems.

2.2 The Rate of Return on Pensions

A conceptual metric for understanding pension issues is the rate of return. For example, the effective rates of return on pensions will determine their impact on private saving. Similarly, tax relief on pensions is measured by the increase in return to the individual arising from the tax relief. The risk of pension systems is characterized by the degree of variance in the potential rates of return. Incentives for delaying retirement are also measured in terms of the gradient of effective rates of return. Redistribution is measured by how rates of return to pension contributions and savings differ across socioeconomic and income classes. In this analysis, the rate of return thus provides a sufficient statistic for examining a wide array of attributes and implications of the pension system.

While the rate of return is a standard financial indicator, its application in a pension setting requires some care. Therefore, before we outline our formal framework, it is useful to underscore some important potential myths and issues needing to be addressed when using standard financial methods in the analysis of pension systems. In particular, we will need to assess how to measure and quantify rates of return for unfunded pension systems and collective pension systems in which there is substantial redistribution.

The statistical properties of internal rates of return to pension contributions depend on:

- Taxes
- Administrative costs
- Risks (or, in particular, asset allocation and its implications for risk)
- Incentives (or, in particular, the retirement age of the individual)
- Socioeconomic characteristics (or, in particular, the redistribution in the pension system).

One standard problem with internal rate of return analysis is uniqueness; there can sometimes be several rates of return consistent with cash flows. However, such is not the case in the analysis for rates of return for generic pension arrangements, which usually embody a "single crossing" condition that is sufficient for uniqueness. In Appendix A, we show that if an individual can only retire once, the internal rate of return is always unique.

An alternative measure would be to look at comparisons in final outcomes relative to some benchmark. For instance, we could look at replacement rates. As another example, we could assess administrative charges in terms of reduction in final pensions or tax breaks in terms of increases in final pensions. These approaches however have one key drawback: they do not permit simple comparisons between people who retire at different dates. A key issue we wish to examine is early retirement and late retirement incentives, an issue for which this measure is not applicable. We have nevertheless referred to the approach, where applicable.

To illustrate some of the core issues conceptually, we refer the reader to Figure 2.1. The figure represents an individual's choice between consumption and savings over the life cycle, expressed in two periods: 'young' (i.e., in work) and 'old' (i.e., in retirement). The horizontal axis shows consumption when young, and the vertical axis represents consumption when old. Income when young is Y. In the absence of tax incentives for savings, workers can achieve any outcome along the intertemporal budget constraint OY. The larger the ratio of O to Y, the higher the rate of return on savings for the individual. An individual facing a budget constraint OY and having indifference curves U will choose to consume C and receive an income when old of P.

There are a number of problems with this basic analysis. First, our figure does not fully illustrate the general equilibrium consequences of tax incentives. If the government gives tax incentives to pension savings, the loss in tax revenue has to be financed (e.g., with higher taxes in other areas than in the absence of the pension tax incentives). The budget constraint then changes, and OY and O'Y' cross each other. Second, tax incentives for pension saving also introduce distortions having negative effects into labor markets. Indeed, this is the point made in a large literature led by Feldstein (1974): the general equilibrium effects of pensions are such that national saving does not rise as much as one would expect, based on partial equilibrium analysis.

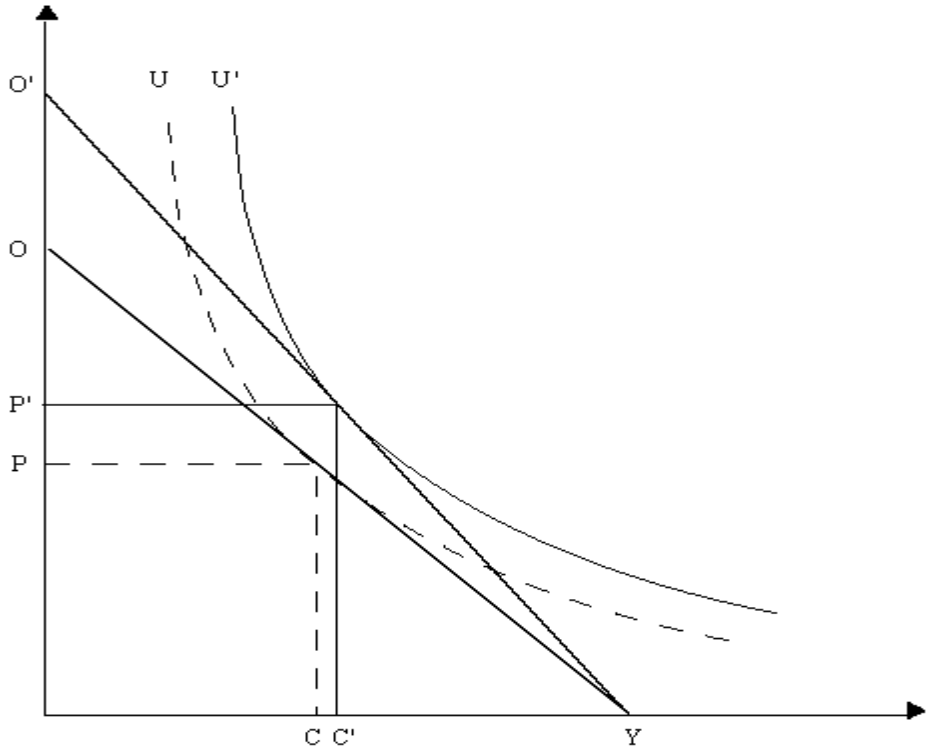

Figure 2.1. *Consumption and savings over the life cycle*

2.3 Tax Incentives for Pension Savings

Pensions are less liquid and flexible than regular savings. In the absence of tax incentives or an insurance component, individuals would therefore prefer to hold their savings for retirement in standard investment vehicles rather than old age savings plans. Tax inducements are the most common means of encouraging voluntary pension savings. In Figure 2.1, tax relief on pension savings involves an increased rate of return so that the individual faces a budget constraint of OY' rather than OY and therefore chooses to consume C' and receive a higher income of P' when old.

Tax incentives can work in a complex variety of ways.[5] Contributions can be taxed, i.e., consist of post-tax income, interest income (or assets) can be taxed, and pension income upon retirement can be taxed. If we let 'E' stand for 'Exempt' and 'T' stand for taxed, a system of EET means that contributions are exempt, asset accumulations are exempt (so-called tax-free inside buildup), but pension income is taxed. On the other hand, a system of TEE means that contributions are taxed but nothing else. Ordinary saving is usually TTE in that contributions are made out of post-tax income, and interest income (and sometimes assets as well) are taxed in the accumulation stage.

Consider an investment of €1 in an EET system. Neither contributions nor accumulations are taxed. If the interest rate is *R*, and the investment period is *Y*, the initial investment

[5] For a detailed treatment of pension taxation, see Andrew Dilnot and Paul Johnson, *The Taxation of Private Pensions*, Institute for Fiscal Studies, 1993.

grows to €$(1+R)^Y$ by the end of the investment period. On withdrawal, it is taxed, and if the tax rate is t, the net amount available to the individual is $(1+R)^Y$ (1-t). In a TEE system, contributions are taxed, but not withdrawals or accumulations. If the tax rate at the point of contribution is also t, then TEE and EET are equivalent.[6] However, tax rates at retirement are typically lower than during the accumulation stage, so that EET is perceived as more tax advantageous, all else being equal.

Both TEE and EET systems pose political risks for the individual pension saver. With TEE systems, the government could decide to increase taxes or reduce exemptions after inducing the saving, despite the earlier promise not to do so. EET systems are not exempt from such political economy problems either. After all, the government could always increase tax rates in the future,making an EET system less attractive. Indeed, as just one example, pension fund surpluses in the UK led the Chancellor to withdraw dividend tax relief for pension funds during the accumulation stage. In Chapter 3, we note that there have been similar *ex post* changes in tax relief in some of the Nordic countries as well. Nevertheless, EET systems are often perceived to be preferable and have been endorsed by the EU in a recent paper on supplementary pensions.

We note that the issue of the tax structure of pensions ideally should be looked at in terms of optimal taxation theory. This necessarily means that tax designs for pensions should take into account issues such as similarity of taxes between different types of capital income as well as the level of liquidity of pension savings and taxes on related savings instruments.

In the absence of tax advantages on savings, funds typically face taxes on interest income and asset taxes. If interest income is taxed at I and assets are taxed at a rate A, the net fund after a savings period of Y years is:

$$€\left[(1+R(1-I))(1-A)\right]^Y$$

[6] In addition to potential differences between the individual's marginal tax rate at the time of contribution and at the time of retirement, another difference between a TEE and EET system involves any Euro limitation on the contribution amount. For example, assume that only €15,000 can be deposited into any tax-preferred pension system, whether EET or TEE. A contribution of €15,000 into an EET plan today, accumulated at a 5 percent real tax-free rate of return over 20 years and then taxed at a 31 percent rate upon withdrawal, yields €27,461.63 in after-tax income in 20 years. But €15,000 deposited in an TEE system, accumulated at a 5 percent real tax-free rate of return over 20 years and then distributed tax-free, yields €39,799.46 after-tax in 20 years. The equivalent deposit in the EET plan today, to obtain the same €39,799.46 after-tax in 20 years, would be €21,937.13, rather than €15,000. The €15,000 limit in the TEE system is thus the equivalent for this taxpayer of a €21,937 limit on a TEE plan. More broadly, if the same Euro limit is set on a TEE and EET plan, the limit is effectively more generous under the TEE plan. This fact does not contradict the statement in the text: any *given* Euro deposit is equally beneficial under the TEE and EET approaches (assuming a constant tax rate). But the amount that can be contributed under the TEE plan is effectively higher.

The ratio of net savings at the end of the accumulation stage with complete tax relief to those in the absence of tax relief is:[7]

$$\frac{(1+R)^Y}{\left[(1+R(1-I))(1-A)\right]^Y}$$

We call this ratio the "Accumulation Relief Ratio" (ARR) to measure the degree of tax relief in the accumulation stage. For example, if Y is 40, R = 10 per cent, I = 30 per cent, and A = 1 per cent, the ARR is 4.52, indicating that the accumulated fund with tax relief is 4.52 times that which it would have been in the absence of tax relief. For an individual who begins saving at age 20 and whose contributions increase at 5 per cent per year, the career ARR with these parameters is 2.82. It is indeed no coincidence that the growth in aggregate private pension assets in the US and UK has been strongly correlated with tax relief on pension savings. (It should be noted, however, that the increase in aggregate private pension saving does not necessarily correspond to an increase in national saving. A large literature in the United States explores the degree to which tax-preferred saving has merely displaced other private saving.)

As our discussion of TEE and EET system highlights, one must also consider tax treatment of contributions and withdrawals, in addition to tax relief during the accumulation stage, in evaluating the degree of tax relief. In the absence of tax relief, the net income to the individual of a contribution of €1 is:

$$(1-t_c)\left[(1+R(1-I))(1-A)\right]^Y(1-t_w) \tag{3}$$

where:

t_c - tax on contributions

t_w - tax on withdrawals

With tax relief on interest and assets during accumulation, the corresponding net income is:

$$(1-t_{c'})\left[1+R\right]^Y(1-t_{w'}) \tag{4}$$

where:

$t_{c'}$ - tax on contributions in tax-advantaged system

$t_{w'}$ - tax on withdrawals in tax-advantaged system

The tax relief ratio or the ratio of net income with tax relief to that without tax relief is thus:

$$\text{TRR}=\frac{(1-t_{c'})\left[1+R'\right]^Y(1-t_{w'})}{(1-t_c)\left[(1+R(1-I))(1-A)\right]^Y(1-t_w)} \tag{5}$$

where R' is the rate of return in the tax-advantaged system (we use R' here instead of R to allow for the possibility of some taxes on tax-advantaged returns during the accumulation stage).

[7] As we note below, this formula is in practice oversimplified, and there are often smaller taxes on income and assets during the accumulation stage in tax-advantaged systems.

This ratio can be decomposed into the product of three separate ratios:

$$TRR = CRR \times ARR \times IRR \quad (6)$$

where:

- CRR is the contribution relief ratio,
- ARR is the accumulation relief ratio,
- IRR is the income relief ratio.

Each of the component ratios corresponds to different timing of tax reliefs and taxes. For example, an EET system will typically have CRR > 1, ARR > 1 and TRR < 1, whereas a TEE system will have CRR = 1, ARR > 1, TRR = 1. Harmonization of tax systems requires that not only the overall level of tax relief be harmonized, but also that its timing be synchronized.

Two other related perspectives on the level of tax relief for pension funds can be examined. The first is the increase in yield from tax relief. Assume that an individual makes a stream of contributions to a pension fund and a savings account. The savings account yields *R*' net of tax, whereas the pension fund yields *R*''. The difference in the yields is the TIY or "tax increase in yield". A second related alternative is to build on the James (2000) MP1 for financial services costs. MP1 is the ratio of the tax-advantaged return to the taxed return. In this context, it measures how much needs to be invested in a pension fund to earn the same return as in a fully taxed fund. Because of the tax advantages, the MP1 is less than 1. For example, with interest taxation of *I* and no asset tax, the MP1 is (1 - *I*), so that only €(*I* - *I*) needs to be invested to earn the return of €1 in a non-tax advantaged account.

The MP1 is an attractive metric. But in its simplest form, it does not capture the effects of savings on asset taxes, reinvestment over the career, or differential taxes on retirement. To address these shortcomings, MP1 can be calculated on an internal rate of return basis over an entire career–in which case, it captures the effects of differential asset taxes and reinvestment of illiquid assets. For our example with asset taxes of 1 per cent, the relevant MP1 is 0.59 instead of the 0.70 in the absence of asset taxes. Alternatively, the MP1 can be calculated by computing end-of-period assets minus contributions during the period, divided by the beginning-of-period assets and subtracting one. Since MP1 may vary based on age, assets and income, we refer to the career-averaged MP1 as the AP1 to reflect that it is the average price of €1 of returns through the career. We use the terminology MP1-T and AP1-T to refer to the fact that these measures are applied specifically to taxes.

Table 2.1 shows the tax treatment of contributions, interest income (and/or assets), and pension income upon retirement in the Nordic countries in the context of the discussion above.

Table 2.1. Tax treatment of pension savings in the Nordic countries

	Tax treatment		
	Contribution	Accumulation	Benefits
Denmark	E	T	T
Finland	E	T	T
Iceland	E	E	T
Norway	E	E	T
Sweden	E	T	T

2.4 Administrative Costs of Pension Saving

While tax relief may increase the returns on pension saving for the individual, administrative charges may increase costs for the individual or for the government providing pension arrangements. As discussed in further detail in Chapter 5, cost structures for pension funds typically depend on the maturity of the scheme, and it is therefore useful to measure costs on a forward-looking basis. Fees and costs related to any funded pension scheme reduce future benefits and consequently beneficiaries' future consumption possibilities.

Kevin James' MP1 concept for pension charges can also be extended to look at charges from an average internal rate of return lifetime perspective. Because we also use the MP1 for taxes, we refer to the MP1 for administrative costs as the MP1-A. A career average MP1 based on internal rates of return during the accumulation and annuitization stages can also be used. We call this measure the AP1-C. The MP1 and AP1 are particularly useful tools, where measuring the baseline rate of return is difficult. Because MP1 and AP1 are ratios, the sensitivity to the underlying baseline is attenuated.

2.5 Returns on Pay-as-you-go Systems and Funded Systems

The individual return net of tax advantages and charges is the relevant one in investment decisions. Comparisons are often made between the relatively low returns on some state pay-as-you-go schemes and the relatively high returns on equity investment. For example, the *Financial Times* reported recently that the "rate of return [on individual accounts] would be higher – perhaps 6 to 8 per cent on past stock market performance, against the roughly 2 per cent the social security system will produce."[8]

In a classic paper, Paul Samuelson demonstrated that the real rate of return in a mature pay-as-you-go system is equal to the sum of the rate of growth in the labor force and the rate of growth in productivity.[9] In the decades ahead, fertility rates are expected to remain

[8] Nicholas Timmins, "The biggest question in town: America faces critical choices over the future of its most popular spending programme," *Financial Times*, March 20, 1998, page 23.
[9] Paul Samuelson, "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money," *Journal of Political Economy*, December 1958, pages 219-234.

relatively low, and the world's population is expected to age. World population growth is expected to slow from 1.7 per cent per year in the 1980s and about 1.3 per cent per year currently to 0.8 per cent per year, on average, between 2010 and 2050.[10] As a result, global labor force growth is also expected to slow, putting downward pressure on the rate of return under mature pay-as-you-go systems. Assuming a productivity growth of 2 per cent per year, the long-run real rate of return on a hypothetical global, mature pay-as-you-go system would be about 3 per cent per year.

In a dynamically efficient economy without risky assets, the real interest rate must exceed the growth rate. Therefore, in a dynamically efficient economy, pensions allowing market investments will *always* appear to offer a higher rate of return than a pay-as-you-go system. But appearances can be deceiving. The simple rate-of-return comparison, even without the diversification issues discussed below, is therefore fundamentally misleading for two reasons: administrative costs and transition costs.[11]

- *Administrative costs*. The simple rate-of-return comparison usually compares gross rates of return, even though administrative costs may differ even under idealized versions of pay-as-you-go and private defined contribution systems and, *ceteris paribus*, higher administrative costs reduce the net rate of return an individual receives.
- *Transition costs*. Since individual accounts are usually initially financed from revenue currently devoted to the public social security system, computations of the rate of return under individual accounts need to include the cost of continuing to pay the benefits promised to retirees and older workers under the extant system. Assuming that society is unwilling to renege on its promises to such retirees and older workers, the costs remain even if the social security system is eliminated for new workers and replaced entirely by individual accounts. Since the payments to current beneficiaries are not avoided by setting up individual accounts, the returns on individual accounts should not be artificially inflated by excluding the cost. The comparison of rates of return is thus misguided because higher returns in the long run can be obtained only at the expense of reduced consumption and returns for intervening generations.

An example may be helpful in making this point more explicitly. Imagine a simple pay-as-you-go system, under which one generation pays €1 while it is young and receives €1 when old. Generation A is old in period 1 and therefore receives €1. This €1 is paid for by Generation B, which is young in period 1. Then in period 2, Generation B is old and receives €1, paid for by Generation C, which is young in period 2, and so on. Table 2.1 below presents the operation of the system.

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[10] These projections are taken from the U.S. Bureau of the Census. See *Statistical Abstract of the United States 1998* (Government Printing Office, Washington: 1998), Table 1340.

[11] For further discussion of the simple rate of return comparison, see Peter R. Orszag, "Individual Accounts and Social Security: Does Social Security Really Provide a Lower Rate of Return?" Center on Budget and Policy Priorities, March 1999, http://www.cbpp.org.

Table 2.2. The simplified pay-as-you-go system

Period	Generation			
	A	B	C	D
1	+1	-1		
2		+1	-1	
3			+1	-1
4				+1

Assume further that the market interest rate is 10 per cent per period. Now, consider the system from the perspective of Generation C during period 2:

- Under the pay-as-you-go system, Generation C pays €1 during period 2 and receives €1 back during period 3. The pay-as-you-go system's rate of return is zero (which also follows from the assumption of zero productivity growth and zero population growth).
- Under an individual accounts system, Generation C would invest the €1 contribution and receive €1.10 in period 3. The rate of return would appear to be 10 per cent.

It would therefore appear that a switch from the pay-as-you-go system to individual accounts would produce substantially higher returns for Generation C–10 per cent rather than 0 per cent. But if Generation C put €1 into individual accounts during period 2, this €1 could not be used to finance the benefits for Generation B. Yet Generation B's benefits must be paid for somehow, unless society is willing to allow Generation B to go without benefits.

Assume that Generation B's benefits are financed through borrowing, and that the interest costs are paid for by the older generation in each period. With an interest rate of 10 per cent, the interest payments would cost €0.10 per period. The net benefit to Generation C during period 3, therefore, would be €1 (€1.10 from its individual accounts minus €0.10 in interest costs). Thus, Generation C would earn a zero rate of return, just as under the pay-as-you-go system, once the interest costs are included. Indeed, for Generation C and each generation thereafter, *the extra return from the individual account is more apparent than real: it is exactly offset by the cost of the debt that financed Generation B's benefits.*

Other assumptions about financing the debt do not alter the basic conclusion that the simple rate-of-return comparison is misleading. For example, if borrowing financed benefits, but the younger generation rather than the older generation paid for the interest costs in each period, Generation C would enjoy a 10 per cent rate of return. But Generation D and all subsequent generations would receive a zero rate of return; these generations would pay €1.10 while young and receive €1.10 when old. (The €1.10 paid when young would consist of €1 in deposits into the individual accounts and €0.10 in interest costs on the funds borrowed. The €1 in deposits, at a 10 per cent interest rate, would produce €1.10 in benefits when old.) The higher return for Generation C would in effect be paid for by

requiring all future generations to earn a zero rate of return on a larger contribution base (€1.10, rather than €1).

Finally, note that if the transition costs were financed through tax revenue rather than debt, the rate of return would indeed increase although that is purely a function of the broad prefunding, not the privatization. In particular, the higher rate of return would result regardless of whether the additional funding were routed through individual accounts or a public trust fund, as long as the trust fund were allowed to hold the same type of assets as individual accounts. It is the additional funding, not the individual accounts themselves, that is crucial to producing the higher rate of return.

Another important point with reference to rates of return is that the standard formulae give rates of return on a *mature* pay-as-you-go system. In the early years of such a system, however, beneficiaries receive a substantially higher rate of return than the formula would suggest. Consider Generation A from the example above. This first generation in the pay-as-you-go system received €1 in benefits but had not contributed anything to the system. Generation A's rate of return thus was infinite.

In a similar vein, early beneficiaries under the Social Security system in the United States received extremely high rates of return because they received benefits disproportionate to their contributions. They contributed for only a limited number of years, since much of their working lives had passed before the collection of Social Security payroll contributions began. The earliest beneficiaries under Social Security, those born in the 1870s, enjoyed real rates of return approaching 40 per cent.

Table 2.3. Average rate of return on US Social Security by cohort

Year of birth	Average annual real rate of return
1876	36.5 per cent
1900	11.9 per cent
1925	4.8 per cent
1950	2.2 per cent

Source: Leimer 1995, Table 3

This decline in rates of return from the earliest groups of beneficiaries is a feature of any pay-as-you-go system, under which the early beneficiaries receive very high rates of return because they contributed little during their working years. The rate of return for subsequent beneficiaries necessarily declines. As the system matures, this decline in rates of return may be attenuated or exacerbated by changes in productivity and labor force growth rates.

2.6 Risk and the Choice of Pension System

The amount of income risk individuals bear differs substantially across types of pension systems. The sources of risks to individuals include:

- *Investment risk*. Equity returns are volatile and therefore the value of the accumulated fund has a high variance under a pension system involving such equity investments.
- *Labor market risk*. Workers face risks associated with the imperfect predictability of their wages and labor market status, both of which contribute to their pension.
- *Annuitization/longevity risk*. Annuity rates are closely tied to rates of the underlying investment vehicle. The investment portfolio for annuities has typically less risk than the investment portfolio during the accumulation stage. If the individual does not annuitize, he bears longevity risk. For pay-as-you-go pension systems, these demographic risks are borne by the state.
- *Other demographic risks*. In pay-as-you-go systems, the volatility of migration and fertility patterns are also important. These volatilities also will influence funded systems through their general equilibrium implications.
- *Inflation risk* arising from incomplete indexation of benefits. Inflation also erodes the value of normal annuities.

For defined benefit supplementary pensions, the largest risks are labor market risks and inflation. With pensions based on wages and years of service, the individual's pension is affected directly by lack of promotion or loss of job. In addition, pensions in payment or deferred pensions may be incompletely indexed so inflation risk may be important. On the other hand, investment and annuitization/longevity risks are restricted to indirect effects that feed through to changes in contribution rates and discretionary benefit increases, and which may be shared across several generations rather than being concentrated on only one generation.

In defined contribution pensions, individuals typically will bear investment and annuitization/longevity risks that in defined benefit plans are at least partially employer risks. Workers would obtain a much higher pension retiring in years when equity and bond markets are booming than when they are stagnating. To illustrate this, workers who had invested their balances in personal plans in the US and retired in 1999 would have obtained 180 per cent higher replacement ratios than workers retiring in 1995, cf. Alier and Vittas (1999).[12]

The risks embodied in equity investments by individuals are underlined by some recent work done by Gary Burtless of the Brookings Institution in the US.[13] Burtless studied the pensions that US workers would have achieved if they had invested 2 per cent of their earnings in stock index funds each year over a 40-year work career and converted the accumulated balance to a retirement annuity upon reaching age 62. Workers reaching age 62 in 1968 would have earned a pension of 39 per cent of final salary whereas a worker

[12] Max Alier and Dimitri Vittas (1999), "Personal Pension Plans and Stock Market Volatility," paper presented at World Bank conference: New Ideas About Old Age Security, September 14-15, Washington DC.
[13] Gary Burtless (1998), Testimony before the Committee on Ways and Means, Subcommittee on Social Security, U.S. House of Representatives, June 18, available at www.house.gov/ways_means/.

retiring only six years later would have received a pension of only 17 per cent of final salary.

Given the degree of risk, there is some concern that individuals make appropriate investment choices. Even in the US, where there is a high level of financial education, more than half of all adults do not know the difference between a stock and a bond.[14] One policy option is to restrict the investment choices of individuals, with the typical policy recommendation involving mandatory investment in index funds. Such a policy may reduce the need to educate workers about financial market risks and returns, but could also leave workers with excess risks relative to their optimal portfolio and induce capital market distortions if the funds represent a significant share of the market.

One way in which risks to individuals may be reduced is by smoothing returns through a participating policy in which reserves are built up when equity returns are high and drawn down to provide better payoffs when equity returns are low. A substantial fraction of personal pensions in the UK were traditionally issued on such a *with profits basis*. The problem with such an approach is a potential lack of transparency as well as the capital costs of smoothing returns.

Another important aspect of the risk issue is that a diversified, partially funded system may have beneficial portfolio effects even if there are long-term rate of return differentials. Merton (1983), Merton, Bodie, and Marcus (1987), and Dutta, Kapur, and Orszag (1999) show that combining an unfunded component (with a rate of return tied to earnings growth) with a diversified, funded component (with a rate of return tied to a market index) may reduce risk relative to a completely funded system.[15] The intuition is simply that partial funding provides access to an asset–the human capital of the young–that is not normally tradable on the financial markets, thereby providing further diversification relative to the set of assets available on financial markets. Boldrin, Dolado, Jimeno, and Peracchi (1999), studying the historical correlation among annual GDP growth, earnings growth, bond returns, and stock returns in the United States, Germany, United Kingdom, France, Italy, and Japan, find that the correlations in all countries are substantially less than one, and often negative. They conclude that "diversification of risk provides an additional reason to invest in both human and physical capital."[16] Dutta, Kapur, and Orszag (1999) find that, based on historical data, the optimal funded share of pensions is highest for the US, Germany and UK and much lower for France and Japan.

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[14] Arthur Levitt (1998), speech at the John F. Kennedy School of Government, Harvard University, October 19.

[15] Robert Merton, "On the role of social security as a means for efficient risk sharing in an economy where human capital is not tradable," in Zvi Bodie and John Shoven, eds. *Issues in Pension Economics* (University of Chicago Press: Chicago, 1983); Robert Merton, Zvi Bodie, and Alan Marcus, "Pension Plan Integration as Insurance Against Social Security Risk," in Zvi Bodie, John Shoven, and David Wise, eds., *Issues in Pension Economics* (University of Chicago Press: Chicago, 1987), and Jayasri Dutta, Sandeep Kapur, and J. Michael Orszag, "A Portfolio Approach to the Optimal Funding of Pensions," May 1999.

[16] Michele Boldrin, Juan Jose Dolado, Juan Francisco Jimeno, and Franco Peracchi, "The Future of Pension Systems in Europe: A Reappraisal," *Economic Policy*, forthcoming.

These results point to the importance of looking at risk in analyzing pension systems; standard deviations of returns are a common measure of looking at such risk. Another approach is to look at inequality of returns over time, using tools from the economics of inequality. For example, a Gini coefficient reflects how dispersed rates of return are for an average individual. In the figure below, we sort returns by size. If returns were equal, the 'Lorenz' curve in the figure below is a straight line. If returns were very unequal over time, the 'Lorenz' curve would be very far from the straight line, as shown by Curve B in Figure 2.2.

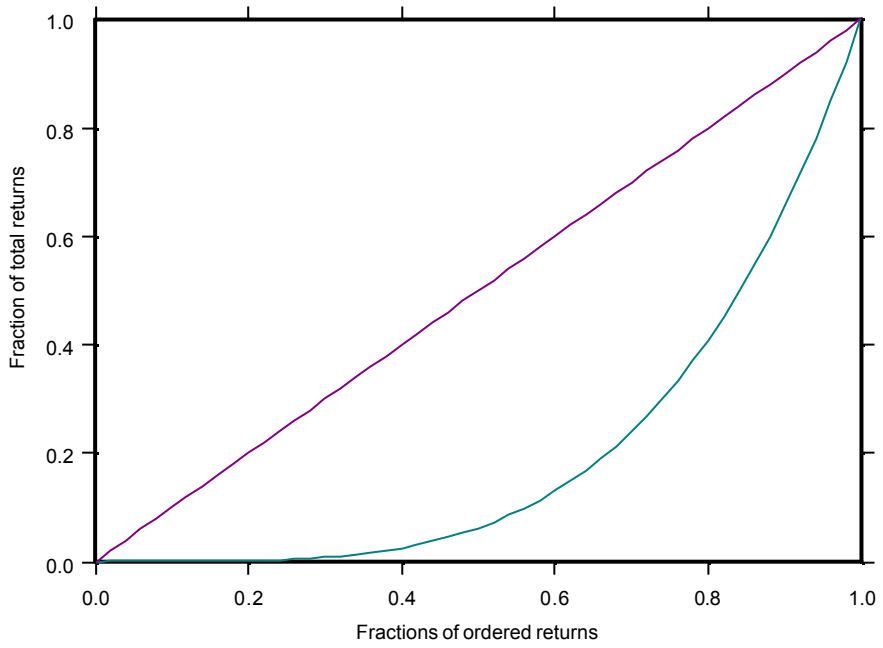

Figure 2.2. *Inequality of returns over time*

2.7 Redistribution

An important role of the public sector in pension provision is in providing redistribution: both from poor to rich and also to those, such as women, who have taken time off the labor market for bearing children and taking care of the disabled and less fortunate. Indeed, effective public systems for preventing old age poverty can be found in all the Nordic countries. In the context of multipillar pension systems, redistribution typically takes place in the first pillar since the lifetime poor do not contribute enough (while working) in occupational pension schemes to sustain minimum standards of living (while retired). For example, approximately 29 per cent of households in the poorest quintile of households in selected OECD countries received pensions, relative to 46 percent of the top quintile. And occupational pensions accounted for only 3.4 per cent for the bottom quintile on average,

relative to 23 per cent of income for the top quintile.[17,18] The scope of redistribution within public systems is usually a function of how much is paid in benefits. The UK National Insurance tax system has a high degree of redistribution, as does the US system, whereas countries with larger public systems, such as France and Germany, have considerably less redistribution. As Folster (1999) has indicated, a careful distinction needs to be made between income redistribution and lifetime redistribution in assessing welfare systems. One related issue is that socioeconomic differentials in mortality tend to reduce the progressivity in pension systems.[19]

Redistribution is also a significant issue within the context of supplementary pensions. Defined benefit pensions, for instance, can include the following types of redistribution:

- *Redistribution from young to old*. Older workers often receive higher marginal increments to pension wealth than younger workers do in defined benefit plans. This also can make older workers more expensive and hence more likely to be replaced.
- *Redistribution from leavers to stayers*. Workers changing jobs often suffer portability losses (cf. above) relative to those staying in the scheme their whole career.
- *Redistribution from low wage growth to high wage growth*. Because contributions to defined benefit plans are based on current salary, not anticipated wage growth, there is a cross-subsidy from those with low wage growth to those with high wage growth. This cross-subsidy can be quite significant in final salary schemes.
- *Redistribution between low and high earners*. Scheme designs may benefit the low earners by explicit or implicit redistribution of pensions in payment.

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[17] World Bank (1994), *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth*, A World Bank Policy Research Report, Oxford University Press, p. 185.

[18] Although informative, the figures are not adjusted for age. One could suspect that the average age of the poorest quintile is lower than that of other quintiles (more students , etc.) and hence that pension income could be less common in this quintile.

[19] Steuerle and Bakija (1994) find that even accounting for differential mortality rates by income, the lifetime rate of return on contributions in the U.S. Social Security system is higher for lower-income workers than for higher-income workers. On the other hand, Steuerle and Bakija find that net transfers in absolute dollars are higher for higher-income workers. These results raise the question of whether "progressivity" should be evaluated on a relative or absolute dollar basis. Even on a net transfer basis, the intra-generational transfers are expected to be reversed (i.e., become progressive) in the near future. See Eugene Steuerle and Jon Bakija, *Retooling Social Security for the 21st Century* (Urban Institute Press: Washington, 1994), pages 115-126. Other studies find mixed results for the progressivity of the Social Security system on a lifetime basis. See, for example, D.M. Garrett, "The Effects of Differential Mortality Rates on the Progressivity of Social Security," *Economic Inquiry,* Volume 33, July 1995, and J.E. Duggan, R. Gillingham, and J.S. Greenlees, "Progressive Returns to Social Security? An Answer from Social Security Records," Department of the Treasury, Research Paper No. 9501, 1995. For a summary of the literature, see Dean R. Leimer, "Lifetime Redistribution under the Social Security Program: A Lifetime Synopsis," *Social Security Bulletin*, Volume 62, No. 2, 1999, pages 43-58.

There is a fundamental conflict in employer pension schemes providing redistribution in that employers want to maximize incentives for workers to stay on the job and work hard. Final salary schemes tend to have the best incentives but the worst redistributive properties. Career revalued schemes are less redistributive but have worse incentives and therefore are found much less in practice.

Defined contribution schemes also typically contain some redistribution. For example, the annuitization phase may involve complex socio-economic cross-subsidies. However, it is generally acknowledged that redistribution in pure defined contribution schemes is less significant than in defined benefit schemes. At the same time, defined contribution schemes may have guarantees or other features, such as smoothing of returns, which introduce redistribution either between cohorts or income classes.

Redistribution in pension systems can be measured by the inequality in rates of return to contributions. For example, if there is a subsidy from those who switch jobs frequently to those who stay in jobs for their whole career, it will be captured by inequalities in the rates of return for contributions.

2.8 Incentives

A final core issue in pension analysis is the role of incentives. It is a well-established fact that disincentives to work depend on the preferences for leisure, which usually become stronger with higher income and older age. The trend in most industrialized counties is that labor force participation of older workers is declining. 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.[20] This huge fall in participation of the oldest in the labor force constitutes a rise in unused production capacity in the economy, a lower tax base, and an increased burden on pension and fiscal systems. It is therefore of critical importance to design pension systems that do not entail incentives for early retirement and provide appropriate incentives for delaying retirement.

Workers in public defined benefit plans may have incentives to retire earlier than workers in defined contribution plans if the early retirement penalties are too light, as they often are. The exact effects depend on what kind of salary scheme the contributions are based on and on the age earning profiles. The theory predicts that in systems with high replacement ratios, workers would be tempted to retire early. In a recent study, Blöndal and Scarpetta (1998) find no clear relationship between high replacement rates and early retirement.[21] This can partly be explained by the fact that in some countries when workers retire early, they are penalized by actuarial adjustments. Accrual rates at older ages seem to have a significant impact on the retirement decision. In Chapter 4, we also argue that labor demand effects are also crucial in understanding early retirement.

[20] Richard Disney and Edward Whitehouse (1999), "Pension Plans and Retirement Incentives," SP Discussion Paper No. 9924, World Bank, August.
[21] Blöndal and Scarpetta (1998), "The Retirement Decision in the OECD Countries," Economics Department Working Paper No. 202, OECD, Paris.

When the income-tax system is progressive, the difference between the tax on earned income and the tax on income from pensions distorts decisions in favor of early retirement. Also, if taxes on earned income are higher than taxes on pension benefits, an incentive for early retirement is created.

A related issue arising in the context of private occupational 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. Because firms do not internalize the costs, more employees retire early, leading to higher costs to the state than if firms were forced to bear the cost burden.

An important aspect of the early retirement/incentive problem, particularly in countries such as the Netherlands and, as noted in this report, some of the Nordic countries, is disability. Disability benefits are often substitutes for early retirement pensions as an unemployment reduction mechanism for the young.

The incentives inherent in different pension systems can be examined by looking at the internal rates of return to pension contributions, and how they depend on the retirement age. An actuarially fair system has internal rates of return independent of age, whereas a socially optimal solution should have increasing rates of return. As discussed in Chapter 4, such a system would encourage workers to work longer and bear the full social cost of their withdrawal from the labor market.

2.9 Summary

In this chapter, we have presented a conceptual outline and introduction to pension issues, using the internal rate of return as a metric. We have reviewed issues of returns, risk, redistribution, incentives and taxation in the context of pension system design.

Chapter 3
Overview of the Nordic Pension Systems

3.1 Introduction

Across the Nordic countries, governments have in recent years been reforming their pension systems to meet the coming demographic challenges.[22] The systems in all five countries have evolved since their inception early last century, and this chapter summarizes their current provisions. In particular, it provides an overview of the extant pension system in each Nordic country, including both public and occupational pensions. It focuses primarily on retirement benefits, but also covers disability, spousal, and survivor benefits.

The generic Nordic pension system combines a public, means-tested minimum benefit, a public earnings-related component, and occupational pension coverage. The normal retirement age is typically between 65 and 67, usually with earlier retirement available for those willing to accept reduced annual benefits. In Finland, the public and private pension systems are formally integrated; in the other countries, the systems are informally integrated. Many of the combined public-occupational systems are designed to produce a replacement rate of 60 to 70 per cent. The private systems in the Nordic countries rely heavily on with-profits insurance funds, the provision of which is largely dominated by local companies.

Despite these similarities, however, there are also substantial differences in the welfare systems across the Nordic countries. An examination of the institutional details of each country's pension system, as undertaken in this chapter, highlights that there is no simple monolithic Nordic welfare model.

Each of the country summaries below is arranged as follows. An introduction reviews the basic features of the system. A second section reviews the state pension system. A third section covers public-sector pensions. A fourth section reviews private provision, and a fifth section reviews supplementary, voluntary provision as well as complementary savings products for retirement.

[22] The exchange rates used to convert local currencies to euros date to 4 April 2000. The resultant exchange rates for one euro are: 7.4401 DKK, 5.94573 FIM, 70.29 IKR, 8.1254 NOK, and 8.2768 SEK.

3.2 Denmark

3.2.1 Overview

Denmark adopted a system of old age insurance in 1891 and a disability insurance system in 1921.[23] In the initial old age insurance system, everyone above age 60 with no means of support was, in principle, eligible for a pension, the size of which was determined by local officials, based on perceived need. By 1960, the system had evolved into a uniform one in which everyone above age 67 was entitled to a pension. Between 1960 and 1999, minor reforms were enacted, e.g., in how means testing was carried out.

Denmark's current system of public old-age pensions and disability benefits combines a flat-rate pension with a small earnings-related pension. Early retirement is currently very common, with very few Danes waiting until the official age of 67 to retire. Such early retirement is encouraged by a generous system of early retirement payments through the so-called post-work schemes. Indeed, the generosity of these schemes is such that lowering the state pension retirement age from 67 to 65 in 2004 is anticipated to *reduce* overall government costs, because reducing the state pension retirement age restricts access to the more generous early retirement payments provided through the post-work schemes.

A particularly important feature of the Danish pension system is the extensive system of labor market pensions. The Danish labor market model involves collective agreements formed among the social partners that include the labor unions, the employer's associations, and the government. Over 80 per cent of Danish employees are members of trade unions, and this high level of coverage facilitates collective agreements. The vast majority of occupational schemes are defined contribution.

In addition to these private occupational schemes, workers often have personal pensions. Figure 3.1 shows the coverage of different private pension schemes by age in the population.

[23] Social Security Administration, *Social Security Programs throughout the World 1997,* page 103.

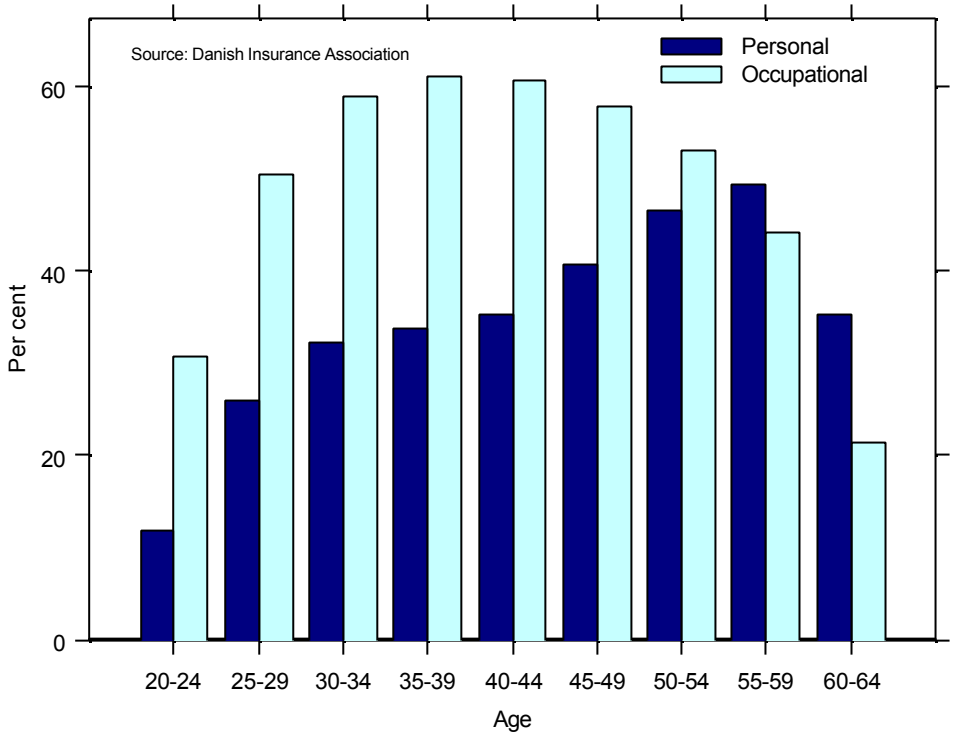

Figure 3.1. *Percentage contributing to a private pension scheme in Denmark in* 1998

Occupational pension coverage is over 60 per cent in the age range 35-44 and many of the remaining people have personal pension arrangements. The number of people with personal pension arrangements rises sharply with age and is over 50 per cent as individuals approach retirement age. This healthy coverage of private pensions, particularly occupational pensions, is a relatively recent phenomenon in Denmark, however. Before the 1980s only about one-third of employees were covered by a labor market pension scheme.

The formal Danish pension system thus consists of four elements:

- A public pay-as-you-go plan
- A funded public plan (ATP)
- Funded labor market schemes, and
- Funded private pension schemes

We examine each element in more detail below.

3.2.2 Public Pension System

Public pension benefits in Denmark consist of three basic components:

- A basic flat-rate benefit (FP), with a means-tested supplement,

- An older flat-rate funded Labor Market Supplementary Plan (ATP), and
- A new funded supplementary pension (SP) paying a flat-rate 10-year annuity from age 67 to age 76

These three schemes together provide a relatively generous flat-rate retirement income, which means that elderly poverty is relatively low in Denmark.[24]

3.2.2.1 Contributions

The FP scheme is funded on a pay-as-you-go basis out of tax revenues. Other welfare programs are funded by an earmarked Social Security tax introduced in 1994. The Social Security tax applies to employees and self-employed workers, who must contribute 8 per cent of their gross income (minus any employee contributions to employer-sponsored pension plans). Since 1997, employers must also pay an earmarked Social Security tax. This tax rate was 0.33 per cent of payroll in 1998 and 0.28 per cent in 1999 and will be discontinued in 2000.

Contributions to the ATP are a flat annual rate of DKK 895 (€120) for employees and DKK 1,789 (€240) for employers. (Some public sector employees pay a lower flat-rate contribution and receive correspondingly lower benefits.) ATP contributions are set as part of the wage bargaining process and have changed four times since 1964. The average ATP contribution has fluctuated around one per cent of the average wage.

The SP pension is financed out of a one per cent tax on the gross salary of all employees.

3.2.2.2 Benefits – Normal Retirement

Basic Pension
In 1999, the FP basic benefit was DKK 96,048 (€12,909) per married couple, and DKK 48,024 (€6,455) per unmarried person. The means-tested supplement to the basic benefit ranged up to DKK 42,936 (€5,771) for a married couple and DKK 47,616 (€6,400) for a single person.

To qualify for the full means-tested supplement, annual income must be under DKK 45,000 (€6,048) if single or DKK 90,300 (€12,137) if married. The means-tested supplement is reduced with increasing income: if annual income exceeds DKK 203,700 (€27,379) if single or DKK 233,400 (€31,371) if married, then no supplement is paid. For those receiving the full means-tested supplement, the basic benefit (with supplement) thus totaled DKK 138,984 (€18,680) for a married couple and DKK 95,640 (€12,855) for a single person. The full FP pension is available to citizens and to others having resided in Denmark for at least 40 years after age 15; a reduced pension is available to those having lived at least 10 years, but less than 40 years, in Denmark.

[24] In 1997, only 150,000 individuals belonged to families with less income than half the median income, down from 200,000 in 1987. Of these, 16,000 individuals were pensioners. Studies have shown that poverty falls with age in Denmark, and that the lowest poverty rates are found among pensioners. Only 2.4 per cent of pensioners in 1997 were classified as living in poverty, compared with 3 per cent of the total population. Source: Ministry of Economic Affairs (1999), *Familier og Indkomst* [Families and Income], ch. 4.

The FP pension is indexed each year to the increase in wages (with a two-year lag). The pensions are ordinarily recomputed yearly (based on income from other sources), but may be computed more frequently if there are major changes in income from other sources.

ATP Pension
The ATP program, created in 1964, covers all workers working more than 9 hours a week. Pensions are based on investment income from contributions, with guarantees on returns. There is no income test under the ATP program, and pensions are payable abroad. Pensions are payable in effect as with-profits annuities, with guarantees that payments will not decline from the initial level.

Supplementary Pension
The SP program was introduced in 1999; it replaces the temporary DMP program created in 1998. The SP pension is funded; contributions amount to a 1 per cent tax on the gross salary. Under the SP plan, all pensioners receive a 10-year annuity, beginning at age 67 and ending at age 76. From 2004, this 10-year annuity begins at age 65. The value of the annuity is not earnings-related; all full-time workers receive the same amount (part-time workers receive a lower amount).

Box 1. ***ATP Fund Management***

The ATP scheme, currently with assets of about 25 per cent of GDP, invests largely in Denmark, including equity and corporate and mortgage bonds. Because it is such a large fund and has existed since 1964, its investment performance and governance could provide some interesting lessons for funded public pension funds in other countries.

As a public pension fund representing a majority of the Danish population, ATP has scale economies enabling it to operate at stunningly low expense, with costs per member at about 18 DKK (about €2.4) consistently from 1994 to 1998. These costs correspond to approximately 10 basis points, which is considerably lower than the average costs of retail private provision in the US, UK or elsewhere and is competitive with institutional fund managers. The ATP is so efficient administratively that it provides outsourced administrative services to private occupational schemes. Indeed, more of the ATP staff currently work on administering outsourced plans than on the ATP itself, and close to 700,000 Danish workers have their private pensions administered by this service.

The ATP is, however, remarkable not only for its low administrative expenses. Public pension funds in Malaysia and Singapore also have low expenses. What is particularly special about Denmark is that there has been little evidence of any political interference with asset management decisions, as has been common in other countries. As indirect evidence of the independence of the ATP decision-making process, ATP returns typically exceed performance benchmarks as well as those achieved by private pension fund managers. This stunning performance has occurred despite the lack of any formal rules against political interference. Indeed, the government has representatives on the ATP board, as do the employers' associations and unions.

Source: ATP annual reports.

3.2.2.3 Benefits Early/Late Retirement

The normal retirement age in Denmark is 67, although legislation passed in 1999 will reduce it to 65 starting in 2004. This *normal* retirement age, however, is misleading: the average retirement age in Denmark is now about 61. The old-age pension system as such does not encourage people to take early retirement, but a special early retirement scheme introduced in 1979 has provided such incentives. In particular, individuals with unemployment insurance for twenty years can begin receiving a post-employment wage at the age of 60. Early retirement is especially pronounced among the unskilled and among skilled persons for whom the replacement rate is relatively high.[25]

For the FP components of the system, early retirement benefits (equal to the FP basic benefit plus mean-tested supplement) are available as early as age 50 for those demonstrating a permanent health problem; socioeconomic factors are taken into account in the disability evaluation. The benefits awarded depend on the age of eligibility. If the pension is awarded before age 60, the person receives the FP basic benefit plus mean-tested supplement plus an additional supplement of DKK 12,204 (€1,640). If the pension is awarded after age 60, the person receives the FP basic benefit plus a means-tested supplement. At age 67, the benefit for early claimants is replaced by the FP basic pension (that includes the mentioned means-tested supplement). In addition, a special partial retirement pension is available to workers between the ages of 60 and 67 continuing to work 12 to 30 hours a week (with a maximum benefit of DKK 75,396 (€10,134) if work is reduced to 12 hours per week). Within the ATP component, no early retirement is allowed. In Table 3.1 we show the main early retirement schemes in Denmark and their characteristics.

The temporary early retirement pension scheme was closed to new entrants in 1995/1996, and the post-work salary schemes are undergoing substantial reforms to reduce early retirement.

[25] Ministry of Economic Affairs

Table 3.1. Main early retirement schemes and their characteristics

Scheme	Eligible group age	Special conditions for eligibility	Is continued work possible?	Number of recipients in 1995 (1000)
1. Disability pension	18-66	Minimum 50% disability; social and economic criteria	Partly	272
2. Part-time (old age) pension	60-66	10-year contribution to ATP: reduction of hours worked	Part-time	5
3. Post-work salary	60-66	Long membership of UB scheme; eligible for UB	Very limited	117
4. Part-time post-work salary	60-66	UB as above: reduction of hours worked	Part-time	1
5. Temporary early retirement pension	50-59	Conditions of post-work salary if work continued until age 60	Very limited	45
6. Prolonged unemployment benefit	50-59	50 when UB expires	No	Few

Note: Post-work salary and part-time post-work salary is now combined in one scheme including an option for continuing to work.
Source: *European Economy* (1998), "Income Benefits for Early Exit from the Labour Market in Eight European Countries: A Comparative Study, No. 3, European Commission and authors research.

Disability pension eligibility is based roughly on an ability-to-work test. Disabled workers receive generous housing benefits and reasonably generous benefits. These higher benefits raise moral hazard concerns. However, new rules passing on much of the cost of disability cover to local authorities making judgments on eligibility have reduced disability benefit claims dramatically. Determination of disability is based on the reduction of the capacity to work in any occupation. The size of the pension depends on whether the capacity to work is reduced by more than half, more than 2/3 or is almost completely lost. For people over 50, socioeconomic criteria can be used as well. Some continued work is possible for those receiving disability benefits, and such individuals can also join part-time work schemes, where the government pays part of the salary, without losing benefit eligibility. The FlexJob program, described in more detail in Chapter 4, is an alternative to receiving a pension.

The post-work salary schemes are similar in terms of their payments to unemployment benefits. An individual must have paid into an unemployment fund at least 20 of the past 25 years. Members retiring at age 65 satisfying these contribution conditions can receive up to 90 per cent of pre-retirement pay for the first 2½ years and 82 per cent of the maximum unemployment benefit thereafter. Those delaying retirement until age 63 receive benefits at the higher rate until retirement.

At the end of April 1999, the Danish Parliament adopted several changes to the existing voluntary early retirement pay scheme (post-work salary) in order to increase the labor supply. The state pension age was also reduced to 65 years for everybody turning 60 on or

after 1 July 1999. The new rules apply to voluntary early retirement for unemployment insurance fund members turning 60 on or after 1 July 1999.

People can still retire under the voluntary early retirement pay scheme when they turn 60. But the flexible scheme allows people to retire gradually from the labor market because they can now work for an unlimited number of hours against a deduction from the voluntary early retirement pay.

The main rule of eligibility for voluntary early retirement pay is that a person must have been a member of an unemployment insurance fund–and paid contributions to the voluntary early retirement pay scheme–for at least 25 of the past 30 years. There is, however, a transitional scheme. This scheme ensures that everybody satisfying the membership condition under the previous rules can retire under the new rules for voluntary early retirement. Before this amendment, the main eligibility rule was membership in an unemployment insurance fund for at least 20 of the past 25 years, and no special contribution to the voluntary early retirement pay scheme was required.

If the person retires under the scheme less than two years after age 60, the retirement pay cannot exceed an amount corresponding to 91 per cent of the maximum unemployment benefits. Before the amendment, retirement pay was 100 per cent of the maximum unemployment benefits the first 2½ year and 82 per cent of it thereafter.

If a person retires under the voluntary early retirement pay scheme before age 62, all pension schemes influence the retirement pay. This applies whether the pensions are straight life annuities, limited annuity schemes, money purchase schemes or other pension schemes. Both private and occupational pension schemes must be included. It is irrelevant whether the pension is payable or not.

There are several economic advantages for people who stay longer in the labor market and postpone voluntary early retirement:

- They can qualify for voluntary early retirement pay at the highest rate of unemployment benefits (retirement after age 62 and at least 3,120 hours work after age 60).
- There are more favorable deductions for pensions if one retires after age 62 (the person must have had paid work (full-time insured) or been self-employed (combination insured) for at least 3,120 hours after age 60) than if retirement is taken before age 62.
- Finally, there is the possibility of earning a tax-free premium (The premium is higher the longer the person works after age 62).

Retirement can be delayed beyond age 67 (or 65, once the official retirement age changes). For each year of delay until age 70, the ATP pension (but not the FP or supplement components) is increased by 10 per cent.

There is no formal retirement test in order to claim benefits. However, someone aged 67 or over with a high wage income will face special means testing of his or her pension. If wages exceed about 140 per cent of the average wage among prime-age workers, the means testing eliminates the entire pension. Any such reduction in benefits is not recaptured later.

3.2.2.4 Special Features

The basic FP pension does not provide a specific survivor benefit. Nonetheless, in certain cases, the spouse may be entitled to other benefits, such as a means-tested lump sum of 10,000 DKK (means tested) (€1,344).

The ATP provides a lump-sum death benefit of 35 per cent of the capital value of the worker's pension to a surviving spouse. Since 1992, employees, aged at least 67, must have contributed to the ATP for 10 years and been married for at least 10 years for the surviving spouse to be eligible for this benefit. The ATP also provides a surviving child benefit to any of the deceased employee's children under the age of 18.

Workers are entitled to public disability benefits if at least half of their earnings capacity is permanently lost. For disabled workers under age 60 losing all earning capacity, the public disability benefit is equal to the basic FP retirement pension (DKK 48,024 (€6,455)) plus the means-tested supplement (DKK 47,616 for a single person (€6,400)), plus a disability allowance of DKK 23,364 (€3,140), plus an incapacity supplement of DKK 32,244 (€4,334). The total potential payment is thus DKK 151,248 (€20,329) for a single disabled worker. For totally disabled workers over age 60 and for workers under age 60 who are at least two-thirds, but not totally, disabled, the benefit is the basic pension, supplement, and disability allowance. For workers under age 67 who are at least half, but no more than two-thirds, disabled, the benefit is the basic retirement pension plus supplement, along with an additional supplement of DKK 11,892 (€1,598) if the worker is below age 60.

3.2.3 Public Sector Pensions

The Danish civil service pension scheme, although dating from 1849, grew most rapidly in the 1950s and 1960s. The scheme is unfunded. Civil service normal retirement ages are below the official retirement age of 67.[26] While the main civil service scheme is still defined benefit, fewer of the employees in the public sector are employed as civil servants

3.2.4 Private Pensions – Employer

Private pensions are common in Denmark: roughly 95 per cent of full-time workers, aged 41 to 50, have some sort of private pension, most frequently linked to their employment. But as noted above, this high private pension coverage is a relatively recent phenomenon.

[26] The official retirement ages for civil servants in Denmark are: army officers, age 60; police (in uniforms), age 63; state-employed (airports) and fireman (fire brigade), age 60. There is mandatory retirement at age 70 for public sector workers.

Occupational private pensions are known as *Labor Market Pensions* and are almost always defined contribution insurance contracts. The Labor Market Pension schemes are based on an agreement between the social partners. The schemes are compulsory for employees working in areas covered by collective bargaining agreements.

Under the Pension and Savings Fund Act, employees must be immediately vested in the benefits from their own contributions, and vested in the benefits from their employer's contributions after five years. In practice, almost all pension plans have full immediate vesting. The combination of the defined contribution approach and rapid vesting is believed to promote labor market flexibility, since it allows workers to move their pensions easily from one job to another. Workers changing jobs are also allowed to transfer their private pension to the new employer's plan without being taxed.

Most plans combine a lump-sum payout with an annuity. Lump-sum payments are taxed at a rate of 40 per cent, which, for some, is less than the personal income tax rate, whereas annuity benefits from a defined contribution plan are taxed as regular personal income. The lump-sum component is handled through a separate retirement account, often held either with an insurance company or a bank. As discussed below, tax-deductible contributions to lump-sum schemes are now limited.

Contributions are designed to produce a replacement rate (including state pensions) of 60 to 70 per cent of final salary. Contributions vary widely and range from 5 to 15 per cent. (In the few defined benefit plans in Denmark, the employee typically contributes between 2.5 and 7.5 per cent of earnings.) In the industry-wide pension plans of employees in the private sector, the employee typically contributes 2 per cent and the employer 4 per cent. The social partners (at the central level) negotiate contribution rates as part of wage bargains. The last negotiations included an increase in the contribution rate: as of 2004, the employee will typically contribute 3 per cent and the employer 6 per cent.

Labor market pension contributions are taxed at 8 per cent gross. Tax-deductible contributions to lump-sum schemes are allowed only up to a combined employer-employee total contribution of DKK 34,000 (€4,570). Beginning in 1999, contributions are only deductible at the maximum tax rate of local taxes (average 32.6 per cent) plus 13.5 per cent, even though the top income tax rate is of local taxes (average 32.6 per cent) plus 28.5 per cent (for income over DKK 258,400 (€34,731)).

Employers are required to prefund benefit promises. Pension funds and insurance companies must place at least 60 per cent of assets in low-risk investments, such as bonds, and a maximum of 2 per cent may be invested in any single stock. Since the majority of firms are relatively small, most pension plans are insured. Pension contracts are with-profits contracts with guaranteed rates of return, which was historically 4.5 per cent. The fee schedule for such insurance must, by law, be based on unisex mortality tables.

There is no general, mandatory retirement age under the private pension system. However, the typical retirement age for private pensions is 67. Private pension benefits can often be drawn as early as age 60.

Most private plans include survivor and disability benefits. Some defined contribution plans and most defined benefit plans may provide a pension equal to 60 per cent of the worker's pension to the surviving spouse, and 10 per cent to any orphans. Defined contribution plans often pay a death benefit as a lump sum or annuity. Collectively, industry-wide pension plans usually provide a life insurance benefit of DKK 60,000 (€8,064) to DKK 100,000 (€13,441), which is tax-free (although the premium is not tax deductible). In addition, private pension schemes often include a disability insurance component. The disability insurance payment, if warranted, is usually the same as the potential old age pension at the time of disability.

Under the Real Interest Taxation Law, accounts held in life insurance companies and pension funds are taxed during the accumulation phase on real (inflation-adjusted) returns above 3.5 per cent. The tax is not, however, applied to returns on equities, property, or index-linked bonds. This tax is being replaced by a nominal returns tax of 26 per cent starting in 2000. A separate tax of 5 per cent of the return on equities has been imposed since June 1998.

Private pension benefits are taxable income when drawn. However, annuity payments and lump-sum payments are treated differently: annuity payments are included in income, whereas lump-sum payments are taxed at a separate, flat rate of 40 per cent. In most cases, the 40 per cent tax rate on lump-sum payments is lower than the marginal income tax rate.

Private plans also usually provide disability insurance, often providing a benefit of between 50 and 80 per cent of salary, with no direct integration with public programs. Payment typically begins within three months of disability and extends until normal retirement age, death, or recovery.

3.2.5 Private Pensions – Individual

Individuals may take out individual pension savings accounts with banks or insurance companies. Full tax deductibility of contributions into these accounts requires annuitization or drawdown over a period of at least ten years. However, some limited tax advantages are available for lump-sum plans (also known as capital pension schemes), which pay out benefits between the ages of 60 and 70. The maximum deduction for lump-sum schemes in 1999 is DKK 34,000 (€4,570), and even then the deductibility is only at the maximum rate of local taxes (average 32.6 per cent) plus 13.5 per cent. In general, the market is split between banks and insurance companies (see Table 3.2).

Table 3.2. Contributions (millions of DKK) to personal pension scheme by provider

	1996	1997	1998
Banks	9,681	10,018	9,539
Insurance companies	6,827	7,480	7,628
Total:	16,508	17,498	17,167

Source : Danish Insurance Information Service, *Insurance and Pensions in Denmark* , (1999), p. 43.

The life insurance market in Denmark is reasonably concentrated with the largest 2 groups having a 38 per cent market share.[27]

3.2.6 Complementary Products

Complementary products in Denmark are dominated by housing. Home ownership is high in Denmark, and home equity constitutes most of personal savings outside of organized pension plans. Mortgage bonds are a common holding of pension funds. For example, at the end of 1998, 47 per cent of ATP assets was in Danish bonds, and 70 per cent of this was in mortgage bonds.

3.3 Finland

3.3.1. Introduction

Finland's approach to old-age pensions consists of a national pension scheme, statutory private and public sector earnings-related pensions, and voluntary pensions. If the private or public sector earnings-related pension does not provide proper income protection, the state pension supplements it. Both employers and employees are able to supplement the earnings-related cover with voluntary pension schemes. The pension system in Finland can thus be classified into three pillars:

- The national pension scheme (KELA pensions),
- Statutory private and public sector, earnings-related pensions (TEL, VEL, KVTEL, YEL, LEL, MYEL, TAEL, etc.),
- Private pensions.

The National Pensions Act of 1937 created a funded national pension system in Finland. Under this system, benefits were tied to accumulated contributions. The funds accumulated in the pension scheme assisted in the post-war reconstruction effort and supported state-directed industries. In 1957, the system was fundamentally changed. Flat-rate benefits were introduced, and the benefits were means tested. The method of financing changed

[27] Insurance and Pensions in Denmark, Forsikring og Pension, 1999.

from funding to pay-as-you-go. In 1966, income-tested assistance supplements were added to the national pensions scheme; in 1969, general survivors' pensions were introduced; and at the beginning of the 1970s, a partial disability pension was added. At the end of the 1980s, an early old-age pension was added. In the 1990s, a variety of reforms were enacted, including a reduction of public-sector pension benefits to private-sector levels, increasing the retirement age for public-sector workers from 63 to 65, and requiring employee contributions to employer-provided pension schemes.

The various components of the Finnish statutory earnings-related pension scheme developed over a number of years. The first earnings-related pension acts for private sector employees (TEL, LEL) came into force in 1962. The act for local government civil servants (KVTEL) followed in 1964 and for central government (VEL) in 1966. The farmers' scheme (MYEL) and others self-employed (YEL) started in 1970. The scheme for artists and certain other employee groups (TaEL) started in 1986 and in 1998 was extended to those on short-term contracts not covered by TEL.

Finland's National Pension scheme and the statutory earnings-related schemes together provide the following benefits:

- A flat, means-tested old-age pension plus an earnings-related pension
- A disability pension
- Survivor benefits for spouses and children
- Unemployment pensions for individuals, aged 60-64
- A part-time earnings-related pension

A review of the projections for pension expenditures, funds and contributions to 2050 indicates that the GDP share of total public pension expenditure (including public sector pensions) is likely to increase from 11 per cent to 16 per cent before 2050, with most of the increased cost arising between 2010 and 2030.[28]

3.3.2 The National Pension System

3.3.2.1 Contributions

The National Pension Scheme is a pay-as-you-go system, with revenues from a payroll tax on employers, along with general revenue infusions from the central government and value-added tax. The payroll tax, which applies to employers only, equals between 2.4 and 4.9 per cent of payroll, depending on the capital intensity of the firm.

3.3.2.2 Benefits – Normal Retirement

A full flat-rate pension of between FIM 26,472 (€4,452) and FIM 31,500 (€5,298) per year is available to residents, aged 65 and over, whose employment pension does not exceed FIM 2,990 (€503). It is reduced gradually for employment pensions above this threshold

[28] Tapio Klaavo, Janne Salonen, Erkki Tenkula, and Reijo Vanne (1999), *Pension Expenditures, Funds and Contributions to the Year 2050,* Eläketurvakeskuksen Monisteita.

and is completely phased out for those with employment pensions exceeding FIM 54,500 (€9,166) to FIM 64,560 (€10,858). Both the value of the flat-rate pension and the phase-out level depend on marital status and region, which is why ranges are given above.

The retirement age for the flat-rate pension is 65. The national pension cannot be drawn early. The rules for retirement under the mandatory private pension system are somewhat more complicated. The normal retirement age is 65, but, in some cases, retirement is currently possible as early as age 55 with little penalty (see below).

The flat-rate pension is indexed to the cost of living index.

3.3.2.3 Benefits – Disability

Survivor benefits are paid to the surviving spouse from both the state pension and the earnings-related pension plan (the TEL, cf. below) if the spouse is at least 50, disabled, or if there are dependent children under 18. Survivor benefits are not available if the surviving spouse is already receiving a retirement or disability pension.

The survivor benefit under the state plan is between FIM 1,623 (€273) and FIM 1,856 (€312) per month for the first six months. Survivors are also eligible for a means-tested supplement of between FIM 1,046 (€176) and FIM 1,233 (€207) per month (which is not limited to the first six months). Survivor benefits are transformed into retirement benefits at age 65.

3.3.2.4 Benefits – Early/Late Retirement

Early retirement is a major public policy concern in Finland. In 1998, labor force participation rates were approximately 55 per cent among 55-59 years old and only about 18 per cent among 60-64 year olds. These are the lowest participation rates by far in the Nordic countries.

Early retirement in Finland is possible through several channels: disability, early retirement, unemployment, and part-time early retirement. Table 3.3 reports the main early retirement schemes in Finland and their characteristics.

Table 3.3. Main early retirement schemes in Finland and their characteristics

Scheme	Eligible group age	Special conditions for eligibility	Is continued work possible?	Topping-up to a guaranteed minimum level	Number of recipents in 1998 (1000)
1. Disability pension	16-64	60% reduced working capacity and socio-econmic conditions	Limited	Yes, minimum pension	244,252
2. Partial disability pension	16-64	40-60% reduced working capacity	Partly	No	
3. Individual early disability	60-64	Reduced work capacity and not eligible for normal disability pension	Limited	Yes, minimum pension	43,795
4. Early old-age pension	60-64	None	Not in same job limited	Yes, reduced minimum pension	58,462
5. Part-time old-age pension	58-64	Works 16-28 hours per week	Partly	No	10,924
6. Unemployment pension	60-64	Unemployed at age 60	Limited	Yes, minimum pension	49,389
7. Farmers' early retirement aid	55-64	Desisted from farming	Not on the farm	No	42,696

Source: *European Economy* (1998), "Income Benefits for Early Exit from the Labour Market in Eight European Countries: A Comparative Study, No. 3, European Commission and authors research.

3.3.2.5 Taxation

Benefits are taxed as earned income. However, if the pensioner has no income other than the full national pension, he or she is exempt from taxation.

3.3.3. Public Sector Earnings-related Pensions

At the end of 1998, 2.12 million individuals had accrued pension rights in Finland. Of these, 645,000, or 30 per cent had accrued rights in three public sector pension schemes: the state employees pension scheme (VEL, 29 per cent of public sector coverage), the local government pension scheme (KVTEL, 69 per cent), and the Evangelical-Lutheran Church pension scheme (KiEL, 2 per cent).

The pension benefits of state employees have historically been larger than in the private sector. Before the 1990s, the full public sector pension replacement ratio was 66 per cent, accrued over 30 years, and general retirement age 63. But in the early 1990s, the benefits and the retirement age in the public sector were conformed to those in the private sector, so that employment contracts underwritten after 1992 embody 60 per cent replacement ratios, 40-year accrual, and a retirement age of 65, as in the private sector.

The State Treasury handles the earnings-related pensions of state employees, whereas the Local Government Pensions Institute attends to the provision of earnings-related pensions for municipal employees.

3.3.4 Statutory Earnings-related Pensions

Finland has an extensive system of mandatory earnings-related pensions, with virtually the entire private sector working population covered. These employer-based pensions are divided into a number of different types of schemes governed by different legislation. A majority of the private sector workforce is covered by TEL, partially funded schemes administered either as independent pension funds or by insurance companies. Separate schemes exist for the self-employed, seamen, farmers, and those with short-term employment.

The system is partially funded, with some unfunded schemes, such as those for the self-employed. In aggregate, about three-quarters of all current benefits are financed on a pay-as-you-go basis. In such a partially funded environment, in which workers may contribute to multiple pension funds in the course of their careers, a clearinghouse is particularly important. This clearinghouse function is performed by the Central Pension Security Institute (ETK), which registers pension rights and coordinates enforcement. When payment of pensions begin (e.g., upon retirement), actual payment is handled by the last relevant pension fund. But the ETK calculates the pension due the worker, and also coordinates the transfer of funds from the relevant pension funds and insurance companies. ETK data is also used to calculate pension rights for those wishing to contribute to voluntary supplementary arrangements, insuring that individuals do not build up more pension entitlements than permitted by tax legislation.

Insurance companies manage most private pensions, but firms with more than 300 employees may set up special pension funds. About 85 per cent of individuals are in plans managed by pension insurance companies. A particular feature of the system is the use of pension funds as a source of employer loans; from 1996, the maximum term of these loans was one to ten years. However, such loans are declining in importance. Most of the portfolio in Finnish pension funds is now in bonds.

3.3.4.1 Contributions

The contribution rules differ across the types of schemes, but the TEL scheme features employee contributions of 4.7 per cent of pay, and employer contributions, which average about 17 per cent. Employer contributions are based on the age of the employee.

Employers must make pension arrangements for all employees under age 65. Employees are required to contribute 4.7 per cent of salary to the employment pension, while the employer contribution varies. Under the TEL, small employers with fewer than 50 employees pay 17.3 per cent of payroll.[29] Larger employers with 50 or more employees pay

[29] Contribution rate for 2000.

between 11.6 and 22.8 per cent of payroll, depending on the age and gender of the employee. Employment pensions are financed by these employer and employee premiums.

Part of the contribution is the actuarial basis of funding one-third of the accrued rights for those between 23 and 54 years old, as well as the cost of funding disability and unemployment pensions. These parts of the contribution increase with age and depend on gender. The other part of the overall contribution is the pay-as-you-go cost of the unfunded benefits. The contribution rates for this component tend to be set more evenly across age, so that the end result is that older workers are not that much more expensive for firms. The social security payroll tax also depends on the size of the firm, with smaller firms (under 50 workers) paying a flat-rate contribution.

The TEL funding principles were changed in 1997. Individuals between the ages of 23 and 54 accrue pensions at 1.5 per cent per year, of which 0.5 per cent is funded (with a 3 per cent discount rate on liabilities). Asset returns below 5.25 per cent are kept in the fund and used to pay benefits; fund returns of more than 5.25 per cent may be returned to the employer. Before 1997, discount rates of 5 per cent were used; the fall in the discount rate to 3 per cent increased required funding and made the contribution profile less steep as a function of age. The impact of the 1997 reforms was thus to increase notional reliance on the pay-as-you-go component in the short term because the lower discount rates led to higher unfunded pension liabilities.

Contributions to the earnings-related pensions are tax deductible both to the employers and employees.

The TEL contributions also include funding for disability and unemployment, with sophisticated experience rating built into the premium calculations. For employers with more than 1,000 workers, this experience rating is 80%. For employers with fewer than 50 employees, there is no experience rating of premiums, and the disability pensions are paid as insurance benefits directly by the relevant pension fund. Insurance premiums that firms pay for disability pensions are based on the product of the disability incidence probability and the discounted value of disability pension payments. The premium is age-dependent, representing the higher incidence of disability and lower recovery rates as retirement age approaches. For the directly funded part of disability pensions, the firms pay a capital sum to the relevant pension fund or insurance company upon occurrence of the disability, with funding deficits and surpluses subsequently fully covered by the employer.

On average, disability pensions cost about 3.4 per cent of payroll in 1998. However, the funding cost is primarily concentrated in workers over 55, whereas old age pension costs only accrue with workers aged 23-54. The net result is that disability pension contributions do not result in an overall steep age-contributions profile.

A further component of mandatory employer contributions goes to unemployment pensions, which go to employees retiring early after age 60. Unemployment pensions are computed on principles similar to those for disability pensions. On average, the funded component of unemployment pensions cost 0.7 per cent of payroll.

Overall, about one-third of contributions go to the funded component of TEL. Administrative costs amount to about 5 per cent of contributions, a relatively low figure by international standards reflecting the statutory group nature of provision as well as the clearinghouse role played by ETK.

Prior to 1996, TEL funds were permitted a liabilities deficit of up to 30 per cent, provided that these liabilities were insured. In 1994, indeed, the government allowed a reduction in contributions during the recession of 2 per cent, with a repayment schedule of 0.4 per cent of wages between 1996 and 2000.

Contributions for other statutory earnings-related pensions are somewhat simpler. For instance, the seamen's pension (MEL) involves employers and employees each making contributions of 10 per cent, an amount covering roughly two-thirds of current pension expenditures, with the remainder covered by the central government. Self-employed (YEL) contributions are set independently of age and gender at the average TEL contribution rate, but are reduced by half in the first three years of self-employment for individuals under 43 years of age. In practice, the revenues from YEL contributions have been smaller than benefits, with funds not accumulating and deficits covered by the state. The situation of the farmers' scheme (MYEL) is similar. Farmers pay the same rate as YEL, but only for earnings over FIM 153,000 (€25,733) per year; lower earners pay contributions on a sliding scale. Again, MYEL contributions are not sufficient to cover the current benefit obligations so that the deficiency is covered by the State.

Box 2. ***The pooled component and the EMU***

Pension institutions in Finland are jointly responsible for the pay-as-you-go components of pensions. The premium covers old-age pension, disability insurance, unemployment and a so-called pooled component covering the pay-as-you-go pension expenditures paid from the clearing reserve. Costs of the pay-as-you-go expenditures are divided approximately in proportion to the wage bill of those insured in a pension institution.

The pooled component of the TEL-premium accounted for 13.9 percentage points of the total premium in 1999, i.e., approximately 65 per cent, and preliminary estimates indicate that it will be increased to 14.5 percentage points in the year 2000. The total amount of clearing reserve is at least 30 per cent of the annual amount of pooled expenditures. In case of a pension institution's bankruptcy, the uncovered pension liabilities are financed with the aid of the joint liability system.

Included in the pooled component is a special buffer reserve, amounting to 1.1 percentage points, i.e., 7.5 per cent, of the pooled component. In 2000, estimates call for the buffer reserve to be increased to 1.4 percentage points. The buffer was introduced as Finland joined the European Monetary Union, the first year of accrual being 1999. The rationale for the buffer finds its roots in the theory of Optimum Currency Areas (OCA), cf. Mundell (1961). The hypothesis is that if asymmetric shocks hit an area with a single currency, in this case the EMU, either reduced real wages or work force mobility (to move freely to other parts of the area to work) is necessary to avoid regional unemployment spikes. Such flexibility is necessary since the countries in question have given up the possibility of devaluing their own currency as an adjustment mechanism. (Another possibility is that all countries within the currency area follow the same business cycle, i.e., are hit by external shocks symmetrically. In that case, shocks are never asymmetric, and it is therefore not necessary to consider their regional unemployment implications.)

Finland has joined a single currency, but by reducing or increasing the buffer reserve included in the pooled component, the wage bill can be reduced (increased). Such movements in the buffer reserve have the same effect for export industries as appreciation (depreciation) of the currency, i.e., Finland can *devalue internally* through its social security system.

3.3.4.2 Benefits

Benefits accrue at 1.5 per cent of pensionable earnings between the ages of 23 and 60, and 2.5 per cent of earnings from age 60 to 65, up to a maximum of 60 per cent.[30] The laws also stipulate a minimum pension of 38 per cent of pensionable earnings for workers continuously employed since the enactment of the pension law in 1962 or age 23, whichever was later. Eligibility for TEL pensions requires that the applicant work for at least 12 months under the Finnish earnings-related Pension Acts during the 10 years before retirement. The applicant must also have been resident in Finland for at least 5 years. The earnings-related schemes, as noted above, are fully integrated with the national pension

[30] Since 1996, pensionable earnings are based on the average of the final 10 years in each covered employment period. If the worker has worked fewer than 10 years, the pensionable earnings are based on the actual number of years of employment. A transition period from the previous rules (final four years of salary) is scheduled to end in 2005.

scheme; workers with TEL pensions exceeding FIM 54,500 (€9,166) to FIM 64,560 (€10,858) (depending on region and marital status) receive no pension.

The normal retirement age is 65, but individuals can choose to retire earlier (although not before age 60 if non-disabled or 58 if disabled) in exchange for reduced benefits. For example, the maximum pension is 60 per cent of salary for those who retire at age 65, and is reduced by 4.8 per cent per year for each year (0.4 per cent per month) of retirement before 65. Pension receipt can also be delayed beyond 65, in which case benefits are actuarially increased. Currently, roughly 80 per cent of pensioners elect benefits before the normal retirement age. Part-time pension benefits are also available to workers, aged 56 to 64, subject to certain conditions. The part-time pension is equal to 50 per cent of the difference between full-time and part-time earnings (up to a maximum of 75 per cent of the worker's accrued TEL pension).

Pension benefits are indexed to a weighted average of increases in the consumer price index and wages.[31] Since 1996, two indices have been used, one for working-age persons under 65, and one for those over 65. In particular, the percentage increase in TEL pension benefits for those 65 and over is equal to 20 per cent of the percentage increase in wages plus 80 per cent of the percentage increase in the cost of living. Benefits for those under 65 are adjusted by an equal weighting (50 per cent each) of the percentage increases in wages and the cost of living. The pensions in payment are adjusted annually in January in line with the index increase.

Pension income is fully taxable when received.

3.3.4.3 Survivor Benefits

The survivor benefit under the TEL plan is 50 per cent of the deceased worker's accrued pension, reduced to $5/12^{ths}$ if an orphans' pension is paid to two children (and reduced further if such an orphans' pension is paid to more than two children).[32]

Orphans receive pensions of $4/12^{ths}$ of the deceased's pension. Two orphans receive a total of $7/12^{ths}$ of the deceased's pension, three orphans $9/12^{ths}$ and four or more orphans receive $10/12^{ths}$. A supplement of $2/12^{ths}$ is paid to orphans without either parent. Orphans pensions are paid until age 18.

Group life insurance resulting from collective agreements pay lump-sum payments. Employer contributions to group life tax deductible and employee contributions are tax deductible as long as the projected pension is less than 66 per cent of salary.

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[31] Prior to 1977, benefits were indexed to wages instead of prices, Cf. Tuulia Hakola (1999), *Race for Retirement*, VATT, pp. 38-39.

[32] The spouse's pension is $3/12^{ths}$ if paid to three children and $2/12^{ths}$ if paid to four and more pensions. Spouse's pensions is reduced if the spouse's pension entitlement exceeds an adjustment basis carrying between FIM 19,664 (€3,307) and FIM 45,636 (€7,675) and the spouse's pension is reduced by 50 per cent of the difference between the spouse's pension entitlement and the adjustment basis.

3.3.4.4 Disability Benefits

Both the state plan and the TEL system provide disability insurance. Under the state plan, workers are entitled to disability benefits after one year of receiving sickness benefits. Under the TEL system, disability benefits are paid for incapacity of at least 40 per cent. For 60 per cent or more incapacity, the benefit is equal to the projected retirement pension.

Prior to 1996, the TEL disability pension was based on 1.5 per cent of pensionable earnings per annum from the time of disability to retirement. As of January 1996, this rate went down to 1.2 per cent between age 50 and 60 and 0.8 per cent from age 60 to 65.

The Occupational Accidents Insurance Act requires employers to insure employees against occupational accidents, including commuting accidents. This Workmen's Compensation insurance provides pensions and survivor benefits for those becoming disabled or dying at work. The average cost of this insurance in 1998 was about 1.5 per cent of payroll. Before 1999, foreign companies could only sell workmen's compensation insurance through a Finnish subsidiary.

3.3.4.5 Special Features

Insurance companies play a key role in the pension market, although banks are becoming increasingly involved.

Insurance companies need a Finnish license to underwrite statutory pension insurance. There are relatively few asset restrictions in Finland. Holdings larger than 50 per cent in another business require special approval, but this regulation does not apply to shares held in other financial institutions.

Firms are also allowed to offer 'non-registered' plans that are not regulated by the ETK, and which are more flexible than registered plans. Tax contributions to non-registered plans, however, are allowed only up the maximum possible benefit within a TEL registered plan (66 per cent of salary). Such non-registered plans are usually set up to provide benefits before the normal retirement age (but not before age 55) under the registered plan or to extend and augment the TEL pension and survivor benefits in other ways.

For these non-registered plans, index linkage of pensions in payment is flexible and can be based on fund returns. Some non-registered arrangements held with pension companies also have vesting periods. Funding rules for pension funds on non-registered plans have been less stringent than for TEL pensions, but the rules are set to tighten by 2010.

3.3.5 Private Pensions – Individual

In addition to the mandatory TEL pensions, tax-advantaged voluntary pension arrangements can be used to fund an early retirement or to make up for periods of unemployment, education or for childcare. Voluntary pension arrangements are also used to

fund extensions of orphans' pensions from 18 to 21 or correct for the small portability losses from job change in the TEL system.

These supplementary pensions are either employer- or individual-based. The employer may provide supplementary cover for all employees, for a limited part of employees or for an individual employee. In terms of collective arrangements, the employer may buy the cover from a pension fund, pension insurance company or life insurance company. Supplementary pensions for individuals must be purchased from insurance companies.

In 1998, overall supplementary pension contributions were roughly FIM 4.3 billion (€723 million), whereas statutory earnings-related pension contributions were over FIM 60 billion (approximately €10 billion). Voluntary pension contributions (including the supplementary 'non-registered' employer pensions referred to above) represent about 28 per cent of life insurance business in Finland.[33]

Premiums paid to voluntary defined contribution pension insurance are tax deductible (decreases taxable income) up to FIM 50,000 (€8.409) (maximum of 10 per cent of salary) if the cover does not exceed an acceptable level. Contributions over FIM 15,000 (€2,523) require an annual headroom check that overall benefits will not be over 66 per cent (60 if the policy is bought as of 23 June 1999 or later) of pensionable salary[34] or FIM 5,000 (€841) per month. The pension may be drawn at the minimum age of 58 (60 if the policy is bought 23 June 1999 or later).

Voluntary pensions are typically paid as fixed-term benefits or annuities after the retirement age or over the period to retirement, depending on the purpose of the supplementary pension. Due to tax regulations, individuals do not draw supplementary pensions as lump sums.

The market for supplementary pension assurance is concentrated largely with life insurance companies. The life insurance market is highly concentrated, with the three largest groups underwriting over 80 per cent of all new business in 1998. Despite the economies of scale, expenses as a per cent of assets in 1998 overall represented over 108 basis points before accounting for asset management charges.[35] The expense ratios for the statutory pension business sector are considerably lower.

Direct sales are the predominant distribution channel, with remuneration by salaries and bonuses rather than commission. The largest foreign competitor in the market is Skandia Life, which has a 4 per cent market share and operates through an agency of tied agents. Independent brokers receiving commissions have been operating in the market since 1995. The Insurance Supervision Authority oversees the regulation of the sales process and

[33] Federation of Finnish Insurance Companies, Finnish Insurance Economy 1998 Performance.

[34] For pensions used to fund early retirement, the relevant pensionable salary is that used to compute the disability pension.

[35] Calculated from Federation of Finnish Insurance Companies, Finnish Insurance Economy 1998 Performance, pp. 20-21, using (Operating expenses + Other expenses)/Total Assets. Investment expenses were excluded from the calculations.

regulates brokers so that they provide 'best advice' on the range of products on the market and disclose commissions to their customers. Multiple sales relationships are prohibited.

Group and individual insurance premiums are of similar magnitudes, with the vast majority of individual defined contribution policies sold as with-profits contracts with guaranteed interest rates of 3.5 per cent (in terms of older policies, the guaranteed rate is 4.5 per cent). Table 3.4 below reports business volumes for individual voluntary pensions business. While unit-linked policies are growing quickly, the table shows that they still have a reasonably small market share.

Table 3.4. Individual private pensions, premium income (FIM million)

Manager	January-July 1999	January-July 1998	Change
Traditional	1,141	1,087	5%
Unit-linked	278	77	260%
Total:	1,419	1,164	22%

Bonds and commercial paper dominate insurer portfolios. Equities are only a small share of life insurer portfolios.[36] The surrender and transfer values of contracts tend to be very poor, so that few contracts are in practice transferred to other providers. On the other hand, these low surrender values coupled with high asset returns have placed the life insurance sector in a very strong financial position, with perhaps the biggest problem being the investment of idle capital.

3.3.6 Complementary Products – Life Insurance and Savings

While published statistics rank Finnish insurance expenditure as a percentage of GDP as the largest in the Nordic countries,[37] these statistics include compulsory pension provision and hence are a bit misleading. There is about FIM 7.5 billion (€1,26 billion) in individual life business.

[36] At the end of 1997, the equity share of life portfolios was 26.8 per cent, source: Federation of Finish Insurance Companies, Finnish Insurance Economy 1997 Investments.
[37] Data is for 1995. Coopers & Lybrand, European Insurance Handbook 1997.

The Finnish Pension System

Pension act	Group of employees covered	Year ratified	Number accruing rights '98 ****	Number of insured*** 1997	Pensioners all* 1997	Pensioners under 65* 1997	Contribution employee**	Contribution employer**	Number of pension funds 1997*	Number of insurance companies 1997*	Funds % of wage bill 1997*	Administrative costs, % of premium 1997*
A. Private sector			**1,212,000**	**1,225,100**	**607,200**	**227,900**			**54**	**6**		
TEL	Blue- and white-collar workers	1962	1,100,000	1,069,000	490,800	178,800	4.7%	15.1% - 29%	42	6	105%	2.3%
LEL	Blue-collar workers in earth work, forestry dock work and construction	1962	80,000	89,500	111,500	45,800	4.7%	22.20%	8	1	10%	0.3%
TaEL	Artists with emloyment contracts shorter than a year, employees with TEL employment lasting less than a month with earnigs below the TEL earnig limits, houshold workers	1986	25,000	59,200	600	300	4.7%	16%	1	0	0.2%	0.0%
MEL	Sailors in international traffic	1956	7,000	7,400	4,300	3,000	10%	10%	1	0	1.2%	0.1%
B. Self-employed			**270,000**	**277,500**	**263,200**	**61,700**						
MYEL	Farmers	1970	115,000	118,400	199,100	41,900	10.3% - 21%		1	0	0.1%	0.3%
YEL	Self-employed persons	1970	155,000	159,100	64,100	19,800	21%		4	6	0.5%	0.4%
C. Public sector			**645,000**	**615,200**	**350,000**	**143,000**						
VEL	State employees	1967	185,000				4.7%					
KVTEL	Local government employees	1964	445,000				4.7%					
KiEL	Evangelical-Lutheran church	1967	15,000				4.7%					
A+B+C			**2,127,000**		**1,029,000**	**349,000**			**56**	**6**		

* Figures as of end of 1997 (source Tuomisto (1999))

** The Central Pensions Security Institute (1999), " The Emploee's Pension" and "Private Employers and Ernings-relates Pension Insurance."

*** Klaavo et al. (1999).

**** The Central Pension Security Institute (1999), "The Finnish Statutory Ernings-related Pension Scheme."

3.4 Iceland

3.4.1. Introduction

Iceland's pension system is one of the more privately oriented among the Nordic countries and is closer in nature to systems in countries like New Zealand, cf. Ólafsson (1999). Consequently, the Icelandic social security system is relatively small by European standards. Furthermore, because of its relatively favorable demographic profile and high labor force participation among the elderly, Iceland faces fewer public social security challenges than the other Nordic countries.

The Icelandic old-age retirement system consists of a:

- Social security system financed on a pay-as-you-go basis,
- Mandatory fully funded occupational pension system,
- Private system with voluntary individual accounts, investment plans, life insurance, etc.

The foundations of the present occupational pension system in Iceland were laid down by general wage settlements in the spring of 1969, in which the labor unions traded wage increases for the creation of fully funded occupational pension funds from the beginning of 1970. The system became mandatory by laws enacted in 1974. Although pension schemes became widespread in the early 1970s, various pension schemes existed before that, i.e., the VR fund (currently the biggest fund) was formed in 1956, and various pension schemes for craftsmen were set up in the early 1960s. 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.[38]

The prevalence of occupational schemes is particularly important, and the private-sector orientation of the system is underscored, because the unfunded social insurance system provides only a modest degree of earnings-related benefits. The social security system in Iceland pays a basic pension from the age of 67 to all Icelanders and a means-tested supplementary pension from the age of retirement (normally 65-70). To further encourage private provision, the government has recently set up optional individual accounts, which are held with pension funds, banks or other financial providers licensed to offer individual account schemes in Iceland.

[38] 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. In Herbertsson, Orszag, and Svavarsson (1999) is a detailed analysis of the switching behavior and other aspects of the Icelandic public sector pension reforms.

3.4.2 Social Security

To be eligible for social insurance benefits, individuals only have to live in Iceland. However, to enjoy full benefits, individuals must have lived in the country for 40 years. The social insurance system in Iceland provides basic old-age pension benefits, supplementary means-tested pensions, disability, sickness, maternity, survivor, etc. benefits. Furthermore, there is a special system for unemployment benefits, and the municipalities provide housing benefits and poverty assistance.

Pensions are payable from the age of 67. Sailors (mostly fishermen) are eligible for pensions from the age of 60 if they have been professional sailors for at least 25 years.

3.4.2.1 Contributions

The Icelandic social insurance system is a pay-as-you-go system with contributions regarded as a part of the tax system.

3.4.2.2 Benefits – Normal Retirement

The Icelandic public pension system pays a flat-rate pension, a relatively low supplementary pension, and a special allowance for single households and a special household supplement.

Basic Pension

The basic pension guarantees a single pensioner a maximum of IKR 211,104 (€3,003) in basic pension per year. Under special circumstances, the spouse can receive 80 per cent of this amount. The basic pension is means-tested in that it is reduced by 30 per cent for any income above an income threshold equal to IKR 1,136,277 (€16,166). Income for the means test is wage income in retirement plus half of capital income. Occupational pension income is not included in the means-test calculation with regard to basic pension, nor is it tested against spouse's income. Married individuals receive 90 per cent of what single individuals receive.

Supplementary Pension

In addition to the basic pension, there is a supplementary pension of IKR 362,988 (€5,164) per annum for individuals with an income lower than IKR 250,998 (€3,571) per annum. The supplementary pension has a very strict means test, with a 45 per cent reduction rate for an income over IKR 250,998 (€3,571). Furthermore, the income base against which the supplementary pension is tested is broader than the one used for the basic pension: the supplementary pension is also tested against half the income of a spouse and pension from occupational pensions above a threshold.

Special Supplement

In addition to the basic and the supplementary pensions, there is an allowance for a single person to receive a supplementary pension, amounting to IKR 173,556 (€2,469) per annum. The allowance is reduced by the same rules as those applying to the supplementary pension. If the only income that a single person receives is from the social security system, there is a special household allowance for single persons, IKR 84,888 (€1,208) per annum,

which is reduced krona for krona if the individual has other income. Under special circumstances, individuals can receive additional allowances.

The maximum pension per annum for an individual with no other means of income, excluding the special additional pension supplement, is thus IKR 69,378 (€987) per month. This is roughly equal to the minimum wage within the Icelandic Federation of Labor. Benefits are indexed to the wages of government employees.

3.4.2.3 Benefits – Disability

Individuals that are at least 75 per cent disabled are eligible for disability benefits. The structure of the disability pensions system is the same as for the old age pensions. The maximum disability benefit amounts to IKR 211,104 (€3,003) per year and is reduced by 25 per cent of the amount exceeding an income of IKR 1,157,887 (€16,473) or double that amount for couples. If the individual's income is lower than ISK 373,140 (€5,309), he/she is eligible for an additional IKR 376,497 (€5,356) in benefits. Income in excess of IKR 376,497 (€5,356) reduces the benefits by 45 per cent. Individuals 50-74 per cent disabled are eligible for reduced disability benefits amounting to 13,194 (€188) per month.

Survivors benefits are payable to spouses younger than 67 for six months and amount to IKR 19,903 (€283) per month. If the surviving spouse provides for a child younger than 18 years of age, reduced benefits IKR 14,923 (€212) can be extended for up to 18 months and up to 54 months if the spouse has two or more children to provide for.

3.4.2.4 Benefits – Early/Late Retirement

Early retirement (before the official retirement age of 67) is not possible in the public pension system (except for sailors, who can retire at the age of 60). No extra benefits accrue by postponing retirement.

Table 3.5 reports all social security expenditures in Iceland 1995-98 by type of benefits.

Table 3.5. Social security expenditure by benefit categories 1995–1998

	1995	1996	1997	1998
Total expenditure:	**28,540**	**29,876**	**30,166**	**33,021**
Pensions, total:	**13,233**	**13,881**	**14,786**	**16,063**
Basic retirement pension	3,349	3,515	3,824	4,193
Basic disability pension	1,124	1,226	1,347	1,475
Income supplement of retirement pensioners	5,094	5,270	5,469	5,846
Income supplement of disability pensioners	1,637	1,746	1,860	2,008
Disability allowance	207	189	196	227
Child pension	636	690	774	843
Maternity benefits	1,172	1,224	1,285	1,434
Other	14	20	31	37
Social assistance benefits and allowances:	**3,859**	**3,703**	**4,019**	**4,551**
Single parent's allowance	284	153	168	193
Benefits and allowance for carers of sick and disabled children	342	375	400	541
Spouse's benefits	29	30	29	28
Widow's/widower's benefits	81	72	71	70
Rehabilitation pension	70	103	134	145
Child pension/education	54	43	46	54
Household supplement	886	922	1,194	1,448
Additional household supplement	159	146	135	139
Additional pension supplement	1,830	1,786	1,751	1,832
Car purchasing grants	125	74	91	100
Occupational injury insurance:	**512**	**464**	**445**	**480**
Health insurance:	**10,935**	**11,828**	**10,917**	**11,926**

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

3.4.3 Government Employees' Pensions

Government employees can belong to one of two occupational schemes, Department A and Department B. Department B is, however, closed to new members.

3.4.3.1 Contributions

Department A is a contributory fund, under which the employee pays a premium of 4 per cent of total salary (i.e., fixed salary and overtime pay) and the government contributes 11.5 per cent. 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 70. Annually, the premiums paid on behalf of an employee become the basis for calculating retirement pension points, which are then used to make pension payments.

Department B is a contributory fund to which the employee pays a premium of 4 per cent of fixed salary (excluding overtime pay) and the government's initial contribution is 6 per cent, for a total of 10 per cent. Additionally, the government and other contributing concerns reimburse the pension fund for retirement payments, which bases its payments on nominal pay level at the time of retirement, in excess of the first retirement payment made to members of the department. At the end of 1998, the pension assets were sufficient to pay an estimated 19 per cent of the total present value of future retirement and other benefits. The remaining 81 per cent will be financed in the future by the government and other contributing concerns.

Table 3.6 compares the rights of the two schemes.

Table 3.6. Comparison of rights in Department A and B

	Department A	Department B
Accrual	1.9% of total wages	2% of wages first 32 years 1% of wages until age 65 2% of wages after 65
Survivor benefits	50% for three years followed by 20% for 2 years or 50% for child under 21 years	50% pensions plus 20% of reference pay for active members
Disability benefits	Benefits as if worked until retirement	Accrued rights only unless disabled on job
Indexation of benefits	To the CPI	To government wages
Early leavers	CPI	Government wages
Early retirement penalty	0.5% penalty per month	Non, unless sum of rights plus age >= 95 years

Source: Herbertsson, Orszag, and Svavarsson (1999)

3.4.3.2 Benefits – Normal Retirement

The base pay for pensions is IKR 55,339 (€787) as of April 2000; the amount is adjusted to reflect changes in the consumer price index. An employee with a monthly salary of IKR 110,678 (€1,575) would gain two points for a year. The total points at retirement are multiplied by the factor 1.9, which means that an employee who has 50 points at retirement receives 95 per cent of the base pay (adjusted for changes in general prices).

3.4.3.3 Benefits – Early/Late Retirement

Employees have the right to receive retirement payments between the ages of 60 and 70. If an employee retires before 65, the retirement pay is adjusted downwards by 0.5 per cent for each month. Conversely, if an employee postpones retirement until 70, the retirement pay is adjusted upwards by 0.5 per cent for each month.

The retirement payments to members in Department B are based on the final pay for each member, regardless of 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 per cent 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 per cent until the employee retires. Additionally, the employee accrues a 1 per cent pension right for each year until the age of 65 after completing the premium payments for 32 years, and also accrues an additional 2 per cent 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 the period for which premiums have been paid is equal to 95.

3.4.3.4 Special Features

The surviving spouse of a member of Department A receives a survivor payment equal to half of the member's retirement pay, but this amount is only paid for 36 months, and the payment is subsequently reduced by 50 per cent for the next 24 months. Additionally, the surviving spouse receives child support payments for each child until they are 22 years of age. Finally, if a member suffers a 40 per cent disability or more, he/she is entitled to disability payments. In order to receive disability payments, a member must have been in the government's employ 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 B receives a survivor payment equal to half of the member's retirement pay in addition to 20 per cent of the final salary payment used for calculating retirement payments. The extra 20 per cent payment is subject to certain conditions. Additionally, the surviving spouse receives child support payments for each child until they are 18 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 per cent 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.

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.

3.4.4 Occupational Pensions

According to Icelandic law, all wage earners and self-employed persons are obliged to belong to a pension fund, which operates either according to law or has been specially approved by the Ministry of Finance. At the end of 1998, 65 occupational pension funds operated in Iceland (10 of which were closed funds). Iceland's pension funds operate in principle closest to Department A of the government sector pension (in fact, Department A of the government employee pension fund was designed using the private occupational pension system as a model); they are career-revalued plans, in which individuals earn points relative to a reference wage, and feature disability and other insurance benefits. However, unlike Department A of the public sector pension system, many of Iceland's pension funds operate more on a defined contribution basis, whereby the translation of points into benefits is adjusted, based on investment returns.

This system facilitates running industry-wide schemes, which pool risk across members and do not involve *ex post* employer liabilities. In this sense, top-ups to the pension are based on some assured or notional rights rather than on accumulated assets, as is the case with insured arrangements one would see in the other Nordic countries.[39]

3.4.4.1 Contributions

Contributions to the funds must be at least 10 per cent of gross salary, 6 per cent paid by the employer and 4 per cent by the employee. Under law, assets and liabilities cannot diverge by more than 10 per cent in a particular year or 5 per cent over a five-year period. Otherwise, benefits and/or contributions need to be adjusted. The schemes differ in how much they will adjust contributions in response to differences in investment returns, mortality, and expense experience. Contributions are tax exempt, but benefits are subject to general income taxation in the same way as earned income.

3.4.4.2 Benefits – Normal Retirement

Benefits accrue according to a point system, whereby the number of points earned is the wage in a year relative to the reference wage. Under new laws, ratified in 1998, funds must have index-linked benefits, paying at least 56 per cent of average earnings for those working and contributing for at least 40 years.[40] This corresponds to an accrual in terms of

[39] This model is closest to the traditional UK with-profits model that became established in the UK life assurance sector in the 19th century because of its simplicity and low administrative overhead. The Icelandic model, however, differs from unitized with-profits models in which bonuses are based on accumulated assets rather than sums assured.

[40] When the minimum funding requirements are met, the pension fund either increases the replacement ratio or allows its members to put the contribution exceeding the contribution needed to finance the minimum into an individual account. All the occupational pension funds have opted for the former. For example the biggest fund has raised the replacement ratio to approximately 66 per cent. However, approximately 4-5 per cent of the total assets of pension funds in Iceland have been placed into individual accounts through this option by members of non-occupational funds, i.e., funds designed for the self-employed, etc.

points of 1.1 when retiring at the age of 67 (and 1.4 when retiring at the age of 70). Valuations are done at 3.5 per cent real discount rates; actual returns tend to exceed this level.[41] The resulting surpluses of many of the funds may mean benefits will be adjusted in the future.[42] On the other hand, even the largest fund is working on the basis of a benefit level 15 per cent over the minimum, so there is a considerable solvency margin even with 3.5 per cent valuations.

The pensions are paid as a lifetime annuity by the pension fund, and there is no lump sum. The definition of 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, 2 per cent real wage growth reduces the replacement rate of a 40-year pension with 1.4 accrual from 56 per cent to 39 per cent, and 3 per cent real wage growth reduces it to 33 per cent. 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 an extent, subsidizing those of older workers. However, we should emphasize that there is a direct relation between future returns on the funds and future benefits, with 56 per cent replacement as the minimum replacement ratio.

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.[43] One of the funds offers only non-linear accrual, but the others offer both linear and non-linear accrual.

3.4.4.3 Benefits – Disability

It has been possible to operate a mandatory, pure, defined contribution pension scheme in Iceland since July 1st 1999. Under the new law, all occupational funds must satisfy a number of benefit conditions, including payment of a disability pension, and pension payments to surviving spouses and/or children.[44] Disability benefits are based on an assumption that the worker works until retirement, retiring with a reference calculated wage, based on wages around the time of being disabled. Individuals receive benefits in accordance with their ability to work, i.e., a 75 per cent disabled person gets 75 per cent of the old age pension that he/she would have received, with the last three years used as reference wages. Because of these insurance benefits, pension funds with fewer than 800 members contributing must be insured. The costs associated with these disability and survivor benefits have led to consolidation among pension funds, with only limited use of insurance companies to insure the benefits of smaller schemes.

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[41] In the period 1991-1994, the average net real return on the total assets of the occupational pension funds in Iceland was 6.65 per cent and 7.4 per cent in the period 1995-1998, Gudmundsson (2000).
[42] Central Bank of Iceland: Bank Inspectorate (1997).
[43] The funds are Samvinnusjódurinn, Sameinada lífeyrissjódnum, Lífeyrissjódur verkfrædinga, and Lífeyrissjódur starfsmanna sveitarfélaga.
[44] Source: Financial Supervisory Authority.

3.4.4.4 Benefits – Early/Late Retirement

Actuarial reductions apply for early retirement. A generic scheme would reduce benefits by 0.6 per cent per month for early retirement after age 65 but before the normal age of 67. It would increase by the same rate for late retirement up to the age of 70.

3.4.4.5 Funding

The total assets of these pension funds at the end of 1999 were estimated to be approximately 80 per cent of GDP, up from 69 per cent in 1998. Table 3.7 decomposes investments of the Icelandic occupational pension funds according to type of investment.

Table 3.7. Investments of pension funds distributed by type of investment

	1984	1990	1994	1996	1998
Central government and institutions	8.7	6.3	13.5	17.7	4.4
Municipalities	0.2	2.6	12.8	6.1	2.2
Housing bonds	15.9	54.2	30.0	25.7	14.6
Financial institutions	11.3	15.1	20.0	24.5	39.6
Loans to members	66.3	13.7	10.3	7.7	3.8
Loans to companies	1.2	3.4	8.4	12.0	7.8
Equity	0.0	2.9	2.2	6.9	16.9
Mutual equity funds	0.0	0.0	0.0	0.0	7.4
Other	-3.6	1.9	2.8	-0.6	3.3
Foreign investments	0.0	0.0	4.5	6.6	20.6

Source : Már Gudmundsson (2000)

The table reveals at least three major trends in the investment strategies of the funds, which can be traced to the recent liberalization of financial markets in Iceland and changes in legislation. First, investments in housing mortgage have decreased substantially (after the introduction of a new state system for financing housing loans). Second, investments in equity have increased in phase with the development of the Icelandic financial market, and third, investments abroad have increased substantially. Also, we note a substantial decline in loans to pension fund members. These loans were often made at below-market interest rates in an era when Icelandic financial markets were less developed. Nevertheless, if the aim of a pension scheme is to provide retirement income, it is unclear why Icelandic schemes ever provided loans to their members at anything except market rates.

Various investment restrictions also apply to the pension funds. Foreign currency exposures of more than 40 per cent must be hedged, and no more than 35 per cent of assets may be in equity. (These rules are now under review, with proposals to raise both percentages to 50 per cent.) In addition, no fund may own more than 15 per cent of the shares of an individual firm or 25 per cent of shares in a particular equity fund.

3.4.5 Private Pensions – Individual

Since January 1st 1999, all employed persons in Iceland, aged 16 to 70, have been accorded the rights 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.[45] An individual can save 2 per cent of his before-tax income in an account, which will be matched by a 0.2 per cent contribution from his employer.[46]

Payment of deposits shall commence no later than two months following the commencement of a contract. A contract can be terminated with six months' notice. However, termination does not convey the rights to withdraw deposits before the individual reaches age 60 years or becomes an invalid.

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 the individual 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.[47]

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

[46] The employer contribution is likely to increase in the future. The results of wage settlements in January 2000 between the Confederation Icelandic Employers and one of the biggest 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 per cent in 1999 to 0.5 per cent in 2001, 1.5 per cent in 2002, and finally to 2 per cent in 2003. This is in line with a number of contracts signed in the fist half of 2000. This will give a gross contribution rate of 4 per cent of the payroll to the individual account, and under reasonable assumptions this might increase the replacement ratio to as much as 12 per cent of final salary.

[47] 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 (Lífeyrissjódur íslenskra stjórnunarstarfsmanna á Keflavíkurflugvelli), but this is deemed an occupational pension fund.

Box 3. ***The charge ratio on individual accounts in Iceland***

To measure the level of consumer charges in Iceland, surveys were sent out to providers of individual accounts in Iceland. In these surveys, providers were asked to disclose their current charge levels as well as provide projections of what these current charge levels will mean at retirement for a typical Icelandic worker opening such accounts. Providers were also asked to reveal how high the account balances would be should the individual stop contributing or wish to change plans after some period. This second set of figures provides insight into how costly it is for individuals with variable earnings and employment to alter or stop their contributions.

Providers were asked to identify the charges for a 2.2 per cent account whose initial contribution amounted to 5,000 IKR (€71) per month. This figure is a bit higher than the typical Icelandic worker will contribute to an account so, to the extent that there are fixed charges from accounts, our figures may understate costs.

A 9 per cent annual rate of return was assumed, from which providers were to subtract all relevant charges, based on their current charge structure. At the same time, providers were asked to account for a typical wage growth of 4 per cent per annum by increasing the contribution level by 4 per cent at the start of each year. The table below reports the charge ratio on individual accounts in Iceland.

The Charge Ratios on Individual Accounts in Iceland

	Years to retirement				
	5	10	15	25	40
Charge Ratio (lowest)	0.26%	0.54%	0.84%	1.48%	2.56%
Charge Ratio (average)	0.83%	1.60%	2.42%	4.16%	7.00%
Charge Ratio (highest)	1.83%	3.03%	4.28%	7.14%	12.05%

Source : Benediktsson, Herbertsson, and Orzag (1999).

From the table, we observe that the charge ratios on individual accounts in Iceland ranged from 0.25 per cent to approximately 12 per cent, depending on the number of years to retirement. Overall, we found that the average reported consumer charges for Icelandic individual accounts amounted to about 30 basis points, but hidden and other charges are likely to mean that actual charges are significantly higher. Still, there are products on the market with under 50 basis points including all charges. Over a 40-year period for a typical Icelandic worker, 50 basis points in charges corresponds to about 13 per cent of the fund deducted in charges. This level is significantly lower than in the UK, where the comparable figure is closer to 36 per cent (Murthi, Orszag and Orszag, 1999). Indeed, it is also lower than average retail finance charges observed in the US, which have recently been estimated at 150 basis points per year. The US figure implies a charge ratio of roughly 31 per cent.[48]

[48] John D. Rea and Brian Reid (1998) find an average cost of mutual funds in the US of 149 basis points. This figure excludes brokerage costs, which may add an additional 12 basis points.

Because the individual accounts are relatively recent, both the sales and administration of these individual accounts are relatively lightly regulated. In particular, what is included as charges is not clearly defined by legislation or regulatory guidance. For occupational pension funds, charges are divided into administrative charges and investment charges. But when cost ratios for those funds were scrutinized, only the administrative charges were counted as charges, and the reported costs were therefore lower than the actual costs.

While part of the reason for the low charges has to do with the fundamental reasons discussed above, at least part of it must be attributed to the immature market. Indeed, of the providers answering our survey, only one did the calculations correctly the first time, suggesting room for improvement in financial awareness and consumer education in Iceland as well as a likelihood that providers may have underestimated the costs and overestimated the new business with individual pension accounts.

Source: H.C. Benediktsson, T.T. Herbertsson, and J M. Orszag (1999). "The Charge Ratio on Individual Accounts and Investment Plans in Iceland," Birkbeck College Discussion Papers, No. 10/99.

The take-up of individual accounts was relatively slow in the initial stages, but a recent survey indicates that the coverage is 22.7 per cent.[49]

3.4.6 Complementary Products – Life Insurance and Savings

The life insurance market in Iceland is the smallest life market in the OECD in per capita terms. Written life insurance premiums per capita were only 1,978 IKR (€28) in 1997, or 0.1 per cent of GDP. This, however, is subject to change.

As of April 1999, six insurance companies in Iceland offered life-assurance based investment plans. Of these six companies, three are foreign, i.e., Friends Provident, Sun Life, and Allianz, and three domestic, i.e., Alþjóda Líftryggingafélagid, LIFIS, and SAMLIF. The first company to offer investment plans in connection with their life insurance schemes in Iceland was SAMLIF in 1997. These investment plans have some tax advantages in that they are exempt from the asset tax of 1.45 per cent on the level of net assets over 5.28 million IKR (€75,117) and 1.2 per cent on amounts between 3.74 million (€53,208) and 5.28 million IKR (€75,117). Both domestic and foreign life insurance companies sell such funds; policies tend to have high front load charges because of the need to pay direct sales forces or commission to intermediaries. The foreign companies tend to rely on local insurance brokers, to which they pay higher rates of commission than their Icelandic counterparts. The Icelandic companies rely much more on sales forces. Because pension funds provide adequate life and disability cover for most individuals, the formal life sector in Iceland is small and as a result its costs are quite high. For example, the ratio of total costs to total premiums (measured in a variety of different ways) is significantly more than double that in the UK.

[49] 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.

It is important to emphasize that the life investment plans are much different than individual accounts in terms of the type of customer for which they are appropriate. Since they avoid taxes (which reduce the yield on investment by more than 140 basis points), life insurance plans have certain advantages for investors who do not switch jobs or face lapses. However, the low surrender values of the new life investment plans reduce incentives for individuals to avoid tax in this way.

3.5 Norway

3.5.1 Introduction

Norway combines an extensive public social security system with reasonably wide supplementary-pension coverage. The normal retirement age is 67, but for about 60 per cent of the work force, retirement is possible as early as age 62 with little or no penalty. Although early retirement has been growing rapidly, it remains low in comparison to other European countries.

The state pension system, the National Insurance Scheme (NIS), has a flat-rate component and a redistributive earnings-related component. For average wage earners, the replacement ratio of the social security system is around 50 per cent before tax. The replacement ratio is higher for below-average wage earners and lower for above-average wage earners. The replacement ratio is higher after-tax due to both the typical decline in income upon retirement, combined with the progressive tax system, and special tax rules for pensioners.

For many workers, private and public sector supplementary pensions provide additional benefits, bringing retirement pensions up to two-thirds of (before tax) final salary. Supplementary pensions are largely of the defined benefit form. Defined contribution arrangements with tax advantages are currently limited to individual accounts (IPA) with 10 per cent of wages, up to 40,000 NOK (€4,923) maximum, tax-free annual contributions. Though this savings facility has been available since 1952, the assets are relatively small and currently amount to less than one-fifth of pension assets.

Figure 3.2 shows the relationship between income before taxes and pension income, again before taxes, for a single individual with full pension rights in the National Insurance Scheme, and with additional private pension coverage.

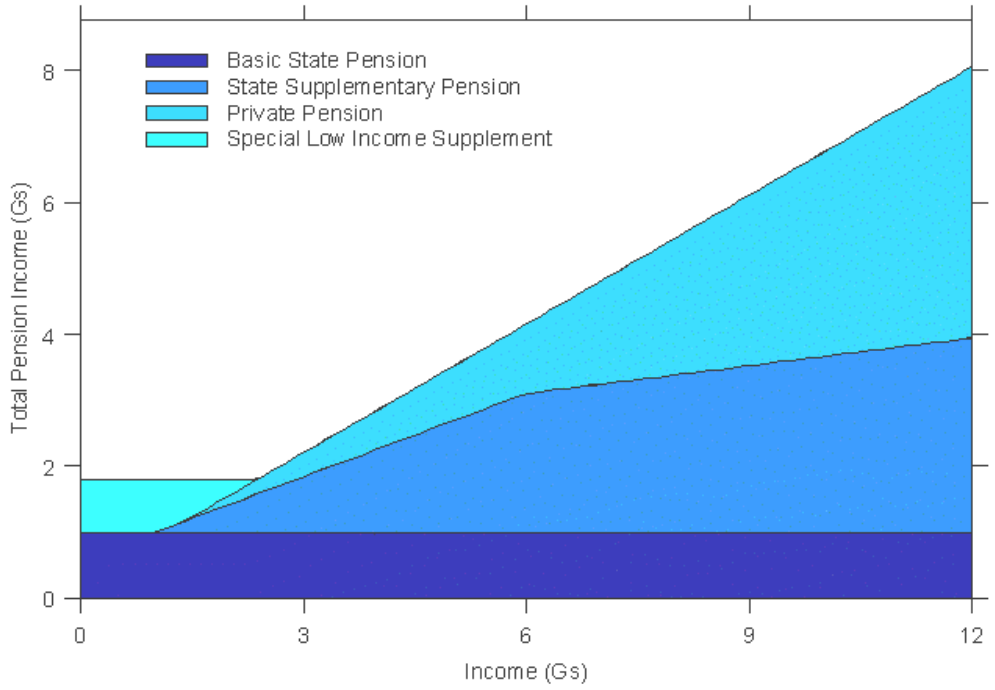

Figure 3.2. *Gross income versus gross total income from pensions for a single individual with full pension rights* (*in basic amounts*)

About 75 per cent of private pensions are underwritten through life insurance companies, and the large majority of the assets and new business of life insurance companies are associated with pension business.

A number of features of the Norwegian system are set to change with new legislation, which is currently in the drafting stage. In particular, the tax treatment of defined contribution plans is expected to change. The tax treatment of defined contribution plans has limited employer pension provision basically to defined benefit plans. The Norwegian pension market may see significant change in the coming years as unit-linked products and defined contribution products sold by a wider variety of financial institutions increasingly supplement and displace traditional defined benefit contracts underwritten with life insurance companies on a with-0profits basis.

3.5.2 Public Pension System

The NIS provides public pensions in Norway. The scheme, which covers all people resident or working in Norway and certain categories of Norwegian citizens working abroad,[50]

[50] Oil workers who are not residents of Norway are also entitled to occupational injury benefits.

provides old-age pensions, survivor, disability, sickness, maternity, adoption, and unemployment benefits.

Social security is generally regarded as an integrated part of the public sector, with social security contributions regarded as a part of the tax system. On an individual level, there is thus no direct connection between contributions and future benefits, highlighting the redistribution embedded in the system.

3.5.2.1 Contributions

The NIS is financed by contributions from employees and employers, along with general revenue contributions from the government. Contributions from employees and self-employed persons are calculated on the basis of multiples of a basic amount, which is termed 1G. As of May 1, 1999, the level of G is NOK 46,950 (€5,778). The level of basic amount is generally adjusted every May by the Parliament in line with changes in the general income level, although there is no automatic indexation.

The tax rate on employees is 7.8 per cent of pensionable income over NOK 21,400 (€2,634) in 1999. The contribution rate for employers varies by regional zone; the range of contribution rates is from 0 per cent in some remote areas to 14.1 per cent in the capital city, Oslo. The low rates obtain in remote regions and are intended to attract employers to those regions. Recently, there have been some complaints from the EU that this arrangement is in fact a subsidy to employers and therefore in violation of EEA competition laws. The average contribution rate in the country is approximately 12 per cent. In addition, employers contribute a special surtax of 12.5 per cent of earnings above 16 times the basic amount. Employer contributions are tax deductible but employee contributions are not. The self-employed pay social security taxes of 10.7 per cent of taxable income between 1G and 12G and 7.8 per cent on income above 12G.[51] Pension income is subject to social security taxes, but at a lower rate of 3 per cent.

3.5.2.2 Benefits – Normal Retirement

The retirement component of the NIS includes a basic pension, a supplementary pension, and a special supplement. The NIS was established in 1967, while the special supplement was introduced in 1969. The benefit levels are tied to the basic amount or 1G, which, as indicated above, the government adjusts annually, generally in line with changes in average earnings.

Basic Pension
Workers with at least three years of coverage between 16 and 66 are entitled to a basic pension.[52] A full basic pension requires, however, an insurance period of 40 years, and the pension is reduced proportionally for shorter coverage periods. For unmarried pensioners,

[51] The self-employed pay contributions up to 16G, 75G, or 134G, depending on their self-employment category.
[52] Residents of at least 20 years or those entitled to a supplementary pension are also entitled to the basic pension.

the full basic pension equals the basic amount for that year, i.e., 1G.[53] A pensioner supporting a non-pensioner spouse may be entitled to a spousal supplement of up to 50 per cent of the basic pension.[54] If the pensioner is married or co-habiting with someone earning at least 2G from pensions or wage income, the full basic pension is reduced to 75 per cent of the basic amount. An old-age pensioner supporting children under 18 years of age may also receive a means-tested supplement of up to 30 per cent of the basic amount for each child.

Supplementary pension

The supplementary pension scheme provides a pension to retirees if they earned pension points for at least three years after 1966. Pension points are computed for each calendar year by taking pensionable income up to 6 times the basic amount (6G's), subtracting the basic amount, and dividing the difference by the basic amount. Income between 6 and 12 times the basic amount is divided by three times the basic amount. No credit is given for earnings above 12 times the basic amount; thus, an individual earning 12Gs receives 7 points. People taking unpaid care of children under 7 years of age, of disabled, sick, and elderly persons at home are credited a pension point figure of up to 3 per annum in the supplementary pension scheme.[55]

Since 1992, the full annual supplementary pension is 42 per cent of the current basic amount multiplied by the average pension points for the person's 20 highest income years. Given that the maximum accrual in a year is 7G, the maximum supplementary pension is 0.42 × 7G or NOK 138,033 (€16,988) (in May 1999). Workers with fewer than 40 years of earnings have their pensions scaled down.

Prior to 1992, pensionable income was calculated using different rules giving a higher supplementary pension. Points on income up to 8G were then calculated by subtracting the basic amount and dividing the difference by the basic amount. Income between 8G and 12G was credited with 1/3 point for income in this range. The maximum credit was 8.33 points. Furthermore, for rights accrued prior to 1992, the supplementary pension was 45 per cent of the basic amount rather than 42, as is now the case.

As an example, individuals working 20 years prior to 1992, earning 8 points per year and working 20 years after 1992, earning 7 points per year will have their pension calculated on the basis of 8 points per year. This means a pension of:[56]

$$(1G \times 8 \times 45 \times 20)/(100 \times 40) + (1G \times 8 \times 42 \times 20)/(100 \times 40) = 3.48G$$

[53] Almost all spousal provisions also include any co-habitant to whom the worker previously was married or had children with.

[54] The supplement is income-tested and reduced by 50 per cent of income in excess of the minimum pension for couples (see below) plus 25 per cent of the basic amount.

[55] This corresponds to pension entitlements based on a work income of NOK 181,400 (€22,325).

[56] The calculation is a bit more complicated than this due to transitional provisions for people having no possibility of earning a full supplementary pension. The transitional provisions are described in The Norwegian Social Insurance Scheme, January 2000, pp. 8-9. This document is available on the internet at http://odin.dep.no/shd/eng/publ.html.

Individuals earning more than 1G of wage income in retirement have their pensions scaled down by 40 per cent of the amount of their excess wage earnings above 1G.

Special supplement
Persons with low supplementary pensions receive a special supplement from the NIS. Any supplementary pension is deducted from the special supplement, so that a one-for-one offset exists between the special supplement and supplementary pensions. For unmarried pensioners, the special supplement equals 79.33 per cent of the basic amount. For married pensioners with spouses age 60 years or older, the special supplement is 158.66 per cent of the basic amount. For married couples receiving the minimum pension, the special supplement equals 79.33 per cent of the basic amount. For those married or cohabiting with pensioners who receive more than the minimum pension, the special supplement is 0.74G, with the proviso that the total supplementary pension and basic amount must be at least 1.59G.

3.5.2.3. Benefits – Disability

Disability benefits have been growing rapidly in Norway since 1993. As a result of an aging population and relaxation of disability qualification rules in 1995, the number of disability pensioners is estimated to have risen to 269,000 in 1999, or 9.3 per cent of the working age population; this is one of the highest rates in the OECD. With no policy changes, disability pensioners are expected to account for 11.6 per cent of the working population by 2005.[57]

Disability benefits include a disability pension; pensioners may also have the right to a basic benefit and an attendance benefit. A disability pension is paid to an insured worker between the ages of 16 and 67, whose work capacity is permanently reduced by at least 50 per cent due to illness or injury, according to a medical certificate, and who has been insured for at least three years before the onset of the disability.[58] Before the individual is determined permanently disabled, he/she has to try vocational/medical rehabilitation. Disability is defined on the basis of capability to do any work.

While in the program, the individual receives a rehabilitation benefit. (Sickness benefits are given for a maximum of one year and give a higher compensation ratio than disability benefits). A beneficiary determined to be 50 per cent disabled is allowed to work up to 50 per cent of what a normal worker works. However, after one year he/she can in addition to this earn up to 1G per year. Workers can leave disability for three years without being disqualified as being disabled. Both wage earners and self-employed workers qualify for this program.

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[57] OECD, *OECD Economic Surveys: Norway, 1999-2000*, page 55.
[58] The disability pension is payable as long as the beneficiary is still insured, or entitled to a supplementary pension, in which case a basic pension, corresponding to the number of years pension points are credited for, is also granted.

Benefits
The disability pension consists of a basic pension and a supplementary pension, plus a special supplement (as for retirement pensions), if appropriate. To determine the benefit level, future pension points until the person turns 66 are assumed on the basis of income before the disability occurred and then used in the regular retirement benefit formula. Persons born disabled or who become disabled before reaching 26 are granted a guaranteed minimum supplementary pension on the basis of a final pension point of 3.3. In the case of partial disability, the pension is reduced proportionally.

A basic benefit is granted if the disability involves significant extra expenses. There are six basic benefit rates, which the Parliament adjusts each year.

An attendance benefit is granted if the disabled person needs special attention or nursing. There are four attendance benefit rates, which the Parliament adjusts.

3.5.2.4. Benefits – Early/Late Retirement

Early retirement has also been rising rapidly in Norway. The number of people retiring soon rose from less than 2,000 in 1990 to more than 20,000 in 1998. Despite this rapid increase, however, the absolute number of people retiring early remains relatively small: The 25,000 people in 1999, for example, represent 0.75 per cent of the working-age population. The effective retirement age remains significantly higher than in other European countries. In 1995, for example, it was three years higher than the average in the European Union.[59]

The retirement age for old age pensions is 67, with no provisions for early retirement in the NIS. There is, however, an option to defer retirement until age 70. If the beneficiary earns more than the basic amount, the retirement pension is reduced by 40 per cent of the excess income. Deferring retirement accrues additional service and hence may make up for a shortfall for those with less than a full career of service. However, there is no actuarial adjustment to benefits to make deferral otherwise attractive.

A number of government and private sector employees are required to retire early at ages below 67. These classes of employees in the government include the military, the police and fire department, and their early retirement pensions are paid for from within the public sector pension system.[60]

The AFP plan, which is administered jointly by unions and industry, allows individuals to retire as early as 62 with no reduction. Within the current rules, it is possible to retire fully or partly, and then make a decision later to return to work. The AFP is not available for the self-employed.

The financial burdens of the AFP plan are borne by the government (40 per cent) and employers (60 per cent) for private sector workers, aged 64-66 years. For those, aged 62-63

[59] OECD, *OECD Economic Surveys: Norway, 1999-2000*, page 57.
[60] In the private sector, some occupations, for instance, divers and airplane pilots, are required to retire early.

years, there is no direct government contribution. On the other hand, the government bears the full cost for public sector workers. Eligibility for AFP depends on earnings amounting to at least 1G in 10 years after the age of 50 and the type of occupation. Part-time retirements are also possible under AFP. In all cases, 50 per cent of earnings above 1G are deducted from the pension. It is of concern for the government that this part-time scheme gives very high replacement ratios, especially for low-income workers. The rules for partial retirement within AFP are expected to change as of 1 August 2000, and the new rules will give somewhat lower replacement rates for part-time workers.

3.5.2.5. Special Features

A surviving spouse under the age of 67 is entitled to pension benefits if one of the spouses was insured during the previous three years. However, this only applies if the marriage has lasted for five years or more, or the survivor had children with (or is taking care of the children of) the deceased. The same rules apply to a divorced spouse who has not remarried at the time of death, as long as death occurs within five years after the divorce, and the marriage lasted for at least 25 years (or 15 years if there were children in the marriage). A divorced spouse loses entitlement to benefits if he or she remarries.

A full survivor pension equals the basic amount, plus 55 per cent of the supplementary pension that the deceased received (or would have been entitled to). If the deceased had, or would have had, a reduced basic pension, the survivor's basic pension is reduced proportionally. If the surviving spouse's income exceeds 50 per cent of the basic amount, the pension is reduced by 40 per cent of the excess income, i.e., income above 50 per cent of the basic amount. Benefits are also available for temporary transition periods, education, and childcare.

A child under 18 receives a pension if one or both parents die and had entitlement to (or received) pension benefits for three years immediately prior to the death. Children in school continue to receive the pension until age 20 if both parents die. If one parent dies, the pension for a single child equals 40 per cent of the basic amount. Each subsequent child adds another 25 per cent of the basic amount. If there are two or more children, the benefits are added together and divided equally among the siblings. If both parents die, the pension for a single child equals the survivor pension that would have been paid to the parent with the highest pension. The pension for the second child equals 40 per cent of the basic amount, and each subsequent child adds 25 per cent.

3.5.2.6 Taxation

Benefits from the NIS are taxed as income except for any lump-sum grants and benefits in kind. However special provisions apply to pensioners, so that a a pensioner pays lower taxes than a wage earner at the same income level. Pensioners with only a minimum pension do not pay tax. Special provisions apply to pensioners with low income who receive higher deductions but also face higher marginal income and capital taxes. For pensioners with income above the minimum limits for these special provisions, a special deduction applies, NIS contribution rates are lower, and other provisions ensure that the tax

and NIS contributions on net income do not exceed 55 per cent of the income above the minimum limits.

3.5.2.7 Funding

The 1992 pension reforms reduced the cost of future obligations by roughly 15 per cent; nevertheless, the cost of Norway's pension obligations is expected to rise to 15 per cent of GDP from 8 per cent over the next thirty years. An important aspect of meeting these obligations will be the extent to which the State Petroleum Fund (SPF) is used to fund future social security benefits, as discussed in Box 4, although currently there is no formal link between the two.

Box 4. ***The State Petroleum Fund***

For some years, the Norwegian government has been transferring oil revenues into the State Petroleum Fund (SPF) for foreign investment. At the end of 1998, the SPF had assets of about 15 per cent of GDP, making it the largest state investment fund in Europe. The experience of the Norwegian SPF hence can provide lessons for countries, such as Ireland, which are now embarking on setting up large state funds to pre-fund social security obligations. It may also provide an alternative model to individual pension accounts for countries such as Germany.

The IMF projection for Norway is that the oil funds will be depleted in 2038 if used for meeting current social security obligations. The Norwegian government's projections are slightly different in terms of their revenue assumptions; they suggest that the fund will still be solvent in 2050. However, if the pension G were indexed to prices instead of wages, the IMF projects pension expenditure would rise to only 12 per cent of GDP, and the SPF would amount to about 50 per cent of GDP in 2050.

The SPF invests largely in foreign bonds though the foreign equity share is now over 40 per cent and will possibly increase in the future. SPF investment in equities is primarily in managed and index funds, with a maximum of 1 per cent investment in individual companies. The portfolio share of the SPF was originally determined by Norway's import weights so that most of the fund is invested in Europe, particularly in other Nordic countries. After 1997, the portfolio strategy was adjusted to reduce exposure in Europe.

In terms of management, Norges Bank and the Ministry of Finance have overall supervision, with the Ministry of Finance formulating investment guidelines and a benchmark portfolio. While Norges Bank manages most of the bond fund, several foreign companies entirely manage equity investments externally. The equity investment strategy has largely been index tracking though there is likely to be a small active management brief in the future. A foreign custodian is used for externally managed investment, and the BARRA risk management system is used to control portfolio risk.

The fund is managed at very low cost and tracking errors relative to the benchmark have been relatively low. For instance, for 1998, the tracking error was 0.22 points (in the fund's favor).

Source: International Monetary Fund (1999), *Norway: Selected Issues*, February, IMF Staff Country Report No. 99/11.

3.5.3 Public Sector Pensions

In 1997, 33.2 per cent of the labor force worked in the public sector.[61] Most of these workers are covered by the public sector pension scheme. The public sector pension scheme is integrated with the National Insurance System and provides integrated benefits of 66 per cent of the final salary (up to a certain limit) at the normal retirement age of 67 years. The central government schemes are run on a pay-as-you-go basis, with the majority of funding for current expenditures coming from central government expenditure, with a small amount coming from a required 2 per cent payroll contribution from public sector employees. Local government schemes are funded. A special insurance company KLP manages the bulk of municipal pension fund assets.

Full service pensions accrue over a minimum of 30 years, with entrants having more than 30 years to retirement earning lower accrual rates. In payment, pensions are indexed to the basic amount, and there is a spouse's pension of 60 per cent of the total integrated state plus public sector pensions.[62]

3.5.3.1 Benefits – Disability

Benefits are tied to current salary, assuming service to retirement. The disability pension escalates in payment with G.

3.5.3.2 Benefits – Early Retirement

As noted earlier, government employees are eligible to apply for an early retirement pension through the AFP if they satisfy eligibility requirements. Of around 25,000 persons receiving AFP pensions by the end of 1999, more than half were employed in the public sector. Special classes of government workers not only may, but must, retire earlier: firemen, police, and military retire at 60; government seamen at 63; cleaning staff, jail guards, air traffic controllers, nurses, railway workers, and government drivers retire at 65.

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[61] Statistics Norway (1998), *Labour Market Statistics* 1996-1997, Table 4, p. 100.

[62] The minimum is 30 years, which can be attained continuously or discontinuously up to retirement. Time in local and central government employment is added together. If employment is ended before old age retirement, accrual is the actual number of years in public employment divided by min (40; 70 - age hired in public service). If employment is ended because of disability or early retirement (that is, AFP), the time in these schemes is added to accrued time. Examples:

- Hired at 25, retires at 67: Accrued pension 66 pct * final salary
- Hired at 25, resigns at 35: Accrued pension equal to 10/40 * 66 pct * final salary
- Hired at 37, retires at 67: Accrued pension 30/30 * 66 pct * final salary
- Hired at 37, resigns at 66: Accrued pension 29/30 * 66 pct * final salary
- Hired at 25, resigns at 56: Accrued pension 29/40 * 66 pct * final salary
- Hired at 37, retires with AFP at 62: Accrued pension 30/30 * 66 pct * final salary
- Hired at 25, resigns at 35, hired again at 47, retires with AFP at 62: Accrued pension 30/30 * 66 pct * final salary.

3.5.4 Private Pensions - Employer

Private pension coverage rates in Norway are relatively low, with roughly 465,000 workers, or approximately 34 per cent of the labor force working in the private sector, covered by private occupational pensions in 1998.

As noted earlier, these occupational pensions are final salary schemes with the final salary determined by the wage during the last year of employment. The minimum accrual period for full private pensions is 30 years. Most schemes operate on the basis of accrual periods of MAX(30,Y), where Y is the number of years to retirement. For example, a 20-year-old entrant will have full service benefits accrue during his career over 47 years, whereas a 37-year-old entrant will have full service benefits accrue at 30 years.

Premiums paid by employers and employees on earnings up to 12G are deductible from income tax. Employers are liable for social security taxes on contributions for pension plans started after 1988. Group life insurance contributions by employers attact both taxable income for employees and social security taxes for employers but are deductible from employer taxes.

An informal norm is that public plus private pensions should ensure replacement rates of 60 to 70 per cent after a full working career. The tax rules for approval are such that no worker on a higher salary can have a higher replacement ratio, including social security, than a worker on a lower salary. Private plans include a retirement age of 67, and typically there are no provisions for early retirement, but pensions may be deferred until age 70. The plans typically include disability benefits as well as special benefits for those born before 1940. Plans also typically include widow and widower benefits of slightly more than half of projected retirement pensions. Orphans' pensions payable to age 21 are also common. Furthermore, disability benefits are ubiquitous, with the usual benefit based on the projected retirement pension. Group life insurance plans with lump-sum payouts are also common, but for tax reasons these are underwritten separately from occupational pension arrangements.

Norwegian occupational pensions are regulated and funded largely on insurance principles.[63] About 75 per cent of pension fund assets are held with life insurance companies, but this percentage will perhaps shrink as a greater number of larger companies run their pension funds through independent trusts. These independent pension funds are regulated by the Credit and Financial Supervisory Authority and must also have a board of trustees with at least four members, at least two of whom must be elected by employees.

The investments of pension assets are governed by certain restrictions that are of both a general and a more specific nature. Of greatest importance is the upper limit of 35 per cent of the investments in equities. This upper limit was increased in 1998 from the previous level of 20 per cent. The increase was combined with the introduction of a requirement that

[63] The supervisory authorities also impose BIS capital standards for insurance companies and pension funds. However, in practice, these 8 per cent capital requirements only matter for relatively small companies, and, in most cases, the EU solvency rules result in larger capital requirements.

the pension fund should have financial strength to be able to absorb an adverse development in the financial markets of a certain order.

The large volume of *with-profits* contracts in Norway induces natural concerns about transfer values for customers wishing to change companies, as well as concerns that future underwriting will be at a loss to the disadvantage of existing policyholders. The Insurance Act of 1988 addressed these concerns, having a fundamental impact on the structure of the Norwegian insurance industry and hence on occupational pensions. One of the implications of the Act was strict cost accounting, which forced the allocation of surplus funds into either taxable profits or accounts earmarked for individual policyholders. The share of taxable profits was limited to 35 per cent but, in practice, has worked out to be 10-15 per cent. Because costs had to be allocated to individuals, the effect was to mandate the charges on insurance products to be front-loaded to reflect up-front costs. The immediate impact of this was a dramatic change in compensation arrangements for direct sales forces, which moved largely from commissions to salary-based wages. Commissions are not a significant part of the pension sales business, with independent advisors operating mainly on a fee basis.

The rules on the earmarking of individual surplus funds were eased somewhat in 1993, with companies being allowed to hold supplementary reserves for future allocation to individual policyholders. Occupational pension fund contracts can have a maximum guaranteed rate of return of 3 per cent per annum; this maximum level of 3 per cent is what is usually observed for new contracts.

Private pension premiums in Norway are calculated based on prospective benefit methods. A worker is assumed to continue to work until retirement, but no wage increases are assumed. In 1994, existing plans were to use a discount rate of 4 per cent in calculating liabilities, while new plans were to use a 3 per discount rate. Deficits in funding arising from wage increases are assumed to be spread equally over the remaining time to retirement. Pension contracts are typically managed on a with-profits basis with profits allocated since 1988 on a per contract basis. Transfers to other life companies and pension funds were permitted as of 1988, although since 1999, transfers have been at book value rather than market value.

The sum of accumulated bonus funds may significantly exceed the actuarial minimum premium due in a given year. Firms are allowed to make tax-free additional contributions of 150 per cent of the normal premium, plus 75 per cent of any required deficit funding. Payments may only be made to the fund if the surplus funds do not exceed ten times the normal premium.

Early leavers receive the basic fund as a separate individual contract, but surplus funds are reverted to the employer. No allowance is made for inflation, but since full service pensions are paid, and an early leaver receives the with-profits payouts until retirement, early leaver benefits in low inflationary environments are not too bad. The maximum waiting periods for joining a scheme are five years for those under 25 and one year otherwise. Certain part-time workers and workers over 57 may also be excluded from occupational schemes.

On the other hand, early leavers are disadvantaged by vesting rules, under which vesting can be as little as $1/10^{th}$ of the accrual period of the scheme, and when pension reserves exceed 0.25G. In practice this means a vesting period of 3 years. Furthermore, there are fees if the individual chooses to transfer his contract to another insurance company.

Annuitization is mandatory with most annuities underwritten on a with-profits basis. Annuities must in general be permanent and no guarantee periods or death benefits are permitted. Temporary annuities are more likely to be observed in the individual market, but a limited number of new schemes have been writing temporary annuities to age 77.

The pension business overall represents about 80 per cent of life insurance assets in Norway, and about 90 per cent of these assets are associated with occupational pension funds. The life insurance sector in Norway is exceptionally concentrated. In 1997, the top four companies controlled 88 per cent of the market.[64] By contrast, the top 10 companies in the UK have a market share of about 60 per cent. In addition, we note that the second largest Norwegian insurance company is the municipal pension fund KLP. At the same time, the level of non-pension business in Norway is exceptionally low. Life premiums in Norway as a percentage of GDP are only 2.1 per cent, which is well below all the other Nordic countries, with the exception of Iceland.

Several features contribute to the highly concentrated nature of the market:

- *Regulation of pension business*. All firms underwriting occupational pension fund business must be registered in Norway.[65] Some Norwegian subsidiaries of foreign companies exist – Vesta Liv is a subsidiary of Skandia Life, for instance – but the indirect foreign share of the market in occupational pensions is small.
- *Limited distribution channels.* Most sales continue to be through direct sales forces operating on a salaried basis. The cost base for entry into the market makes it uneconomical for foreign competitors at present.
- *Business mix and the importance of brand*. Since 1997, companies have been able to enter the market on a unit-linked basis to sell a limited range of products, but business volumes remain small. Most sales remain in with-profits business, and brand recognition and trust are very important for such non-transparent, non-commoditized products, where products cannot be sold and compared on a few easily identifiable characteristics.
- *Solvency regulation* applies both EU insurance and BIS capital adequacy standards. The BIS standards raise capital requirements, and hence costs, for smaller firms and entrants to the market. The specific regulatory issues on with- profits funds and cost allocation are also a complex factor though their effect on competition and market entry is ambiguous.

[64] Association of Norwegian insurance companies (1998), *Norwegian insurance statistics* 1997, Table 1, p. 17.

[65] Firms holding a non-Norwegian single European license under the Third Life Directive may underwrite individual pension business only.

The government is currently considering legislation to improve the tax treatment of defined contribution pensions. It is expected that smaller employers will subsequently start to offer defined contribution pension plans, and that coverage will increase.

3.5.5 Private Pensions – Individual

Individual defined contribution pension contracts can be taken out on a tax-advantaged basis, but the annual premium is limited to 10 per cent of wages to a maximum of 40,000 NOK (€4,923). These arrangements are typically handled through insurance companies that underwrite the business on a with-profits basis. While there were 705,000 individual pension policies in force at the end of 1997, the amounts in each account were relatively small so that individual pension accounts represented in sum only about 10 per cent of total pension business of life insurance companies. Much of this business is above the 40,000 NOK (€4,923) maximum and is not tax-advantaged.

While traditionally higher guarantees were required, new individual products have a maximum 2 per cent guarantee only.

Unit-linked products were first introduced on the Norwegian market in 1997. That year, unit-linked products amounted to approximately 0.3 per cent of life insurance in Norway; a comparable figure for 1998 is 0.6 per cent.[66]

3.5.6 Complementary Products – Life Insurance and Savings

There is a substantial amount of gross savings in Norway, which is independent of pension arrangements. According to Norges Bank, banking deposits were 32.3 per cent of household financial assets in 1998, whereas securities funds were 6 per cent. The level of savings in securities funds is somewhat above the UK as a percentage of household savings, but far below other European countries, especially Holland, Spain, France, and Denmark.

As with other Nordic countries, a wealth tax discourages accumulation of non-tax-advantaged capital, and there are distortions in the tax laws encouraging accumulation of wealth through home ownership. As yet, however, there are no reverse mortgage products on the market facilitating the use of this wealth in retirement.

The past few years have seen Norway's retail financial markets increasingly consolidate into integrated banking and insurance operations. Indeed, the growing role of bank assurance has been important in facilitating the new defined contribution laws referred to above.

A background to the consolidation, occurring in recent years, was the 1992 financial crisis in Norwegian banking, the result of which was that three of the four largest banks now have

[66] Norsk forsikring i tall 1998.

majority government ownership. Indeed, government-owned institutions represent almost half of the total bank assets in Norway. While the government is likely to reduce its stake in the two largest banks in the near future, the 1992 crisis brought in new regulation and led to a focus on capital strength that can be more easily achieved by large companies.

Bank profitability (as a percentage of total assets) has been falling from over 100 basis points in 1994-1996 to closer to 60 basis points in 1998.

3.6 Sweden

3.6.1 Introduction

The national basic pension system in Sweden–the first non- means-tested pension of its kind in the world–was introduced in 1947. This exists in more or less the same form today. However, two major reforms have taken place since the national system was introduced. First, the national supplementary pension (ATP) system was introduced in 1960**.** Second, an important pension reform in Sweden in 1998 will eventually unify all these public pension systems under a single old-age pension system, combining a defined contribution pension and pension guarantees.

As in Norway, Finland, and Iceland, pension contributions are computed in terms of basic amounts (BA). In Sweden, only income up to 7.5 BA accrues rights in the public system, so there is room for private provision of pensions for high earners.

3.6.2 Public Pension System

Sweden's public pension system currently combines:

- A basic flat-rate pension (FP) with
- A supplementary earnings-related component (ATP).

In the summer of 1994, Parliament adopted guidelines for a substantial pension reform, which were finalized by the Parliament in 1998. The reforms include innovative approaches to both benefits under the pay-as-you-go system and prefunded individual accounts. Starting in 2001, the new system will gradually replace the FP and ATP (workers born before 1954 will remain partially covered by the old system).

The current public pension system combines retirement pensions, disability pensions, and survivor pensions in one unified approach. The system has two components: the national basic pension (FP) and the national supplementary pension (ATP). Most benefits under the public insurance system are linked to the base amount, which is used to calculate pensionable income, pension points, and maximum benefit levels within Sweden's social

insurance system.[67] In 1998, the stipulated base amount was SEK 36,400 (€4,398). The base amount is indexed each year to the consumer price index. The base amount is used for computing entitlements from both the FP and ATP systems.

3.6.2.1 Contributions

Pensions from 2000 are to be financed by a fixed contribution of 18.5 per cent of earnings. The shares payable by employers and employees have not yet been decided, although they will most likely be split evenly. Persons looking after their own children under the age of five, who are in national service, or who are disabled, pay contributions based on actual income, but accrue rights based on a higher rate of notional income. Most of the 18.5 per cent in contributions finance the pay-as-you-go system, but 2.5 percentage points are funded and will carry interest in individual prefunded accounts.[68] To handle temporary macroeconomic fluctuations and the demographic transitions affecting the pay-as-you-go scheme, there is a buffer fund. As a part of the introduction of the new pension system, a part of the fund will be transferred to the state budget and used to reduce the state debt. After this transaction, the fund's size will be approximately 580 billion SEK (€70 billion), which is roughly 28 per cent of GDP.

Individuals are now able to designate a private fund manager for their prefunded pension component of 2.5 per cent of earnings. However, the actual records remain with the Premium Pensions Authority, which, like the Central Pension Security Institute in Finland, performs a clearinghouse function. The default option for a fund manager is the National Pension Insurance Fund, which is managed by a fund board. All fund managers must report a detailed breakdown of expenses each year and report the results to policyholders (see Box 5).

[67] Between 1993 and 1998, many programs were linked to the lower base amount, which is slightly below the stipulated base amount.
[68] The contribution to funded accounts was 2 percentage points from 1995 to 1999.

Box 5. ***Premium Pension Authority (PPM)***

The Premium Pension Authority (PPM), which is set up to administer the funded part of the new Swedish public pensions, is modeled on a unit-linked insurance company. It will act as a clearinghouse for the system as a whole, with individual members choosing up to five different private funds in which to invest. The PPM will collect funds and transfer them to the relevant private fund managers. A key design feature of the PPM is that the fund managers administering investments will not know the identity of the investors. Marketing and acquisition costs have traditionally been a high component of private pension costs and regulatory problems; the PPM's anonymity rules are an attempt to lower costs to consumers. At the same time, the PPM anonymity rules probably lower entry costs to the Swedish market because entrants need only provide investment management services and need not spend as much effort on buying up distribution channels. Indeed, as of the spring of 2000, the PPM offered a choice of 453 different funds provided by 67 different fund managers, most of them based outside Sweden. In addition, for those not choosing funds to invest in, a special low-risk government fund called the Premium Savings Fund (*Premieparfonden*) will compete with the private sector.

The organization along unit-linked lines also makes private pension provision accessible to both fund managers and life insurance companies, as opposed to the situation in some Nordic countries, where pension funds effectively have to be organized as insurance companies, again impeding entry into the market. The downside to the Swedish arrangement is the lack of guarantees and risk sharing as would be found in with-profits funds elsewhere in the Nordic countries. By design, however, the new Swedish system has built in guaranteed pensions with the guarantee underwritten by the state.

To be registered as a fund in Sweden, a fund must meet the requirements of the European UCITS directive and must also satisfy the fee/discount structure of the PPM. These fees are lower for small funds, encouraging entry into the market. The PPM will charge individuals 30 basis points for its management services.

At retirement, the fund must be annuitized at market rates but individuals can (as of 2002) withdraw funds to purchase survival cover during retirement for children under 20 or a partner. The Swedish annuities will work in one of two ways. The first way is that the PPM will offer traditional with-profits annuities with a guarantee that the annuity payment will not decrease. The second way involves the individual continuing to invest with fund managers, but the capital of those who die will be redistributed to survivors in a cohort by the PPM, hence leading to higher returns in retirement for individuals. The latter approach is similar to the CREF annuity offered by TIAA-CREF in the United States.

Source: The Premium Pension Authority (1999). *The Premium Pension: A Part of Sweden's New Pension System.*

3.6.2.2 Benefits – Normal Retirement

Residents of Sweden for at least three years–regardless of their nationality–are eligible to receive the FP. A full FP pension requires 40 years of residency in Sweden, or 30 years

with earnings above the base amount, after the age of 16 and before age 65. The full FP pension benefit was 0.785 times the base amount in 1998 for single pensioners (0.96 × 0.98), and 1.57 times the base amount for married pensioners (0.785 × 0.98). The basic pension also provides disability benefits, survivor benefits, and spousal and child supplements. In 1998, the average FP basic pension was SEK 29,837 for men (€3,605) and SEK 35,079 (€4,238) for women. The FP basic pension is uprated each year in line with the base amount.

The FP pension is also supplemented for retirees with a small ATP pension. The pension supplement for retirees provides a maximum of 55.5 per cent of the base amount. Most of the supplements are means-tested. For example, low-income pensioners receive a variety of housing supplements, including a housing supplement to pensioners (BTP), a special housing supplement to pensioners (SBTP), and a municipal additional amount (KKB).

Workers with earnings above the base amount for at least three years are entitled to a national supplementary pension, the ATP pension. Workers earn *pension points* for each year of such earnings. The number of pension points equals the worker's covered earnings minus the base amount, divided by the base amount, up to a maximum of 6.5 points per year. For example, a worker with SEK 109,200 (€13,193) in 1998 would earn 2 points:

$$(109{,}200 - 36{,}400)/36{,}400 = 2$$

The benefit level depends on the years worked and pension points earned per year. Once receipt of benefits begins, benefits are uprated each year in line with the base amount.

Retirement pensions under the ATP system equal 60 per cent of the base amount multiplied by the average of the pension points earned for the worker's 15 best years. If a worker has pension points for fewer than 30 years, and was resident for fewer than 40 years, the pension is reduced in proportion to the number of deficient years ($1/30^{th}$ for each deficient year based on pension points and $1/40^{th}$ for each deficient year based on residency). The normal retirement age is 65, but early and late benefit election is allowed (see below). The average ATP retirement pension in 1998 was SEK 90,718 (€10,961) for men and SEK 44,364 (€5,360) for women. Among female pensioners, 75 per cent received an ATP pension in 1998; among men, 97 per cent did.

Under the new system, pension *claims* will be calculated by determining the value of accrued pension rights. These rights are calculated with reference to contributions over the whole career as well as accumulated fund interest and expenses. The 16 per cent contributions to the notional defined contribution system grow at the rate of wage growth net of expenses and corrections of mortality forecasting errors. The sum of accrued rights is then divided at retirement by a coefficient based on cohort life expectancy. This sum is calculated such that a real growth rate of 1.6 per cent is anticipated, and this also reflects a survivor bonus due to deaths of individuals in a cohort over time, enabling an upward adjustment in pensions during retirement. Pensions are then adjusted annually based on wage indexation, reduced by 1.6 percentage points, the so called "growth norm." This

means that if wage index growth exceeds 1.6 per cent, pensions will be adjusted upward, and if wage growth falls below 1.6 per cent, a reduction will take place.

Guaranteed minimum pensions are claimable from the age of 65 and the amounts are likely to be around 2.13 BA for single pensioners and 1.90 BA per person for married pensioners. There will be some means testing against other types of social security income, but not occupational or private pensions.

Individuals may also invest their prefunded reserve in a traditional fixed annuity (calculated by the PPM) at retirement, instead of assuming the risk associated with investment and earnings fluctuations as in the default payment mechanisms. Under the default payment mechanism, the same notional income growth as described above applies.

The new system is based on a defined contribution of 18.5 per cent of pensionable income. In order to guarantee that pension expenditure does not exceed income in the long run, the system also includes a "break mechanism." This mechanism will adjust the wage indexation of pension rights in the face of an unfavorable economic or demographic development. It is based on a yearly assessment of future pension contributions and the size of the buffer fund relative to the value of future pension liabilities. If this ratio is estimated to be smaller than one, full indexation does not take place. If conditions improve, pension rights will be allowed to catch up with the normal index until full compensation is obtained. In this way, factors like varying rates of return in the buffer fund, changing labor market behavior, and increasing life expectancy at the age of retirement will be accounted for.

In addition to this there exists a housing allowance system for low-income families. Description of this system is not included here.

3.6.2.3 Benefits – Disability

Besides a retirement pension, the ATP system includes disability and survivors pensions. To qualify for a disability pension, a worker's capacity to work must be reduced by at least 25 per cent, and the worker must be between ages 16 and 65. The benefit calculation assumes that the pre-disability earnings level would have been continued throughout the rest of the worker's career. The benefit level is then based on the combined FP and ATP retirement pension, scaled to the degree of disability. (Before 1995, full disability pensions were equal to the full retirement pension. Since July 1, 1995, however, the full disability pension has been reduced to slightly below the full retirement pension.) The average annual ATP disability pension in 1998 was SEK 61,274 (€7,403) for men and SEK 51,397 (€6,210) for women.

Survivor pensions include a so-called adjustment pension, special survivor pension, child's pension, and widow's pension. The adjustment pension is paid to spouses for six months (and longer if the surviving spouse is caring for a child under age 12) as long as the surviving spouse had lived with the deceased worker and is not above the age of 65. Following the end of the adjustment pension period, a special survivor pension is available to those unable to work and not receiving a retirement pension. In addition, children under

the age of 18 can receive a child's pension if one or both of their parents have died and if the parents had sufficient ATP pension points (the benefit is always at least 25 per cent of the base amount if one parent has died and 50 per cent of the base amount if both parents have died). Finally, a widow's pension is paid to some women whose husbands have died, but this pension is being phased out.

3.6.2.4 Benefits – Early/Late Retirement

The normal retirement age is 65. Since 1998, early drawing can be made at the age of 61 (before 1998, early drawing was possible at the age of 60) in exchange for a reduction in the pension amount of 0.5 per cent per month of early receipt. Benefit receipt can also be delayed past age 65, with a pension increase of 0.6 per cent per month for each month of delay past 65 and before 70 under the existing system. These possibilities are little used. In the new system, early retirement will be possible from the age of 61 in exchange for an actuarial reduction in old age pension. Early old-age pensioners have mostly been self-employed.

Currently a partial pension is available to those between the ages 61 and 65. To qualify, workers must agree to reduce the hours worked, for example, working part-time every day or full-time every second day, week or month. The partial pensioner must work no less than 17 and no more than 35 hours per week on average. The partial pension then replaces between 55 and 65 per cent of the lost income from the reduction of hours (up to a maximum of 7.5 times the base amount). This scheme will not accept new members after December 31, 2000. Relatively few workers in Sweden go to early retirement through this channel. The number of early part-time pensioners in 1999 was only 2,700, compared with approximately 51,000 in 1994 (which was a year with high unemployment in Sweden). Due to the closing of the scheme, a temporary increase in part-time pensions is expected in 1999 and 2000. In Table 3.8, we report the main early retirement schemes in Sweden and their characteristics.

Table 3.8. Main early retirement schemes in Sweden and their characteristics

Scheme	Eligible group age	Special conditions for eligibility	Reduction of normal old-age pension	Topping-up to a guaranteed minimum level	Number of recipients in 1999 (1000)
1. Disability pension	16-64	Medical certificate	No	Yes, minimum pensions	419
2. Early old-age pension	60-64	None	Yes	Yes, reduced minimum pension	18
3. Part-time pension	61-64	In work 17-35 hours per week	No	No	2.7

Source: *European Economy* (1998), "Income Benefits for Early Exit from the Labour Market in Eight European Countries: A Comparative Study," No.3, European Commission and Ministry of Social Affairs, Sweden

Both wage/salary earners and the self-employed are eligible for all retirement schemes, and continued work is only possible when receiving part-time pension.

Under the new system, prefunded pensions are claimable from age 61 on a partial basis. Annuity amounts are calculated using actuarial principles so that those who retire early receive lower pensions.

In the early 1990s, disability pension was clearly used as a means to keep the unemployment rate down. Since then, the qualification requirements have been tightened, and it is no longer possible to receive a disability pension without a medical basis. In an attempt to encourage disability pensioners to return to the labor market, new legislation has been passed, making it possible to hold a job for a maximum of three years without loosing one's pension rights. During the first year, one is even allowed to keep his/her housing allowance.

3.6.3 Public Sector Occupational Pensions

Government employees are covered by agreements similar to those in the private labor market. For the central government, the so called PA-91 agreements cover some 700,000 employees and retired people. Present pension liabilities are estimated to be around 100 billion SEK. A smaller part of the public-sector pension system, approximately 1.5 per cent of pensionable salaries, is funded in a defined contribution system. The main part is a defined benefit pension, based on the average salary during the last five active years, and is indexed by the basic amount (basbelopp). Pension coverage is the same as in private programs: 10 per cent on top of the government pension, 65 per cent of income between 7.5 and 20 basic amounts, and 32.5 per cent of income between 20 and 30 basic amounts for remaining life after the age of 65. In order to receive a full pension, a minimum of 360 months' work of at least 40 per cent of full time is necessary. For every month missing, a 1/360 share is deducted. There is the possibility of receiving a reduced pension from the age of 60, or a bigger pension if work is continued until 70. The defined contribution part of 1.5 per cent can increased by an agreement with the employer, or by voluntary contributions. There are provisions for employees who cannot continue to work for medical reasons and for the partner/children in the event of untimely death.

The PFA98 agreement applies to roughly 1 million local government employees. Just as for central government workers, future taxation is the principal basis for local government pension liabilities, although some local governments have agreements with private insurance companies or have made their own saving provisions. There is a small funded part of 1 per cent of the wage bill funded in all local governments, and for which the investment decision is a matter for the insured person. Pensions in the defined benefit part are based on average income during the seven years preceding retirement and the number of years of employment. Benefits are roughly the same as for central government employees. A reduced pension can be granted from the age of 61, and if payments start after the age of 65 there will be a bonus. Sick benefits and a family coverage in the case of death are available.

3.6.4 Private Pensions

Private employer-based pensions in Sweden (as opposed to voluntary private savings) comprise the ITP plan for salaried employees and the STP plan for wage earners. All members of the Swedish Employers' Confederation must provide such pensions if they employ any members of the Confederation of Salaried Employees (PTK), and the pensions must be held with the Swedish Staff Pension Society. The result is that more than 90 per cent of employees are covered by private pension plans. (Some senior executives are allowed to contract out of ITP. Foreign firms that are not members of the employers' confederation are not bound by the same regulations, but they often set up pensions through an insurance company, foundation, or book reserve on the firm's own accounts.)

Occupational pensions normally provide 10 per cent extra compensation in relation to final salary for incomes below the upper limit of 7.5 BA. High-income earners receive approximately 65 per cent of the part of the income exceeding the upper limit of 7.5 times the base amount (SEK 301,000 (€36,367)) for the year 2000) for up to 20 base amounts, and receive 32.5 per cent for between 20 and 30 base amounts.

Contributions within the occupational pension system are non-taxable. However, the yield on the fund is taxed. Pension benefits are taxed as earned income. There are no lump-sum benefits.

The ITP plan includes both a defined benefit and a defined contribution component. Benefits under the defined benefit component of the ITP plan amount to 10 per cent of earnings below 7.5 times the base amount, plus 65 per cent of earnings between 7.5 and 20 times the base amount, plus 32.5 per cent of salary between 20 and 30 times the base amount. Compensation in excess of 30 times the base amount (SEK 1,092,000 (€131,935)) is not counted for benefit purposes. Earnings are defined as earnings at age 65 (excluding any increases between 60 and 65 above the cost of living). This part of the scheme is thus a final-salary defined benefit. The other part of the ITP plan is a 2 per cent money purchase plan, the ITPK. The ITPK can be held with any financial provider, and the accumulated balance used for either a temporary 5-year pension or a smaller additional lifetime pension. The normal retirement age under the ITP plan is 65, although retirement at age 62 is allowed in exchange for reduced benefits.

The STP plan for wage earners provides benefits equal to 10 per cent of earnings below 7.5 times the base amount, based on the average of the highest three years of earnings between age 55 and 59. The normal retirement age under the STP plan is 65, and early retirement is not allowed. The STP plan is being replaced by a new defined contribution system, under which employers will contribute 2 per cent of earnings to an individual account for the employee. The individual is then free to choose from a number of different providers and investment plans.

Contributions are tax-deductible unless they exceed certain limits, but interest income is taxable and payments are taxable. Investment income on pension assets is taxed at 15 per cent.

In the same way as there are collective insurance policies for old-age pensions; there are collective insurance schemes for early retirement/disability pensions. In contrast to the old-age pension system, early retirement/disability pensions must be awarded from the public sector pension system before it is possible to receive an occupational pension. Some of the collective insurance systems for early retirement/disability pension are directly integrated, i.e., they are dependent on the pension from the central government pension system and, in many cases, lead to higher compensation. Others are formulated as collective insurance for old-age pensions. The level of compensation varies between different contractual areas. For example, within one contractual area, additional compensation equal to 15 per cent of the recipient's final salary is payable on income up to the upper earning limit. For income above the upper earning limit, 65 per cent of that part of the income that exceeds the upper earning limit pays up to 20 base amounts. For between 20 and 30 base amounts, 32.5 per cent is payable.

3.6.5 Private Pensions – Individual

The individual pension market largely operates through life insurance companies, selling through direct sales forces. The Swedish life insurance market is very concentrated, with the top few companies having a substantial market share. Individual pension fees are tax-deductible, and the pension is taxed in the normal way. Capital gains are also taxed at 15 per cent, which is below the rate of taxation for other insurance savings vehicles. On retirement, individual accounts need to be annuitized, but only for a minimum of five years in a temporary annuity. Pension insurance is well over half of regular premium business but a smaller fraction of single premium insurance business.

The Swedish market has changed dramatically in recent years after new laws permitted life insurance companies to operate banks. Unit-linked funds have grown particularly fast in recent years, but the market is still dominated by with-profits funds. Bank assurance and brokers are an increasing feature in the market, with the broker share of the life insurance market rising to over 30 per cent in recent years. Under a 1990 law, brokers, which are a relatively recent feature in Sweden, must be licensed by the Financial Supervisory Authority. They must be independent and cannot have ties to multiple companies.

The Consumers Insurance Bureau in Sweden provides some comparisons and product overviews, but consumer protection is largely in the hands of individual companies, and the Financial Supervisory Authority does not have large resources for handling complaints. Nevertheless, problems with selling inappropriate products have been relatively uncommon in Sweden.

3.7 Summary

In this chapter, we have reviewed the pension systems of the Nordic countries. There are a number of similarities across the different systems: the reliance on flat-rate systems for basic provision, the heavy role of with-profits investment funds for private provision and the general lack of elderly poverty. On the other hand, there are major differences in early retirement incentives, the structure of private benefits, and the degree of private provision and regulation. The differences as well as similarities are reviewed in Chapter 4, which provides an analytical comparison of the systems to complement the institutional overview in this chapter.

Table 3.9 below summarizes the minimum pension before tax in the five Nordic public pension systems.[69] Chapter 5 compares the private pension systems.

Table 3.9. Minimum pension in the Nordic pension systems, before taxes

	Denmark	Finland	Iceland	Norway	Sweden
Official retirement age	67	65	67	67	65
Minimum social security pension before tax for a single individual with no alternative income (basic pension and supplements).	€12,855	€4,452 - €5,071	€11,844	€10,362	€9,368
Is minimum state security pension income tested?	Not the basic amount but the low income supplement	Yes	Yes	Not the basic amount but the low income supplement	Not the basic amount but the low income supplement

[69] In some of the countries persons receiving only minimum pension pay no tax, i.e. Sweden and Finland.

Chapter 4
Conquering the Labor Participation Problem

4.1 Introduction

Despite substantial increases in longevity, the age of retirement has steadily fallen throughout most of the twentieth century. In 17 OECD countries, the employment-population ratio of 55-64 year-old males fell by an average of more than 10 percentage points between 1980 and 1996.[67] Similarly, as illustrated in Figure 4.1, labor force participation rates for those 65 and above have fallen significantly across the OECD economies. As shown in Figure 4.2, the Nordic countries have roughly paralleled this trend. Particularly substantial decreases in labor market participation have occurred in Finland and Norway.

It is apparent from Figure 4.1 that labor force participation rates have fallen substantially in all countries. This withdrawal of older workers from the labor force causes a variety of economic challenges, including an increase in unused production capacity in the economy, a lower tax base, and an increased burden on pension and fiscal systems. It is therefore of critical importance to design pension systems providing appropriate incentives for delaying retirement.

[67] Richard Disney and Edward Whitehouse (1999), "Pension Plans and Retirement Incentives," SP Discussion Paper No. 9924, World Bank, August.

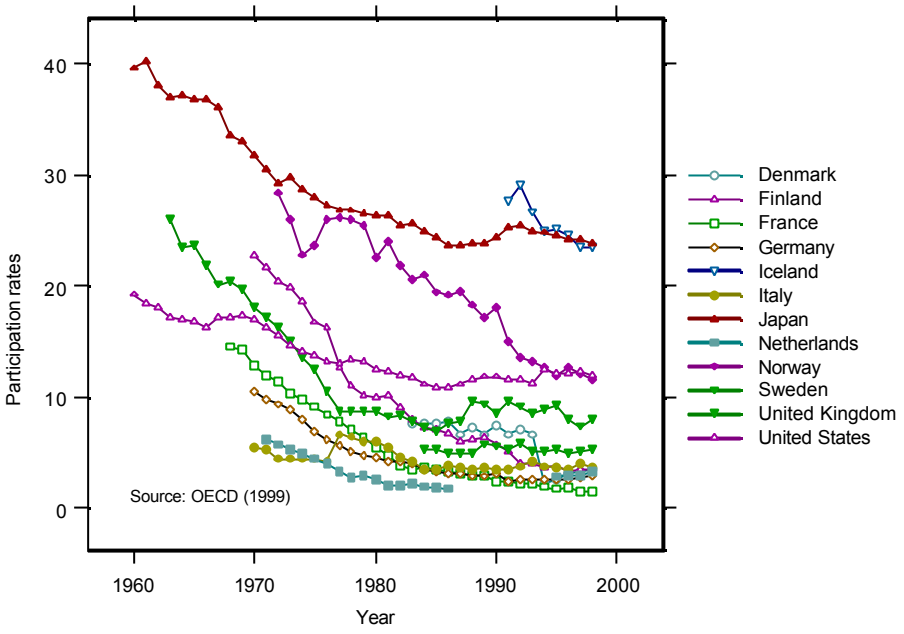

Figure 4.1. *Labor force participation rates for men over* 65 *in the OECD*

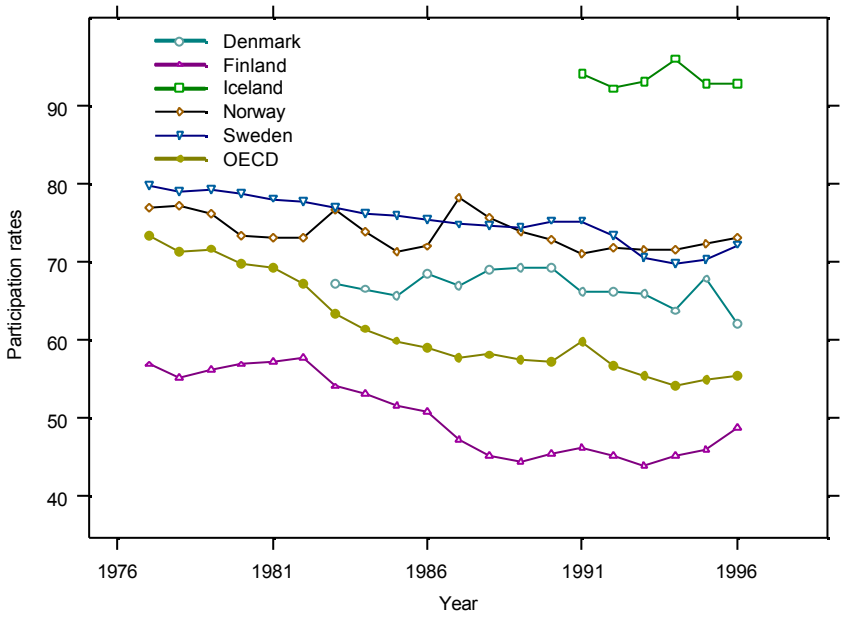

Figure 4.2. *Labor force participation rates among* 55-64 *year-old males in the Nordic countries*, 1977-1996

The economic cost of the low labor market participation in some Nordic countries is substantial (see Table 4.1). Even if we ignore the cost of benefit payments and the

distortionary effect on the labor supply of financing these benefits, and we also ignore the higher average wages of older versus younger workers, the low labor market participation of those aged 50-64 reduced output in the EU by over 10 per cent in 1997, relative to what it would have been had the labor market participation rates of those aged 50-64 been the same as for younger workers.

Table 4.1. Costs in therms of lost output in 1997, arising from early retirement of 50 to 64 year olds

Denmark	7.45 per cent of potential GDP
Finland	10.36 per cent of potential GDP
Iceland	0.60 per cent of potential GDP
Norway	4.71 per cent of potential GDP
Sweden	3.26 per cent of potential GDP
EU-15	11.22 per cent of potential GDP

Source: *Eurostat Yearbook: Data* 1987-1997, European Commisson (1999), *Winning the Generation Game* , UK Cabinet Office (2000), and authors calculations.

Table 4.1 shows that the Nordic countries are all below the EU average in terms of forgone output from early retirement, with Finland and Denmark closer to the EU average than other Nordic countries. Indeed, Iceland is estimated to suffer less than a 1 per cent decline in output from low market participation. But the costs involved are still substantial, despite forgone output being lower in the Nordic countries than elsewhere in Europe: the output losses in the Nordic countries other than Iceland are all over 3 per cent of GDP and hence of significant policy concern.

It should be emphasized that these estimates are rough approximations.[68] But more refined figures would show the same fundamental point: the costs involved in early retirement are significant.

Exploring the causes of early retirement is thus a critical economic policy issue. Workers in public defined benefit plans, as are found in the Nordic countries, may have incentives to retire earlier than workers in defined contribution plans if the early retirement penalties embedded in the defined benefit plans are too small, as they typically are. The exact effects depend on what kind of salary scheme the contributions are based and on the age-earning profiles. Theory predicts that, *ceteris paribus*, systems with high replacement ratios would induce workers to retire early by raising their lifetime income and therefore their demand

[68] These calculations assume that workers aged 25-49 have the same average wage as those aged 50-64, and that additional labor supply from those aged 50-64 would have no impact on aggregate wages, so that the level of actual output relative to what would have obtained if those who are older had the same participation rates as younger workers can be calculated using data on only the labor force and population of different ages. In particular, the ratio of actual output to potential output is given by the actual labor force relative to the labor force, which would be obtained if those aged 50-64 worked at the same rate as younger workers. This ratio can be expressed as: $\frac{1 + LF(50-64)/LF(25-49)}{1 + POP(50-64)/POP(25-49)}$ where LF is the labor force and POP is the population. Also, the calculation assumes the same rate of disability incidents in both age groups, which is a further simplification.

for leisure. However, in a recent OECD study, Blöndal and Scarpetta (1998) find no clear relationship between high replacement rates and early retirement.[69] This can partly be explained by the fact that in some countries, workers retiring early are penalized by actuarial adjustments. The accrual rates for continued work do seem to have an impact on the retirement decision.

The incentives for early retirement are not restricted to the pension system *per se*. For example, the tax system also matters: with a progressive income tax system, the difference between the tax on earned income and the tax on income from pensions may provide an incentive for early retirement.

A related issue arising in the context of private occupational defined benefit schemes is that older workers can be quite expensive in terms of their pension costs. Therefore, early retirement is a particularly effective method of cutting business costs for firms. Firms, however, 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 (1999a), because firms do not internalize the costs of forcing early retirement, more people retire early - leading to higher costs to the state - than if firms were forced to bear the cost burden themselves.

Although some decline in labor market participation is a common trend across the Nordic countries, there remain substantial differences across the countries on the level of labor market participation and its rate of decline. In particular, Iceland's labor market participation rates for older workers rival Japan's as the highest in the world. Despite the recent decline in Norway, its rates of old age labor market participation are still quite high, roughly equal to US levels. On the other hand, there are clear signs of both rapid decline and low levels of participation in Denmark and Finland. (Tables 3.1, 3.3, and 3.8 in Chapter 3, report the main early retirement schemes for Denmark, Finland, and Sweden. One can observe that in Denmark and Finland many schemes exist for early retirement, while in Sweden they are relatively few.) Sweden is an intermediate case, in that its rates of labor market participation for older workers declined significantly in the 1960s and 1970s but have remained steady since the mid-1990s.

These differences are important for policy-makers to the extent that their causes are based on economic policy and structure rather than cultural and environmental factors. However, deriving causal relationships is difficult because, in many of the countries, early retirement schemes were expanded in the 1980s as a means of dealing with high unemployment. Discerning whether the increase in early retirement resulted from the early retirement scheme or from the macroeconomic events generating the high levels of unemployment is therefore difficult. Indeed, one of the key themes of this chapter is that one must examine labor demand as well as labor supply in policy assessment.[70]

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[69] Blöndal and Scarpetta (1998), "The Retirement Decision in the OECD Countries," Economics Department Working Paper No. 202, OECD, Paris.

[70] 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

In summary, while the Nordic countries do have a better record on labor market participation than most other European countries (such as Germany, France, and Italy), there are still important reasons for renewing attention to the problem at a Nordic-wide level:

- Early retirement is an important contributor to pension and other costs. For instance, in Finland, less than half of men between 55-64 were working, and in Denmark the average retirement age is closer to 61 than the current official retirement age of 67. Early retirement also leads to less work after retirement and hence has long-term fiscal consequences. And as shown in Table 4.1 above, the economic cost of early retirement is significant.
- Some of the Nordic countries have experienced similar policy problems and hence could benefit from more shared information and policy analysis in the future.

In particular, policy measures such as the Danish FlexJob scheme may be useful for other Nordic countries to consider. The similarity of the underlying demographics–although not necessarily the labor market participation rates for older workers–across the Nordic countries suggests room for coordination. In addition, the new Swedish premium pension system is transparent in the degree of flexibility offered for early retirement, and this may lead to sharp swings in the numbers retiring early when business conditions change.

4.2 Explanations for Labor Market Participation Declines

4.2.1 Labor Supply Incentives

The academic explanations for low labor market participation typically focus on incentives for workers to supply labor. Such incentives include, among other factors, the pension accrual rate, the level of pension wealth, earnings tests on pension eligibility, and more traditional tax considerations.

Boskin (1977) was one of the first to pay close attention to the effects of incentives on early retirement. Other subsequent work includes Quinn *et al*. (1990).[71] Indeed, incentives are the focus of a huge US literature, which includes papers by Stock and Wise (1990)[72] and Fields and Mitchell (1984).[73] Empirical work in Europe also examined early retirement

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retirement schemes and yet had much higher levels of labor market participation. OECD, *The Transition from Work to Retirement*, OECD Social Policy Series No. 16, 1995, p. 92.

[71] Joseph F. Quinn, Richard Burkhauser and Daniel Myers, *Passing the Torch: The Influence of Economic Incentives on Work and Retirement*. Upjohn, 1990.

[72] James Stock and David Wise, "Pensions, the Option Value of Work and Retirement", *Econometrica,* 1990, 58, 1151-1180.

[73] Gary S. Fields and Olivia Mitchell, "The Effects of Social Security Reforms on Retirement Ages and Retirement Incomes", National Bureau of Economic Research Working Paper 1348.

from an incentive-based approach; examples include Borsch-Supan (1992)[74] for Germany and Meghir and Whitehouse (1992) for the UK.

Furthermore, three main cross-country studies focus on incentives for early retirement. These include work by the OECD (1995, 1995a) (which mixes cross-sectional and time series regressions), a project for the journal *European Economy*, and a National Bureau of Economic Research book edited by Jonathan Gruber and David Wise (1999). The methodology in each of the cases was slightly different. The *European Economy* study focuses on replacement rates for different routes out of the labor market, whereas the Gruber/Wise project focuses on 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. It has spurred much policy and academic interest in its findings. Unfortunately for this study, however, the Gruber/Wise approach was applied only in Sweden among the Nordic countries. Sweden has less early retirement and less unused labor capacity than most other countries in the Gruber/Wise 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 Nordic pension system because it did not generally incorporate the impact of private benefits. Private benefits, particularly individual accounts with tax advantages, may be important to take into account when considering incentives for early retirement in the Nordic countries, especially since individual accounts in the Nordic countries are sometimes used to fund early retirement.

4.2.2 Alternative Explanations for the Rise in Early Retirement

An alternative explanation for higher levels of early retirement is a cohort effect, since 60-70 year-olds in the 1980s were 20-30 years old in the 1940s and were particularly susceptible to injuries and disability because of World War II.[75] Indeed, one Australian study in 1983 used cohort analysis to successfully predict an uptick in early retirement at the end of the decade.[76] Furthermore, Sweden (which did not participate in the war) has not seen an uptick in early retirement as in other European countries. Similar cohort effects have also been advanced for mortality improvements.[77] To the extent that early retirement effects are cohort-specific, they are more likely to be temporary and therefore may not pose so large a policy problem. Similarly, to extend the logic, if increased morbidity among early retirees is cohort-specific, there are fewer public policy issues with the disability system.

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[74] Axel Borsch-Supan, Population Aging, Social Security Design and Early Retirement, *Journal of Institutional and Theoretical Economics*, 148, 533-557.

[75] OECD, The Transition from Work to Retirement. OECD; 1995, p.20.

[76] Bureau for Labour Market Research, "Retired, Unemployed or at Risk: Changes in the Australian Labour Market", Australian Government Publishing Service, Canberra, 1983.

[77] Richard Willets, Mortality *in the Next Millennium*, Presented to the Staple Inn Actuarial Society – 7th December 1999

Cohort effects are one shortcoming with the labor-supply based incentive approach from the academic literature. Labor demand effects are another. For example, legislation, such as the Age Discrimination in Employment Act of 1968 in the United States, which prohibits discrimination against older workers, can have an important impact on the labor demand for older workers. Laws against mandatory retirement or age discrimination can tilt labor demand and thereby affect retirement behavior. (Despite their potential costs in terms of demand for older workers, mandatory retirement programs do have some economic benefits, as discussed by Lazear (1979).[78])

Tuulia Hakola of the Finnish Government Institute of Economic Research (VATT) conducted an interesting study of early retirement in Finland that highlights labor demand effects.[79] Hakola uses data from a sample generated by the Employment Registry of Statistics Finland. Since 1987, the Employment Registry has assembled and linked together data from different government sources. Hakola's subsample consisted of observations on about 150 variables for 12,000 individuals between 1987 and 1994. The individuals falling within the early retirement age group of 55 to 64 numbered about 2,000.

Despite other shortcomings, Hakola's data allowed her to construct forecasts of future wages and discounted benefits to calculate economically meaningful incentive measures. Using random effects probit modeling, Hakola found evidence that labor supply incentives are important in determining behavior. However, her results point also to the importance of labor demand factors, such as firm size and characteristics, as well as individual effects, such as health.

Hakola's results point to the fact that it is difficult to generate the observed cross-sectional pattern of early/late retirement in Nordic and OECD countries from incentive effects alone. Finland, for example, has some of the largest incentives for delaying retirement anywhere in the world, yet has a relatively low incidence of late retirement. The importance of labor demand effects was highlighted in the 1990s, when a major recession led to a significant decline in demand and an increase in early retirement. Indeed, the work of Helka Hytti in Finland focuses on these demand side effects. Her research examines the effect of recession on certain industries and how the incidence ofearly retirement is the highest in the industries suffering most during the recession.

Similarly, Dahl, Nilsen and Vaage (1999) examined early retirement for Norway, using a dataset of over 10,000 individuals, aged 56-61 in 1989.[80] They found that industry characteristics and local unemployment rates had a significant effect on early retirement, suggesting that labor demand factors were of high importance.[81]

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[78] E.P. Lazear, "Why is there mandatory retirement?", *Journal of Political Econo*my, 87, 1261-1264.

[79] Tuulia Hakola, *Race for Retirement*, VATT Research Report 60, 1999. Hytti (1999) provides an excellent history of different pathways to early retirement in Finland.

[80] Svenn-Age Dahl, Oivind Anti Nilsen and Kjell Vaage, "Work or Retirement: Exit Routes for Norwegian Elderly," IZA DP 32, 1999.

[81] An, Chistensen and Gupta (1999), using data from the US, suggest a mechanism making this effect more important. They estimate a bivariate duration model and find that retirement probabilities of couples are quite closely related. Mark An, Bent Jesper Chistensen and Nabanita Datta Gupta, A Bivariate Duration Model of

A recent report by the Cabinet Office in the UK also finds that at least two-thirds of people leaving work early do not do so voluntarily, suggesting demand-side factors are important.[82]

The legal structure across countries also suggests of a role for labor demand. For example, Sweden has relatively low levels of early retirement. It also is one of the few Nordic countries with employment protection legislation for older workers. The Security of Employment Act of 1974 requires more notice for older workers, and redundancies have to be justified potentially on a "last in, first out" basis, unless labor unions agree otherwise.[83] In addition, by law, the County Labour Market Board must be notified of redundancies. Another relevant factor affecting demand for older workers is government training and employment programs. In Table 4.1 below, we show the fraction of older workers in Swedish training and employment programs in May 1992. In addition, placement rates for the unemployed over 55 looking for work in Sweden are quite low relative to the population.

Iceland's experience with higher labor market participation of older workers also points to the importance of labor demand factors. Unlike the other Nordic countries, Iceland did not encounter unemployment problems so that there was less pressure to use early retirement as a redundancy vehicle. In addition, the structure of Icelandic occupational pension schemes is such that older workers are not more expensive for employers, thereby minimizing the effects of higher pension costs on labor demand for older workers.

Table 4.2. Fraction of older workers in Swedish training and employment programmes

	% of older workers
Public relief work	5.8
Employment training	1.2
Subsidised employment	9.3
Sheltered workshops	25.6
Labour market rehabilitation	2.2

Source: OECD (1995) and the Swedish national labour market board.

4.2.3 Part-time Employment and Self-employment

Standard labor supply models do not typically take part-time employment into account. For men in the Nordic countries, aged 55-59, part-time employment is not much higher than for the population as a whole, but it rises substantially after age 60. For example, in

the Joint Retirement Decisions of Married Couples. Centre for Labour Market and Social Research Aarhus, Working Paper 99-10, Dec. 1999.

[82] UK Cabinet Office (2000), *Winning the Generation Game*, Performance and Innovation Unit, April.

[83] OECD, The Transition from Work to Retirement, 1995, p. 28., E. Wadenso, "Sweden: Partial Exit" in Kohli, M., Rein, M. Guillemard, A.M. and Van Gunsteren, H. (eds.), *Time for Retirement: Comparative Studies of Early Exit from the Labour Force*. Cambridge, 1991.

Sweden, part-time employment in 1989-1990 was 30.5 per cent of the labor force, relative to 7.3 per cent for the whole population (OECD, 1995). The percentage of older people in part-time employment rose through the 1980s, with much of the change attributed to gradual retirement.[84] But a high-cost, partial retirement program was severely cut back in January 1995, which may attenuate the shift toward gradually easing into retirement through part-time work.

There is substantial evidence in OECD countries (although not necessarily the Nordic countries themselves) that workers move into bridge jobs and self-employment before entering early retirement, with many decisions driven by health considerations.[85] Part-time employment generally implies flexibility. But one of the costs in many OECD countries with part-time work is that individuals need to switch jobs frequently, and these frequent shifts often involve lower average wages.[86] Some older workers may have difficulty in adjusting to these frequent changes, reducing their ability to work part-time.[87]

Self-employment is also important for the elderly. Older workers are more likely than others to be self-employed (see Table 4.2).[88]

Table 4.3. 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	30.5	7.2
Germany	29.4	11.3	16	5.4
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

Source: OECD (1995), pp. 34-35.

[84] Eskil Wadensjo, Gradual Retirement in Sweden, in Delsen *et al*. (1996).

[85] G. Bazzoli, "The Early Retirement Decision: New Empirical Evidence on the Influence of Health", *Journal of Human Resources*, 20, 2, 214-234. K. Anderson and R. Burkhauser, "The Retirement-Health Nexus: A New Measure of an Old Puzzle", *Journal of Human Resources*, 20, 3, 315-330.

[86] Evidence from Canada is in Ross and Shillington, *FLUX: Two Years in the Life of the Canadian Labour Market*, Statistics Canada, Ottawa. US evidence is in Alan Gustman and T.L. Steinmeir, "The Effect of Partial Retirement on the Wage Profiles of Older Workers", *Industrial Relations*, 24, 2, 257-265 as well as J.F. Quinn, R.V. Burkhauser and D.A. Myers (1990*), Passing the Torch: The Influence of Economic Incentives on Work and Retirement*. Upjohn. C.J. Ruhm, "Career Jobs, Bridge Employment and Retirement" in Peter Doeringer, *Bridges to Retirement in a Changing Labor Market*. ILR Press, Ithica, 1990. Also, D. Shapiro and S.H. Sandell, "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.

[87] OECD (1995), *The Transition from Work to Retirement*.

[88] B. Casey 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.

4.3 Disability

The importance of disability in explaining changes in labor market participation is controversial.[89] In the US literature, John Bound and others have argued that while disability benefits have led to lower labor market participation, the primary explanation for declining labor market participation 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 US is due to enhanced disability benefits. Bound (1989) also casts doubt on how strong the disincentive effects of disability insurance are by looking at the labor market behavior of rejected applicants.

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

In Figure 4.3, we report disability incidence among men and women, aged 55-59, in the Nordic countries, defined as individuals receiving disability benefits. Disability affects up to 25 percent of men and women aged 55-59 in Finland and Norway. As disability benefits are typically more expensive than ordinary early retirement benefits, disability expenditure is of particular concern in the Nordic countries.

With the potential exception of Norway (where efforts to control costs are underway) and Iceland (where disability levels are relatively low), disability incidence appears to be on the decline in the Nordic countries. There have been particularly sharp drops in Finland and Sweden (see Figure 4.3).

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

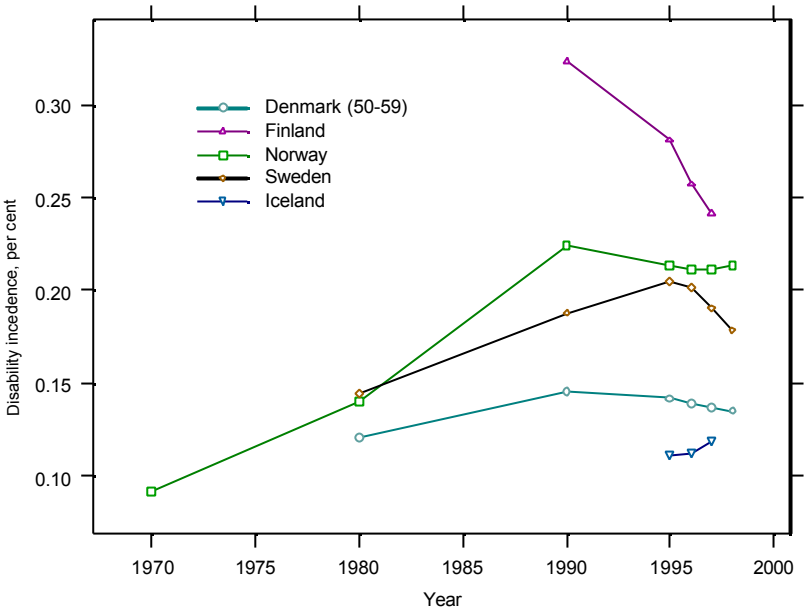

Figure 4.3. *Disability incidence among men and women, aged* 55-59, *in the Nordic countries*

4.4 Policy Options

Given that the discussion above suggests that both incentive and non-incentive effects can significantly affect behavior, we discuss both types of reforms in this section. Incentive reforms involve increasing the return to work for individuals. One of the key issues regarding incentive reforms is whether to increase the return to work for all workers near retirement and past retirement, or only those who have already left the labor market. We point out important distributional as well as incentive issues with both approaches. Conventional policy analysis and the academic studies referred to above have focused on pure returns to work, whereas the successful Danish FlexJob program is an example of a program that relies on improving marginal returns to work for the disadvantaged. This program is closest in spirit to the unemployment voucher program advocated by Snower (1994).

For non-incentive policy options, we look at a recent analysis of Orszag and Snower (1999b), which shows that under most circumstances, policy makers should focus more on quantity mechanisms and less on price mechanisms. Their analysis suggests that more explicit focus should be placed on controlling access to early retirement rights. Orszag and Snower (1999b) make a related point about private pension schemes. Private schemes operating in an actuarially fair manner do not take into account the social costs of forcing early retirement or encouraging late retirement. (This social externality parallels that of unemployment insurance in that firms do not bear the social costs of creating unemployment. Finland is the only Nordic country to have some degree of experience-

rating of unemployment and disability and therefore is something of an exception in this regard.)

4.4.1 Middle-age Work Subsidies versus Employment Vouchers

Phelps (1997) provides perhaps the most elegant argument for work subsidies for the low paid. By increasing the reward to work, the number of unemployed under such a scheme falls.

Hoon and Phelps (1997) provide supporting analysis. In the context of encouraging middle-aged workers to work, the Phelps approach would involve improving the return to work for all workers. This would involve changing taxes or social security benefits to remove the disincentive effects for continuing to work reported in the Gruber and Wise (1997) volume and elsewhere.

An alternative approach is one suggested by Dennis Snower and analysed in Orszag and Snower (1999a). In this approach, incentives are targeted exclusively at those who have already retired or are unemployed, or perhaps those in high-risk groups.

Both approaches aim to stimulate employment, but the mechanisms are radically different. One subsidizes the employment of those currently unemployed (in particular, the long-term unemployed), while the other subsidizes the employment of those already working. Orszag and Snower (1999a) compare the two policies, as well as intermediate approaches, and look at the optimal dynamic policy for any given policy objective concerning employment, unemployment, and wage disparities.

Both policy approaches are able to alleviate a wide variety of market failures resulting in excessive labor costs and thereby depressing labor demand (such as the market failures highlighted in the adverse selection, moral hazard, insider-outsider, and union theories of labor market activity). However, both types of policies become ineffective in stimulating employment if their incidence falls entirely on the individual workers, with firms reducing their wages by the amount of the subsidy.

Orszag and Snower (1999a) found that key factors influencing the effectiveness and desirability of vouchers versus subsidies are the coefficient of relative risk aversion and the slope of the employed wage profile (i.e., how fast wages increase over time). The coefficient of relative risk aversion is important in that when it is low, incentive effects dominate, and the optimal policy is more likely to subsidize long-term employment because workers value the end reward and do not pay much attention to the risk of not attaining the reward for long service. On the other hand, when the coefficient of relative risk aversion is high, the optimal policy is closer to that of optimal tax theory, where inelastically supplied labor (long-term employed) is taxed, whereas elastically supplied labor (new hires of the long-term unemployed) is subsidized. The other key lever is the slope of the wage profile; the steeper the slope of the wage profile, the greater the effectiveness of hiring vouchers relative to employment subsidies. The reason for this is that when the wage profile is steep,

the disincentive effects of vouchers on the long-term employed are more than compensated by the incentive effects of higher wages.

In the context of the analysis of early retirement, the wage profiles tend to be very flat, suggesting continued focus on incentive effects. On the other hand, workers near retirement are likely to be very risk averse, suggesting that vouchers (or targeted subsidies) can have a particularly strong effect. While the net result of the Orszag and Snower (1999a) analysis is ambiguous as to the ideal nature of policy reform, it does point to the potential optimality of policies, such as the FlexJob program in Denmark.

The FlexJob program provides subsidies to people:

- Who have a permanent reduction in their capacity to work,
- Who do not receive a disability pension,
- Where every possibility of readying the person to return to an ordinary job has been tried.

The local authorities have responsibility for securing FlexJob for the relevant people. The FlexJob can be created in either the public or private sector. As part of the process, an agreement is required for which (special) measures are needed to ensure that the person can handle the job.

Wages and other conditions concerning the job are determined in relation to the agreements with the social partners about wage and working conditions. The employer pays the wage to the employee in the FlexJob. The local authorities then give a refund of $^{1}/_{3}$, ½ or $^{2}/_{3}$ of the minimum wage for that type of job to the employer. The size of the refund depends on the degree of reduction in the employee's capacity to work. The state government then refunds 100 per cent of the local authorities' expenses.

There are approximately 6,000 persons employed in this scheme in Denmark. The number of jobs is targeted to increase to 24,000 new FlexJobs through 2005.

An important issue with subsidy schemes is that it often is not profitable for firms to train older workers. For example, Casey and Wood (1994) find that older workers are difficult to train.[90] There is substantial evidence of declining training with age.[91] This cost issue is even more substantial with disability.

Disability differs from unemployment and other involuntary exits from labor market in that evaluation criteria are medical in addition to economic. In addition, the investment needed to return to work in terms of rehabilitation and potential lost benefits is also quite high.

[90] Bernard Casey and S. Wood, "Great Britain: Firm Policy, State Policy and Recruitment and Retention of Older Workers", in F. Naschold and B. de Vroom (eds.), *Regulating Employment and Welfare*. 1994. Walter de Gruyter, Berlin and New York.

[91] For example, OECD, *Labour Market and Older Workers*, Paris, 1995 and OECD, *Transition from Work to Retirement*, Social Policy Series 16, 1995.

Targeted incentives to get disabled workers back to work (as in the FlexJob program) may therefore be especially effective. These programs, however, have run into problems in other countries, either because of cost or lack of publicity. Lack of publicity was a particularly serious problem for the UK Disability Working Allowance; one study found that a large majority of all those disabled who returned to work and received benefits were not influenced by the existence of the subsidy primarily because they had not heard of it.[92]

4.4.2 Alternative Mechanisms

Orszag and Snower (1999a) present an alternative viewpoint, arguing that the choice between the use of incentive effects and quantity restrictions on access to early retirement programs should be based on the information available to the government. In their analysis, given the uncertainty regarding the marginal social costs or the marginal social benefits from early retirement, the socially optimal decision of whether to use pension taxes or early retirement rights depends on the source of the uncertainty and the relative slopes of the marginal social cost and marginal social benefit schedules. (This result is similar to an analogous result concerning the relative desirability of pollution taxes versus pollution rights, as pointed out by Weitzmann 1974.) In practice, some Nordic countries already implement some form of quantity restrictions on early retirement; for instance, in Finland, almost half of those applying for early retirement pensions under relaxed medical criteria are rejected.[93] Another form of quantity restriction is changing the earliest eligibility age for early retirement.[94]

To illustrate the Orszag-Snower model, Figure 4.5 illustrates the effects of the changes in incentives to retire late or early. The number of retired people P is measured on the horizontal axis. The horizontal OC line denotes the marginal private opportunity cost of retiring, say, the wage income minus the pension benefit (in real terms), which for simplicity has been assumed constant across the population of retirees. The downward-sloping MB curve stands for the marginal benefit of retiring. The downward slope arises since heterogeneous people are ordered along the MB curve from those with the highest benefits to those with the lowest. People have an incentive to retire as long as the marginal benefit from employment MB exceeds the marginal opportunity cost OC. Thus the equilibrium number of retirees P^* lies at the intersection of the MB and OC curves.

[92] Rowlingson and Berthoud (1996).
[93] Heidi Nyman and Raija Gould, *Disability Pension Refusals over the Years 1990-1995*. CPSI, 1996, No. 14.
[94] We thank Tuulia Hakkola for this observation.

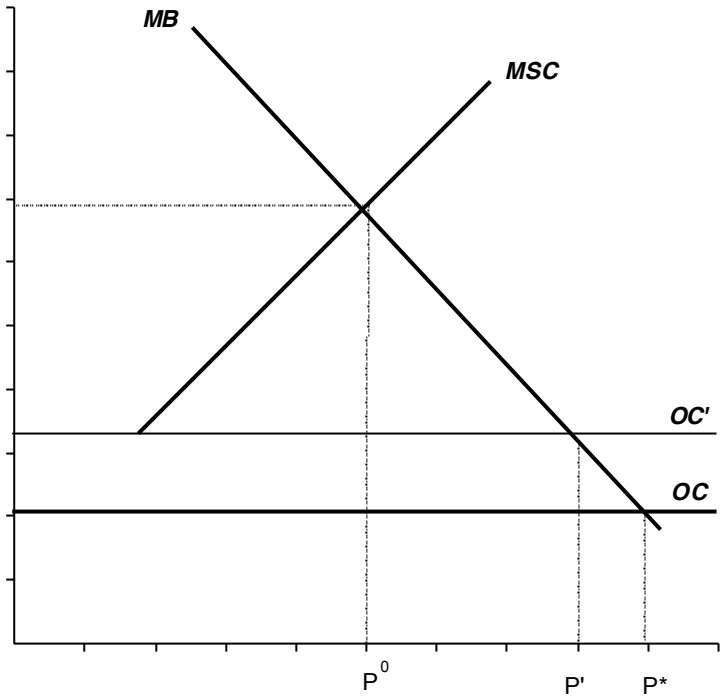

Figure 4.5. *Marginal social costs and benefits.*

The marginal social cost of retirement, however, is in general different from the private opportunity cost above. For simplicity, let us measure this marginal social cost in terms of forgone national output. Then the marginal social cost curve, denoted by *MSC* in Figure 4.5, is the inverse of the marginal product of labor. If the marginal product of labor declines as employment increases, then the marginal social cost of retirement must rise as the number of retired people increases.

The socially optimal retirement level P^o lies at the intersection between the marginal benefit curve *MB* and the marginal social cost curve *MSC* in Figure 4.5. Since the marginal social cost *MSC* exceeds the private marginal opportunity cost *OC* at the equilibrium retirement level *P**, the socially optimal level of retirement is less than the equilibrium level: $P^o < P^*$.

In this context, the provision of employment vouchers raises the opportunity cost of retiring, and thereby reduces the equilibrium retirement level. For instance, if the opportunity cost of retiring rises from *OC* to *OC'*, then the equilibrium retirement level falls from *P** to *P'*.

Orszag and Snower also show that if the marginal benefits from early retirement are more uncertain than the marginal social costs of early retirement, auctioning early retirement rights is preferable to altering early retirement incentives. Conversely, if the marginal social costs are more uncertain than the marginal benefits, changes in incentives are preferable.

Orszag and Snower find that when marginal benefits are the only source of uncertainty, quantity restrictions are preferable to the imposition of pension taxes when the pension-tax externality is significant. This analysis is made more explicit in Appendix B, shows that the same considerations apply in the case where the source of uncertainty is marginal social costs instead of benefits. The policy implication is that perhaps it may be useful to index the early retirement age to GDP growth or otherwise link the eligibility standards for drawing benefits early to economic conditions.

4.5 Conclusions

This chapter has reviewed policy options for coping with lower labor market participation. In a sense, low labor market participation is a luxury good reflecting the economic prosperity of the Nordic countries, and early retirement is not associated with any major problems with elderly poverty. Indeed, some of the increase in early retirement in the 1980s may have facilitated more employment for younger workers in difficult job market conditions. Finally, early retirement remains relatively low in the Nordic economies. Therefore, there are important social welfare questions as to how much needs to be done about early retirement.

Nevertheless, the Nordic countries have in general already made significant strides in halting the decline in labor market participation. This chapter suggests that perhaps some attention should be given to the Denmark model of FlexJob. In addition, a Swedish model of mixing age discrimination legislation with changes in incentives seems perhaps preferable to a pure focus on incentives.

Chapter 5
Fostering Prefunding of Pension Liabilities

5.1 Introduction

Most European countries are struggling with challenges to the solvency of their pension systems as their populations age. European pension systems rely heavily on pay-as-you-go financing: 88 per cent of all pensions paid out in the EU are pay-as-you-go state pensions, and the costs of maintaining these pay-as-you-go system represent approximately 10 per cent of GDP.[95] Given the high reliance on pay-as-you-go systems in most European countries, the current level of benefits will be difficult to sustain over the next thirty years as the "baby boom" generation retires, and the average age of the population increases.[96] Indeed, one recent study concluded that with a fixed level of social security taxes in Germany, benefits would fall by 40 per cent by 2030.[97]

The situation of the Nordic countries is not as dire as in most comparable countries in continental Europe. Indeed, each of the five Nordic countries has taken substantive steps to prefund pension liabilities:

- **Denmark** is the only country in Europe with a large funded public pension fund. Its ATP fund has one of the largest and most successful histories of a publicly managed state pension fund in the world.
- **Finland** has partially funded occupational pension schemes. Its TEL scheme mixes prefunding with pay-as-you-go benefits. The Finnish employment pensions scheme (partly funded) have a special character: private pension institutions (specific pension insurance companies, pension funds and pension foundations) administer the statutory employment pensions of the private sector. However, the employment pension cover is part of public social security because it is compulsory, and its scope and benefits are precisely defined by law. Moreover, the pensions paid under the employment pension legislation are integrated with other social security benefits.

[95] European Union (1997), Green Paper on Supplementary Pensions in the Single Market, DG XV, June, available on the internet at http://europa.eu.int/comm/dg15/en/finances/pensions/gppensen.pdf.

[96] In 1990, the ratio of the the population over age 60 to those aged 20-59 in Europe was about 36 per cent. This figure is projected to increase to 59 per cent by 2040 due to increased life expectancy and falling fertility rates. European Federation for Retirement Provision (1996), European Pension Funds: Their Impact on European Capital Markets and Competitiveness.

[97] Axel Boersch-Supan (1995), "Age and Cohort Effects in Saving and the German Retirement System," *Richeche Economiche* 49. For projections of increased required contribution rates to fund benefits in other European countries, see Daniele Franco and Teresa Munzi (1996), "Public Pension Expenditure Prospects in the European Union: A Survey of National Projections," *European Economy* 3.

- **Iceland** has a relatively small unfunded public pension and well-developed funded occupational funds; in recent years, it has taken steps to strengthen the regulation and funding of private occupational funds, as well as to improve the solvency of its public sector employees fund. Iceland has also recently introduced voluntary individual accounts to foster retirement saving.
- **Norway** has a large state petroleum fund that is expected to be used to fund pension liabilities. It has also taken steps to further encourage employer pension provision by introducing new legislation for defined contribution pensions.
- **Sweden** has introduced a new premium pension system involving individual accounts with potentially low administrative costs.

The principal method of prefunding retirement income for the baby boomers in Iceland has been private pensions, while Denmark (with its ATP fund), Norway (with the State Petroleum Fund), and Sweden (through its "buffer fund," which amounts to approximately 28 per cent of GDP in 2000) rely more on public trust funds.

One common theme, however, is substantial growth in private pensions in recent years. For example, in Sweden, Table 5.1 shows that coverage of voluntary private pensions rose among men from 20.5 per cent in 1991 to 27.9 per cent in 1997 and among women from 21.2 per cent in 1991 to 31.4 per cent in 1997.[98]

[98] Estimates of the number of Swedes participating in private voluntary pension plans are based on the Swedish Income Distribution Survey with a sample of approximately 25,000 individuals. Figures have been calculated to represent national averages. It should be noted that the apparently rapid growth may be deceiving. For example, the rapid increase in coverage in Sweden has not been matched with an increase in average premiums; indeed, average contributions to voluntary private pensions in Sweden in 1997 had fallen by about 35 per cent since 1991. This is partly explained by the fact that the number of women saving has increased more rapidly than the number of men, and women pay smaller contributions. In addition, the limit on tax deductions was cut in half in 1995. Indeed, a myriad of complications—including changes in tax treatment and the fundamental complexity of the systems—means that as the systems struggle to grow, they also face obstacles.

Table 5.1. Swedish voluntary private pension coverage

	1991	1994	1997
Male 25-44	18.4	22.2	26.2
Male 45-54	27.3	28.2	32.4
Male 55-59	20.0	25.8	29.4
Male 60-64	13.4	20.1	22.0
All Men	20.5	24.0	27.9
Women 25-44	21.3	27.4	35.2
Women 45-54	28.5	37.5	45.9
Women 55-59	18.8	30.4	38.6
Women 60-64	11.4	13.4	18.9
All Women	22.0	29.0	37.1
Population	21.2	26.4	32.4

Note: Coverage as percentage of total potential contributors. The figures due not include people who are covered, receiving early benefits and not paying contributions.

Despite the common trend toward increases in private pensions, their prominence remains significantly different across the Nordic economies. Table 5.2 provides a snapshot of private pension funding in the entire EEA. Iceland, Denmark, and Sweden have significant private pension fund assets, whereas the figures are much smaller for Norway and Finland.

Table 5.2. Total assets of pension funds in the EEA, 1997

	Assets in billions of USD	Assets/GDP ratio	Ptc. of total	Ptc. of market value of registered equity
Holland	366.47	92.54	18.70	95.43
UK	848.79	73.59	43.31	48.34
Iceland	4.58	62.80	0.23	328.31
Ireland	30.74	43.48	1.57	87.53
Sweden	109.23	43.40	5.57	44.33
Denmark	37.51	21.45	1.91	51.58
Germany	342.18	14.54	17.46	50.70
Austria	26.73	11.69	1.36	81.85
Portugal	10.39	10.03	0.53	41.53
Finland	9.85	7.87	0.50	15.69
France	97.44	6.34	4.97	16.24
Belgium	11.35	4.23	0.58	9.34
Norway	6.68	4.23	0.34	11.49
Spain	22.28	3.81	1.14	9.01
Greece	3.50	2.86	0.18	14.52
Italy	32.13	2.65	1.64	12.22
Luxemburg	0.03	0.20	0.00	0.10
Total/average EEA	**1960**	**22.36**	**100**	**42.26**

Source: SAL News, No. 51

Other differences exist across private pensions in the Nordic countries. In Denmark, Iceland, and Sweden, for example, private pensions are largely based on a social partnership between firms and employees. In Norway, private provision involves both employer schemes and insurance companies, while in Finland, private provision is dominated by insurance schemes. Nonetheless, despite these and other differences across the Nordic countries, similar challenges for prefunding exist.

5.2 The Economics of Prefunding

The importance of prefunding is almost taken for granted in policy-making circles. It may therefore be worth examining the benefits and costs of prefunding in more detail.

5.2.1 Benefits of Prefunding

The need for prefunding primarily arises from demographic shifts. Three major factors affect the demographic structures of countries: fertility, mortality, and migration. Since the beginning of the industrial revolution, mortality rates have steadily improved in most countries of the world, especially during the twentieth century. At the same time, fertility rates have been declining.[99] Consequently, today each working individual supports a greater number of old people than before. In 1990, the ratio of the population over age 60 to those aged 20-59 in Europe was about 36 per cent. This figure is projected to increase to 59 per cent by 2040, due to increased life expectancy and falling fertility rates. The Nordic countries are experiencing a similar shift, as shown in Figure 5.2 in the introductory chapter. Figure 5.1 further illustrates the forthcoming change in the age structure in the Nordic countries.

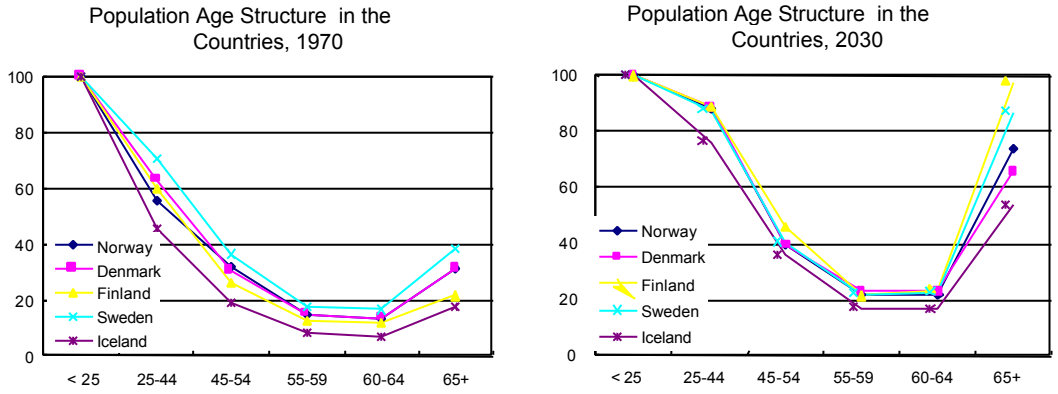

Figure 5.1. *Population age structure in the Nordic countries*

The left-hand side panel shows the age structure, scaled by the youngest cohort, in 1970. The right-hand side panel shows the predicted age structure in 2030. The figures dramatically illustrate that the Nordic population is growing older, suggesting a growing need for non- labor income in the future.

[99] Herbertsson, Orszag, and Orszag (1999) find in an empirical study, using data from over 100 countries, that fertility rates are converging to a common rate in the world.

It is useful to examine age-specific death rates over time to understand better the population dynamics in the Nordic countries. Figure 5.2 compares mortality by age in the five Nordic countries in 1987 and 1997.

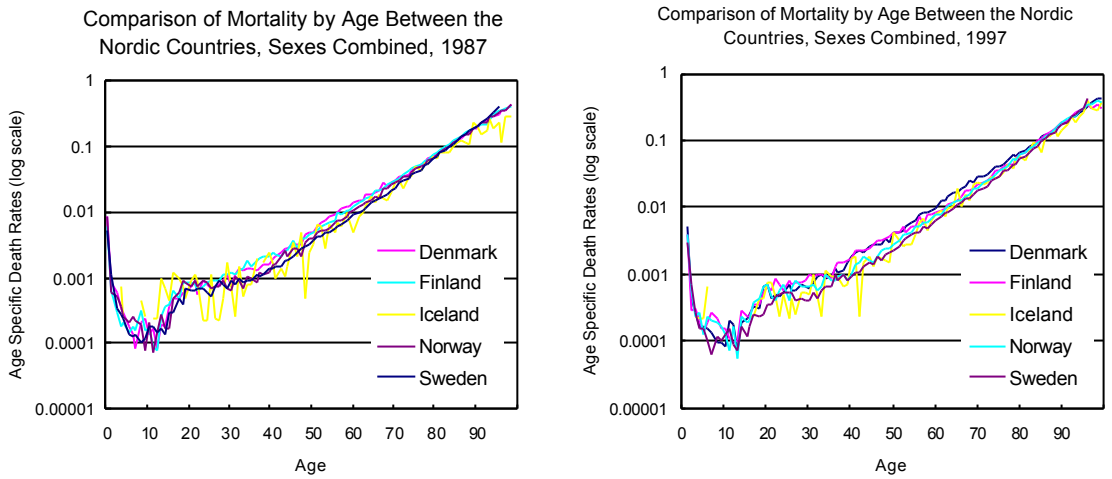

Figure 5.2. *Mortality by age in the Nordic countries*

The figures show that mortality rates behave very similarly in the Nordic countries. They also show that mortality rates have been falling over the decade under scrutiny. Figure 5.3 draws the average (unweighted) mortality-rate profile for the Nordic countries in 1987 and 1997 in the left side panel and the difference between the two profiles in the right side panel.

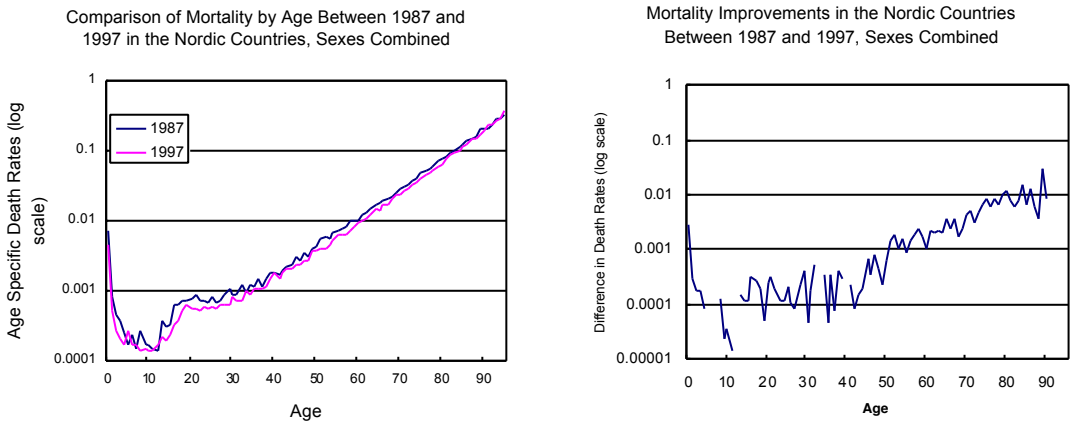

Figure 5.3. *Mortality by age and mortality improvements in the Nordic countries*

As expected, the profiles are now smoother than in Figure 5.2 (because the mortality rates have been averaged across the Nordic countries). In addition, the well-known "young-adults hump" is now apparent. The right side panel shows the substantial improvements in mortality in the youngest age group, i.e., infant mortality has been declining. The greatest improvements have been among middle-aged and old people, with the improvements

among the very oldest greatest. These factors will all contribute to higher old-age dependency ratios and increased pressures on the Nordic pension systems in the future if fertility rates do not rise substantially.

In this context, the fundamental benefit of prefunding is that it forces current workers to forgo consumption today in order to ease the future burden of providing for their retirement income. By raising national saving, prefunding increases future gross domestic product (if the increase in national saving is absorbed through higher domestic investment) or future receipts from abroad (if the increase in national saving is absorbed through higher net lending to foreigners, or equivalently a larger current account balance).[100] Either way, the burden imposed on future domestic workers in providing a given level of retirement income to today's current workers is reduced.

5.2.2 Demographic Uncertainty and Prefunding

Most analysts believe that prefunding is socially beneficial: That is, they believe that the reduction in consumption today is less valuable than the benefits of prefunding in attenuating the costs of meeting future needs. But the vast majority of analyses on this issue do not reflect the substantial uncertainty inherent in demographic forecasts. For example, if death rates do not decline as anticipated, if fertility increases more quickly than anticipated, or if large net migration occurs, the problem may not be as large as implied by baseline forecasts. The growing literature on "investment under uncertainty" suggests that in the face of substantial uncertainty, basing decisions on central estimates (without incorporating the uncertainty) may be grossly misleading.[101]

Long-range calculations are notoriously sensitive to underlying assumptions, as was illustrated in a Coopers and Lybrand survey in 1996 for UK private pension funds. The average actuary allocated £100 to fund a given liability. Different actuarial assumptions, however, led to results of between £29 and £148 for funding it. Even government rules lead to widely differing assumptions: the new terms for contracting out of the UK state pension system (SERPS) led to a need of £110 in funding, whereas the minimum funding requirement regulations led to a need of £93. Assumptions about funding levels are far from innocuous because they have direct effects on perceived solvency and security.

Similar issues have been pointed out in the United States. For example, the Social Security actuaries in the United States traditionally prepare three estimates of the 75-year actuarial balance of the program: low cost, intermediate cost, and high cost. The intermediate estimates are the ones commonly cited in the press, and they suggest a non-trivial actuarial imbalance. Yet the current low-cost estimate shows a small actuarial *surplus* projected over the next 75 years (Social Security Administration 1999). Many observers have objected to the manner in which the Social Security actuaries reflect parameter uncertainty (Lee and

[100] See Herbertsson and Zoega (1999) for a discussion on the connection between national savings, the current account, and demographic structures.
[101] For a general introduction to the investment under uncertainty literature, Dixit and Pindyck (1994).

Skinner 1999), but the key point here is that the uncertainty is substantial and has a significant impact on projected pension imbalances. As Lee and Tuljapurkar (1998) conclude, "Rational planning for the next century must somehow take into account not just our best guesses about the future but also our best assessments of the uncertainty surrounding these guesses."

In the Nordic countries, Herbertsson, Orszag, and Svarsson (1999) looked at the sensitivity of Icelandic public sector pension liabilities with respect to underlying assumptions. They also found significant sensitivities.

Orszag and Orszag (2000) examine different approaches to prefunding, given such uncertainty in demographic and economic projections. The following simple example serves to illustrate their main point. Consider a country with a pay-as-you-go pension system. Actuarial and economic analysis of the pension system indicates that the social welfare cost of the pension system will rise to 2 per cent of GDP in the next period. As just one motivating example for the social cost, assume that payroll taxes distort labor market choices.[102] Feldstein (1998) argues that such distortions already amount to approximately 1 per cent of GDP for the U.S. Social Security system. As the payroll tax increases, the distortion would increase more than proportionately.

The social welfare costs are highly uncertain, however, because of uncertainties over mortality, fertility, productivity, and other economic variables. (These uncertainties affect the cost rate of the pay-as-you-go pension system, and therefore the social welfare costs from the distortions caused by payroll taxes.) The social costs could therefore be 1 per cent of GDP or 3 per cent of GDP, with a 50 per cent probability of each, and thus an expected value of 2 per cent of GDP. Assume that the social costs in the next period will then be perpetuated into the indefinite future.

By raising national saving today, the government can increase GDP in the next period and reduce the social welfare costs of the pension system as a percentage of GDP. Assume, again for simplicity, that broad prefunding would reduce the cost of the pension system to 1 per cent of GDP next period, and that there would then be no uncertainty over the welfare cost from period to period.

In this context, the benefit of broad prefunding is that it reduces the expected tax rate, and therefore–in this simplistic model–the labor market distortion, in the long run. Indeed, Feldstein and Samwick (1998) highlight this reduction in tax rates as a key advantage of funding.[103]

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[102] The labor market distortions caused by payroll taxes within a redistributory pension system are not as clear as they may initially appear. See Orszag, Orszag, Snower, and Stiglitz (1999) and Diamond (1998).

[103] They write: [The] "reduction in the payroll tax rate results in a reduction in the deadweight loss that is itself equal to about 2 per cent of payroll. Thus, the long-run gain from shifting to a funded system is almost as large as the entire 12 per cent payroll tax. This is equivalent to a permanent increase in real income of about 5 per cent of GDP." See Feldstein and Samwick (1998), page 216.

Such broad prefunding has a cost, however: the additional revenue necessary to produce it. In the absence of non-distortionary taxes, raising the additional revenue necessary to prefund the pension system will impose deadweight losses on the economy. We assume that temporary cost is equal to a one-off cost of 10 per cent of GDP, which includes both the cost of paying down the implicit debt under the pay-as-you-go system and the cost of financing the pension system in the period during which the transition cost is borne. It is worth noting that the unfunded, implicit debt of the pay-as-you-go system is a stock that could be many multiples of GDP, a flow. The social welfare costs of paying down the debt may thus be substantial in the short run.

Then consider a social planner trying to decide whether to prefund. At a real social discount rate of 5 per cent, the expected present value (expressed relative to GDP) of the prefunding is:

$$-10 + \sum_{t=1} \frac{2-1}{1.05^t} = -10 + 20 = 10 \qquad \{1\}$$

- The pension system is expected to grow more costly over time, but there is uncertainty regarding how costly it will be.
- The prefunding is socially beneficial, but focusing solely on the long-term is highly misleading. In other words, focusing solely on the expected differential between the pay-as-you-go system and the prefunded system in the long run is misleading. A full analysis must take into account the transition costs of moving from the pay-as-you-go to a prefunded system.
- The analysis is undertaken in terms of social welfare costs, not financial costs. The net present value of a pay-as-you-go system across all generations is always zero, and the expected value of the risk-adjusted cash flows associated with moving from a pay-as-you-go to a prefunded system must also be zero (Geanakoplos, Mitchell, and Zeldes, 1999). This zero net present value condition implies that there is no free lunch in net present value terms from prefunding, but it does *not* require that the impact on social welfare be zero. Indeed, most economists support prefunding because it is widely believed to boost social welfare. The social welfare implications depend on a broader array of considerations–including inter-generational and intra-generational redistribution concerns–than the financial zero net present value condition may suggest (Orszag and Stiglitz, 1999). We assume in this example that the prefunding is socially beneficial, consistent with the beliefs of many economists.

The above example thus seems to capture the essence of the argument for prefunding: The existing pay-as-you-go system is expected to become more costly; acting now by prefunding can reduce the long-run cost; and the social welfare would be improved by prefunding. This conforms generally to the argument often put forward in favor of prefunding. Feldstein and Samwick (1998), for example, note that the long-run reduction in tax rates and deadweight losses from prefunding follow only after an extended period (23

years in their base scenario), in which overall contribution rates and deadweight losses are *higher* than under the existing system.

Note, however, that if the prefunding is irreversible, an alternative strategy may be better than the one adopted above. In particular, consider the following strategy: wait to see how the demographic and economic uncertainty resolves itself, and then prefund only if the "bad" case arises. In particular, consider the strategy of waiting until next period, and prefunding only if the pay-as-you-go welfare cost actually did turn out to be 3 percent of GDP. (If the welfare cost instead turned out to be 1 percent of GDP, the pay-as-you-go system would be perpetuated.) The expected net present value of this strategy is:

$$(0.5)\left\{-\frac{10}{1.05}+\sum_{t=2}\frac{3-1}{1.05^t}\right\}=0.5(-9.5+38.1)=14.3 \qquad \{2\}$$

This strategy thus produces a higher expected value than the straightforward funding strategy. This result obtains because the strategy avoids paying the transition cost for the scenario in which the social costs of the pay-as-you-go system turn out to be unexpectedly low. In that case, having paid the transition cost would (in this example) have been a mistake *ex post*.

The higher expected value produced in (2) relative to (1) could be seen as supporting the arguments made by opponents of prefunding: they argue that social security projections are highly uncertain, and that it is therefore not worth incurring current costs to eliminate the projected imbalance. For example, Dean Baker of the Center for Economic and Policy Research has stated: "It's hard to see what the benefits are of acting now. We want to plan ahead but want to have some idea of what we're planning for…The idea that we have to do something now because 40 years from now the fund will be out of balance doesn't make sense."[104] Baker (1999) similarly argues that, internationally, the expected payroll tax increase from existing pay-as-you-go systems is not as burdensome as often depicted.

An alternative strategy, however, dominates the Baker approach in this model. In particular, consider a strategy that could be called "conditional prefunding."[105] Under this conditional prefunding strategy, the prefunding is undertaken today, but reversed tomorrow if the welfare costs under the pay-as-you-go system turn out to be 1 percent of GDP rather than 3 percent. Assuming the 10 percent of GDP can be recaptured next period if the "good" case arises, the net present value of that strategy is then:

$$(0.5)\left\{-10+\frac{10}{1.05}\right\}+(0.5)\left\{-10+\sum_{t=1}\frac{3-1}{1.05^t}\right\}=0.5(-0.48)+0.5(-10+40)=148 \qquad \{3\}$$

Note that this conditional prefunding approach has the highest net present value of all. The reason is that it does not wait to prefund, like the Baker strategy, in the case in which

[104] As quoted in Pianin (2000).

[105] Henning Bohn uses "conditional prefunding" in a somewhat related sense. See Bohn (1998).

prefunding turns out to be socially beneficial. But unlike the irreversible prefunding approach, it eliminates the costs of prefunding in the scenario in which such prefunding turns out not to have been necessary.

The implication is that prefunding can be socially beneficial, but that systems in which the prefunding can be adjusted as information changes may be *better* than systems in which the level of prefunding is irreversible. As one extreme example, assume that prefunding occurs today, but that tomorrow the economy becomes dynamically inefficient. Given the changed situation, the ability to "undo" or reverse the prefunding could be quite valuable.

Partial prefunding
The examples above were predicated on full funding of the pension system. In reality, partial prefunding is more likely than either no funding or full funding. In a fully funded system, the risks are asymmetric: assuming that overfunding is precluded, the only possible adjustment is to reduce the funding level. Therefore, assuming that the funding has been undertaken, the only relevant risks are ones that make undoing some of the funding more attractive. In a partially prefunded system, however, the risks are more symmetric: shocks may hit that warrant an increase or decrease in the funding level. Nonetheless, the key point carries across: *the flexibility to adjust the funding level is essential to responding appropriately to a pension challenge involving an expected, but highly uncertain, gain from a given level of funding*.

In a partially funded environment, it is important to have flexibility in both directions: to increase or decrease the level of funding. The political economy of an increase in funding, given that the system is already partially prefunded, seems unclear. On the one hand, concerns over government interference in the economy are likely to be greater, increasing in the size of the prefunding undertaken through a public system. If so, it may be increasingly difficult to increase the level of prefunding in a public system. On the other hand, the contribution rate in a private, individual account system may also have substantial levels of upward rigidity.

The upshot of both the partially prefunded and fully funded scenarios is that it is important to investigate precisely what makes one approach more or less flexible than another. In the context of pension reform, this funding "reversibility" means the ability to undo some of the funding–either reducing the contribution rate below the funded path or raising benefits above that path, thus re-introducing a pay-as-you-go component to the system.

5.2.3 Public versus Private Approaches to Prefunding

The Orszag and Orszag (2000) results thus suggest that reform should be undertaken in the most reversible way possible. A key policy issue is which types of pension reforms are the most flexible.

Our inclination is that it may be easier to accomplish some degree of reversibility within a public rather than private approach to prefunding–especially since this is precisely the point

that many advocates of a private approach make. In particular, if adopting a mandatory, privately managed second pillar is as dramatic and discrete a step as many descriptions of this approach suggest, the substantial uncertainty surrounding its benefits should give us pause.

On the other hand, the Orszag and Orszag (2000) results do not take account of additional portfolio flexibility, as well as product design issues, which private providers may be better equipped to handle. Furthermore, Palacios (2000) argues that public trust fund investment is necessarily subject to political interference and is therefore less efficient than private investments. Returns should be examined on a net basis (net of administrative costs), adjusted for risk. From a pure cost basis, public pension funds tend to be relatively cheap to administer. The Danish ATP, for instance, claims administrative costs of about 15 DKK (€2) per member per year. Singapore and Malaysia also have low cost public pension funds.

Palacios (2000) looks at realized returns of public pension funds and finds serious deficiencies. The approach of measuring efficiency based on past returns rather than pure cost data has been applied to private funds by Kevin James (2000) for the UK and the Investment Company Institute in the US. In Figure 5.4 below, we plot returns and standard deviations for Palacios' dataset, which he compares with funded private pensions in Chile.

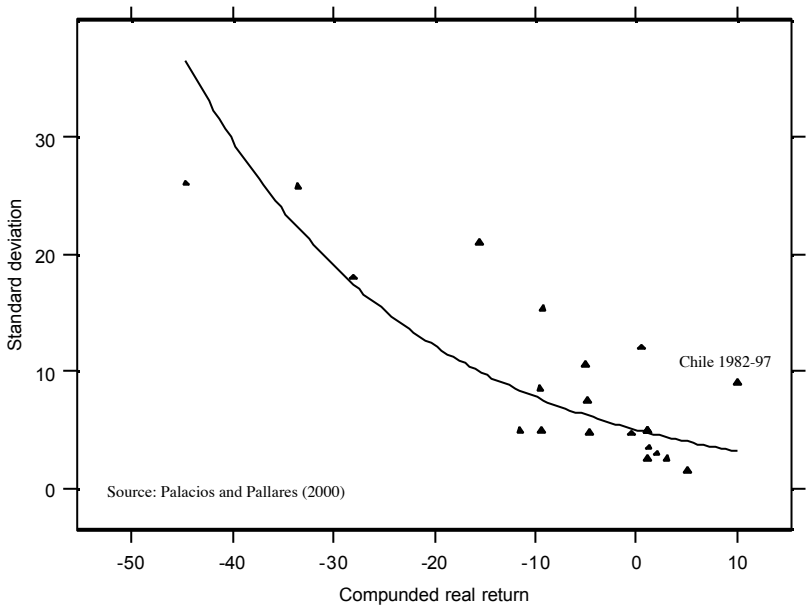

Figure 5.4. *Annual, compounded, real returns and volatility in 22 publicly managed pension funds*

Palacios runs regressions to test the effect of privatization on performance for any level of governance. After controlling for governance, Palacios finds that privately managed funds do better. Palacios' governance index is constant over time, so his sample is restricted.

Even so, there are a number of problems with his results. First, the privatization variable is endogenous. Indeed, Brooks and James (1999) have tried to explain shifts to private systems in terms of the governance variables Palacios uses as regressors. Second, his analysis does not include the Nordic countries of Norway and Denmark, which have substantial publicly managed funds (the analysis does include Sweden).

The general conclusion we reach is that there are clearly some very poorly performing public trust funds. For example, in Tanzania, the prime minister's house was funded with pension money. On the other hand, Sass (1999) outlines similar issues with the management of Teamster's money in private pension funds in the United States. And, the debate on US state and local public pension funds indicates that there is probably not much, if any, underperformance (Munnell and Sunden, 1999).

From a pure efficiency point of view, it is thus unclear whether state or private funding is better. From a flexibility point of view, individual accounts clearly offer more investment choice flexibility for the individual but potentially at the cost of less policy flexibility. How the Nordic governments weigh these factors is important to which routes they choose for prefunding.

Another important issue with trust funds is the political reality that governments may not be able to raise the necessary additional tax revenue to finance a substantial trust fund. In some cases, the political economy of additional contributions routed through individual accounts is markedly different from the political economy of additional contributions routed through a public trust fund, and individuals must provide for their own retirement by prefunding retirement accounts. Within this broad rubric of private pensions, furthermore, there are many different possibilities. For example, contributions to the accounts can be voluntary, like in Iceland, or mandatory, like in Sweden. The accounts can be held individually or through an employer. The investment choices can be limited or unlimited; and annuitization upon retirement can be voluntary or mandatory. Many of these choices can affect the degree to which the contributions made to the accounts are offset by reduced private or public saving elsewhere in the economy, and thus the degree to which the narrow prefunding undertaken through private pensions represents true broad prefunding.

5.2.4 Examples of Conditional Prefunding in the Nordic Countries

Two of the best "real world" examples of conditional prefunding are given by Finland and Sweden. As noted above, the overall Finnish pension system is partially funded, with some schemes–such as those for the self-employed–unfunded. (In aggregate, about three-quarters of all current benefits are financed on a pay-as-you-go basis.) Interestingly, as we note in Chapter 3, Finland created a special buffer reserve, amounting to 1.1 percentage points of payroll, when it joined the European Monetary Union in 1999. The size of the buffer moves over time; in 2000, it is estimated that the buffer reserve will be increased to 1.4 percentage points. The buffer is explicitly intended to provide a flexible source of prefunding: it can be adjusted in response to external shocks and thus offset some of the adjustment costs that would otherwise be associated with EMU.

A second potential example of flexible funding is given by Sweden with partially funded notional defined contribution (NDC) schemes. In an NDC system, wage earners pay contributions based on a fixed contribution rate. The value of these contributions is then accredited to notional accounts, giving the system a defined contribution feature. The account values are then indexed annually to some macroeconomic metric (for example, a nominal per capita wage index in Sweden and GDP in Italy). Upon retirement, the NDC benefit is calculated by dividing the value of the account at the chosen time of retirement with a factor based on life expectancy.

The NDC system need not involve any broad prefunding; it could be undertaken purely on a pay-as-you-go-basis. But it is possible to incorporate some prefunding into the NDC system, with the degree of funding similar to a "reserve requirement" on accounts that can be adjusted in line with economic conditions, much as central banks adjust reserve requirements for banks. Contrary to the conclusions of Disney (1999),[106] the flexibility of such a *partially funded* NDC approach in coping with shocks may provide a rationale for preferring such an approach to other pension reform strategies. It is important to note, however, that NDC schemes do not necessarily have to include a funded component.

Table 5.3. Main occupational private pension systems in the Nordic countries

	System set up by trade or professional association	System set up at sectoral level	System set up by one or more firms and managed by a legally distinct entity	Book reserve system	Pay-as-you-go funding system
Denmark	Majority	Majority	Minority	None	None. System prohibited by regulation, although some exemptions were granted in 1986
Finland	Very few	No	Majority	Possible in principle, but not under the supervision of the ministry	None
Iceland	Majority	None	Very few	None	Not prohibited but not exercised
Norway	Very few	None	Majority	Minority	Tolerated
Sweden	Minority	Majority	Very few	Very few	Very few

Source: OECD (1999), *Financial Market Trends*, No. 73, June, pp. 198-200; Occupational Pension Systems, paper by OECD Secretariat for First Meeting for OECD Forum on Private Pensions, Prague, April 3-7, 2000.

[106] Richard Disney, Notional Accounts as a Pension Reform Strategy: An Evaluation, World Bank Social Protection Discussion Paper 12/99, December 1999.

5.3 Fostering Private Provision

As noted above, private provision of occupational pensions in the Nordic countries differs considerably, and many of these differences are summarized in the Tables 5.3-5.5. The differences become yet more pronounced when individual accounts are added. The differences in provision point to the problems in making general policy conclusions for all Nordic countries as well as considering issues relating to harmonization of systems to foster cross-border competition in financial services.

Table 5.4. Defined contribution and defined benefit schemes in the Nordic countries

	Defined contribution scheme	Defined benefit scheme
Denmark	Majority	Minority
Finland	None	All
Iceland	Majority (special version of DC system)	Minority (funds for civil servants)
Norway	Minority (not tax-deductible)	Majority
Sweden	Minority, but usually in combination with DB systems	Majority

Source: OECD (1999), *Financial Market Trends*, No. 73, June, pp. 201.

Table 5.5. Access to pension schemes in the Nordic countries

	Requirement that the employer set up pension system for some or all employees	Requirement that the employee join an occupational pension system
Denmark	No statutory requirement but requirement through collective bargaining on a market labor agreement	Yes
Finland	No legal requirement	It is possible for the employees and the employers to make an agreement on private pension systems. These agreements determine which employee groups will join the system.
Iceland	No requirement	Yes, mandatory. The employee is obligated to join a system put in place by her/his union (or independent funds operated by a financial institution if the individual does not belong to a union (mostly the self-employed)).
Norway	No requirement	Yes (if under age 57)
Sweden	No requirement	No requirement

Source: OECD (1999), *Financial Market Trends*, No. 73, June, pp. 202-203; Occupational Pension Systems, paper by OECD Secretariat for First Meeting for OECD Forum on Private Pensions, Prague, April 3-7, 2000, and authors' research.

Despite these difficulties, there are some common themes. The private individual account markets in the Nordic countries are still relatively small and dominated by local regulation. There probably would be some benefit in considering ways of breaking down these barriers and enabling integrated marketing and provision across all the Nordic countries. The following steps would help to promote the growth of private pension arrangements in the Nordic countries:

- Keep consumer transaction costs low
- Protect consumers
- Boost portability and preservation
- Harmonize solvency regulation
- Improve investment regulation
- Rationalize taxation
- Reduce insularity
- Increase transparency

By addressing these common challenges, the Nordic countries could facilitate the growth of private pensions and thereby help to prefund more of their overall pension systems.

5.3.1 Reduce Consumer Transaction Costs

Fees and costs related to any funded pension scheme reduce future pension benefits and consequently the future consumption possibilities of beneficiaries. A key question is whether the fees reflect factors adding to the well-being of consumers–such as investor education–or rather represent wasted resources or excess profits. To gain some insight into this question, it is critical to examine the administrative costs in detail.

A considerable amount of research has examined administrative costs in different countries.[107] In general, the conclusions from recent experience with supplementary pension accounts are that institutional differences in regulation and market structure are very important in determining administrative costs. Recent experiences with individual supplementary pension accounts in countries, such as Bolivia, Sweden, and Iceland, indicate radically different levels of charges to consumers than in countries taking other approaches, such as the UK, Argentina, and Chile.[108] Group or employer systems for supplementary pension arrangements also can reduce transaction costs and often have considerably lower administrative costs than decentralized systems of individual accounts.

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[107] Relevant comparative work includes Olivia Mitchell, Annika Sunden, and Ping-Lung Hsin (1994), "An International Comparison of Social Security Administrative Costs," *International Compensation and Benefits*. Salvador Valdes (1994), "Administrative Charges in Pensions in Chile, Malaysia, Zambia, and the United States," World Bank Policy Research Working Paper No. 1372, October, Olivia Mitchell and Annika Sunden (1994), "An Examination of Social Security Administrative Costs in the United States," Pensions Research Council, Wharton School.

108 See Estelle James, James Smalhout, and Dmitri Vittas (1999), "Administrative Costs and the Organization of Individual Account Systems: A Comparative Perspective," paper presented at World Bank Conference: New Ideas About Old Age Security, September 14-15, Washington DC. Available at: http://www.worldbank.org/knowledge/chiefecon/conferen/papers/smalhout.htm

In order to understand supplementary pension costs, Murthi *et al*. (1999) identified three different sources of administrative costs for individuals:[109]

- *Accumulation costs*, which capture fund management and administrative costs for a worker contributing funds to a single financial provider or pension plan throughout her career.
- *Alteration costs*, which measure the additional costs of failing to contribute consistently to a single financial provider or pension plan over an entire career. These include any costs from switching from one financial provider, or pension plan, to another or from stopping contributions altogether.
- *Annuitization costs* reflect the costs of converting an account to a lifetime annuity upon retirement.

Murthi *et al*. (1999) decompose total costs for an individual over a lifetime into the three costs above. The "alteration costs" are particularly significant where there are substantial up-front costs that providers recover partially or wholly by "front-loading" charges. These up-front costs are common where either complex advice is required, and/or there are inefficient or costly sales forces. High front-loading of costs coupled with high lapse rates can result in considerable detriment to consumers. Front-loaded charges are particularly worrisome for lower-income consumers who tend to have higher lapse rates.

Such front-loading of costs need not occur. In many countries, supplementary pensions do not have front-loaded charges because of their structure or because they are sold directly or in a particularly simple manner, e.g., in Denmark the costs are mainly back-loaded. However, in other countries, such as the UK (at least traditionally), costs are heavily front-loaded, which leads to substantial losses to consumers from turnover. We were unfortunately not able to obtain specific details of surrender values or lapses in any of the Nordic countries. But casual evidence suggests that transfer values have been so poor that, historically, very few people switched providers or accounts.

To understand provider costs, Murthi *et al*. (1999) suggest three types of provider costs:

- *Acquisition costs* include the costs of new business, which include commissions to advisers, compensation to sales forces, and any advertising costs.
- *Administration costs* involve administering on-going business, including IT infrastructure costs and back and front office management.
- *Asset management costs* are the costs of managing assets.

Of these three sources of costs, the final one, asset management, is often the smallest component. Complexity of the pension system and the consequent high acquisition costs of consumers, on the other hand, can lead to considerable costs. For example, Murthi et al.

[109] Mamta Murthi, J. Michael Orszag, and Peter Orszag (1999), "Administrative Costs Under a Decentralized Approach to Individual Accounts: Lessons from the United Kingdom," paper presented at World Bank conference: New Ideas About Old Age Security, September 13-14, Washington DC. Available at http://www.econ.bbk.ac.uk/ukcosts.

(1999) assessed the UK historical level of costs (including annuitization costs) for a typical "Personal Pension" account holder at over 40 per cent . A key reason for the high charges in the UK is complexity, which manifests itself in high acquisition costs.

Another important factor in costs is the pure costs due to administrative recordkeeping and collection. Here, James and Vittas (1999) consider economies of scale to be of crucial importance. Mitchell (1999) also finds costs low in Mexico, where economies of scale are enforced.[110]

The international experience is not unambiguous on costs, however. As described in Chapter 3, costs in Iceland are relatively low despite the absence of economies of scale, the decentralized nature of the system, and an unregulated sales process. Iceland's immature market, however, might simply explain these results.

Sweden's Premium Pension Fund (PPM) is an attempt to cut costs for consumers through creating anonymity in marketing. Consumers can allocate their funds to up to five fund managers, but the fund managers do not know the identity of the consumers, preventing cross-selling. The PPM has a complex fee structure, involving fund management fees and discounts back to the PPM, which recognizes the economies of scale in fund management thereby allowing smaller funds to charge more.

All mutual funds are free to participate in the PPM system, as long as they accept the fee structure. Mutual funds in Sweden charge amounts ranging from 0.4 per cent to over 2 per cent per year (James, Smalhout, and Vittas 1999). In 1997, the average fee plus trading commissions was 1.5 per cent (Dahlquist *et al*. 1999). The fee structure within the PPM is related to these expense ratios in the voluntary market.

In particular, the PPM fee structure ties the net fee (fee net of discount back to the PPM) to the mutual fund's expense ratio in the voluntary market and the volume of PPM contributions received by the fund. For example, a PPM investment of €6 million with an underlying fee of 2 per cent for the retail fund will return 1.60 per cent in fees to the fund manager, whereas with €3.5 billion, the fund will receive only 22 basis points. In a sense, because the administration and payment is done by the PPM, the fund is being compensated for wholesale fund management, having substantial economies of scale. A fee of 15-20 basis points certainly is consistent with wholesale fund management charges for large actively managed funds in the UK. The low fees that funds receive hence cannot be treated as covering all costs of serving the consumer, because much of the activity normally performed by pension managers (e.g., recordkeeping) is handled by the PPM. Indeed, all workers will be charged an additional fee to cover recordkeeping costs, with the startup expenses amortized over a 15-year period (James, Smalhout, and Vittas 1999). Since contributions are linked to the tax collection system, and centralized administration is applied, the administrative costs are expected to be relatively low: 30 basis points at the beginning of the system, eventually dropping to 10 basis points.

[110] Olivia Mitchell (1999), "Evaluating Administrative Costs in Mexico's AFORES System," Pensions Research Council, January.

Interestingly, part of the discount to the PPM is rebated back to all workers (not just those who hold their accounts with the specific fund) on a proportional basis. Those choosing funds with low fees and small discounts therefore receive larger rebates than warranted by their specific fund.

James, Vittas, and Smalhout (1999), however raise some questions about the Swedish approach. They note that the average price appears high enough to encourage substantial participation by funds, but argue that participation will probably be skewed by the PPM fee structure. In particular, they predict that bond, large cap, and index funds investing in Sweden and other industrialized countries will participate, but that actively managed small cap and emerging market funds will be reluctant to join.

5.3.2 Protect Consumers

Private supplementary pensions may be provided by the employer or sold through life insurance companies or other financial institutions. Europe has no single system of sales authorization or regulation of private pensions (although a single market does exist for life insurance–EU companies authorized to provide life insurance products in one country can do so in another under the same solvency regulations).

In competitive markets with perfect information, economic theory suggests no need for regulation of the sales process. However, in the presence of imperfect information (including information that is costly for individuals to obtain), there may be welfare gains from regulation. (Regulation may also suffer under information imperfections, thus providing government failure in conjunction with the market failure.) The regulation can take the form of either information disclosure to particular consumers or direct regulation of the sales process.

A commonly cited example of the need for sales process regulation is the UK experience with "mis-selling" of personal pensions. The UK introduced personal pensions in 1988. Subsequently, high-pressure sales tactics were used to persuade members of good occupational pension schemes (especially older, long-serving members) to switch into unsuitable personal pension schemes. Sales agents had often sought too little information from potential clients to provide proper advice, and their firms did not keep adequate records to defend themselves against subsequent mis-selling claims. The total amount of investor compensation resulting from the mis-selling scandal is estimated to be about £15 billion.

The UK sales process is, and has been, heavily regulated relative to most other European countries. Indeed, even before the mis-selling controversy, the Financial Services Act of 1986 had introduced strict regulation of the sales process, including a principle of "polarization" so that independent advisers and salespeople must either sell the product of

one company or sell products of all providers.[111] Yet the protections were not sufficient to avoid the mis-selling controversy, and they have since been further tightened.

In general, supplementary pension provision in most European countries involves heterogeneous marketing channels: independent advisers, direct sales forces, bank assurors, and appointed representatives, as well, increasingly, as direct sales by telephone and e-commerce. In such an environment, consumers need to know whether an adviser is independent, or there are multiple ties between the advisers and companies selling the pension products.[112] Polarization can thus increase consumer welfare by ensuring that advisors are either clearly identified with one product or not tied to any of them. On the other hand, the UK Office of Fair Trading has argued that there is some evidence that sales-weighted average commissions are higher than unweighted average commissions, indicating that independent advisers tend to suggest high commission plans. And, clearly, regulation of the form in which products can be marketed has potential effects on the level of competition in the market.

In addition, any regulatory regime has independent costs, which normally raise industry costs. Another problem is that because of the front-loading of commissions, salespeople and advisers have less incentive to ensure that individuals hold a policy for a long period of time. Commissions spread over longer periods and salary-based remuneration are becoming more common and will help relieve these problems. These solutions are, however, often not advantageous to sales forces and advisers (especially in the short run) and are difficult to implement in practice without explicit or implicit regulatory pressure.

Fee-based advice is one solution to the problems apparent from the UK experience. However, individuals have in general not been willing to pay directly for financial advice in Europe. Fee-based advice is, however, common in the US, suggesting that one of the possible disincentives in Europe may be a taxation issue: commission payments are not subject to value-added tax, whereas advice remuneration is. One of the important conceptual problems is that it is often difficult to determine the proper market price for information goods, such as financial advice. To some degree, if individuals knew how to calculate the value of the advice, they might not need the advice in the first place. Since 1987, Denmark has decreased the tax "value" of the deductibility of interest. Hence the usage of fee-based services has become more widespread in the financial sector in Denmark, especially in credit institutions.

Since individuals have difficulty judging the value of advice in imperfect markets, a question arises as to whether transparency and disclosure of charges improves consumer welfare. On the one hand, consumers may not buy what is good for them if they explicitly recognize the high commission income they provide to a salesperson or an independent adviser. On the other hand, disclosure allows consumers to buy the lowest-cost products

[111] An excellent review of the regulatory issues behind the UK Financial Services Act 1986 is: Barry Rider, Charles Abrams, and Michael Ashe (1989), Guide to Financial Services Regulation, CCH.
[112] A related issue emphasized by the Forum of European Securities Commissions (FESCO) is making sure that “ownership” of the provider is transparent (http://www.fsa.gov.uk/pdf/fesco.pdf).

and compare financial services products on cost. The UK originally regulated the sales process for direct sales forces so that voluntary disclosure was limited,[113] but in 1995, a new regime of mandatory disclosure was introduced. In general, disclosure has had a greater effect in reducing the dispersion of costs than in reducing costs overall.

Another way of reducing consumer information costs in the sales process is to regulate product design. The UK's new Stakeholder Pensions have a mandatory maximum 1 per cent annual charge and no other charges can be imposed. Such simple, commoditized products lead providers to compete on price rather than product characteristics. Single-premium retirement annuities are another example of simple commoditized products. The economic issue with such commoditized products is that while margins can be driven down, consumers can be worse off with product regulation if they would gain from product diversity (for example, non-standard asset allocation to reflect risk preference). Companies are also very sophisticated at marketing to the most profitable consumers and cost or product regulation very often hurts the least profitable consumers, who are also usually the least well off.[114] The sales force for life insurance in Denmark consists of either employees in pension institutions or brokers. Brokers are regulated through the pension institutions, which are ultimately responsible for the pension product.

Despite the tradeoffs involved, strict regulation can produce significant benefits for consumers. Unfortunately, most of the Nordic countries undertake very little in the way of useful financial services regulation of sales forces; there is a bit more regulation in the broker markets. Given this weak regulatory framework, policy-makers should emphasize increased disclosure and other regulatory steps to ensure that consumers reap the benefits of private pensions.

5.3.3 Boost Portability and Preservation of Rights

Iceland, Finland, and Norway have a significant level of defined benefit pension coverage. In these systems, pensions were traditionally provided as a reward for a full career of service to the employer, and early leavers often suffered substantial pension losses. Lee (1986) relates an extreme story of an *early leaver*: Anthony Trollope left the UK Post Office in 1867 after 33 years of service and received no pension.[115] While there has been a dramatic improvement in the rights of early leavers from occupational schemes since then, early leavers still suffer portability losses. While such losses are significant in all countries, their level differs across countries.

One step in improving portability is vesting. In the UK example above, pension benefits were not vested even after 33 years. The current maximum vesting period in the UK is 2 years and 1 year in the Netherlands. On the other hand, German book reserve pensions do not vest for 10 years, or until the employee is age 35, wichever comes first.

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[113] Securities and Investments Board (1986), *Life Assurance Companies Disclosure of Expenses and Charges*, December, is a publication reviewing the initial considerations on disclosure.
[114] John Marsh (1988), *Managing Financial Services Marketing*, Pitman.
[115] E.M. Lee (1986), *An Introduction to Pension Schemes*, Institute and Faculty of Actuaries.

Blake and Orszag (1997) divided portability losses into two components:[116]

- *Cash equivalent losses*, which arise because the early leaver's leaving salary is revalued to retirement age at a less favorable rate than used to determine the projected final salary.
- *Backloading losses*, due to the implicit backloading of contributions in a defined benefit scheme. The forgone backloading can cause losses to those switching to schemes not backloading contributions (e.g., money purchase schemes).

In the UK, workers in private schemes now receive limited inflation protection, so cash equivalent losses amount to losses in average real wage growth. Full preservation is viewed as costly and risky for employers to provide. Nevertheless, the UK public sector and the Netherlands have transfer arrangements, which essentially provide full preservation of pension rights for early leavers. The problem with this approach, however, is that such transfer arrangements effectively require homogeneity in scheme design, and there are no financial securities available to hedge some of the risks (aggregate wage growth).

Backloading losses can be more significant and can be particularly relevant to switching from defined benefit to defined contribution arrangements. Most occupational defined benefit schemes are funded on an accrued-rights basis, and it takes a larger contribution to fund the marginal accrued rights of an older worker (since there is a smaller length of time for investment income to accumulate). The backloading losses are thus potentially significant in a shift from a defined benefit to a defined contribution plan. Defined contribution schemes are generally regarded as better for workers in a flexible labor market–in general, defined contribution plans are fully portable. However, there can be significant transitional costs for a move to pure defined contribution pensions from a world in which there are pre-existing defined benefit supplementary pensions.

Bolstering pension portability is an important objective for policy-makers in the Nordic countries, especially with regard to shifts between defined benefit and defined contribution plans, and between different defined benefits plans. The lack of such portability can impede efficient labor market matching and reduce retirement income.

Transferability of benefits can also be harmed by tax and solvency regulation. Nordic countries have recognized this, with Sweden most recently revising tax laws for insurance companies to remove tax obstacles for individuals moving policies between insurance companies.[117]

5.3.4 Harmonize Solvency Regulations

An important issue for supplementary provision in the Nordic countries is protection of accumulated contributions held by pension funds or insurers. The Maxwell scandal of the

[116] David Blake and J. Michael Orszag (1997), *Portability and Preservation of Pension Rights in the United Kingdom*, Report for UK Office of Fair Trading's Pensions Inquiry.
[117] Report on Swedish Pensions, OECD Working Party on Private Pensions, Nov. 1999.

early 1990s in Britain and the Studebaker Company in the US in 1964 are just the most prominent of a number of key examples where individual pension rights were compromised by poor corporate performance, inappropriate reliance on pension funds as a source of capital, or simple malfeasance.

A number of different approaches are used in Europe to insure solvency of accumulated pension funds. The EU-wide solvency regulations and reserve requirements apply to funds held with life insurers. These regulations provide security of capital for individual investors and insured corporate pensions. The solvency guarantees are particularly important for book reserve pensions.

Solvency regulations for pension funds can be very different from life insurance solvency regulations. They also differ considerably across EU countries. These heterogeneous solvency and funding regulations create difficulties for pan-European pension harmonization. In 1997 the Minimum Funding Requirement (MFR) rule, which requires pension funds to be at least at the level of funding on a discontinuance basis, was introduced in the UK. If funding is below 90 per cent of the discontinuance basis, a more rapid schedule of contributions is required. MFR calculations use a prescribed calculation method. There is also a Pension Compensation Fund to make up shortfalls as well as criminal penalties for employers failing to make contributions to a scheme on time. In Denmark, solvency rules for life insurance companies and pension funds are identical.

In other countries, pension funds are insured or guaranteed centrally. Smalhout (1996) reviews the economics of pension guarantees and examples from throughout the world.[118] The German Pensions-Sicherungs-Verein (PSVaG) insures book reserve pensions on an essentially pay-as-you-go basis.[119] In Sweden for instance, employer-provided ITP pensions are secured with the FPG insurance company; in 1995, the insolvency insurance cost 0.3 per cent of pension liabilities.[120] The general lessons about guarantee programs seem to be:

- These arrangements come under pressure primarily when there are large aggregate shocks that create a large numbers of employer insolvencies. In Finland, claims against the insurance fund rose by a factor of 40 between 1988 and 1992.[121] If the guarantee system is privatized, some sort of central government guarantee or external reinsurance program is important to insure against aggregate risks.
- Risk-related insurance premiums are important in reducing employers' disincentive effects to underfund. Without risk-related premiums, there is a subsidy to underfunded schemes (bad risks), and problems may be exacerbated by windups of solvent schemes.

[118] James Smalhout (1996), *The Uncertain Retirement*, Irwin.
[119] For more details on Germany, c.f., James Pesando, "The Containment of Bankruptcy Risk in Private Pension Plans" in OECD, *Private Pension Systems and Policy Issues,* 2000.
[120] Eskil Wadensjo, "The Welfare Mix in Pension Provisions in Sweden", in Martin Rein and Eskil Wadensjo (eds.), Enterprise and the Welfare State, Edwin Elgar, 1997, p. 286.
[121] Op. cit., p. 217.

- Solvency regulation and intervention/supervisory powers are also very important.
- Public disclosure of funding status can also be useful. The Netherlands is illustrative in this respect.[122]

Providing guarantees for pension benefits is a complex issue, not only because any form of insurance introduces incentive problems, but also because the risks are both aggregate and long-term in nature. Private solutions for guarantees have been tried in many countries, but are most successful if backed up by additional regulation and government guarantees. An important part of developing pan-European supplementary pensions is developing appropriate guarantees and solvency regulation.

5.3.5 Improve Investment Regulation

Various restrictions exist on portfolios of pension funds in Europe. In particular, Germany, Switzerland, Denmark, and Iceland have very stringent asset allocation rules. (In 2000 Denmark has eased the asset allocation rules. The rules now allow 60 per cent of Danish-denominated liabilities to be matched by Euro-denominated assets.) While these might appear at first glance to be regulatory constraints, which unambiguously lower consumer welfare, investment freedom and solvency regulation for pension funds can be intertwined; thus, the investment restrictions could raise consumer welfare in some cases. For instance, if pension liabilities are in one currency, there may be some justification in mandating these liabilities to be appropriately matched with assets of an appropriate risk class denominated in the same currency, particularly if there are implicit or explicit government guarantees. Although this will not be a problem in the single currency countries, Iceland and Norway will remain exposed to exchange rate risks. From 1994 to 1998, the pension institutions in Denmark have substantially increased the share of foreign stocks in their portfolios. In 1994 the share of foreign stocks was 5 per cent, and in 1998 it had increased to 12.7 per cent. In 1998 foreign stocks contributed more than 40 per cent of the total amount of stocks in the pension institutions' portfolios.

At the same time, pension funds' international investment conveys many important benefits, including:

- *Potentially higher returns*. A wider variety of investment opportunities increase the scope for high asset returns at any given level of risk.
- *Better risk reduction*. By moving investment funds abroad, pension funds can effectively insure against adverse country-specific shocks.

As little as ten years ago, the share of international assets in European pension fund portfolios was quite limited, with the exception of the UK and the Netherlands. Furthermore, the majority of foreign European pension fund equity holdings are from UK

[122] Op. cit., p. 195-200.

equity holdings.[123] However, there are several key economic arguments leading to more international investment of pension funds:

- *Lighter regulation*. Regulation on asset allocation has become less severe in Europe under implicit suasion from the European Union.
- *The Euro*. As pension liabilities become denominated in a single currency, investing abroad does not induce the same asset-liability mismatch and is hence more attractive.
- *Growth of defined contribution funds*. Defined contribution funds do not have explicit home currency liabilities and hence do not create an asset-liability mismatch.

Another example of the relationship between investment regulation and solvency regulation is the restriction that employers' pension funds cannot invest too much in the sponsoring employers' business. The Maxwell scandal points to the importance of careful regulation of the custody of pension fund assets. A key element of these regulations is restrictions that no more than a small percentage of assets can be held with the employer. In general, such limits are generally about 5 per cent with higher limits in Belgium and especially Finland (as long as covered by credit insurance).

Such asset restrictions are helpful on the solvency front but can be a problem for small and medium-sized enterprises, which may find pensions a good source of capital for business expansion. The UK has lighter employer investment regulation for very small pension funds, called SSASs, which are self-administered schemes for groups of 12 or fewer individuals. There are similar provisions in other countries for small and medium-sized enterprises to help provide them with low-cost access to capital, with the extreme example being the book reserve systems of Germany, Luxembourg, and Austria. On the other hand, the setting up of book reserve schemes is no longer permitted in Spain. The trade-off between the costs of capital and the security of it is thus important to consider in the design of supplementary pensions. Given the capital needs of small businesses, particularly in under-developed financial markets, policy-makers may be tempted to allow access to pension funds for capital financing purposes. But it is unclear whether pension funds of employees are the appropriate vehicle to solve problems of capital market imperfections, or whether other forms of explicit or implicit subsidy might be better. For example, easy access to capital may delay development of capital markets. Indeed, it has been claimed that the book reserve system in Germany is partly responsible for the lack of development of German equity capital markets.[124]

[123] At the end of 1993, UK pension funds held 86 per cent of the total equity of EU pension funds, cf. EFRP, op. cit., p. 29.
[124] Cf. Dick Taverne (1995), *The Pension Time Bomb in Europe*, A Federal Trust Report, Federal Trust, London, p. 13.

5.3.6 Rationalize Taxation

Because pensions are less liquid than other financial investments, investment in a supplementary pension is disadvantageous for the individual, or firm, relative to other investment vehicles if tax treatment is equivalent. Tax advantages for savings for retirement are hence important in encouraging the growth of supplementary pension. But such tax relief can have important *deadweight losses,* in which individuals who would ordinarily have saved for retirement receive inefficiently high levels of tax relief.

Taxes can be imposed on pensions either at the time of payment into the scheme, during accumulation, or at retirement. Consider an individual who uses a non-pension vehicle to save for retirement. Contributions to this non-pension vehicle are not tax deductible and accrue tax during accumulation, but not at withdrawal. Taxes on pensions are usually quite different. Contributions are deductible from taxes in Finland, the UK, Norway, Netherlands, Ireland, Iceland, Germany (book reserves), and Switzerland, and the accumulation period has tax relief. Taxation is at withdrawal on retirement in these countries. Some countries, such as Denmark and Sweden, levy taxes during the accumulation period on either the level of the fund or on returns. In Denmark, the taxation of pension yields during the accumulation period is motivated by neutral taxation of yields of fortune. In Denmark, pension saving is the most favorably taxed type of saving. Allowing self-sponsorship through pension saving would lead to distortion of the neutrality in the tax system and possible state aid for business and industries. All the Nordic countries allow tax deductibility of pension contributions.

One of the key economic risks individuals face with taxes is political risk. In particular, taxes might be changed in the future. However, different timing of taxes on pensions and ordinary savings helps to hedge this political risk. If the government taxed contributions to pension funds, there would be no guarantee that a later government would not change the tax treatment and tax the accumulated funds or the withdrawals. By deferring taxes to retirement, the government reduces the risks to the individual that it will raise the level of tax on benefits at the decumulation stage. (Such risk may reduce the attractiveness of investment in supplementary pensions. On the other hand, the current level of tax relief in Europe is significant, so the changes in future taxes would need to be large in order to make a supplementary pension unattractive on a pure rate of return basis.)

Another key issue with taxation of pensions is the more conventional one of tax arbitrage. With differing tax restrictions, pension funds and individuals with pension accounts may try to transfer funds to countries with the most advantageous regulations. For instance, Ireland's new rules lifting mandatory annuitization for those with enough capital may lead to demands for pension transfers to Ireland. More fundamentally, the lack of a common tax policy on pensions would seem to pose important problems for pan-European pensions.

5.3.7 Reduce Insularity

Despite the complexities and inherent differences among the Nordic systems, one common feature permeates them: local pension markets are largely insular and difficult for

foreigners to enter. (One possible exception is Sweden, where the Premium Pension Reserve has been open to foreign investors, many of whom have entered the market.) To some degree, the Nordic markets may be ones in which foreigners would simply choose not to enter, regardless of any barriers or lack thereof. But the evidence suggests that the lack of foreign involvement is heavily affected by culture and regulation. For example, the Danish insurer Royal and Sun Alliance, a UK insurer, own Codan. The fact that it trades under a Danish brand name on the Danish stock exchange obscures its true ownership–a step that would seem unnecessary in a market more friendly to outsiders. However, even here, the use of Danish brand names is by no means universal. For example, the German companies Provinzial and Heimburg-Mannheimer use their original German brand names in the Danish pension market. Despite these examples, the Nordic life insurance and pensions markets are largely closed to foreigners though there is wide speculation this will change in the future.

In principle of course, the Third Life Directive allows entry of European insurers into any participating country using a single passport. But numerous exceptions exist. In Norway, for example, the single passport cannot be used for pension business. Furthermore, the details of the with-profits funds used by insurers differ considerably across the Nordic countries, making it difficult for foreigners to enter and compete effectively.

Many of the issues delineated above are intended to reduce this insularity, for example, by harmonizing regulatory and tax treatment of pensions. But a broader policy objective of reducing insularity, which addressed informal as well as formal barriers to entry, would likely produce significant benefits.

The case for harmonization is here posed in terms of increasing competition and making markets more transparent for providers. Another argument for harmonization is based on mobile labor and the fact that people might earn pensions from different countries. For example, many people move after retiring, and therefore receive pensions in another country. As shown in Table 5.3, the number of such people remains relatively low–the number of Nordic people living abroad in retirement in 1998 was 72,356. But if more people retire abroad in the future, more flexibility in benefit design may be beneficial.

Table 5.2. Nordic pensioners receiving benefits and living in other countries

	Age group						
	50-69	60-64	65-69	70-79	80-89	90+	Total
Denmark	1,127	859	3,114	7,192	2,013	225	14,530
Finland	7,294	7,699	11,959	14,637	3,411	376	45,376
Iceland	48	23	97	133	30	1	332
Norway	912	747	2,787	6,432	1,166	74	12,118
Sweden	na	na	na	na	na	na	na
Total	9,381	9,328	17,957	28,394	6,620	676	72,356

Note: As of 31 December 1998.

There are some Nordic people working in other countries, but net migration rates are generally fairly low. Swedish projections are for about 65,000 immigrants per year and 53,000 emigrants per year, implying an annual immigration rate of about 1 per cent. These migration rates suggest that a small but significant fraction of people may ultimately receive at least some pension from another country. Amalgamation of private pensions from different country sources is therefore a potentially difficult problem.

5.3.8 Increase Transparency

One of the core problems with introducing better consumer information is that the Nordic pension markets rely heavily on with-profits funds. With-profits funds are extremely hard to make transparent, but if bonus-crediting mechanisms can be made explicit rather than implicit, there are important gains for consumers. Anders Grosen of Aarhus Business School and Peter Jorgensen of the Univ. of Aarhus have, however, analyzed a transparent with-profits fund with broad policy implications.[125] They develop a simple and transparent bonus-crediting formula that depends on just three parameters and is easy to implement in practice. Transparency helps consumers to compare policies, regulators to judge solvency and companies to compete in different markets. They credit bonuses to a policy according to the formula:

$$r_B(t) = \max\left[0, \alpha\left(\frac{B(t-1)}{P(t-1)} - \gamma\right) - r_G\right]$$

where:

$r_B(t)$ - rate of bonus for policy at time t,
$B(t-1)$ - bonus reserve fund for policy at time t - 1,
$P(t-1)$ - reserve fund for policy at time t - 1,
α - distribution ratio for fund,
γ - target buffer ratio,
r_G - guaranteed interest rate (e.g., 3.5 per cent).

With an approach such as the one analyzed by Grosen and Jorgensen, one could rank and compare policies sharing the same distribution ratio, target buffer ratio, and guaranteed interest rate. Hence, a transparent with-profits formula, such as the one developed by Grosen and Jorgensen, could be an important way forward for Nordic insurance markets.

5.4 Effective Development of Public Trust Funds

While the development of private pensions may be useful for the Nordic countries, other countries may also wish to evaluate the proportion of prefunding done through public trust fund vehicles or buffer funds (as in the case of Finland). Indeed, given that public trust funds have the advantage of adopting flexibly in response to changes in demographic and

[125] Anders Grosen and Peter Jorgensen, "Fair Valuation of Life Insurance Liabilities: The Impact of Guarantees, Surrender Options and Bonus Policies", Insurance, Mathematics and Economics 26(20000), 37-57.

economic circumstances and seem to enjoy low administrative costs, they are worth further exploration, especially given the success of both Denmark and Norway in avoiding overly political management of large public trust funds.

In the context of further developing public trust funds, Joseph Stiglitz has suggested that countries invest in each other's public trust funds. For example, the Norwegian petroleum fund could invest in the Danish ATP, and, more generally, the portfolio shares of public trust funds could be determined with reference to asset-liability analysis, based on correlations of demographic shocks in the different Nordic countries.

It is also important to explore institutional arrangements, such as independent boards, clear legislative mandates to avoid political investing, and restrictions on investments to broad market indexes, to protect trust funds from political pressures. For example, Canada has recently changed the regulations governing its Canada Pension Plan (CPP) to allow the system to invest a portion of its reserves in private securities. The impact of a trust fund's institutional structure deserves closer attention. Funds with independent boards and sources of financing, a clear legal mandate to pursue competitive returns, and a focus on broad market index funds may fare better than other funds. Active private fund managers do not tend to outperform index funds, so it is hard to argue, at least when the public trust fund would be a relatively small share of the market, that private funds would outperform a public fund invested solely in broad indexes. Given the critical importance of prefunding in many countries, further scrutiny of whether public trust fund structures can be designed to avoid malfeasance and under-performance (even on a risk-adjusted basis) is crucial to a full evaluation of policy choices (in particular, between public and private approaches to prefunding).

5.5 Conclusions and Policy Options

The development of private pensions markets in the Nordic countries should be an important priority. The key ingredients for successful private markets lacking in **all** the Nordic countries are:

- Adequate formal consumer protection mechanisms.
- Simple tax regimes and with profitswith-profits rules which do not confuse consumers and deter entrants.

We recommend consideration of harmonized with-profits rules and more room for the growth of unit-linked funds as well as proactive attention to consumer protection and the introduction of disclosure of expenses and costs to consumers and firms. In addition, many Nordic private pensions increase early retirement in ways making it difficult for other public policies to keep early retirement under control.

Prefunded public trust funds also have an important role to play, and we recommend that in order to hedge demographic uncertainty better, public funds in the Nordic countries consider investment in other country's trust funds.

Chapter 6
Policy Recommendations and Conclusions

In this report, our analysis has focused on two main policy issues: encouraging pre-funding of pension liabilities and increasing the labor market participation of older workers. We found that the Nordic countries, despite their overall wealth and sophistication, have relatively immature private markets for pension products. These markets could be further developed. In some countries, early retirement is also becoming a more serious problem, and the trend toward earlier retirement is often spurred by inadequate policy design. Our policy recommendations are hence largely aimed at rectifying the weaknesses in these two areas.

While some aspects of the pension systems in the Nordic economies could be improved, we also found examples of very good practice and policy in many of the Nordic countries from which other countries could benefit. One potential example is the FlexJob program in Denmark, which may reduce disability costs and promote work. Another is the Swedish Premium Pension system, which has attracted a high degree of foreign participation at relatively low cost to the consumer and the government. Iceland's high level of labor market participation for older workers is an impressive example for other Nordic countries. The Finnish system of providing transfer values to early leavers, based partly on expected future wage growth, is a good example of how to reduce the cost to workers of changing jobs within a defined benefit system. The Norwegian petroleum fund is an excellent example of a publicly managed trust fund.

To some degree, our principal policy conclusions involve highlighting the benefits of sharing additional information and experiences across the Nordic countries. Indeed, in the case of demographic data and forecasts, the sharing of information could be so valuable that we propose the establishment of a special pan-Nordic office to facilitate cooperation.

Thus, our policy recommendations are:

General

- The Nordic Council should fund a common Nordic actuarial office to collect data and make forecasts for Nordic demographics.

Encouraging Labor Market Participation of Older Workers

- Early retirement ages should be indexed to economic and demographic conditions. As economic conditions improve and mortality decreases, minimum early retirement ages should be increased.

- The other Nordic countries should examine in detail the Danish experience with the FlexJob program for applicability to their own experiences.
- The tax treatment of early withdrawal and early retirement should be examined with a view to charging pension funds for the cost to the government of workers retiring early and not contributing taxes in the future.
- Iceland should be encouraged to report on any special features of its labor market and pension system that result in its remarkably high labor market participation of older individuals. As noted in Chapter 4, we believe this is due to a combination of factors, including particularly Iceland's general labor market and macroeconomic structure, whose flexible real wages have led to little unemployment before 1990.

Pre-funding Pension Liabilities

- The Nordic countries should increase the degree of prefunding of their pension systems.
- The Nordic countries should agree on a common set of transparency standards for with-profits insurance funds.
- The Nordic countries should agree on a common implementation of the EU Insurance Intermediaries Directive to facilitate cross-border sales of private pensions.
- The Nordic ministers should make arrangements to allow countries to invest in each other's public trust funds or pension systems, where relevant.
- The other Nordic countries should study the Finnish buffer reserve system to see how it could be adapted to their specific circumstances.

A Common Nordic Actuarial Office

In the introduction to this report, we noted that the central determinants of old-age retirement system costs fall into three main categories: demographics, economics, and law. We recall that demographic considerations encompass fertility, mortality, and migration and are important determinants of underlying costs. Better statistical information is essential for maintaining and implementing policies. Therefore, one of our core policy proposals is the institutionalization of better data collection.

The Nordic countries have similar demographics and are influenced by similar shocks. We therefore see some use for a common Nordic actuarial office to compare and combine forecasts of mortality, fertility, and migration. This common Nordic office for preparing better forecasts for each individual country can use the correlations between these factors across the Nordic countries. We envisage this office also gathering data on morbidity and creating data and tables for occupational pension funds and private providers. This office would also provide a set of benchmark actuarial assumptions and independent calculations for governments. Whether based at the Nordic Council of Ministers or elsewhere, the costs of such cooperation would be low and the benefits potentially very substantial.

Encouraging Labor Market Participation of Older Workers

Although the Nordic countries enjoy relatively high labor market participation rates among older workers, early retirement is increasing rapidly in some countries. We noted that when workers retire early, it is often at actuarially advantageous rates. Indeed, even when the commutation of benefits for early retirement is at an actuarially fair level, the reduction in pension benefits for the worker does not reflect the loss in tax revenue from the worker's not continuing to work. In other words, in order for a rise in early retirement to have no impact on fiscal balance, the reduction in benefits needs to be larger than the actuarially fair level (evaluated without regard to tax revenue). Especially since most retirement systems continue to subsidize early retirement even from the narrow perspective of lifetime benefits, we suggest a review of the tax rules on withdrawal from pension funds and receipt of benefits before the official retirement age.

We noted the impact of labor demand effects on early retirement, and our analysis suggested that it is perhaps better for the government to ration the number of people retiring early implicitly through quantity mechanisms rather than price mechanisms. This would suggest that the early retirement age should be adjusted, perhaps in conjunction with a tax rate on benefits that depends on the age of retirement. In addition, the age of early retirement could be indexed to estimates of life expectancy, to avoid increases in the expected length of retirement and to protect retirement incomes. The age of early retirement could be indexed automatically to economic and demographic conditions, since in practice legislation changes very slowly relative to economic and demographic conditions. (In the 1980s an early retirement age provided a comfortable exit during difficult times, but as conditions improved, it has taken governments a considerable amount of time to make the requisite adjustments to control costs.) Therefore, we suggest that the Nordic ministers discuss ways in which to make these adjustments automatic and according to common principles.

The Danish experience with the FlexJob program has been particularly successful in getting employable older workers back to work using financial incentives. This experience could be very relevant for other Nordic countries, especially Norway and Finland.

Encouraging Pre-funding of Pension Liabilities

Our report has emphasized the benefits of prefunding. Such prefunding could be undertaken either through a public trust fund or through private pensions. Yet in our analysis of private pensions, we noted that marketing and distribution arrangements were very much country-specific and in most cases non-transparent. The lack of transparency makes it difficult for consumers to compare financial service products or to change providers and hence impedes competition. The country-specific nature of marketing and distribution raises entry costs to foreign firms. We therefore recommend that the Nordic ministers investigate a common transparent form of with-profits fund as well as common standards for unit-linked funds in the Nordic countries.

On marketing arrangements, a number of important factors suggest substantial benefits for the Nordic ministers to undertake initiatives now rather than later. The first is the forthcoming EU directive for insurance intermediaries that will seek to provide portability

of licensing for insurance sales, and for which the Nordic countries will have to discuss strategies for implementation in the near term. Sweden, Finland and Denmark are members of the EU and will have to follow the directive. As signatories to the insurance markets directives, Iceland and Norway will also be affected. The second factor is the growth of e-commerce and distance selling. If the Nordic governments provided a common regulatory framework for marketing and licensing of agents across the Nordic countries, Nordic companies would be able to take advantage of the high level of Internet penetration in their countries to increase cross-border financial services.

Our analysis emphasizes not just the need for more prefunding of pension liabilities, but also that the level of prefunding should adjust in response to changes in economic and demographic conditions. This requires a level of flexibility that can be facilitated perhaps more easily through public trust fund vehicles or buffer funds instead of purely private individual accounts. Indeed, given that public trust funds have the potential advantage of adopting flexibly in response to changes in demographic and economic circumstances and seem to enjoy low administrative costs, they are worth further exploration–especially given the success of both Denmark and Norway in avoiding overly political management of large public trust funds.

In the context of further developing public trust funds, it has been suggested that countries be allowed to invest in each other's public trust funds. For example, the Norwegian petroleum fund could invest in the Danish ATP. More generally, the portfolio shares of public trust funds could be determined with reference to asset-liability analysis based on correlations of demographic shocks in the different Nordic countries. This idea could be extended further still to allow different countries to absorb each other's pension liabilities. (This sort of reinsurance and pooling of macroeconomic risk would require common monitoring mechanisms, which could be provided by the common Nordic actuarial office.) These reinsurance and pooling operations could also be extended to excess-of-loss insurance for guarantee funds for private pensions to provide insurance against serious collapse such as the Finnish guarantee system in the early 1990s.

Another example worth considering for conditional prefunding is the Finnish system of partially funded schemes. Interestingly, Finland created a special buffer reserve, amounting to 1.1 percentage points of payroll, when it joined the European Monetary Union in 1999. The size of the buffer changes over time; in 2000, it is estimated that the buffer reserve will be increased to 1.4 percentage points. The buffer is explicitly intended to provide a flexible source of prefunding: It can be adjusted in response to external shocks and thus offset some of the adjustment costs that would otherwise be associated with EMU. A larger buffer of this type may be useful for responding to demographic shocks.

Summary

The coming demographic shift in the Nordic countries will put increasing pressure on their pension systems, which in turn may put increasing pressure on fiscal and other public policies. This report documented the extent of the challenge facing the Nordic countries and explored various potential responses, including innovative policy measures that have not yet been fully analyzed within the policy community.

It is important not to be overly sanguine. To be sure, the Nordic countries have pension liabilities under much more control than their continental neighbors. But at the same time, the demographic shift in the Nordic countries is likely to be a permanent rather than a temporary phenomenon. By increasing the degree of prefunding in their pension systems, discouraging early retirement, bolstering private pension provision, and taking advantage of the various benefits (including economies of scale and scope) from increased harmonization across the Nordic countries, policy-makers in the Nordic economies could do much to reduce the burdens associated with the retirement of the baby boomers and continuing improvements in health and longevity.

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Appendix A. The Uniqueness of Internal Rates of Return for Pensions

Suppose all the contributions precede all the withdrawals to a pension fund (e.g., the individual can retire only once), then we note denote the discounted value of contributions by C(R) and that of benefits by B(R) where R is the rate of return. Let W be the retirement date then:

$$B(R) = \sum_{t=W} b_t (1+R)^{-t} = (1+r)^{-W} \sum_{t=W} b_t (1+R)^{-t+W} \quad \text{(A1)}$$

where b is the benefit received at any date past or at W. Now the internal rate of return solves:

$$A(R) = C(R) - B(R) = 0 \quad \text{(A2)}$$

The internal rate of return therefore also solves:

$$APV(R) = (1+R)^W A(R) = \tilde{C}(R) - \tilde{B}(R) \quad \text{(A3)}$$

We note that as R approaches infinity, only contributions effect APV(R) and it goes to infinity whereas as R goes to –1, only the liabilities effect APV(R) goes to minus infinity. This implies at least one root crossing of APV(R) in the interval [-1, infinity].

Furthermore, the second term in APV(R) is strictly decreasing in R whereas the first term is strictly increasing in R. The net effect is that the term APV(R) is increasing strictly monotonely in R. The strict monotonicity of APV(R) implies that the pensions internal rate of return equation has only one root.

Appendix B. Marginal Benefits from Early Retirement

We define b(p) = MB(P) and c(p) = MSC(p) and a(p) = b(p) – c(p). Deadweight loss when number retiring are p^0 and optimal number is p* is:[126]

$$\int_{p^0}^{p^*} | a(p) | dp \tag{B1}$$

We analyse the special case where a(p) is linear and in this case the problem reduces to determining under which system the number retiring is closest to the equilibrium p*.

Suppose that benefits are uncertain so that b(p) = e + b*(p) where e is a random number with mean zero. We define:

$$b(p) = b_0 - b_1 p \tag{B2}$$

$$c(p) = c_0 + c_1 p \tag{B3}$$

The optimal number retiring is:

$$p^* = \frac{b_0 - c_0 + e}{b_1 + c_1} \tag{B4}$$

With rights calculated as if e=0, the number retiring is:

$$p^r = \frac{b_0 - c_0}{b_1 + c_1} \tag{B5}$$

which differs from the optimal level by:

$$\frac{e}{b_1 + c_1} \tag{B6}$$

We note that if, instead of uncertain benefits, there were uncertain costs with c(p) = -e + c*(p) we would achieve the same result.

[126] From Orszag and Snower(1999a).

With taxes fixed at an optimal level for e=0, the number retiring solves: $e + b(p) - c(p^r) = 0$ and the number retiring is:

$$p^t = \frac{b_0 - c_0}{b_1 + c_1} + \frac{e}{b_1} \tag{B7}$$

The difference between the number retiring and the optimal level is:

$$\frac{e}{b_1 + c_1}\frac{c_1}{b_1} \tag{B8}$$

We note that one also obtains the same solution with uncertain costs instead of uncertain benefits.

Thus, if $\frac{c_1}{b_1} > 1$ or the cost curve is steeper than the benefit curve, then numerical early retirement restrictions are better.