



Network for Studies on Pensions, Aging and Retirement

Post-retirement employment: determinants and labor market consequences

Raymond Montizaan

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CONTENTS

<i>Abstract</i>	4
<i>Nederlandse samenvatting</i>	5
<i>Policy recommendations</i>	6
<i>Introduction</i>	7
1. <i>Defining post-retirement employment</i>	9
2. <i>Post-retirement employment trends</i>	10
3. <i>Post-retirement employment from a labor supply perspective</i>	15
4. <i>Post-retirement employment from a labor demand perspective</i>	26
5. <i>Post-retirement employment and labor market consequences</i>	33
6. <i>Discussion and conclusion</i>	36
<i>Literature</i>	38

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POST-RETIREMENT EMPLOYMENT: DETERMINANTS AND LABOR MARKET CONSEQUENCES

Abstract

Many studies in the literature on retirement continue to treat retirement as an absorbing state (an individual who is retired will not start working again) and consider work and retirement as mutually exclusive conditions, despite the fact that the post-retirement participation rate has strongly tended upward in the past three decades. Post-retirement employment can have important consequences for the labor market and the economy as a whole. This paper summarizes theory and empirical evidence on the determinants and consequences of post-retirement employment for the labor market. Why does a growing number of retirees continue working after retirement, what are the main characteristics of those who choose this pathway, and is post-retirement employment a desirable phenomenon? This paper discusses the literature from a labor supply perspective by focusing on the personal and economic determinants of post-retirement as well as examining the labor demand perspective. Finally, this paper reviews the growing body of literature that explores the impact of continued employment of older workers on the labor market.

Nederlandse samenvatting

In dit paper wordt de theorie en empirisch bewijs samengevat over de determinanten en de gevolgen van post-retirement werk op de arbeidsmarkt. Het bespreekt ook de relevante literatuur vanuit een perspectief op arbeidsvoorziening door zich te concentreren op de persoonlijke en economische determinanten van na-pensionering en de arbeidsvraagperspectief. Tenslotte beoordeelt dit paper de groeiende hoeveelheid literatuur die de impact van de voortdurende inzet van oudere werknemers op de arbeidsmarkt verkent.

Policy recommendations

- The increase in the post-retirement employment rate in Europe is predominantly caused by the strong growth of the participation of retirees with low education. It is questionable whether this trend is desirable. On the one hand, post-retirement employment extends the choice set of these individuals, enabling them to acquire a higher income during retirement and to escape full retirement in case retirement negatively affects their utility. On the other hand, individuals in this group are likely to be financially illiterate, to have less financial planning skills, and to be generally less employable, which implies that they will have more difficulties finding a new job after retirement. It is important to help this group in their financial planning so as to avoid continued employment which does not enhance their welfare.
- There is scope for further growth of the post-retirement employment rate. Policymakers have no reason to fear that post-retirement employment will crowd out the employment opportunities of the young as well as of closer substitutes such as employees who are nearing retirement. The evidence in the literature rather points to the opposite relationship, in which the employment rate of the old relates positively with the employment rate of the young.

Introduction

Many industrialized countries have implemented pension reforms that are aimed at increasing the labor supply of older workers. These reforms consist of decreases in the generosity of pension benefits and increases in the eligibility ages for early and statutory retirement (Gruber and Wise 1998; Duval 2005; Mastrobuoni 2009; Hanel 2010; Börsch-Supan 2012; Staubli and Zweimüller 2013). Moreover, several industrialized countries have introduced gradual retirement schemes which enable workers to not end their career abruptly but rather in a stepwise fashion (Reday-Mulvey 2000; Hutchens 2010; Van Vuuren 2014; Elsayed, 2015).¹

The dominant approach in the retirement literature is to treat retirement as an absorbing state and to consider work and retirement as mutually exclusive conditions. However, the increasing flexibility in pension schemes across various industrialized countries leads to a new situation, in which workers have the opportunity to choose their personal retirement pathway. Today many workers who have retired from their job reverse their retirement decision and take up different kinds of work. This has been documented not only for the U.S. (Maestas 2010), but also for Europe (Komp et al. 2010; Pettersson 2011; Kanabar 2012; Larsen and Pedersen 2013). A strong upward trend in post-retirement employment for both males and females is evident over the past three decades.

Post-retirement employment of workers can have major consequences for the labor market and for the economy as a whole. Currently, the general retirement age is 65 years in most European countries and 66 years in the US. For all these countries, the share of workers aged 65 and older is increasing sharply due to population aging. Post-retirement employment is already more than a marginal phenomenon, and the rising unretirement trend will therefore increasingly impact the overall labor force participation rate. Post-retirement employment may furthermore impact government

1 Sweden adopted a gradual retirement scheme in 1976. In Denmark, a reform in 1987 aimed to promote gradual retirement by replacing the system of full early retirement with a part-time work regime. In Finland, a partial retirement scheme was introduced for wage earners aged 60 or older in the late 1980s. This scheme was extended in the 1990s to workers aged 56 or older and was further supported by additional government incentives (e.g., tax breaks for firms). Germany, Austria, France, Belgium, and the Netherlands currently also offer the option to enter gradual or partial retirement before or after the standard retirement age. Australia introduced "transition to retirement" pensions in 2005, which allow older workers to reduce their working hours and access part of their superannuation savings in the form of a pension to supplement their labor income (Warren 2015).

budgets through its influence on payroll and income tax revenues and consumption patterns after retirement.

The growing awareness of the upward trend in post-retirement employment has led to new research questions within the retirement literature. Researchers have been actively involved in studying whether the decision to re-enter or remain in the labor market is voluntary and whether the choice thereto is planned prior to retirement or based on shocks after retirement. Post-retirement employment can be a desirable welfare-enhancing phenomenon when individuals are physically able to work and also desire to work after their retirement. The introduction of post-retirement employment options may then extend the choice set of such individuals, enabling them to fine-tune the pathway towards realization of their personal preferences. However, there is ample empirical evidence of widespread time-inconsistent preferences, financial illiteracy and limited pension knowledge, leading to insufficient retirement savings (Bernheim et al. 2001; Van Rooij et al. 2011; Lusardi and Mitchell 2007a, 2007b, 2008, 2009, 2011). If an individual continues working after retirement age due to financial illiteracy and poor planning, it is questionable whether post-retirement employment is optimal from an ex ante perspective. Of course, it may also occur that workers are forced into retirement by their employer while they preferred to continue their employment. The exploration of employee, employer, and economic determinants of post-retirement employment is therefore of vital importance to gain better insight into the desirability of continued employment and its consequences for the labor market.

This paper summarizes theory and evidence on the determinants and consequences of post-retirement employment decisions for the labor market. Section 1 focuses on the definition of post-retirement employment. Section 2 documents post-retirement employment trends in various OECD countries. Section 3 shows theoretical and empirical evidence from a labor supply perspective by focusing on the personal and economic determinants of post-retirement employment. Section 4 discusses the labor demand perspective: are employers willing to employ workers beyond their retirement age, and to what extent does the labor market present barriers to continued employment? Section 5 documents the evidence on the effects of post-retirement employment on the labor market. Section 6 concludes with thoughts about future research on post-retirement employment.

1. Defining post-retirement employment

To come up with a definition of post-retirement employment, we should first have a clear view on how to define retirement. Problematic aspects in this regard are that retirement has no universal definition and that it can take many forms (Ekerdt and DeViney 1990; Pleau 2010), thus making it difficult to compare the results of different studies (Maestas 2010). Common ways of defining a person as being retired are when such person separates from his or her career job, ceases work for pay, exits from the labor force, works fewer hours, or receives a public or private pension.

It becomes immediately clear that, under one definition, a person may be retired, but that, under a different definition, such person may still be working. For example, when using an operationalization that defines retirement as the situation in which an individual ceases to work for pay or exits the labor force – a definition which is frequently used in the field of economics – one cannot define people with gradual retirement patterns as retired. Furthermore, although eligibility ages for pension benefits are usually strong predictors of retirement (Gruber and Wise 1998; Duval 2005; Staubli and Zweimüller 2013), the receipt of benefits may not be automatically related to work. Similarly, defining retirement as occurring when individuals leave their career job raises issues. What is a career job, and how should we deal with workers who do not have a career job?

The growing flexibility in pension schemes and retirement pathways across industrialized countries, the different institutional settings, and the different kinds of work activity that an individual can take up after retirement warrant a broad definition of post-retirement employment. The broadest definition can be found in the psychology and management literature that characterizes post-retirement employment as any paid work after retiring, by any definition of retirement (Beehr and Bennett 2014). This characterization permits us to consider all kinds of paid work after people retire, thus including a wide range of alternative retirement and employment pathways. Consistent with Maestas (2010), post-retirement employment includes, in this definition, the transition from full retirement to full-time employment, from full-time retirement to part-time employment in combination with partial retirement, and from partial retirement to full-time employment.

2. Post-retirement employment trends

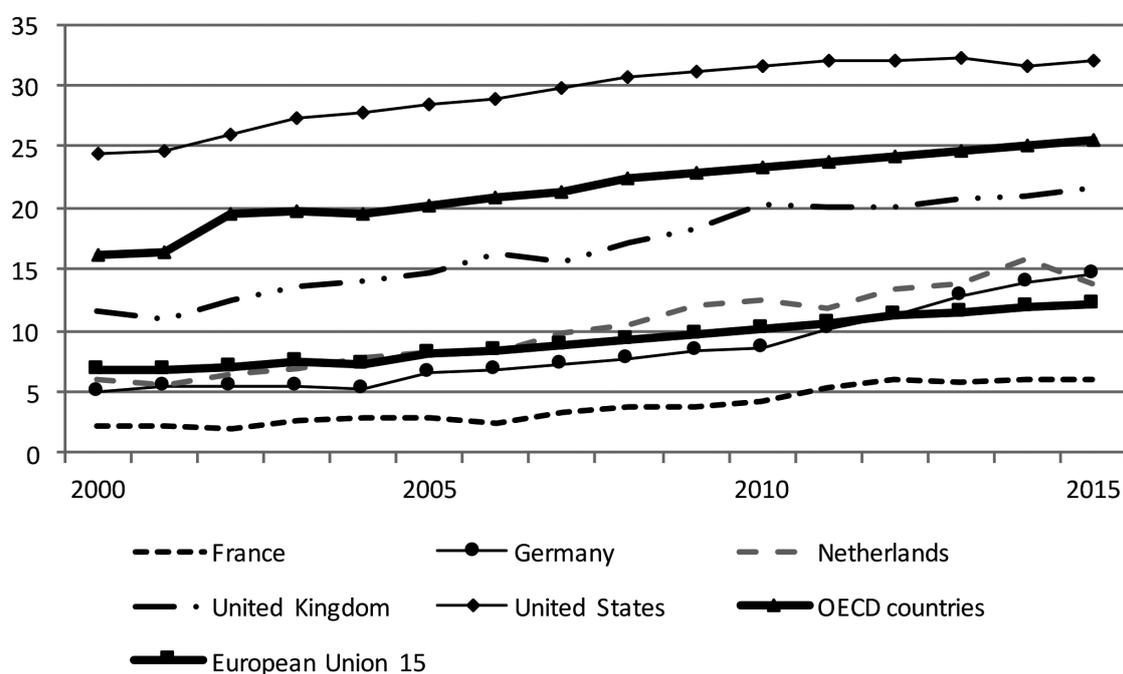
The introduction of post-retirement employment has largely been shaped by public policies aimed at breaking the long-term trend since World War II of earlier retirement for men. Coile et al. (2016) and Coile (2015) document a steady decline in men's labor force participation in the United States and Europe since the 1950s. This trend reached its zenith in the early 1990s. Coile (2015) reports that in most European countries by 1995 only 10 to 30 percent of men in the 60–64 age range was employed, while the participation rate was 50% in the United States. In the mid-1990s the labor force participation substantially increased among men aged 60–64 in most industrialized countries. This was due to pension reforms aimed at increasing the labor supply of older workers and providing more flexible retirement pathways, and the prohibition of age discrimination by abolishing mandatory retirement (e.g., the Age Discrimination in Employment Act, enacted in 1967, which was further reinforced by U.S. congressional actions in 1986). The ongoing increase in labor force participation among older age cohorts can be expected to further influence cultural norms with respect to how people experience retirement. Clark (2003) showed that the well-being of inactive individuals correlates positively with reference group inactivity. As such, as the number of retired individuals in the reference group declines, workers may be less inclined to opt for early retirement, and retired individuals may even consider unretirement.

Along with the introduction of public policies, demographic changes in society have played an important role. The aging of the labor force, in combination with improvements in health, health care and life expectancy, have led to a steady increase of the number years of active and healthy life (Cutler et al. 2006; Gheorghe et al., 2015). We can therefore expect that more individuals will be physically and mentally able to work during retirement (Pleau and Shauman 2013).

2.1 Trends in post-retirement employment

An international comparison of the labor force participation rate among retired individuals between different countries based on the existing literature is virtually impossible because of the completely different definitions of post-retirement employment used, each with its own merits and benefits. For convenience, I compare the participation rates among individuals aged 65–69, using OECD Statistics data. Most workers in this cohort are past the eligibility age for retirement, which averages 65 years in the EU15 states. Figure 1 shows that the labor force participation of individuals aged 65 years and older has risen continuously since 2000 in the United States and Europe.

Figure 1: Annual Net Labor Force participation rate, age 65–69, 2000–2015

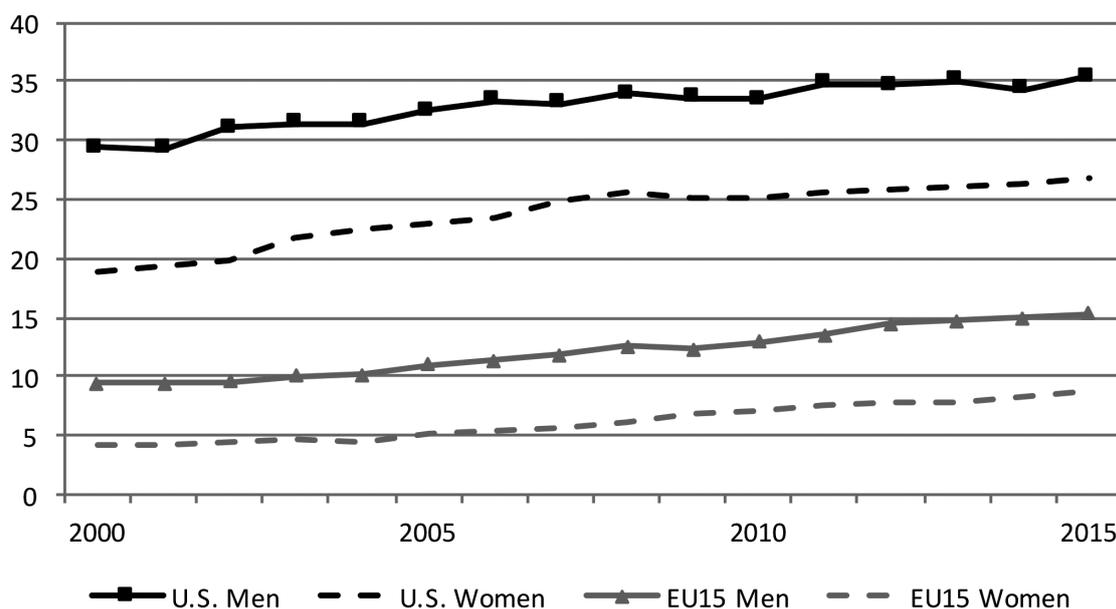


Source: OECD Statistics (Data extracted on Sep. 20, 2016 08:55 UTC (GMT) from OECD.Stat)

This strongly indicates that post-retirement employment is becoming a widespread phenomenon.² For Europe, participation has almost doubled, from 6.7% in 2000 to 12.2% in 2015, but it remains comparatively low to the participation rate in the United States, which increased from 24.5% to 32.1%. The higher labor force participation in the United States can partly be explained by the fact that workers in the United States, on average, retire at age 66 and many workers do not participate in pension plans. However, several longitudinal studies for the United States also report a relatively high post-retirement employment rate. These studies, which identify post-retirement employment by using self-defined states of full or partial retirement, find that approximately 30% to 50% of individuals engage in post-retirement employment (Ruhm 1990; Blau 1994; Maestas 2010; Pleau 2010; Warner et al. 2010). Looking at various European countries, it is evident that participation rates are not only lower than in the United States but that they also vary considerably across countries. In 2015, the participation rate was only 4.9% in Belgium, 5.2% in Spain, and 6.2% in France,

2 Larsen and Pedersen (2015) used data from the Danish Longitudinal Survey of the Ageing (DLSA), the German Socioeconomic Panel (GSOEP), SHARE, and the European Community Household Panel (ECHP) to investigate the development in the labor force participation of individuals aged 60 years and older and found similar trends.

Figure 2: Annual Net Labor Force participation rate by gender, age 65–69, 2000–2015



Source: OECD Statistics (Data extracted on Sep. 20, 2016 08:55 UTC (GMT) from OECD.Stat)

versus 24.6% in the UK, 22.2% in Sweden, and 19.1% in Portugal. It is also notable that labor force participation growth was relatively strong in the Netherlands.³

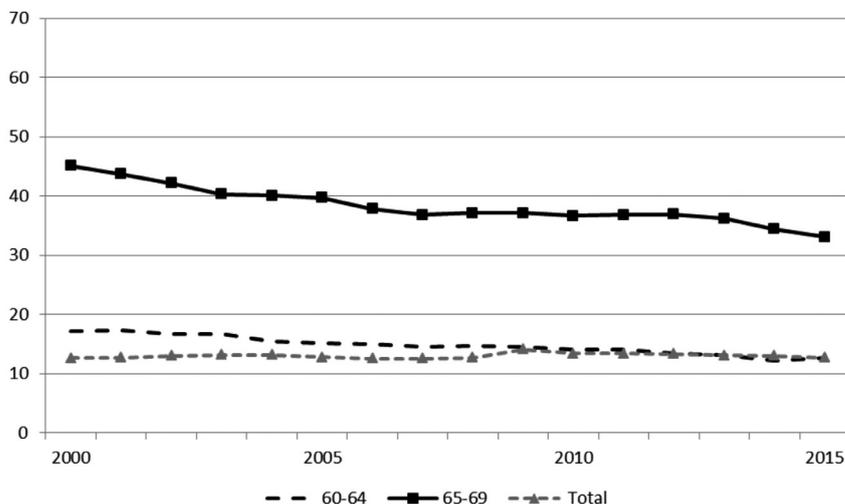
2.2 Gender differences in post-retirement employment rates

Previous research has shown that the degree to which post-retirement employment takes place differs substantially between men and women. Most studies report that women remain less often in the labor force after retirement, despite the societal trend of greater labor force participation by women of all ages (Sing and Verma 2003; Maestas 2010; Pettersson 2014). Figure 2 illustrates the labor force participation rate of individuals aged 65–69 by gender for the United States and the EU15 in the period 2000–2015. It appears that the gender gap in post-retirement employment only closes slowly. The participation rate of women in the United States was 36% lower than that of men in 2000. By 2015 this gap had come down to 24%. The average participation rate of women in the EU15 was 55% lower in 2000 than for men, while it was 43% lower in 2015. Evidence suggests that the gap is due to persistent traditional gender

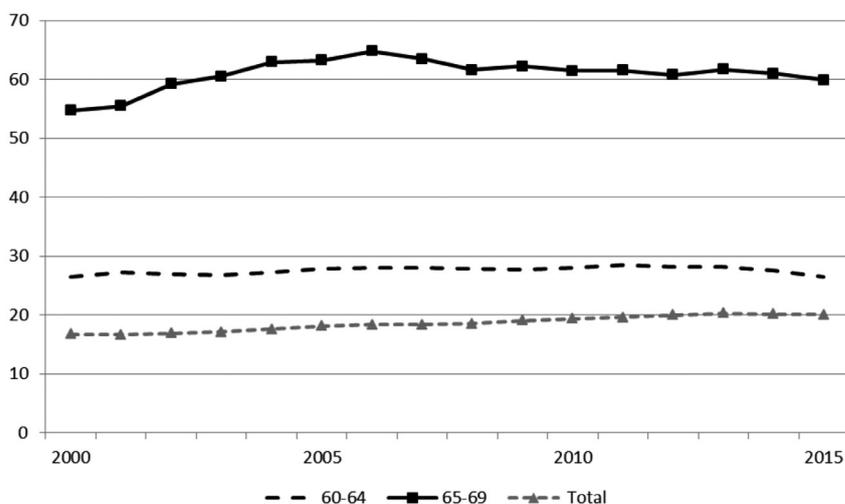
³ Due to reforms in 2013 and 2015, the eligibility age for the statutory pension is gradually increasing to 66 years in 2018 and 67 in 2021 in the Netherlands. However, the strong increase in post-retirement employment already started in 2006.

Figure 3: Part-time employment share, age 65-69, 2000-2015

United States



European Union



Source: OECD Statistics (Data extracted on Sep. 20, 2016 08:55 UTC (GMT) from OECD.Stat)

roles within households. In particular, married women with low preretirement earnings do not remain active in the labor market (Pleau 2010).

2.3 Part-time and full-time post-retirement employment

Retirement transitions include multiple stages, and retirement pathways come in many different varieties. To get a good overview of the total labor supply and of the retirement pathways chosen, we need not only information on the size of the group

that continued employment, but also on their full-time and part-time status. Figure 3 shows that most retirees continue employment in combination with partial retirement. The part-time employment share in the United States is almost 20 percentage points higher among individuals aged 65–69 compared to those aged 60–64. In Europe, this difference is even bigger: a 30 percentage points difference. Workers aged 65 and older work on average 33.8 hours per week in the United States, whereas this is 22.1 hours per week in the EU15. This suggests that transitions often include employment in bridge jobs between a full-time job and full retirement after reaching the retirement age (Gauthier and Smeeding 2003).

A striking aspect is that the part-time employment share among the oldest birth cohort has continuously decreased in the United States, while it marginally increased in the EU15. This divergence can partly be explained by the ongoing negative treatment of part-time jobs in the United States and changing attitudes in Europe. Between 1990 and 2010, several European countries enacted laws that gave workers the right without exception to demand a change to a part-time work schedule and forbidding discrimination against part-time workers. Workers in the United States do not have such protection (Blau and Kahn 2013). There are several explanations for the trend toward higher full-time employment of retirees in the United States. First, the U.S. economy has become generally stronger after 1985, which has led to an increasing demand for labor. Second, the 1977 and 1983 amendments to the Social Security Act raised the full-benefit age from 65 to 67 in stages beginning in 2000 and instituted other changes that made delaying retirement more attractive. Third, restrictions to the amount that workers can earn after age 65 while receiving benefits were eliminated in 2000. Fourth, the rapid growth of health care costs has led to reduction of employer coverage of retirees, thus providing an incentive for workers to continue working full-time.

3. Post-retirement employment from a labor supply perspective

Why do more and more people continue employment after retirement, what are the main characteristics of the individuals who choose this pathway, and is post-retirement employment really a desirable phenomenon? The existing literature has tried to answer these burning questions by predominantly focusing on whether the decision to re-enter the labor market is planned or not, and whether the decision is made on a voluntary basis.

3.1 Planned vs unplanned post-retirement employment

Post-retirement employment can be planned for several reasons. Post-retirement employment can be part of a multistage retirement process that involves a person's intentional choice to gradually withdraw from the labor market. Alternatively, a person may decide to fully retire for a certain period to spend time with or care for relatives or for health reasons after a psychological burnout or physical health impairment. Consistent with the standard dynamic retirement model, workers will form expectations about the future, based on currently available information, and decide to leave the labor market, and at a later stage to retreat from retirement when the expected value of leisure of this retirement pathway is greater than the expected value of continued full-time employment (Maestas 2010). Post-retirement employment can, however, also be an unplanned action, such as when individuals receive new information after retirement and as a consequence need to change their labor force status to optimize their situation. Examples of idiosyncratic events that are likely to involve a new optimization process are positive health shocks and negative financial shocks. In addition, retired people may experience an unexpected dissatisfaction with full-time retirement.

Empirical evidence shows mixed results with regard to whether idiosyncratic events during retirement or preretirement planning are the main drivers behind post-retirement employment. Maestas (2010) presented evidence from the Health and Retirement Study (HRS) for the United States which suggests that post-retirement employment is predominantly planned. She used expectation data in combination with (un)retirement realizations to investigate whether unexpected information was gathered between the periods in which expectations and realizations were observed and whether this information was positive or negative. Maestas' findings provided suggestive evidence that most post-retirement employment decisions were planned prior to retirement, that most deviations between realization and expectation occur because people retire earlier than expected due to positive information on wealth

or negative health shocks, and that the small percentage of people who retire later than expected (only 8.4% of all workers were still working after the age at which they initially expected to retire) did so because of unexpected dissatisfaction with full-time retirement instead of income shocks after retirement.⁴ Financial and health shocks thus predominantly cause employees to retire early, but to a limited extent also impact post-retirement employment decisions.

This outcome is backed by a recent study of Kutlu-Koc (2014). She addressed the retirement consumption puzzle by considering that individuals may re-enter the labor force after being retired. Based on the standard lifecycle theory of consumption, we would expect that anticipated income changes do not affect the consumption profiles of individuals before and after retirement because rational agents smooth their consumption over the lifecycle using their savings. This holds likewise for post-retirement employment when this transition is planned. Kutlu-Koc (2014) used nine waves of the HRS and respondents' subjective retirement expectations as an instrument to distinguish between expected and unexpected post-retirement employment, and she investigated changes in consumption at retirement transitions. She found that post-retirement employment is mainly determined by pre-retirement expectations of work. In her instrumental variables model, where retirement and post-retirement employment are instrumented with individuals' retirement expectations, consumption does not respond to retirement or post-retirement employment, indicating that post-retirement employment decisions of American workers are not caused by financial shocks and that they are generally able to smooth their consumption pattern.

Kanabar (2015) used English Longitudinal Study of Ageing data (period 2002–2013) for the United Kingdom and found, consistent with Maestas (2010) and Kutlu-Koc (2014), that individuals with a medium-term or long-term financial planning horizon are more likely to continue employment than those with a short-time horizon, and that pension wealth does not have an effect on the risk of unretirement. Schlosser et al. (2012), on the other hand, found for a cross-section of Canadian retirees that negative financial shocks do lead to higher post-retirement employment rates. However, their measure of the existence of negative financial shocks is problematic as it is based on subjective survey questions that ask people whether they experience financial worries.

4 Griffin and Hesketh (2008) show for Australia that dissatisfaction with retirement significantly increases the likelihood to engage in volunteer work.

3.2 Post-retirement employment and socio-economic background: financial constraints

Although idiosyncratic shocks in the financial position and health of retirees have little or no impact on the likelihood of continued employment, wealth, income, and health shocks can remain important determinants of post-retirement employment because they affect the long-term planning process during which employees choose their optimal retirement pathway. Due to the many European pension reforms that lead to reversal of public pension rights, we could expect that the role of private wealth and income has become even more important over time.

This discussion on the determinants of post-retirement employment is often framed in terms of voluntary versus involuntary post-retirement employment (e.g., Pettersson 2014; Madero-Cabib and Kaeser 2016). Such framing should be avoided at this stage because it erroneously suggests that negative experiences of retirement impel retirees to take up again work, whereas they are in fact confronted with an optimization problem in which they can voluntarily decide to stay retired or to unretire, i.e. to choose between the value of leisure and the value of generating a higher income after retirement. People make different decisions depending on their earning capacity and wealth. It is therefore better to frame this discussion in terms of the constraints and opportunities (financial and otherwise) that shape the choice of individuals for post-retirement employment.

Various empirical studies have shown that the experience of post-retirement employment in the United States and other industrialized countries differs substantially by subpopulation (Ruhm 1990; Quinn and Kozy 1996; Clark and Ogowa 1997; Han and Moen 1999; Cotter et al. 2002; Davis 2003; Singh and Verma 2003; Komp et al. 2010; Maestas et al. 2010; Pleau 2010; Warner et al. 2010; Pettersson 2014; Kanabar 2015). Individual characteristics such as gender, marital status, health, age, education, pension, income, and wealth are found to affect the likelihood of post-retirement employment. We can roughly divide these subpopulations into two separate groups, who continue employment after retirement for completely different reasons. On one side of the spectrum we observe individuals who continue employment after retirement mainly because of financial constraints. On the other side of the spectrum we see individuals who continue working for reasons unrelated to wealth and income.

The group of individuals that continues employment after retirement because of financial constraints behaves more or less in accordance with predictions of standard economic and dynamic retirement models that focus on the sequential nature of the retirement process, in which individuals adjust their behavior as events unfold. These models of forward-looking retirement behavior aim at explaining the

empirical regularities of a full-time employment rate that declines with age, with particularly large drops at the eligibility ages for social security and private pension plans (e.g., Gustman and Steinmeier 1986; Stock and Wise 1990; Berkovec and Stern 1991; Lumsdaine et al. 1992, 1994, 1996; Rust and Phelan 1997; Blau and Gilleskie 2003, 2005; Van der Klaauw and Wolpin 2008). Besides emphasizing the role of health, income, and wealth to explain retirement patterns, these studies typically point to the significance of social security and private pension rules for the labor supply decisions of low-wage individuals, who accumulate relatively little tangible wealth after the age at which they first become eligible to receive benefits. When people define retirement as the situation in which they are entitled to and receive a small public or private pension, they may report themselves as being retired while deciding to continue employment due to financial constraints.

For the United States, the estimated impact of income and wealth on post-retirement employment should be treated with caution. Two studies used the same dataset (HRS) but show contrasting results. Maestas (2010) found no significant effect of income and employee pension levels on the likelihood of post-retirement employment. However, in her study, income and financial resources for retirement are entered linearly in the multinomial logit specifications for retirement path choice. Such a linear specification is too simple to capture the true impact of income and wealth on post-retirement employment, especially because the literature on bridge jobs suggests a U-shaped pattern, with workers at both ends of the socioeconomic scale being more likely to utilize bridge jobs as a retirement pathway (Cahill et al. 2006). Cahill et al. (2011) therefore entered income and financial wealth in a non-linear way in their specifications on HRS data, thereby showing that post-retirement employment is indeed more common among those with the lowest as well as the highest wage rates than among those in the middle of the wage distribution scale. A similar pattern was found for wealth. The differences in the wage and wealth effects were too small, however, to be statistically significant. Nevertheless, the results of Cahill (2011) give provisional evidence that financial constraints do matter for post-retirement employment.

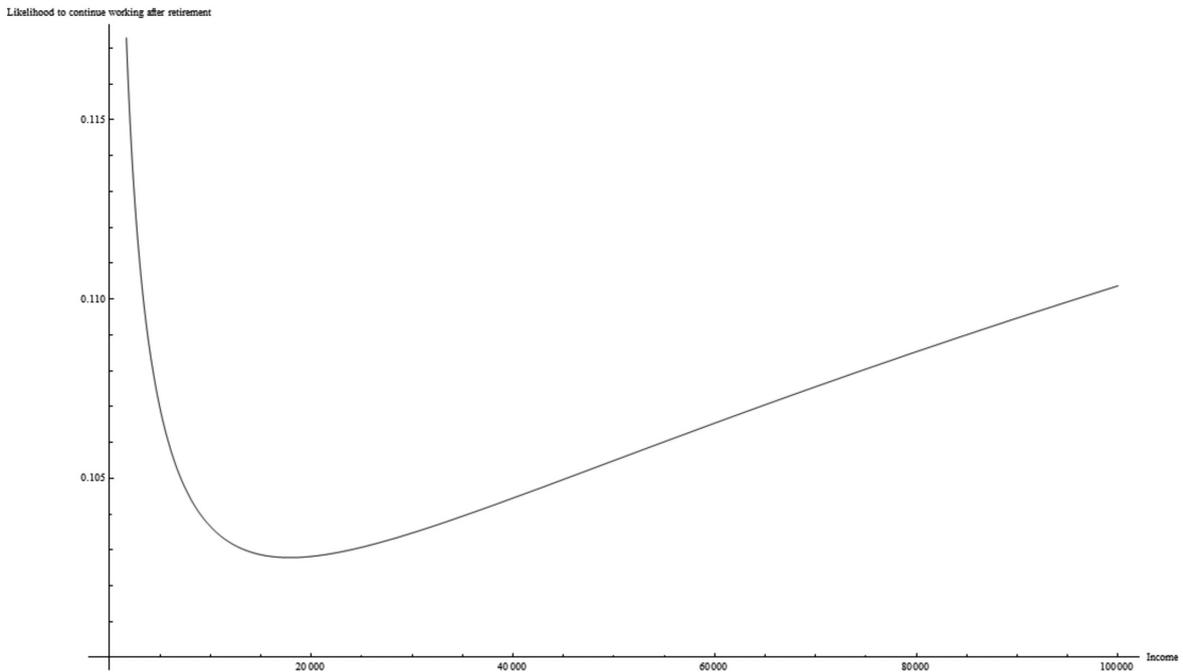
The degree to which financial constraints determine post-retirement employment varies significantly between European countries. Pettersson (2014) found no evidence that financial incentives matter for re-entry into the labor force in Sweden because of the existing generous social security system. Madero-Cabib and Kaeser (2016), on the other hand, found that it is access to private pensions and beneficial economic growth in Switzerland that makes workers decide less often to extend their career. As to the United Kingdom, Kanabar (2015) furthermore showed that benefit

income strongly reduces the likelihood of a post-retirement employment episode. Bijlsma et al. (2016) used register data from The Social Statistics Database of Statistics Netherlands to investigate to what extent the likelihood of continuing employment after retirement in 2014 depends on income (measured in 2006).⁵ Figure 4 shows their main results. It is immediately clear that the relationship between income before retirement and the likelihood of continuing employment after retirement is highly non-linear in the Netherlands. Retirees with an extremely low income, who arguably experience financial constraints because they depend mostly on the public pension after retirement, as well as those with a high income, continue to participate in the labor force.⁶

The EU Labour Force Survey contains an ad hoc module on transitions from work to retirement in the 2012 wave, which includes a question as to the main reason why persons who receive a pension decide to continue working. No less than 51.4% of all workers in the EU15 who continue working when receiving a pension indicate that they do so for financial reasons, related to providing sufficient personal or household income or to generating further pension entitlements. Figure 5 shows that this percentage is lower in EU15 countries with more generous pension systems and greater personal financial wealth (e.g., 14.9% in Denmark, 34.1% in Sweden, and 41.0% in France) and higher in the EU15 countries which were most affected by the European debt crisis and where average income and financial wealth is significantly lower (86.1% in Greece, 76.0% in Italy, 74.7% in Portugal, and 68.1% in Spain). However, the largest shares of workers that continue employment in Europe when receiving a pension can be found in Central and Eastern Europe (97.8% in Romania, 94.3% in Slovakia, and 91.7% in Lithuania) since absolute poverty – as measured by indicators

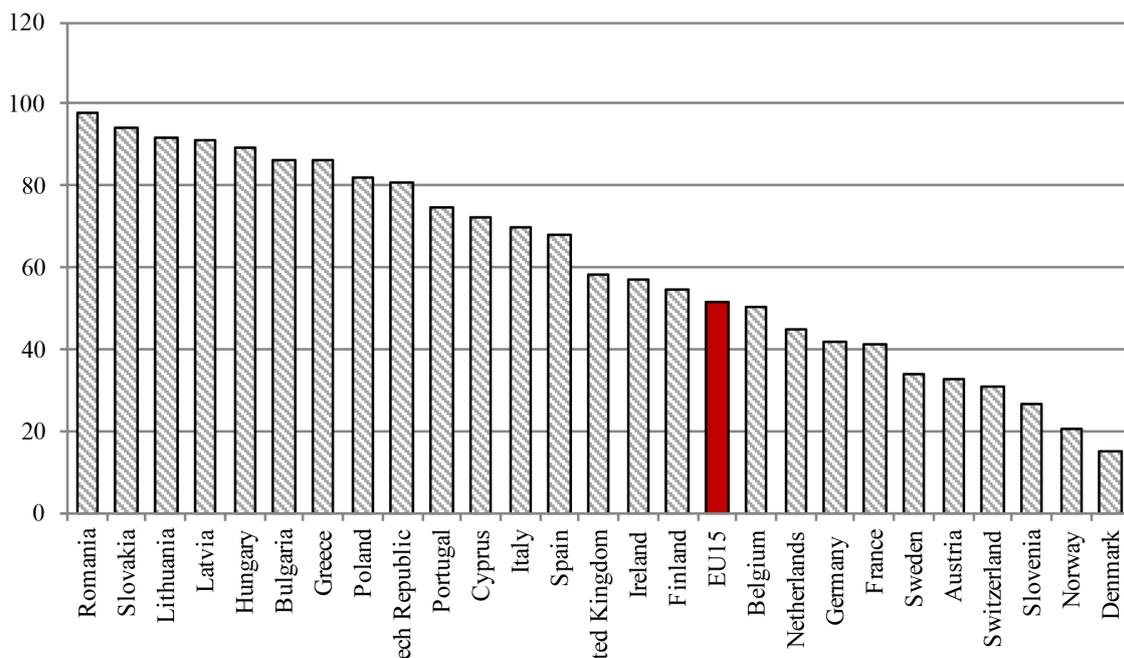
- 5 Figure 5 is based on the marginal effects of a probit specification on a dummy variable, indicating whether individuals continue employment after their retirement as the dependent variable, with age, age squared, gender, self-employment, marital status, log income and log income squared as explanatory variables.
- 6 The Netherlands has a multi-pillar pension system consisting of social security retirement benefits (pillar 1), company or occupational pension benefits (pillar 2), and private retirement savings (pillar 3). The first pillar includes the state old age pension (AOW), which provides a minimum pension that is linked to the minimum wage. The second pillar accounts for roughly 40% of retirement income in the Netherlands. Benefits under this pillar are financed by employers and employees, with the government acting as supervisor and facilitator. The AOW benefit is a factor that is included in most calculations of second pillar pension schemes by applying a so-called 'franchise'. This implies that employees and employers do not pay for the part of the pension which is covered by the AOW. Only workers with a wage above this franchise build up an occupational pension.

Figure 4: Likelihood of continuation of working after retirement, measured in 2014 with earned income in 2006



Source: Social Statistics Database, Statistics Netherlands: presented in Bijlsma et al. (2016)

Figure 5: Continuation of working when receiving a pension because of financial reasons, 2012



Source: EU Labour Force Survey, Transition from work to retirement module, EUROSTAT.

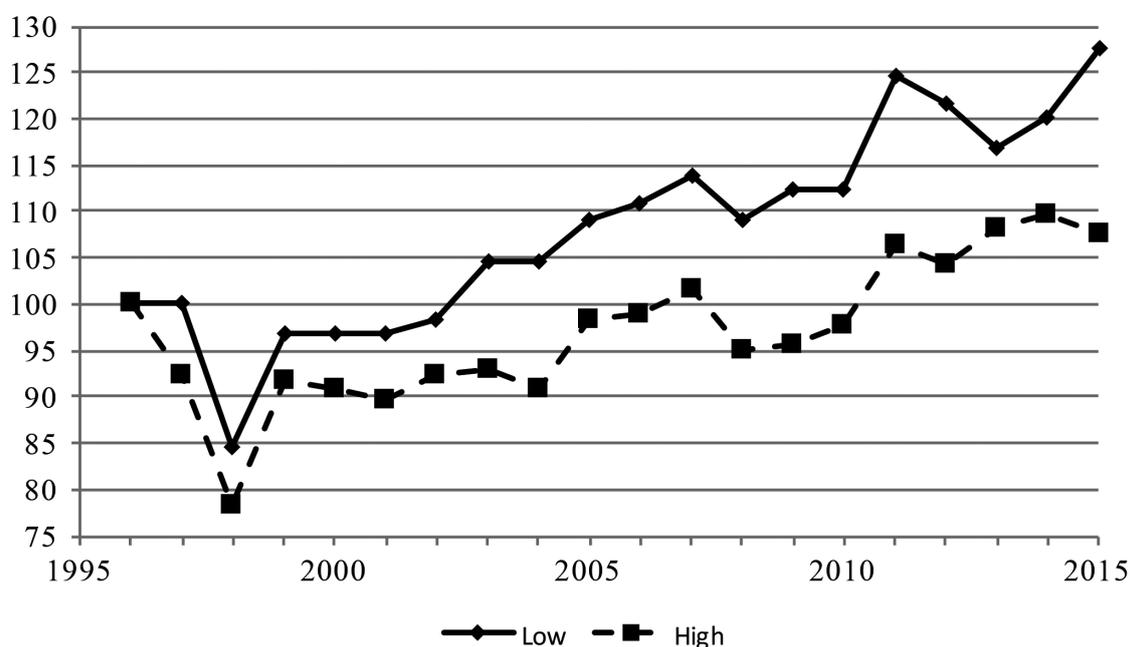
of severe material deprivation – is much more of a challenge for older people in these countries (European Commission 2015).

Post-retirement employment thus partly reflects inadequate pension wealth accumulation. In the case of low income workers, in particular in Eastern Europe, it is obvious that the low level of pension savings for retirement is caused by their limited possibilities to save (see also Van der Klaauw and Wolpin (2008) for a discussion of the impact of social security changes on retirement and savings behavior for people with low income). But also financial illiteracy plays a role here. There is mounting evidence that knowledge about pensions and social security has considerable impact on retirement decisions. Chan and Stevens (2003) and Mastrobuoni (2005) show that a lack of pension savings reflects the fact that many workers are poorly informed about social security and pensions, the two most important components of retirement wealth. They furthermore show that uninformed people do not respond, or only too late, to changes in actual retirement incentives, whereas people who are well informed respond much earlier by increasing their private savings.

3.3 Post-retirement employment and socio-economic background: education

Another indicator for socio-economic background is the level of education. Educational level is highly correlated with income and wealth accumulation, but it also provides important additional information on the socio-economic background of individuals and can thus stimulate continued employment after retirement. First, workers with higher education are not a random sample of workers, because signaling and screening through education serves to sort workers by their unobserved abilities (Spence 1973; Weiss 1995). Highly educated employees can have higher productive abilities as well as higher job motivation. Second, highly educated workers have more general human capital, which enhances their employability in later life. There is general agreement, in particular within the displacement literature, that educational level plays a major role for the ability to maintain employment in later life because the labor markets for workers with firm-specific knowledge are smaller. The general knowledge acquired during education allows workers to move into a broader range of expanding sectors (e.g., Fallick 1993; Kletzer 1998). This is best illustrated by Hanushek et al. (2016). They employed a difference-in-differences approach that compares employment rates across different ages for people with general and vocational education and found that individuals with general education initially face a worse employment outlook but experience improved employment probabilities as they become older compared to individuals with vocational education. In countries with apprenticeship systems, such as Denmark, Germany, and Switzerland, the easier entry

Figure 6: Development of net participation in 1996–2015 in the EU15 for persons aged 65–69 by education (indexed, 1996 = 100)



Source: EU Labour Force Survey (LFS), EUROSTAT

into the labor market early in life is balanced by markedly greater withdrawal at older ages. Having more general skills thus helps a person to continue employment, and there is no reason to believe that this would not also hold past retirement age.

The literature shows, for both the United States and the EU15, that individuals with higher education levels are more likely to continue employment after their retirement (e.g., Maestas 2010; Cahill et al. 2011; Pettersson 2014; Kanabar 2015; Bijlsma et al. 2016; Madero-Cabib and Kaeser 2016). In the EU15, 19.9% of all persons with a high educational level aged 65–69 was still employed in 2015, against 8.3% for those with a low education level.

The ongoing pension reforms in Europe, aimed at increasing the labor supply of older workers by retrenching public pensions, have, however, led to remarkable shifts in the composition of retired workers by educational level. Figure 6 shows for the EU15 that the percentage of people with low education aged 65–69 years who are still working is continuously growing. The growth in the participation rate since 1996 for people aged 65–69 was 27 percentage points higher for people with a low education compared to those who have a high educational level. The strongest growth was reported for Denmark, Germany, and the Netherlands. Each of these countries experienced pension reforms that led to higher financial constraints during retirement,

while at the same time their strong economies ensured that the unemployment rate of persons with lower education remained low during the global financial crisis compared to other European countries. Bijlsma et al. (2016) show for the Netherlands that the participation rate among the highly educated rose by approximately 75%, while it almost tripled for the lowly educated. Portugal and Greece are notable exceptions, as here the participation rate among people aged 65–69 declined as a consequence of the failing labor demand that accompanied the deep recession in these countries, irrespective of educational level.

3.4 Post-retirement employment without financial needs

Aside from people who continue working after retirement because of financial constraints, many people continue to work after retirement for reasons unrelated to wealth and income. They thus belong in the second subpopulation of our rough division of groups of workers, who continue working for different reasons. Data from the EU Labour Force Survey shows that in 2012, in the EU15, 33.3% of all persons who receive a pension and who are still working, non-financial reasons are their main reason to continue working. In Denmark (78.8%), Sweden (64.8%), and the Netherlands (51.2%) this percentage is significantly higher. Several disciplinary fields of research are interested in how the preferences of this specific group for continued employment after retirement are shaped. In particular the fields of psychology, gerontology, and management have focused on the non-financial drivers behind post-retirement employment by taking a theory-driven approach. The most dominant theories in explaining the preference formation for post-retirement employment are the role theory and the continuity theory (e.g., Wang 2007; Wang et al. 2008).

Role theory emphasizes the importance of the role exit and role transition processes in retirement. It starts with the notion that, when a worker has heavily invested in his or her work role, such person's feelings of personal worth tend to be associated with the ability to carry out that role in an effective manner. Retirement then leads to a role transition (Moen et al. 1992; Riley and Riley 1994). An individual has a role as worker and organization member when employed and derives a certain status or positive self-image from this role (Feldman 1994; Hulin 2002). Role theorists argue that the loss of one's role resulting from a full retirement transition can lead to a low level of well-being in retirement when the work role has been central to the formation of personal identity. It may even make people feel anxious or depressed. In particular, persons who identify strongly with their work can therefore be expected to unretire or to continue employment after retirement.

Continuity theory emphasizes the adaptation to change and workers' preferences for consistent patterns over time (Atchley 1989, 1999). It predicts that older adults will try to preserve existing structures to avoid the experience of a stressful disruption. Instead of focusing on retirement as a disruptive loss of role, continuity theory focuses on the opportunities and barriers for maintaining social relationships and lifestyle patterns in such a transition. It predicts that there will not be a significant drop in well-being when people transition from work into retirement, except when they experience severe difficulties in preserving those general patterns. In case the latter happens, retirees may attempt to maintain continuity by continuing to work during retirement (Kim and Feldman, 2000).

These two theories have been tested in numerous empirical studies (e.g. Kim and Feldman 2000; Wang 2007; Wang et al. 2008, 2009; Beehr and Bennet 2014). These studies found that post-retirement employment is strongly related to both retirement satisfaction and general well-being, as predicted by both role and continuity theory. Particularly striking is that this relationship is stronger for individuals with a longer organizational tenure. This evidence is seen as support for the continuity theory, as one would expect that in particular for such workers full retirement would entail a greater discontinuity in life (Kim and Feldman 2000). Consistent with the role theory, Gobeski and Beehr (2009) found that individuals who have a stronger level of involvement in the job and are more likely to identify themselves with their job continue employment after retirement (Gobeski and Beehr 2009). Such claims should be treated with caution, however, because these relationships may also be driven by other personality traits, such as risk and ambiguity aversion.

3.5 Job characteristics and post-retirement employment

The split between individuals who predominantly continue working after retirement because of financial constraints and those who continue working for reasons other than financial becomes even more apparent from the job characteristics of post-retirement jobs. All studies that provide stylized evidence on the job types of post-retirement workers show, without exception, that a large majority of post-retirement jobs are reported to involve higher managerial or supervisory skills or sales, administrative support and service positions (Maestas 2010; Kanabar 2015; Bijlsma et al. 2016). The most common job types in this category are government officials, chief executives, architects, authors and linguists, and artists (Bijlsma et al. 2016). Arguably, such workers employees have more income and wealth and are able to derive more satisfaction from their work. At the same time, the studies indicate that 15.6% of part-time and 11.4% of full-time post-retirement jobs involve operating tasks or

unskilled manual labor (Maestas 2010). Most common in this category are taxi and bus drivers, newspaper deliverers, garbage collectors, and farmers (Bijlsma et al. 2016). At the same time it is observed that employees seldom transition after retirement to self-employment (Bijlsma et al. 2016).

4. Post-retirement employment from a labor demand perspective

Actual post-retirement employment rates reflect the interplay between labor supply and labor demand. It is therefore important to determine whether and how labor supply side changes are accompanied by changes in the willingness of employers to employ older workers. There are several indications that older individuals face a demand problem that slows down the growth of post-retirement employment. This demand problem for older workers depends crucially on how employers compare their productive value to the price of their labor services and on their preferences for the presence of older workers within their organization.

4.1 Earning profiles, productivity, and mandatory retirement

In early versions of the theory of competitive labor markets, every worker is paid the value of his or her marginal product at every moment. In many occupations, however, wages diverge systematically from the values of marginal products. An important body of theoretical and empirical research has shown that workers' wages tend to grow with seniority in the firm and with labor market experience and are only loosely related to actual productivity (Medoff and Abraham 1981; Kotlikoff and Gokhale 1992; Flabbi and Ichino 2001). These earning profiles, involving upward sloping with seniority, can therefore not be explained by classical human capital theory, which predicts that seniority has a positive effect on wages because of productivity increases due to firm-specific human capital investment. The most prominent alternative explanation for the gap between productivity and wages comes from the implicit contract theory, which conjectures that a positive correlation between seniority and wages (or accrual of investments in pensions) is required, as set out in implicit employment contracts that are aimed at creating the proper incentives to discourage shirking and malfeasance or to facilitate firm-specific training (Lazear 1979, 1981; Hutchens 1989; Montizaan et al. 2013). The argument of the implicit contract theory is that a career-long contract, which pays workers less than their productivity when young and more when old, can stimulate them to work hard and stay with the firm, enabling employers to recoup their training costs and boosting productivity and firm profits. To make such a contract profitable for both employer and employee, there must be a cutoff date at which employees are forced to retire. Mandatory retirement is necessary to ensure that the firm can end the period during which the older worker is overpaid. An important implication of this theory is that we can expect that firms that apply earning profiles that slope upward with seniority will not be willing to keep

older workers employed beyond the mandatory retirement age without changing the employment contract terms and conditions.

From a theoretical perspective, it is likely that mandatory retirement in combination with upward-sloping earning profiles will lead to lower post-retirement employment, since it normally ends the older worker's contract with the current employer in light of the higher labor costs. This especially holds for the EU15, as most member states still have general mandatory retirement ages or mandatory retirement ages that differ between occupations and sectors.⁷ Although older workers who wish to continue working after mandatory retirement have the opportunity to negotiate a new contract with their current employer or other employers, they will most likely experience restrictions to post-mandatory retirement employment. For example, costs may be involved in finding new jobs, new or renegotiated arrangements can be unattractive compared to the labor conditions before mandatory retirement, and mandatory retirement increases the exposure of older cohorts to age discrimination due to their lower bargaining power after their labor contract expires.

The empirical literature provides some evidence on the effects of mandatory retirement on employment rates. Early work by Neumark and Stock (1999) considered the impact of age discrimination laws of American states on employment rates of older workers and found that the laws had positive effects on employment. However, they found no evidence that explicit bans on mandatory retirement led to higher employment. Ashenfelter and Card (2003) found that, at universities, removal of an exemption to the U.S. ban on mandatory retirement at age 70 in 1994 had substantial negative effects on the retirement rates of persons aged 70 and 71. Their retirement rates dropped by two-thirds and were approximately equal to those of persons aged 69. Similar results were obtained by Warman and Worswick (2010); they compared retirement rates for Canadian universities with and without mandatory retirement at age 65 and found that exit rates at age 65 were 30 to 38 percentage points higher for university professors who faced mandatory retirement. The latter studies provided suggestive evidence that mandatory retirement can constitute a serious barrier to the labor force participation of older people. It remains unclear in these studies, however, whether this is predominantly caused by employee or employer behavior.

Van Dalen et al. (2010) provided a tentative answer to this question by showing that a large majority of employers in five European countries in 2005 found it

7 The EU Labour Force Survey contains information on the main reason why inactive individuals who receive a pension stop working. Approximately 10.5% of all inactive individuals aged 50–65 in the EU15 in 2012 who receive a pension indicate that they stopped working due to having reached the mandatory retirement age.

undesirable that older workers would continue to work after the age of 65. As age 65 was the general mandatory retirement age in Europe, this result provided suggestive evidence for failing labor demand for post-retirement employees. The UK is the only country in which the share of employers in favor of employment after age 65 exceeded the share of those opposed. Employment after age 65 was supported by only one fourth of employers in Spain and by no more than nine percent in the Netherlands.

Another notable contribution is the study by Oude Mulders et al. (2014); it stands out by using a vignette experiment among Dutch managers to examine the willingness of employers to rehire employees after mandatory retirement. A vignette presents a hypothetical situation, to which research participants respond thereby revealing their perceptions, values, social norms or preferences. Within their experiment they randomly varied the employee's downward wage flexibility (i.e., employee willingness to accept a lower wage) and contract flexibility (i.e., employee preferences for a contract which allows flexible hours or employment). Their results showed that Dutch employers are generally unwilling to rehire employees after their mandatory retirement. Employers are somewhat more willing to rehire retired employees who offer to work for a significantly lower wage. On the other hand, their rehiring decision is not affected by the employee's preference for a particular labor contract.

4.2 Age discrimination

The lukewarm attitude of employers towards post-retirement employment cannot solely be explained by the presence of upward-sloping earning profiles. The results of Oude Mulders et al. (2014) unmistakably show that employers remain less willing to offer employment to retired employees even when they work for a significantly lower wage. An alternative explanation comes from several studies in sociology and psychology, which have shown that considerable negative stereotypes about older workers exist among employers, leading to age discrimination (e.g., Finkelstein et al. 1995; Finkelstein and Burke 1998; Chiu et al. 2001; Henkens 2005; Van Dalen et al. 2009). Evidence that older workers experience discrimination because of their age is widespread.

Within economics there are two leading theories that explain why age discrimination occurs: taste-based discrimination and information-based statistical discrimination. The first type of discrimination was introduced in the literature by Becker (1957). Taste-based discrimination occurs when employers obtain disutility from working with persons belonging to a certain age group. Because of this disutility, they prefer not to interact with individuals of that age group and are in fact willing to pay a

financial price to avoid interactions. Taste-based discrimination is considered to be inefficient in terms of overall social welfare (Becker, 1957). The second type of discrimination – information-based statistical discrimination – occurs when an individual is judged on the basis of group characteristics that reflect incomplete information, for example because of signals of ability and productivity that are less informative within that group (Levitt, 2004). Stereotyping older workers may be efficient for individual employers in case of imperfect information about the age-productivity and age-wage nexuses. Stereotyping is nevertheless inefficient at the macro level in such a situation. Information-based statistical discrimination can also occur when specific groups of employers have acquired incorrect information about the productivity and wages of older workers, which would imply that discrimination is inefficient on both the micro and the macro level.

The empirical literature encounters difficulties in the effort to identify which type of discrimination is most dominant in the age discrimination observed in the labor market. Most of the recent papers try to establish the degree of age discrimination by applying field experiments (Bendick et al. 1996, 1999; Levitt 2004; Riach and Rich 2006; Lahey 2008).⁸ These field experiments usually make use of audits, where matched pairs of applicants are sent for job interviews or correspondence testing (Neumark 2012)⁹. Correspondence testing involves sending off fake resumés in which a job applicant's characteristics are randomly changed, after which the invitation rate to job interviews is taken as an indicator for the discrimination of specific groups of applicants in the labor market. Irrespective of the method applied and the type of discrimination investigated, these experiments show that older job seekers are strongly disadvantaged. This finding is backed by observations of registration data. In the United States., 23% of all the charges of discrimination in 2014 involved age discrimination (U.S. Equal Employment Opportunity Commission 2014). In the Netherlands, 33% of all officially reported discrimination complaints in 2013 were related to age (Van Haaften 2014).

In a recent study, Neumark et al. (2015) presented provisional evidence for the way discrimination specifically affects post-retirement employment. They designed a large-scale resumé correspondence study in which they looked at age discrimination

8 Levitt (2004) did not focus on labor market discrimination. Instead, he used the contestant voting behavior on a television game show to distinguish between taste-based and information-based theories of discrimination. He found convincing evidence for taste-based discrimination against older players.

9 The basic design of an employment audit involves sending matched pairs of individuals (called testers) to apply for real job openings in order to see whether employers respond differently to applicants on the basis of selected characteristics.

for ages closer to the retirement age than in previous studies; they used a richer set of job profiles for older workers to test whether age discrimination differs with transitions to less demanding jobs at older ages. They found that age discrimination against job applicants near the retirement age is much stronger than for middle-aged workers, but also that discrimination does not differ for older workers looking for a bridge job with fewer responsibilities or less demanding tasks. Since post-retirement employment coincides with transitions to part-time bridge jobs, Neumark et al. (2015) conclude that it is encouraging that there is no additional discrimination towards older employees who seek a bridge job, despite the observed barriers to older workers getting hired in new jobs generally.

4.3 Experiencing barriers to continued employment and self-employment

The restraining effect of the failing demand for post-retirement employees on the labor participation of retirees, either due to wage-productivity concerns or taste-based and information-based statistical age discrimination, is reflected in the number of inactive persons with a pension who would have preferred to continue working. The 2012 wave of the EU Labour Force Survey includes a survey question which asks inactive respondents in the 50–69 age range whether they would have preferred to continue working at the time of leaving employment. A staggering 31.9% of economically inactive persons with a pension in the EU15 indicated that they experienced a barrier to continue working. A similar figure is found by Dorn and Sousa-Poza (2010) using International Social Survey Program 1997 data. This result holds not only for Europe but is also found for the United States. Szinovacz and Davey (2005) report for the United States, using HRS data for the 1992–1998 period, that nearly one third of older workers perceived their retirement as forced.

Important to note here is that these observed forced retirement rates not only reflect a failing labor demand but also involve choice restrictions through, for example, health limitations, job displacement, and care obligations. To get a clearer view on the impact of the failing labor demand for post-retirees, it is useful to concentrate on self-employment rates around retirement transitions. Classic retirement studies strictly focus on wage earners, do not distinguish between wage earners and self-employed workers, or omit self-employed workers from their analyses (e.g., Diamond and Hausman 1984; Ruhm 1990; Stock and Wise 1990; Berkovec and Stern 1991; Blau 1994; French 2005; Gustman and Steinmeier 2005; Hairault et al. 2010; Hetschko et al. 2014). But self-employment rates can provide valuable information because the self-employed have much greater flexibility in terms of labor supply and retirement choices (Hochguertel 2015). Self-employed workers will have flatter and

more variable wage rates over their lifetime because they do not experience typical principal-agent problems, such as the discouragement of shirking and malfeasance and hold-up problems surrounding investments in firm-specific training that warrant the introduction of implicit labor contracts. Self-employed workers around the retirement age, whose wages must equal the marginal product according to implicit contract theory, do not experience forced layoffs, despite cyclical variations in their employment (Lazear 1981). Moreover, self-employed workers are less likely to experience age discrimination in their choice for post-retirement employment, since they are not dependent on employers' decisions to continue working, even though age discrimination might also affect the market demand for their services.¹⁰

The few studies that have analyzed the relevance of self-employment for continued employment after retirement document that the post-retirement employment rate among self-employed workers is significantly higher than for wage earners. Maestas (2010) showed for the United States that the self-employment rate is 19.6% among preretirement jobs, while it is 24.0% among post-retirement part-time jobs and 27.8% among post-retirement full-time jobs. Cahill et al. (2011) found that this difference in the United States is driven by the participation of self-employed women. Self-employed men were not significantly more likely to continue employment after retirement than male wage earners. Pettersson (2014) showed that the fraction of self-employed persons in Sweden increased from 20.9% before retirement to 25.9% after retirement. Bijlsma et al. (2016) found that in the Netherlands the self-employment rate among working 64-year-olds who are not eligible for the state pension increased from 17.5% to 35.8% for those who became eligible to the state pension at age 66.

Hochguertel (2015) used panel data from the SHARE survey to study the labor market behavior of older wage earners and self-employed workers for several European countries, and showed that self-employment rates in most countries increase after the standard social security retirement age is reached and that the self-employed have a lower exit rate. He furthermore documented the answers to a survey question which asked retirees whether or not their last job before retirement offered them opportunities to work full-time or part-time after the official retirement age. Only one third of previous wage earners indicated that this was the case, against 70% of all who were previously self-employed. This can be interpreted as direct evidence

10 An additional factor which impacts self-employed decisions to work past the regular retirement age is that many types of benefits which are available to employees are not available to the self-employed. It should be noted that this difference in alternatives (or lack thereof) makes comparison more difficult.

that older self-employed retirees do indeed experience fewer labor demand barriers to continued employment than wage earners and therefore enjoy greater flexibility in choosing their optimal retirement age. This result is robust for analyses which control for self-selection into self-employment, occupational and industry characteristics, and health.¹¹

The self-employed are particularly prone to work in administrative or managerial functions and as skilled farm workers (Hochguertel 2015), which is consistent with the studies of Maestas (2010), Kanabar (2015) and Bijlsma et al. (2016) mentioned earlier, who show that most post-retirement jobs involve higher managerial or supervisory positions or sales, administrative support and service positions. The self-employed also have a considerably higher private net wealth (Hurst and Lusardi 2014; Hochguertel 2015), implying that older self-employed persons do not continue employment because of financial constraints, but predominantly for reasons that are unrelated to wealth and income.

11 Pettersson (2014) and Hochguertel (2015) present labor market transition matrices between self-employment and wage employment over time and show that a self-employed worker is on average more likely to transfer into wage employment than an employee to transfer to self-employment. Both studies thus suggest that seeking self-employment to enable post-retirement employment as a wage earner is not a common approach to avoid demand barriers on the labor market.

5. Post-retirement employment and labor market consequences

Another potential barrier to post-retirement employment is the changing public opinion within the European Union and to a lesser extent within the United States. Young people suffered most from the recent global financial crisis through rising unemployment and declining employment rates, whereas the employment rates of older workers were less responsive to the crisis and even increased in most countries as a consequence of the withdrawal of early retirement incentives. Politicians in several countries have called for a reversal of the recent efforts to reduce or eliminate the financial incentives to retire early, giving as underlying reason that the employment of older persons reduces the opportunities for employment of the young. Most economists would discharge this idea as a 'lump of labor fallacy', which conjectures that there is a fixed supply of jobs and that any increase in the labor supply of one group of workers would increase the unemployment of other groups of individuals. A more subtle claim, however, is that, when controlling for population size and demand, the employment rate of younger workers might be affected by the share of older workers employed, depending on the substitutability of both groups (Banks et al. 2010).

Several studies have explored the validity of this claim. The most comprehensive study is a project initiated by Gruber and Wise (2010), which is the product of analyses conducted in the United States, Japan, and ten European countries by researchers in these respective countries. These country papers used a wide range of techniques, such as within-country natural experiments, cross-country comparisons based on various comparison methods, and panel regression analysis, to investigate the relationship between the employment of older persons and the employment of youth and persons into their 40s and 50s. The various estimation methods yield very consistent results. There is no evidence that reducing the employment of older persons leads to more job opportunities for younger persons on the macro level. Similarly, there is no evidence that increasing the labor force participation of older persons reduces the job opportunities of younger persons. The results actually showed that an increase in the employment of older persons might be paralleled by an increase in the employment of youth. Other studies that have studied the substitutability between workers of different ages in fact confirm that younger and older workers are imperfect substitutes (Card and Lemieux 2001; Fitzenberger and Kohn 2006; Eichhorst et al. 2014) or report a negative elasticity of substitution, which suggests that older and younger workers are complements rather than substitutes (Hebbink 1993; Kalwij et al. 2010; Munnell and Wu 2012; Boheim 2014). We can therefore assume that encouraging post-employment retirement has no adverse effect on youth employment.

Table 1: Relationship between participation grades of retirees, cohorts nearing retirement, and the young

	Unemployment 55-64	Employment 55-64	Unemployment 15-24	Employment 15-24
Levels	-0.178** (0.071)	1.043*** (0.137)	-0.225 (0.173)	-0.068 (0.119)
3-year lag	0.0245 (0.075)	0.651*** (0.134)	0.128 (0.168)	-0.252** (0.101)
5-year difference	-0.472*** (0.113)	0.799*** (0.103)	-1.064*** (0.170)	0.575*** (0.144)
5-year log difference	-0.691*** (0.234)	0.134 (0.084)	-0.538*** (0.190)	0.131** (0.064)

Notes: The above shows the coefficient of the participation rates of people aged 65-69. Covariates include GDP growth and country fixed effects.

*** significant at 1% level, ** significant at 5% level, * significant at 10% level.

Source: OECD Statistics, own calculations (Data extracted on Sep 20, 2016 08:55 UTC (GMT) from OECD.Stat).

The limited substitutability between young and old workers is partly explained by differences in sectors, occupations, and skills (Eichhorst et al. 2014). Fouarge et al. (2011) furthermore found that older workers possess a set of skills which, according to employers, younger workers do not have, including handling of responsibility, accuracy, and acquired expertise. Younger workers have better commercial skills and are better able to handle organizational or technological change according to the employers.

Post-retirement employees may still, however, be perfect substitutes for employees nearing the retirement age. After all, economic theory predicts that the more similar groups of workers are, the greater the degree of substitution. Since the existing studies exclusively focus on the impact of the labor participation of older cohorts which are nearing the retirement age on youth employment, the existing literature is completely silent on this topic. Table 1 therefore presents the results of ordinary least squares regressions on OECD data for 32 countries that mimic the analyses of Gruber and Wise (2010) on the relationship between the employment of the old and the young, but that instead estimate the impact of the participation rates of people aged 65-69 on the unemployment and employment rates of people nearing their retirement age (ages 55-64) as well as the young (ages 15-24). Four regression specifications are estimated: one specification of the participation rate of people aged 65-69 in levels, a specification that includes a three year lag of the participation rate,

and two specifications with a five-year and five-year log difference.¹² The results are consistent with those of the country papers that are part of the project of Gruber and Wise (2010). The correlation results show a positive association between post-retirement employment rates and the employment of people nearing the retirement age, even after controlling for the aggregate effects of GDP growth. The same holds for the relationship between the employment rates of retirees and the young (with the exception of the specification that includes the three-year lag). This suggests that, when labor market conditions are good for retirees, they are also good for people nearing retirement and the young and that at the macro level there is no evidence for systematic crowding out by employed retirees, even not of groups of workers who are just marginally younger.

12 Regressions are run with and without control variables (GDP per capita growth and country fixed effects). The results do not change when adding control variables.

6. Discussion and conclusion

Post-retirement employment rates have risen continuously in the majority of industrialized countries in the past two decades, such that post-retirement employment has become a nontrivial and widespread phenomenon. Although most studies in the retirement literature treat retirement as an absorbing state, researchers have started to explore the determinants and labor market consequences of post-retirement employment. Employment is continued after retirement either because individuals have financial constraints to allow full retirement, or due to reasons unrelated to wealth and income, and it appears nearly always to be an action that is planned in advance. While the group of post-retirement employees initially consisted mainly of highly educated workers with high income and wealth, the ongoing European pension reforms aimed at increasing the labor supply of older workers have led to a shift in the composition of employed retirees. The increase in the post-retirement employment rate is predominantly caused by the strong growth in the participation rate of retirees with a low educational level. This trend seems hardly desirable. On the one hand, the introduction of post-retirement employment extends the choice set of the individuals involved, enabling them to acquire a higher income during retirement and to escape full retirement where this involves a disutility of retirement. On the other hand, this group is also likely to be financially illiterate, to have fewer financial planning skills, and to be generally less employable, which implies that it will have more difficulties finding new jobs after their retirement. Moreover, post-retirement employment can be ex ante suboptimal for this latter group.

There is scope for further increase and stimulation of the post-retirement employment rate, in particular in European countries where mandatory retirement still prevails and where the demand for post-retirement employees by employers is low due to downward wage flexibility and widespread age discrimination. Policymakers have no reason to fear that post-retirement employment will crowd out the employment opportunities of the young as well as closer substitutes such as employees nearing retirement. The evidence in the literature rather points to the opposite relationship, in which the employment rate of the old relates positively with the employment of the young.

In spite of the wealth of research on post-employment retirement in the past two decades, various pressing questions remain. More research is needed that directly links financial illiteracy and lack of planning skills to the choice of different retirement pathways such as post-retirement behavior. It is important to incorporate the insights of behavioral economics into such analyses. Second, substitutability between retirees and employees nearing retirement should be investigated at the meso level, for

example in occupational and sectoral contexts, to fully understand the consequences of policy changes that stimulate continued employment. Finally, it is important to consider why post-retirement employment correlates positively with the employment prospects of people nearing the retirement age. The existing literature does not provide a clear explanation for this relationship. First, this correlation could arise from the internal organization of companies of their production processes, which enables young and old workers to be complements. Second, it might also be explained by positive spillover effects of policies that aim to stimulate the labor participation of older people. Third, increases in post-retirement employment rates might change the social attitude towards employment at a higher age and as a consequence lead to changes in human capital investment behavior. Finally, the positive correlation between employment of the young and the old might be caused by the rising consumption expenditures of older employees. For all of these reasons it is essential to continue future research. This would serve to identify the main drivers behind post-retirement employment and its impact on the labor market.

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