

# Extending working lives: How policies shape retirement and labour market participation of older workers

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## Abstract

This study investigates how policies shape retirement and labour market participation of older workers and thus help extending working lives. It employs a time-series-cross-section analysis of the effects of macro-level institutional pull, push and retention factors on effective retirement age and employment rate of older workers in 15 OECD countries from 1992 to 2010. The comparative approach reveals that public pension system rules that have been geared towards postponing retirement in many countries in past decades, indeed, are significant determinants of lengthening working lives. In particular, statutory retirement age and financial disincentives for early retirement proof important. Institutional effects differ by gender, though. Furthermore, the results point to the importance of social policies supporting labour market participation throughout the life-course: social investment in human capital and public services clearly supports extending working lives.

## KEYWORDS

employment, labour market, pensions, retirement, social investment

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## 1 | INTRODUCTION

Past decades have witnessed a multitude of pension system reforms in all advanced welfare states. Achieving sustainability in the face of fiscal pressures, which are caused by demographic ageing, has been the key driver for the majority of the reforms. However, tools for reaching this goal have varied both in the course of the years and across countries. The latest reform wave has been more homogeneously characterized by reforms that aim at postponing retirement and extending working lives in almost all countries (Ebbinghaus, 2012; OECD, 2015). The most important reforms of public, mandatory pension schemes in this direction include raising the statutory retirement age, restricting or abandoning early retirement routes, setting financial incentives for working beyond the official retirement age as well as increasing the contribution or employment period entitling to full pension (Ebbinghaus, 2012; Ebbinghaus, 2021 and Hinrichs, 2021 in this Special Issue). Consequently, the link between length of working life, life-time earnings and the adequacy of old-age income level is strengthening, and old-age income has become more dependent on labour market participation and its intensity during the working age, but even more importantly, at the tail end of working life.

Despite the clear policy shift, comparative empirical evidence is scarce on how the pension system reforms gearing incentives towards working longer actually affect retirement and labour market participation of older workers (see e.g., D'Addio, Keese, & Whitehouse, 2010; Ebbinghaus, 2006, 2012; Geppert, Guillemette, Morgavi, & Turner, 2019; Hofäcker, 2010). Studying the effects of pension policies, which aim at extending working lives from a comparative perspective, is essential for at least two reasons. First, the anticipated effects for enhancing the sustainability of public pension schemes are dependent on the actual outcomes in terms of later retirement and higher employment rates of older workers. Second, these outcomes also determine the degree to which pension schemes are able to fulfil their primary tasks in providing adequate income security and preventing old age poverty. Attention should also be paid to gender and socio-economic inequalities that pension system incentives for working longer may (re)produce.

Previous literature emphasizes a multitude of micro- and macro-level factors determining labour market participation in later career and retirement (see e.g., Ebbinghaus & Radl, 2015; Hofäcker & Radl, 2016; Hofäcker, Schröder, Li, & Flynn, 2016). At the macro-level, both pension and labour market policies, but also the economic context set important incentives and constraints for work continuation. Such institutional incentives and constraints have been discussed as “push” and “pull” factors determining early exit from labour market. Furthermore, “retention” or “maintain” factors such as active labour market policies and social services have gained attention lately with regard to their potential to promote labour market attachment of older persons (Ebbinghaus, 2012; Ebbinghaus & Hofäcker, 2013). Despite their presumed importance, empirical evidence on the macro-level pull, push and retention effects is mostly restricted to case studies and cross-sectional comparisons. Analyses over longer periods of time are still rare and therefore the question of whether and how policies, pension policies in particular, actually matter for extending working lives remains understudied.

In this paper, we contribute to filling this research gap by performing a time-series cross-sectional analysis of the anticipated effects of macro-level pull, push and retention factors for extending working lives in 15 advanced welfare states over the period of 1992–2010.<sup>1</sup> With gender-specific analyses, we furthermore contribute to a better understanding of how policies are likely to have a different impact on employment and retirement patterns of men and women because of the gendered career patterns and their impacts for pension entitlements (Frericks, Knijn, & Maier, 2009; Möhring, 2015).

We focus on two dependent variables measuring the extension of working lives: (a) effective retirement age, and (b) employment rate for workers aged 55–64 years. These variables cover the most commonly used indicators of policies aiming at extending working lives. They are reported and estimated for men, women and total population. With regard to explanatory factors, our main focus is on institutional pull factors inherent in mandatory public pension schemes, but we also consider the effects of unemployment benefit incentives, welfare state-related retention factors as well as socio-economic structural push factors. In particular, we account for those pension policy

parameters that are seen as crucial incentives for retirement and exit decisions and which also have been subjected to reforms in recent years (Duval, 2003; Ebbinghaus, 2006, 2010; Ebbinghaus & Hofäcker, 2013; Geppert et al., 2019; Hofäcker, 2010; Johnson, 2000; OECD, 2011).

In the next section, we first discuss pension policy trends related to the goal of extending working lives, and what we know so far about the impact of institutional context on retirement and labour market attachment of older workers. In Section 3, we present our indicators and data. The results of the regression analyses on the effects of pull, push and retention factors on effective retirement age and labour market participation of older workers are presented in Section 4 and the final section concludes by discussing the findings.

## 2 | THE POLICY CONTEXT OF EXTENDING WORKING LIVES

### 2.1 | Pension reforms for postponing retirement

Attempts to raise the retirement age and reverse the trend of early exit have spread across welfare states after they were first planned in the USA in 1983 (Duval, 2003; Ebbinghaus & Hofäcker, 2013). Increasing the age of retirement is particularly appealing from the point of view of sustainability because it both increases revenues by increasing the size of working population by retaining older workers and decreases expenditure by reducing the number of beneficiaries in the respective cohorts (Bonoli, 2000). Increasing employment rates and reversing the early exit trend were set as targets in the Lisbon Strategy of the European Council in 2001 and have been promoted by further international institutions thereafter (OECD, 2006).

Pension policy reforms aiming at extending working lives and postponing retirement consist of instruments that mandate working longer (such as increasing statutory retirement age, restricting or closing early retirement schemes or disability and unemployment routes to retirement, or automatic adjustments that tie benefit levels closer to length of employment and/or contribution period and life expectancy). Other instruments such as flexible retirement or the possibility to combine pension and work give more choice for people's retirement transitions (D'Addio, 2014; see also Ebbinghaus, 2006, 2012). Although latest pension reforms, especially those aiming at postponing labour market exit, are considered incremental rather than radically changing the pension system design (Arpaia, Dybczak, & Pierini, 2009), they make adequate old age income much more dependent on employment and earnings throughout the working life, but specifically at its tail end. This, in turn, reinforces existing inequalities in working life during retirement. First, gendered effects are likely because women more often than men have interrupted careers due to childcare, earn less and more often work part-time and in temporary contracts in most of the advanced welfare states (Bettio, Tinios, & Betti, 2013; European Commission, 2015; Frericks et al., 2009; Kuivalainen, Nivalainen, Järnefelt, & Kuitto, 2018). Working longer may be even more important for women to ensure adequate pensions than for men. Second, the chances of older persons to continue working in later life depend both on the opportunities at the labour market and on individual capacities, which, in turn, are unequally distributed among socio-economic groups (Boudiny, 2013; Walker & Maltby, 2012). This is one of the reasons why restricting early retirement routes in part is substituted by other exit routes, disability pensions, in particular (Riekhoff, Kuitto, & Palomäki, 2020).

### 2.2 | Research on the institutional context of working later

Due to prominence of extending working lives as one of the main goals of recent pension reforms, there is a growing body of literature on retirement and late-career employment and their macro- and micro-level determinants (Duval, 2003; Ebbinghaus & Hofäcker, 2013; Ebbinghaus & Radl, 2015; Ebbinghaus, 2006; Geppert et al., 2019; Gruber & Wise, 2002; Hofäcker, 2010; Hofäcker et al., 2016; Radl, 2013). In this research tradition, the macro-level factors are often categorized into pull, push and retention factors. Pull factors refer to those institutional incentives

in welfare systems that provide opportunities to leave work early (Ebbinghaus, 2006; Hofäcker et al., 2016). Early retirement schemes with only small actuarial reduction, but also other pathways to early retirement (such as unemployment or disability schemes), pose powerful incentives for rational individuals not to continue working until or even after the minimum statutory retirement age (Duval, 2003; Ebbinghaus, 2006; Riekhoff et al., 2020). Low statutory retirement age, high pension benefits as well as eligibility conditions and actuarial rules, which are less connected to long working/contributions periods, pose further pull factors. Recent pension reforms to extend working lives clearly aim at scaling down existing pull incentives, especially by increasing the statutory retirement age and restricting early exit routes (Ebbinghaus & Hofäcker, 2013).

Previous research indicate that pull incentives affect early retirement and low employment rates of elderly likewise (Blöndal & Scarpetta, 1999), and that eligibility age is related to employment rate of especially elderly worker cohorts (Duval, 2003; Geppert et al., 2019; Gruber & Wise, 2002). However, economic incentives affect workers in different class positions in different ways, leading to a strong class and gender effect on retirement decisions (Arpaia et al., 2009; OECD, 2015; Radl, 2013).

Irrespective of deliberate choice based on pull factors, retirement and labour market participation of older workers depend on a multitude of other factors. The most important macro-level factors are often described as push factors, referring to structural economic and labour market conditions, which impede labour market participation chances of older workforce. They include business cycle shifts, changing occupational and production structures as well as labour market institutions in different production regimes (Ebbinghaus & Hofäcker, 2013; see also Schmitt & Starke, 2015). These factors affect older workers potentially more than younger ones, because the skills structure of older cohorts is often less updated to the arising needs (or is not perceived as such). High-skilled workers have a greater probability to continue working, while low-skilled workers exit early either due to economic and labour market situation-related reasons or bad health due to hazardous work (Hofäcker, Hess, & Naumann, 2015).

As with the labour force in general, the state can mitigate the negative effects of such push factors not only by a posteriori social security measures, but also by measures that seek to enhance the capacities and chances of individuals at the labour market. By means of targeted active labour market measures and life-long learning and training, the capacities of older workers can be enhanced in the face of changing labour market needs (Ebbinghaus & Hofäcker, 2013). Measures fostering older workers' labour market participation and combatting push factors are described as retention factors (Ebbinghaus & Hofäcker, 2013). However, not only targeted measures for elderly, but also the broader context of welfare policy orientation may lay the foundations for labour market participation chances of elderly; social investment policies throughout the life course strengthen the human capital and thus employability and flexibility of people in all ages (Hemerijck, 2013; Jepsen, Foden, & Hutsebaut, 2002; Morel, Palier, & Palme, 2012). Those include not only education from early childhood to life-long-learning, but also public social services offering care help for children and fragile family members that may mediate individual contexts in which long working lives are feasible, especially for women (Ebbinghaus, 2012; Kuitto, 2016). Social policies throughout the life course are also key drivers for increasing life expectancy and educational attainment, which have proved important for rising the labour market participation rate of older people (Geppert et al., 2019). Welfare states emphasize social investment-type policies to a varying degree—while much of the public social policies are directed towards compensating income losses due to unemployment, sickness or other hardships by providing cash benefits, for example, in the Mediterranean, and in many Continental European welfare states, the social investment perspective has gained much more weight in the social policy mix of the Scandinavian welfare states (see e.g., Hemerijck, 2013; Kuitto, 2016; Morel et al., 2012). The importance of social policies at different stages of life for working longer and retiring later have so far received less scholarly attention, which is why we explicitly address the social investment-type orientation of the welfare state as a relevant institutional retention factor in our study.

According to Ebbinghaus and Hofäcker, pull, push and retention approaches represent complementary explanations that need to be considered simultaneously in explaining early exit from labour market (Ebbinghaus & Hofäcker, 2013, p. 834). The empirical analysis in this paper therefore focuses on the system-level policies for extending working lives in advanced welfare states by looking at how patterns of expected outcomes – effective

retirement age and employment rate of workers aged 55–64—are related to institutional parameters of pension systems and other public policies since the 1990s. In particular, we test whether pension system pull incentives and constraints, which have been under reform in recent years, indeed have unfolded the expected impact on extending working lives, and whether the effects are gendered.

### 3 | DATA AND METHOD

#### 3.1 | Dependent variables of working later

We include two outcome variables measuring the extension of working lives as our dependent variables: effective retirement age and employment rate of older workers. Both outcome variables are available for women and men sub-populations as well as total population.<sup>2</sup> First, effective retirement age, which is the average effective age at which people withdraw from the labour force and start receiving pension (even if not full), is an important indicator of retirement behaviour. Besides giving information on the average age of entering retirement, this indicator also shows the discrepancy between statutory retirement age and actual retirement age.

The second dependent variable is the employment rate of workers aged 55–64, capturing labour market participation of people at the tail end of their working lives. Depending on the pension system and its benefit conditions, working in these last years before retirement can be very important for the expected level of pension benefits of an individual, especially in cases of temporally interrupted careers due to unemployment, sickness or parenting. Employment rates in this age group also give important indication of the overall labour market attachment of older workers and its gender-specific variance. Labour market participation of older age groups lays the foundation for later retirement; the more older persons belong to the active labour force, the more of them can also continue working longer. Therefore, the employment rate of older workers is perhaps even more important indicator for lengthening working lives than effective retirement age.

The trends of the two outcome variables show that older workers indeed participate in the labour market to a higher degree and retire later (Table A1 in the Data S1). However, there is considerable variance between as well as within countries when considering the outcomes for women and men both with regard to levels and development. The effective retirement age has increased on average by 0.4 years during our period of observation, 1992–2010, the increase being greater among women (0.6 years compared to 0.2). On the other side, the variance in retirement age is higher for women in Europe, which might be a consequence of differing labour market participation patterns in different welfare regimes. The picture is a bit more coherent for labour market participation rate of older workers. The employment rate of older workers aged 55–64 has increased by almost 10 percentage points, while the growth in employment is much higher among women (15.7 p.p.) than men (3.4 p.p.).

The two indicators are related to each other, but not in a unanimous way. In nine of the 15 countries, country-specific correlations show a consistent positive relationship between the two indicators (see Table A7 in Data S1). Five countries (Austria, France, Italy, Spain and the United States) show a negative relationship, which can be either rooted in a consistently negative relationship for men and women (i.e., Austria and France) or the absence of a relationship at all (i.e., Italy, Spain). Switzerland seems to be an outlier with a contrary relationship for women and men. The relation of our two dependent variables points to the need of analysing these separately, and, in addition, looking at the gender-specific figures.

#### 3.2 | Independent variables: Pull, push and retention factors

Our analysis focuses on those pension and unemployment benefit parameters, which clearly can be linked with targets of extending working lives and reduction of pull incentives for retirement. The operationalisation of these

factors is strongly determined by availability and quality of macro-level cross-nationally comparable time-series data. The pension policy parameters include four main determinants: (a) (gender-specific) statutory retirement age, (b) level of pension benefits, (c) qualification period for pension eligibility and (d) implicit tax rate on continued work.<sup>3</sup>

In operationalising the first three variables, which reflect terms of public mandatory old-age pension schemes, we rely on data provided by the Comparative Welfare Entitlements Dataset (CWED2) (Scruggs, Jahn, & Kuitto, 2017). The first variable, gender-specific statutory retirement age, pensionable age, is a key variable capturing pension reforms aiming at later retirement. For the overall population, we calculated the mean of women's and men's pensionable ages. We expect the pensionable age to be the most discerned parameter determining people's retirement decision and therefore higher pensionable ages to lead to higher effective retirement ages. Within our sample period, the average pensionable age for men had risen about half a year and for women about 1 year (see Table A1 in Data S1).

The level of public earnings-related old-age pension benefits is captured via standard pension replacement rate. A generous average level of benefits may set incentives to exit from labour force before retirement age or not to continue working thereafter, because the expected level of own pension income is perceived to be adequate. The standard pension replacement rate is the rate of wage compensation provided by public mandatory earnings related pension schemes in relation to the income of the last 12 months before labour market exit for an average worker (Scruggs et al., 2017). On average, pension replacement rates increased about 2.3 percentage point during our period of observation.

The third pension system variable is the qualification period. Qualification period measures the number of years of pension-insured employment or contributions that are required for full standard pension benefit (Scruggs et al., 2017). We assume that a long qualification period constitutes a powerful incentive for working longer, especially if all years and/or earnings count for pension accrual. Qualification period for gaining full pension had increased by 2.7 years on average in our sample.

Fourth, as an indicator for the incentives set by early retirement routes to exit labour market, we include the implicit tax rate on continued work developed by Duval (2003).<sup>4</sup> It reflects the marginal benefit of continued work at a certain age (in this case, the age of 60), or put another way around, the marginal cost of retiring early. Provided that an individual is eligible for pension and that receiving pension benefit cannot be combined with earnings from work, there is an implicit tax on continued working if the pension system is not actuarially neutral (that is, the cost in terms of foregone pensions and contributions paid during the period of continued working is not offset by an increase in future pension; Duval, 2003, p. 18). The higher the implicit tax on continued work, the greater is the incentive to exit labour market earlier. Due to closing or restricting early retirement paths in many countries, the implicit tax to continued work had lowered considerably from the beginning of the 1990s.

For unemployment policies with potential impact on late-career labour market attachment and retirement, we focus on benefit duration and the level of unemployment benefit (Scruggs et al., 2017). The variable unemployment benefit duration contains the number of weeks of benefit entitlement excluding times of means-tested assistance.<sup>5</sup> Similar to the standard pension replacement rate, the unemployment benefit replacement rate is the ratio of the benefit to the income prior to the job loss. We assume that longer unemployment duration and more generous benefits constitute incentives for not entering labour force anew once getting unemployed in later stage of the career and thus should have a negative impact on extending working lives.

For retention factors, we first include a composite measure of the social investment orientation of a welfare state. Social investment policies over the life course such as (life-long) education and active labour market policies cumulate and update human capital and help to make efficient use of it (Hemerijck, 2013; Morel et al., 2012). They thus capacitate people to participate at the labour market also at later stages of their working lives. In addition, public social services ease labour market participation for workers with care responsibilities. This applies more often to women than men, because the former do traditionally carry the main responsibility for care of family members in need. We use the social investment/compensation ratio, which indicates the relative importance of public spending on social investment-type of social policies compared to spending on compensating (i.e., income-replacing) social

policies (Hemerijck, 2013; Kuitto, 2016). Social investment policies refer to public expenditure in (a) education, (b) social services for families, (c) active labour market policies, (d) social services for disabled and socially excluded as well as (e) social services for elderly. Compensation policies in case of income or job loss, in turn, refer to public expenditure on (a) passive labour market policies (i.e., unemployment cash benefits), (b) family cash benefits, (c) cash benefits for incapacity, (d) cash benefits for old age (i.e., pensions) and (e) cash benefits for survivors. The ratio is investment expenditure divided by compensation expenditure. We assume that employment rate of older workers and effective retirement age is higher in countries with a stronger social investment orientation. As a second retention factor, we include life expectancy at 65 as an indirect but widely used indicator for state of health that is affected by a combination of public policies. Better health at older ages has not only a direct effect on the capacity to work, but may also boost employment because of the need for a higher lifetime income (Geppert et al., 2019).

Following macro-level economic and labour market-related structural factors represent push factors. We include the unemployment rate<sup>6</sup> as an indicator for business cycle pressures that might affect older peoples' exit from the labour market. Furthermore, we include unemployment rates for women and men separately in order to capture gender-specific effects in models that capture group-specific outcomes. We also include a composite measure of strictness of employment protection legislation (EPL). Rigorous EPL can help especially older workers with long-term job tenures to work longer. But at the same time, it can be disadvantageous for people with fragile careers, since stricter dismissal rules provide lower incentives for employers to hire new workers and older workers, in particular (Bennett & Möhring, 2015).<sup>7</sup> Finally, we also control for overall wealth and business cycle effects by including the level and the growth rate of gross domestic product.<sup>8</sup>

### 3.3 | Method and the model

To estimate the impact of pull, push and retention factors presented above, we analyse 15 advanced welfare states from 1992 until 2010 with a time-series-cross-section regression with panel corrected standard errors (Beck & Katz, 1995; Plümpfer, Troeger, & Manow, 2005). Estimation of the coefficients is conducted by Prais–Winsten regressions with panel-specific autocorrelation structure. These specifications ensure that estimated coefficients and their standard errors will be unbiased and unaffected by panel-specific characteristics.<sup>9</sup> We estimate the effect of pull, push and retention factors on our two dependent variables for different subsets of the population (men, women and total population). We proceed to build our models in a stepwise fashion by separately testing groups of coefficients (i.e., push, pull and retention factors) before testing the entirety of all coefficients to demonstrate the robustness of the results. All models include the identical set of matched independent variables, which were lagged by 1 year. All models include unit and period fixed effects to capture unit heterogeneity. Furthermore, we ran alternative specifications including a first-difference model, controlling for welfare regimes and conducting regression diagnostics (see Tables A2–A6 in Data S1).

## 4 | EFFECTS OF POLICY INCENTIVES ON WORKING AND RETIRING LATER

### 4.1 | Effective retirement age

The first model in Table 1 shows the impact of pull factors on levels of effective retirement age. The first four parameters represent the pull factors of the pension system. All parameters exert a statistically significant effect on the level of effective retirement age. On average and *ceteris paribus*, higher statutory retirement age, longer qualification period for full public pension, lower implicit tax on continued work and, with a lower significance level, lower replacement rates are correlated with higher retirement age. In contrast, the effect of the two parameters of unemployment benefits is close to zero. Thus, our first model shows that when solely looking at pull factors, public

**TABLE 1** The influence of push, pull and retention factors on effective retirement age, 1992–2010

	Effective retirement age			
	(1) Pull	(2) Retention	(3) Push	(4) Full
Pull factors				
Pension policy parameters				
Pensionable age	0.514*** (−0.067)			0.239*** (−0.068)
Qualification period	0.035** (−0.013)			0.031*** (−0.008)
Pension replacement rate	−0.024† (−0.012)			0.015 (−0.011)
Implicit tax rate	−2.053*** (−0.459)			−1.492*** (−0.334)
Unemployment policy parameters				
Unemp. benefit duration	−0.001* (0.001)			−0.002*** (0.001)
Unemp. replacement rate	0.003 (0.013)			0.000 (0.011)
Retention factors				
Social investment/compensation ratio		3.533*** (0.619)		2.549*** (0.641)
Life expectancy at 65		0.410* (0.167)		0.502* (0.197)
Push factors				
Employment protection			−0.667*** (0.100)	−0.536** (0.189)
Unemployment rate			0.043 (0.026)	0.035 (0.033)
GDP growth			0.117** (0.037)	0.089* (0.041)
GDP per capita (in thousands)			0.171*** (0.029)	0.115*** (0.024)
$R^2$	.995	.998	.993	.998
RMSE	0.509	0.486	0.477	0.530
N	278	278	278	278
No. of countries	15	15	15	15

Note: Prais–Winsten regression coefficients with panel-specific autocorrelation structure for unbalanced panels and panel-corrected standard errors (in parentheses). All independent variables are temporally lagged by 1 year. Period fixed effects and constant included, but not shown.

† $p < .1$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

pension system parameters with in-built financial incentives indeed exert the anticipated effect. In the second model, only the retention factors, the social investment spending ratio and life expectancy are included. A higher relative share of spending on social investment as well as a higher life expectancy clearly and significantly increase effective retirement age. Within the third model, we look at four factors that “push” older workers into retirement. The model shows that stricter EPL is negatively correlated with effective retirement age, whereas economic growth and wealth exert the expected positive effect.



The fourth model in Table 1 combines all three groups of regressors and allows for a controlled assessment. The effects described above are robust to this full specification, although the effects of pensionable age and implicit tax rate become smaller. Looking at the standardized regression coefficients in Table A4 (Data S1) reveals that pensionable age, together with implicit tax rate, social investment ratio, life expectancy and employment protection legislation (and the level of GDP) exert the strongest effect on effective retirement age. The level of pension and unemployment benefits, unemployment rate and economic growth, in turn, have only a minor impact.

**TABLE 2** The influence of push, pull and retention factors on employment rates, 1992–2010

	Employment rate (age 55–64)			
	(5) Pull	(6) Retention	(7) Push	(8) Full
Pull factors				
Pension policy parameters				
Pensionable age	1.532*** (0.379)			1.302*** (0.321)
Qualification period	0.219*** (0.054)			0.231*** (0.038)
Pension replacement rate	−0.141*** (0.033)			−0.015 (0.049)
Implicit tax rate	−8.229*** (2.010)			−9.212*** (1.926)
Unemployment policy parameters				
Unemp. benefit duration	−0.010*** (0.003)			−0.007* (0.003)
Unemp. replacement rate	0.058 (0.047)			−0.028 (0.044)
Retention factors				
Social investment/compensation ratio		31.678*** (4.764)		33.049*** (3.014)
Life expectancy at 65		1.676** (0.585)		3.784*** (0.727)
Push factors				
Employment protection			−1.904*** (0.425)	−0.227 (0.811)
Unemployment rate			−0.391*** (0.087)	−0.570*** (0.110)
GDP growth			0.321** (0.118)	0.279 (0.187)
GDP per capita (in thousands)			0.605*** (0.107)	−0.018 (0.105)
$R^2$	.855	.898	.895	.948
RMSE	1.769	1.587	1.222	1.843
N	278	278	278	278
No. of countries	15	15	15	15

Note: See Table 1 for notes.

## 4.2 | Employment rates

The results for the second outcome variable, employment rates of workers aged 55–64, are presented in Table 2 and show a slightly different pattern of effects than those for retirement age. All pull, push and retention factors except for the unemployment benefit replacement rate exert the expected, significant effect on employment rates of older workers when entered in the separate models 5–7. Only the effect of EPL is negatively contrary to our assumptions. In the full model 8, pension replacement rate is not anymore significantly correlated to employment rates.

**TABLE 3** Effects of push, pull and retention factors by gender, 1992–2010

	Effective retirement age		Employment rate (age 55–64)	
	(9) Men	(10) Women	(11) Men	(12) Women
Pull factors				
Pension policy parameters				
Pensionable age (subset)	0.343*** (0.065)	0.206* (0.087)	1.093** (0.352)	1.260*** (0.268)
Qualification period	0.019** (0.006)	0.031** (0.012)	0.085 <sup>†</sup> (0.047)	0.392*** (0.043)
Pension replacement rate	–0.003 (0.010)	0.039* (0.016)	–0.022 (0.060)	–0.034 (0.067)
Implicit tax rate	–1.723*** (0.409)	–1.319* (0.570)	–8.969*** (2.164)	–6.876** (2.106)
Unemployment policy parameters				
Unemp. benefit duration	–0.001 (0.001)	–0.003*** (0.001)	–0.007 <sup>†</sup> (0.003)	–0.006* (0.003)
Unemp. replacement rate	–0.013 <sup>†</sup> (0.007)	–0.005 (0.017)	–0.020 (0.045)	0.064 (0.057)
Retention factors				
Social investment/compensation ratio	2.719*** (0.659)	2.253*** (0.666)	18.154*** (2.650)	43.170*** (4.348)
Life expectancy at 65	0.623** (0.212)	0.351 <sup>†</sup> (0.209)	3.158*** (0.807)	3.785*** (0.468)
Push factors				
Employment protection	–0.304 (0.200)	–0.691** (0.256)	–1.156 (0.797)	0.348 (0.932)
Unemployment rate	0.031 (0.031)	0.037 (0.043)	–0.552*** (0.121)	–0.545*** (0.138)
GDP growth	0.096* (0.043)	0.098 <sup>†</sup> (0.058)	0.474** (0.171)	0.071 (0.220)
GDP per capita (in thousands)	0.140*** (0.027)	0.113*** (0.032)	0.421*** (0.116)	–0.253* (0.113)
R <sup>2</sup>	0.999	0.995	0.954	0.871
RMSE	0.536	0.672	1.808	2.196
N	278	278	278	278
No. of countries	15	15	15	15

Note: Subset indicates that parameters are matched with the corresponding subset (men or women) of the dependent variable within the respective model. For further notes, see Table 1.

**TABLE 4** The influence of social investment and compensation policies on effective retirement age and employment rate (age 55–64), 1992–2000

	Effective retirement age			Employment rate (age 55–64)		
	(1) Composite index	(2) Sub- indices	(3) Indicators	(1) Composite index	(2) Sub- indices	(3) Indicators
Social investment/ compensation ratio	3.592*** (0.766)			34.288*** (3.483)		
Social investment		0.113* (0.053)			2.315*** (0.216)	
Compensation		−0.547*** (0.031)			−2.322*** (0.136)	
Social investment policies						
Education			0.313* (0.132)			0.588 (0.380)
Active labour market policies			0.515† (0.265)			−0.131 (0.803)
Family (in kind)			−0.242 (0.239)			4.077*** (1.006)
Incapacity (in kind)			0.275 (0.334)			4.724*** (1.064)
Old age (in kind)			0.520† (0.278)			3.985*** (0.686)
Survivors (in kind)			−15.186 (23.539)			108.263 (67.894)
Other (in kind)			0.715 (0.880)			2.607 (2.436)
Compensation policies						
Passive labour market policies			−0.065 (0.092)			−2.451*** (0.346)
Family (in cash)			−0.618* (0.246)			−2.157*** (0.547)
Incapacity (in cash)			−0.474** (0.161)			−0.511 (0.577)
Old age (in cash)			−0.485*** (0.066)			−1.926*** (0.192)
Survivors (in cash)			−0.864*** (0.190)			−4.156*** (0.526)
Other (in cash)			−2.336*** (0.566)			−3.375 (2.258)
R <sup>2</sup>	.993	.998	.997	.939	.964	.953
RMSE	0.467	0.495	0.490	1.582	1.619	1.596
N	277	277	277	277	277	277
No. of countries	15	15	15	15	15	15

Notes: Public social spending categories according to the ESSPROS expenditure functions (<https://ec.europa.eu/eurostat/web/social-protection/data>), in % of GDP. Needs-adjusted and summarized into investment and compensation according to Kuitto, 2016. See Table 1 for further notes.

Furthermore, the coefficients for the push factors lose their size and significance, the unemployment rate now showing the only significant effect. However, when controlling for welfare regimes (Table A5 in Data S1), the effect of EPL on employment rates becomes positive and significant, suggesting that the role of dismissal rules for the employment of older workers is sensitive to the overall welfare model and production regime. The regression models of the two outcome variables thus differ the most with regard to the macro-economic push factors. This is also visible when comparing the relative importance of the predictors by looking at standardized regression coefficients in Table A4 (Data S1). The retention factors social investment ratio and life expectancy yield the greatest impact on employment rates of people aged 55–64, followed by the pension policy parameters pensionable age, qualification period and implicit tax rate as well as the overall unemployment rate.

### 4.3 | Gender-specific effects

In Table 3, we turn to gender differences that occur mainly in the effect of retention and push factors. Of the pension system pull parameters, qualification period is less related to men's than to women's employment rate in older age. Furthermore, the higher the public pension replacement level, the higher is the effective retirement age of women, while the effect is negative and non-significant for men. One explanation for these differences could be that especially in countries with more generous public pensions or longer qualification period for full pensions, men feel no need to continue working if labour market exit is possible, while women's shorter or fragmented careers may make it necessary to continue working even if the level of pensions in general is higher. Considering gender-specific differences on how older workers are “pushed” out of the labour market, the results show that retirement age and employment rates of older men and women are in part affected differently by those factors. While both are unanimously affected by the overall unemployment rate, periods of economic growth seem to be related to men's higher employment rates to a greater degree. The strictness of EPL shows gender-specific effects as well. Its effect on effective retirement age is negative and significant only for women, but the effect is positive, albeit not significant for women's employment rate. This points once more to the need to explore the role of employment protection legislation in different macro-economic contexts for age- and gender-specific labour market participation patterns (cp. Van Dijk, van Dalen, & Hyde, 2020).

Life expectancy is a stronger predictor of men's retirement age, but there are no gender differences with respect to its effect on employment rate. Given that men on average suffer from poor health more often than women and their life expectancy is generally lower, this is not surprising and underlines the unequal distribution of health-related capacities to continue working in old age between men and women. The retention factor social investment ratio is also statistically significant in all four models, but its positive effect is much stronger for women's employment rate at older ages than for men. This points to the gender-specific effects of social investment strategies for late life labour market attachment that needs more attention.

### 4.4 | Decomposition of social investment effects

The impact of the so far less studied social investment policies turns out to be very robust across all models and specifications and holds also when controlling for different welfare regimes (Table A5 in Data S1). Therefore, we take a closer look at the effect of the single social policy components that are subsumed under the social investment and compensation measures (Table 4). All control variables were omitted from the regression equation to avoid possible multicollinearity and to keep the models parsimonious. Both sub-indices of our social investment ratio variable (i.e., investment and compensation) exert statistically significant effects on the dependent variables in a way that social investment spending is positively correlated and compensation spending negatively correlated with our measures of extending working lives. Yet different aspects of social policies drive retirement age and employment rate of older workers. Effective retirement age is positively influenced by higher expenditure on education, active labour market policies and old age public services, while all cash-

related benefits except for unemployment benefits exert a negative effect. The employment rate of older workers, in turn, is positively influenced by family and old age in-kind expenditure, while cash-benefits related to unemployment, family, old-age and survivors also exert a negative impact. In other words, investing in public services for the care of children, elderly and fragile people boost employment also at older ages, building the basis for lengthening working lives. The effect is even higher for women (not shown), meaning that social policies that enable labour market participation throughout the life course by offering public services push employment particularly for women. A greater focus on income compensation coincides with earlier retirement and lower labour market participation at the tail end of working lives. Because data for disaggregated social expenditure are not available for cross-national comparisons back in time, we cannot directly assess the impact of such social investment policies for the cohorts the retirement and employment of which we observe within our period sample. However, we know from the literature on comparative welfare state research that the social investment/compensation orientation is a rather long-term phenomenon and comes with path dependencies (Hemerijck, 2013; Kuitto, 2016). Therefore, we can at least to a certain degree assume that the measures of social policy orientation utilized in this study also indicate long-term trends of social policy orientation that have affected the cohorts included in our sample during their lives.

## 5 | CONCLUSION

In this study, we have examined the effects of macro-level institutional pull, push and retention factors on effective retirement age and employment rate of older workers in 15 OECD countries from 1992 to 2010. We find that policies do matter for retirement and labour market outcomes, and different (but not all) push, pull and retention factors have a substantial impact on extending working lives. First, the results show strikingly that pension system reforms gearing the institutional rules towards retiring later indeed unfold their hoped-for impact. A higher statutory retirement age of public pensions increases effective retirement ages even though the effect is understandably far from one-to-one year increase (cp. Geppert et al., 2019). If the marginal cost of retiring early is high, people are more likely to continue working later. The incentives for labour market exit set by early retirement schemes and other routes for retiring before the statutory retirement age thus have an important impact not only on retirement age, but also on labour market participation of older workers. These results confirm the findings by Duval (2003) and Johnson (2000) and convey them to the recent time period.

Second, the role of macro-economic and labour market policy factors pushing older workers out of the labour market is less clear. While wealth and economic growth had a positive effect on retiring later, they were not unanimously related to employment rate of people aged 55–64. Instead, and less surprisingly, a higher overall unemployment rate was related to a lower employment rate of older workers. The effect of employment protection legislation seems less straightforward. Stricter dismissal rules come with lower effective retirement age and this effect is stronger for women than for men. In our sample, countries with strict employment protection legislation against dismissals include mainly Southern and some Continental European countries, where at the same time early exit routes are more common and retirement ages as well as the overall labour market participation rate of women are lower. Women who work at older ages in those countries represent a more selective group with higher occupational status and long tenures. This finding is in line with the results by Bennett and Möhring (2015) who find that more rigorous EPL leads to a lower risk of early retirement for the labour market insiders compared to those with inconsistent careers (i.e., the outsiders).

Third, the overall orientation of a welfare state towards social investment proves to be effective in preventing early exit and increasing employment for older workers. This finding underlines the relevance of social investment policies throughout the life course. The high significance of the social investment orientation in a country's welfare policy mix demonstrates how policy choices towards investing to people's skills and supporting care work via public services can also help fulfilling the goals of lengthening working lives. At the macro level, social investment policies promote employment, and with the demographic ageing, the gains of the positive effects on older workers' labour market attachment found in this study will even become more important from the view of the national economy. The nexus between pension policies and broader welfare policy orientation has yet received relatively little scholarly attention, calling for further research.

Fourth, the positive effect of higher life expectancy on extending working lives strikingly underlines the importance of health-related capacities to continue at work. Even though this macro-level measure bears high individual-level variance, the finding once more points to the fact that not everyone is able to continue at work, irrespective of their willingness or labour market exit-related policies (cp. Geppert et al., 2019).

Finally, institutional factors have in part gender-specific effects on working longer. In countries where women's labour market participation is high in general, women also on average have better premises because of their better health in later age compared to men to continue working until the statutory retirement age or even beyond. The choice may not be deliberative, though. Women may need to compensate pension accrual losses caused by career breaks and non-standard employment at earlier stages in their lives, and this is the case especially the longer the period for qualifying for full public pension is. Also, women's high labour market participation tends to coincide with big public service sector with female dominance among the employees, and this may enable staying longer in employment (cp. Riekhoff & Järnefelt, 2017). Social investment policies enhance the human capital of both gender but may help women in particular in overcoming career disadvantages related to care work by offering public services. Men's late career employment, in turn, is influenced by business cycles to a greater extent than women's employment.

The empirical analyses of the investigated policies thus confirm the assumed dynamics of pull and retention factors (and to some extent the push factors) for extending working lives (cp. Ebbinghaus & Hofäcker, 2013). Our analysis has its shortcomings, though. Due to data availability, the sample is restricted to 15 countries and the time period from early 1990s until 2010. Many countries have implemented further pension reforms aiming at working longer after 2010 and the effects of these intensified reforms are not covered by our analysis. In addition, more detailed analysis of the interplay of labour market policies and longer working lives focusing on age- and occupation-specific features of labour market regulations that were not captured in our analysis is needed. Our analysis also captures the mandatory public pension schemes only. Even though these still play a major role in many countries' pension provision, great variance in the importance of occupational and private pension schemes' exists across countries. The role of the occupational and private pension schemes for extending working lives therefore needs additional research. Furthermore, our analysis captures the influence of macro-economic push variables on labour market outcomes, thus neglecting the importance of individual characteristics and chances of older workers influencing their retirement and employment. Future studies could circumvent these shortcomings by conducting a multilevel analysis that captures the interplay of the individual and the policy dimension by linking micro and macro data over time.

From a bird's eye view, the aims of recent pension reforms for extending working lives and postponing retirement seem to have materialized and they are supported by other social policies. However, policies to extend working lives also bear danger of rising inequalities and challenge the adequacy of pensions (cp. Ebbinghaus, 2021 in this Special Issue). Adequate pension provision will only be granted in the future if longer working lives will become reality for an overreaching majority of the people – a fact that is recognised also by international organisations, all above the EU. Parallel efforts to capacitate as many people as possible to work in later years are needed, including life-long learning, rehabilitation and overall preventive health care. Furthermore, change in attitudes towards older employees and more flexible employment conditions for elderly are needed. However, extending working lives at their tail end is but only one dimension of ensuring pension adequacy; youth unemployment, late entry in the labour market, career breaks affecting especially women in care work and disability are major concerns for achieving full pension rights in the environment of ever tightening ties between employment/contribution periods and pension rights. An approach taking a life course perspective and emphasizing the interplay between pension and labour market policies as well as the wider context of social policy appears inevitable for both research on and policy of extending working lives.

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## ENDNOTES

- <sup>1</sup> The period of analysis covers the main era of pension system reforms targeted at lengthening working lives, but it is also determined by the restricted availability of cross-country data on some of our main indicators. The target population of our analysis are advanced welfare states of the OECD countries. Due to data availability, our sample is restricted to the following 15 countries: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and the United States. Because all major types of welfare states and different pension systems are well represented within the sample, our results yield generalisability to a reasonable degree.
- <sup>2</sup> OECD. Stat database (OECD, 2019).
- <sup>3</sup> There is a great complexity of the instruments of making longer working pay in different earnings-related pension systems, in particular with respect to accrual rules, which we cannot measure in a cross-country, time-series manner. The four major features included in our analysis, however, are prevalent in all public pension systems and cover the main pull factors. Furthermore, they are more visible in public debate than more complex mechanisms and thus probably have a greater weight in people's retirement decisions. For more detailed measures, albeit not for time series, see among others Ebbinghaus (2006) and Ebbinghaus and Hofäcker (2013).
- <sup>4</sup> We would like to thank Romain Duval for providing access to the implicit tax rate data. Data for later years are taken from OECD (2012).
- <sup>5</sup> In some countries, older unemployed persons may be eligible for longer duration of unemployment benefit or have other rights granting them higher protection and benefits in case of unemployment compared to younger workers. However, lack of comparative time series data for our sample restrains from accounting for this in our analysis.
- <sup>6</sup> Eurostat (2016).
- <sup>7</sup> OECD Employment Protection Legislation Database (OECD, 2020). Composite indicator of strictness of employment protection, individual dismissals in regular (EPR\_V1) and temporary (EPT\_V1) contracts.
- <sup>8</sup> Per capita in USD, constant prices and PPP in 2010; OECD [https://stats.oecd.org/Index.aspx?datasetcode=SNA\\_TABLE1\\_ARCHIVE](https://stats.oecd.org/Index.aspx?datasetcode=SNA_TABLE1_ARCHIVE).
- <sup>9</sup> Since our panels are unbalanced and the degree of autocorrelation distinctly varies between them, we use a panel-specific approach for calculation of the autocorrelation parameter  $\rho$  (rho).

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