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# **Rethinking Retirement**

From participation towards allocation

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## Abstract in English

This study argues that Dutch policy regarding the labour market for elderly is at a crossroads. Previous reforms in the Netherlands have encouraged labour supply and are expected to boost labour-market participation of individuals aged 55 to 64 to 60% in 2020. Further stimulus of supply is debatable due to perverse distributive implications. The increase in participation reveals inefficiencies in the demand side of the market. Indeed, the Dutch labour market for elderly is characterised by long unemployment duration, long job tenures, low mobility and little investment in human capital. The inefficiencies were previously hidden by massive early retirement, but will become more pressing as the workforce ages and participation rates increase. This imposes a new challenge for Dutch policy, a challenge that has become more urgent due to the current financial crisis that is expected to cause a substantial rise in unemployment. The study offers up-to-date insight in the consequences of policy reforms for the labour market.

Key words: Participation; Welfare-state institutions; Retirement; Wage-productivity gap; Flexibility; Allocation. JEL code: D6; H2; H5; J14; J26; J3; J6

## Abstract in Dutch

Deze studie stelt dat het Nederlandse beleid rond de arbeidsmarkt voor ouderen op een kruispunt is aanbeland. Hervormingen in het verleden hebben het arbeidsaanbod aangemoedigd en zullen naar verwachting leiden tot een stijging in de arbeidsparticipatie van de leeftijdsgroep 55 t/m 64 naar 60% in 2020. Een verdere stimulering van het arbeidsaanbod is wellicht minder wenselijk omdat het financiële voordeel terecht komt bij mensen die het minder nodig hebben. Het groeiende aanbod van ouderen op de arbeidsmarkt legt echter wel verstoringen bloot aan de vraagzijde. Zo wordt de arbeidsmarkt voor ouderen gekenmerkt door lange werkloosheidsduren, lange baanduren, weinig mobiliteit en weinig investeringen in kennis en vaardigheden. De inefficiënties waren in het verleden minder zichtbaar vanwege de massale vervroegde uittreding, maar zullen in de toekomst nijpender worden vanwege de vergrijzende beroepsbevolking. Het stelt het Nederlandse beleid voor een nieuwe uitdaging. Deze wordt versterkt door de huidige financiële crisis die de komende jaren naar verwachting de werkloosheid fors zal doen toenemen. De studie biedt inzicht in de gevolgen van beleidshervormingen in het licht van deze uitdaging.

Steekwoorden: Participatie; Instituties van de verzorgingsstaat; Uittreding; Loonproductiviteitsverschil; Flexibiliteit; Allocatie. RETHINKING RETIREMENT: ABSTRACTS

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## Preface

The reform of Dutch welfare state institutions affecting individuals aged 50-70 is at a crossroads. During the last decade, obstacles and disincentives for labour-market participation of elderly workers have been removed and participation rates are rapidly increasing. At the same time, mobility among elderly is low, job tenures are long and elderly unemployed can hardly find a new job. With a growing number of senior workers this becomes more pressing. The financial crisis reinforces these tensions and puts them higher on the policy agenda.

To contribute to the discussion about welfare state design and the functioning of the labour market for elderly workers, this volume contains an up-to-date review of the economic literature. It contains a conceptual framework for thinking about optimal institution design, which offers a good starting point for several more detailed analyses of institutions. Most emphasis is on the empirical knowledge with respect to the impact of institutions on labour-market performance. Apart from discussing existing literature and previous CPB research on this topic, the study contains new data analysis for the Netherlands and applications of the key insights to concrete policy debates.

The study has been written by several staff members of CPB whose names are mentioned as authors of the respective chapters. The coordination and editing was in the hands of Rob Euwals, Ruud de Mooij and Daniel van Vuuren. Several CPB colleagues provided helpful comments and discussions. We are particularly grateful to an external group of experts from the Ministries of Economic Affairs, Social Affairs and Employment, and Finance for helpful suggestions and improvements. Lans Bovenberg and Bas Jacobs provided excellent comments on some crucial parts of the study. The study also forms input for the conference `Rethinking Retirement´ that will be held on 23-24 April, in collaboration with Netspar and the Social and Economic Council of the Netherlands (SER).

Coen Teulings Director of CPB RETHINKING RETIREMENT: PREFACE

## Nederlandse samenvatting (Executive summary in Dutch)

De vergrijzing van de beroepsbevolking betekent een grote uitdaging voor de Nederlandse overheid. De toename van het aantal gepensioneerden ten opzichte van het aantal personen met een betaalde baan vergroot de druk op de overheidsfinanciën en leidt tot spanningen tussen generaties. Een veelgehoorde remedie is een verhoging van de arbeidsparticipatie van ouderen. In dat kader hebben al verschillende hervormingen plaatsgevonden in zowel de regelingen voor vervroegde uittreding (VUT, Prepensioen) als de sociale zekerheid (WAO, WW). Het beleid staat nu voor een fundamentele keuze. Moet de arbeidsparticipatie van ouderen nog verder worden gestimuleerd? Of is het zinvoller om een nieuwe richting in te slaan die zich concentreert op de productiviteit en de beloning van oudere werknemers?

## De arbeidsmarkt voor ouderen: de uitdaging

In de jaren tachtig en negentig was de arbeidsparticipatie van 55 tot 65-jarigen laag. Dit werd in belangrijke mate veroorzaakt door de relatief genereuze VUT-regelingen en het gebruik van de arbeidsongeschiktheidsverzekering (WAO) als 'glijbaan' naar het pensioen. Vanaf het midden van de jaren negentig werd begonnen met het actuarieel neutraal maken van de regelingen voor vervroegde uittreding, de overgang van VUT naar Prepensioen. Daardoor werd het financieel aantrekkelijker om langer door te werken. Tevens is de WAO steeds verder aangepast en werd deze regeling minder toegankelijk als uittredingsroute. De participatie van 55 tot 65-jarigen is daardoor sterk gestegen. Op dit moment wordt langer doorwerken zelfs aangemoedigd via de doorsneepremie voor het ouderdomspensioen en door de zogenaamde doorwerkbonus.

Volgens projecties van het CPB zal de participatie van 55 tot 65-jarigen verder stijgen naar 60% in 2020. Dit zou betekenen dat Nederland tot de beter presterende landen in de OESO gaat behoren. De hogere arbeidsparticipatie leidt tot verdere aanpassingen in het gedrag. Zo zullen ouderen in de toekomst meer geneigd zijn om te investeren in scholing, omdat deze investering langer kan renderen.

Ondanks de stijgende participatiegraad functioneert de Nederlandse arbeidsmarkt voor ouderen matig. Bedrijven zijn terughoudend bij het aannemen van werknemers boven de 55 jaar. De lonen van veel werknemers stijgen met de duur van hun dienstverband, en door de strenge ontslagbescherming blijven oudere werknemers in een soort 'gouden kooi' gevangen. In vergelijking met andere landen is de gemiddelde duur van het dienstverband in Nederland hoog, en de baan-naar-baan mobiliteit laag. Eigenlijk kan er nauwelijks worden gesproken van een 'arbeidsmarkt' voor ouderen, aangezien zeer weinig transacties plaatsvinden bij het gegeven niveau van de lonen.

Wanneer geen verdere hervormingen plaatsvinden, bestaat het risico dat Nederland een land wordt waarin weliswaar tot op hoge leeftijd wordt doorgewerkt, maar waarbij veel mensen niet op de beste plek zitten en een te lage productiviteit hebben. Met andere woorden, de allocatie van de productiefactor arbeid is dan niet optimaal. Globalisering en technologische ontwikkeling leiden tot een versnelde afschrijving van specifiek menselijk kapitaal, en om een optimale allocatie te bereiken kan meer flexibiliteit nodig zijn. Een niet-optimale allocatie van werknemers tussen de 55 en 65 jaar wordt steeds kostbaarder voor de samenleving omdat relatief steeds meer mensen tot deze leeftijdsgroep behoren. De grote uitdaging voor het beleid is daarom om mensen te stimuleren om in de juiste banen te werken, te blijven leren en zich te blijven inspannen in hun werk. Dit is essentieel voor een hoge productiviteit en om ervoor te zorgen dat ook werkzoekende ouderen aan een baan kunnen worden geholpen.

Een andere uitdaging is de hervorming van arbeidsmarktinstituties die inkomens herverdelen tussen generaties. Zo kennen we in Nederland vaak beloningen volgens vaste salarisschalen die stijgen met leeftijd, de doorsneepremie voor het ouderdomspensioen, de doorwerkbonus, en premiekortingen voor werkgevers met oudere werknemers in dienst. Dergelijke herverdeling van jong naar oud vergroot de financiële druk op jongere generaties die toch al worden geconfronteerd met hoge lasten van de vergrijzing.

De financiële crisis versterkt de noodzaak tot verandering. Het financiële vermogen is verminderd en zal sommigen ouderen ertoe aanzetten langer door te werken. Bovendien zullen er oudere werknemers getroffen worden door ontslag. Velen van hen willen graag een nieuwe baan. De arbeidsmarkt voor ouderen moet daarom beter gaan functioneren. Werkgevers en werknemers moeten elkaar gemakkelijker kunnen vinden, instituties moeten flexibeler worden en er moet meer worden geïnvesteerd in scholing.

## **Opties voor beleid**

Waar liggen de kansen voor beleid in Nederland? We bespreken maatregelen die een nietoptimale allocatie op de arbeidsmarkt voor ouderen zou kunnen verbeteren. Daarbij geven we tevens een indruk van de maatschappelijke effecten op herverdeling en onzekerheid.

#### Subsidies voor langer doorwerken

Het uitstellen van vervroegde uittreding is financieel duidelijk aantrekkelijker geworden. De impliciete belasting op langer doorwerken was gedurende de jaren tachtig voor veel werknemers tussen de 80 en 100%. Sindsdien is de impliciete belasting omgeslagen in een impliciete en zelfs expliciete subsidie op doorwerken. Een subsidie op doorwerken kan zinvol zijn volgens de theorie van optimale belastingen van Ramsey. Er zijn immers aanwijzingen dat personen die vlak tegen hun pensioen aanzitten gevoeliger zijn voor financiële prikkels dan jongere personen. Een klein aantal studies bevestigt het verschil in gedrag tussen jongeren en ouderen, maar hoofdstuk 2 laat zien dat de empirische kennis nog erg beperkt is. De zin van leeftijdspecifieke belastingen kan bovendien ter discussie worden gesteld vanuit herverdelingsoogpunt. Het zijn namelijk vooral de gezonde ouderen met goede banen die langer doorwerken en de bonussen van de overheid ontvangen. De subsidie impliceert daardoor een perverse herverdeling van arm naar rijk. Daarnaast impliceert de subsidie herverdeling van jong naar oud waardoor de financiële druk op jongeren toeneemt. De bovenstaande overwegingen stellen de doorwerkbonus, die per 1 januari 2009 is ingevoerd ter discussie. De participatie van mensen in de leeftijdsgroep 60-64 stijgt met 0,6%-punt door de bonus. De stijging van de totale participatie is ongeveer 0,1%-punt. Dit is echter het partiële effect, ofwel er wordt geen rekening gehouden met de financiering van de maatregel. Alternatieve vormen van belastingverlaging, die ook ongeveer 0,3 miljard euro kosten, kunnen een vergelijkbaar effect bereiken (Graafland et al, 2001). De verdelingseffecten zijn dan echter anders.

Aanpassing van de doorsneepremie is een andere manier om de subsidies voor oudere werknemers te beperken. Volgens Bonenkamp (2009) betekent de huidige vormgeving van de premies een impliciete belasting van ongeveer 3% op het levensinkomen van laagopgeleide mannen. Daarentegen krijgen hoogopgeleide vrouwen een impliciete subsidie van ongeveer 2,5%. Deze herverdeling kan verzacht worden door bijvoorbeeld een geleidelijke omvorming naar een 'defined contribution' systeem vanaf een bepaalde leeftijd. Dit zou de herverdeling van arm naar rijk tegengaan. Merk op dat een dergelijke aanpassing de participatie op hogere leeftijd financieel minder aantrekkelijk maakt.

#### Eerste pijler pensioen (AOW)

Nederlandse ingezetenen hebben vanaf leeftijd 65 recht op een AOW uitkering. De uitkering wordt gefinancierd middels een omslagstelsel. Ter verbetering van de houdbaarheid van de overheidsfinanciën, die onder druk staat door de vergrijzing, is voorgesteld om de AOW gerechtigde leeftijd op te schuiven naar 67 jaar of te koppelen aan de stijging van de levensverwachting. Een verhoging van de AOW-gerechtigde leeftijd heeft op meerdere manieren een effect op het arbeidsaanbod. Ten eerste, de maatregel betekent een verlaging van het totale pensioenvermogen. Hoofdstuk 2 laat zien dat het effect van de beloning voor doorwerken belangrijker is dan het effect van het pensioenvermogen, maar desondanks leidt de maatregel door het vermogenseffect tot een uitstel van vroegpensioen met 2 tot 3 maanden. Ten tweede laat hoofdstuk 5 van de studie zien dat individuen ook eerder in het leven meer uren zullen gaan werken. Daarmee anticipeert men op een kleiner vermogen na de leeftijd van 65. Tot slot, de AOW leeftijd kan invloed hebben sociaaleconomische normen en ook op die manier invloed hebben op uittredingsgedrag. De leeftijd kan als richtleeftijd gelden bij vervroegde uittreding. Veranderingen kunnen dan een groter effect hebben dan gesuggereerd wordt door het pure vermogenseffect. Empirisch onderzoek uit de VS, waar het opschuiven van de pensioengerechtigde leeftijd al is begonnen, laat zien dat een verschuiving van twee jaar leidt tot een uitstel van vroegpensioen met ongeveer één jaar.

Het recht op AOW is afhankelijk van het aantal jaren dat een persoon in Nederland verblijft en dus niet van het aantal jaren dat iemand financieel heeft bijgedragen. De AOW is daarmee een basisinkomen voor de overgrote meerderheid van gepensioneerden. Een optie voor beleid is om het recht op AOW afhankelijk te maken van de bijdrage aan het AOW systeem. Dit verstekt de financiële prikkel voor arbeidsaanbod (Disney, 2004). Simulaties met het CPB arbeidsmarktmodel (Graafland et al., 2001) wijzen uit dat een dergelijke hervorming een positief effect van ongeveer 1,6% heeft op het arbeidsaanbod. Dit is vooral het gevolg van een stijging van de participatie van 6,3% van partners. De hervorming betekent namelijk dat in de eerste plaats niet-werkende partners hun AOW rechten zouden verliezen.

## Tweede pijler pensioen

De meerderheid van de Nederlandse werknemers bouwt een tweede pijler pensioen op in een bedrijfs- of bedrijfstakpensioenfonds. De overheid ondersteunt de pensioenbesparingen door middel van een gunstige fiscale behandeling. De pensioenbesparingen zijn relatief hoog in vergelijking met andere landen. Bij een volledige opbouw is het pensioen circa 80% van het gemiddelde loon van een werknemer over zijn carrière. Werknemers in een bedrijf of bedrijfstak met een pensioenfonds zijn verplicht om daarin deel te nemen. Dit beschermt de werknemers tegen kortzichtig spaargedrag en het zorgt voor risicodeling tussen generaties. Tegelijk leidt de verplichting ook tot verstoringen. Dat geldt met name voor werknemers die de financiële middelen eerder in het leven nodig hebben, bijvoorbeeld omdat ze een huis willen kopen, een opleiding willen volgen, of zorgtaken willen combineren met werk. De verplichte deelneming kan er dan voor zorgen dat zulke werknemers in hun jonge jaren te veel werken, te weinig leren en vervolgens ook te vroeg met pensioen gaan.

De vormgeving van de pensioenen is primair de verantwoordelijkheid van de werkgevers en werknemers. Zij kennen immers de wensen van hun leden het beste. Zij zijn daarmee ook verantwoordelijk voor een optimale vormgeving van regelingen voor vervroegde uittreding en deeltijdpensioen. De overheid deelt echter mee in de verantwoordelijkheid omdat ze bepaalt welke en hoeveel pensioenbesparingen onder de fiscaal gunstige regeling vallen. Daarmee kan ze het gedrag van de sociale partners beïnvloeden. Zo kan de overheid de pensioenbesparingen beperken door bijvoorbeeld het maximum bedrag voor de fiscaal gunstige regeling te verlagen. Dat zou individuen meer ruimte geven om arbeid, consumptie en besparingen over de levensloop zelf te bepalen.

Een andere mogelijke hervorming is om niet het gewenste pensioeninkomen vast te stellen, maar om de bijdrage aan het pensioen vast te stellen. Een dergelijk pensioensysteem kan geïntegreerd worden met de levensloopregeling. Daardoor zouden individuen vroeger in de levensloop over liquiditeit beschikken. Dit kan de financiële druk op jongere generaties verlagen, en zou hen vrij laten in hun keuze voor besparingen voor vervroegde pensionering. Een nadeel van het systeem is dat er minder risicodeling is tussen generaties. Het risico voor een hogere of lagere opbrengst van de besparingen is immers geheel voor het individu zelf. Die moet schokken in het pensioenvermogen dan opvangen door bijvoorbeeld de pensioenleeftijd aan te passen.

#### Besparingen

Naast de verplichte pensioenbesparingen zijn er ook andere spaarvormen die een gunstige fiscale behandeling krijgen. Voorbeelden zijn vrijwillige pensioenbesparingen, levensloopbesparingen en besparingen in de vorm van eigenwoningbezit. De belastingvrijstelling van kapitaalinkomen kan worden gemotiveerd vanuit de gedachte van een consumptiebelasting. Zo'n stelsel - dat vormgegeven kan worden door een inkomstenbelasting met een aftrek voor besparingen - beïnvloedt de keuze van het tijdstip van consumptie in de levensloop niet. Dit is een groot voordeel. Echter, belastingen op kapitaal hebben ook belangrijke voordelen die dit effect teniet kunnen doen (Banks and Diamond, 2008). Ten eerste treft een belasting op kapitaalinkomen vooral de midden- en hogere inkomens. Deze draagt het op bij aan de herverdeling van rijk naar arm. Ten tweede kan een belasting op kapitaal investeringen in kennis en vaardigheden, het zogenaamde menselijk kapitaal, bevorderen. Financieel en menselijk kapitaal zijn immers twee alternatieve manieren om te investeren in toekomstig inkomen. Als de overheid het arbeidsinkomen belast en inkomen uit kapitaal niet, dan zullen individuen op jonge leeftijd geneigd zijn om veel te werken en weinig te investeren in kennis. In plaats daarvan accumuleren ze op jonge leeftijd veel financieel kapitaal, dat ze in staat stelt om vroeg uit te treden. Jacobs (2009) benadrukt deze interactie tussen menselijk kapitaal en uittreding: een laag niveau van kennis en vaardigheden leidt tot vervroegde uittreding, en vervroegde uittreding leidt weer tot weinig investeringen in kennis en vaardigheden. Om deze verstoring te verminderen is het aantrekkelijk om kapitaal te belasten, net zoals ook arbeidsinkomen wordt belast. Dit pleit voor het beperken van fiscale faciliëring van sparen.

### Arbeidsongeschiktheid

De publieke arbeidsongeschiktheidsverzekering is grondig hervormd en heeft zijn uiteindelijke beslag gekregen in de WIA. De meest cruciale elementen uit de hervorming zijn de sterkere prikkels voor werkgevers en werknemers om ziekte en arbeidsongeschiktheid te voorkomen, reintegratieverplichtingen, en sterke financiële prikkels om het (resterende) arbeidspotentieel te benutten. De hervorming heeft belangrijke gevolgen gehad: in hoofdstuk 3 wordt betoogd dat de WIA niet langer als glijbaan naar het pensioen wordt gebruikt. Enerzijds is het onjuiste gebruik van de regeling dus verminderd. Anderzijds gaat het wel ten koste van het verzekeringsaspect. Gedeeltelijk arbeidsongeschikten krijgen een lagere uitkering dan voorheen. Voor hoger opgeleiden is het waardeverlies van minder verzekering beperkt, omdat zij zelf goeddeels in staat zijn om een dergelijke schok op te vangen. Voor lager opgeleiden is het waardeverlies groter. In Nederland is de nadruk sterker komen te liggen op de bestrijding van onjuist gebruik dan op het verstrekken van genereuze publieke verzekeringen.

## Werkloosheid

De Nederlandse werkloosheidsuitkeringen zijn gebaseerd op het laatstverdiende loon, tot aan een maximum van ongeveer 50 duizend euro. De maximale duur is afhankelijk van het arbeidsverleden en bedraagt maximaal 38 maanden. Daarmee is de werkloosheidsverzekering relatief genereus voor ouderen. Een mogelijk argument hiervoor is dat ouderen een grotere risicoaversie hebben dan jongeren. Ouderen hebben bovendien een minder lange tijdhorizon, waardoor zij minder mogelijkheden hebben om een negatieve schok te compenseren. Daardoor hebben zij meer profijt van een verzekering tegen werkloosheid.<sup>1</sup> Daartegenover staat dat ouderen gemiddeld meer financieel vermogen hebben dan jongeren. Een deel daarvan, zoals het pensioenvermogen is echter niet liquide. Voor zover ouderen wel toegang hebben tot alternatieve inkomensbronnen gedurende werkloosheid, is de marginale verzekeringswinst juist kleiner. Vanwege dit argument zou de optimale werkloosheidsverzekering voor ouderen beperkter moeten zijn dan voor jongeren.

Genereuze verzekeringen leiden tot *moral hazard* in de vorm van verminderde inspanningen om een nieuwe baan te vinden, minder scholing en hogere reserveringslonen van werklozen. De gunstige uitgangspositie van ouderen, in de vorm van een relatief genereuze WW, leidt ertoe dat zij relatief hoge lonen kunnen onderhandelen. Dit veroorzaakt werkloosheid. De WW is dus waarschijnlijk een van de oorzaken van de matige werking van de arbeidsmarkt voor ouderen.

Verschillende hervormingen kunnen de verstorende effecten van de WW verminderen. Een lager plafond voor WW-uitkeringen zou lage inkomens niet deren, maar wel midden- en hoge inkomens. Zowel de zoekinspanning als investeringen in scholing van middelbaar en hoger opgeleide werklozen zouden hierdoor worden gestimuleerd. Verkorting van de maximale WWduur betekent dat geen verandering plaatsvindt voor jongeren, maar wel voor middelbare en oudere werknemers met een lang arbeidsverleden. Een dergelijke maatregel leidt tot een beter functionerende arbeidsmarkt voor ouderen, lagere werkloosheid, en een kortere werkloosheidsduur. Verkorting van de maximale WW-duur stimuleert de zoekinspanningen van werklozen en verlaagt hun reserveringsloon. Ook kunnen vakbonden een minder hoog loon onderhandelen voor ouderen, wat hun kansen op een baan verbetert. Het CPB (2008) berekent dat een verkorting van de maximale WW-duur van 38 tot 12 maanden leidt tot een verhoging van de totale werkgelegenheid met 0,4%.

De sociale winst in termen van een betere werking van de arbeidsmarkt moeten worden afgewogen tegen de sociale lasten van minder publieke verzekering. Dat laatste leidt ertoe dat mensen meer gaan sparen uit voorzorg. Sommigen stellen voor om de WW volledig te vervangen door een individuele 'voorzorgspaarregeling'. Deze kan worden geïntegreerd in het pensioensysteem om te voorkomen dat uiteindelijk te veel wordt gespaard (Stiglitz en Yun, 2005; Teulings, 2008). Een dergelijk systeem kan solidariteit bewerkstelligen door negatieve besparingen toe te staan en kwijtschelding van eventuele 'restschulden' wanneer men bijvoorbeeld met pensioen gaat. Jongen en van Vuren (2008) vinden dat de welvaartswinst van individuele spaarrekeningen beperkt zijn, vooral wanneer kredietbeperkingen minder relevant zijn. Sommige groepen, zoals hoger opgeleiden die vaak slechts kort werkloos zijn, zouden in een dergelijke regeling te veel gedwongen besparingen opbouwen.

<sup>&</sup>lt;sup>1</sup> Een ander veelgenoemd argument voor betere verzekering lijkt minder relevant. Oudere werklozen hebben een kleinere baanvindkans dan jongeren, zodat zij een hoger arbeidsmarktrisico kennen. Dit risico is echter deels endogeen en afhankelijk van de maximale WW-duur. Slechts het exogene deel van het genoemde arbeidsmarktrisico zou een hogere verzekering voor ouderen kunnen rechtvaardigen.

## Ontslagbescherming

Ontslagbescherming biedt een verzekering tegen onvoorziene schokken in de waarde van bedrijfsspecifieke kennis en voorkomt een te hoge instroom in publiek gefinancierde werkloosheidsverzekeringen. Ontslagbescherming leidt echter ook tot ongewenste verstoringen in de economie. Dat kan tot uitdrukking komen in lagere prestaties, weinig mobiliteit en weinig creatie van nieuwe banen. Onderzoek laat steevast zien dat ontslagbescherming tot minder dynamiek op de arbeidsmarkt leidt. Resultaten in hoofdstuk 7 suggereren dat een vermindering van de striktheid van de ontslagbescherming naar het niveau van Denemarken leidt tot een kortere werkloosheidsduur van oudere werknemers van ongeveer 6 maanden. Wel kan het aantal ouderen dat ontslagen wordt toenemen. Het leidt uiteindelijk tot minder ongelijkheid tussen oudere 'insiders' en oudere 'outsiders'.

Regels voor ontslagbescherming in Nederland beschermen oudere werknemers met een lang dienstverband beter dan jongere werknemers. Het is moeilijker of duurder om een oudere werknemer te ontslaan, bijvoorbeeld omdat de ontslagvergoeding hoger is. Argumenten voor de betere bescherming zijn dat oudere werknemers meer bedrijfsspecifieke kennis hebben die buiten het bedrijf geen waarde heeft, en dat ze recht hebben op een langere duur van de werkloosheidsuitkering. Deze argumenten rechtvaardigen echter niet de huidige praktijk in Nederland waarin de mate van bescherming toeneemt met leeftijd, om dan in één klap te vervallen bij de leeftijd van 65. Als werknemers de pensioengerechtigde leeftijd bereiken neemt de waarde van hun bedrijfsspecifieke kennis af, omdat ze spoedig stoppen met werken. Ook de duur dat ze een werkloosheidsuitkering kunnen krijgen neemt af. Dit suggereert dat de ontslagbescherming op een bepaalde leeftijd een maximum zou moeten bereiken, en dat de bescherming daarna geleidelijk afneemt.

Een ander belangrijk element van het Nederlandse systeem is dat werknemers hun bescherming verliezen als ze naar een andere werkgever overstappen. Dit creëert een gouden kooi voor oudere werknemers, en reduceert daarmee mobiliteit. Een alternatief is om de rechten overdraagbaar te maken, bijvoorbeeld de waarde van de ontslagvergoeding. In 2003 is Oostenrijk overgestapt op een systeem met individuele spaarrekeningen voor baanverlies. Werkgevers storten maandelijks een bepaald bedrag op de rekening. Werknemers ontvangen het bedrag in het geval van ontslag, en kunnen daarna de rekening meenemen naar de volgende werkgever. Bij pensionering wordt het gespaarde bedrag overgedragen naar een pensioenrekening. Een dergelijk systeem breekt de gouden kooi open. Het systeem elimineert echter ook alle mogelijkheden tot herverdeling en impliceert in feite een nieuwe vorm van verplicht sparen.

Ouderen zijn gemiddeld langer werkloos dan jongeren, en werkloze ouderen maken dan ook langer gebruik van de WW dan jongeren. Zijn ontslagprocedures de meest efficiënte manier om werkgevers en werknemers aan te sturen op efficiënte ontslagbesluiten? Een alternatieve manier om prijsverstoringen aan te pakken is het invoeren van een Pigou-belasting in het geval van ontslag. Dit kan bijvoorbeeld via een 'ontslagbelasting' of een systeem van 'experience rating' bij de WW. Indien de huidige regeling zou worden vervangen door een ontslagbelasting of een aanverwant instrument, dan zou dat een belangrijke maatschappelijke besparing opleveren.

#### Lonen en de rol van sociale partners

De sociale partners en individuele werkgevers en werknemers zijn primair verantwoordelijk voor het vaststellen van lonen. Zij kunnen contracten overeenkomen waarbinnen oudere werknemers relatief beter worden betaald dan jongeren. Dergelijke contracten kunnen werknemers stimuleren tot een hogere productiviteit. Wanneer de herverdeling van de lonen tussen jong en oud louter plaatsheeft binnen het bedrijf vinden kennelijk zowel de werkgever als de werknemer de situatie optimaal.

Wanneer de betrekkelijk hoge beloning van ouderen samenhangt met publieke instituties dan kan dit echter inefficiënt zijn. Oudere werknemers genieten meer ontslagbescherming dan jongeren. Ze hebben daardoor een sterkere onderhandelingspositie. Hierdoor kunnen zij een relatief hoger loon onderhandelen. Dit wordt versterkt door de betrekkelijk grote invloed van ouderen in de vakbonden die de loononderhandelingen voeren. Het resulterende steile loonprofiel beïnvloedt het aanname- en ontslagbeleid van bedrijven. Bovendien leidt het tot een zogenoemde 'gouden kooi' voor oudere werknemers: zij zijn minder mobiel, minder geneigd om zich te scholen, en raken minder gemotiveerd naarmate pensionering in zicht komt.

In de komende decennia zullen de steile loonprofielen onder druk komen te staan vanwege de vergrijzende beroepsbevolking. Er is immers herverdeling van jong naar oud mee gemoeid, en het wordt steeds moeilijker om die in stand te houden naarmate de jongeren een steeds kleiner deel van de beroepsbevolking uitmaken.

## **Executive summary**

The ageing of the labour force imposes major challenges on the Dutch government. The rising ratio of retired elderly to the working young population induces pressure on public finances and tension in the solidarity between generations. One often-heard remedy is an increase in the labour-market participation of elderly workers. To achieve that, the Netherlands reformed various institutions, such as disability and unemployment insurance and early retirement schemes. Today, Dutch policy is at a crossroads. Should new reforms encourage participation of elderly? Or should we move into a new direction which concentrates on the productivity of older workers or their wages? Is it time for *Rethinking Retirement*?

## The challenge of rethinking retirement

During the 1980s and early 1990s, labour-market participation of elderly was low in the Netherlands. This was mainly due to poor incentives imposed by early retirement schemes and lax enforcement of disability insurance. Since the reforms starting in the 1990s, labour-market institutions have become friendlier towards participation between the ages of 55 and 64: early retirement schemes have been made actuarially fair, and early exit via disability insurance has become difficult. Postponing retirement is even encouraged by special in-work tax credits for elderly and a subsidy on delayed retirement through the uniform contribution rate of occupational pensions. As a result, labour-market participation rates of elderly are rapidly increasing. Projections suggest that they will continue to do so in the coming years towards a participation rate of individuals aged 55 to 64 of around 60% in 2020. It would imply that the Netherlands will belong to the group of better performing countries in the OECD. The extension of working lives may also trigger other behavioural adjustments, such as more investment in human capital, as longer working lives will increase the returns to such investments.

At the same time, the Dutch labour market for elderly workers does not function well. Firms are reluctant to hire older workers. Wages rise with tenure, and strict employment protection create 'golden chains' for elderly workers. Therefore, job-to-job mobility is low compared to other countries and tenures are long. Unemployment duration is exceptionally high and unemployed elderly face a very low probability to find a job. As a consequence, one can hardly speak of a 'labour market', because no transactions take place at the wages that firms are willing to offer.

Without future reform, the Netherlands runs the risk of becoming a country of people with extended working lives, but with older workers that are increasingly misallocated, i.e. they work in the wrong jobs and with too low productivity. Globalisation and technical change may increase the depreciation rates specific skills and thus increase the need for a more flexible labour market of elderly. Indeed the inefficient allocation will become more pressing with an increasing number of people in the 55-64 age groups and a rapidly rising participation rate

among elderly. A key challenge for future policy is therefore to shift from stimulating participation to stimulating elderly to work in the right job, with the right skills and with the best productivity and to improve the job-matching of unemployed elderly.

Another challenge is imposed by labour-market institutions that redistribute income from young to old age – such as deferred payment schemes, occupational pensions and tax bonuses for older workers. This redistribution contributes to the pressure on young generations who will already carry an increasing burden of age-related public expenditures.

The financial crisis reinforces the need for change. The reduction in financial wealth will induce some older workers to postpone retirement. At the same time, older workers losing their jobs will need to be employed elsewhere. This increases the need for a better functioning market with easier matching, sufficient flexibility, and appropriate training.

## Policy options for the Netherlands

What would be promising directions for reform in the Netherlands? This section summarises a number of measures that directly or indirectly tackle inefficiencies. We also discuss the cost of these reforms in terms of redistribution, increased uncertainty or reduced commitment.

## Subsidies for working longer

Financial incentives to extending working lives have greatly changed. Implicit tax rates on postponed retirement ranging from 80 to 100% in the 1980s have been transformed into implicit or explicit subsidies today. There may be a rationale for in-work subsidies for people close to retirement if they are more responsive to financial incentives than young people. Therefore, tax relief at old age may be justified on the basis of Ramsey optimal tax principles. While some studies indeed offer support for larger elasticities at old age, chapter 2 suggests that the overall evidence is scarce. The case for age-specific tax relief is therefore not undisputed. Moreover, in-work benefits for older workers go against distributional objectives, because participation at old age is positively correlated with good health, high ability and high life-time income. That is, they involve perverse redistribution from the life-time poor to the life-time rich. Transfers from young to old employees also exacerbate distortions induced by the forced reallocation over the life cycle and reinforce the pressure on young generations.

These considerations raise doubt about the recently introduced work bonus for people beyond age 62. This bonus raises the participation of the 60-64 age group by 0.6%-points, which is equivalent to 0.1% of the total labour force. However, this is the pure effect of the bonus without taking account of its financing. Alternative forms of tax relief (which would also cost approximately 0.3 billion euro) may yield similar effects on employment, depending on their design (see Graafland et al., 2001 for an overview of such measures).

Another way to reduce subsidies for older workers is to modify contributions or benefit accrual in occupational pensions. Bonenkamp (2009) finds that the current structure leads to an implicit tax of 3% of life-time income for low-skilled males. For high-skilled females, he finds

the largest implicit subsidy of 2.5% of lifetime income. This perverse redistribution could be mitigated by e.g. a transformation towards a defined contribution scheme, perhaps only beyond a certain age. Part of the redistribution from low to high-skilled will then be eliminated. Again, this would come at the cost of smaller incentives for participation at old age.

Depreciation of human capital reduces the productivity of older workers, while generous insurance linked to final pay is responsible for a high reservation wage. As a result, unemployed elderly are less willing to accept wages offered by employers. This may explain the low job-finding probability of unemployed elderly. To reduce the gap between the reservation wage and productivity, the Dutch government offers a discount on social security premiums to employers for their employees above age 62 and for new hires aged over 50. This age-specific wage subsidy reduces wage costs for older workers and makes it more attractive for firms to employ them. Firms can pass on the discount to employees by offering higher wages, thereby possibly going beyond the reservation wage and increasing employment. In that case, the incidence of wage subsidies is shared across workers and firms. It gives these subsidies the same properties as age-specific tax relief for employees.

## State pensions

People in the Netherlands receive a state pension beyond age 65. This system is financed on a pay-as-you-go basis. Proposals to increase this pension age to 67 and/or to link the pension age to life expectancy have been made in order to relax the pressure on public finances in light of ageing. Such an increase in the pension age affects labour-market participation through different channels. First, it involves a reduction in pension wealth. Although chapter 2 of this study finds that the effective retirement decision is more sensitive to the price of postponed retirement, the impact of pension wealth cannot be ignored. An increase in the pension age by two years would, for instance, postpone average retirement by approximately 2 to 3 months on the basis of the pure wealth effect. Second, chapter 5 of this study shows that reduced wealth will also increase labour supply earlier in life. Indeed, people will anticipate the lower level of wealth beyond age 65. Finally, the official pension age may influence retirement choices through socio-cultural norms. The pension age may reveal a focal point for people in determining their retirement decision. Changes in this age may therefore have a larger impact on the effective retirement age than suggested by pure wealth effects. The impact of norms is however difficult to quantify. In CPB (2008), a rough estimate based on results for the US suggests that a two-year increase in the pension age may lead to a one-year increase in the effective age of retirement.

State pensions in the Netherlands are conditional upon residence but unconditional upon contributions during one's lifetime. It therefore forms a basic income for the majority of the retired population. It is sometimes suggested to link state pensions to life-time contributions to the system. By increasing the actuarial component in state pensions, this would mitigate the distortions in life-time labour supply (Disney, 2004). This would be in line with the notional

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defined contribution schemes in e.g. Scandinavian countries.<sup>2</sup> Simulating a reform that introduces a link between benefits and contributions with CPB's labour-market model (Graafland et al., 2001) suggests that we can expect an increase in labour supply of 1.6%. This is mainly due to a 6.3% higher participation of partners, as the reform would primarily affect non-participating partners who lose their state pension rights.

## **Occupational pensions**

The majority of Dutch employees is covered by agreements on occupational defined-benefit pension schemes. The government supports this by means of a favourable tax treatment. The level of mandatory saving is relatively high compared to international standards: the pension level can increase to more than 80% of the average wage. While motivated by the lack of self control and hyperbolic discounting, the compulsion to commit to saving also induces distortions, especially to people suffering from credit constraints earlier in life. In case young individuals are in need of liquidity, mandatory savings force people to work too much in younger years, learn too little and retire too early. A lower level of mandatory pensions might therefore be desirable for a substantial share of the workforce, as chapter 4 of this study argues.

In principle, the design of occupational pensions is the responsibility of employers and employees who can best decide about the appropriate level of pension income for their members. They are also responsible for organising efficient retirement patterns, with the opportunity for flexible pensions and part-time retirement. Yet, the government shares in the responsibility for occupational pensions as it determines the maximum level of pensions that fall under favourable tax treatment. This influences the decisions made by social partners. If the government would favour a lower amount of mandatory saving, it may reduce the level of taxfavoured pension savings. This would give individuals more room to allocate work effort, consumption and savings optimally over the life course.

Reforms could transform part of defined benefit schemes into defined contribution plans. These can then be integrated with other life-cycle saving schemes that are more liquid during the life cycle. This would reduce the pressure on young generations, while leaving room for individuals to save for retirement if they wish doing so. The flip side is that the reform reduces intergenerational risk sharing that is inherent in defined benefit schemes. Employees would become more responsible for absorbing shocks, which would take place for instance by varying their age of retirement.

#### **Tax-favoured savings**

Apart from saving through occupational pensions, other saving plans also receive favourable tax treatment, such as defined contribution schemes and the life-course saving account. The tax exemption of capital income is advocated by proponents of a consumption-based tax. This is efficient to the extent that it leaves intertemporal consumption choices undistorted. However,

<sup>&</sup>lt;sup>2</sup> As the Dutch government currently has no long track record of past earnings, this reform can only be implemented over a long time horizon.

taxes on capital can also be attractive for various reasons (Banks and Diamond, 2008). First, taxes on savings usually affect people with middle and high incomes more than lower incomes. Therefore, they contribute to the redistribution of income from rich to poor. Second, a tax on capital may encourage investment in human capital. Intuitively, human capital and financial capital are two alternative ways to invest and generate future income. A different tax treatment of these investment may distort the portfolio of human and financial capital. Indeed, if the government taxes labour income but not capital income, people are encouraged to work too much when young and invest too little time for investment in human capital. Instead, they accumulate financial wealth that enables them to retire early. Jacobs (2009) emphasises this interaction of human capital investment in skills. To mitigate these distortions in human capital and financial capital, it is attractive to impose a tax on capital income.

## **Disability insurance**

Disability Insurance in the Netherlands has been rigorously reformed. Crucial elements of the reforms were stronger incentives for employers and employees to prevent sickness and disability, obligations regarding reintegration, and a strong financial incentive for benefit recipients to continue working when possible. The reform had its effect: chapter 3 of this study argues that disability insurance is no longer used as an early exit route into retirement. This is a reflection of lower moral hazard, which is an important benefit of the reform. Yet, the reforms also reduced insurance. Indeed, people who are partially disabled receive lower benefits than before. For high-skilled older workers, this lower insurance is less costly as they usually have accumulated more wealth and face smaller disability risk due to relatively good work conditions. For low-skilled older workers, however, lower insurance may be harsh. It seems that the Netherlands has shifted along the trade-off from generous insurance towards good incentives and efficiency.

#### **Unemployment insurance**

Dutch unemployment benefits are based on final pay up to a maximum of approximately 50 thousand euro. Benefit entitlement increases with tenure up to a maximum of 38 months. Hence, unemployment insurance is relatively generous for older workers. This can be justified if, for instance, risk aversion increases with age. Moreover, unemployment at old age leaves less future periods to even out the shock, which increases the insurance gain.<sup>3</sup> However, older workers usually also have accumulated more financial wealth, although not all of this may be liquid, e.g. pension wealth. To the extent that they have access to other income during unemployment, this reduces the marginal insurance gain from a given level of unemployment benefits, leading to a lower optimal benefit level for older workers.

<sup>&</sup>lt;sup>3</sup> One other argument for better insurance seems less compelling. Older workers have a lower job-finding probability than younger unemployed so that they face a larger labour-market risk. However, this risk is partly endogenous and depends on benefit duration. Only the exogenous part of the increasing risk could justify more insurance.

Generous insurance comes along with moral hazard. It takes the form of reduced search effort, less training and higher reservation wages of the unemployed. Moreover, the good fallback position enables employees or their trade unions to raise wages, which causes unemployment. This form of rent seeking can explain more generous unemployment insurance for older worker. This unemployment insurance may form an important component of the poor matching in the labour market for older workers.

To reduce the distortionary effects of unemployment insurance on the labour market for elderly, several reforms can be proposed. A lower maximum benefit level would not hurt low incomes, but only reduces replacement rates for medium and higher incomes. It would stimulate job search and training for the high skilled. A lower maximum duration will not affect young people, but only hurts prime-aged and older unemployed with long tenures. It would contribute to a better functioning labour market for elderly, lower unemployment, and lower unemployment duration. To get an indication of these effects, CPB (2008) assesses the labourmarket effects of a reduction in unemployment duration from 38 to 12 months. They find that this stimulates job search and eases job matching by lowering reservation wages. Moreover, the less generous fall-back for employees moderates wage claims by trade unions. Overall, employment is found to expand by 0.4%.

Note that these social gains in terms of labour-market performance should be weighed against the social cost of less insurance. With less insurance, people will engage in more precautionary savings. It is sometimes suggested that insurance can be fully replaced by a system of individual saving accounts that is based on precautionary savings. Integrating this saving scheme with pensions would mitigate inefficiencies induced by excessive wealth accumulation (Stiglitz and Yun, 2005; Teulings, 2008). Moreover, solidarity can be introduced by allowing for negative accounts and offering a bail out at the age of retirement for those who end up with debt. Jongen and Van Vuren (2008) find that the welfare gains of the introduction of individual saving accounts in the Netherlands are small, especially if credit constraints are not important. However, when credit constraints play a limited role, also reduces the value of this insurance. In this case, rates may be too high for some groups, in particular those with short unemployment durations, like high skilled workers.

#### **Employment protection legislation**

Employment protection provides insurance against shocks to firm-specific human capital and prevents an excessive inflow into publicly financed unemployment insurance. However, employment protection also causes inefficiencies that may materialize in reduced work effort, mobility and job creation. Indeed, a robust finding is that employment protection reduces labour-market dynamics. Estimates in chapter 7 of this study suggest that a reduction in the strictness of Dutch employment protection to the level of Denmark would reduce the average unemployment duration of elderly workers by some 6 months. Higher flows would reduce the inequality between elderly insiders and elderly outsiders on the labour market.

Older employees with long tenure are better protected by employment protection legislation than younger employees in the Netherlands. It is harder to fire older workers, and severance pay and notice periods are higher as well. This is usually justified on the grounds that older workers have more firm-specific human capital, and that they are entitled to unemployment insurance for a relatively long time. However, should employment protection rise all the way up to retirement and then suddenly drop to zero, as in the current Dutch setup? As a worker approaches retirement, the return period for the firm specific human capital falls, as does the remaining period over which the elderly worker can claim unemployment insurance. It suggests that employment protection should display a hump shape, falling to zero again as the worker approaches retirement.

Another element of the Dutch system is that workers lose their accumulated employment protection 'rights' when they switch employer. This creates golden chains for (older) workers, reducing job-to-job mobility. An alternative would be to make the accumulated severance pay portable. For example, in 2003, Austria switched to a system of individual saving accounts for job loss. Employers pay contributions in this account, employees can receive a payment from the account in case of dismissal, but can also carry the account over to a new job. At retirement the remaining funds go to the individual retirement account. This system breaks the golden chains. However, it also eliminates all redistribution. People that are fired simply get early access to their retirement savings.

Older workers are unemployed longer and use unemployment insurance longer than younger workers. Are procedures the most efficient way of steering employers and employees to efficient separations? Another way to deal with distorted prices is to impose a Pigovian tax on employers and/or employees in the case of separation. This can be in the form of a firing tax or letting the employer pay (part of) the unemployment benefits the fired individuals receives. It occurs e.g. in a system of experience rating of unemployment insurance. Replacing current procedures by firing taxes or related instruments would free up resources for use in other productive activities.

## Wages and the role of social partners

Social partners and individual employers and employees are responsible for determining wages. Chapter 6 demonstrates why they may find it optimal to agree upon a deferred payment scheme, whereby young employees are paid less and old employees are paid more than their productivity. Indeed, this strategy may stimulate productivity over the worker's life-cycle. As long as redistribution takes place within the firm, it is a matter of 'revealed preference': such payment schemes are apparently in the interest of both the firm and the employee. Deferred payments seem particularly attractive as a way to encourage effort if other incentives are absent, like market discipline.

Steep wage profiles can, however, be inefficient if they are driven by public institutions. In particular, better employment protection of older workers implies a stronger bargaining position. It enables them to bargain higher wages, in particular when older workers have a

relatively large vote in trade unions. The resulting deferred payment schemes will then cause distortions in the hiring and firing decisions of firms. Moreover, it contributes to the golden chains for older workers, making them less mobile, less willing to train and less motivated to provide effort.

During coming decades, deferred payment schemes may come under pressure due to the ageing of the workforce. Indeed, the implicit redistribution from young to old is increasingly difficult to sustain if the higher wage costs of elderly workers have to be financed by a falling number of young workers.

## 1 Introduction

## Rob Euwals, Ruud de Mooij, Daniel van Vuuren

## 1.1 Setting the scene

Population ageing imposes major challenges on European governments. The rising ratio of older inactive persons to the young active population induces substantial pressure on public finances and causes tensions in the solidarity between generations. Moreover, the decline in labour supply may cause scarcity in of non-tradable services in the economy, leading to wage increases and higher prices (Euwals et al., 2009).

One key remedy to these challenges is an increase in the labour-market participation of elderly workers. European governments have agreed in the Lisbon agenda that the participation rate of people between 55 and 64 should increase from an average of 38% in 2000 to over 50% in 2010. To achieve this, governments in Europe have started to reform their pension schemes, social insurances and tax systems during the last decade. The Netherlands is no exception: it reformed disability and unemployment insurance, early retirement schemes and introduced new tax incentives, all with the aim to improve labour-market outcomes for the elderly.

Dutch policy is now entering a new phase. After a first wave of reforms, the question arises whether and what type of new reforms would be desirable in the future. (How) should the Dutch government encourage participation incentives for elderly? What reforms would raise the productivity of older workers? And how should the welfare state interfere with saving and learning? Is it time for *Rethinking Retirement*?

This study offers guidance into this debate. First, we use welfare theory to structure the discussion on optimal institution design and the relationship with the labour market for elderly. Section 1.2 of this chapter introduces this general conceptual framework and illustrates the key dilemmas in designing the welfare state. Second, this chapter demonstrates stylized facts for the Netherlands by discussing Dutch welfare state institutions (section 1.3) and Dutch labour-market performance for elderly (section 1.4). In later chapters, the aim is to identify the causal relationship between institutions and labour-market outcomes. Indeed, various chapters offer an up-to-date review of empirical literature on the behavioural responses to policy. The aim is to arrive at the best-available empirical knowledge on each theme. Where possible, this is complemented with an analysis of Dutch data. The empirical insights are sometimes used for a quantitative (or qualitative) assessment of the impact of concrete policy reforms in the Netherlands. In section 1.5, we look into the future by presenting participation projections if no further reforms are imposed. It also formulates future policy challenges and puts this in the context of the current financial crisis.

## 1.2 Welfare state design and the labour market for elderly

The welfare state aims at a higher collective wellbeing in society. It does so by intervening in individual sovereign decision making through collective intervention. This can be organised by either the state or other collective groups, like social partners.

## 1.2.1 Dilemmas in welfare state design

De Mooij et al. (2006) distinguish three key roles of the welfare state in achieving a higher level of social welfare (three R's): <u>R</u>edistribution, dealing with <u>R</u>isk, and <u>R</u>eallocation of income over the life cycle.

- The welfare state aims at interpersonal <u>R</u>edistribution. People differ in their innate ability, i.e. their talent. If society assigns a positive valuation to equality of welfare among these people, the government may intervene. For instance, it can obtain more equality via the tax-benefit system, through benefits in kind, or institutions that compress wage structures. In redistributing income, however, institutions cause distortions, especially on the labour market. Therefore, society meets a trade-off between *equity* and *efficiency*.
- The welfare state deals with <u>R</u>isk. Future incomes for people are uncertain due to idiosyncratic shocks, e.g. in health, skill, or employment. The government can reduce these risks through the provision of social insurance. It improves social welfare to the extent that people are risk averse. However, insurance may also hurt participation incentives, work effort, job search, and training. This moral hazard reduces social welfare. The government needs to trade off the benefits of *insurance* against the cost of *moral hazard*.
- The welfare state <u>R</u>eallocates income over the life cycle. This can be welfare improving because it contributes to efficient consumption smoothing. Indeed, people may fail to commit to pension saving plans early in life due to hyperbolic discounting and lack of self control. However, public intervention may also create distortions in saving, learning or labour-market participation. For instance, capital market imperfections may prevent people to borrow, especially at a young age. Governments thus face a trade-off between *commitment* and *flexibility* in shaping consumption patterns over the life cycle.

An optimal design of the welfare state seeks the ideal balance of the different trade-offs and ensures that these trade-offs are at their possibility frontier. It is impossible, however, for economists to design an optimal welfare state, since trade-offs depend on social preferences for equality, certainty and commitment. Determining these preferences belongs to the political domain, not to economics. However, economists may help to clarify, assess and quantify the dilemmas faced by policy makers and politicians. This is also the aim of this study. We focus in particular on the interaction of the welfare state with the labour market for elderly workers, say between age 50 and 70. This specific group of people – or, alternatively, people in this specific phase of life – may differ from younger age groups in several ways.

## 1.2.2 The special case of elderly

An important difference between old and young workers on the labour market is their human and financial capital. An old worker typically has ample experience and seniority in a firm, reflecting a high stock of accumulated (specific) human capital. It usually results in a relatively high wage rate of older workers, i.e. due to returns to tenure and seniority. Yet, older workers increasingly start to suffer from health problems, which reduces their productivity. Moreover, the short remaining career span means small incentives to learn and adapt to new technologies, which can also hurt productivity. On balance, the stock of human capital accumulated during younger years starts to depreciate after a certain age. Indeed, although not all studies agree, a wide range of evidence suggests that there is a decline in several aspects of physical and mental abilities after age 50, leading to declining productivity (Skirbekk, 2003). At the same time, however, wage and non-wage costs of elderly do not fall with age in many countries. This creates a wage-productivity gap for elderly.

The short remaining career span also means that older workers feature a relatively low stock of human wealth, defined as the net present value of future labour incomes. In contrast, financial wealth generally increases with age. People foresee that they will be unable to work after a certain age due to physical and mental deterioration. Financial wealth accumulation (e.g. via a pension fund) enables them to smooth consumption over the life cycle. A large financial wealth also enables older people to exit the labour market early, i.e. they face an extensive decision margin in labour supply, a choice that most younger workers do not have.

How should the welfare state take account of these specific characteristics of senior workers? We discuss this subsequently for the three R's of the welfare state.

## 1.2.3 Redistribution

The tax-benefit system redistributes from talented to less talented people. Talent determines the ability to generate a high income during life and, therefore, to enjoy a high lifetime utility. Yet, due to information constraints, the government cannot use talent as a basis for redistribution. It therefore relies on observed income. As income depends on endogenous factors like work effort, efficient redistribution requires that the government trades off the social gains from equality against the social cost of reduced incentives. In principle, lifetime income can be observed by the government and forms a good approximation for talent. Under a tax system that is based on lifetime income, age would be irrelevant. However, in practice governments rely on annual incomes for redistribution, rather than lifetime incomes. This might be due to capital-market imperfections, administrative constraints or because an annual income tax offers an insurance mechanism in an uncertain world.

With a tax system based on annual income, age can be used as a tag for redistribution, i.e. there can be a case for age-specific taxation. For instance, talented people may feature higher participation rates at old age because they are healthier and experience better work conditions. The government can exploit this information for its redistributive purposes by imposing higher taxes on elderly workers. However, participation is endogenous. Especially older workers may feature a relatively high responsiveness to taxes, which makes such taxes particularly distortionary. There are some studies supporting this, although the evidence is still scarce (see chapter 2). Hence, it remains too early to say whether age-specific income taxes or age-specific tax relief is socially desirable.

In the Netherlands, age-specific tax relief for older workers exists via a special work bonus beyond age 62. Also occupational pensions redistribute to older workers. The reason is that pensions are financed by a flat contribution rate while the associated pension wealth accrual is the same for young and old workers, i.e. independent of the number of years that contributions mature. As talented people in the Netherlands participate more often, both the fiscal bonus and the financing of occupational pensions favour talented individuals with high lifetime incomes over less talented people who exit the labour market earlier. This goes against distributional objectives. It could only be justified on the basis of Ramsey tax principles, i.e. if older workers indeed feature a relatively large elasticity of work effort.

## 1.2.4 Labour-market risk

Labour market risk depends on age. Senior workers generally have accumulated more (specific) human capital than young workers due to on-the-job training and learning by doing. To the extent that workers themselves pick the fruits of these investments, they suffer a larger risk from a job separation. Moreover, dismissed older workers generally have a smaller probability to find a new job than younger workers. Accordingly, labour-market risk for older workers is larger than for younger workers. Insurance may also become more valuable with age due to habit formation: people get used to a certain standard of living. Thus, they become increasingly risk averse beyond a certain age.

In the Netherlands, older workers are indeed better protected against labour-market and human capital risk by means of unemployment insurance and employment protection legislation. Unemployment insurance is based on final pay (up to a maximum) and duration rises with tenure. Employment protection legislation becomes stricter as severance payments increase with tenure and age.

Although the gains from insurance might increase with age due to the larger risk, they can also decline with age because elderly have accumulated more financial wealth. This holds in particular for highly educated workers. Wealth reduces the value of liquidity insurance as households can rely on it to smooth consumption. Moreover, insurance via strict employment protection can also increase the size of risk by reducing job-finding probabilities. Dismissal at old age can also be perceived as a signal to the market that a person has low productivity, thus implying stigmatisation that further reduces the job-finding probability of older unemployed.

A high level of insurance for elderly clearly has a cost in terms of moral hazard. This appears in the form of reduced incentives for participation, training or job search. First consider participation. In principle, a gradual reduction in participation rates with age is not necessarily distortionary. For instance, if people exit the labour market before their official retirement age because of their individual preferences or due to their health situation, this can be both individually and socially desirable. Yet, participation decisions can be distorted by institutions. Indeed, high implicit tax rates on continued work in the 1980s and 1990s have been detrimental for the participation incentives of elderly in many countries (Gruber and Wise, 1999; 2004). Also financial wealth that elderly have accumulated makes them responsive to such incentives as they face a choice at the relatively elastic extensive margin of labour supply.

Second, consider training and job search by elderly. In principle, it seems natural that older workers invest less in human capital and job search than young workers since their short career span implies lower returns on such investments. However, individual capacities change with age so that elderly have different relative strengths and weaknesses on the work floor. Moreover, job requirements change in light of sectoral restructuring in the economy, organisational change and technological development. Therefore, it is desirable that workers switch jobs or tasks over their life cycle, upgrade and acquire skills through life-long learning or engage in a second career. Institutions can distort these investments and render them too low from a social perspective. For instance, generous insurance can lead to high reservation wages for elderly and, therefore, reduce job matching and efforts in search and training. Moreover, job protection may causes underinvestment in training, job search or job switching because it is tight to an existing job.

To the extent that institutions impede efforts in training and job search, this becomes increasingly harmful for society. Indeed, the expansion of the working lives of individuals due to improved work conditions, better health and improved participation incentives will increase the social returns on these investments and, consequently, increase the social costs of distortions.

#### 1.2.5 Life-cycle reallocation

The rationale for public involvement in life-cycle consumption smoothing has to do with the lack of self control and hyperbolic discounting. It implies that the compulsion to commit to a saving plan can benefit households ex-post. This is particularly relevant for pensions. In the Netherlands, mandatory savings via collective defined benefit schemes serve this goal. These savings are substantial and typically yield an annuity payment after retirement of 70 to 80% of the average wage during working life.

A number of other institutions add to the reallocation of funds from young to old age. For instance, deferred payment schemes lead to steeper wage profiles over the life cycle and imply an implicit subsidy in wage payments from young to old. In addition, pension premiums in the Netherlands involve an implicit transfer from young to old as the build-up of pension rights is independent of how long contributions mature in pension funds. Further to this, the tax system supports redistribution to old age, both via age-specific tax relief for older workers and because subsidised savings redistribute income to later in life.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup> Not only is income redistributed from young to old, but risk is redistributed from old to young. For instance, defined benefit schemes impose a substantial risk of capital funded pensions on the young.

While attractive for people with self-control problems, life-cycle reallocation may create distortions as well. These apply in particular to people with credit constraints earlier in life. The inability to borrow against future income can make it undesirable to be forced to postpone consumption. There is growing concern that especially families with young children feel the pressure imposed by institutions that redistribute income to later in life. Wealth accumulation through compulsory saving and saving subsidies may also discourage participation at old age as it allows workers to exit the labour market early.

The ageing of the labour force reinforces the tensions on the reallocation of income from young to old age. Indeed, deferred payment schemes, occupational pensions and tax bonuses for older workers involve a pay-as-you-go type transfers which redistributes income from the currently young to the currently old. The demographic hic-up due to the baby-boom will create substantial pressure on this redistribution. For instance, young workers may opt out of the system by means of self employment, moving abroad or otherwise evading or avoiding transfers.

## 1.3 The Dutch welfare state for elderly workers

This section discusses the current design of institutions in the Netherlands that are relevant for the labour market of elderly workers, namely early retirement schemes, disability insurance, unemployment insurance, tax incentives, the pension system and employment protection legislation. Moreover, we demonstrate the major reforms during past decades.

## 1.3.1 Pensions and early retirement

The Dutch pension system consists of three pillars: (i) a flat rate state pension that is pay-asyou-go based. It offers a guaranteed income at the minimum subsistence level; (ii) occupational pensions that are the responsibility of social partners. It offers a defined benefit pension that is capital funded. The savings are subsidised by the government up to generous level of pension income; (iii) individual pension plans for those not covered by occupational pensions. Savings in these defined contribution plans are subsidised by the government.

Ever since the introduction of the state pension in 1957, the statutory retirement age in the Netherlands is 65. Working until that age has been the norm, unless a worker was disabled or had accumulated enough wealth to retire earlier. During the 1970s and 1980s, the introduction of the so-called VUT early retirement schemes in many sectors of industry offered an attractive early exit route for many older workers. In particular, after reaching a certain eligibility age a worker could retire and receive an early retirement benefit of about 80% of the last earned wage in gross terms. The eligibility age varied across sectors and ranged between 58 and 62. The implicit tax on continued work was high as retirement benefits did not increase with postponement of retirement. Hence, the system was actuarially highly unfair. Empirical studies

show that the impact on the participation of elderly was substantial.<sup>2</sup> The early retirement schemes are held responsible for a major drop in the participation rate of men aged 55 to 65 during the 1980s and the early 1990s.

Today, early retirement schemes still have an important effect on the labour market for elderly workers. About 40% of all males aged 60 to 64 receive an early retirement benefit and have no labour income. In the age group 55 to 59, this holds for about 8%. For women, these numbers are smaller: about 25% in the age group 60 to 64 receives an early retirement benefit. This number is, however, rapidly increasing as the participation rate of women rises over consecutive generations.

During the late 1990s, Dutch labour unions and employer organisations transformed the actuarial unfair early retirement schemes into actuarial fair schemes. Civil servants were the first to face the new regime in April 1997. Most sectors of industry implemented transitional arrangements, often taking 20 years.

In January 2006, the Dutch government installed a new law on pensions and early retirement. Early retirement schemes were no longer treated under a fiscally favourable system. The government allowed, however, the pension funds to expand the mandatory pension savings for old age. People now can save an annuity pension of 100% of their average wage during their working life. Workers are allowed to use this pension wealth for an actuarial fair early retirement. The goal of the government was to encourage the participation of elderly by speeding up the transition towards an actuarial fair early retirement system. All sectors of industry introduced an actuarial fair system from that date onwards.

In an international perspective, pensions are relatively high in the Netherlands. Figure 1.1 shows this for the average pension level in OECD countries, defined as the average pension entitlement in percent of economy-wide average earnings. The average pension level is 57.5% in the OECD. The Netherlands is ranked third, with an average pension level of almost 82%. Only Greece and Luxembourg have higher pension levels than the Netherlands.

<sup>2</sup> See De Vos and Kapteyn (2004) for evidence on the Netherlands. Gruber and Wise (2004) show empirical evidence for other industrialised countries.



#### Figure 1.1 Pension level in OECD countries

Source: OECD Pensions at Glance, 2007

## 1.3.2 Unemployment and disability insurance

Dutch unemployment insurance was introduced in 1949. It was designed to insure workers to involuntary job loss. In the first years, the insurance offered a replacement rate of 80% in gross terms. From the 1980s onwards the insurance was reformed several times. In some cases the insurance became more generous, but under the pressure of the public deficits in the early 1980s most reforms made the insurance less generous. Most notably, the replacement rate was lowered to 70% in 1985. In more recent years, stricter job-search requirements were imposed for unemployment benefit recipients aged 57.5 and above, and the maximum duration of unemployment benefits was reduced from 60 to 38 months, which is still long compared to other countries (see Figure 1.2). The duration of benefits depends on tenure.

The Dutch disability system was introduced in 1967 to insure workers who did not recover from sickness within one year. The inflow in the scheme was higher than expected, especially in the second half of the 1970s. Since then, the scheme underwent several reforms. The government introduced more responsibility to workers and firms. Important elements were the introduction of an independent physician to judge the sickness of a worker (a 'gatekeeper'), stronger financial incentives for employers to prevent sickness and disability enrolment, and incentives for partially disabled workers to accept paid work. The first two elements obliged firms to undertake immediate action in case of long-term sickness. The reforms are considered to be successful as the inflow in the disability schemes for workers declined from almost 120 000 persons in 2000 and 2001 to less than 25 000 persons in 2006 and 2007.



Figure 1.2 Maximum unemployment duration in a selection of OECD countries, 2007

Source: MISSOC, European Commission.

## 1.3.3 Employment protection legislation

Dutch employment protection legislation is characterized by a dual system. On the one hand, a public body offers an *ex ante* check on dismissals. On the other hand, the civil courts offers an *ex post* (repressive) check on dismissals and determines a severance pay. Employers are able to choose their most desirable route, depending on their financial situation, their opportunities to pass the ex-ante check, and the notice period under the first route. In international comparisons, Dutch employment protection for permanent workers is characterized as being relatively strict. Figure 1.3 shows that the popular OECD EPL index for permanent contracts is above the OECD average, which is mainly because of a high severance pay for workers with long tenure. Older workers are better protected as severance pay increases more rapidly after a certain age. For temporary workers, the Dutch system is found to be relatively lax, which is due to the large number of consecutive contracts allowed, and the liberal rules for temporary work agencies. During the last decades, employment protection legislation has gone through some minor reforms. The dual system and the substantial difference between permanent and temporary workers remained. The reforms caused a reduction in the OECD EPL index from 3.05 in 2003 to 2.63 in 2008.





Source: OECD Going for growth, 2009.

#### 1.3.4 Wage setting

The Netherlands has a corporatist system of industrial relations with centralised collective wage bargaining. Contractual wages and other labour conditions are negotiated between unions and employer organisations, mostly on a sectoral level. Agreements are mostly extended to non-union members and made 'generally binding' by the Dutch government to the entire sector. As a result, about 80% of the labour force is covered by collective labour agreements.

For individual workers, most sectors of industry use fixed wage scales where salaries increase with tenure up to a certain maximum. The increase with tenure is not automatic but at least partly depends on individual performance. For older workers, wage reduction (demotion) is uncommon. Indeed, older workers often have reached a maximum wage scale and are not set back in a lower scale, even if their productivity declines. Figure 1.4 compares the life-time wage profile of Dutch males with those in the Scandinavian countries, Anglo-Saxon countries and two Asian countries. The Netherlands is included in the group of Austria, Belgium, France and Germany. We see that the wage profile of an average Dutch worker is relatively steep. In Anglo-Saxon countries, the wage profile levels off after age 50 and subsequently declines. This is even more pronounced in the Asian countries. In Scandinavia, wage profiles are considerably flatter than elsewhere. In the Netherlands and other continental European countries the wage profile for males continues to rise. At age 65, the wage difference for elderly men between the Netherlands and the UK is 30%. The difference can be partly explained by selection as individuals who continue to work until age 65 may feature an above-average wage. Yet, it may
also reflect deferred payments (see chapter 6) that create a wage-productivity gap for workers at old age.



Figure 1.4 Wage profiles by age for males for various selections of countries

Source: Live Longer, Work Longer', OECD, 2006.

#### 1.3.5 Taxation

The Dutch government facilitates savings for retirement by applying the so-called EET-system (exempt-exempt-taxed) to pension savings. Contributions to a pension fund are exempt from taxation, the returns on the assets are exempt, and pension benefits are taxed upon payment. This EET-system is also applied to the so-called life-course savings scheme, in which workers can voluntarily save for leave during their career or for early retirement. The deduction for savings implies that the Dutch tax system reflects a consumption-based system in which capital income is effectively untaxed. In fact, as the income after retirement is generally lower and because Dutch retirees are exempt from paying social security contributions for state pensions, pension savings are subsidized by the Dutch tax system.

The Dutch government has also introduced a number of age-specific tax incentives in the income tax system. It introduced special tax credits for people with labour income between 62 and 67. Moreover, employers receive special credits for social security contributions paid for workers in older age groups.

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#### 1.3.6 Summing up

Today's institutions in the Netherlands can be characterised as being friendly towards labourmarket participation. This is markedly different from the past. Indeed, retirement schemes have been made actuarially fair, which removed an important distortion in the labour-market for elderly. In fact, postponing retirement at old age is currently subsidised due to the way Dutch pensions are financed, an age-related tax credit for older workers, and deferred payment schemes. Substitution towards other retirement routes, such as disability schemes, is limited as the Netherlands has also reformed this scheme. Pressure on unemployment insurance as a substitute pathway into retirement may become more relevant in the future.

Although financial incentives for participation are large, several institutions distort the labour market for elderly. Elderly workers are well protected by employment protection legislation. Moreover, relatively generous unemployment insurance with long duration causes high reservation wages. Workers also accumulate considerable wealth during their life via mandatory and subsidised savings for pensions.

# 1.4 Labour-market performance for elderly in the Netherlands

The performance of the Dutch labour market for elderly workers has changed considerably during the last decades. This section discusses this performance on the basis of data on participation, unemployment, mobility and training.

#### 1.4.1 Labour-market participation rates

During the 1970s, the participation rate of individuals aged 55-64 in the Netherlands was about 50%. The female participation rate was very low, but for men it was around 80%. Between the 1970s and the mid 1990s, participation of older men dropped substantially to around 40% in 1995. Since then, it has been rising.

Figure 1.5 compares the Dutch trend in male and female labour-market participation since the mid 1980s with that of Denmark, Germany, France and the UK. We see that that participation of men fell until the mid 1990s. Together with France, the Netherlands then had the lowest rate. Since then, Dutch participation increased. In 2007, the participation rate of men aged 55-64 has increased to 58% and is substantially above the French rate. In the 55-59 age group, it is close to the rates in the UK and Germany, but still lower than in Denmark. In the 60-64 age group, participation in the UK and Denmark is somewhat higher.





# Source: OECD Statistical Database, Paris.

The participation rate of women increased steadily over the entire period and reached a level of 45% in 2007. While participation was considerably lower than in other countries during the 1980s, the catching up during the last 20 years has moved the Dutch rate above that in France. It is still lower than in the other countries. The participation rate in Denmark is the highest, almost 20%-points above that in the Netherlands. The growth in female labour participation can largely be explained by cohort effects. Indeed, younger generations feature a much higher propensity to participate (Euwals et al., 2007). The strongest increase occurs for women aged 50-59.

#### 1.4.2 Participation by gender and education

Table 1.1 shows participation rates for older workers in the Netherlands by gender and educational level, both for 2006 and its change between 1992 -2006. We see that the increase in the participation rate of individuals aged 55-64 varies by education. The strongest increase for men is observed for the low educated between 55-59: the increase is 18.8%-points. This group still features a lower participation rate than medium and highly educated men. Yet, the gap has decreased during the last decade. The participation rate of men aged 60-64 increased by between 6 and 10%-points. For men aged 65 and older, participation rates are 10% or lower.

For women, participation rates are lower than for men. For instance, in the age group 55-59, it runs between 30% for low-educated women and 65% for high-educated women. The growth in participation is particularly large for high-skilled women: it increased by 28.7%-points between 1992 and 2006.

Table 1.1	Participation of elderly by gender and level of education						
	Low ec	lucation	Mediu	m education	High e	ducation	
		Growth		Growth		Growth	
	2006	1992-2006ª	2006	1992-2006 <sup>a</sup>	2006	1992-2006 <sup>a</sup>	
	%	%-points	%	%-points	%	%-points	
Men							
50-54	81.0	7.0	88.9	1.6	93.1	1.1	
55-59	71.2	18.8	77.6	13.0	82.0	9.4	
60-64	26.1	10.2	31.5	10.5	36.1	6.0	
65-70	6.8	- 0.5	10.3	4.0	10.6	- 3.6	
70-74	5.3	3.0	5.5	1.6	5.6	1.0	
Women							
50-54	45.2	22.4	68.7	25.5	81.0	17.4	
55-59	30.6	17.6	54.0	26.4	65.0	28.7	
60-64	8.9	6.6	16.7	9.0	25.5	17.5	
65-70	0.8	0.2	2.1	– 1.6	5.9	3.6	
70-74	0.4	0.2	2.3	2.3			
<sup>a</sup> For cohort 70-74	4, growth 1995-2006.						
Source: Statistics	Netherlands.						

## 1.4.3 Type of labour contract and self employment

Figure 1.6 divides the participation rate into three types of employment: fixed contracts, flexible contracts and self employment.<sup>3</sup> It shows the development of these shares between 1996 and 2008, both for the 15-54 age group and the 55-64 age group. The rise in elderly participation is concentrated on jobs with permanent contracts, which increased from 22 to 53%. Hence, the lion share of the increased participation of elderly is due to workers that remained in their job for a longer duration. Yet, also the number of older people in flexible contracts and self employment is rising. Between 1996 and 2008, the share of the population in flexible contracts increased from 1 to almost 3%. The share of self-employed elderly increased from 9 to 14%. Since 1996, permanent contracts have thus become relatively more prevalent among participants in the labour market, whereas self employment moved with the business cycle. The share of flexible contracts among participants has remained more or less constant.

Note that the fraction of self-employed among elderly has traditionally been high. In 2008, 14% of the 55-64 year old is self-employed; the share for 15-54 year olds equals just 9%. The incidence of flexible labour contracts – contracts with either limited duration or flexible working hours – is relatively low among the elderly.

<sup>3</sup> Note that there is some overlap as people can participate in more than one category.



#### Figure 1.6 Participation rate by labour relation (Left figure: 15-54 years; right figure: 55-64 years)

Source: Statistics Netherlands.

## 1.4.4 Unemployment rate and duration

Table 1.2 shows unemployment among Dutch workers between 55-64 and compares it with aggregates of the working age population. The figures reflect averages for the 1990-2006 period. We see that the unemployment rate among elderly is lower than the average in the Netherlands. Yet, the share of long-term unemployment, defined as unemployment longer than one year, is higher: 68% for elderly and 43% on average. Average unemployment duration of elderly is 31 months, much higher than the 19 months for all unemployed. The inflow into unemployment is relatively small. Among the people in the age group 55-64, only 0.1% was unemployed for less than one month.

Table 1.2 La	Labour-market indicators elderly workers compared to average, 1990 - 2006 averages					
		Aged 15-64	Aged 55-64			
Unemployment rate (% work force)		5	3			
Inflow into unemployment (% workforce)		0.3	0.1			
Long-term unemployment (% of total)		43	68			
Average unemployment duration (months)		19	31			

Table 1.3 compares Dutch labour-market indicators for elderly with those of other OECD countries. The figures reflect averages for the 2004-2006 period. The participation rate in the Netherlands of 47% is approximately at the European average, but somewhat below the OECD average. In the ranking, the Netherlands takes a 16<sup>th</sup> position. Participation is particularly high in the Scandinavian countries and New Zealand.

The elderly unemployment rate of 4% in the Netherlands is below the averages in the EU and the OECD. It is mainly due to high rates in some European countries, like Germany and Slovak Republic. In terms of rank, the Netherlands takes again position 16.

The last three indicators involve unemployment duration. First, inflows in the Netherlands, measured by unemployment of less than one month, is among the lowest in the OECD, together with France and Ireland. It is 10 times smaller than in the US and Canada, and 3 times smaller

than the European average. The share of long-term unemployment is 59%, which is above the averages in the EU and the OECD. It gives us rank 19 in the OECD26. Average unemployment duration of 37 months is among the highest in the OECD, together with France and Portugal. It is almost twice as large as the OECD average, three times that of Sweden and Denmark and seven times the length in Norway, New Zealand and Canada.

Table 1.3 Labou	r-market i	ndicator	s individua	als aged	55-64, ave	rage 200	04-2006			
	Partic	ipation	Unemplo	yment	Inflow in	ito	Long-te	rm	Unemplo	yment
		rate		rate	unemplo	yment	unemployment in %		duration	
	in %	rank	in %	rank	in %	rank	total	rank	months	rank
Australia	56	11	3	9	0.69	24	38	7	5	4
Austria	33	23	4	10	0.19	9	57	18	19	13
Belgium	32	25	5	19	0.14	5	79	26	32	22
Canada	58	9	5	17	1.13	26	16	2	5	5
Czech Republic	47	17	5	18	0.17	7	56	14	30	20
Denmark	64	6	4	12	0.37	18	47	12	13	12
Finland	57	10	7	23	0.28	10	49	13	25	17
France	40	20	6	21	0.10	2	67	23	53	26
Germany	52	15	12	26	0.34	15	71	24	36	23
Greece	43	19	4	11	0.18	8	60	21	20	14
Hungary	34	22	4	14	0.13	4	57	17	29	18
Iceland	85	1	2	2	0.29	12	43	11	7	7
Ireland	53	14	2	5	0.09	1	42	10	30	19
Italy	33	24	3	6	0.29	13	60	20	12	10
Japan	67	5	4	13	0.43	21	40	9	10	9
Mexico	55	12	2	3	0.50	23	2	1	3	2
Netherlands	47	16	4	16	0.11	3	59	19	37	24
New Zealand	71	3	2	4	0.41	20	23	4	5	6
Norway	69	4	1	1	0.29	14	28	5	5	3
Poland	32	26	8	24	0.44	22	56	16	24	16
Portugal	53	13	6	22	0.16	6	64	22	37	25
Slovak Republic	35	21	10	25	0.41	19	74	25	31	21
Spain	46	18	6	20	0.28	11	56	15	22	15
Sweden	73	2	4	15	0.36	16	39	8	13	11
United Kingdom	58	8	3	7	0.37	17	35	6	8	8
United States	63	7	3	8	1.00	25	18	3	3	1
Average OECD26	52		5		0.35		47		20	
Average EU18	46		5		0.25		57		26	
Source: OECD.										

#### 1.4.5 Disability and early retirement

Figure 1.7 shows recent developments in early retirement, disability insurance and unemployment insurance among elderly men.<sup>4</sup> We see that patterns for the youngest age category (50-54 years) are stable over time. Labour force participation is the norm (about 87%) and social insurance is used by 22%. Overlap between different categories may e.g. occur when partially disabled have paid work or in case of part-time (early) retirement. Between 1999 and 2005 the fraction of 50-54 year old men receiving disability benefits declined from 16 to 13%, whereas the fraction of unemployment benefits and alternative benefit recipients remained stable. The main development for the 55-59 years old is a decrease of the share of disability insurance recipients from 25 to 19%, and a simultaneous increase in the participation rate from 70 to 76%. The other categories remain stable over time. The fraction of disability insurance recipients among 60-64 year-old men decreased from 32 to 26%. The fraction of unemployment insurance and alternative benefits decreased by 8%-points. At the same time, the participation rate for this age category went up by 10%-points and the fraction of early retirees by 9%-points. Changes for men aged 65-74 are practically negligible. Retirement is the norm, and 10% of retirees continues to do paid work. Compared to other age groups, a relatively large portion of these participants consists of self-employed: nearly half.





<sup>4</sup> We focus on figures for men as developments for women are principally driven by cohort effects (see Euwals et al., 2007).





Note: Probability to find a job within a year for those who have a job (left panel) or receive a social benefit (right panel) on September 24, 2004. The figure on benefit-to-job mobility includes those who became unemployed before a particular age. Source: Statistics Netherlands.



Figure 1.9 Unemployment-benefit-to-job mobility by age group, 2004

Note: Probability to find a job within a particular number of months for those who start to receive an unemployment benefit in the year 2004, and who do not have or start a small low-income job during the unemployment benefit period. Source: Statistics Netherlands.

# 1.4.6 Mobility

Figure 1.8 shows the share of older workers that moves from one job to another (job-to-job mobility) and the share of benefit recipients that moves back into employment (benefit-to-job mobility). We see that job-to-job mobility declines with age: the probability of a worker aged 40 to 44 to change job is about three times as large as for a worker aged 55 to 59. At old age, job mobility is around 1%, which includes involuntary job loss. Hence, voluntary job mobility is very small. We see that the probability of changing job also depends on the business cycle, i.e. it is relatively high during a downturn due to involuntary job losses.

The probability for benefit recipients to find a job also declines with age. About one out of three unemployed aged 45 to 49 (on September 24, 2004, including those who became unemployed before age 45) finds a job within a year. For those aged 55 to 59 this one out of ten. Note that the figure is based on those being unemployed and therefore includes long-term unemployed. The probability to find a job for disability pension and welfare recipients is low and, again, the probability declines with age.

Figure 1.9 shows the probability to find a job within a particular number of months for those who start to receive an unemployment benefit in 2004. Hence, this indication excludes long-term unemployed. Again, mobility declines with age. For individuals aged 25 to 29, the probability to find a job within 12 months is 67% and for the group aged 45 to 49 it declines to 36%. It then drops to 35% for age group 50 to 54 and 20% for age group 55 to 59.

Table 1.4	Distribution of tenure, worker age 55 to 64, 2007 <sup>a</sup>									
	0-1 years	1-3 years	3-5 years	5-10 years	> 10 years					
Austria	6	4	5	12	74					
Belgium	4	4	4	10	78					
Czech Republic	9	8	7	17	60					
Denmark	11	7	8	16	58					
Finland	8	5	4	12	71					
France	4	3	5	12	76					
Germany	5	5	5	13	72					
Hungary	6	6	8	20	60					
Ireland	8	5	9	22	57					
Italy	4	4	5	10	77					
Luxembourg	3	1	5	8	83					
Netherlands	2	4	4	17	72					
Norway	6	5	6	13	70					
Poland	8	8	7	14	63					
Portugal	4	5	4	13	73					
Spain	8	6	6	12	68					
Sweden	7	5	5	14	68					
Switzerland	5	5	7	19	64					
United Kingdom	8	9	11	21	51					
United States	9	7	11	20	53					
Average OECD2	20 6	5	6	15	67					
Average EU17	6	5	6	14	68					
<sup>a</sup> U.S. data refer to	o January 2008.									
Source: OECD, U.	S. data: Bureau of Labor Statistics.									

Table 1.4 gives information about job mobility in an international perspective. It shows data on the tenure distribution of workers between 55 and 64 in 20 OECD countries. We see that the share of workers aged 55-64 with a tenure less than one year is only 2% in the Netherlands. This is approximately one third of the average in the OECD and less than one fifth of that in Denmark. The share of workers with tenure over 10 years is 72%, which is 5%-points higher than the OECD average. In Denmark, this share is 14%-points lower, wile in the UK and the US this share is just over 50%.

#### 1.4.7 Training

Table 1.5 shows the participation in formal and informal learning activities by age group, based on the adult education survey. We see that more than 40% of the respondents engage in learning activities in the EU 25. The Netherlands is an average European country with 42%. In the Scandinavian countries (except Norway) and the countries around the Alps (Switzerland, Austria and France), learning is higher. Among elderly workers, 29% engages in learning in the EU25. Again, the Netherlands is an average country with a participation rate of 30%. In Sweden, Finland and Denmark, the share of elderly that engages in training is twice as high as in the Netherlands.

Table 1.5	Percentage workers that participates in learning						
		Age 25-64	Age 55-64				
Austria		89	92				
Denmark		80	72				
Finland		77	66				
Sweden		71	62				
Switzerland		68	58				
France		51	32				
Ireland		49	42				
Italy		49	35				
Portugal		44	33				
Belgium		42	27				
Germany		42	32				
Netherlands		42	30				
United Kingdom	ı	38	22				
Norway		35	25				
Poland		30	16				
Czech Republic	;	29	19				
Spain		25	14				
Greece		17	7				
EU25		42	29				
Source: Eurostat.							

# 1.4.8 Summing up

Dutch labour-market participation of elderly was relatively low in the 1980s, but has caught up during past decades. Today, it is comparable to the average in Europe. The unemployment rate among the elderly is relatively low, especially due to small inflows into unemployment. Moreover, early retirement schemes and disability insurance have long been used as early exit routes in the Netherlands and functioned as substitutes for unemployment insurance. Unemployed elderly face a very low probability to find a job, resulting in relatively long unemployment duration. The mobility of older workers is small, both when measured by job movements and when we look at the tenure distribution. It reflects a relatively rigid labour market for elderly workers in the Netherlands.

FUTURE TRENDS

# 1.5 Future trends

What does the future hold in store regarding the labour market for elderly workers in the Netherlands? This section discusses some projections for the population and labour-market participation, based on a baseline scenario without additional policy reforms. We do not make projections for specific education groups, the form of labour contract, unemployment or job mobility. We also address the rising influence of older generations in unions, which is relevant for the political feasibility of reforms.

#### 1.5.1 Baseline projections

Both the Dutch population and its workforce will be ageing during the coming decades. Ageing is a result of the increase in life expectancy, the baby boom of the second half of the 1940s, and the decrease in the birth rates starting in the 1970s. The workforce is currently ageing fast. The size of the age group 55 to 64 as a fraction of the working age population of age 20 to 64 increased from 15% in 1990 to 20% in 2005. According to the latest demographic forecast of Statistics Netherlands this fraction will increase further to 25% in 2025. It will remain stable thereafter and might even decrease somewhat. Population ageing will continue, however, due to the increase of life expectancy. Hence, the labour market for elderly will become increasingly important due to the larger size of the age group 55 to 64.

Euwals and Folmer (2009) develop a baseline projection for the elderly participation rate in the coming decades. The projection includes demographic trends, cohort effects and the impact of reforms that have already been implemented by the Dutch government. It assumes no further policy changes that may affect participation in the future. This so-called baseline is shown in Figure 1.10. The baseline projection suggests that the participation rate of individuals aged 55-64 is expected to increase from 45% in 2007 to about 60% in 2020. Subsequently, the rate is expected to stabilize.

Two aspects are crucial for the continuing increase in elderly participation. First, the participation rate of elderly women is expected to increase most. This is because the current generation of women aged 55-64 features a relatively low participation rate. When this generation is replaced by new generations of elderly women for which working on the labour market is much more common, the participation rate is expected to increase. The projections suggest a rise from 30% in 2007 to about 50% in 2020. Second, the reforms of the early retirement and disability system are expected to have a substantial impact on the participation rate of men aged 55 to 64 in the coming years. It is expected to increase from 60% in 2007 to about 75% in 2020. The higher participation of elderly amplifies the impact of the demographic trends. Indeed, the share of elderly in the workforce will increase from 12% in 2005 to 20% in 2025.

The expected rise in the participation rate could move the Netherlands up in the ladder of international comparisons, although this will also depends on trends in other countries. A participation rate of elderly of 60% would move the Netherlands to a level that is currently

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observed in the Anglo-Saxon countries like the UK and the US, as well as in Denmark. It is still lower, however, than in Sweden, Norway and New Zealand that feature participation rates over 70% for elderly.





Source: Statistics Netherlands for population, Euwals and Folmer (2009) for workforce and participation.

#### 1.5.2 Union membership

Institutional reforms may find opposition from the growing group of older workers. They form an increasing share of voters in the coming years who will not favour reforms that are against their interest. Moreover, Table 1.6 shows that elderly form a rapidly growing share of the membership in trade unions. Indeed, while union membership of younger cohorts fell by more than 20% between 1997 and 2006, membership of the 45-64 age group increased by 20%. Among union members, the oldest age category now has a majority. It is therefore a challenge to design reforms that both improve the future labour-market performance of elderly, and which are politically feasible. Transitional regimes with grandfathered rights for the currently old are probably unavoidable.

Table 1.6	Percentage of trade union members in the Netherlands in 1997 and 2006 by age group							
	Age 15-24	Age 25-44	Age 45-64	Total (age 15-64)				
	in % c	of total population 15-64						
1997	1.1	8.0	7.0	16.2				
2006	0.8	6.0	8.2	15.0				
Change in %	- 24	- 23	20	- 4				
Source: Sociaal	l-economische trends, 1st quarter 2008 (S	Statistics Netherlands), own	calculations.					

#### 1.5.3 Rethinking retirement in light of the financial crisis

The financial crisis has a considerable negative effect on pension wealth. CPB (2009) reports that pension funds wealth declined from 144% of its future nominal obligations at the end of 2007 clearly below 100% during the beginning of 2009. In the coming years, many pension funds will not index benefits to wages or even to inflation because they need to restore their buffers in order to meet the legal requirements with respect to future obligations. The lack of

indexation implies that current pensioners will face a real decline in their pension benefits. Moreover, the current working population will suffer because indexation applies also to future pension benefits. For instance, Bonenkamp et al. (2009) estimate that individuals borne in 1955 will experience a reduction in pensions of approximately 10%. The substantial reduction in pension wealth for these workers will extend their working lives. It adds to the already growing participation of elderly.

At the same time the financial crisis will have major implications for labour demand. Indeed, CPB (2009) predicts that the unemployment rate will increase to 8¾% of the workforce in 2010. Absorption of these unemployed in the labour market after the crisis will come along with a considerable restructuring of the economy. It requires sufficient flexibility, adaptability and training from workers, also from elderly. It imposes a major challenge for society.

# 1.6 The challenge ahead

While the Netherlands has implemented a number of reforms during past decades that have been successful in increasing employment among older workers, the question is: do we need more reform? The answer is probably: yes and no. On the one hand, participation incentives have considerably improved. One might even argue that policy is overshooting participation incentives as the implicit subsidies for the well-off older workers have perverse distributive effects. Moreover, redistribution from young to old workers puts pressure on young families and exerts an extra strain on the solidarity between generations. On the other hand, we can hardly speak of a market for elderly workers today due to severe rigidities. These lead to low job mobility, small job finding probabilities for elderly unemployed, long unemployment duration and low job search and training. With an increasing share of elderly in the labour force and a rapidly rising participation, these inefficiencies become more and more pressing. This imposes a challenge for future policy. Policy reforms should switch from encouraging participation to creating a more efficient market for elderly workers. The labour market needs more elderly in the future, but we need them in the right jobs and with the right skills.

Figure 1.11 illustrates the challenge. It shows that not supply, but distortions in demand and wages are problematic. The prevailing wages for older workers – denoted by W – are high as a result of deferred payment schemes and institutions such as employment protection and unemployment insurance. This wage premium for older workers who are lucky to have a job leads to misallocation and inefficiency. Indeed, workers who face a small risk of being fired have little incentive to provide effort, to train or to look for another job. Those who are unlucky to become unemployed receive relatively generous social insurance and high severance pay, causing high reservation wages for elderly. Many elderly who loose their job do not work for the rest of their life and are in practice retired already.

Figure 1.11 The labour 'market' for elderly



## 1.7 Outline of the study

The rest of this study discusses the state-of-the-art knowledge regarding the impact of institutions on labour-market outcomes for individuals aged 55-64. The chapters are divided into two parts: (i) supply and (ii) demand.

The first part deals with the supply side of the labour market for elderly. Chapter 2 explores how an individuals' retirement decision responds to financial incentives. Thereby, we consider both effects via price changes and effects via wealth. We apply these insights to some concrete policy changes, which influence either the individual's effective wage rate and/or his wealth. Chapter 3 discusses how different routes to exit the labour market interact, namely early retirement schemes, disability insurance and unemployment insurance. How important is substitution between exit routes, in particular for the Netherlands? And will it be likely that reforms in early retirement schemes will cause pressure on other schemes? Chapter 4 deals with saving for retirement. It discusses government policies with respect to mandatory savings and tax-favoured savings and explores how this interacts with labour supply and investment in human capital. Chapter 5 uses a recently developed life-cycle model to analyse the impact of an increase in the statutory retirement age. It then compares the results with previous findings in the literature and a recent assessment of this policy by CPB based on a broader analysis. The second part of the study concentrates more on demand for labour and its price. Chapter 6 discusses how wages and productivity develop over the life cycle and how they relate to each other. Various theories are discussed and then used to draw a conclusion about the desirability and sustainability of current wage profiles. Chapter 7 considers employment protection and its implications for the labour market for elderly.

# 2 Financial incentives for retirement

# Rob Euwals, Daniel van Vuuren

Pension schemes often encourage early retirement, either through mandatory wealth accumulation or implicit taxes on continued work. The empirical literature shows that both effects matter. The magnitude of the latter effect is quantitatively more important. Therefore, lifting the implicit taxes, as has been done in the Netherlands during the past decade, importantly contributes to the increasing participation rate of elderly. It is doubtful whether further stimulation through tax credits is desirable from a social welfare point of view.

# 2.1 Introduction

In the Netherlands, second-pillar pensions and early retirement schemes are the responsibility of social partners, i.e. trade unions and employers' organisations. The central government can influence the outcomes either through directly setting the rules or through a special fiscal treatment. Thus, it can use its discretionary power to stimulate or discourage retirement decisions by affecting the financial incentives for retirement. This chapter explores how financial incentives impact retirement behaviour. We start with a discussion of the Dutch early retirement system and empirical evidence on financial incentive effects on retirement behaviour. The idea is discarded that mandatory wealth accumulation for early retirement wealth with one year-salary leads to a postponement of early retirement of about one year. Empirical evidence shows that this is not true. Next, we discuss the impact of the financial reward to postponing retirement and use this to explain recent trends in Dutch retirement behaviour. We conclude by discussing trade-offs in using financial incentives to stimulate labour force participation.

# 2.2 Retirement in the Netherlands

# 2.2.1 The current system

Since 2006, the Dutch early retirement scheme is integrated with the second-pillar old-age pension system. Before this date the systems were separate, especially with respect to the financing. Second-pillar pensions are capital-funded, whereas early retirement benefits used to be largely financed on a pay-as-you-go basis. Both systems are organised by sector of industry. This section discusses the new system and subsequently the previous system.

The statutory retirement age in the Dutch state pension system is 65. From that age on, Dutch citizens that lived in the Netherlands from age 15 to 64 receive a flat-rate state pension benefit, the so-called AOW.<sup>5</sup> This first-pillar pension benefit guarantees an income of 70% of the minimum wage for singles, and 50% of the minimum wage for couples. Premiums are paid by all citizens under 65 years of age, regardless of their labour-market status. Starting in 2011 citizens above age 65 will gradually start paying premiums for the state pension as well.

On top of the flat-rate benefit, most retired employees receive an occupational pension. Occupational pensions are subject to negotiations between unions and employer organisations. They are capital funded and mostly defined-benefit pensions. The government is involved in the occupational pensions in two ways. First, savings receive a special fiscal treatment. The taxation of the schemes can be characterised as an EET-system (exempt-exempt-taxed). Contributions to a scheme are tax exempt, the returns on the assets in the capital funding system are exempt, and the pensions are taxed. Accordingly, the Dutch income tax system largely leaves capital income untaxed and comes down to a consumption-based tax system. Moreover, due to the progressive tax system there is a fiscal subsidy on pension savings. In particular, the marginal tax rate applying to the tax exemption of pension premiums exceeds the average tax rate on pension benefits. The difference between these rates is a fiscal subsidy which could easily be 10% of the gross wage rate (Kooiman et al., 2003).

Second, the government facilitates occupational pension schemes by extension to all workers in the concerning sector or firm.<sup>6</sup> Most agreements between unions and employer organisations receive the 'generally binding' approval from the government (AVV).

Within most occupational pension schemes, early retirement before age 65 is possible. The fiscal framework of the occupational pensions allows for a building up of a pension benefit (flat-rate state pension benefit plus occupational pension) of a full 100% of the last or average earned wage at age 65. Workers are allowed to retire before age 65. The special fiscal treatment stays in place as long as the pension benefit is adjusted actuarially fair. Some of the largest Dutch pension funds allow for an early retirement benefit of about 70% of the average earned wage at age 63.

The early retirement system that is currently in place is the result of a law on early retirement, life-course savings and pensions, which was installed on January 1, 2006. The law is called VPL (Vut-Prepensioen-Levensloop). The life-course arrangement is a fiscally subsidised savings arrangement to finance leave during the working-life. It can however be used to finance early retirement. The installation of the law implied a replacement a previous scheme that facilitated actuarially unfair early retirement. The old scheme had an important impact on the participation rate. Still today, the early retirement system plays an important role for the labour market of elderly. About four out of ten Dutch men in the age group 60 to 64 receive early retirement benefits and have no labour income, and in the age group 55 to 59 this holds for about one out of twelve men. For women, the numbers are smaller: about one out of four in the age group 60 to 64. This number will, however, increase in the upcoming years as the

<sup>&</sup>lt;sup>5</sup> For each year spent abroad between the ages of 15 and 65, the state pension is lowered by 2%.

<sup>&</sup>lt;sup>6</sup> Collective labour agreements are either made at the firm level or at the sectoral level.

participation rate of younger generations of women is substantially higher than that of older generations.

Since January 2009, older workers receive an age-related tax credit on their wage income. At age 62, the tax credit is 5% of gross wages, at age 63 it is 7%, at age 64 it is 10%, at age 65 and 66 it is 2%, and at age 67 it is 1%. The tax credit is limited to individuals who work the whole year, and who earn a labour income of at least 8,860 euro. The tax credit is subject to a maximum. The tax credit aims to stimulate the participation of older workers. It complements the reform of the early retirement schemes in 2006.

The uniform pension premium is an important aspect of Dutch second-pillar pensions. Each participant in a pension fund pays the same contribution rate, regardless of age, gender, and education. Yet, the actuarial value of a pension premium is not constant among different groups. For instance, the life-expectancy of a highly educated individual exceeds that of a lowly educated person, which would justify higher pension premiums for highly educated workers. Moreover, pension accrual accumulates by a constant amount, independent of age. As premiums paid by the young have a much longer time to mature, this implies an implicit subsidy from young to old. Bonenkamp (2009) shows that indeed a substantial part of the pension premiums should be considered as an implicit tax or subsidy rather than deferred compensation. Figure 2.1 shows the amount of redistribution over the life-cycle for both men and women, for different degrees of education. The amounts are expressed in percentages of wages. Older workers, women, and highly educated receive an implicit subsidy within this system. Younger workers, men, and lowly educated pay implicit taxes. Older women receive the largest implicit subsidies (about 8%), whereas young men with low educational attainment pay the highest implicit taxes (nearly 5%).

Within a time span of about ten years, the Netherlands moved from a system with an implicit tax rate on continuing to work of about one hundred percent to a system with an implicit subsidy on continued work. Both the age-related worker tax credits and the uniform pension premium with constant pension accrual render a subsidy on postponed retirement.





#### 2.2.2 Past reforms

During the 1970s and the first half of the 1980s, many sectors of industry introduced a so-called VUT early retirement scheme. The schemes were financed on a pay-as-you-go basis and were highly actuarially unfair. After reaching a certain age, a worker could retire and receive a VUT benefit of about 80% of the last earned wage in gross terms. Due to the progressive tax system and a continued accrual of old-age pension rights, the net replacement rate was often more than 80%. The eligibility age varied over the sectors of industry from about age 58 to 62. The implicit tax rate of continuing to work another year was more than 100% for many workers, implying a net subsidy on retirement rather than a reward for work (De Vos and Kapteyn, 2004). Empirical studies show that the impact on the participation of elderly was strong (Gruber and Wise, 2004).

The VUT early retirement schemes are held responsible for a drop in the participation rate of men aged 55 to 65. At first, this was actually in line with the goal of these schemes. During the 1980s, the Netherlands went through a severe economic crisis. The explicit goal of the scheme was to allow firms to lay off older workers in order to save jobs for the young. The VUT early retirement schemes, however, became costly and doubts arose about the saving of jobs for the young.

During the 1990s the Dutch unions and employer organisations agreed on transforming the VUT early retirement schemes into less generous actuarially fair schemes. One goal was to remove the substantial implicit tax on continuing to work. Another goal was to limit the costs of the early retirement schemes. The participants of the pension scheme for civil servants were the first to face the new early retirement conditions, from April 1997 onwards. In most sectors of industry it was decided to implement transitional arrangements. In some sectors the transition was supposed to take more than ten years. The transition was initially supposed to be completed in the year 2022, but was accelerated considerably by introducing the law VPL in 2006.

# 2.3 Financial wealth and retirement

#### 2.3.1 Empirical literature

Economic theory predicts that wealth exerts an impact on the timing of retirement. More wealth means that more money can be spent on goods, services, and/or leisure. More leisure implies fewer working hours and/or earlier retirement. It is thus expected that an increase of wealth leads to more early retirement. The question is: how large is the impact of wealth on retirement? If the wealth effect is smoothed over the life-cycle, then the demand for leisure increases in all periods left. It can be particularly important for young individuals, who face a relatively long time horizon.

There are two reasons why the impact of wealth on retirement may be larger than predicted by standard economic theory: credit constraints and labelling. The wealth effect could be inflated by an imperfect functioning of the capital market. For instance, suppose that mandatory savings for retirement are increased. The individual may respond by lowering his other savings or by borrowing, so that the mandatory savings simply crowd out other savings (see chapter 4). Thus, pension wealth does not increase, and labour supply is not affected at any age. Yet, if the individual does not possess enough private savings and he cannot borrow on the capital market against his future retirement benefits, then total savings will rise and illiquid pension wealth increases. If pension wealth can only be obtained by retirement from the labour market, wealth can have a much larger impact on retirement decisions due to credit constraints. Many economists acknowledge that capital markets are imperfect, and that a non-negligible share of individuals is liquidity constrained. Hence, mandatory wealth accumulation may lead to more savings and earlier retirement.

A second reason for a larger wealth effect than textbook models predict is labelling. That is, the individual's expenditure may depend on the source of income. In particular, it could be the case that individuals tend to spend their early retirement wealth on early retirement. This fits into the theory of mental accounting, see for example Thaler (1990). As logical as it may sound, such behaviour is often irrational from the life-cycle point of view: a wealth increase should be spent where it maximises the individual's utility, irrespective of the source of income. A rational agent following the life-cycle model would typically smooth a wealth increase over his remaining life-cycle and allocate it to different goods, services and/or leisure. Although there is virtually no empirical evidence on a labelling effect of early retirement wealth, many believe it is relevant to some extent. Some empirical evidence does exist for other applications, such as child benefits (Kooreman, 2000).

The size of the impact of wealth on retirement is an empirical issue. Imagine that an individual has a preference to retire early. He carefully plans an optimal working and consumption path over the life cycle (chapter 5). Say the individual incorporates mandatory early retirement wealth accumulation in the plan, but a policy reform reduces this wealth with one year salary. Will the individual postpone early retirement with one full year? Or will the individual accumulate more wealth to retire early and/or retire with a lower pension?

A number of studies explore the impact of mandatory early retirement and pension wealth on the decision to retire. An overview of empirical estimates can be found in Lumsdaine and Mitchell (1999). Overall, these empirical studies suggest that the wealth effect on retirement is small. Note that empirical estimates are typically estimated within reduced-form models. Hence, no distinction is made between the pure wealth effect and liquidity constraints or mental accounting. The finding of a small wealth effect suggests that these complicating factors are of limited relevance. Krueger and Pischke (1992) find that a reform in the US state pension did not affect labour supply, indicating a zero wealth effect. Euwals, van Vuuren and Wolthoff (2006) find a statistically significant but limited effect of early retirement and pension wealth for the Netherlands. They find that a wealth increase of about one year-salary on average implies nearly two months earlier retirement. Banks, Emmerson and Tetlow (2007) find virtually the same effect for the UK. They find that a reduction of pension wealth of about one year-salary leads to a postponement of early retirement of about two months. Few studies look at the impact of general wealth. Joulfaian and Wilhelm (1994) find that inheritances have a relatively modest effect on the retirement decisions of older men. Imbens *et al.* (2001) estimate that lottery winners consume about 11% of their winnings in the form of reduced labour earnings. Bloemen (2007) finds a relatively small wealth effect for the Netherlands.

# 2.3.2 Impact of policy

Many policies with respect to early retirement and pensions affect the level of pension wealth and the timing of early retirement and pension benefit rights. For instance, transformation of early retirement schemes (section 2.2) in the Netherlands implied a reduction of early retirement benefits from 79 to 73% on average. Moreover, the standard early retirement age at which this benefit level applies was on average raised from 60.3 to 61.3 years (Ministry of Social Affairs, 2004). Also, the building-up of pension rights during early retirement was abolished, implying an average loss in early retirement wealth of about 26% of the yearly wage (Bonenkamp et al., 2006). In sum, about half of the early retirement wealth was lost as a result of the reform, which equals more than two yearly salaries. If we assume a wealth effect of two months per yearly salary (see previous subsection), this implies that the reform induced an effect on the retirement age of four to five months, purely due to the change in wealth. Note that the implicit tax on continuing working was also reduced, so that the total effect of the reform was even greater as a result of a substitution effect. This will be discussed in the next section.

Another important reform with an important wealth effect is a rise in the statutory pension age. If the first-pillar pension benefit is postponed by two years, i.e. from 65 to 67, total pension wealth decreases with about one to one-and-a-half year-salary (most workers do not reach the target of a 70% replacement rate due to incomplete careers). The wealth effect would increase the average retirement age by two to three months (Table 2.1).<sup>7</sup>

# 2.4 Financial reward to work and retirement

# 2.4.1 Empirical literature

According to economic theory, the price of leisure determines an individual's decision on retirement. The price of leisure equals the *effective wage rate*, that is, the net individual wage rate plus all benefits and costs which are directly related to the supply of labour. Examples of the latter are acquired pension rights when working, and work-related costs such as travel. An increase in the effective wage rate increases the price of leisure, and will make individuals substitute leisure for the consumption of goods and services. Indeed, a high price of leisure means that retirement is expensive, so that staying in the labour market is relatively attractive. This effect is offset by the income effect on labour supply (see previous section). That is, a wage increase also implies an increase in total wealth, hence more consumption of leisure. However, a large majority of empirical studies shows that the wealth effect is smaller than the substitution effect (Blundell and MaCurdy, 1999; Evers et al., 2008).

<sup>&</sup>lt;sup>7</sup> See chapter 5 for a more elaborate analysis of this reform.

Determining the price effect on retirement is more complex than the standard price effect in consumption theory, as it involves future income streams such as pension benefits. In the case of an actuarially neutral retirement scheme, the postponement of retirement leads to higher benefits in subsequent years so that total retirement wealth remains unchanged. However, retirement schemes are often not actuarially neutral, implying a price effect in early retirement: postponement of retirement and continuing to work one extra year leads to a change in retirement wealth, and thus affects the effective wage rate. Such a price effect is often presented in terms of an implicit tax on labour income (Gruber and Wise, 2004). For the Netherlands, De Vos and Kapteyn (2004) find a median implicit tax rate of 130% for workers who are eligible for the old-style early retirement scheme.

The price effect of early retirement is complicated as it depends on discount factors and uncertainty in mortality. Pension funds typically use one discount factor and one mortality scheme, based on either expected or realised mortality rates for an average participant. Individual discount factors vary, however, as some individuals are more impatient than others. Estimates by Samwick (1998) and Gustman and Steinmeier (2005) show that about one quarter to one third of the population has an individual discount rate above 15%. Both studies find that only 40% of the individuals have a time preference rate below 5%. The same occurs for mortality. Individuals who know that they are unlikely to become old will not be triggered by a higher benefit level in case of postponement. Hence, price effects are heterogeneous within the population, and may vary with fundamental behavioural parameters.

Empirical studies suggest that the price effect is important. In an overview study for the US, Lumsdaine and Mitchell (1999) conclude that the price effect is more important than the wealth effect. Asch *et al.* (2005) and Coile and Gruber (2007) find a substantial price effect on the basis of US data. A change from a zero reward to a postponement reward of one year-salary leads to a postponement of retirement of about 10 months. Euwals, van Vuuren and Wolthoff (2006) use an early retirement reform in the Netherlands to identify the impact of financial incentives. They find that changing the reward to retirement postponement from zero to one year-salary leads to postponement of retirement by six months on average.

## 2.4.2 Impact of policy

A number of policy reforms during the last decade caused a change in the financial reward to a postponement of retirement. As price effects are substantial, the potential impact of these reforms can be sizeable. For instance, the transformation of retirement schemes (section 2.2) substantially increased the financial reward to postponing retirement. In the old system, the reward of continuing to work with one year was typically near zero, and even negative for many workers. The reward increased to the full yearly wage in the new system. As a consequence of the uniform contribution rate, the reward to working an additional year is even higher than a yearly wage for most workers (see figure 2.1). The impact on the participation rate is substantial as the increase in the reward holds for each year from the first year of eligibility to age 64. If we take the elasticity of Euwals, van Vuuren and Wolthoff (2006), it follows that the average

career extension as a consequence of the price effect is more than two years. Taking into account both the wealth effect discussed in the previous section and the price effect computed here, the total effect on retirement age is about 2.5 years (Table 2.1). Note that this effect is only relevant for workers who are fully eligible to early retirement. This is not the case for all workers. Nonetheless, a rough estimate indicates that the reform could raise the participation rate of 60 to 64 year old individuals by almost one quarter of the respective age group (CPB, 2008).

Another reform that triggers the price effect is the tax credit for older workers. The agespecific earned income tax credit increases the reward to working for individuals aged between 62 and 67 (section 2.2). The size of the policy is small compared to the change to an actuarially fair system as the decrease in the tax rate is relatively small. Yet, the effect is potentially larger as the tax credit applies to all persons aged 62-67, while the early retirement reform only applied to those eligible. Applying our elasticity suggests that the tax credit for older workers leads to an average postponement of retirement by about one month (Table 2.1). Note that the measure induces a wealth effect as well. This effect is however negligible given the earlier reported wealth elasticity. The participation rate of individuals in the age group 60 to 64 increases by less than a percentage point (CPB, 2008).

A similar effect results from the uniform contribution rate to second pillar pensions. In comparison with an actuarially fair contribution rate, especially older women receive large implicit bonuses when extending their careers (see figure 2.1). For older men, the implicit bonuses are somewhat smaller. In combination with the just-mentioned tax credit, it turns out that both men and women pay much less taxes on their labour income than younger workers.

Table 2.1	Effects of policy reforms						
		Effect on retiremer	nt decision	Effect on participation rate			
					(%-points)		
		Wealth effect	Price effect	Total	60-64 years	20-64 years	
Abolishment VU	T <sup>a</sup>	4-5 months	2 years	2-2.5 years	25	2	
Pension age 2 y	ears later <sup>b</sup>	2-3 months	-	2-3 months	2	-	
Age specific tax	credit <sup>c</sup>	-	1 month	1 month	1	-	

<sup>a</sup> See section 2.4.2 and Euwals, Van Vuuren and Wolthoff (2006).

b See section 2.3.2 and Chapter 5.

<sup>c</sup> See section 2.4.2 and CPB (2008). The tax credit is 5% at age 62, 7% at age 63, 10% at age 64, 2% at age 65 and 65, and 1% at age 67. The tax credit is limited to individuals who work the whole year and who earn a labour income of at least 8,860 euro. The tax credit is subject to a maximum.

# 2.5 Understanding recent developments in the Netherlands

# 2.5.1 Recent developments in participation

The participation rate of Dutch elderly increased substantially since the mid 1990s (figure 1.1). The reforms of the early retirement schemes have contributed to this. However, other factors played a role as well. In particular, the increase in the participation rate started before the reforms had an effect on retirement behaviour. The first workers exposed to a more actuarially fair early retirement scheme were the civil servants in 1997. The second group were the health care workers in 1999. Workers in other sectors were exposed to later reforms. Since 2006, early retirement schemes have been made actuarially fair, as this was required to get a favourable fiscal treatment (section 2.1.2). These reforms are likely to substantially increase the participation rate in the coming decade. Below we discuss which other factors have contributed to the increase in the participation rate since the mid 1990s.

#### 2.5.2 The role of non-financial factors

Alternative factors explain a substantial part of the increase in the participation rate of elderly, in particular the role of education (Van Vuuren and Deelen, 2009). Individuals with a high level of education have physically less demanding jobs which are often more challenging, making continuing to work more attractive. So individuals with a high level of education retire on average at an older age than individuals with a low level of education. This holds for both men and women. The increasing participation rate of men is for 29% related to education (table 2.2). Note that this figure may include the effect of wage changes.

Second, empirical evidence shows that the participation of elderly men is related to the increase in the participation of women. This is because partners generally enjoy leisure more in case it is taken together. Partners coordinate working hours during the week, holidays, and they also coordinate the timing of retirement. As within couples women are on average younger than men, the coordination implies that men retire at an older age than women. This may imply that men with an employed partner may postpone retirement. Empirical evidence for the US and the UK shows that the increasing participation rate of older men is indeed partly the result of the increasing participation rate of women (Schirle, 2008). The increasing participation rate of men in the Netherlands is for 21% related to the education level of their partners (table 2.2), which indicates that this theory is likely to play a role in the Netherlands as well.<sup>8</sup>

Third, health is an important determinant of labour market exit. Yet, its importance for early retirement is less clear. Many countries offer disability insurance for the risk of bad health, which is an exit route from the labour force. The administration of the disability insurance faces however the problem that health is difficult to measure and bad health is hard to verify. So in practice there may be substitution between exit routes (chapter 3). Due to policy reforms the

<sup>&</sup>lt;sup>8</sup> Note that the partner's participation could not be included in the model as it is endogenous. The partner's education level therefore serves as a proxy variable for her participation.

rate of substitution between exit routes may have decreased over time. As it has become harder to enter the disability scheme, health may become more important for early retirement.

Finally, retirement behaviour may be affected by social norms. These play a role in consumption and labour supply behaviour, and are important for the welfare state (Lindbeck, 1997, Lindbeck *et al.*, 1999). Although there is no direct evidence that social norms affect retirement behaviour, indirect evidence suggests it does. For instance, most pension systems contain one or more ages at which retirement is a 'natural' choice. In the US, the ages of 62 and 65 were natural choices. In the Netherlands, the early retirement eligibility age – usually around the age of 60 – was for a long time considered the 'standard' retirement age. Although systems contain financial incentives to retire at these particular ages, several studies show that there is still an unexplained retirement peak at such ages (Lumsdaine and Mitchell, 1999). One explanation is that preferences of individuals are interdependent; if one individual retires at a certain age, then other individuals want to retire at that age as well. Another explanation is that such ages in a pension system set a norm. The quantitative importance of such effects is difficult to estimate though.

Table 2.2	able 2.2 Contribution to participation growth of men aged 50-69, 1995-2006						
		Contribution to total growth (%)					
Education		29					
Education partr	ner	21					
Age compositio	on	2					
Other factors		48					
Total		100					
Source: van Vuur Labour Force Sur	ren and Deelen (2009). The decomposition is based on the estimation of a bina rvey (EBB). The category 'Other' is modelled as a set of year dummy variables.	ry Logit model using data from the Dutch					

# 2.6 Conclusion

Pensions, early retirement schemes and tax incentives determine financial incentives that play a role in early retirement behaviour. The effects can be measured by the impact of wealth on retirement (the wealth effect) and the impact of the return to postponing early retirement (the price effect). Empirical evidence shows that both incentives play a significant role. The price effect however exceeds the wealth effect. From the empirical literature we can obtain consensus estimates for the size of both effects. In particular, a reduction of retirement wealth with one year-salary induces workers to retire one to two months later. An increase in the return to postponing early retirement with one year-salary induces a postponement of five to six months.

The Dutch early retirement system went through substantial reforms in recent years. Most importantly, the Dutch system moved from an actuarially unfair system in which the financial reward of postponing early retirement was very low towards an actuarially fair system. The

CONCLUSION

reform has already increased the participation rate of individuals aged 55 to 64, and it is expected to increase the rate further in the coming years.

Are policies that reduce pension wealth or increase the reward to postponing retirement welfare improving? Not necessarily. Retirement decisions are made on the basis of individual choices. These choices are distorted if there is a gap between the social and private value of retirement. High implicit tax rates on continuing work form such a distortion. However, the implicit tax in the Netherlands has been transformed into an implicit subsidy. This is a consequence of reforms in the early retirement scheme. By further stimulating participation through a higher price of leisure at old age, the government may well move beyond the optimum (Cremer et al., 2007). Subsidies for postponed retirement involve a transfer to healthy and able elderly workers. As it is financed from the general budget, it may be unattractive from a distributional perspective as it tends to increase inequality. Yet, in-work subsidies for elderly may be desirable on efficiency grounds. In particular, Ramsey optimal tax considerations suggest that tax rates for elderly should be reduced if the supply of labour is more elastic at old age. This could be the result of elderly facing the extensive margin of labour supply more often than younger cohorts. Fenge et al. (2006) use German panel data to estimate labour supply elasticities over the life-cycle. They find that elasticities are more or less flat before 50 years of age, and show an increasing profile after that age. This is in line with the relatively large price effect of early retirement (section 4.2). The large elasticity for individuals of age 55 to 64 could justify age-specific tax relief for older workers. The scarcity of empirical studies on this issue does not allow firm conclusions though.

Policies that reduce pension wealth are expected to increase participation. Hence, institutions supporting wealth formation such as saving subsidies and mandatory savings induce a distortion in participation. The financial crisis is likely to extend working lives due to a reduction in pension wealth. RETHINKING RETIREMENT: ALTERNATIVE PATHWAYS INTO RETIREMENT

# 3 Alternative pathways into retirement

# Annemiek van Vuren, Daniel van Vuuren, Rob Euwals

In the Netherlands, early retirement schemes and disability insurance have been important 'pathways' into retirement. This has been cut off as a consequence of major reforms during the last decade. Pressure on unemployment insurance as a substitute pathway into retirement may increase in the future.

# 3.1 Introduction

This chapter discusses the role of institutions facilitating early retirement. 'Early' here means before the statutory old-age pension age, which is age 65 in the Netherlands. As in many other western countries, retirement before age 65 was the rule rather than the exception. For an important part this was the result of the 'official' early retirement (ER) schemes introduced during the 1970s and 1980s. Yet, also Unemployment Insurance (UI) and Disability Insurance (DI) schemes were used as alternative exit routes.

When comparing early retirement trends in western countries, it is remarkable that they occurred seemingly independent from the prevailing institutions in these countries. In particular, the decline in the labour force participation rates of men aged 55-64 was similar in the Netherlands, France and Germany (Figure 1.5), whereas institutions in these countries were quite different. Kohli and Rein (1991) have argued that the process of early exit is primarily driven by evolutions in the labour market, such as the high unemployment rates during the 1970s and 1980s. During that period, early retirement was deemed an attractive policy option in order to combat youth unemployment while avoiding inflation, which led to the development of generous arrangements. According to Kohli and Rein's theory, push factors generated by the organization of work were decisive in the rise of early retirement, and the institutions facilitated this trend regardless of their original aim.

This chapter explores whether the reforms in the Netherlands during the past decades have led to a different functioning of the institutions surrounding early retirement. Are UI and DI still being used as early retirement arrangements? Is the 'pathways' concept formulated in Kohli and Rein (1991) still relevant? What are the challenges ahead?

# 3.2 Institutions in the Netherlands

#### 3.2.1 Unemployment Insurance

Employees who meet two work-history conditions are covered by Unemployment Insurance (UI). First, the employee must have earned wages in 26 out of 36 weeks before becoming unemployed. Second, he must have done so in 4 out of the 5 previous years.<sup>9</sup> The replacement

<sup>&</sup>lt;sup>9</sup> It is possible to qualify for UI benefits after having worked less than 4 out of the 5 previous years, but these benefits are then equivalent to social assistance.

rate equals 75% during the first two months and 70% thereafter. Some collective agreements supplement UI benefits up to 80 or even 90%. The maximum duration of UI benefits depends on age and employment history, and ranges in principle from 6 months to 3 years and 2 months. The maximum age is 65. Unemployed individuals who are no longer eligible for UI benefits may apply for social assistance.

The most important changes in Dutch UI during the past decades are summarised in table 3.1. Until 1987 the unemployment benefit program consisted of the Unemployment Insurance Act (WW) and the Unemployment Provision Act (WWV). After the introduction of UI in 1949, the first reforms took place during the 1980s. In response to the disastrous development of public finances and the poor performance of the Dutch labour market at that time, the government reduced the replacement rate from 80 to 70% in 1985. In 1987 the WW and WWV were integrated into a single unemployment insurance scheme. At the same time eligibility conditions were eased in order to offer more security to flexible and part-time workers. The benefit duration became dependent on the working history. The minimum entitlement period became 6 months, and the maximum period five years, dependent on the person's work history. Consequently the benefit duration for the young was reduced while at the same time it was increased for the elderly. By then, laid off workers above age 57.5 would receive UI until the age of 65 without the requirement to search for a new job.

Table 3.1	Main changes in the unemployment insurance scheme
1949	Introduction unemployment insurance scheme
1985	Replacement rate reduced from 80% to 70%
1987	Integration of WW and WWV in one unemployment scheme
1987	Eligibility criteria and benefit duration depends on work history: 26 out of 52 weeks; 3-out-of-5-years
1995	Eligibility criteria more stringent: 26 of the 39 weeks; 4-out-of-5-years
1996	Monitoring and sanctions to avoid moral hazard
2003	Abolishment follow-up-benefits
2004	More stringent job search requirements
2006	Reform: maximum duration reduced from 60 to 38 months; benefit level: increase from 70 to 75% first two
	months; eligibility criteria: 26 out of 36 weeks

During the 1990s, monitoring and sanctions in UI were intensified. The new law focused on reducing moral hazard. Active work search assistance and reintegration efforts increased the obligation to find work. This increased the administrative costs from about 0.2 billion euro in 1991 to 0.6 billion euro in 2001. In 1995 the eligibility criteria became more stringent through the work-history conditions mentioned above.<sup>10</sup> In 2003 the so-called follow-up-benefit was abolished, implying a shorter maximum duration. In 2004 more stringent job search requirements were introduced. Unemployed workers older than 57.5 however did not have to fulfil these requirements. In 2006 a new UI act was introduced. Since then, entitlement requires that one has worked 26 out of 36 weeks prior to unemployment instead of 26 out of 39 weeks.

<sup>&</sup>lt;sup>10</sup> Since then, the employee must have earned wages in 26 out of 39 weeks before becoming unemployed, and second, he must have done so in 4 out of the 5 previous years.

Furthermore, the maximum duration of UI benefits was reduced from 60 to 38 months. Duration depends on employment history: one month's benefit for each year. The replacement rate was raised from 70 to 75% during the first two months of unemployment, and kept at 70% thereafter. In case an unemployed worker does not meet the 'four-out-of-five-years condition', but does meet the 'week condition', she receives a wage-related benefit for a period of 3 months. This differs from the old scheme in which this group received a lower benefit of 70% of the minimum wage during a maximum of 6 months.

#### 3.2.2 Disability Insurance

All employees in the Netherlands are covered by Disability Insurance (DI), regardless of their work history. The public DI scheme in the Netherlands is designed to insure those workers who do not recover from sickness within two years. Any form of disability is insured, whether stemming from professional risk or social risk. Workers becoming disabled for 80% or more receive full DI benefits, while partially disabled (less than 80%) receive pro rata benefits. Replacement rates vary by firm or sector (Van Vuren and van Vuuren, 2007). The maximum age is 65.

After the introduction of DI in 1967 many reforms took place (table 3.2). During the 1970s, the annual growth of DI recipients was about 11%, which was much higher than expected at the introduction of the system. At the time, benefits were 80% of final pay, entry conditions were weak, and enforcement by the public body was lax. In 1985 the replacement rate was reduced from 80 to 70%. However, it did not lead to sufficient volume and cost reductions. More financial incentives were introduced to confront both employees and employers with the financial consequences of the excessive use of sickness and disability benefits. In 1992, a premium differentiation system for sickness benefits and a (not long-lived) no-claim bonus system were introduced (TAV). The system implied that employers had to pay a penalty for each employee entering DI. A firm employing a DI beneficiary for at least one year would receive a bonus. Until 1993, a fully disabled person received a wage-related benefit (70%) of unlimited duration. Since then, both the duration and the level of the benefit became dependent on the recipient's age and employment history. This loss in benefits was repaired in practice for about 80% of the employees through collective labour agreements made by the social partners (SER, 2002). A restricted own risk for employers for sickness benefits was introduced in 1994 (TZ) in order to reduce absence through illness. Large firms became responsible for the continued payment of wages during the first six weeks of sickness, and small firms for the first two weeks. Since 1996 employers must pay sickness benefit during the entire first year (WULBZ). The no-claim bonus system was replaced in 1998 by a system of experience rating (PEMBA). Thereby, firms could opt out of the public system to bear the risk themselves or to reinsure the risk with private insurance companies.

Many policy reforms during the late 1990s and early 2000s aimed at achieving a more efficient administration. This has resulted in the merger of five different administrative offices into one public monopoly (UWV) which is responsible for the administration of all DI and UI benefits in

the Netherlands. The Gatekeeper Improvement Act (Wet Verbetering Poortwachter) was implemented in 2002, implying more stringent reintegration obligations of the employer and its employees. In order to be eligible for the DI, UWV assesses whether both employer and employee have met the reintegration obligations in the sickness period. The duration of the sickness benefit (SB) period has been extended from one to two years in 2004. In 2006, the old DI scheme (WAO) is replaced by a new scheme called WIA - Income According to Capacity for Work Act (Wet Werk en Inkomen naar Arbeidsvermogen). Employees who become disabled for less than 35% are no longer insured. The WIA focuses on the remaining capacity to earn income. It distinguishes between (a) fully and long-lasting disabled and (b) temporarily and/or partially disabled. Employees who become fully and permanently incapacitated<sup>11</sup> can qualify for 'IVA-benefits' (Inkomensvoorziening volledig arbeidsongeschikten), which are earnings related with a replacement rate of 70%. Individuals who are partially or temporarily fully disabled may qualify for a WGA-benefit (werkhervatting gedeeltelijk arbeidsgeschikten). The level of their disability benefit depends on both their remaining work capacity and employment history. The WGA-benefit consists of an earningsrelated benefit in the first period, followed by a continuation benefit in the second phase. Partially disabled workers who still work and use between 50-100% of their remaining earnings capacity receive a wage supplement.

Table 3.2	Main reforms in disability insurance scheme
1967	Introduction WAO
1985	replacement rate was reduced from 80% to 70%
1993	Earnings related benefit became of limited duration and benefit cuts; loss in benefits has been repaired
	though collective labour agreements made by the social partners
1996	Employers must pay sickness benefit during the entire first year (WULBZ)
1998	System of experience rating (PEMBA)
2002	The Gatekeeper Improvement Act (Wet Verbetering Poortwachter)
2004	Maximum sickness period has been extended from one till two years of sickness
2006	The WAO is replaced by the WIA: distinguishes between fully and long-lasting disabled (IVA) and the
	temporarily disabled and/or partially disabled (WGA)

# 3.3 Evidence on pathways into retirement

As most workers exit the labour market several years before the official old-age pension age, Kohli and Rein (1991) formulate the concept of 'pathways into retirement'. A pathway can be defined as a combination of institutional arrangements to manage the transition process between exit from work and entry into the old-age pension system. Typically, institutional arrangements that were originally constructed for purposes other than early exit are used as pathways into retirement. In France, UI was the typical pathway into retirement; in Germany both UI and DI; in the Netherlands, both UI and DI as well as 'official' pay-as-you-go early retirement schemes.

<sup>&</sup>lt;sup>11</sup> The first group consists of employees with a disability degree between 80 and 100%. Recovery is ruled out or cannot be expected within five years. The second group has a disability degree between 35 and 80%.

During the 1970s and 1980s, UI and DI were made more easily accessible for older workers in many countries. For instance, in Sweden unemployed persons above age 63 would receive a disability pension without medical justification. Some countries facilitated early exit through the old-age pension scheme. For instance, in Germany a work-history condition allowed workers to retire at age 63. Sickness benefits and social assistance were also used as early exit routes in several western countries (e.g., the Netherlands). In the following we discuss the empirical literature addressing the different pathways into retirement.

#### 3.3.1 Substitution between DI and UI

Substitution between DI and UI is a general phenomenon in many western countries, i.e. not specifically linked to elderly workers. A substantial literature has focussed on the degree of hidden unemployment in the DI scheme in the Netherlands. Explicit estimates – ranging from 10 to 50% – were provided by Aarts and de Jong (1992), Westerhout (1996), and Hassink et al. (1997). However, according to recent estimates, various reforms during the 1990s and early 21st century have led to a substantial decline in the degree of hidden unemployment in DI enrolment to a point where there is almost no substitution left (Koning and van Vuuren, 2007; 2009). Note that it might still take decades until the *stock* of DI recipients is freed from hidden unemployment. It is similarly expected that the 'use' of DI as an early exit scheme has practically halted by now.

In the German policy debate, it has been often suggested that the DI and UI schemes are exchangeable pathways into permanent retirement. Riphahn (1997) however rejects the hypothesis of full substitutability. In particular, the two schemes are not equally sensitive to individual health and aggregate employment measures. The author is even quite sceptical in general on the impact of the labour market on the utilisation of DI. Dahl et al. (2000) reject the hypothesis that disability and unemployment are exchangeable pathways into retirement for older Norwegian workers in the period 1989-1995.

Rejection of the hypothesis of 'full substitutability' implies that the reform of one scheme should imply an increasing participation rate. On the other hand, most empirical studies are based on micro data sets covering a limited period in time. In the longer run, the full substitutability hypothesis may still be valid, taking into account that social security arrangements can – either formally or informally – be adjusted.

#### 3.3.2 Substitution between DI, UI and ER

Kerkhofs et al. (1999) estimate a competing risk model for the transition from work to ER, DI and UI schemes for the years 1993-1995. The attractiveness of the different schemes is characterised by (i) the replacement rate, (ii) an eligibility indicator for the ER scheme, and (iii) a 'waiting time indicator' for this scheme. The ER schemes considered in this study are not actuarially adjusted over different retirement ages, implying that the estimated coefficients on the replacement rate represent an effect of the implicit tax rate on the labour force participation decision. The second and third indicator are likewise related to the lack of actuarial adjustment,

as retirement before the ER eligibility age would mean a complete loss of ER entitlements. The authors find that high replacement rates in DI and UI schemes reduce the individual propensity to retire early through the official ER schemes. Second, they find that the ER scheme seems to be preferred over the two other schemes (after controlling for replacement rates). Yet, health is the most important determinant of transitions into DI and UI, whereas financial incentives are the most important determinant of transitions into the official ER scheme. This is consistent with findings for the US (Bound et al., 1991).

Using the same data set to estimate a structural dynamic model of retirement behaviour, Heyma (2004) finds that restricting DI leads to more pressure on UI. Reforms in the pension scheme are shown to increase pressure on both DI and UI. The author concludes that policies aimed at changing attitudes towards retirement seem necessary to increase labour participation of the elderly.

In an earlier study, Woittiez et al. (1994) showed that early retirement and DI are preferred exit routes from the labour market, whereas UI is subject to a so-called 'stigma effect'. Using data for the period 1986-1992, the authors find relatively small substitution effects between the different schemes. Simulations indicate that a reduction in the financial attractiveness of a scheme mainly leads to a higher participation rate, and that spill-over effects to other schemes are of limited size.

Using survey data for the 1990s and early 20th century, Schils (2008) compares labour force exit rates for workers aged 50 to 65 years in Germany, the UK, and the Netherlands. The author distinguishes between three different pathways: ER, 'social security' – either DI or UI – and 'inactivity' – i.e. not receiving any of these benefits. Estimating a multinomial Logit model, she concludes that social security pathways and ER act as communicating vessels in Germany and in the Netherlands, but less so in the UK.

#### 3.3.3 Substitution between DI and ER

In the U.S., the DI enrolment rate for individuals aged 45 to 64 has increased from 4.5% in 1983 to 6.7% in 2005. In 2005, 12% of the 64 year old Americans were receiving DI benefits. A part of this increase is thought to be a direct consequence of the 'pathways concept'.<sup>12</sup> The 1983 Social Security reform reduced the generosity of public old-age pensions in the U.S. by both increasing the full retirement age and increasing the penalty for claiming benefits at the early retirement age of 62. This has made the DI pathway to retirement relatively more attractive. Duggan et al. (2007) indeed find that DI enrolment has significantly increased as a consequence of the reform. Estimates indicate that each \$5000 decline in the present value of old-age pension benefits increased DI enrolment by 0.4%-points for men and 0.8%-points for women.

<sup>&</sup>lt;sup>12</sup> Note that the official name of the American DI scheme is Social Security Disability Insurance (SSDI). Autor and Duggan (2003) link the increased use of DI to rising replacement rates for low-skilled workers, and Black et al. (2002) demonstrate that the recessions in 1991 and 2001 increased pressure on DI.

According to the authors, the aggregate DI enrolment figure of 45 to 65 year olds would be more than a percentage point lower were it not for the reform.<sup>13</sup>

# 3.4 An empirical analysis for the health care sector

This section is based on administrative data from the pension fund of the Dutch health care sector (PFWZ, formerly PGGM). It is the second largest pension fund, providing pensions arrangements to more than 2 million employees in the health care and social work sector and retirees who have previously worked in these sectors. We try to gain some more insight into the development of substitution between Disability Insurance and official early retirement schemes. The many reforms discussed in section 3.2 may well have put a halt on such substitution. Have the pathways into retirement been closed down?

#### 3.4.1 Early retirement and disability in the health care sector

The early retirement scheme of the health care sector went thought the reforms described in Section 2.1. During the 1990s all sectors of industry planned and announced a transition from an actuarially unfair system, the so-called VUT, to an actuarially fair system. The health care sector started the transition on January 1, 1999. They were the second group of employees to be confronted with the switch; civil servants were the first group as their transition started on April 1, 1997. Concerning disability, the reforms described in section 3.2.2 apply to all workers, including the health care sector.

From January 1, 1999, the actuarially unfair early retirement scheme was replaced by an actuarially fair 'pre-pension' scheme. All workers had access to this so-called 'FLEX' scheme. The new benefit system offered a lower replacement rate at age 60. Moreover, early retirees did no longer accrue old-age-pension-rights.

A transitory scheme called 'OBU' was installed for workers who were born before 1949, and who would have qualified for the old VUT early retirement benefit.<sup>14</sup> This scheme is financially more attractive than the new FLEX scheme for almost all workers. Postponement of OBU results in a higher future OBU-pension. However, after age 63 no actuarial adjustments are made. During the period of early retirement, members continue to build up old-age-pension-rights. The FLEX-scheme implies a larger incentive to continue working than the OBU-scheme, since each year of postponement result in a higher future FLEX or old-age pension.

From January 1, 2006 onwards, the OBU and FLEX early retirement schemes were both de facto abolished. Since then, the pension-build-up for old-age-pension is increased and members may take up their old-age-pension in part before the age of 65 (see section 2.1).

<sup>&</sup>lt;sup>13</sup> An earlier study by Mitchell and Phillips (2000) concluded smaller spill-over effects. However this study did not exploit the actual changes in Social Security rights over different birth cohorts, and was not able to observe DI enrolment rates beyond the age of 60 for individuals affected by the reform.

<sup>&</sup>lt;sup>14</sup> The Dutch acronym OBU stands for 'OverBrUgginpensioen'.

#### 3.4.2 Administrative data

The empirical analysis in this section is based on administrative data from the pension fund of the health care sector. The data covers the period 1999-2007, and contains individual information on gender, date of birth, working hours, pension base, tenure, and pension and early retirement rights of the participants of the pension fund. The dataset contains all individuals who either receive a yearly pension overview, or contribute to the system. Former members receive a pension overview once every five years, and only appear in the dataset in 2002 and 2007.

The dataset is administered by Statistics Netherlands and it can be linked to other types of administrative data, like the Social Statistics Database (SSB).<sup>15</sup> For the analysis in this section, the administrative pension fund data is merged to the municipal population register (the so-called GBA). This administrative data contains individual information on demographic and household characteristics.

#### 3.4.3 Descriptive statistics

The number of observations increases from 150 thousand in 1999 to 330 thousand in 2006. For our purpose, the sample is restricted to individuals aged 50 to 64. The health care sector has many female employees, and the share of women in the sample is 84% in 2006. Part-time employment is very common in the Dutch health care sector, and the average hours worked equals 69% of the standard full-time job in the period 1999-2006.

The possible status of participants is divided into six groups: active (employed in the sector), stand-by-employee, sleeper, disabled, OBU-prepension, and FLEX-prepension (table 3.3). The unemployment status is not observed. The number of sleepers is large in 2002, as in that year they all received a pension overview. Since the OBU-scheme is relatively more attractive, the percentage of members who use the FLEX-pension-scheme increases from 0% in the period 1999-2002 to only 0.8% in 2005. Therefore, we will focus on substitution between disability and the OBU early retirement scheme in the next subsection.

<sup>15</sup> The core of the SSB consists of linked registers with demographic and socio-economic data. There are also SSB satellites which describe a certain topic in more detail. By linking the registers a large number of data on persons, jobs, and benefits become integrally available and can be used to compile statistical overviews. Because the information is linked for several years, people can be followed in time.

Table 3.3 Labour-market status individuals age 50-64, 1999-2006 <sup>a</sup>									
	1999	2000	2001	2002	2003	2005	2006		
Observations	154569	180324	180661	259853	250978	246096	327030		
Status	%								
1:= Active in sector	76	74	77	64	73	87	71		
2:= Stand-by-employee	<sup>b</sup> 4	3	3	2	3	3	2		
3: = Sleeper <sup>c</sup>	2	9	1	16	3	5	4		
4: = Disabled	11	8	10	10	13	1	11		
5: = OBU-prepension	7	6	9	7	9	4	12		
6: = FLEX-prepension	0	0	0	0	0	0.8	0.4		

<sup>a</sup> Due to a recording problem for the year 2004 the data for that year will not be used in the analysis.

b Stand-by-employees are employed based on call-up contract.

<sup>C</sup> A sleeper is an individual under age 65 who has built up old-age pension rights, but who is currently not working in the sector.

Table 3.4   Next year's labour-market status of active individuals age 50-64 1999-2006							
	1999	2000	2001	2002	2003	2005	2006
Next year's status							
1:= Active in sector	94.5	90.8	92.7	93.7	93.5	91.1	98.4
2:= Stand-by-employee	0.3	0.3	0.2	0.2	0.3	0.3	0.3
3: = Sleeper	0.2	2.3	1.8	2.0	3.0	3.3	0.3
4: = Disabled	1.4	2.0	1.6	1.4	0.5	0.2	0.3
5: = OBU-prepension	3.7	4.6	3.7	2.7	2.4	4.8	0.7
6: = FLEX-prepension	0.0	0.0	0.0	0.1	0.4	0.3	0.1
<sup>a</sup> The status of year t+2 is imputed in case the status of year t+1 (the next year's status) is missing.							

Most workers of age 50 to 65 stay in the sector (table 3.4). Mobility, in the sense that a worker leaves the sector and becomes a sleeper, has been significant in the years 2003 and 2005. The number of individuals that started to receive a disability pension has decreased substantially over time. This is in line with the reforms in the disability scheme. The number of individuals that started to receive an OBU early retirement pension decreased over the years 2000 to 2003, but peaked again in the year before the reforms of the year 2006.

# 3.4.4 Descriptive analysis

Employees who are eligible for an OBU early retirement benefit are likely to stop working, as it is financially attractive. In case of substitution between early retirement and disability, employees who are eligible for OBU should have a relatively low probability to enter the disability scheme.

The first age at which employees may start to receive an OBU benefit is age 58 (figure 3.1). The first age to receive a full OBU benefit is 60, but from age 58 onwards employees are allowed to retire with a benefit level of 50% of the full OBU benefit. In that case, the retiree receives a 50% benefit level at age 58, 59, 60 and 61, and from age 62 onwards he starts to receive the full benefit. Less than 5% of the employees at age 58 or 59 decides to retire at these ages. This is not surprising, as the net income reduction is substantial. But the option of retiring

at age 60 seems an 'offer you cannot refuse'. Almost 70% of the working employees at age 60 decides to retire at this age.



Figure 3.1 Hazard rate into OBU early retirement by age for those being eligible <sup>a</sup>





<sup>a</sup> The hazard rate is defined as the probability that an individual will receive an OBU early retirement benefit at age a conditional on being active at age a-1. The figure presents the so-called Kaplan-Meier estimator of the hazard rate.

The DI hazard rates change substantially between 2001 and 2005 (figure 3.2). The conditional probability of entering DI in 2005 is for all ages less than a quarter of the same probability in 2001. This is likely related to the many reforms discussed in section 3.1.3. The decline in hazard rates for higher ages could be a consequence of individuals exiting the labour market using the early retirement scheme. The hazard rates of disability are not very different for employees who are either eligible or non-eligible for the OBU early retirement scheme. For the years 1999 and 2001, we see a substantial drop in the probability for those being eligible for the OBU scheme at age 60, which is exactly the age at which the probability to enter the OBU scheme peaks. The most striking observation is however the severe decline in disability
enrolment, which takes place both for eligible and non-eligible workers for OBU early retirement benefits. It seems that the DI early exit route has been closed down.

# 3.5 Conclusion

In the Netherlands, the official early retirement schemes have been substantially reformed. Conditions are now actuarially fair. Many empirical studies have shown that both DI and UI have functioned as early exit routes into retirement as well. This is a form of moral hazard. It raises a question about the classical trade-off between insurance and moral hazard. More insurance will attract more moral hazard, and less insurance increases risk, which can be undesirable from a social point of view. In the Netherlands, the inflow of hidden unemployment (retirement) in DI seems to have halted. DI is largely closed off as an exit route, and there are strong financial incentives for partially disabled to continue participation. One may however ask whether older workers are sufficiently insured by DI. The admittance to DI benefits for 'fully disabled' has become very strict. The other 'pathway' UI is used less as an exit route among 60-64 years old, and its use is now comparable to other age groups. However, as a result of the reforms of DI and early retirement schemes, pressure on UI may increase in the near future. It runs the risk of becoming the alternative early retirement scheme. Indeed, unemployment duration in the Netherlands is relatively long. RETHINKING RETIREMENT: ALTERNATIVE PATHWAYS INTO RETIREMENT

# 4 Savings, pensions and labour supply

## Rob Euwals, Mauro Mastrogiacomo, Ruud de Mooij, Raun van Ooijen

The Dutch welfare state features several forms of mandatory and tax-favoured savings schemes. The goal of such policies is to protect individuals from saving too little for lifecycle purposes. However it distorts the allocation of work effort and consumption over the life course. Moreover, individuals may invest too much in financial and too little in human capital. Precautionary saving may partly replace insurance and play a bigger role in the welfare state. The increase in efficiency due to stronger financial incentives comes, however, at the cost of less insurance.

## 4.1 Introduction

Many countries have mandatory savings for old age income provision. In recent years, these mandatory savings have been cut back and replaced by arrangements with more individual responsibility. Thereby, tax-preferred savings aim to encourage saving for old age. Moreover, countries generally adopt tax-favoured saving plans to stimulate savings. But why does the government intervene in saving choices?

In a standard life-cycle model with uncertainty, there are three reasons why households save. First, the bequest motive implies that individuals save to leave an inheritance to their heirs. Second, due to the precautionary motive individuals save to build a buffer for unforeseen negative shocks in income. The importance of precautionary savings depends on the availability of (social) insurance. Third, individuals save for life-cycle motives, such as retirement. Life-cycle motives involve foreseeable events and retirement is probably the largest foreseeable drop in income during someone's life.

If agents have perfect information and perfect foresight, agents will make efficient saving choices. In that case, there is no reason for government intervention to improve upon the allocation. Capital market imperfections may even render mandatory savings welfare decreasing if people at a young age cannot borrow against their future pension wealth.

There can be two reasons that can justify government intervention in household savings. First, households may not save enough due to a self-control problem. Individuals may not properly discount the future, for instance, because they are myopic or they have hyperbolic preferences.<sup>16</sup> Undersaving can justify government intervention, e.g. via mandatory saving or tax-favoured saving plans. Second, households may not take efficient saving decisions due to information and cognitive problems. Many people do not understand how the pension system works and how much they should save for retirement. In that case, collective saving plans may be motivated on paternalistic grounds or to save transaction costs.

<sup>&</sup>lt;sup>16</sup> Individuals that are myopic are not forward looking and live by the day. Individuals with hyperbolic preferences do take the future into account, but cannot resist the temptation of excessive consumption today. These individuals undervalue pension savings, which they regret ex-post.

In the Netherlands, the government is heavily involved in household saving, both via mandatory savings and through the tax treatment of savings. This chapter discusses these two forms of saving and tries to underpin the key motivations for it.

# 4.2 Mandatory savings

## 4.2.1 Mandatory pension savings in the Netherlands

The Dutch pension system contains three pillars (see chapter 2). The first pillar is a flat-rate state pension (AOW) that guarantees an income at the minimum subsistence level beyond age 65. The financing of the system is based on pay-as-you-go, i.e. younger generations pay for the pensions of the currently old. The second pillar involves an occupational pension that is related to average wage of the individuals over their careers. The financing of this system is based on capital funding, i.e. people save for their own pension. The system is based on a defined benefit scheme. It implies risk sharing across generations, which is welfare improving (Cui *et al.*, 2006). The vast majority of employees (over 90%) is covered by second-pillar pensions. The third pillar involves free savings or life insurance, which is based on a defined contribution scheme.

The Dutch government is involved in all three pillars. The second-pillar occupational pensions is in principle the responsibility of social partners. Indeed, different industries and firms have their own pension funds that are responsible for second-pillar pensions. The government facilitates the mandatory character of the savings by making agreements between unions and employers 'generally binding' for a whole sector of industry and for all workers therein.<sup>17</sup> Workers and firms cannot opt out from a pension arrangement for its industry, which ensures that intergenerational solidarity induced by the defined-benefit character can be sustained. The mandatory pension arrangements imply that a vast majority of Dutch dependent employees accumulate pension rights within a mandatory scheme.<sup>18</sup>

The Dutch government also facilitates the second-pillar pensions via the tax system. In particular, the taxation of the occupational pensions can be characterised as an EET-system (exempt-exempt-taxed). Contributions to the scheme are exempt from taxation, the returns on the assets in pension funds are exempt from taxation, and the pension benefits are taxed upon payment. This EET system effectively exempts savings from the income tax. Thus, it moves the Dutch income tax system in the direction of a consumption-based system, which leaves capital income untaxed. In fact, capital income is subsidized by the EET system since the income of retirees is generally lower than for employees while tax rates for retired people is lower than for those under 65. Pension savings are thus not only made mandatory by the government, but they are also subsidized. The subsidy is bound to a maximum defined benefit of 100% of the average wage during one's life. Savings beyond this are not subject to the EET system.

<sup>&</sup>lt;sup>17</sup> In Dutch this is called Algemeen Verbindend Verklaren (AVV)

<sup>&</sup>lt;sup>18</sup> Individuals with a labour income who are not a dependent employee of one of the sectors can not participate in such a scheme, except for certain professional groups.

Mandatory pensions reduce the need to save voluntarily for old age income provision. This is called displacement of mandatory for free savings. A mandatory savings rate that is too high may induce distortions if individuals are liquidity constrained and, therefore, create a welfare loss. However, lack of self control (myopia and hyperbolic discounting) and information constraints may justify a certain level of mandatory savings. Subsection 4.2.2 discusses evidence on displacement, which yields information on how individuals value pension savings. For instance, if they find pension saving important, one would expect full displacement. However, if mandatory saving is too high or people suffer from self-control problems, displacement may be lower. Subsections 4.2.3 and 4.2.4 discuss subjective data, showing how well individuals are informed about the Dutch pension system, respectively, how they rate the importance of pension savings. It offers insight in the crucial motivations for mandatory savings. Overall the results hint at considerable heterogeneity: while some individuals seem to save too little, because they are myopic or have hyperbolic preferences, other individuals seem to save too much.







## 4.2.2 Displacement

The empirical literature on the displacement effect is extensive and the estimation results vary from zero to full displacement. Most papers are however based on individual differences in mandatory pension wealth. This variation may however not be suitable to identify the causal displacement effect. Individuals with little mandatory wealth may be different from individuals with substantial mandatory wealth. Exogenous variation in mandatory pension wealth, for example due to changes in policy, helps to identify the causal effect.

To our best knowledge, four studies use a natural experiment to identify the causal displacement effect of mandatory pension savings. Attanasio and Brugiavini (2003) and Bottazzi *et al.* (2006) use the 1992, 1995 and 1998 reforms in Italy, Attanasio and Rohweder (2003) use the UK 1975, 1978 and 1981 pension reforms, and Kapteyn, Alessie and Lusardi (2003) use the introduction of the state pension in 1956 in the Netherlands. The results vary over different groups. Still most results are statistically significant. On average the displacement effect is about a half. That means that a reduction of mandatory wealth of € 100 leads to an

increase of free savings of about  $\in$  50. The flat savings profile, observed on the basis of Dutch survey data, is possibly a result of a displacement effect of mandatory pension savings (figure 4.1). Workers may not need to save for retirement as these savings are fully covered by the pension savings system. It is however remarkable that the displacement effect is less than one, individuals seem not to be willing to save themselves that much for retirement. So mandatory pensions do not fully explain the flat savings rate.

The key remaining question is, whether mandatory saving is too high from a social point of view or not. On the one hand, a high level of mandatory saving induces intertemporal consumption distortions that create a welfare loss for individuals. On the other hand, mandatory savings create commitment and relaxes self-control and information problems. The next two sections elaborate further on the latter argument.

#### 4.2.3 Information problems

One explanation why the displacement effect of mandatory savings on free savings is relatively low is that individuals have a wrong perception of their future retirement income. This section investigates one aspect of individual expectation: the section tests the consistency of the expected replacement rates with computed post-retirement income. Inconsistency between the two expectations may imply that individuals do not fully understand the pension system and eventually may underestimate the importance of retirement savings.

The expected replacement rates are around 70% (Table 4.1). This is not surprising as 70% is the target figure of most Dutch pension funds. It is considered as a sort of goal for retirement by most employees (van Els, van den End and van Rooij, 2004. Most funds have designed their contribution plans in order to get to such a benchmark for a median career worker with a full employment career. Notice that the benchmark is related to gross income and that the net replacement rate for such a median worker is higher because of the progressive tax system. Still most workers do not expect to have a full career and so the expected replacement rate should be lower than the benchmark.

The gap between the expected and computed replacement rate is particularly large for the younger generations. The older generations seem to be quite able to reach the expected replacement rate, which is close to the benchmark of 70%. Of course the older generations have more information and less uncertainty as they are reaching retirement age. Furthermore the pensions of the older generations are more often based on the last earned wage and older generations are entitled to more generous early retirement arrangements (see Chapter 2).

Statistics Netherlands (CBS) reports retirement replacement rates for several segments of the Dutch population in 2005. It is observed that the replacement rates of median income households vary from 44% (employees aged 25 to 30) to 63% (employees aged 50 to 55). We find larger gaps, due to the fact that in 2005 the policy changes described were not yet fully implemented. When these changes, together with stricter rules for early retirement eligibility, will fully be in place, the replacement rate of the youth should be expected to fall even further and enlarge the gap among generations.

The younger generations clearly overestimate their replacement rate. The large gap partly explained the pensions of the younger generations being based on average wage and partly because the younger generations are not entitled to generous early retirement arrangements. The younger generations seem not to have taken this fully into account, or at least not yet. Furthermore, van Duin *et al.* (2009) conclude that the improper knowledge about future income, rather than poor institutional knowledge, is also partly responsible for the gap of the young. Similar findings are shared by Bottazzi *et al.* (2006), who look at the reforms in Italy and confirm the inadequacy of retirement savings in Italy.

Table 4.1 Expected	and computed replaceme	nt rates <sup>a</sup>	
	Expected replacement rate	Computed replacement rate (based on current wage) b	Computed replacement rate (based on predicted future income) <sup>b</sup>
Cohort year of birth	%	%	%
1972 - 1976	73	56	48
1967 - 1971	71	57	50
1962 - 1966	72	58	52
1957 - 1961	71	58	52
1952 - 1956	69	59	55
1947 - 1951	71	66	61
1942 - 1946	70	68	66
1937 - 1941	70	67	66
1932 - 1936	69	70	69
1927 - 1931	68	72	74
Weighted average	70	64	59

<sup>a</sup> DNB Household Survey and van Duijn et al. (2009).

<sup>b</sup> The replacement rates reported by pension funds to their participants is based on current wage (the funds assume that workers remain working the same number hours and earning the same wage during the rest of their career), the computed replacement rate based on predicted future income takes into account that wages increase with age.





<sup>a</sup> Cohorts in 3-year groups, from cohort with year of birth 1938-1940 to cohort with year of birth 1953-1955.

### 4.2.4 Self control problems

Do individuals who plan to retire early really save more than other individuals? The standard life-cycle model predicts that individuals with such preferences plan their consumption and savings behaviour such that they are able to finance early retirement. Furthermore, economic theory also predicts a direct causal impact of wealth on early retirement, for example because of an unexpected increase in financial wealth.

Planned early retirement increases over subsequent generations (Figure 4.2). In particular the generations born after 1949 plan to retire at an older age. This may clearly be related to the reforms in the early retirement schemes. The new law on early retirement (VPL) was installed. An important reform took place on January 1, 2006, but policy discussions on the issue may have affected individual expectations already before this date. During the years 1994 to 1998, a rather substantial number of individuals expected to retire at age 60 or 61. The number of individuals that expects to retire at age 60 or 61 decreased over time. And now during the years 2004 to 2007, a larger number of individuals expect to retire after age 65.

Do individuals who plan to retire early exhibit other savings behaviour than individuals who do not plan to retire early? As early retirement has become more expensive after the reforms of the early retirement system the difference in behaviour should be particularly apparent in more recent years. Workers who plan to retire early in the years 2003 to 2007 have significantly more financial wealth than similar individuals in the years 1994 to 1998 (Table 4.2). Average savings more than doubled from  $\notin$  44,500 in 1996 to  $\notin$  93,500 in 2006, corrected for inflation. There is no increase in savings for workers who plan to retire later. The difference in savings behaviour between individuals who plan to retire early and late may also be reflected by the ownership of different assets. The table shows that workers who plan to retire early more often invest in stocks, annuities, employer-sponsored savings plans and house equity.

The relation between early retirement plans and wealth holdings may be affected by other factors that influence early retirement as well. Regression analysis additionally corrects for such other factors, like demographic characteristics and income. The results exhibit a statistically significant relation between planned early retirement and wealth holdings.

Workers with a higher level of financial wealth expect to retire earlier. An increase in the level of financial wealth with one yearly salary (average  $\notin$  30,000) induces workers to postpone their planned retirement age with one month. The effect is reasonably in line with the evidence presented in Chapter 2.

Workers who plan to retire early are more likely to invest in mutual funds and are not more likely to invest in annuities. This is a surprising result as annuities offer an opportunity to save for retirement in a fiscally favourable. This may be interpreted as evidence against the theory of mental accounting (see, for example, Thaler, 1990). Individuals with hyperbolic preferences may want to commit themselves to retirement savings by participation in an annuity savings plan. Instead, we find that individuals who want to retire early prefer to invest in mutual funds. An alternative asset to invest in for early retirement purposes is a life-course savings arrangement. It is not included in the empirical analysis as it is observed in the last year only, leading to too few observations. But the descriptive statistics show an interesting result: about half of the respondents that participate in a life-course savings arrangement claim to do this for early retirement purposes. This makes early retirement by far the most important purpose to participate, only one out of ten respondents claims to participate to finance parental leave and one out of eight respondents claim to participate to finance a year of leave for travelling.

The empirical regression results show that individuals who own mutual funds plan to retire about 4 months earlier compared to individuals who do not invest in mutual funds. An explanation offered by Benitez-Silva (2003) is that individuals who plan to retire early have more flexibility to overcome bad luck in their financial investments. Investments in mutual funds give a higher average return than bonds or savings accounts. If the returns are lower then expected, for example because of a burst of the stock market, individuals may decide to work longer in order to guarantee a certain level of income after retirement. Workers who plan to retire at the normal retirement are less flexible in their labour supply and are therefore less able to adjust to a negative shock in case it occurs.

Table 4.2Wealth and asset allocation by planned retirement age												
Year	1994-1	998					2003-2	2007				
	Owner	ship %		Mean (	€ 1000)		Owner	ship %		M	ean (€ 10	000)
Planned retirement age	<63	≥63		<63	≥63		<63	≥63		<63	≥63	
Financial net worth	%			44.0	45.0			%		96.2	54.2	***
Checking and saving account	97	95	**	27.3	26.4		97	98		59.1	34.3	***
Bonds	7	6		14.2	16.4		4	4		110.1	42.2	**
Stocks	12	19	***	47.3	53.8		19	14	**	34.5	27.4	
Mutual funds	21	24		21.3	20.0		25	23		30.1	22.7	
Life insurance	12	14		29.2	25.6		20	18		78.5	40.0	*
Annuity insurance	27	31		17.3	12.2	**	43	36	**	11.3	8.5	
Employer-sponsored savings	52	35	***	3.8	2.6	*	60	49	***	5.0	4.9	
House equity	70	69		193.2	198.6		76	62	***	293.7	271.9	**
Observations	707	421					538	543				

<sup>a</sup> DNB Household Survey, individuals age 50 to 64.

<sup>b</sup> The sample is split up in two groups, one group for those who want to retire early (before age 63) and one for those who do not want to retire early (age 63 or later). The table presents the percentage of individuals who own a certain type asset and the amount of wealth for those who do own a particular type of asset.

## 4.3 Tax-favoured saving plans

## 4.3.1 Tax-favoured savings in the Netherlands

The third pillar of the Dutch pension system, based on defined contribution, is open to individuals that have no access to an occupational pension scheme or those who are unable to save sufficiently via the occupational system. Those savings typically occur in a life insurance. As in the second pillar, individuals contribute to the insurance during working life and they can use the accumulated wealth to buy an annuity at retirement. Contributions and benefits are treated according to the EET rule in case it meets certain criteria. The insurance typically goes along with a survivor benefit or a guaranteed pay-out at retirement. The maximum tax-favoured contribution depends on the amount of contributions made to the mandatory occupational schemes. The insurance is used mainly by self-employed and dependent employees with limited pension rights, e.g. because they lived and worked outside the Netherlands for a certain period of their life.

Next to savings in the two pension pillars, the Dutch government facilitates other savings as well. First, Dutch citizens with a labour income can participate in the so-called life-course savings account. Savings in this account are treated according to the EET rule. The capital accumulated in the account can be used only for specific purposes, such as temporary leave from work. Indeed, the account aims to encourage household savings for periods of care, e.g. for children or other family members, and periods of study. Yet, people are also allowed to save for early retirement. The maximum yearly saving subject to EET in the life-course saving account is 12% of gross income.

A third tax-favoured saving scheme competes directly with the life-course saving account. In particular, people have to choose between participation in either the life-course saving account or this alternative scheme, which we call wage-saving scheme. Individuals can save around 600 euro per year, which is deductible from the income tax, although employers pay a 10% tax on contributions. After an accumulation period of four years on a fixed account, individuals can get their income tax free. Hence, the tax system treats these savings even more favourably than under the EET, although the maximum amount of saving under this scheme is relatively small.

#### 4.3.2 Effectiveness and efficiency

The aim of tax-favoured saving accounts is diverse: some aim to stimulate personal and national savings, others are designed to support old-age pension savings and the Dutch life-course saving account aims to facilitate periods of leave. A large empirical literature has explored the impact of tax incentives on individual savings (see Hubbard and Skinner, 1996). These studies do not yield an unequivocal picture of its effect. Some studies report zero effects of tax-favoured accounts on saving rates, while others reports substantial increases in savings. Some studies suggest that saving rates increase only if a plan succeeds in creating extra saving among the low and moderate income households (OECD, 2007).

What about the efficiency of tax-favoured saving plans? Tax-favoured savings via an EET system imply that capital income remains untaxed. It transforms the income tax into a consumption based tax system. Such a system may be preferred on efficiency grounds, a government that has sufficient tax and expenditure instruments for redistribution will not find it optimal to tax capital income (Bernheim, 2002). The reason is that a consumption tax eliminates distortions in the intertemporal allocation of consumption. This holds even if society aims at an equitable income distribution. The efficiency properties of a consumption tax only hold, however, in a stylized world without other distortions.

In a second-best world, i.e. a world with pre-existing distortions, it may be desirable to tax capital income from an efficiency point of view.<sup>19</sup> One reason is that capital income taxes can mitigate distortions in human capital development imposed by the labour income tax. For instance, a redistributive tax on labour income distorts investment in human capital and provides an incentive to accumulate financial assets. Thus, households under invest in their own skills and over invest in financial capital. A tax on capital discourages the incentive to save and encourages investment in human capital. Thus, a tax on capital may help to alleviate the distortion of labour income tax on human capital formation (Bovenberg en Jacobs, 2005).

# 4.4 Free savings and labour supply

Wealth accumulation matters for retirement decisions, as we saw in chapter 2. Yet, not all lifecycle savings are geared towards the accumulation of pension wealth. Other reasons are, for instance, based on precautionary motives. It is important to understand the motives why people save and whether government involvement is efficiency enhancing.

## 4.4.1 Life-cycle saving profiles

The standard life-cycle model predicts that individuals will save for retirement income during working life. Several studies show that until about age forty or fifty the precautionary motive should be dominant. From that age onwards, the life-cycle savings motive should become dominant and the savings rate should start to increase (Carroll and Samwick, 1997, 1998, Gourinchas and Parker, 2002).

Empirical evidence for the Netherlands does not confirm the prediction that savings increase with age. Figure 4.1 shows the development of free saving and wealth accumulation (i.e. excluding pension and housing wealth) of Dutch households over their life cycle. The data are based on the DNB household survey. We see that free savings in the Netherlands do not increase with age. Moreover, savings do not decrease after retirement.<sup>20</sup> As income increases with age, the savings pattern even implies a decreasing savings rate as a percentage of income over the age profile. An explanation for the relatively flat savings profile over the life cycle is

<sup>&</sup>lt;sup>19</sup> For a comprehensive overview, see e.g. Banks and Diamond (2008).

<sup>&</sup>lt;sup>20</sup> This is consistent with other empirical findings, see Alessie et al. (1999).

the substantial mandatory pension wealth of Dutch households. Indeed, mandatory pension savings may have displaced free savings.

Figure 4.1 reveals no notable change in free savings over subsequent generations. That is to say, for every cohort measured by year of birth, the savings profile over age is about the same as the profile for the previous cohort. There is a sharp increase in the level of private wealth, however, over subsequent generations. Private wealth for someone aged 55 born in 1945 is about  $\notin$  31,000, while for someone born in 1955 private wealth is about  $\notin$  47,000 (corrected for inflation). The large increase in private wealth implies that younger cohorts have accumulated more wealth. It is consistent with the positive free savings rate over the subsequent generations, which has led to more private wealth.<sup>21</sup>

Table 4.3 shows the portfolio of individuals' wealth. The share of stocks and mutual funds increased substantially since 1995 and reached a maximum in 2001 and 2002. After the stock market crash of 2001, it decreased somewhat. Participation in annuity insurances increased until 2002 and stayed constant thereafter. The life-course arrangement was introduced in 2006 and first covered by the DNB Household Survey in 2007. Between 9% (in 2007) and 11% (in 2008) of the workers participates is the an arrangement.

Table 4.3	Asset ownership, 1995-2008 <sup>a, b</sup>	)		
	Stocks	Mutual funds	Annuity insurance	Life-course
				arrangement
	%			
1995	9	14	18	
2001	15	28	28	
2005	11	21	30	
2006	13	21	29	
2007	10	20	28	9
2008	11	16	29	11
<sup>a</sup> DNB Househ	old Survey, individuals age 25 to 64.	sat		

## 4.4.2 Savings motives

It is not easy to identify different saving motives, i.e. the role of precautionary savings, lifecycle savings and savings to leave a bequest. Studies based on income and consumption data do not reach a consensus on the importance of life-cycle pension savings (Gan *et al.*, 2004 and Ventura and Eisenhauer, 2006). Recent studies have therefore started to use subjective data on savings motives. In particular, some studies have actually focussed on the relevance of precautionary savings (Kennickell and Lusardi, 2006). Results are far apart and show that the contribution of precautionary savings to total wealth accumulation ranges from 2% (Arrondel,

<sup>&</sup>lt;sup>21</sup> From the figure it is not clear whether this is a cohort or a time effect; the prosperous economic circumstances during the last decade is likely to have contributed to the accumulation of private wealth. The current developments on the stock market will have the opposite effect.

2002) to 50% (Gourinchas and Parker, 2002). As a consequence pension savings are also appointed different relevance depending on the study being discussed. Furthermore, the life-cycle savings motive includes more than pension savings alone. Subjective data on savings motives and savings intentions helps to identify the different motives. Savings motives are measured on the basis of questions like 'how important is savings for retirement?', while savings intensions are measured on the basis of questions like 'how much did or will you put aside in order to be able to retire earlier?'

Studies using subjective information on savings show that savings for retirement are important in the US and Japan. Pension savings amount to 20 to 25% of total savings. On the basis of the Japanese Government Survey, Horioka and Watanabe (1997) find that Japanese respondents in particular save for retirement. On the basis of their data they are able to identify how much an individual saves for a particular motive. About 25% of total savings is reserved for retirement. Other important savings motives are housing, 20% of total savings, and illness, 14% of total savings. Education and marriage are important motives to save as well. On the basis of comparable US data, Horioka *et al.* (2000) conclude that about 20% of total savings of US citizens is reserved for retirement.

Empirical evidence for the Netherlands suggests that retirement is an important motive to save. In the DNB household Survey, respondents are asked how important a number of savings motives are in a scale from 1 (very unimportant) to 7 (very important). The motives include, for example, savings to repay debts, to buy durables, to buy a house, precautionary savings and savings to supplement future pension income. Figure 4.3 shows two selected life-cycle motives: retirement savings and saving to purchase durables. It reveals that respondents of each age and cohort find saving for retirement almost as important as buying durables, whereby the young find durables more important than retirement. Clear age or cohort effects are not present in the retirement motive. This is in line with the flat savings profile of Figure 4.1.





<sup>a</sup> The importance of a savings motive varies from 1 (very unimportant) to 7 (very important), cohorts in 7-year groups, from cohort with year of birth 1928-1934 to cohort with year of birth 1970-1976.

Table 4.4 shows the ranking of saving motives according to the survey. We see that savings for retirement are felt as being relatively important. Other life-cycle savings motives, like savings to buy durables, to pay children education and to buy a house rank lower. Yet, precautionary savings are more important than saving for retirement. The ranking holds for both the young and the old. The gap in importance for the precautionary and retirement savings motive is smaller for the old, but still the different remains. This is at odds with theoretical predictions, which claim that for age forty to fifty onwards life-cycle savings should be more important.

The ranking of the savings motives is likely to be affected by many aspects, like household situation and mandatory pension savings. Corrections for such underlying characteristics leave the ranking however unchanged. Alessie *et al.* (2009) use regression analysis to relate the savings rate to the different savings motives. Due to the high correlation among several related motives they group the motives in 4 different factors: precautionary savings, bequest, retirement savings and other intertemporal savings. Using Social Judgement Theory (Cooksey, 1996) they conclude that about 20% of free savings is being put aside for retirement, while 36% is for precautionary motives. The result is in line with Bernoth and van Rooij (2005), who also shows that in the perception of Dutch households the retirement motive is important but nevertheless the precautionary motive is more relevant.

Table 4.4     Ranking of savings motives <sup>a, b</sup>			
	All ages	Age 25-45	Age 45-65
Pure precautionary savings	5.4	5.5	5.3
On bank account to repay debts	5.1	5.0	5.1
Health related precautionary savings	5.0	5.0	5.0
To supplement future pension	4.8	4.7	4.9
To supplement future AOW	4.5	4.4	4.6
To buy durables	4.3	4.4	4.2
To pay children education	3.8	4.4	3.1
Unemployment rd precautionary savings	3.6	3.9	3.3
To generate interest and dividends	3.1	3.1	3.2
Gifts to grandchildren	2.9	2.8	3.0
To buy house in the future	2.8	3.4	2.3
Money to children	2.6	2.6	2.6
To set up business	1.9	2.2	1.6
<sup>a</sup> DNB Household Survey, individuals age 25 to 64.			
<sup>b</sup> The importance of a savings motive varies from 1 (very unimp	ortant) to 7 (very import	ant).	

#### 4.4.3 The role of sole insurance in the welfare state

Insurance and saving and borrowing are two ways to deal with risk. In principle, insurance is the most efficient way to reduce uncertainty due to health or employment risks. Insurance contracts, however, are incomplete. Hence, they give rise to moral hazard. The government therefore faces a trade-off between insurance and moral hazard.

Two properties of a risk determine how complete an insurance contract can be: verification and exogeneity. If a risks is exogenous and claims can be verified by the insurer, a complete contract can be concluded. Full insurance would then be efficient. People would then have no reason to engage in precautionary savings. Yet, the combination of endogenous risk and nonverifiability makes insurance vulnerable to moral hazard. In the extreme case of risks that are fully endogenous or if ex-post verification is impossible, moral hazard is such a serious threat so that insurance becomes impossible. In that case, sole insurance via saving and borrowing.

Most risks are partly endogenous so that a combination of collective insurance and sole insurance is optimal.

In light of the limited insurability of unemployment risk due to endogeneity and verification problems, it is sometimes suggested to substitute unemployment insurance by individual savings accounts for unemployment, (Orszag and Snower, 1997: Feldstein and Altman, 1998; Bovenberg and Sorensen, 2004). With individuals' savings accounts, part of the insurance premium is replaced by a mandatory contribution that is credited to an individual public account on which a person receives interest. During a period of unemployment, individuals are allowed to draw money from their account. If a person is short of funds during unemployment, he/she can borrow from the government. Individuals who end up with a positive account at the end of their working life are allowed to increase their pensions. Individuals will be bailed out if they end up with a negative account at their pension age or when they die. This latter involves insurance against the risk of low lifetime income. This insurance is more targeted than under social insurance as the government no longer smoothes the intrapersonal income shocks of individuals over the lifecycle.

An individual saving account provides better incentives to avoid moral hazard than unemployment insurance. The unemployed will internalise the cost of unemployment benefits and have no incentive to increase in an inefficient way the frequency or duration of unemployment spells. In that sense, they provide liquidity insurance more efficiently. These efficiency gains, however, originate from lower insurance. Furthermore, the bail out of those who end up with a negative balance the moral hazard problem. To combat moral hazard with the public bail out, savings should be mandatory. Mandatory savings, however, would imply that many people accumulate an inefficiently large stock of capital to cover the potential future risk in their human capital. Which today can not undo in their free savings.

Stiglitz and Yun (2005) find that a combination of contribution-funded individual savings and tax-funded social insurance is optimal. The tax-funded share is found to decline with the moral hazard effects and to increase with the magnitude of the risk and the degree of risk aversion. For the Netherlands, Jongen and Van Vuren (2008) find that the introduction of a

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savings account for unemployment risk improves welfare if unemployed are credit constrained. Without such constraints, both mandatory saving and insurance become less valuable.

## 4.5 Conclusion

The Netherlands features a high level of mandatory savings and tax-favoured savings. They protect workers from saving too little for lifecycle purposes. However, many individuals end up with a positive amount of wealth. Mandatory savings may have forced them to save in periods of their life in which they did not want to. For example, at young age individuals may be liquidity constrained, but to want to have more time for family or for education. Mandatory savings gives such individuals less room to fulfil their preferences. Tax-favoured savings increase the return on investments in financial capital and therefore distort the investment decision. In particular, individuals invest too much in financial wealth and too little in human capital. Integration of pension savings with other saving schemes that offers liquidity earlier in life may welfare enhancing for many individuals. Moreover, the abolishment of tax- flavoured savings may mitigate lifecycle distortions, such as those of learning.

Lower mandatory and tax-favoured pension savings may also leave room for more sole insurance via precautionary savings. It can partly replace insurance. The retirement age can then function to absorb shocks. Individuals who end up with a larger amount of wealth than expected may retire early, while others who end up with a smaller amount may need to work longer. The increase in efficiency due to stronger financial incentives comes, however, at the cost of less insurance. This calls for special attention for jobs with a large exogenous risk, like physically demanding jobs.

# 5 Pension-age reform in a life-cycle model

## Frank van Erp, Paul de Hek

Adjusting the eligibility age of first-tier pension benefits is frequently proposed in the policy debate on ageing. In this chapter we focus on the labour supply effects of a shift in this age. Within the framework provided by life-cycle models, we show that total lifetime labour supply increases. It reflects in both a shift in the retirement age and an increase in hours worked until age 65. Despite its theoretical elegance, life-cycle models have several limitations when used for actual policy analysis. Therefore, we discuss more broadly how an increase in the pension age is expected to affect participation applied policy analysis should not entirely rely on the model results.

## 5.1 Introduction

To meet the challenges of an ageing society, several proposals have been suggested to stimulate the labour-market participation of elderly workers. For instance, people have suggested a rise in the eligibility age of state pensions, an abolition of actuarial unfair early retirement schemes, inwork tax credits for older people, and a removal of the exemption of social security premiums of elderly. It is difficult to assess the labour-market impact of these policy reforms. First, policy may affect behaviour over the entire life cycle. For instance, a shift in the pension age will not only affect people close to eligibility for pensions, but also may change consumption or labour supply behaviour of people earlier in life. Second, reforms generally consist of a package of institutional adjustments, each with its own economic effect. The higher pension age does not only a higher eligibility age for state pension benefits, but may also imply a shift in the age of compulsory dismissal, a change in occupational pensions, and a change in the time-paths of age-dependent taxes and social security premiums. Third, different people will be affected in different ways. This makes it difficult to assess the aggregate impact of the reforms.

This chapter assesses the economic effects of a shift in the eligibility age of first-pillar pension benefits from the current age of 65 towards a new age of 67. To that end, we present a brief overview of the economic literature on this reform in section 5.2. Subsequently, we adopt a recently developed life-cycle model to analyse the reform. The model describes the main interactions between institutions, consumption labour-supply and savings over the life cycle. It is calibrated on the basis of empirical elasticities reported in the literature and data on exit patterns in the Netherlands. With the model, we simulate the labour-supply effects of a higher pension age. Moreover, we decompose the total effect into different components of the reform and look at the behaviour of different age groups.

The life-cycle model is attractive to understand how policy reforms such as an increase in the retirement age, influence incentives and economic outcomes. However, we also emphasise the limitations of the life-cycle model. For example, the model only contains a household sector and no general equilibrium interactions between supply and demand. Moreover, the model abstracts from uncertainty, which excludes precautionary savings. Agents are also fully rational and forward looking, which implies that they ignore behavioural aspects. In presenting the economic effects of actual reform proposals in the Netherlands, CPB therefore supplements the analysis with other information obtained from empirical studies. We present this at the end of this chapter, which also puts the simulation results in a broader perspective.

## 5.2 Literature review of pension-age reform

A few countries are raising or planning to raise the normal retirement age (NRA)<sup>22</sup> in order to prepare for the expanding costs of ageing. Table 5.1 provides an overview of the policy reforms

Table 5.1	International comparison of changes in the norm	al retirement age	
Country	NRA old	NRA new	Transition period
Denmark	65	67	2024-2027
Germany	65	67	2012-2030
Japan	60	65	2013-2025
United Kingdo	m 65	68	2026-2046
United States	65	67	2003-2013

of a selected number of countries. Due to the limited available amount of data, as only one country just recently raised its normal retirement age, studies that provide an ex-post evaluation of an increase in the normal retirement age are limited too. Below we discuss two studies that do provide us with such an ex-post evaluation. In addition we discuss a few studies that engage in ex-ante evaluations of the proposed policy reforms. These studies use economic models to calculate the effects on labour force participation of various policy reforms.

## 5.2.1 Ex-post evaluations

In 1983, the U.S. Congress implemented an increase in the Normal Retirement Age of two months per year, starting in 2003.<sup>23</sup> Each two-month increase translates into a little more than a 1%-point reduction in Social Security benefits. The NRA is scheduled to reach age 66 in 2009, stay at that level for 12 years, and later resume the increase until it reaches age 67. Mastrobuoni (2006) provides the first ex-post evaluation of the reform, studying the effects of an increase in the NRA on recent retirement behaviour. The study uses the Current Population Survey (CPS) 1989-2006 to compare the retirement behaviour of workers born in 1938, 1939, and 1940 with the retirement behaviour of previous cohorts. Based on this comparison, the author concludes that the younger cohorts, those that experienced a reduction in benefits, delayed their

<sup>23</sup> Furthermore, a delay retirement credit was introduced, while the income earnings test was relieved.

<sup>&</sup>lt;sup>22</sup> The normal retirement age is defined as the retirement age at which full pension benefits apply. In some countries, like the United States, early access (eligibility age) to these benefits is possible, but results in a discount on the benefits. In the Netherlands, early access to state pension benefits is not allowed and so the commencement date is the same as the normal retirement age.

retirement. Point estimates imply an increase in the actual age of retirement of about 50% of the increase in the NRA for both men and women, aged 62-65. That is, a rise in the NRA of 2 months yields an increase in the actual age of retirement of about 1 month. The labour force participation rate (LFPR) for older men in the United States declined for much of the twentieth century. However, this long downward trend ended in the 1980s. More recently, the LFPR of men in some age groups began to rise. Blau and Goodstein (2007) quantitatively assess alternative explanations for these trends, including the Social Security reform. Combining data from the CPS, the Survey of Income and Program Participation (SIPP), and the Social Security Administration (SSA), they generate a synthetic panel data set spanning the period 1962 to 2005. The empirical analysis provides an alternative explanation for the recent increase in labour force participation: changes in the education composition of the older male population. Low-participating high school dropouts have been rapidly replaced in recent years by higher-participating college attendees and college graduates. This trend can explain the entire increase in the LFPR of older men in recent years<sup>24</sup>, and the results are quite robust. However, concerning the effect of increases in the NRA, these effects are sensitive to specification; some of the estimates suggest that these effects may have been important while others do not.25

## 5.2.2 Ex-ante evaluations

Ex-ante evaluations of a shift in the official retirement age rely on the use of applied economic models based on past behaviour. Gustman and Steinmeier (1985), for example, construct a structural life-cycle model. The parameters for the model are estimated by a maximum likelihood estimation procedure using a sample drawn from the Retirement History Survey, consisting of white male employees age 60 and older. The model assumes rational agents blessed with perfect foresight. This implies that policy changes that become effective at a certain age will also induce behavioural responses at earlier ages. That is, changes in consumption and leisure are smoothed over the life cycle. Gustman and Steinmeier (1985) analyse the long-run effects on the labour supply of older workers of the 1983 Social Security reforms. In particular, they examine the effects of three separate provisions from the 1983 amendments, viz., the raising of the NRA to 67, the increase in the delayed retirement credit, and the adjustment of the earnings test. The simulations suggest two principal effects. First, the peak of retirement activity at age 65 is reduced somewhat and spread over later years. Second, while total work activity at 65 will be increased slightly, the fraction of individuals over 65 working part time falls relative to the fraction working full time. Using a more elaborate model, Gustman and Steinmeier (2006) have redone the above analysis in the case of white married male employees age 60 and older. This study yields similar results. Based on this study, we

<sup>&</sup>lt;sup>24</sup> Note that this compositional effect is not a fundamental explanatory factor

<sup>&</sup>lt;sup>25</sup> While Mastrobuoni (2006) estimates the 'treatment effects' of these changes, the approach of Blau and Goodstein (2007) forces the effects of NRA increases to operate through their impact on the Social Security benefit. The latter approach, therefore, does not pick up effects of NRA increases that operate through other channels, e.g. by altering social norms or implicit advice from the government on when to retire.

have calculated the effect on the average retirement age of the shift in the NRA with 2 years. Given some extra assumptions, this calculation resulted in an increase in the average retirement age of around 2 months, or 8% of the increase in the NRA.

Fields and Mitchell (1984) examined various potential changes in the pension system, including the raising of the NRA (from 65 to 68), using reduced form estimates of retirement equations. The behavioural parameters of the model are estimated from a sample of white married male employees at the age 59 and older. These parameters indicate that the increase in the NRA with three years induces an increase in the average retirement age of 1.5 months, or 4%. In a similar study, concerning older dual-earner couples, Mitchell (1991) finds that raising the NRA (this time from 65 to 67) results in increases in the average retirement age of 2 months (8%) for men and 0.5 months (2%) for women.

#### 5.2.3 Discussion

The ex-ante evaluation studies typically find a small effect on the average retirement age of less than 10%. This effect is primarily a wealth effect. The increase in the official retirement age is basically a lowering of the pension benefits. This lower income at the retirement stage is spread evenly over the life cycle: the rational agents increase savings to finance their early retirement. This small effect is in line with the empirical literature concerning the wealth effect on early retirement, see Section 2.1 for a more extensive discussion.

These studies, however, do not take account of the possible role of the official retirement age as a social norm. People may base their decision on their (expected) retirement age partly on the official retirement age.<sup>26</sup> This is a potential explanation of the significantly larger effect on the average retirement age as found in one of the ex-post evaluation studies. Brown (2006), however, finds for the U.S. that the pattern of actual retirement ages strongly resembles the pattern of conventional retirement ages (i.e., the retirement ages that people conceive of as common). And he finds no evidence that these conventional retirement ages are changed as a result of the increases in the NRA. An alternative explanation for the relative large effect in Mastrobuoni (2006) is that this effect concerns the short-run effect where people did not (yet) adjust their behaviour at younger ages. Over time, then, people will have more time (and/or become more aware) to adjust their consumption and leisure choices to the new situation.<sup>27</sup>

## 5.3 Simulating a higher pension age in a life-cycle model for the Netherlands

Inspired by the just reviewed literature, the CPB has recently developed an empirical life-cycle model in order to provide additional insights in the reallocation of consumption and labour supply over the life cycle, in particular concerning the Dutch situation.<sup>28</sup> Although this model is

<sup>&</sup>lt;sup>26</sup> Or, as suggested by results from a recent Dutch survey (DNB, 2008), a significant part (40%) of the people base their planned retirement age entirely on the official retirement age.

<sup>&</sup>lt;sup>27</sup> Although the policy reform was announced far in advance, in this view many people are not fully aware of the reform until much later.

<sup>&</sup>lt;sup>28</sup> De Hek and Van Erp (2008) contains a more elaborated description of this model, its calibration and simulation properties.

calibrated on Dutch data, it still has a highly theoretical and partial nature, as exemplified by its far-reaching simplifying assumptions such as full rationality and perfect foresight of economic agents and its unilateral focus on the supply-side of the labour market. However, despite these limitations, the model has proved to be an adequate starting point to explore and understand the backgrounds of life-cycle behaviour. In this section, applied to a postponement of the commencement date of first-tier pension benefits from age 65 to 67, we demonstrate some of these insights.

For instance, we show that people tend to smooth the effects on consumption and labour supply of the considered policy reform over their entire life. The underlying forces of this reallocation pattern consist of wealth effects, income effects, intertemporal substitution effects and intratemporal substitution effects.

A second example of these insights concerns the impact of private financial wealth as an argument in the utility function – reflecting a bequest motive – on people's choices. For example, it affects the incentives concerning intertemporal substitution via its impact on effective wage rates. Before discussing these issues we first describe the highlights of the applied model in the next section.

From the point of view of Dutch institutions, the policy reform of raising the commencement date of first-tier pension benefits from age 65 to 67 consists of – at least – three underlying, more or less interdependent measures. The first, obvious measure concerns the aforementioned shift in the commencement date with two years. Second, in order to offer the opportunity to postpone retirement to all individuals, the same upward shift in the age of the statutory dismissal (as mentioned in collective labour agreements) is required. Third, according to Dutch institutions, Social Security premiums for national and employees insurances are paid until the commencement date of first-tier pension benefits. In this respect a shift of the commencement date simultaneously results in an extended period of Social Security contributions. After presenting the highlights of the life-cycle model, the partial effects of these three underlying measures are separately described in the next three sections. Thereafter, we focus on the combined effect of these three reforms.

So far, the just described decomposition of this policy reform ignores adjustments in the second-tier pension scheme. The results of an extended policy reform including the same upward shift in the pivot age of second-tier pensions and a corresponding cut in the common pension premium to obtain a balanced budget of pension funds are briefly described. Next, this policy reform may result in an altered government budget. In order to assess the effects of a balanced budget policy reform, we report the additional effects of, as it turns out, a cutback in the tax rate on labour income.

Finally, we conclude the analysis with the CPB life-cycle model by aggregating both balanced budget exercises into one almost full balanced budget simulation.

## 5.3.1 A bird's eye view on the CPB life-cycle model

The starting point of the CPB life-cycle model is the standard life-cycle model as in Yaari (1965} and Hurd (1989). This standard model yields predictions of consumption trajectories of individuals over their life cycle. In order to generate labour supply profiles this standard framework is augmented by the participation and the hours worked decisions (extensive and intensive margin). In this respect the CPB model deviates from the mainstream literature, such as French (2005) and Gustman and Steinmeier (2005) in which the participation decision or the hours worked decision is exogenous. In these models the participation and hours worked decisions are often a joined decision where the number of hours worked is limited to full time, part time or not working at all. The last alternative is equal to not participating. Aside from lifetime uncertainty, the CPB life-cycle model assumes perfect foresight and no uncertainty about the future, e.g. wage rates, taxes etc. In addition, to mimic empirical age-profiles of consumption and wealth, the model contains a bequest motive.

Rational agents optimize their lifetime utility, which depends on consumption, leisure and bequests, subject to a time and a budget constraint. These two constraints encompass the institutions and the source of heterogeneity between individuals.

Apart from consumption expenditures the budget constraint discerns labour income, firsttier pension benefits, second-tier pension scheme (premiums and benefits) and age-dependent taxes and Social Security premiums.

By definition, labour income depends on the number of hours worked and the wage rate. Reflecting the contents of many Dutch collective labour agreements, the model contains a statutory retirement age. That is, once individuals reach this age, and are still employed, they face a dismissal. However, in order to describe observed labour supply after the statutory retirement age (in the model imposed at age 65), two jobs are distinguished: a main and a second job. The main job requires a minimum amount of hours worked and its corresponding wage profile rises until age 50. From there on, it is flat until the age of quitting this (main) job. After quitting the main job, individuals receive second-tier pension benefits and additionally may accept a new job. However, we assume that this second job returns a substantially lower wage rate which also gradually declines over time. There are two reasons behind this supposed drop in wages. First, this may reflect the falling productivity of the elderly. This is not reflected in the wage rate of the main job, suggesting that wages of the elderly are higher than their productivity,<sup>29</sup> but manifests itself once the agent takes a new job. A second explanation of the wage drop concerns a loss of firm-specific human capital that may occur if a person changes jobs (see chapter 6 for a survey of theories regarding the wage profile).

<sup>29</sup> Discrepancies between wage and productivity over the life cycle may arise for different reasons, for example due to the presence of implicit contracts. See e.g. De Hek and Van Vuuren (2008).

The first-tier pension benefits are a lump-sum transfer starting from age 65 and are independent from current and/or historical labour income.<sup>30</sup> This pension benefit is paid by the government and financed by taxes and Social Security premiums (PAYG-system).

The second-tier pension benefits are paid by pension funds and related to historical labour income (defined benefit pension scheme). In line with Dutch institutions this pension scheme has a common pension premium and so, in general, is not actuarial fair. Furthermore, and also reflecting Dutch institutions, pension premiums are tax-deductible, while pension benefits are taxed (EET-scheme). For sake of simplicity we assume that pension premiums are only levied on labour income of the main job.

A simple age-dependent tax and Social Security system describes the highlights of the Dutch fiscal system. Until and including age 64, individuals pay income taxes and Social Security premiums. After turning age 65, labour income is exempted from Social Security premiums. So, looking at the aggregate of taxes and premiums, the tax rate on labour income is age dependent. Besides labour income, consumption and financial wealth of households are also taxed. In accordance with Dutch legislation, financial wealth of pension funds is exempted from taxation.

#### Key properties of the model

In order to understand the outcomes of life-cycle models, insight in the determinants of the effective prices (wage rate and consumer price) and the numerical relation between income and substitution effects is crucial.

With regard to the analysis of policy proposals aimed at the labour-market behaviour of elderly, the effective wage rate is the key variable in the CPB life-cycle model. This effective wage rate reflects the marginal revenues of labour supply including efficiency effects. Besides the traditional nominal wage rate and (age-dependent) tax rates and Social Security premiums, this effective price also depends on the features of the second-tier pension scheme and the role of bequests in this model. As the second-tier pension scheme, featuring defined benefits and a common pension premium, is not an actuarial fair pension scheme, the net balance of paid pensions premiums and present value of future pension benefits of individuals is not zero by definition. This implies that the pension scheme influences the effective wage rate. This wage rate is therefore not an exogenous variable in the model as it also depends on labour supply.

Adding a bequest motive to the model implies that individuals allocate lifetime income among consumption, leisure and private wealth.<sup>31</sup> In this respect and compared to a borrowing constraint, the bequest motive implies a weaker, but continuous influence of private wealth on consumption and leisure. Similar to a borrowing constraint, the bequest motive affects the

<sup>&</sup>lt;sup>30</sup> In this respect, this specification differs from French (2005) where benefits paid by the Social Security system depend on the retirement age and historical labour income.

<sup>&</sup>lt;sup>31</sup> That is, in the presence of a bequest motive (and mortality rates), private wealth directly yields utility in each period. Additional to the motive of smoothing consumption and leisure over the life cycle, this causes individuals to hold positive levels of private wealth over their entire life course.

intertemporal allocation through a surcharge on the (real) net interest rate.<sup>32</sup> But in contrast to a borrowing constraint the impact of bequests is not determined by a simple shadow price of the constraint, but depends on the ratio between the marginal lifetime utility of private wealth and the marginal lifetime utility of consumption. Each of these marginal utilities depends on mortality rates, amount of private wealth and consumption level. As mortality rates gradually increase over the life cycle, the influence of the bequest motive on the allocation of lifetime income grows. So, at younger ages the influence of the bequest motive is almost negligible, while it becomes significant at older ages. Regardless of the mortality rates, a large marginal lifetime utility of current private wealth relative to marginal lifetime utility of current consumption implies a large surcharge on the interest rate and therefore a small impact of changes in future income on current consumption, leisure, labour supply and saving. In this respect, the properties of a life-cycle model with bequests are similar to the results of a lifecycle model with a borrowing constraint. In the opposite case of a small marginal utility of current wealth in respect to marginal utility of consumption, the surcharge on the interest rate will be smaller and a change in future income will be smoothed over the life cycle as the resulting change in current private wealth hardly affects utility, while the simultaneous change in consumption improves utility. In this case the model properties – smoothing of consumption - correspond to those of life-cycle models without a borrowing constraint.

Aside from the impact on the intertemporal allocation of lifetime income, the just described influence of the bequest motive on the surcharge on the interest rate also causes an effect of private wealth and consumption on the effective wage rate as the interest rate (plus the surcharge) also determines the present value of future second-tier pension benefits, while the common pension premium is unchanged. In the next section we show that, even in the case of pure income shocks, this feature leads to substitution effects.

The impact of a change in the real wage rate on labour supply depends on the sum of income effect and substitution effect. The income effect caused by a rise in the real wage rate leads to a higher demand for leisure and a fall in labour supply, while the substitution effect encourages consumption, limits the demand for leisure and increases labour supply. The net result of these two opposing effects has been the subject of many papers. Following the mainstream literature on empirical labour supply elasticities, the CPB life-cycle model assumes that the substitution effect dominates the income effect, featuring an (uncompensated) labour supply elasticity of about 0.12 (see also chapter 2).

## 5.3.2 Adjusting the commencement date of first-pillar pensions

Shifting the commencement date of first-tier pensions from age 65 to 67 implies a cut in current income of individuals at ages 65-66. As, within Dutch institutions, these first-tier pension benefits are paid to Dutch citizens and the amount of these benefits does not depend on historical earnings, this reform seems equivalent to a (downward) shock in financial wealth.

<sup>&</sup>lt;sup>32</sup> The intertemporal substitution depends on the discrepancy between the rate of time preference and the interest rate (including the surcharge).

However, we show that, besides this wealth effect, within the present applied life-cycle model this reform produces some substitution effects as well.

In relative or absolute differences with respect to the baseline, the first column of Table 5.2 describes the economic effects of the upward shift of the commencement date of first-tier pension benefits, *leaving everything else unchanged*.

Fable 5.2     Decomposition of economic effects of raising statutory retirement age, without adjustments in							
second pillar pension benefits and tax rate							
	(1)	(2)	(3)	Total			
	Shifting	Shifting age of	Shifting age of	(all measures of			
	commencement	compulsory	exemption social	previous			
	date first pillar	dismissal	security	columns,			
	benefits		premiums	open budget)			
Macroeconomic results							
Average age of quitting the labour force	0.0	0.1	- 0.1	0.1			
Labour supply (%)	0.1	0.1	- 0.1	0.3			
of which 25-64 years	0.1	- 0.1	0.0	0.1			
of which 65-99 years	0.0	0.2	- 0.1	0.2			
Consumption (%)	- 0.7	0.3	- 0.2	- 0.5			
Average lifetime lebour events (fte che dif)	0.1	0.1	0.0	0.1			
Participation rate (% point)	0.1	0.1	0.0	0.1			
	0.0	0.1	- 0.1	0.1			
Government budget (bln, abs dif)	5.3	0.1	0.9	6.4			
Budget of pension funds (bln, abs dif)	- 0.9	- 0.5	0.0	– 1.3			
Age group results							
Age group 25 - 54 years							
Consumption (%)	- 0.1	0.0	- 0.1	- 0.2			
Labour supply (%)	0.1	0.0	0.0	0.1			
Age group 55-59 years							
Consumption (%)	- 0.5	- 0.1	- 0.2	- 0.7			
Labour supply (%)	0.3	- 0.1	0.0	0.2			
Age group 60 - 64 years							
Consumption (%)	- 0.8	- 0.1	- 0.3	– 1.2			
Labour supply (%)	0.4	- 0.5	0.1	0.0			
Participation rate (%-point)	0.0	0.0	0.0	0.0			
Age group 65-69 years							
Consumption (%)	– 1.8	1.7	- 1.0	- 0.8			
Labour supply (%)	3.0	47.0	- 20.0	46.5			
Participation rate (%-point)	0.0	0.8	– 1.9	1.3			

Regarding the macroeconomic impact, the results show that this measure has an effect on macroeconomic labour supply. The change in labour supply does not result in a delayed retirement (extensive margin), but entirely takes place in additional hours worked (intensive margin). Therefore, the participation rate does not change. The largest part of the increase in labour supply takes place before age 65. So, this policy mainly affects the labour supply before the age of 65 years, while it hardly alters labour supply of elderly.

In contrast to the change in total labour supply, the increase in the government budget and the fall in consumption are significant. The fall in consumption reflects the negative income shock.

Finally, the change in labour supply affects paid second-tier pension premiums, built up pension rights and the associated pension benefits. As the defined benefit pension scheme with a common pension premium is not actuarial fair, the net result of these changes in cash flows may differ from zero. In this case financial wealth of pension funds deteriorates. Looking at the responses of different age-groups, Table 5.2, column 1, shows that changes in consumption and labour supply are not just restricted to age group 65-69. As all other age groups show reallocations as well, the effects of the cut in income at ages 65 and 66 are smoothed over the entire life cycle. However, these results show that the effects are not spread out evenly over time: both the fall in consumption as well as the rise in labour supply intensifies over the life cycle.

The observation that adjustments of consumption and leisure of the distinguished agegroups mutually differ, indicates that – besides a wealth effect – substitution effects matter as well. In this simulation the most important substitution effect is caused by the bequest motive.

As explained in section 5.3.2 (key properties), the effective wage rate and so the relative price of leisure and consumption, depends – among others – on the present value of (future) second-tier pension benefits. Due to the assumed bequest motive, the applied interest rate determining this present value contains a surcharge which, similar to a borrowing constraint, depends on the actual value of private wealth.<sup>33</sup>

Furthermore, as the assumed pension scheme<sup>34</sup> implies relatively large pension returns of labour supply at older ages, the increase in the effective wage rate accelerates during the life cycle. This change in the profile of the effective wage rate induces large intratemporal substitution effects at older age groups and an intertemporal shift of leisure towards younger ages.

Summarizing, in addition to the wealth effect of the cutback in lifetime income due to the postponement of first-tier pension benefits, the bequest motive generates intratemporal and intertemporal substitution effects. The change in lifetime income is smoothed over the entire life cycle and alters the age-profiles of consumption and private wealth. So, reallocations already occur in advance of the new commencement date. Due to the assumed bequest motive, the altered age-profiles of consumption and wealth change the effective wage rate which in turn induces an altered allocation of consumption versus leisure at each moment of time (intratemporal substitution) and an altered allocation of consumption and leisure over the life cycle (intertemporal substitution).

<sup>&</sup>lt;sup>33</sup> To be more precisely, in contrast to the borrowing constraint, the bequest motive can be considered as a weaker constraint as it offers the opportunity to choose between less consumption and more private wealth. Therefore, the surcharge on the interest rate depends on the marginal utilities of wealth and of consumption instead of just the level of private wealth compared to the value of its (borrowing) constraint.

<sup>&</sup>lt;sup>34</sup> Defined benefit and common pension premium.

### 5.3.3 A shift in age of compulsory dismissal

In the Netherlands almost all collective labour agreements provide an opportunity to employers to dismiss employees at a particular age, often 65, without paying severance pay. In fact employment protection is (temporarily) elevated at this age. Although dismissal at this particular age is not obliged, in practice the majority of employers lays off its employees at this age. Therefore, from the perspective of employees, this age acts as an age of compulsory dismissal.

The second column of Table 5.2 describes the impact of a shift in the age of compulsory dismissal by two years on aggregate behaviour. Compared to the baseline, this shift implies better job opportunities for the still employed individuals at the age of 65. Instead of being fired and perhaps looking for a less well paid job, they are able to keep their – better paid – current job. At this point it is important to stress the partial nature of the model once again. As the demand side of the labour market is ignored in this model, we implicitly assume that changes in labour supply are absorbed by labour demand without changes in the wage rate.

From a macroeconomic perspective, this policy reform results in a small increase in labour supply (hours worked) and an increase in consumption. In contrast to the change in the commencement date of first-tier pension benefits, the increase in labour supply is mainly caused by additional labour supply of elderly workers, partly resulting in delayed retirement (extensive margin) and consequently a higher participation rate. Concerning the budgets of government and pension funds, the increased participation hardly changes the government budget, while it slightly improves the financial wealth of pension funds.

As expected, the distribution over the life cycle shows the largest responses at the older age groups. For instance, the participation rate and labour supply change significantly after age 65 in response to the improved labour-market opportunities. Simultaneously, labour supply at younger ages falls. After age 65, the improved labour-market participation leads to more consumption. So, similar to the shift in the commencement date, this adjustment in Dutch institutions (or culture) around age 65 not only affects the elderly, but also induces reallocations of younger age groups, albeit at a much smaller scale.

These changes in the reallocation of consumption, leisure and private wealth are entirely caused by income effects, intratemporal substitution effects and intertemporal substitution effects generated by the change in the wage rate – compared to the baseline – at ages 65 and 66.

First, ignoring the influence of the bequest motive, the increased wage rate at these ages leads to an intratemporal substitution effect which results in less leisure and more consumption of elderly workers. Furthermore, the associated income effect of the rise in the wage rate leads to more consumption and leisure. Regarding leisure, this income effect partly compensates the fall in leisure caused by the substitution effect.<sup>35</sup> Furthermore, the increased wage rate at ages 65-66 alters the relative price of leisure over the life cycle and that leads to a shift of leisure towards earlier ages (intertemporal substitution effect). Combined with the income effect and

<sup>35</sup> Remember that we assumed that the (intratemporal) substitution effect dominates the income effect.

still ignoring the bequest motive, leisure and consumption increase up to age 65. As a consequence, private financial wealth is lower.

However, similar to the shift in the commencement date of first-tier pension benefits, the altered time paths of consumption and private wealth and the bequest motive induce additional substitution effects. In this case the just described increased consumption and reduced private wealth at younger ages increase the surcharge on the interest rate of future cash flows. Besides a direct impact on the age-profiles of consumption and labour supply (intertemporal substitution effect), the increased surcharge on the interest rate reduces the present value of future second-tier pension benefits and so the effective wage rate of younger age groups. This reduction in the effective wage rate leads to an intratemporal substitution effect and results in less consumption and less labour supply of these age groups. Regarding consumption, this intratemporal substitution effect exceeds the income effect of higher wages after age 65.

Summarizing, besides the traditional (intratemporal) substitution effect of an increase in the wage rate at age 65, within a life-cycle framework intertemporal substitution leads to reallocations in earlier stages of life. A bequest motive generates additional substitution effects as an altered age profile of consumption and private wealth changes the present value of second-tier pension benefits.

#### 5.3.4 Delayed exemption of Social Security premiums

The Dutch tax and Social Security system<sup>36</sup> contains several age-dependent arrangements, such as: a tax credit for elderly, first-tier pension benefits and an exemption of the payment of Social Security premiums. Related to the analysis of the shift of the commencement date of first-tier pension benefits to age 67, we assume that the starting age of this latter arrangement is also raised to age 67. Without altering the commencement date of first-tier pension benefits and the age of compulsory dismissal nor adjusting the size of the Social Security premiums, in this section we describe the partial effects of the extended period of Social Security contributions as an increase in an age-dependent tax rate.

The third column of Table 5.2 shows the impact of the higher tax rate on labour income of workers aged 65 and 66. Regarding the influence of the effective wage rate this reform is to a large extent the opposite of the increased wage rate caused by the shift in the age of compulsory dismissal. However, in addition to this effect on the wage rate, the increased tax rate also reduces net non-labour income and by that, induces a wealth effect. Therefore, opposite to the preceding simulation, the adjusted tax rate results in less total consumption, and less total labour supply at both the intensive and extensive margin. The improvement of the government budget is the main difference with the results of the shift in the age of compulsory dismissal.

Looking at the responses of the distinguished age-groups, the largest effects appear in the age-group 65-69. In response to a reduced net wage rate this age group shows a sizable reduction of labour supply, both in hours worked and in retirement age. Simultaneously, other

<sup>&</sup>lt;sup>36</sup> In contrast to the United States, the Dutch social security system also contains social insurances for employees.

age groups increase their labour supply. Finally, consumption is reduced by all age groups, with the largest effects at the age group 65-69. So, again the adjustment of institutions of elderly workers induces reallocations of younger workers too.

Besides the wealth effect due to the fall in net non-labour income, the changes in the reallocation of consumption, leisure and private wealth are also caused by income effects, intratemporal substitution effects and intertemporal substitution effects in response to reduced effective wage rates before age 66. Up to the age of 65 these wage rates decrease as the present value of net second-tier pension benefits fall in response to the increased tax rate. At ages 65 and 66, the tax rate directly affects the effective wage rate. The lower effective wage rates lead to a negative income effect on consumption and leisure over the life cycle. In response, private wealth grows. Furthermore, the lower effective wage rate induces an intratemporal substitution effect which results in more leisure and less consumption. Regarding leisure this intratemporal substitution effect on the effective wage rate differs among age groups, a small intertemporal substitution effect moves leisure towards ages 65 and 66.

Apart from the impact of the reduced net pension benefits on the effective wage rate, the altered time path of private wealth affects the effective wage rate – due to the presence of the bequest motive – through changes in the surcharge on the interest rate of future cash flows. In this case the combination of more private wealth and less consumption reduces the surcharge on the interest rate and improves the present value of future net pension benefits. So, the bequest motive partly compensates the negative effect on the effective wage rate of the higher tax rate.

Summarizing, the higher tax rate at ages 65 and 66 leads to less labour supply at these ages. However, the results of the life-cycle model also show reallocations of consumption and leisure in advance of these ages. Besides the influence of the reduced lifetime income on consumption, leisure and labour supply at earlier ages, changes in the effective real wage rate caused by an altered present value of net future second-tier pension benefits are the main cause of these reallocations.

## 5.3.5 Aggregate effects and extensions

#### Aggregate effects

The first, second and third column of Table 5.2 describe the reallocations of total households separately in response to (i) a shift in the commencement date of first-tier pension benefits, (ii) a shift in the age of compulsory dismissal and (iii) a delayed exemption of Social Security premiums. In all three cases the preceding sections provide a description of the reallocations in terms of income and substitution effects and the role of the bequest motive. The fourth column contains the combined effects of the entire policy reform. Due to numerical rounding and second-order effects, the total result is not always identical to the sum of the components. Broadly speaking, the macroeconomic outcomes and the results of the distinguished age groups up to age 65 of the complete policy reform are largely determined by the shift of the

commencement date of the first-tier pension benefits. Large shares of the effects on total labour supply, on total consumption, and on the government budget can be attributed to this adjustment in Dutch institutions.

Regarding responses of older age-groups, the increase in the potential wage rate in response to a shift of the age of compulsory dismissal is the main determinant of the increase in labour supply. This results in an upward shift of the retirement age and hence a rise of the participation rate of the elderly.<sup>37</sup> Looking at the aggregate results, a significant amount of the additional labour supply appears at ages below 65 years.

Further, the reallocations in response to this policy reform differ between age-groups. Besides the just mentioned changes in labour supply of age groups above 65, the percentage changes on consumption decrease over the life cycle. As described earlier, the growing influence of the bequest motive over the life cycle is often the driving force of these differences between age-groups.

As shown by the results in Table 5.2, the policy reform results in changes in both the government budget and in the financial wealth of pension funds. In particular in the case of pension funds, an adjustment of the common pension premium to obtain a balanced budget is a plausible extension to this policy reform. In addition, a two-year shift of the pivot age of pension benefits in combination with a lower annual accrual rate of pension rights is a possible reaction of employers' organizations and labour unions. In the next section we briefly describe the effects of an augmented policy reform containing these changes in the second-tier pension scheme.

In view of the Dutch policy debate it is not evident whether the effects on the government budget of delaying the first-tier pension benefits will be compensated by a cut in taxes. After all, shifting the commencement date of first-tier pension benefits would be intended to limit the costs of an ageing society. Nevertheless, we look at the additional responses if the tax rate on labour income is reduced in order to obtain a balanced budget of the government.

Finally, to conclude the analysis of this policy reform, we present the results of a combined analysis. This should not be confused with a general equilibrium exercise as the model does not contain firms and a foreign sector.

#### Extension with adjustment of second-tier pensions

Although an issue of pension funds, employers' organisations and labour unions, an adjustment of the conditions of second-tier pension schemes in response to a change in the institutions of first-tier pension benefits is conceivable. In particular, we extend the policy reform with both a change in the pension premium (as the financial wealth of pension funds alters) as well as a two-year shift of the pivot age with a simultaneous cut in the annual accrual rate of pension

<sup>&</sup>lt;sup>37</sup> As our model is calibrated using data of 2004, the effect on total macroeconomic labour supply is small as only a minority of people works at ages 60-65 due to the existence of actuarial unfair early retirement schemes.

rights is conceivable.<sup>38</sup> The first column of Table 5.3 replicates the results of the final column of Table 5.2 containing the aggregate policy reform without additional responses of government and pension funds. The second column contains the economic results of the extended policy reform *vis-à-vis* the same baseline scenario as the previous simulations.

Table 5.3Closed budget effects of raising statutory retirement age, with adjustments in second pillar						
pension benefits and tax ra	ite					
	(1)	(2)	(3)	(4)		
	Total effect (is	Column (1) +	Column (1) +	Column (1) +		
	column (4) of	closed budget	closed budget	closed budget		
	Table 5.2),	pension funds	government	pension funds		
	open budget			and government		
Macroeconomic results						
Average age of quitting the labour force	0.1	0.3	0.1	0.3		
Labour supply (%)	0.3	0.2	0.4	0.3		
of which 25-64 years	0.1	- 0.1	0.2	0.1		
of which 65-99 years	0.2	0.2	0.2	0.2		
Consumption (%)	- 0.5	- 1.1	0.3	0.0		
Average lifetime labour supply (fte, abs dif)	0.1	0.1	0.2	0.2		
Participation rate (%-point)	0.1	0.3	0.1	0.3		
Government budget (bln. abs. dif)	6.4	8.2	0.0	0.0		
Budget of pension funds (bln, abs dif)	_ 1 3	0.2	- 1 3	0.0		
Budget of pension funds (bin, abs dif)	- 1.0	0.0	- 1.5	0.0		
Age group results						
Age group 25 - 54 years						
Consumption (%)	- 0.2	- 0.1	0.7	1.0		
Labour supply (%)	0.1	- 0.1	0.2	0.1		
Age group 55-59 years						
Consumption (%)	- 0.7	- 1.0	0.2	0.1		
Labour supply (%)	0.2	- 0.2	0.3	0.0		
Age group 60 - 64 years						
Consumption (%)	- 1.2	- 1.6	- 0.4	- 0.3		
Labour supply (%)	0.0	1.7	0.2	2.6		
Participation rate (%-point)	0.0	0.9	0.0	1.3		
Age group 65-69 years						
Consumption (%)	- 0.8	- 2.3	0.1	- 1.2		
Labour supply (%)	46.5	55.2	46.9	55.8		
Participation rate (%-point)	1.3	2.0	1.3	2.0		

Comparing the first and second column, the adjustments in the second-tier pension scheme result in lower consumption levels. From an intuitive point of view this is an obvious result as the improvement of financial wealth of pension funds implies a lower lifetime income of individuals. Furthermore, total labour supply falls, while the average retirement age rises. This finding points to significant intertemporal substitution effects in addition to a wealth effect. This intertemporal effect is caused by the lower effective wage rate of the first job due to the upward

<sup>38</sup> In our simulation we assume that the sum of annual accrual rates over 42 years equals the baseline amount accumulated over 40 years.

shift of the pivot age of second-tier pension benefits and the lower annual accrual rate<sup>39</sup>, while the effective wage rate of the second job remains unaltered. So, leisure becomes (relatively) cheaper when working in the first job. This leads to lower labour supply at younger ages, while labour supply grows in the second job. This growth is both expressed in hours worked as well as in delayed retirement.

In addition to the wealth effect and the aforementioned intertemporal substitution effect, the fall in the effective wage rate generates intratemporal substitution towards more leisure and less consumption during the working period.

Ignoring the effects of a change in the pension premium, the lower accrual rate and the increase in leisure or the fall in labour supply of younger workers reduce labour income and associated pension rights. Next, compared to the baseline, received second-tier pension benefits will be lower and this implies an increase in the financial wealth of pension funds. To restore a balanced budget, the pension premium is reduced. This improves the effective wage rate during the period of working in the first job. In this respect, the change in the pension premium slightly compensates the aforementioned effects of the shift in the pivot age and the lower annual accrual rate of pension rights.

Finally, the bequest motive has a similar mitigated influence on the effective wage rate. In particular the lower consumption and higher labour supply levels increase the financial wealth at younger ages in order to compensate the effects of the deteriorated second-tier pension benefits. These changes in the time paths of consumption and wealth reduce the surcharge on the interest rate and improve the present value of future pension benefits, partly compensating the aforementioned downward effects on the effective wage rate.

#### Extension with adjustment of balanced government budget

Mainly driven by the shift of the commencement date of first-tier pension benefits, the first column of Table 5.3 shows an improvement of the government budget. To conclude the exploration of the economic effects of a shift in the commencement date of first-tier pension benefits, we briefly describe the economic effects of a cutback in the labour income tax that neutralizes this budgetary effect.

Compared to the results of the open budget analysis (see first column), the cutback in the labour income tax improves labour supply and consumption (see third column). Instead of lower consumption, consumption is now positively affected. This finding reflects the reduction in the distortion of this tax rate regarding the consumption-leisure decision. Concerning the results of the various age-groups, lowering the tax rate has no significant effect on the mutual differences between groups (constant discrepancy between columns 1 and 3). So, each group

<sup>&</sup>lt;sup>39</sup> Within the period of working in the first job, the effect on the effective wage rate is not identical for each age group. Namely, within a pension scheme featured by a common pension premium and defined benefits, the fixed annual accrual rate of pension rights leads to a larger yield of the paid pension premium of elderly workers than the yield for younger workers. In this respect the cutback in the annual accrual rate has more impact on the yield of pension premiums of elderly workers, implying that the reduction of the effective wage rate of older workers exceeds, in absolute terms, the reduction in this wage rate of younger workers.

equally benefits from the lower tax rate, which indicates that the intertemporal substitution effects are small.

Although the cutback in the tax rate hardly induces intertemporal substitution effects, it does cause intratemporal substitution effects, income effects and wealth effects. Wealth effects occur because the reduction of the tax rate improves net first- and second-tier pension benefits. As explained in section 5.3.3, these higher pension benefits will also give rise to substitution effects due to the presence of the bequest motive.

Intratemporal substitution effects occur because the lower tax rate increases the effective wage rate in two ways. First, the lower tax rate directly increases the net effective wage rate. Second, the lower tax rate improves the net value of second-tier pension benefits and therefore the present value of these revenues as part of the effective wage rate. This rise in the effective wage rate causes standard income and substitution effects. The improved net income effect leads to more consumption and a larger demand for leisure. The intratemporal substitution effect generates higher consumption, a fall in leisure and higher labour supply. As the substitution effect exceeds the income effect, the net effect is an increase in labour supply.

#### Extension to (almost) full closed budget analysis

In the previous two sections we focused on the partial effects of closed budget adjustments, either within second-tier pension schemes or within the fiscal policy setting. In this final section we present an almost full closed budget analysis by combining the two adjustments. Except for the effects of this policy reform on the budget of firms, this analysis resembles a general equilibrium analysis.

The improvement in consumption (relative to the open budget analysis, column 1) is largely due to the reduction in the tax rate. Although total labour supply is only little affected, the distribution over the life cycle changes in response to the adjustments in the second-tier pension scheme. These changes encompass additional supply of labour at both the intensive and extensive margins of the older age groups (age 60 and above). Regarding the younger age groups, the adjustments in the second-tier pension scheme practically offset the labour supply effects of both the shift in the commencement date of first-tier pension schemes and the lower tax rate.

Concerning the impact on consumption, the adjustments in the second-tier pension scheme, resulting in reduced pension benefits after the age of 60 years, particularly brings about reductions in consumption of the elderly. Both the lower tax rate and the cutback in the pension premium stimulate consumption of younger age groups.

## 5.3.6 Assessing the economic impact of pension-age reform

Our life-cycle model reveals that a rise of the commencement date of first-tier pension benefits not only affects economic behaviour of the elderly, but also the behaviour of younger individuals who anticipate lower future benefits. As in the literature discussed in section 5.2, we find small effects on the average retirement age. These are primarily caused by a wealth effect (see also chapter 2). The shift in the age of compulsory dismissal generates the largest differences in behaviour of the elderly, as it raises their effective wage rate. The higher retirement age improves the government budget and therefore allows a reduction in the tax rate on labour. This yields an additional increase in labour supply.

Note that the life-cycle model has several limitations when used for actual policy analysis. It assumes that agents are fully rational and have perfect foresight. Social norms or cultural aspects are therefore held constant. Moreover, the model is of a partial nature and does not contain the demand side of the economy, nor does it capture interactions with other markets or with other countries. To the extent that these aspects are important, the numerical outcomes of the model should be taken with proper caution.

We believe that the limitations of the model are important in practice. Therefore, in actual CPB assessments of changes in the official retirement age, we do not rely on the model simulations presented in this chapter (see e.g. CPB, 2008). Instead, we rely on the combination of the traditional wealth effect, an effect via compulsory dismissal and a socio-cultural effect, which we call the framing effect. For instance, CPB assessed a proposal for Bakker Committee in 2008. The report suggests a gradual increase in the age at which state pensions can be collected from 65 towards 68. This should be implemented between 2016 and 2051. In assessing the effects, CPB argued that the framing effect is particularly uncertain. Therefore, it presented three different quantitative scenarios for the effects of the policy reform. In a central estimate, the size of the framing effect is based on evidence for the US discussed in section 5.2. It suggests that a one-year increase in the official retirement age at which benefits can be collected causes an increase in the actual retirement by 0.5 years. This refers to people in the age-groups above 55 years. In an alternative low scenario, the effect is halved to only 0.25years. In an alternative high scenario, it is increased to 0.75 years. Table 5.4 shows the results in terms of total employment (including people above 65) and labour supply of people under 65. We see that the estimated impact on total employment ranges between 0.9% and 2.5%. This is substantially larger than the results obtained by the life-cycle model, although the reform in Table 5.4 is larger than the one analysed with the model (retirement age to 68 instead of 67). Among people below 65, labour supply expands by between 0.4 and 1.2%.

Table 5.4 Effects of increasin   CPB's assessment	Effects of increasing the retirement age from 65 to 68 on employment and labour supply in CPB's assessment of concrete proposals in the Netherlands					
		Low	Central	High		
Employment (including 65 and over) ir	ו %	0.9	1.6	2.5		
Labour supply (20-64 years) in %		0.4	0.8	1.2		
Source: CPB (2008)						

## 5.4 Conclusion

Dutch state pensions involve a basic income for individuals older than 65. The only condition for receiving these state pensions is that someone has lived in the Netherlands for 40 years between age 25 and 65. It is independent of someone's contributions during younger years. At the time of its introduction in 1957, the goal of the state pension was to eliminate poverty among elderly people. With the increasing importance of occupational pensions, the rising health of people at old age, the increase in life expectancy, and the impact of ageing on public finances and intergenerational redistribution, state pensions have become subject of intense debate. Some people propose to increase the retirement age, implying a reduction in pension wealth for all people, irrespective of their life-time income. Others have proposed a closer link between benefits and contributions during life, which would especially affect non-participating partners in couples. A number of countries have indeed increased the official retirement age and feature a system where benefits are closely linked to contributions.

In reforming state pensions in the Netherlands, one needs to think about several related institutions. For instance, what will happen with the age of compulsory dismissal? How will age-specific tax relief be adjusted? What about the age of occupational pensions? The choice of reform in these institutions will determine the implications for labour-market participation. The analysis in this chapter aims to give insight in these implications, thereby taking a life-time perspective. Indeed, people may anticipate the reforms well in advance and adjust their labour supply and saving behaviour. Overall, simulations with the model reveal that an increase in the retirement age by 2 years, will increase aggregate labour supply by approximately 0.3%. This effect is in line with previous simulation models.

Yet, the model is highly stylized and ignores, for instance, framing effects that the official retirement age may have on individuals deciding about their age of retirement. Indeed, the official retirement age may set a socio-cultural norm in society that people and social partners take as a target date for their retirement. A study for the US reports larger effects of a change in the retirement age than would be obtained on the basis of pure wealth effects. When framing effects are taken into account, the impact of a higher retirement age is considerably larger. CPB estimates suggest an effect on aggregate employment that is between 2 and 5 times as large as predicted by our simulations.

Dutch state pensions reflect an age-specific basic income. Like with all basic incomes, the benefits decline with income when measured in relative terms. Therefore, an increase in the retirement age hurts people with low lifetime incomes more than people with high lifetime incomes and thus increases lifetime inequality. Targeted measures may therefore be necessary to compensate people who earn low life-time incomes.

RETHINKING RETIREMENT: FIRMS, WORKERS, AND LIFE-CYCLE WAGE PROFILES
# 6 Firms, workers, and life-cycle wage profiles

# Daniel van Vuuren, Paul de Hek

The accumulation of specific capital leads to higher wages for elderly if they stay with their employer. The mobility of older workers is therefore relatively low. Empirical evidence, however, indicates that there are additional reasons for this low mobility. The relatively strong employment protection of older workers allows them to extract a larger share of the firm's surplus, compared to the less-protected younger workers. Moreover, firms use deferred compensation schemes to motivate their workers. These and other mechanisms drive up the wages of older workers. Employment protection is harmful to the extent that wages are driven up at the cost of people outside the firm.

# 6.1 Introduction

In his overview article, Skirbekk (2004) concludes that individual 'productivity follows an inverted U-shaped profile where significant decreases are found after the age of 50'. Crucial elements of this productivity decrease are difficulties in adjusting to new ways of working, and reductions in memory and reasoning abilities. However, elements such as verbal ability remain rather constant over most ages, so that a more flat productivity profile may appear in particular jobs. If the productivity of older workers is indeed lower than that of young workers, then the change in the age-structure of the population will result in a lower average productivity level. This effect is however fairly limited from a macro-economic point of view (Prskawetz and Lindh, 2006; Carone et al., 2006).

Although productivity declines with age at least for some groups of workers, wages do not. Indeed, wage profiles in the Netherlands and other EU countries generally keep increasing with age. This creates a wage-productivity gap for older workers. This chapter provides a number of explanations for such wage-productivity gaps of older workers based on economic theories. Which theory is true is important, as it determines whether such a gap is desirable from a welfare point of view. Moreover, it determines the extent to which an ageing workforce will put pressure on the relatively high wages of elderly. Therefore, we also summarise the empirical literature testing these theories. The aim is to gain insight in the most likely development of the wage-productivity gap and to structure the debate on policies that could mitigate inefficiencies in the labour market for elderly workers.

# 6.2 Wage profiles in the Netherlands

#### 6.2.1 Institutions

In the Netherlands, wage bargaining is relatively centralised. This 'corporatist' system of industrial relations is comparable to the systems in Austria, Belgium, Germany, and the Nordic countries (Denmark, Finland, Norway, and Sweden). Union membership in the Netherlands is

about 20%, whereas about 80% of the labour force is covered by collective labour agreements. The reason lies in the government extension decrees – in Dutch: Algemeen Verbindend Verklaring (AVV) – according to which a collective agreement is extended to all workers and firms in the same sector of industry. This practice is not uncommon in European countries. Unionisation rates in most European countries are between 10 and 30%, which is comparable to the US, Canada and Japan.<sup>40</sup> In these countries, the share of workers covered by collective agreements is more or less equal to the unionisation rate, whereas European countries typically observe a collective bargaining coverage rate between 80 and 90% (Freeman, 2007). Thus, the bargaining power of unions appears to be a consequence of the government extension of collective labour agreements rather than a direct result of union coverage.

The centrally bargained agreements determine contractual wage scales and wage grades on an individual level. They leave freedom for employers to move workers up or between different scales. Incentive pay is not uncommon in many sectors of industry (Borghans and Kriechel, 2007). Older workers have often reached the highest grade of their wage scale. Demotion is very uncommon. Most older workers do not experience a decrease in their wage profile. The transition from a final pay pension scheme to an average pay scheme – which has taken place in most pension schemes – has not had much effect on the prevalence of demotion.<sup>41</sup>

Recent policy in the Netherlands aims at reducing the labour costs for employers without affecting the net wages of older workers. As of 2004, employers are exempted from paying the fixed part of the Disability Insurance premium for existing employees above age 55, and for all new employees above age 50. Facilitating downward wage flexibility remains on the policy agenda, but until now not much action has been taken.

#### 6.2.2 Wage profiles

Information on individual wage profiles in the Netherlands is scarce. Results from a crosssectional comparison of individual wages within firms by Gelderblom et al. (2003) are shown in Figure 6.1. The figure indicates that the wage bill of a firm employing just 50-54 year old workers would be about 20% higher than that of a firm employing just 30-39 year old workers. The wage curve is even steeper for the youngest age categories. Note that results for the oldest age category (55 and older) were found sensitive for the wage definition used. An alternative definition implied no significant difference between the oldest age category and 30-39 year old workers. However, this result is most probably contaminated by cohort effects: the current 30-39 year old workers are likely to earn higher wages when they become 55 than the current 55 year old workers.

A large majority of Dutch employers expects a higher wage bill as a consequence of their ageing workforce (table 6.1). At the same time, only a small minority of employers expects a rise in the average productivity per worker. In other words, the above-average wage rates of

 $<sup>^{\</sup>rm 40}$  The exception is the Nordic countries, with unionisation rates between 50 and 90%.

<sup>&</sup>lt;sup>41</sup> Note that even in a final pay pension scheme it is not always the case that the pension income is lowered in case of demotion. Moreover, DI and UI payments for persons above age 55 can be based on their wage income prior to demotion.

older workers do apparently not represent above-average productivity rates. In the following sections we discuss theories which may help to explain this finding.





Source: Gelderblom et al. (2003).

Table 6.1	Expected consequences of an ageing workforce, survey among Dutch employers (2005)			
	Increasing wage bill	Higher productivity		
(Very) unlikely	6	52		
Neutral	17	42		
(Very) likely	76	7		
Source: Van Dale	an et al. (2008)			

# 6.3 Human capital investment in long-term employment relationships

# 6.3.1 Specific capital and turnover costs

Investments in human capital lead to a growth of earnings with working age. After completion of schooling, formal or informal on-the-job training is the major productivity-enhancing investment. Human capital theory distinguishes between investments in general and specific skills (Becker, 1964). General skills are equally valuable in any employee-firm match, whereas specific skills are valuable only for a particular match. Under the assumption of a competitive labour market, Becker draws two main conclusions. First, employers share the returns and the costs of investments in firm-specific skills with their employees. Second, firms do not invest in general skills of their employees. Employees capture all the returns to their general human capital, and as a result invest in their own general human capital. Mincer (1970; 1997)

summarizes the empirical evidence concerning the age-earnings profile of individuals. Earnings positively depend on the stock of human capital; the age-earnings profile is at least for a long time upward sloping, at a decreasing rate. If investment in human capital increases, the age-earnings profile becomes steeper and has its maximum later.

Another approach to human capital investments assumes that investment levels are not contractible and that post-training wages are determined by bargaining. This strand of literature recognizes that there are problems in writing contracts contingent on future events that are important for the employment relationship, including investments. With specific investments (in human and/or physical capital) demand and supply conditions do not determine a unique equilibrium wage, but instead determine the lowest wage for which an employee is willing to work and the highest wage the employer is willing to pay. In the absence of an explicit contract, bargaining determines where between those two the wage lies, and thus how the rents to continued employment are divided. If the size or division of the rents depends on the return to an investment undertaken by a firm, ex-post bargaining may result in the employee capturing some of that return. This is called hold-up. As a result, the firm will under-invest in specific capital (Grout, 1984). Similarly, the employee will under-invest in his specific (human) capital if part of the return to that investment is captured by the firm. This constitutes a market failure: hold-up implies underinvestment in human capital, leading to lower levels of employment.

Replacing an employee with someone equally good may involve hiring costs. Similarly, moving to another comparable job often involves search and relocation costs for the employee. With hiring costs, the impact of any investment, specific or general, on the alternative wage of the employee is always less than its impact on the firm's net revenue. This provides the firm with an incentive to invest in general skills. The similarity with specific capital is evident. Turnover costs can be seen as a rent which can be shared between the worker and the firm. Thus, underinvestment is not only a problem with specific human capital, but also with general human capital (Shaked and Sutton, 1984; Stevens, 1994; Acemoglu and Pischke, 1999).<sup>42</sup>

In the following, we first discuss contracts that may (to a certain extent) protect investments from hold-up. Second, we examine the consequences of these contracts for the wage profiles of individual workers.

#### 6.3.2 Contracts to induce investment in general and specific capital

We discuss several types of contracts which induce human capital investment by the firm and/or employee. Employee wages often rise with tenure as a result of such contracts. The main results are summarised in table 6.2. This table includes two 'base cases' in the absence of a contract, either with or without turnover costs (see the previous subsection).

A 'firm sets wage' contract implies that the wage equals the outside option (or default payoff) of the employee. Because the wage is independent from specific investments and fully reflects general investments, the firm invests efficiently in specific skills and the employee

<sup>&</sup>lt;sup>42</sup> Alternatively, complementarities between general and specific capital may lead to firm investments in general capital in the absence of labour market frictions (see, e.g., Franz and Soskice, 1995).

invests efficiently in general skills. As a result, wages do not rise with tenure. An 'employee sets wage' contract, on the contrary, implies that the wage equals the outside option (or default payoff) of the firm. Because the wage fully reflects both general and specific investments, the employee invests efficiently in both general and specific skills, and the tenure effect is positive.

In a 'fixed wage' contract, the wage rate is fixed, and the firm has an incentive to invest in general and specific skills. However, it will not invest efficiently due to the probability of renegotiation. This is because at times of renegotiation the employee captures (part of) the returns to investment. It is precisely this prospect of wage adjustment that provides an incentive for the employee to invest positively in general and specific skills. Whereas the investments in general skills raise the outside opportunities for the employee, and – with high enough investments – will likely lead to renegotiation, investments in specific skills will only pay off in times of downward renegotiations. As downward wage adjustments are unlikely, the investment in specific skills by the employee and the accompanying tenure effect are small.

A 'firm sets wage' contract results in no specific investments by the employee, while the firm invests efficiently. Conversely, an 'employee sets wage' contract implies efficient investments by the employee, but results in no investments by the firm. That is, either the firm or the employee invests efficiently while the other invests not at all.

In some circumstances, however, it may be more efficient to have both parties invest some positive amount than for one to invest efficiently and the other not at all. This is the case if both parties have access to different investment opportunities (with diminishing returns). This may e.g. be the case if an investment requires effort from the employee. A firm will not invest in a training course if the employee has no incentive to provide effort. A fixed wage contract can typically induce both to make some specific investment. In this way, a fixed wage contract can be an improvement over other types of contracts.

Table 6.2 Investment in h	uman capital, and tenure effe	ct on wages		
Type of contract	Type of investment	Investment by <sup>a</sup>		Tenure effect
		Firm	Employee	
No contract	general	0	efficient	
	specific	+	+	+
No contract, turnover costs	general	+	+	
	specific	+	+	+
Firm sets wage	general	0	efficient	
	specific	efficient	0	0
Employee sets wage	general	0	efficient	
	specific	0	efficient	+
Fixed wage	general	+	+	
	specific	+	+	+ <sup>b</sup>
<sup>a</sup> A '+' indicates a generally lower than	efficient investment.			
A fixed wage contract implies only a	small positive tenure effect when do	wnward renegotiation	n occurs.	

#### 6.3.3 Implications for wage profiles

General human capital can be expected to accumulate with total job market experience – given investments in general human capital by the firm and/or the employee.<sup>43</sup> Wages will then increase with experience to the extent that the employee is able to capture some of the return to these investments. Similarly, specific human capital can be expected to accumulate with tenure with a given employer. Wages will then increase with tenure to the extent that an employee is able to capture some of the return to this capital. Acemoglu and Pischke's (1999) model, for example, predicts both an experience premium, as wages are higher during the later career of workers because of the investments in skills during the early years, and a tenure premium, because market frictions make these skills partly specific.

In a frictional labour market with on-the-job search, in which firms can post general contracts, firms may use contracts in which the value to the worker increases with tenure (Burdett and Coles, 2003; Stevens, 2004). This may happen either instantaneously, by means of an entrance fee, or slowly if entrance fees are not possible, by means of a rising wage. Such contracts increase the retention of existing workers (and hence reduce labour-market turnover), and allow the firm to extract rents at the recruitment stage. The firm's benefits of retention are even higher in the case of specific capital investments – to the extent that the firm captures the returns to these investments. At the same time, firms may actually choose increasing wage-tenure contracts for a large part because they want to invest in specific capital in their workers.

Two implications of these human capital explanations for the wage-seniority relationship deserve emphasis. First, wages grow with seniority *because* productivity grows with seniority (experience and/or tenure). Second, at least for older (trained) workers, the spot wage is always less than or equal to the spot value of marginal product.

# 6.4 Incentive theories

If the productivity of an individual worker can be observed without much cost, then commission or piece-rate schemes directly based on output can be used in order to stimulate effort. However, such explicit labour contracts are rare. According to Milgrom and Roberts (1992; p. 329), an employment contract can be described as follows: '[it] is typically quite imprecise. The employees agree that within limits that are rarely completely described and only partly understood they will use their minds and muscles to undertake the tasks that the employer directs them to do. The employer agrees to pay the employees. The range of actions that might be requested or required is unclear.' There are four obvious reasons for this implicit nature of labour contracts. First, workers typically perform multiple tasks. Inducing the right amount of effort for each task would require an intricate explicit labour contract, and high monitoring costs for the firm. Second, it is hard to imagine a contract which adequately defines which amount of effort should be dedicated to each task. Output-based contracts are in practice

<sup>&</sup>lt;sup>43</sup> In the later stages of the life cycle human capital may start to fall as depreciation dominates investments in skills.

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typically focused on tasks which are easiest or cheapest to measure, and this induces employees to reallocate their activities precisely towards these tasks (Holmstrom and Milgrom, 1990; Baker, 1992). Third, it is practically impossible to foresee all the events that might possibly arise over time, and unambiguously describe these events and the actions that should be taken in the explicit labour contract. A fourth fundamental problem with output-based payment schemes is that third parties may not be able to verify the performance of individual workers, so that such schemes cannot be enforced by legal courts. That is, even if worker output is observable by the firm, then output-based payment schemes may be infeasible because of this non-verifiability problem. In this section we discuss how worker effort can be stimulated when (i) it is not verifiable by third parties, and (ii) it can be (imperfectly) assessed by the firm. The typical result is an implicit contract between the firm and the worker where worker effort – as subjectively assessed by the firm – is rewarded by some form of deferred compensation.

# 6.4.1 Early theories

In order to stimulate worker effort, the employer could offer a higher wage than the worker's alternative source of income and at the same time threaten him with dismissal in case he does not meet performance conditions set by the employer (Shapiro and Stiglitz, 1984). While wages are above the market clearing level, there is involuntary unemployment. The relatively high wage combined with the threat of unemployment stimulates the worker to maximise his output. Some empirical support for this theory of *efficiency wages* can be found in, amongst others, Krueger and Summers (1988) and Krueger (1991).

A problem with efficiency wages is that the incentive to perform becomes smaller as the worker becomes older. From a career perspective, it is therefore more attractive for the employer to allocate the wage premium in later periods. Such a wage premium may come in several forms, e.g. occupational pension schemes, early retirement schemes, or simply a relatively high wage during the final periods prior to retirement. In a stylised model, Becker and Stigler (1974) demonstrate that a wage premium in the last period, combined with the threat of dismissal in case of detected malfeasance, is sufficient to motivate the worker over his entire career with the firm.

Such a payment scheme however only works if the employee trusts the employer that the firm's assessment takes place under fair conditions, and that the outcome is in accordance with that assessment. Legal enforcement of the payment scheme is not possible because worker effort is not verifiable by third parties. In principle, the firm could thus be tempted to cheat on the worker in the last period by claiming that he has not shown enough effort, firing the worker, and keeping the wage premium for itself. Therefore, the worker will only trust the firm if it has a good reputation. In fact, in the absence of third parties, firm reputation is necessary in order to make deferred compensation schemes feasible (Bull, 1987). Next, the question arises why the firm would care about its reputation. The answer is that this can only be the case if the firm earns *quasi-rents* from being in business (Klein and Leffler, 1981; Shapiro, 1983). That is, there must be costs attached to going out of business, moving the firm's capital elsewhere, and

attracting new workers. The assumption that the firm cares about its reputation is a crucial element in all deferred compensation schemes. A firm with a harmed reputation will not be able to motivate its employees anymore nor attract new workers.

Thus, a deferred compensation scheme may imply that the worker is disciplined through the concept of equilibrium unemployment (as with efficiency wages). It is however often possible to construct a wage profile with a more efficient outcome. If workers earn relatively high wages, then at least some of the unemployed are willing to pay an entrance fee in order to obtain a job. On the other hand, the firm may demand entrance fees from newly hired workers in order to cut its labour costs. It may do so without demoralising its workers, as wages in the first period do not affect worker effort. If the probability of being caught shirking is small or if the worker's valuation of shirking is large, then paying an entrance fee may imply a net transfer from the worker to the firm during the first period.

In that case, the scheme resembles a 'bonding scheme', in which the worker is required to post a 'performance bond' before work begins. Wages equal the worker's alternative plus interest on the bond. Deferred pay at the end of the contract equals the bond itself. In fact, the incentive to perform is now derived from the threat that the firm does not pay off the implicit bond to the worker. Thus, a bonding scheme does in principle not require wage premiums to stimulate worker effort.

However, both entrance fees or (implicit) performance bonds are very rarely observed in practice.<sup>44</sup> Liquidity constraints of workers as a result of imperfect capital markets cannot explain this (contrary to what is suggested by Shapiro and Stiglitz, 1984). The argument is that whenever demanding the perfect entrance fee is not possible, the firm could still ask whatever up-front payments workers can make. It is unlikely that workers can make no payment at all, and in fact it is very simple to prove that some of them are willing to do so (Carmichael, 1985). The possibility of firm cheating – the firm may falsely claim that the worker shirks and keep the entrance fee for itself – can also not explain the lack of entrance fees, as it is typically assumed that firms are concerned about their reputations.<sup>45</sup> This argument will however most likely imply lower entrance fees (Dickens et al., 1989). In conclusion, it appears that no convincing arguments exist for why firms should not raise entrance fees to newly hired workers. In the next subsection, we consider a wage profile with an integrated entrance fee, i.e. one which is deducted from the wages during the first years of employment.

#### 6.4.2 Lazear's agency theory

While the theory discussed in the previous section may e.g. explain the existence of pensions, the wage profiles developed there are not consistent with what is most often found in practice. We consider three issues. First, as was mentioned in the last subsection, entrance fees (or performance bonds) for newly hired workers are hardly observed. While it was argued that there are no sound theoretical reasons for the non-existence of entrance fees, it may be the case

<sup>&</sup>lt;sup>44</sup> Franchise contracts can be regarded as an exception, see Rubin (1978) and Baker et al. (1988).

<sup>&</sup>lt;sup>45</sup> Other ways to solve this moral hazard problem of firms are discussed in Carmichael (1983) and Malcomson (1984).

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that entrance fees are somehow implicitly integrated into the wage profiles of workers. That is, workers are paid less during their first years of employment. Second, several studies have found that relative earnings increase in time although relative performance does not.<sup>46</sup> This suggests an increasing wage profile over the life-cycle. Third, it has been noted that employers typically stimulate their older workers to retire. Lazear (1979) specifically pointed at mandatory retirement, which was prevalent in many sectors at that time,<sup>47</sup> and to the fact that many pension schemes were actuarially unfair – that is, a financial penalty was imposed on extending the working life once a certain age was reached. This third point suggests that older workers are paid above their productivity level.

Lazear (1979, 1981, 1983) proposed a payment scheme which connects the theory described in the previous section with these empirical facts. Note that in comparison with the schemes discussed above, Lazear focuses on potential dispersions between wages and productivity, rather than between wages and alternatives. In fact, he assumes that the worker's alternative is strictly less than his productivity level (prior to retirement). In the general scheme proposed by Lazear, the worker implicitly posts a performance bond in the early years of his career, by accepting wages below his productivity level. Second, wages typically show an increasing pattern during the worker's career (although this is not necessarily implied by the model), and finally the performance bond is paid out to the worker, usually in the form of a pension. As older workers become relatively expensive in such a payment scheme the firm needs to get rid of these older workers in order to sustain the payment scheme. This can e.g. be achieved through mandatory retirement or through a (properly devised) defined benefit pension plan. The steepness of the payment scheme is closely linked to the probability that the worker is caught shirking. A low probability typically implies a steep wage profile (relative to the productivity profile), as workers can only be deterred from shirking by the threat of losing future payments.

A criticism on LSICs is that the implicit bonding solution is imperfect because young workers do not have the full incentive to perform (Akerlof and Katz, 1989). A worker who has just started his career with a firm and did not post the full bond yet may find it optimal to shirk, as he does not have that much to lose in case he is caught. On the other hand, LSICs may imply equilibrium unemployment similar to what was theorised in the case of efficiency wages. Another argument in favour of LSICs is that firms may offer 'entry level jobs' to young workers in order to assess their productivity. These young workers are paid below their productivity until they have posted the implicit bond, and at that point the worker can be promoted to a job where effort and output are difficult to observe (Neal and Rosen, 2000).

It has further been noted that young workers are nowadays less willing to post implicit bonds, because lifetime jobs are now quite uncommon. In that case, it will be harder for firms to offer LSICs. Finally, LSICs in an ageing workforce may imply more redistribution from young workers to old workers. We will come back to this in the last section of this chapter.

<sup>&</sup>lt;sup>46</sup> See a.o. Medoff and Abraham (1980, 1981). This discussion is pursued in the next section.

<sup>&</sup>lt;sup>47</sup> Note that mandatory retirement is now forbidden by law in the U.S.

#### 6.4.3 Tournaments

The wage growth of workers is for an important part caused by jumps associated with promotions. For the U.S., McCue (1996) estimates that between 9 and 18% of the average within-firm wage growth over the life cycle is due to promotions. As the worker's inherent skills are likely to remain more or less constant in the short run, it is unlikely that his productivity really jumps up on promotion day with a jump equal to that in his wage (Neal and Rosen, 2000). A possible explanation is derived from tournament theory. In a setting where the relative productivity of employees is observable, the employer may reward the worker with the highest productivity score with a bonus or promotion to a higher function, and reward the second most productive worker with the second highest bonus or promotion, etc. The number of bonuses and promotions is fixed beforehand in order to prevent the employer from cheating.

Contrary to piece rate schemes, tournament compensation schemes offer a practical solution to stimulating worker effort when individual output is non-verifiable (Malcomson, 1984; 1986). Based on the worker's relative performance the firm may rank workers on the basis of their productivity scores, and assign bonuses accordingly. Workers maximise expected utility by choosing the effort level which equates the marginal cost of effort with its marginal benefit. The marginal benefit of effort depends on (i) the marginal probability of winning, and (ii) the size of the bonus. A firm may thus stimulate effort by increasing either of the two. Most of the theoretical literature on tournaments focuses on the determination of the optimal size of the bonus (leaving the probability of winning the tournament fixed). If workers are risk-neutral, then a tournament may give the optimal incentive to perform (Lazear and Rosen, 1981). However, in the more relevant case of risk averse workers, the optimal incentive cannot be obtained by a tournament (Mookherjee, 1984).

If a tournament consists of multiple rounds, say over *n* periods, then it may be optimal to keep the bonus constant at a relatively low level in the first *n*-*I* rounds and at a relatively high level in the last round (Rosen, 1986). This offers an explanation for why promotions to top ranks in firms are associated with relatively large wage increases (see Baker et al., 1994a, for some empirical evidence). Another interesting extension is the role of tournaments as an incentive mechanism for workers to acquire specific capital. The firm may attach relatively high wages to jobs which require relatively much specific capital, such that workers face a bonus if they develop the appropriate skills (Prendergast, 1993).

While it is obvious that tournaments affect the wage curves of individual workers, it is difficult to predict what their precise implications are. As was argued in the first paragraph of this section, it is quite certain that promotions cause a difference between wage and productivity.

A drawback of tournaments compared to other payment schemes is that it can be equally rewarding for workers to sabotage the output of co-workers rather than to increase their own effort. Lazear (1989) demonstrates that the optimal bonus should be lower in that case. It is however questionable whether tournaments work if sabotage is a serious problem in the firm. A second drawback mentioned in the literature is that too large a wage dispersion within firms 120 may be discouraging for employees. If workers perceive to be paid unfairly, they may start exerting less effort than they would otherwise (Akerlof and Yellen, 1990). Grund and Westergaard-Nielsen (2004) find that wage growth dispersion and firm growth are *negatively* correlated in Danish firms, which is primarily driven by white collar jobs.<sup>48</sup> This suggests that if bonuses are set too large then this may work counterproductive. Personnel managers appear to endorse this point of view (Levine, 1993). A final point supported by experimental evidence in Dohmen and Falk (2006) is that tournaments may attract specific types of workers. According to the authors' experiment, tournaments attract over-confident, selfish, and less risk averse workers compared to other payment schemes. If properly taken into account, this may however be in the interest of the firm.

# 6.5 Human capital versus incentive theories: empirical evidence

In this section, we present an overview of the empirical literature testing both human capital theories and incentive theories. These tests are mostly indirect, as identification problems are the rule rather than the exception. An obvious problem is that individual productivity is never observed, so that the wage-productivity gap implied by Lazear's agency theory cannot be assessed directly. The recent development of employer-employee matched datasets has however substantially increased the possibilities for empirical research.

The theory of general human capital does not suffice to explain observed wage profiles. This result was established empirically by Medoff and Abraham (1980, 1981) on the basis of personnel data from large U.S. manufacturing firms. The authors use job performance ratings done by immediate supervisors to measure the relative productivity of managerial and professional employees engaged in comparable work. They find no association (or even a negative one) between experience and relative performance, and a strong positive association between experience and relative earnings. Flabbi and Ichino (2001) confirmed Medoff and Abraham's conclusion on a sample of non-managerial employees of a large Italian bank, extending the analysis by considering alternative measures of productivity. Other studies confirming that wages do not necessarily reflect productivity are Bishop (1987) and Kotlikoff and Gokhale (1992).

Of course, general human capital still remains an important factor. Many empirical studies do find a positive effect of general labour-market experience on individual wages, which is an important indication for the relevance of general human capital. Results from three important studies even imply that most wage variation can be attributed to differences in general human capital (Altonji and Shakotko, 1987; Abraham and Farber, 1987; Hellerstein et al., 1999). Although Altonji and Shakotko (1987) do find a small positive tenure effect on individual wages, their main conclusion is that 'general labour-market experience accounts for the lion's

<sup>&</sup>lt;sup>48</sup> Note that the authors do find a positive relationship for some firms, but this category seems to be far less relevant (only 2%) than the share of firms which displays a negative correlation between output and wage increase dispersion.

share of wage growth during a career'. In addition, Yamaguchi (2007) finds that the wage growth of American higher educated workers (college graduates) is primarily driven by general skills, and that firm-specific human capital does not play an important role for this category. The reverse is found for high school graduates. However, Beffy et al. (2006) establish precisely the opposite result for French data.

Practically all studies which have been published during the 1990s and 2000s – typically using better data and/or better estimation techniques than the early studies by Altonji and Shakotko (1987) and Abraham and Farber (1987) – agree that individual wages are simultaneously driven by other factors than general human capital.<sup>49</sup> Thus, at present there does not seem to be much controversy over our first conclusion: besides the theory of general human capital, at least one other theory is relevant in explaining individual wage profiles.

*Tenure with the firm affects the wage rate, but there is controversy over the magnitude of this effect.* A large body of empirical research has focused on obtaining estimates for the returns to experience (time spent in the labour market) and tenure (time spent in the firm). It is often thought that the return to labour-market experience is closely related to the return to general human capital, and the return to tenure is closely related to specific human capital. As was mentioned in the previous conclusion, some authors – in particular Altonji and Shakotko (1987) and Altonji and Williams (1997) – believe that the returns to firm tenure are only modest. On the contrary, a number of other studies, such as Topel (1991), find a strong positive relationship between wages and tenure.

Using longitudinal matched employer-employee data for France, Abowd et al. (2006) find that the average structural returns to tenure are close to zero. However, this masks an enormous amount of heterogeneity in firm compensation, promotion and retention policies adopted by firms. The main contrast is between high-wage, low-mobility firms where returns to tenure are low (even negative) and low-wage, high-mobility firms where returns to tenure are relatively high. Beffy et al. (2006) also find different results for subgroups, ranging from no returns to tenure for high school drop-outs to very high returns to tenure for college graduates. The authors also find higher tenure effects for the US than for France. The rationale is that US firms aim to reduce their relatively mobile workers, while French firms do not need to reward tenure in order to keep their (relatively immobile) workers at the firm.

It should be noted that tenure effects do not necessarily imply that specific human capital is relevant. Other theories, such as Lazear's agency theory do also imply that individual wages rise with firm tenure. For instance, Abowd et al. (1999) find that their (positive) returns to tenure are negatively correlated with firm-specific intercepts in the compensation relation, which is consistent with Lazear's theory rather than the theory of specific capital. One should thus take care not to confuse a significant tenure effect with 'proof' of the relevance of specific human capital.

<sup>&</sup>lt;sup>49</sup> This includes the studies by Altonji and Williams (1997) and Hellerstein and Neumark (2004).

The accumulation of firm-specific capital is important in some firms and at certain education *levels*. Firm-specific capital is never directly observed, and is not necessarily a part of the workers' wages. This severely hampers the task of testing the specific capital model. In addition, while the specific-capital model is able to explain a core set of facts about worker mobility, it also appears that worker heterogeneity can account for much of what we observe in the mobility data. These results and considerations induce Farber (1999) to conclude that, while deriving convincing direct evidence for the specific capital model is difficult, it appears that specific capital is a useful construct for understanding wage dynamics and worker mobility. In addition, Malcomson (1999) concludes that 'models of hold-up look promising candidates for providing rigorous theoretical foundations for at least some of the observed behaviour of wages. These models are, however, too new for the empirical studies drawn on in the discussion to have been designed with them in mind and so those empirical studies have not tested their predictions at all rigorously.' Almost a decade ahead since Malcomson's conclusion, it still looks early to draw a final conclusion on the precise relevance of specific human capital and its impact on individual wages.

This is not too say however that empirical research has halted since, on the contrary. Recently, a number of studies have made use of the large administrative French panel data set 'DADS', and linked these individual employee records to employer data. On the basis of these data, Beffy et al. (2006) interpret their significant tenure effects as an indication for the relevance of firm-specific capital. In addition, the authors find much heterogeneity among different educational categories.<sup>50</sup> They find that in particular university graduates have very high returns to tenure. On the other hand, only small tenure effects are found for high school drop-outs. Thus, following the authors' reasoning, there is substantial heterogeneity among educational categories concerning the relevance of specific human capital. Using the same data set, Dostie (2005) however concludes that '[f]irm-specific capital does not seem to be important, and human capital would be easily transferable from firm to firm.' He bases this conclusion on the finding that the average tenure effect can entirely be related to selection on the basis of unobserved characteristics of both workers and firms. The author does however not allow for heterogeneous tenure effects for different levels of education.

Similar to Beffy et al. (2006), Dustmann and Meghir (2005) also find substantial heterogeneity among different educational groups in Germany, but reach an opposite conclusion, viz. that firm-specific human capital is more relevant for unskilled workers (including high school drop-outs) than for skilled workers. Similar results are found for the US. In a recent study, Buchinsky et al. (2005) find large returns to tenure for all education groups. They find that the cumulative return to tenure is relatively high for the least educated, which leads the authors to conclude that a larger share of their human capital is firm-specific. Using another data set, Yamaguchi (2007) also finds significant returns to tenure for lower educated workers, but none for college graduates.

<sup>&</sup>lt;sup>50</sup> In an earlier study based on the same data set, Abowd et al. (1999) also find substantial heterogeneity in the returns to tenure, although not necessarily related to education.

There also appears to be considerable variation in the return to tenure across firms (Abowd et al., 1999; 2006). This suggests that firm-specific human capital may be relevant in some firms and irrelevant in others.

Many authors seem to agree that the relation between tenure effects and specific capital is more relevant in the US than in France – or continental Europe in general – as American workers are more mobile, and thus need to be stimulated to stay with the firm for a longer period in order to generate returns to specific capital investments made by the employer (Buchinsky et al., 2005; Beffy et al., 2006).

A majority of papers supports the relevance of Lazear style implicit contracts (LSICs). For countries other than the US, results in 18 out of 21 studies are consistent with implications from the theory of Lazear style implicit contracts (LSICs). For the US this holds in 8 out of 15 studies. Thus, there appears to be more controversy in the US than in other countries over the prevalence of LSICs. From a theoretical point of view this can be considered quite remarkable, as Employment Protection Legislation (EPL) in the US is generally less strict than in European countries. It was seen in the previous section that the threat of dismissal is an essential element in LSICs: deferred compensation can only function as an incentive for the individual worker if he runs the risk of missing out on it in case he is detected shirking. Theory thus predicts that LSICs are likely to be less relevant in countries with strict EPL.

It is virtually impossible to test Lazear's theory directly. As was expounded in the previous section, deferred compensation schemes can only be optimal in cases where worker effort is not verifiable by third parties. This means that researchers also have a hard time observing worker effort and productivity. In fact, the more precise the data on individual worker effort or productivity, the less likely it is that Lazear style implicit contracts (LSICs) play a role. Therefore, most papers rely on indirect evidence. In particular, many studies have tested whether individual wage profiles are steeper than productivity profiles (a.o. Lazear and Moore, 1984; Hutchens, 1987; Abowd et al., 1999; Lazear, 2000). Other authors have focused on the issue of mandatory retirement (Lazear, 1979; Clark and Ogawa, 1992). Both papers examine whether an early mandatory retirement age is associated with a steep earnings profile (and vice versa), and indeed find that this is the case. This is in accordance with Lazear's theory.

Some of the best-known studies producing favourable results for LSICs are Lazear and Moore (1984), Hutchens (1987), Kotlikoff and Gokhale (1992), and Hellerstein and Neumark (2004) for the US; Crepon et al. (2003) for France; and Dostie (2006) for Canada. In addition, Huck et al. (2004) provide some experimental evidence on the link between deferred compensation schemes and worker effort by performing tests on a sample of 60 British university students. They propose a three-period compensation scheme based on the Lazear model, and find that this scheme indeed stimulates life-time worker effort in 70% of cases.

Some of the more critical studies – both on data from the US – are Brown (1989), who finds that virtually all within-firm wage growth can be attributed to productivity growth, and

Hellerstein et al. (1999), who find that interpersonal wage differentials do generally reflect productivity differentials.

*None of the alternative theories alone is able to explain the observed wage profiles of individual workers.* The relevance of the different theories clearly depends on the setting. LSICs are more likely to be relevant in jobs where worker output is difficult to verify, and the accumulation of specific capital is obviously more relevant in jobs which require specific skills. On the other hand, several authors have shown that even within a given firm multiple theories are needed in order to understand the observed individual wages. According to Baker et al. (1994b), wage changes cannot be entirely explained by either incentive theory, on-the-job-training (specific capital), or firm learning about the employee's innate ability.<sup>51</sup> Seltzer and Merrett (2000) find that both incentive theory and the theory of specific human capital are the cause of tenure effects in individual wages. We therefore postulate that it is the rule rather than the exception that the wage formation of individual workers involves at least two different theories.

The accumulation of specific human capital may be most relevant for younger workers, and LSICs may be most relevant for older workers. This proposition is confirmed in the case studies by Seltzer and Merrett (2000), who use a long panel data set of white collar workers at an Australian bank, and Shaw and Lazear (2007), who use a panel of workers in an American windshield installation firm. In addition to these studies, many other findings are implicitly consistent with this complementary role for specific human capital and incentive theories. For instance, in studying the growth of wages of young workers (up to the age of 35) in Germany, Dustmann and Meghir (2005) find that returns to (firm) tenure during the initial five-year period at the firm equal 4% per year for unskilled workers and 2% for skilled workers. However, no additional returns to tenure are found after these five years.<sup>52</sup>

*Tournament theory is relevant.* Of those empirical studies focusing on the relevance of tournament theory, not one single study was able to reject any implication by this theory. The influential studies by Baker et al. (1994a; 1994b) in the first place conclude that none of the major theories alone can explain the wage policy of a certain medium sized US firm in the service industry. In the second place, many of the firm's wage policies turn out to be consistent with tournament theory. Amongst others, the authors find that promotions bring discrete salary premiums, and that these are especially high for the highest job levels; and that the firm a priori determines a set of rewards that the workers have to compete for. It should however be mentioned that practically all empirical evidence is derived from US data from the 1970s and 1980s. Moreover, this research typically focuses on the wage policy of one single firm, which of course needs not be representative for other firms. Yet it is very likely that tournament theory

<sup>&</sup>lt;sup>51</sup> The last explanation will be discussed in section 6.6.2.

<sup>&</sup>lt;sup>52</sup> Note that Jovanovic' theory of job matching – which will be discussed in the next chapter – equally predicts that wages initially rise with job tenure, but only for a limited duration (Jovanovic, 1979).

is more relevant in one firm than in the other, in particular it should be relevant in those firms where the relative productivity of individual workers can be observed (and not the absolute productivity level).

#### 6.6 Alternative theories

In this section we review alternative theories presented in the literature that can account for upward sloping experience-earnings and/or tenure-earnings profiles. The theories of worker self-selection and job matching imply that wages are tied to (expected) productivity. These theories can be regarded as special forms of the specific capital model. The theories of collective bargaining, insurance, worker preferences, and job security provisions may imply wage-productivity gaps of individual workers.

#### 6.6.1 Worker self-selection

Workers may differ according to potential productivity, trainability, and expected tenure at a firm. At the same wage rate for each employee, the firm obviously prefers to hire those applicants who will be the most productive, the most easily trainable, and - given these two characteristics - the least likely to quit. Information on workers' characteristics can, however, not be obtained without cost. Thus, faced with this asymmetric information problem the firm may devise alternative ways of evaluating prospective employees. One such method is a selfselection device. This is a pricing scheme that causes the applicant to reveal truthful information about himself by his market behaviour. Salop and Salop (1976) apply such a selfselection device with respect to the firm's objective to minimize turnover costs. Whenever an employee quits and is replaced, the firm incurs training, processing, and other turnover costs. This gives the firm an incentive to hire those applicants with the lowest propensities to quit. Salop and Salop (1976) show that by predictably increasing an employee's wage with his tenure at the firm, the firm discourages high turnover individuals from applying, while it encourages low turnover workers to apply for employment. This essentially has the effect that the worker pays the consequences, in terms of foregone higher earnings, if he quits prematurely.

Deferred wages may thus serve as a self-selection device to attract workers who are inclined to stay with the firm for a longer period. The profit motive causes a firm to introduce such a self-selection device, but competition among identical firms ensures that all the gains from sorting accrue to the scarce factor - the slow quitters.

There is some experimental evidence on the existence of self-selection or sorting. For example, Niederle and Vesterlund (2007) find that women are less willing to compete in tournaments compared to men when the alternative is to work under piece rates. Similarly, Dohmen and Falk (2006) provide evidence that relatively productive workers are more likely to self-select into variable payment schemes rather than fixed payment schemes. In addition they find that tournament schemes tend to attract individuals that are more risk tolerant, more overconfident and more selfish. These results suggest that firms may use payment schemes to

attract particular types of workers. Whether they actually do and to what extent upward sloping experience-earnings and/or tenure-earnings profiles are part of the story remains on the research agenda.

### 6.6.2 Job matching

Like in the self-selection approach, models of turnover involve imperfect information. The associated uncertainty however concerns all parties, i.e. there are no asymmetries. New information arrives either about one's current job match or about a possible alternative match that may lead to a job change. Jobs are pure search goods, and matches dissolve because of the arrival of new information about an alternative prospective match. In addition, a job is an 'experience good': the only way to determine the quality of a particular match is to form the match and experience it. Jovanovic (1979) shows that the assumption that a job match is a pure experience good may, among other things, lead to a positive tenure-wage relationship.

Match quality is often regarded as a form of specific capital. However, the matching model does have some compelling features with regard to the data that the basic specific capital model lacks (Farber, 1999). In particular, the model accounts for the very high rate of job separation in the first year.

#### 6.6.3 Insurance

Risk averse agents would like insurance against fluctuations in consumption. If financial markets cannot be used to provide that insurance, then firms may provide it to their workers instead. For that purpose employers may offer employees a (relatively) stable wage profile. This can be efficient if the employer disposes of relevant information that an independent insurer does not (Malcomson, 1999). In addition, contracts that specify a stable wage profile shift risk from the employee to the employer. That is efficient if employers are less risk averse than employees or are better able to shift some of these risks to the capital market (Bovenberg and Teulings, 2008).

In general, a contract that is not legally enforceable will be adhered to only if it is in the interest of both parties to do so, that is, if it is self-enforcing. In such a setting both the firm and the employee are bounded by their outside option constraints, which define their respective alternative opportunities in the market. A self-enforcing contract consists of a sequence of wages (and possibly a sequence of hours) such that neither prefers to take their outside option as long as it is efficient for employment to continue. The result is that the firm provides insurance to the employee in the form of a constant real wage until such time as the wage is either too low to prevent the employee quitting (in which case it is increased by just enough to ensure the employee stays) or it is too high to prevent the firm laying off the employee (in which case it is reduced by just enough to avoid layoff).

Contracts to insure employees' earnings have a number of characteristics that are consistent with the empirical evidence (Malcomson, 1999). For example, such contracts are consistent with earnings that fluctuate less than spot market earnings of employees with identical characteristics. In addition, employees hired at different dates under different labour-market conditions also have different earnings. In particular, Beaudry and DiNardo (1991) find that, consistent with the contract not being binding on employees and inconsistent with a spot market model, the lowest unemployment rate since the start of the job has a significant negative coefficient in almost all cases. Additional evidence is acquired through interview and questionnaire studies of managers' opinions. Blinder and Choi (1990), for example, report that 53% of the personnel managers indicated that they found the idea of insurance 'somewhat plausible' or 'relevant'.

#### 6.6.4 Collective bargaining

Trade unions are traditionally associated with the standardization of pay-setting procedures, and incremental, seniority-based wage scales in particular. This raises the question why unions often adopt seniority scales.

One strand of the literature on unions shows that unions' distributional preferences – unions pay more attention to 'senior' workers' preferences – can explain various union practices, including rising seniority-wage profiles. For example, Weiss (1985) and Tracey (1986) explain the presence of rising seniority-wage profiles by assuming that 'incumbents' (the older members of the union) control the union at the expense of newcomers. In such a setting, seniority wage increases are found to serve as implicit initiation fees and thus serve as one means of appropriating rents from future union members. Alternatively, union preferences may reflect the preferences of the representative worker, who simply prefers increasing wage profiles (as found by Loewenstein and Sicherman, 1991; see the following subsection).

Another strand of the literature shows that seniority rules for employment and rising seniority-wage profiles are optimal for the union, even when it is indifferent to distribution (Frank, 1985; Kuhn, 1988; Kuhn and Robert, 1989, Frank and Malcomson, 1994). This is the so-called *discriminating monopoly* approach that employs a non-uniform pricing model of union wages. With a seniority wage scale and an associated last-in, first-out (LIFO) layoff rule, the firm must first employ the high-wage senior workers before it can hire lower-wage junior workers. The LIFO rule ensures that the firm cannot replace high-wage senior workers with low-wage junior workers. A new worker is taken on if the present discounted value of the lifetime marginal product exceeds the discounted lifetime income stream. Hiring a worker at the bottom of a steep scale is more profitable for the firm than at the constant average wage (or the wage that would prevail without a wage scale), since the firm pays the higher wage rates in the discounted future. In this way the union can extract (part of) the surplus from the firm, without distorting employment so much, as would be the case with a uniform wage. Thus, a seniority wage scale can achieve greater employment efficiency, and thereby increase the total surplus to be divided

between the firm and the workers.<sup>53</sup> And, for given bargaining power, the union can achieve greater total income for the workers (Booth and Frank, 1996).

There is some evidence that wages rise more with seniority in unionized than in nonunionized workplaces. Booth and Frank (1996), in a study of British panel data, find that, for unions with seniority scales, the union wage differential is increasing with seniority. This is not the case for unions without seniority scales.<sup>54</sup> Using an extended British panel data set, Zangelidis (2008) reports that seniority-earnings profiles appear to be steeper in the union sector, while occupational expertise (as opposed to mere tenure) is estimated to have a more significant role in non-union jobs.

In both situations, with distributional preferences or with discriminating monopoly, the process of collective bargaining between the firm and its workers, as represented by the trade union, induces a shift towards a steeper wage profile. This may result in a situation in which the younger workers are paid less than their productivity, and the older workers more than their productivity.

#### 6.6.5 Worker preferences

Many workers actually prefer increasing wage profiles over flat or decreasing wage profiles of greater monetary value. This is argued by Loewenstein and Sicherman (1991) on the basis of a survey of eighty adults, and confirmed by a.o. Frank and Hutchens (1993). Respondents were asked to rank alternative payment options (for a job or for rental income). All options (yearly payments over 6 years) involved the same undiscounted total payoffs but differed in slope. Given a positive discount rate, the present value of a payment stream is decreasing with the slope of the payments profile. Only a minority of the respondents in their survey made choices consistent with present-value maximisation.<sup>55</sup> This raises the question why workers might prefer increasing wage profiles over flat or decreasing wage profiles with higher present values. Loewenstein and Sicherman (1991) offer four possible reasons. First, workers may associate wages with productivity and derive utility from a feeling of mastery when wages increase.<sup>56</sup> Second, workers could anticipate a need for increased future expenditures but could experience difficulty controlling spending in early periods – a problem of self-control. Third, a preference for increasing wages (or payments) could be explained by a self-control problem combined with a utility function that depends positively on changes in as well as absolute levels of

<sup>&</sup>lt;sup>53</sup> If the union opts for greater employment efficiency with scales than in the case without scales, the present discounted value of a new worker actually decreases – as only then the firm employs more workers. The rationale for this behaviour is that the union maximizes total earnings over the working life, that is, without discounting. Or, in a static sense, it maximizes total earnings of its current members, if its members are equally distributed among seniority levels.

<sup>&</sup>lt;sup>54</sup> Booth and Frank (1996) argue that scales will be adopted only if there is a sufficient gain through lessening the employment distortion of a wage gap. For unions with relatively low power, and therefore a low wage gap, there is little gain to having scales.

<sup>&</sup>lt;sup>55</sup> Note that, given a positive real rate of interest, any choice that does not conform to present value maximization violates dominance. That is, by selecting the (most) decreasing wage profile and saving appropriately, workers could enjoy greater consumption in every period.

<sup>&</sup>lt;sup>56</sup> The rental income questionnaire was introduced to test this 'mastery' explanation. Since such payments are unrelated to individual effort, any preference for increasing payments cannot be explained by satisfaction derived from mastery.

consumption. The fourth reason is that workers may derive utility in the present from anticipating future consumption, again combined with the problem of self-control. Notice that the first reason concerns a direct preference for wage increases, while the other three reasons are based upon a preference for increasing consumption. The latter reasons, therefore, need the assumption that workers have a self-control problem that prevents easy transformation of decreasing payments into increasing consumption sequences.

None of these reasons, however, seems to be entirely consistent with survey results. Many respondents seem to derive positive utility from receiving an increasing sequence of payments or negative utility from a decline in payments, independent of the consumption levels that could be derived from the stream. This preference applies to rental income as well as wages, suggesting that it is not simply due to the association of pay increments with mastery or performance at a job. Additional insight and evidence is gained from interview and questionnaire studies of managers' opinions. According to the managers, one of the main reasons for avoiding pay cuts is that they damage morale. In Kaufman (1984), for example, firms were asked if they could find qualified personnel at less than current wages, and if so, what prevents the firm from cutting wages. The most common response to the latter question was that wage reductions would upset workers and that their response would be a reduction in work effort. Bewley (1999) notices that wages affect morale only when reduced. The reason for this dissimilarity is that workers quickly get used to increases and grow to believe they have a right to them. In other words, the past wage is used as a reference wage from which to infer the 'fairness' of the current wage.<sup>57</sup> Most studies indeed find that workers' concerns about fairness and relative wages play an important role in explaining why firms do not normally cut wages in recessionary periods.

#### 6.6.6 Job security provisions

According to Lazear (1990), 'any state-mandated severance pay can be undone in a perfect market by an appropriately designed labour contract'. Consider an older worker who is eligible to a certain severance pay Q at the end of his career. This leads to an increase in the wages of employed older workers as well, as their shadow wage increases by a similar amount Q. Now, the firm could simply lower the worker's wages in earlier years, precisely by the discounted, expected amount of severance pay. Thus, total compensation, including severance pay, remains unchanged. Compared to a situation in which wages equal productivity, EPL leads to higher wages than productivity for older workers, as they are typically better protected than younger workers.

Leonardi and Pica (2007) confirm the proposition of Lazear (1990) that the effects of EPL can in principle be undone by a properly designed labour contract. The authors compare wage profiles of firms affected by government reform with wage profiles within unaffected firms, and find that, although an increase in EPL does not affect entry wages, it does decrease the returns

<sup>&</sup>lt;sup>57</sup> Fairness involves more than just a reference wage. This is illustrated by the finding that pay cuts are accepted by the work force if they prevent a firm from closing or if they save a large number of jobs.

**ALTERNATIVE THEORIES** 

to tenure. The decline is concentrated in the early years of tenure. They view this result as consistent with Lazear's theory according to which workers pre-pay at entry the increase in EPL costs. The fact that the reduction in wages occurs in the early years of tenure rather than at entry may be explained by the existence of binding minimum wages at entry. There is no evidence, however, that wages in later periods are higher in the presence of EPL.

#### 6.6.7 Empirical evidence

In this section we have reviewed economic theories affecting the wage profiles of workers. The main implications are summarised in table 6.2. As can be read from the table, a wage-productivity gap of older workers could be explained by four different theories.

Which theory is most relevant? Daveri and Maliranta (2007) consider the impact of technological changes on age-related productivity. The authors focus on the relation between age, seniority and experience<sup>58</sup> on the one hand, and productivity and wages on the other, for a sample of plants in three manufacturing industries ('forest', 'industrial machinery' and 'electronics') in Finland during the IT revolution in the 1990s. In the industries that were not subject to major technological shocks productivity and wages keep rising with the accumulation of either seniority (the forest industry) or experience (industrial machinery). In electronics - the industry where people are exposed to rapid technological and managerial changes - the seniority-productivity profile shows a positive relation first and then becomes negative as one looks at plants with higher average seniority. Instead, wages keep going up with seniority. The results are consistent with the idea that fast technological change induces accelerated skill depreciation of senior workers.<sup>59</sup> Daveri and Maliranta (2007) attribute this finding to a combination of highly centralized collective agreements with relatively autonomous but still highly unionized industry wage setting, which has resulted in a very low weight given to performance-related firm-level corrections of wages. But this raises the question why unions and/or firms would opt for wages that are largely unresponsive to productivity changes.

This may very well have something to do with the insurance motive. At the start of one's career the future development of his productivity is uncertain, in particular concerning major technological shocks. Once such a shock occurs, it may boost productivity of the younger workers but at the same time lower productivity of the older workers – as in the situation described above. The finding that wages are not adjusted in accordance with productivity – neither downwards in case of the older workers nor upwards in case of the younger workers – in the face of technological shocks may reflect an (implicit) agreement to keep wages stable. Stable wages, then, provide insurance against obsolescence of human capital.

Another explanation for this downward rigidity of wages concerns the idea that pay cuts damage morale, a manifestation of the influence of workers' preferences. Downward

<sup>&</sup>lt;sup>58</sup> Seniority is defined as the number of years spent working in the current company (tenure), while experience, or more precisely, potential experience, is the number of years after the last completed degree.

<sup>&</sup>lt;sup>59</sup> It cannot be ruled out that these results are (partly) driven by worker movements across plants.

adjustments in wages would induce a reduction in work effort (whereas increases in wages do not induce a similar rise in work effort). This induces firms to avoid reductions in wages.

This example illustrates the relevance of three of the alternative theories in explaining the potential difference between productivity and wages. The other three theories seem to be less relevant. Although there is some evidence that firms may use payment schemes to attract particular types of workers, this evidence is mainly directed at payment schemes that involve different levels of risk, like variable versus fixed payment schemes. There is no evidence that firms use upward sloping wage profiles for self-selection purposes. Second, the job-matching approach, although being able to explain a positive tenure-wage relationship, is primarily meant to explain the central facts of job change. Wages are tied to expected productivity, and wages rise with tenure if productivity turns out to be higher than expected. According to the evidence, this theory is particularly relevant to wage growth in the early stages of the career – at later stages turnover is much less frequent. Third, there is too little empirical analysis devoted to the influence of job security provisions to draw any firm conclusions.

Thus, for our purpose, i.e. explaining the potential difference between productivity and wages, three of the alternative theories seem particularly relevant: the insurance motive, the collective bargaining or union approach, and the workers' preferences approach.

Table 6.2	Effect on individual wage profiles	
Theory		Effect on wage profile <sup>a</sup>
Human capital		Wages rise with tenure
Incentives		Wage exceeds productivity for older workers
Self-selection		Wages rise with tenure
Job matching		Wages rise with tenure
Insurance		Wages are relatively stable over the life-cycle
Collective barga	ining	Wage exceeds productivity for older workers
Worker preferer	ices	Wage exceeds productivity for older workers
		Wages are relatively stable over the life-cycle
Job security		Wage exceeds productivity for older workers
a Note that a posit	ive tenure effect may imply that wages lie at or be	low the productivity level.

# 6.7 Conclusion

The notion of specific capital has received much attention in the literature. In theory, it could explain Hutchens' (1986) question why firms *employ* older workers but never *hire* them. The empirical literature grants support to the theory of specific capital, although its precise relevance is still hotly debated. There are, however, many indications that this theory alone cannot explain the observed wage patterns of older workers. The empirical literature suggests that at least one other theory is relevant. Studies allowing for both specific capital accumulation and deferred payment schemes typically find that there is some complementary role for both

theories. This leads us to conclude that there is a pay-productivity gap for older workers. This is of course not to say that it is relevant for all workers in all sectors.

The question then arises: Is this a problem? And if so, does the ageing workforce exacerbate it?

To start with the first question, the basic answer is: not necessarily. As long as firms and workers find it profitable to make use of whatever payment scheme without shifting costs to society, then the scheme is apparently optimal. For efficiency reasons it is important that redistribution may only occur between employees within the firm. In theory, this is the case for Lazear style implicit contracts. The same holds for theories involving wage rigidities stemming from worker preferences and insurance motives. These can in theory be negotiated between the firm and the employee (or the union) without shifting costs to other groups in society.

The important exception is the theory on wage bargaining, which involves market power by unions. Employment protection of older workers is generally stronger than for younger workers, which makes the firm's demand for labour by older workers less elastic than their demand for younger workers. Unions know this, and given their bargaining power, are able to negotiate relatively high wages for older workers. As a consequence the wage rate of older workers is set above the efficient level, resulting in a loss of social welfare.

An interesting question is where the demographic shift will lead us. Lazear style implicit contracts (LSICs) imply redistribution from young to old workers in order to finance the old workers' pay-productivity gap.<sup>60</sup> Population ageing challenges the financing of such a system, and will lead companies to either decrease the wage bill or lay off older workers (Lazear, 1988). As far as LSICs do not involve any shifting of costs to society, firms can and will make efficient decisions on the survival of LSICs. A similar reasoning is in place for preference and insurance motives. Thus, under the precondition that firms bear the costs themselves of deferred payment schemes, there is no reason for policy intervention.

The most important policy issue for the future is perhaps the role of unions. It is expected that their negotiating power will increase as the fraction of older workers increases, and therefore they might be able to extract more rents from firms. Yet, the total surplus will necessarily decrease as the share of younger workers will decrease. It is thus unclear whether the pay-productivity gap stemming from collective bargaining will increase or decrease. The loss of welfare resulting from the unions' bargaining power will however stay in place. Note that this bargaining power is for an important part granted by the central government, which extends collective labour agreements to non-union members and declares them 'generally binding' within sectors.

Deferred compensation schemes aggravate the problem of liquidity constrained young households. Such compensation schemes imply that young workers are forced to 'invest' part of their wages in their employment relationship, and will be 'rewarded' after spending a certain amount of time with the firm. To the extent that the 'investment' takes place when credit

<sup>&</sup>lt;sup>60</sup> In theory, firms could set up a funded savings facility to finance future pay-productivity gaps, but such firm behaviour seems quite uncommon.

constraints matter most, such a compensation scheme can be harmful. Families with young children may wish to borrow against their future income rather than being forced to accept lower wages. Thus, deferred compensation leads to even more problems for young households in trying to smooth their lifetime consumption.

Another drawback of deferred compensation schemes is that job-to-job mobility is discouraged once a worker earns a wage exceeding his productivity. This could harm efficiency e.g. in case of a technological shock or dynamic adjustment due to globalisation. Indeed, the golden chain of deferred payment prevents a more efficient allocation of labour.

Finally, deferred payment schemes lead to under-investment in general human capital by older workers. High wages imply high opportunity costs, and thus too little investments in schooling. On the other hand, for younger workers, deferred payment schemes may imply too much general training and too little labour supply.

# 7 Employment protection

# Anja Deelen, Egbert Jongen

Employment protection legislation insures workers' firms-specific human capital and prevents excessive use of public unemployment insurance. Yet, it generates a social cost by reducing incentives for search and training and causes inequality between insiders and outsiders. The desired move towards insuring workers instead of jobs calls for a reform of EPL. The current practice in the Netherlands where EPL rises with tenure and age and then evaporates at age 65 is debatable.

# 7.1 Introduction

Employment protection legislation (EPL) can play a productive role in the labour market. Firing restrictions prevent excessive lay-offs in the presence of public unemployment insurance (Blanchard and Tirole, 2007). Severance pay offers insurance against the loss of firm specific human capital. Elderly workers have longer unemployment spells and may accumulate more firm specific human capital than younger workers. This provides a rationale for the rise in employment protection with age and tenure that we observe in the Netherlands. However, employment protection can also play a less productive role in the labour market. Employment protection may be the result of rent seeking by certain groups of workers (Saint-Paul, 2000), and this too can explain employment protection rising with age and tenure. In this chapter we take a closer look at the impact of employment protection on the labour market, where we focus on elderly workers. We study the overall impact on stocks like employment and unemployment, and on labour-market flows. We also discuss the implications of some reform options.

The chapter is organized as follows. Section 7.2 gives a brief overview of employment protection in the Netherlands. Section 7.3 considers the role of EPL in a modern welfare state and discusses the desirability of employment protection rising with age and tenure. Section 7.4 discusses empirical findings on the impact of EPL on labour-market outcomes like unemployment, employment, mobility and productivity, with a focus on the elderly. Section 7.5 presents some new estimates using a cross-country panel for the OECD. In Section 7.6 we quantify the effects of some reform options for the Dutch setup, using the estimation results from Section 7.5. In Section 7.7 we consider the role of political economy considerations in the reform options. Section 7.8 concludes.

# 7.2 Employment protection in the Netherlands

#### 7.2.1 Different routes for workers with permanent contracts

When a firm wants to fire a worker or a group of workers with permanent contracts they have three options in the Netherlands. They can try to reach an agreement with the worker or the group of workers (a so-called 'social plan'), they can turn to the Centre for Work and Income (CWI) or they can go to court.<sup>61</sup> A social plan is typically inspired by the rules that apply at the CWI and at the court. We consider the latter two in turn.

The CWI is a public administrative body. Employers take this route when they believe they can get a permit for dismissal. They have to show that the job disappears and the worker can not be located somewhere in the firm, or that the productivity of the employee does not meet the necessary requirements. The CWI checks whether the dismissal does not involve an individual that can not be fired by law (pregnant women, members of representative bodies of workers *etc.*) and weighs the interests of the employer and employee as well as interests for society at large, according to the rules laid down in the so-called '*Ontslagbesluit*' (Dismissal Resolution). Employers can also turn to court. The court also checks whether the dismissal does not involve An individual that can not be fired. If not, the judge will typically apply the so-called ABC-rule to determine a severance package, where A stands for the wage, B for the years of tenure and C is an adjustment factor that the judge can use to increase or decrease the severance package. In particular, he or she will weigh the interests of the employer and employee and their 'contribution' to the dismissal in the final package. Furthermore, severance pay increases more than linearly with tenure for older workers. Years under 40 years of age get a weight of 1, years worked between 40 and 50 get a weight of 1.5 and years over 50 get a weight of 2.

The CWI-route typically involves lower severance pay but is more time consuming than the court route and results in longer notice periods. According to recent data from Knegt and Tros (2007) the average cost of the CWI route was close to 14 thousand euro, and the average cost of the court route was some 29 thousand euro. This is the sum of administrative and legal costs, wages paid during the period that the worker is no longer working and severance pay. Most of the difference in the cost of the two routes is due to differences in severance pay. Why do not all firms go to the CWI? This is probably in part due to the fact that firms that go to court would not get permission for dismissal from the CWI. For example, larger firms are more likely to go to court than small firms, perhaps because they have a harder time making the case that they can not find alternative employment for the employee within the firm. Furthermore, the court route is relatively fast and the result is more predictable than the CWI route.

#### 7.2.2 The dual face of Dutch employment protection

Weighing the different routes for dismissal of workers with permanent contracts, the OECD comes to rather strict employment protection for workers with these types of contracts in the Netherlands. In 2003, the strictness of EPL for regular employment in the Netherlands was ranked second, after Portugal (OECD, 2004). However, the Dutch system has a dual face. Regulations and restrictions for temporary work and fixed-term contracts are limited from an international perspective. As a result the overall score is an intermediate position within OECD countries.

<sup>&</sup>lt;sup>61</sup> The employer does not need a permit in the case of a summary dismissal (*'ontslag op staande voet*), when the employee is still in the trial-period or when the firm goes bankrupt.

Further inspection of the OECD data suggests that severance payments for individuals with high tenure are relatively high in the Netherlands. After 20 years of employment, the average severance payment is 9 months of salary.<sup>62</sup> Only Portugal and Turkey rank higher (OECD, 2004). In 2003, the Netherlands was also one of the few countries (together with Australia and Switzerland) where EPL is not only related to tenure but also to age directly.<sup>63</sup> Another key aspect of the Dutch dismissal system is the heavy reliance on procedures rather than prices. Indeed, in 2003 the Netherlands was 'number 1' when it comes to procedural inconveniences related to dismissal, according to the OECD (2004).

# 7.2.3 Recent reforms and proposals

In recent years, the Dutch government has implemented a number of minor reforms in EPL. The last-in-first-out (LIFO) principle for dismissal used by the CWI was replaced by the socalled 'reflection principle' where LIFO only applies to employees in cohorts of ten years (and similar jobs), in 2006. In 2007 the Minister of Social Affairs and Employment came up with proposals for a more liberalized system of employment protection, but no consensus was reached. In 2008, an agreement was reached with respect to a cap on the severance pay in case of dismissal via the court. For workers earning 75.000 euro or more per year, severance pay is maximized at one annual salary. In November 2008 the '*Cirkel van Kantonrechters*' (Circle of Cantonal Judges) set new more sober guidelines for severance pay in court cases, in particular for the early years of a career. They proposed a scheme where years of tenure below 35 years of age now only get a weight of .5, years between 35 and 45 get a weight of 1, years worked 45 and 55 get a weight of 1.5 and years over 55 still get a weight of 2.

The OECD estimates that due to these latter two measures the EPL-index for regular employment in the Netherlands will come down from 3.1 (in 2003) to 2.6 (OECD, 2009). According to this update of the EPL-index, the Netherlands drops to the 6th place for regular contracts, dropping below e.g. Germany (which gets a higher index than in 2003).

# 7.3 The role of EPL in the welfare state

Why do countries protect workers against dismissal? Why do unemployment insurance and employment protection coexist? Why does employment protection rise with tenure and age? We take up these questions below.

#### 7.3.1 Employment protection and efficiency

The literature offers (at least) two efficiency reasons for EPL. First, the social value of a job may exceed its private value, for instance due to publicly provided unemployment insurance.

<sup>&</sup>lt;sup>62</sup> This is a weighted average for the two dismissal routes: severance payments are set to zero for dismissal via the 'CWIroute' and are equal to 18 months of salary for termination via courts, both at 20 years of tenure.

<sup>&</sup>lt;sup>63</sup> In the late '80's Ireland, The Netherlands, United Kingdom had featured age-related EPL. In the late 90's this was true for Australia, Ireland, the Netherlands, Norway, Switzerland, and the United Kingdom.

The costs of dismissal in the form of higher unemployment insurance premiums are not taken into account by parties who decide upon the job separation. Blanchard and Tirole (2007) show that an optimal system always combines unemployment insurance with firing taxes to internalize the externalities of dismissal. A firing tax (or equivalently experience rating) may reduce excessive firings and improve the efficiency of firing decisions.

A second efficiency role of EPL is insurance against the loss of firm-specific human capital. When workers are fired, they run the risk of becoming unemployed. While they are protected against income loss via unemployment insurance, they also lose the returns on firm-specific human capital. Severance pay can be used to insure against this type of risk.

However, employment protection may also create inefficiencies, and inequality. For instance, EPL tends to reduce job creation, in particular when workers use employment protection to bargain for higher wages. Reduced hiring increases the inequality between incumbent insiders and unemployed outsiders.

Employment protection may also reduce work effort and training as employees know that a separation is costly for the employer. To remedy this, one would like to exclude workers that were found shirking from employment protection, but this information is typically not available. In this way, EPL may hurt productivity.

A third drawback of employment protection is that it reduces the flows from less productive matches to more productive matches. Insofar as technological change is embodied in job-worker matches, this reduces the level and the growth of technological development in the economy and the productivity of workers. Also, workers will be less willing to give up their current job with the accumulated employment protection 'rights' to accept a job that better fits their skills. On the other hand, longer match durations may stimulate specific investments by firms and workers. Via this channel employment protection may raise productivity, which would also raise welfare when there is initial underinvestment in firm specific skills (see e.g. Belot *et al.* (2007) and Jongen and Visser, (2009).<sup>64</sup>

Overall, theory provides an ambiguous picture on the welfare implications of EPL. Empirical evidence can help us gauge the empirical relevance of the different effects on welfare, which we consider below in Section 7.4.

#### 7.3.2 Employment protection, age and tenure

Should employment protection rise with tenure or age? Given the longer unemployment duration of elderly workers, it seems likely that the firing distortion is relatively large for this group. This would justify employment protection that increases with age. An efficient way to do this seems a firing tax that rises with age. Currently this is done via rules and procedures that effectively make it harder to fire older workers. The advantage of firing taxes over procedures is that they do not constitute a social cost, and can be used to e.g. lower public unemployment insurance premiums. One form in which firing taxes can appear is through experience rating in

<sup>&</sup>lt;sup>64</sup> However, it is always more efficient to overcome the hold up problem directly through a contract. Prolonged job matches come at the cost of increased 'sclerosis'.

unemployment insurance. Insurance premiums for firms then depend on the firings of that firm in the past, i.e. more firing causes higher premiums.

Given that severance pay can be viewed as insurance against the loss of firm specific human capital, it might be optimal to have severance pay rise with tenure. Workers with high tenure presumably have a larger stock of firm specific knowledge (assuming that mental or technological depreciation is fairly low). However, the closer an employee is to retirement, the shorter the remaining return period for the firm-specific capital. This suggests that severance pay should eventually decline again as the worker starts to approach retirement. The same holds for firing taxes to 'internalize' the social cost of unemployment insurance. Close to retirement few remaining periods of potential unemployment insurance remain, and the firing tax can fall accordingly.

The analysis above suggests that it may indeed be optimal for employment protection to rise with age and tenure up to some age, but close to retirement employment protection should fall again. The current system does not feature this 'hump shape' in employment protection. Employment protection keeps rising up to retirement and then suddenly drops to zero.

# 7.4 Empirical literature on the economic effects of EPL

Employment protection has an ambiguous effect on e.g. employment, productivity and welfare in theory. The 'verdict' has to come from empirical studies. In this section we review the empirical literature on employment protection. We build on the survey by Deelen *et al.* (2006), but focus more on the implications for the labour market of the elderly.

#### 7.4.1 Flows and stocks

Theory predicts that EPL reduces both firing and hiring. Empirical studies confirm the impact of EPL on job flows. For instance, they generally report significant effects of EPL on the duration of unemployment or the share of long-term unemployment. Moreover, there is evidence that insider-outsider effects contribute to the effect on unemployment durations. In particular with an intermediate degree of centralization /coordination in wage bargaining – which is associated with high insider power – EPL is likely to raise unemployment durations. With lower inflows and outflows, the net effect of stricter EPL on the levels of employment and unemployment is ambiguous. The empirical literature suggests that the overall effect on unemployment is small, perhaps slightly positive. There are also typically small (negative) effects on employment and labour supply.

Table 7.1 Overview of the main findings in the empirical literature on employment protection legislation			
Study	Main findings		
Employment and Une	employment		
Lazear (1990)	Young workers bear a disproportionate share of the costs of EPL		
Scarpetta (1996)	Effect of EPL on unemployment larger for young workers than for the overall population		
Nickell (1997)	Overall labour supply is negatively related to EPL, for males aged 25-54 no effect		
Heckman et al.(2000)	EPL decreases the employment rate of young workers more than that of prime-age men		
Kugler <i>et al</i> .(2003)	A decrease in the firing costs (Spain 97') increased hiring and firing for older workers		
Behaghel <i>et al.</i>	Abolishment of experience rating restricted to older workers in France in 1992 reduced firms'		
(2005) Oshaslasahaan at	propensity to nire older workers		
al. (2008)	(Australia)		
Deelen (2009)	Strict EPL prolongs the average duration of unemployment, especially for the elderly		
Productivity			
Nickell <i>et al.</i> (1999)	No evidence that employment protection lowers productivity growth rates.		
Scarpetta <i>et al.</i>	Strict EPL has a significant negative impact on productivity only in countries with an intermediate		
(2002)	degree of centralisation/coordination in wage bargaining		
Belot <i>et al.</i> (2004)	There is a non-linear (hump-shaped) relationship between EPL and GDP-growth		
Autor <i>et al.</i> (2007)	Higher EPL raises the capital-labour ratio which increases labour productivity, but decreases total factor productivity and hence efficiency in production.		
MacLeod <i>et al.</i>	EPL has a negative (positive) effect on employment for occupations characterized by low (high)		
(2007)	levels of specific investment		
Perceived job securi	ty		
	Countries offering relative strict EPL and less unemployment benefit coverage are characterized		
Boeri <i>et al.</i> (2001)	by a larger share of workers that demand for extra coverage of UI		
	The perceived job security of Spanish young workers has increased due to the reduction in		
Trevisan (2007)	strictness of EPL. No significant effect is found for workers above 45.		
	There is a negative correlation between EPL strictness and perceived job security and a positive		
Clark et al. (2008)	relation between UI-generosity and perceived job security		

While the effect on overall employment and unemployment of stricter EPL seems limited, the evidence suggests significant effects for particular groups on the labour market. In particular, the employment rate of prime-age males typically rises with EP. This comes at the expense of the employment opportunities for younger workers, other newcomers to the labour market (immigrants) and women with intermittent spells of non-participation. For example, Lazear (1990) finds that young workers are likely to bear a disproportionate share of the costs imposed by severance pay, decreasing their employment rate and increasing their unemployment rate. Heckman and Pagés (2000) find that EPL decreases the employment of prime-age men only half as much as it decreases total employment, while the effect of EPL on the employment rate of young workers is almost double the effect on total employment. Nickell (1997) reports that overall labour supply is negatively related to employment protection, but for males aged 25-54 the regressions show no correlation. Finally, Scarpetta (1996) also finds that the effect of EPL on unemployment is larger for young workers than for the overall population. Table 7.1 provides an overview of selected empirical studies.

Some studies explore the effects of EPL on elderly workers. OECD (2004) finds that EPL significantly reduces the employment of prime-age women, while it does not appear to play a significant role for employment of prime-age<sup>65</sup> males. Kugler *et al.* (2003) conclude that the decrease in the firing costs in Spain in 1997 increased both hiring and firing for older workers. Schnalzenberger *et al.* (2008) investigate the effect of a higher layoff tax for older workers in Austria in 2000, comparing a control group just below the age of 50 with the treatment group above 50. They find substantial reductions in layoffs for workers aged 50 and over. Behaghel *et al.* (2005), study a natural experiment involving the abolishment of experience rating for older workers in France in 1992. They find strong evidence of an adverse effect of the implicit firing tax on the firms' propensity to hire older workers.

Figure 7.1 OECD EPL-index (2003) and the inflow into unemployment of workers aged 55-64 (left panel) the unemployment rate of workers aged 55-64 (averages 1990-2007, right panel)



Figure 7.2 OECD EPL-index (2003) and the average duration of unemployment of workers aged 55-64 (averages 1990-2007, left panel),the share of discouraged workers in the labour force aged 55-64 (averages 2000-2007, right panel)



The conclusions from empirical studies can be illustrations with some simple univariate relations in cross-country data. Figures 7.1 and 7.2 show correlations of the EPL index of the OECD for 28 countries and a number of labour-market indicators for the elderly between 55-64, in particular unemployment < 1 month, the unemployment rate, unemployment duration and the

<sup>&</sup>lt;sup>65</sup> Prime-age refers to the age-group 30-54.

share of discouraged workers. We see that there is no clear correlation between EPL and the overall unemployment rate of elderly. Yet, stricter EPL is clearly associated with smaller inflows into unemployment (i.e. unemployment < 1 month), longer unemployment durations and a higher share of discouraged older workers.

#### 7.4.2 Productivity

EPL has an ambiguous effect on productivity in theory. On the one hand, stricter EPL may reduce productivity because of sclerosis in the production structure, a loss of skills by workers during spells of unemployment, or EPL induced shirking. On the other hand, stricter EPL may promote specific investments and result in more learning-by-doing, increasing productivity. The empirical studies produce mixed results.

Nickell and Layard (1999, p. 3065) conclude: " ... there seems to be no evidence that either stricter labour standards or employment protection lowers productivity growth rates." They argue that reallocation may not easily be hampered by EPL since firms can reduce employment by about 10% every year just by relying on workers leaving. In addition, in many European countries job creation and destruction are at levels comparable to the US, although EPL is much lower in the US. This can be explained, according to Nickell and Layard, by the fact that wages are very flexible at the firm level in the US, which increases job stability *ceteris paribus*. Hence, employment protection and wage flexibility are substitutes. In their cross-country analysis based on OECD-data, they find a positive effect of EPL on the growth rate of labour productivity as well as a positive effect of EPL on total factor productivity, although this effect disappears in other specifications.

Autor *et al.* (2007) exploit the time variation in the adoption of common-law-exceptions to the employment-at-will doctrine. The vast majority of US state courts adopted one or more of these exceptions between 1972 and 1992. They find that the increase in adjustment costs enhances capital investment, and raises the employment of skilled workers, which are substituted for low skilled workers. The rise in the capital-labour ratio increases labour productivity, but decreases total factor productivity and hence efficiency in production. Their results are similar to those of Acemoglu *et al.* (2005) who explore the effects of increases in the cost of labour relative to capital in hospitals in the US resulting from a policy change. They find a higher capital-labour ratio as well as a shift in the skill-composition of the workforce, explained by the complementarity capital-skill complementarity. Hence, according to these two studies, higher EPL reduces the demand for labour, especially for the low skilled.

The degree of centralisation/coordination in wage bargaining may contribute to the effect that EPL has on productivity (growth). Scarpetta *et al.* (2002) find that strict EPL has a significant negative impact on productivity only in countries with an intermediate degree of centralisation/coordination in wage bargaining (like the Netherlands). However, centralised and coordinated wage bargaining may also influence productivity growth positively, by increasing the rents on the training of low-skilled workers.

Belot *et al.* (2007) suggest that higher firing costs may promote productivity growth up to some level and find empirical support for a hump-shaped relationship between EPL and GDP-growth in a panel data set of countries. They also argue that the positive effects of employment protection are larger in sectors where firm-specific skills matter more. Indeed, MacLeod and Nakavachara (2007) find that adoption of common-law-exceptions to the employment-at-will doctrine in the US has a negative effect on employment for occupations that are characterized by low levels of specific investment, and a positive employment effect for occupations characterized by high levels of specific investment.

Overall, the effects of EPL on productivity seems ambiguous. Furthermore, EPL may stimulate productivity at low levels of EP, but this effect may be reversed at higher levels. EPL may further be beneficial for productivity in sectors that rely heavily on specific knowledge.

#### 7.4.3 Perceived job security

EPL serves as an insurance against the loss of ones job. However, it also reduces the probability of finding another job. The risk of job loss is reduced, but the associated costs rise. The question is therefore whether people feel more or less secure in countries with stricter EP?

Clark and Postel-Vinay (2008) use data from the European Community Household Panel for men aged 20-55 in 1997 in 12 countries, and construct an indicator for the perception of job security for various job types. They find that the perceived job security in (non-public sector) jobs is lower in countries with stricter EPL (and higher in countries with more generous unemployment insurance). They conclude that "job protection is not the best response to the problem of job insecurity" (Clark and Postel-Vinay, 2008, p. 3).

Trevisan (2007) analyses the effect on perceived job security of the Spanish reform in 1997, which increased the probability to get hired on a permanent contract, but also fired. Trevisan finds that the perceived job security of Spanish young workers (aged 30 and below) increased due to the reduction in strictness of EP. No significant effect is found on the perceived job security for workers over 45.

Boeri *et al.* (2001) use survey data for France, Germany, Italy and Spain to explore the extent to which citizens would be willing to pay for more generous unemployment insurance. They find that countries offering relatively strict EPL and less unemployment benefit coverage are characterized by a larger share of workers that demand for extra coverage of unemployment insurance and are prepared to pay for it. Intuitively, EPL concentrates the unemployment risk on the 'outsiders', so tighter EPL is expected to decrease the demand for unemployment insurance among the 'insiders' and increase the demand for unemployment insurance among 'outsiders' (workers in unsecured jobs, on temporary contracts and unemployed).

To conclude, these studies suggest that higher EPL does not necessarily raise perceived job security, quite the contrary for some groups.

# 7.5 Further results for EPL and senior employees

Most cross-country studies on the impact of EPL use of the popular OECD EPL-indicator for the strictness of employment protection legislation, which describes the overall strictness of EPL of a country. In this section, we present new results of the effects of EPL on the labour-market outcomes of the elderly, using an adjusted OECD indicator.<sup>66</sup>

#### 7.5.1 Cross-country estimates

To perform our estimations, we adjust the OECD EPL index to reflect the employment protection of elderly. The OECD indicator is a weighted average of 18 sub-items, grouped in three main areas: (a) employment protection of regular workers against individual dismissal; (b) regulation of temporary contracts; and (c) specific regulation for collective dismissals (OECD, 2004). Each item is assigned a score ranging from 0 to 6, where the higher the score, the stricter the regulation. The scores are weighted to construct the main index as well as sub-indices for 'procedural inconveniences', 'notice and severance pay for no-fault individual dismissals' and 'difficulty of dismissal' of regular workers. The OECD sub-index 'Notice and severance pay for no-fault individual dismissals' is based on the assumption, when relevant, that the worker was 35 years old at the start of employment.

We adjust the EPL index for the specific group of workers of age 55 up to 64 by recalculating this sub-index under the assumption that the worker is 60 years of age when dismissed. This makes a difference when severance payments or notice periods are age related, as is the case in the Netherlands. The sub-index 'difficulty of dismissals' is also adjusted in order to represent the average case of the elderly. The weights by which the items are also aggregated are adjusted, using data on the average tenure by age group. For example, we give a higher weight to severance payments after a tenure of 20 years, and a lower weight to severance payments after a tenure of 4 years. In this way we take into account that long tenures are on 'overrepresented' among elder workers.

We explore the impact of this newly created EPL indicator on the employment/population ratio, the labour force participation rate, the unemployment rate, long-term unemployment (> one year), the duration of unemployment and the flow into unemployment. These measures are available for the total working age population, for elderly workers separately and also by gender. In the regressions, we take into account several control variables that may influence these labour-market outcomes. First, indicators of the wage bargaining position of employees and employers are included, such as union density (the proportion of employees who are union members), the coverage of collective agreements, the degree of union and employer coordination and the degree of centralization. Second, we include variables representing alternative income insurance institutions: the generosity of gross unemployment benefits, the net replacement rates and the budget for disability benefits (as % of GDP). Third, we also

<sup>&</sup>lt;sup>66</sup> See Deelen and Bourmpoula (2009) for a detailed analysis.

include expenditures on active labour-market policies (ALMPs) (per unemployed, as a % of GDP) and the payroll tax rate. Finally, we include the business cycle using an output gap variable.

Table 7.2 RE-GLSE estimated coefficient of EPL under different specifications for each dependent variable, results per population group						
Dependent variable	Overall	Male	Female	55-64yrs	55-64yrs Male	55-64-64yrs Female
Employment/Population ratio	- 2.2***	0.1	- 4.1***	- 2.3**	0.0	- 4.2***
Labour force participation rate	- 2.1***	- 0.2	- 3.9***	- 3.4**	- 1.2	- 5.1***
Unemployment rate	0.4	- 0.4	1.5**	- 0.9*	- 1.0*	- 0.8*
Flows into unemployment	- 0.2***	- 0.2***	- 0.1***	- 0.2***	- 0.2***	- 0.2***
Long-term unemployment	3.5	2.2	4.7***	4.2**	3.5*	6.5***
Duration of unemployment	6.1***	5.3***	6.6***	8.5***	7.5***	10.0***
* Statistically significant at 10% level. ** At 5% level.						
*** At 1% level.						

The dataset contains 28 OECD countries over three periods in 1988-2005. EPL varies both over time and across countries, with the largest variation across countries. Also other institutional variables, like the degree of co-ordination in wage bargaining procedure do not change frequently and again their variation mainly comes from cross-country differences.

Following Scarpetta (1996) we estimate a linear panel data model. The panel dataset allows us not only to exploit the cross section variation but also to control for unobserved heterogeneity of countries. Our preferred estimates assume random effects (RE-GLSE).<sup>67</sup>

Table 7.2 gives the regressions results. The first three columns show the impact of the adjusted EPL indicator for aggregate labour-market performance, and for males and for females. Columns 4-6 present the effects for elderly workers, overall and for males and females separately.<sup>68</sup> We see from Table 7.2 that stricter EPL significantly reduces the inflow into unemployment for all age groups and for both genders. At the same time, stricter EPL increases the average duration of unemployment and the share of long-term unemployment. The effect on unemployment duration is relatively strong for the elderly, and especially for elderly women. The results on the unemployment rate are mixed, but the regressions suggest weak evidence for a decline in the unemployment rate for elderly. EPL tends to reduce the participation rate of the elderly, especially of females. Apparently, EPL discourages elderly women to participate. This is also reflected in the negative effect on the employment rate for women. The results are consistent with the findings in the empirical literature discussed above.

<sup>&</sup>lt;sup>67</sup> Cross-country regressions suffer from some methodological problems, which make it difficult to precisely considered together with identify the impact of institutional variables on performance indicators. The regression results should therefore be other evidence, e.g. based on micro data and interpreted with caution.

<sup>&</sup>lt;sup>68</sup> For the regressions for elderly in columns 4-6 the adjusted EPL-index is applied, for the other regressions (columns 1-3) the OECD EPL-index is used.

#### 7.5.2 Simulating reform in Dutch EPL

We can use the estimates from Table 7.2 to simulate the labour-market effects of changes in the employment protection in the Netherlands. This also makes clear what is the quantitative relevance of these estimates for policy changes.

Suppose that the EPL index for the Netherlands is reduced from the current level of 2.1<sup>69</sup> to a level of 1.4. The latter corresponds to the level of Denmark. To simulate the effects of this policy change, we take the average values for the dependent variables over the period 2002-2007 as our point of departure for the Netherlands. Table 7.3 gives the results.

The flow into unemployment would increase from .2 to .3 percent. For workers aged 55-64, the probability to become unemployed increases from .1 to .2 percent, for elderly women even to .3 percent. Still, the inflow rates remain low. The average duration of unemployment falls by 22 percent, from 20 to 15 months. For the elderly the decrease is less pronounced, the average unemployment duration comes down from 43 to 37 months. The share of long-term unemployment falls for elderly females from 59 to 54 percent. For elderly men, it decreases from 64 to 61 percent. The participation rate of women increases, by 4 percent. For elderly women, the increase is even 10 percent. The overall unemployment rate falls from 4.3 to 4.1 percent. However, for elderly men and women, the unemployment rate increases, by around .5 percentage points. The increase in firings dominates the increase in hirings for this group.

# 7.6 The political economy of employment protection

The analysis above suggest that reducing employment protection would increase the participation of the elderly workers, in particular elderly women. Furthermore, the sclerotic labour market of the elderly would become more dynamic. However, the gains would not be evenly distributed across workers. In particular, current incumbent elderly workers are likely to lose from the reform. The distributional effects may play an important role in the level of EPL and its persistence.

Saint-Paul (2002) considers political economy aspects of EPL in a vintage model. The unemployed oppose employment protection, since it reduces the likelihood of finding a job and reduces the average wage due to an adverse effect of EPL on technological development. Incumbent employees trade off a lower wage induced by a lower adoption of new technology against longer job duration. The latter provides a benefit if workers can earn rents from being employed.

<sup>&</sup>lt;sup>69</sup> This 2.1 refers to the OECD EPL-index version 1, 2003 for 2008. The adjusted EPL-index that we construct amounts to 2.4 for Dutch elderly in 2003. In this application, we assume that both the OECD EPL-index and the adjusted EPL-index decrease by .7 points.
	Baseline (average levels 2002-2007)				Level after change in EPL-index from 2.1 to 1.4			
Dependent variable	Overall	55-64 yrs	55-64 yrs Men	55-64 yrs Women	Overall	55-64 yrs	55-64 yrs Men	55-64 yrs Women
Labour-force participation rate	75.5	47.0	58.7	35.2	76.9	49.4	59.6	38.8
Unemployment rate	4.3	3.7	3.9	3.3	4.1	4.3	4.5	3.8
Flows into unemployment	0.2	0.1	0.1	0.1	0.3	0.2	0.2	0.3
Share of long-term unemployment	35.9	62.0	63.5	58.9	33.4	59.1	61.0	54.4
Duration of unemployment	19.5	43.2	52.2	31.3	15.2	37.3	47.0	24.2

#### Table 7.3 Labour-markets outcomes before and after a decrease in the Dutch EPL-index

This depends on their bargaining power in the wage determination process. In the model, the support for EPL by employer workers then depends on the growth rate of the economy. High growth implies that the cost of not keeping up with the latest technologies is higher. Accordingly, a higher growth rate is associated with less support for EP, since it increases its cost in terms of lower wages. Hence, EPL is more likely to arise in economies with low growth

cost in terms of lower wages. Hence, EPL is more likely to arise in economies with low grow rates and large employee rents induced by strong insider bargaining power.

Boeri *et al.* (2003) use Italian survey data to explore the support for EPL among different age groups. Thy find that being over 55 yields a 20 percent higher probability to vote in favour of EP. Estimates based on aggregate panel data of European countries shows similar results: a high share of elderly workers is associated with a higher preference for EP.

Clark and Postel-Vinay (2008) explore how the gain of being an insider (measured as the difference between the perceived job security of workers in the public sector and that of workers in the private sector / in temporary jobs) is related to EPL and unemployment benefits. The gain of being an insider increases with EPL (and decreases significantly with unemployment insurance generosity). This is broadly consistent with the theoretical literature that considers EPL to be in the interest of 'insiders', while 'outsiders' are expected to favour generous unemployment insurance.

Brügemann (2004) studies why differences in EPL across countries are persistent. On the one hand, strict EPL creates a mass of workers in favour of EPL because deregulation would mean they face a higher probability to lose their job. On the other hand, introducing stricter EPL is also opposed by incumbent workers since employers would, in anticipation of the tightening of EPL, have an incentive to dismiss part of their workers. Therefore, EPL is not only tough to scrap but also tough to get, resulting in 'status quo bias'.

How difficult will it be to reform EPL in the Netherlands? We can illustrate this by looking at the ageing of the organized part of the workforce in the Netherlands. Table 1.6 in chapter 1 shows that the population of organized Dutch employees is ageing rapidly. Indeed, the share of the elderly among members of labour unions increased between 1997 and 2006 by 11 percentage points. Today, workers beyond 45 form an absolute majority among union members. With an ageing labour force and with a generation of older workers favouring strict EP it will become increasingly difficult to find feasible reforms in Dutch EPL in the future. If the Dutch

government aims at a more flexible labour market for elderly, the challenge is to reform sooner rather than later. Alternatively, the government can implement a reform package that treats different cohorts differently.

### 7.7 Conclusion

Employment protection provides insurance against shocks to firm specific human capital and prevents an excessive inflow into publicly financed unemployment insurance. However, employment protection also causes inefficiencies that may materialize in reduced work effort, and mobility and job creation. Indeed, a robust finding is that employment protection reduces labour-market dynamics. We provide further evidence on this using cross-country panel data. Our estimates suggest that a reduction in the strictness of Dutch EPL to the level of Denmark would reduce the average unemployment duration of elderly workers by some 6 months. Higher flows would reduce the inequality between elderly insiders and elderly outsiders on the labour market.

The impact of stricter employment protection on employment, unemployment and productivity in empirical work is mixed. However, there seem to be significant effects for subgroups on the labour market. Indeed, new entrants to the labour market and women suffer in terms of reduced employment rates, older women in particular. Older men gain in terms of higher employment rates.

Survey studies further suggest that employment protection does not contribute to the perception of job security. Indeed, it is harder to get fired, but it is also harder to get hired once fired. The probability of risk thus declines due to EPL, but the size of the risk increases. This suggests that employment protection protects mostly jobs, not workers.

Older employees with long tenure are better protected by employment protection legislation than younger employees in the Netherlands. It is harder to fire older workers and severance pay and notice periods are higher. This can be justified on the grounds that older workers have more firm specific human capital, and that they are entitled to unemployment insurance for a relatively long time. However, should employment protection rise all the way up to retirement and then suddenly drop to zero, as in the current Dutch setup? As a worker approaches retirement the return period for the firm specific human capital falls, as does the remaining period over which the elderly worker can claim unemployment insurance. Provided these are the two main reasons for employment protection, employment protection should display a hump shape, falling to zero again as the worker approaches retirement.

Another element of the Dutch system is that workers lose their accumulated employment protection 'rights' when they switch employer. This creates golden chains for (older) workers, reducing job-to-job mobility. An alternative would be to make the accumulated severance pay portable. For example, in 2003, Austria switched to a system of individual saving accounts for job loss. Employers pay contributions in this account, employees can receive a payment from the account in case of dismissal, but can also carry the account over to a new job. At retirement,

the remaining funds go to the individual retirement account. This system breaks the golden chains. However, it also eliminates all redistribution. People that are fired simply get early access to their retirement savings. Moreover, it adds to the already high rate of mandatory savings.

Older workers are unemployed longer and use unemployment insurance longer than younger workers. This justifies higher employment protection for older workers. However, are procedures the most efficient way of steering employers and employees to efficient separations? Another way to deal with the distorted prices is to impose a Pigovian tax on employers and/or employees in the case of separation. This can be in the form of a firing tax or letting the employer pay (part of) the unemployment benefits the fired individuals receives. Experience rating in unemployment insurance is an example. Replacing current procedures by firing taxes or related instruments would free up resources for use in other productive activities. RETHINKING RETIREMENT: EMPLOYMENT PROTECTION

# 8 Research agenda for the future

#### Rob Euwals, Ruud de Mooij and Daniel van Vuuren

This study has drawn some clear conclusions on the labour market for elderly. At the same time, the study has identified several weak spots in the economic literature with respect to the impact of welfare state institutions on labour-market outcomes for elderly. Indeed, effects are not always fully understood or effect sizes are highly uncertain. This information is, however, crucial for policy makers who need to design institutions. Therefore, we present a brief agenda for future research that could improve our insight in the effects of policy reforms.

First, the literature has been unable to offer a sufficiently precise decomposition of the payproductivity gap for older workers. Alternative theories have been proposed and tested empirically, but there still exists considerable uncertainty about the effect on elderly wages of, *inter alia*, specific capital, incentive contracts involving deferred compensation, and the bargaining power of workers or their unions. Understanding the different components of the pay-productivity gap is crucial for its normative assessment.

Second, theory suggests ambiguous effects of employment protection on employment, unemployment, productivity, wage profiles, and age differences. Empirical studies often exploit cross-country variation to identify this relationship, but these studies are plagued by econometric problems and yield inconclusive outcomes. Properly identifying the impact imposes a major challenge to empirical research, and mainly calls for studies using micro data.

Third, an important input for deriving optimal tax and incentive schemes is the age differentiation in labour supply elasticities. Indeed, this could offer a rationale for age-specific tax cuts. Yet, empirical studies are scarce.

Fourth, to determine the optimal level of mandatory savings, we need more information on the importance of commitment problems and credit constraints. While some information has come available, more research is necessary to see what would be an appropriate level of mandatory saving.

Fifth, economic models often assume rational behaviour under perfect information and perfect foresight. This is at odds with actual behaviour of many people suffering from information constraints and myopia. Developments in behavioural economics may yield additional insights in thinking about optimal policy design.

Sixth, it is not fully understood why elderly unemployed cannot be matched in jobs at lower wages. One explanation is high reservation wages, but also elderly who are willing to accept such jobs are difficult to match. It seems likely that stigma effects play role and that dismissal at old age is a signal for low productivity. A better understanding of how this works exactly is important.

Seventh, we do not fully understand lifecycle interactions between investment in human capital, saving, labour supply and retirement. While theoretical models offer some insights, empirical information about these relationships are generally unknown. Yet, it is crucial for the design of a comprehensive system of institutions that are mutually consistent.

Finally, economic analysis generally emphasises the impact of financial incentives on individual decision making. The size of the effects is often estimated using cross-section data or panels that cover a short time horizon. Yet, financial incentives may also influence behaviour by modifying social norms. For instance, a higher pension age may increase the effective age of retirement via a change in the social norm. The long-run effects of policy changes may therefore be larger than can be identified by cross-section or panel estimations. The challenge for empirical research is therefore to identify the long-run impact of such changes (Lindbeck, 2006).

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