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IZA DP No. 17586

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DECEMBER 2024

ISSN: 2365-9793

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ABSTRACT

Why Life Gets Better After Age 50, for Some: Mental Well-Being and the Social Norm of Work*

We provide evidence that the social norm (expectation) that adults work has a substantial detrimental causal effect on the mental well-being of unemployed men in mid-life, as substantial as, e.g., the detriment of being widowed. As their peers in age retire and the social norm weakens, the mental well-being of the unemployed improves. Using data on individuals aged 50+ from 10 European countries, we identify the social norm of work effect using exogenous variation in the earliest eligibility age for old-age public pensions across countries and birth cohorts.

JEL Classification: I10, I31, J60, D63

Keywords: mental well-being, social norm of work, retirement institution

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* We thank editor Kevin Lang, two anonymous referees, Jasper Bates, Miriam Gensowski, Raphael Guber, Arie Kapteyn, Pierre Koning, Fabrizio Mazzonna, Owen O'Donnell, Bastian Ravesteijn, Stefan Staubli, Arthur Stone, and Judit Vall Castelló and conference and seminar participants at the Tinbergen Institute Amsterdam, Vrije Universiteit Amsterdam, University of Southern California, Universitat Pompeu Fabra, the Center for Health Economics, Max Planck / NBER Workshop on Health and Aging 2018, European Society for Population Economics 2017, the International Society for Quality of Life Studies 2018, the Centre for Health Economics at Hamburg University, Germany and JRC at Ispra, Italy. Research was supported by the European Union's Horizon 2020 research and innovation programme under the Marie Sk lodowska-Curie grant agreement (ESSGN 101073237), the National Institute on Aging, under grants R01AG037398, RF1055654, R56AG058726, R01AG078522 and R01AG079554, and by the Dutch National Science Foundation (NWO) under 016.vidi.185.044. This project has received funding from the European Union's Horizon 2020 research and innovation programme (Grant Agreement No. 733206 LifeCycle). Declarations of interest: none.

1 Introduction

Finding oneself without a formal job can be a stressful experience in work-centered societies, with potentially serious mental well-being consequences for those unable to find work. Here, we connect the social norm that able-bodied adults ought to work to a popular, growing, and extensively debated literature on whether age-patterns in well-being are U-shaped: better among the young and old and worse during prime working ages (e.g., Blanchflower and Oswald, 2008; Deaton, 2008; Steptoe et al., 2015; Bond and Lang, 2019; Blanchflower, 2021; Blanchflower et al., 2023). While the decline in mental well-being in early adulthood is questioned for various reasons (e.g., Frijters and Beatton, 2012; Galambos et al., 2020; Blanchflower et al., 2024), well-being improvements in the second half of life are more consistently, but not always, observed across a range of well-being measures (e.g., Stone et al., 2010, 2017). Yet there exists no compelling explanation for improvements at older ages. The literature has suggested that a biological (Weiss et al., 2012), or other age-related mechanism, explains improvements in well-being at later ages, e.g., age-related changes in self-reporting or *"cognitive and behavioral changes in older people that lead to enhanced emotional regulation and stability"* (Stone et al., 2017; Carstensen et al., 2003; Buecker et al., 2023).

We offer an alternative explanation, namely that the relaxation of the social norm of work improves the well-being of those that cannot abide by it, e.g., unemployed men. This being a particular and relatively small sub-group, whose mental health improves with age, may also explain why the U-shape is not always observed, as studies have focused on population averages. Figure 1 (top-left panel), using data on men from the Survey for Health, Ageing and Retirement in Europe (SHARE), shows that average mental well-being – measured by the prevalence of depression – indeed improves in the second half of working life (ages 50-70), consistent with the right-hand side of the U-shape. However, while the average prevalence of depression steadily decreases by almost 8 percentage points (pp) between ages 50 and 70 after controlling for education, income, marital and labor-market status, this pattern hides important heterogeneity. The age-pattern markedly changes (top-right panel) when we distinguish between two groups: (1) those that do meet the social norm of work, i.e., men who earn income from (self-)employment or receive pension payments (retirees are not expected to work), versus (2) those that do not meet the social norm of work, e.g., prime-age men who are unemployed. Among the employed and retired, mental well-being is stable with age. By contrast, among unemployed men we find strong and statistically significant improvements in mental well-being with age: an almost 20pp reduction in depression between ages 50 and 70 (top-right panel). The bottom two panels show the same pattern for the EURO-D score – an ordinal scale that ranks mental well-being from 0 (best) to 12 (worst).

Overall, we find the same pattern when analyzing countries separately (Appendix Table F.1). To the best of our knowledge, we are the first to report this striking pattern.

We build on our finding to propose the central hypothesis of this paper: that the inability to conform to the social norm of work – the commonly held belief that able-bodied adults ought to work – plays a significant role in observed mental-health improvements during the second half of working life (i.e. the right-hand side of the U-shape). We focus on men (see section 4.3.1 for women). An important dimension of variation in the social norm of work is *age*: the social stigma associated with inactivity may be higher for a fifty year old male, whose peers of comparable age are typically working, than for a sixty-two year old, whose peers are increasingly in retirement. As the social norm of work relaxes with a growing share of peers in age in retirement, the mental well-being of unemployed men improves.

The endogenous nature of labor-market stratification prevents us from directly interpreting the age-patterns by labor-market status in Figure 1. Therefore, we proxy variation in the social norm of work using plausibly exogenous variation in the earliest eligibility age for old-age public pensions – the *Early Retirement Age* (ERA) – across ten European countries. Conceptually, reaching the legally determined ERA provides a measure at which employed individuals increasingly begin to retire, weakening the social norm of work in subsequent periods. Because ERAs differ across countries and between birth cohorts within countries, the timing of when the social norm of work begins to weaken varies.

We use panel data on the mental well-being of unemployed men aged 50+ from SHARE, and track their mental well-being both before and after reaching the ERA to estimate the social norm of work effect in a difference-in-differences framework with staggered treatment adoption. Specifically, we employ Wooldridge's (2021) extended two-way fixed-effects (ETWFE) model with individual fixed effects to estimate heterogeneous treatment effects of reaching the ERA at different ages. Our approach flexibly estimates how treatment effects develop over time in post-treatment periods. The model compares mental well-being changes of unemployed individuals who have reached the ERA (treated) to mental well-being changes of unemployed individuals who have not yet reached the ERA (not-yet treated). We uncover an average drop of 23pp in depression when unemployed men pass the ERA. This effect is strikingly large, larger than, e.g., the correlation between depression and being widowed (10pp).

We provide evidence that supports the interpretation of our estimates as a social norm of work effect. First, there is a significant increase in retirement upon reaching the ERA, but not before, and the share of retirees grows in later periods. This supports the notion that the ERA captures a relaxation of the social norm of work. Importantly, the phasing-in of mental-well being improvements for unemployed men beyond the ERA coincides with the increase in the fraction of retired peers. Second, a growing number of individuals, who are

unemployed based on their source of income, increasingly self-identify as being retired after having passed the ERA. Indeed, the identity economics framework of Akerlof and Kranton (2000) predicts restoration of self-perceived norm conformity (e.g., unemployed men starting to self-identify as being retired as more peers in age are retired) to have a positive utility effect. Third, we find null effects of passing the ERA for social groups that should not be affected (as much) by a relaxation of the social norm of work: employed men (who conform to the norm), disabled men (who are not expected to work), and women (who have much lower labor-force participation in the studied cohorts). Finally, in placebo tests we do not find support for alternative interpretations, such as benefit-generosity, income-security, and leisure-coordination channels. Our results therefore suggest substantial "untapped well-being potential" among unemployed men in mid-life driven by norms around work.

We make three distinct and novel contributions. First, we connect an extensive literature on the U-shape in well-being to social norm of work effects. In doing so, we shed light on a large empirical literature on age-patterns that argues that age-patterns in well-being are likely universal to the human condition (e.g., Stone et al., 2010, 2017; Blanchflower, 2021). Instead, our quasi-experimental evidence for unemployed men suggests that improvements in mental well-being at older ages need not be biological or otherwise predestined, but may, to an important extent, depend on the social and cultural context.

Second, we provide methodological and substantive contributions to the literature on the social norm of work. Much of previous literature has used the local unemployment rate as a proxy for the prevalent social norm of work (e.g., Jackson and Warr, 1987; Clark, 2003; Gathergood, 2013). This literature finds higher unemployment rates to have a positive effect on the mental well-being of the unemployed. Our identification, using retirement institutions, has some important methodological advantages over the local unemployment rate in capturing the social norm: it is (i) not sensitive to business-cycle fluctuations, (ii) arguably more exogenous as it does not depend on labor-market decisions by the unemployed, and (iii) not subject to the confounding mechanism that a higher local unemployment rate reduces the probability of returning to work, which in itself may affect mental well-being (Ruhm, 2000; Chadi, 2014). Substantively, we provide an important extension to the finding by Hetschko et al. (2014) that the life satisfaction of unemployed Germans improves when they restore norm conformity upon entering a retirement scheme. Our analysis tracks unemployed individuals between ages 50-62 – i.e., well before the normal retirement age – and shows (i) that well-being improvements are gradual and take place over a longer period, (ii) that improvements are more substantial (as they accumulate over time), and (iii) that they occur across a range of European countries with diverse labor-market and retirement institutions.

Third, our social norm of work interpretation suggests that formal labor-market policies,

such as early retirement ages, impose well-being externalities through norm enforcement. Such externalities, and their potential welfare implications, are not fully appreciated yet in the literature on labor-market policies.

2 Data

We use the harmonized version of the Survey for Health, Aging, and Retirement in Europe (SHARE, Börsch-Supan et al., 2013; Gateway to Global Aging Data, 2017). SHARE, modeled after the US Health and Retirement Survey, gathers data on individuals aged 50+ on a wide range of topics, including work and retirement, assets, income and consumption, health and healthcare utilization. We use data from the first six waves,[1] excluding wave 3 as it does not include mental well-being measures. The first wave was collected in 2004/2005 and subsequent follow-ups were timed at approximately two-year intervals.

We exploit the panel dimension of SHARE and include ten countries that were part of the first wave: Austria, Belgium, Denmark, France, Germany, Italy, The Netherlands, Spain, Sweden, and Switzerland.[2] Our main analyses focus on men (see section 4.3.1 for women).

2.1 Labor-market definitions

We use income-based measures of labor-market status as they represent an official, more objective, classification of an individual's labor-market status, and self-reported labor-market status as an indicator of perceived identity.

Income-based measures: We apply the following labor-market status categorization using reported income sources and hours worked:

- **Retired:** any retirement income (public or private) and less than 10 working hours per week.
- **Employed:** no retirement income, no public disability insurance income, but income from work or self-employment and 10 or more working hours per week.
- **Unemployed:** no retirement income, no public disability insurance income, and less than 10 working hours per week. These are working-age individuals who do not conform to the social norm of work. We do not define unemployment on the basis of unemployment benefits because after benefit exhaustion individuals may remain effectively unemployed and exposed to the social norm of work.

[1] We do not use waves 7 and 8 of the Harmonized SHARE data because wave 7 does not include our mental well-being outcome and data collection for wave 8 was suspended because of COVID-19.

[2] We exclude Greece because of sample selection issues (Mazzonna and Peracchi, 2017).

- **Disabled:** any public disability insurance income, no retirement income, and less than 10 working hours per week. These are working-age individuals with a health impairment that limits the ability to perform gainful work and justifies inactivity.
- **Other:** Not in any of the above categories.[3]

Self-reported measures: In SHARE, self-reported labor-market status is elicited using the question: "In general, how would you describe your current situation?" Respondents can then select from the following six categories: employed or self-employed, unemployed, retired, permanently sick or disabled, homemaker, other (i.e., don't know, or refuse to answer).

2.2 Mental well-being: EURO-D score

The EURO-D scale, a 12-item screening instrument for depression, was developed to enable cross-country comparisons of risk profiles for older Europeans (Prince et al., 1999). The 12 items consist of survey questions in the following domains: depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness. Responses are coded as indicative (1) or not indicative (0) of depression (see Appendix A). The total EURO-D score is the sum of the individual items, resulting in a score that ranges from 0 (best) to 12 (worst) mental well-being. It has been validated and shown to perform well as a screening instrument for depression in SHARE data (Castro-Costa et al., 2008). A total score of 4 or higher is indicative of a mood disorder, such as depression (Prince et al., 1999; Castro-Costa et al., 2007).

We use the clinically validated depression indicator as our main outcome, and the total EURO-D score, a more continuous measure of mental well-being, as a secondary outcome. Besides the clinical validation, the depression indicator has two advantages: (i) it is less sensitive to measurement error and (ii) is less subject to concerns about the cardinal use of ordinal well-being scales (see Schröder and Yitzhaki, 2017; Bond and Lang, 2019; Kaiser and Oswald, 2022).

2.3 Early retirement ages (ERAs)

Besides a statutory, or normal, retirement age (NRA), most European pension systems also have an early retirement age (ERA): the earliest age at which an individual can start receiving retirement benefits, usually at some penalty (reduced benefits) compared to retirement at the NRA. For historical and political reasons, ERAs differ across European countries, and

[3]About 9% of person-wave observations are classified as other (Appendix Table F.3). In robustness tests we show that our results remain unchanged when we allocate these individuals to one of the above categories.

within European countries by cohort, as governments attempt to delay retirement for later born cohorts.

We rely on the ERA as a plausibly exogenous source of variation in the social norm of work along the age dimension. It reflects an officially sanctioned age at which individuals are allowed to retire. A substantial number of individuals indeed retire at the ERA and increases in retirement are sharper at the ERA than at the NRA (e.g., Gruber and Wise, 2007). ERAs have successfully been used to study the causal effects of retirement on health (e.g., Coe and Zamarro 2011; Bonsang et al. 2012; Mazzonna and Peracchi 2017) and serve as anchors for the retirement decision over and above financial incentives (Seibold, 2021; Kleven, 2016). The ERA therefore provides a comparable measure across countries and birth cohorts at which retirement takes place, potentially weakening the social norm of work.

We collect information on ERAs from Gateway to Global Aging (2024), OECD (2024), and previous literature that uses ERAs to instrument for the retirement decision. See Appendix B for detailed information on how we determine the ERA relevant to each individual in our data, based on (i) country, (ii) gender and (iii) birth cohort.

Table 1 provides an overview of ERAs by country in the analysis sample of unemployed men. ERAs range between 56-64, with ages 60-63 being relevant for birth cohorts from multiple countries, so that individuals from different countries can belong to the same treatment group. Belgium, Denmark, Germany, Italy, the Netherlands, and Spain have ERAs that change across birth cohorts in our sample. Appendix Figure G.1 shows that for most countries in our data, men retire at higher ages in later survey waves. This is consistent with recent successive policy reforms that increased the incentives to delay retirement.

3 Empirical model

We focus on unemployed men, for whom we expect the effect of the social norm of work on mental well-being to be the largest. We consider an unemployed individual i to be treated by a relaxation of the social norm of work from the moment he reaches the ERA for his birth cohort and country. The idea is that as peers (the employed) in age retire, the social norm relaxes, improving the mental well-being of the unemployed. With age, each unemployed individual will eventually reach the ERA for his country-birth cohort group g. This implies we have staggered treatment adoption: the treatment occurs in multiple units in different time periods, where age a is the time dimension and g the group dimension.

With homogeneous treatment effects, a common approach to estimating the average

treatment effect on the treated (ATT) is to estimate a two-way fixed-effects (TWFE) model:

$$MWB_{ia} = \mu_i + \alpha_a + \beta AfterERA_{ia} + \varepsilon_{ia}, \tag{1}$$

where MWB_{ia} represents the mental well-being of individual i of age a, μ_i are individual fixed effects, α_a are age fixed effects, and $AfterERA_{ia}$ is an indicator variable for whether individual i has passed the ERA at age a. Under a common age-trend assumption, β can be interpreted as the causal effect of passing the early retirement eligibility age for individuals who remain unemployed, which we attribute to a weakening of the social norm of work.

However, treatment heterogeneity may occur both in the group and age dimension. In general, we expect that in post-treatment periods the social norm of work increasingly weakens as more employed peers transition into retirement, so that the cumulative effect on well-being increases in later post-treatment periods. Moreover, across groups g the rate at which individuals retire – i.e., the rate at which the social norm of work weakens – may differ. Recent literature on difference-in-differences with staggered treatment adoption shows that in the presence of such treatment heterogeneity the estimates from the TWFE estimator in equation 1 may be biased due to 'forbidden comparisons', i.e., the use of already-treated units as controls for later treated units (Borusyak and Jaravel, 2018). A range of heterogeneity-robust estimators have been proposed in recent literature to address this issue.

We follow Wooldridge (2021), who proposes an extended two-way fixed-effects (ETWFE) estimator. This estimator avoids comparisons with already-treated units by saturating the model with fixed effects for all possible combinations of treatment groups and event time, thereby estimating separate average treatment effects on the treated (ATTs) for each group-period combination. This yields the following model:

$$MWB_{ia} = \mu_i + \alpha_a + \sum_{g=q}^{A} \sum_{s=g}^{A} \delta_{gs} D_{igs} + \varepsilon_{ia}, \tag{2}$$

where individual i belongs to treatment group g if the ERA is age g, q is the first treatment year of treatment group g, A is the last age of the panel, D_{igs} is a time-varying treatment indicator equal to 1 for individual i from group g for $s = a$ in post-treatment ages and 0 otherwise. We cluster standard errors ε_{ia} at the group g level. Wooldridge's (2021) baseline model is designed for balanced panel data, where including group fixed effects is equivalent to controlling for individual fixed effects. However, when the panel data is unbalanced – as in our case – this equivalence no longer holds. To address this, we control for individual fixed effects μ_i. Our approach is identical to the "chained difference-in-differences" framework proposed in Bellégo et al. (2024) while retaining the flexibility of Wooldridge (2021).

The coefficient δ_{gs} captures the group-age specific average treatment effect (ATT): it measures the change in mental well-being after passing the ERA for group g in post-treatment period s. For example, $\delta_{60,60}$ captures the treatment effect of individuals with ERA set to 60 years old in the first year of treatment, and $\delta_{60,61}$ captures the effect for the same group of individuals in the second year of treatment, etc. It is identified by comparing the change in mental well-being of unemployed individuals of group g from ages before the ERA to post-treatment age s with the change in mental well-being for not-yet treated unemployed individuals (i.e., individuals that reach the ERA after age s) over the same ages. Identification of δ_{gs} hinges on two assumptions. First, the no anticipation assumption requires that there is no effect of treatment prior to the ERA. This implies that, on average and conditional on fixed effects, potential outcomes prior to treatment are the same. Second, the conditional common trends assumption requires that in the absence of treatment there would be no differential age trends in mental well-being between already-treated individuals and not-yet treated controls, after conditioning on unit- and time-invariant covariates.

To test the identifying assumptions, we investigate pre-treatment periods in an event-study analysis, where only *never-treated* observations are used as controls.[4] We implement this by truncating our sample after age 62 so that unemployed men with ERAs set to ages 63 and 64 effectively serve as a control group of never treated individuals. Table 1 shows that this concerns 27.8% of the sample with individuals coming from 5 of the 10 countries, ensuring that we have sufficient controls in each time period. For consistency we restrict all analyses to ages 50-62. This implies that, compared to earlier-treated groups, we have fewer post-treatment observations for later-treated groups, reducing our ability to estimate longer-run ATTs for them. Among individuals aged 50-62, we can use both the full set of *not-yet* treated individuals and the set of never treated individuals – a subset of the not-yet treated – as controls to estimate equations 2 and 3, respectively. While using variation among the full set of not-yet treated controls yields greater precision, we can investigate pre-trends in support of the identifying assumptions only when we use never treated controls.

Including individual fixed effects μ_i removes time-invariant composition effects, but would not address time-variant changes in the composition of the sample that occur when individuals transition between labor market states. For this reason, we restrict our analysis to individuals

[4]For the event-study analysis in Figure 2 we adjust the ETWFE model to:

$$MWB_{ia} = \mu_i + \alpha_a + \sum_{g=q}^{A} \sum_{a=a_0}^{g-1} \delta_{gs}^{pre} D_{igs} + \sum_{g=q}^{A} \sum_{s=g}^{A} \delta_{gs}^{post} D_{igs} + \varepsilon_{it}, \tag{3}$$

where δ_{gs}^{pre} and δ_{gs}^{post} are the ATTs for pre-treatment and post-treatment periods, respectively. We cannot estimate pre-treatment ATTs in equation 3 without a never treated group, i.e., when only not-yet-treated observations are used as controls.

who remain in the same labor-market state in consecutive periods in the sample. Naturally, this implies that our estimates are not informative of the potential well-being effects of labor-market transitions (e.g., unemployed men transitioning into retirement as in Hetschko et al., 2014).[5]

4 Results

We begin by validating our approach that exploits ERAs as a measure of the social norm of work (section 4.1). Next, we estimate the effects of passing the ERA on the mental well-being of unemployed and employed men (section 4.2). Finally, we provide additional results to support our interpretation of well-being improvement for unemployed men as a social norm of work effect (section 4.3).

4.1 Validation of the ERA as a proxy for the social norm of work

Figure 2 presents event-study analyses of various outcomes among men ages 50-62 using the ETWFE estimator and the never treated, i.e., men with ERA 63 or 64 (see Table 1), as controls, to estimate ATTs for all pre- and post-treatment event periods. We aggregate ATTs over the group dimension into event-time-specific treatment effects: $\bar{\hat{\delta}}_{\cdot s} = \sum_{g=q}^{s} \frac{N_{gs}}{N_{\cdot s}} \hat{\delta}_{gs}$, where $N_{\cdot s} = \sum_{g=q}^{s} N_{gs}$ is the total number of observations in period s. The year before treatment onset is the reference period.

Panel (a) presents results using retirement as the outcome for the full sample of men, i.e., irrespective of labor-market status (other panels present results for the unemployed [b, c and d] and the employed [e and f]). We define retirement as an absorbing state: once an individual is classified as retired, we consider the individual to be retired in all subsequent waves. We find no evidence of anticipation or a significant pre-trend: no significant increase in retirement before reaching the ERA (compared to the never treated). This provides support for the no anticipation and conditional common trend assumptions needed for identification. In the years after the ERA, men are increasingly in retirement, growing from 6.6pp 0-1 years after the ERA to 20.2pp 4-5 years after the ERA, effects that are all highly statistically significant.

Panel A of Table 2 provides single point estimates for the increase in retirement after the ERA. The TWFE estimator (equation 1) in column 1 of Table 2 shows an increase in retirement by 7.3pp after passing the ERA. Next, we aggregate the ATTs of the ETWFE

[5]Some countries (e.g., Germany) allow (early) retirement for the unemployed. Individuals who receive a retirement pension are, by definition, dropped from the unemployed sample.

estimator: we take the weighted sum of the estimated group-age-specific treatment effects: $\bar{\hat{\delta}} = \sum_{g=q}^{A} \sum_{s=g}^{A} \frac{N_{gs}}{N_D} \hat{\delta}_{gs}$, with weights defined as the fraction of the number of observations of group g in period s (N_{gs}) relative to the total number of treated observations ($N_D = \sum_{g=q}^{A} \sum_{s=g}^{A} N_{gs}$). Column 2 shows, using the not-yet treated as controls, an increase in retirement by 12pp, which is substantially larger than the TWFE estimate. This is consistent with treatment effects accumulating over time (Figure 2), and short-run bias of the TWFE estimand in the presence of treatment effect heterogeneity (Borusyak et al., 2024). In column 3 we restrict the control group to never treated individuals. The estimate remains highly significant and similar in magnitude at 10pp. This is our preferred estimate because for this specification we can provide support for the identifying assumptions by analyzing pre-treatment periods (panel (a) of Figure 2).[6]

Unemployed individuals may increasingly self-identify as being retired as a growing share of peers in age are no longer working. This implies that from their own perspective unemployed individuals restore norm conformity, since not working is the norm for the retired, which can positively affect well-being (Akerlof and Kranton, 2000; Cohn, 1978). Panel (b) of Figure 2 repeats the event-study analysis using the sample of unemployed men (income-based definition) with self-reported retirement as the outcome. In pre-treatment periods effects are generally small and statistically insignificant. Although we find a significant positive increase in self-reports 2-3 years before the ERA, there is no clear pre-trend. In the periods after reaching ERA we find positive and significant estimates that show that unemployed men increasingly self-report to be retired. Indeed, columns 2 and 3 in panel B of Table 2 show highly statistically significant point estimates of 9.8 and 21pp, respectively.[7]

In sum, retirement increases significantly at the ERA, but not before, providing support for our empirical approach to capture changes in the social norm of work. Self-reports of being retired among unemployed men (who are in fact not retired based on income sources) also increase in post-treatment periods, suggesting they increasingly self-identify as being retired. This is consistent with a social norm of work that increasingly weakens in periods after the ERA. As more peers in age retire, unemployed men may themselves find it more acceptable not to work, which potentially improves their well-being.

4.2 Mental well-being

Panel (c) of Figure 2 presents event-time-specific treatment effects for the depression indicator in the sample of unemployed men. Before treatment onset (i.e., before the ERA) all coefficients

[6]The similarity between estimates in columns 2 and 3 is reassuring, suggesting estimates are not driven by our choice of never treated controls.

[7]Here too ETWFE estimates are larger than the marginally significant TWFE estimate.

are insignificant and small, supporting the ETWFE identifying assumptions. 0-1 years after passing the ERA the probability that unemployed men have a EURO-D score indicative of depression declines by 18pp and about 37pp at 4-5 years, showing the treatment effect is substantial and accumulates over time. Both (i) the start of significant mental well-being improvements at the ERA, and (ii) the pattern of increasing effect sizes support the idea that the mental well-being of unemployed men improves at the moment their peers in age begin to retire and grows as more and more peers in age are retired. Together with support for the identifying assumptions (no pre-trend), this lends credibility to a causal interpretation of a social norm of work effect on depression.

Panel A of Table 3 provides the corresponding point estimates. Column 1 reports TWFE estimates and columns 2 and 3 ETWFE estimates. Column 1 shows a significant reduction of 12pp in the probability of being depressed after passing the ERA. Aggregating the ATTs from the ETWFE model results in larger estimates: a highly significant 15 and 23pp decrease in depression for the specifications that use the not-yet treated and never treated as controls, respectively. Again, the ETWFE estimates are larger than the TWFE estimate, consistent with treatment effects accumulating over time.

To put our estimates of a 15 to 23pp decrease in depression in perspective, we compare them to correlates (see Appendix Table F.5) commonly included in analyses of the U-shape (e.g., Blanchflower, 2021). Estimated effects are larger than the gender gap in depression (11pp), being widowed (10pp), or having completed tertiary education (13pp). Moreover, they capture the full mental well-being gap observed in the raw data between unemployed and employed men at age 50 of almost 20pp (see Figure 1).

We also analyzed the total EURO-D score. Overall, results are similar, but somewhat less precise. Treatment effects in panel (d) of Figure 2 show a similar pattern, but only the estimate 2-3 years after the ERA is statistically significant. Nevertheless, panel B of Table 3 shows a significant reduction of 0.66 and 0.73 EURO-D points (columns 2 and 3), respectively. The high concordance in results between columns 2 and 3 and panels A and B is reassuring.

Support for a social norm of work effect is further provided by null results for employed men (see panels (e) and (f) of Figure 2). Because employed men conform to the social norm of work, we do no expect them to experience mental well-being improvements when the social norm of work relaxes. If anything, post-treatment effects indicate a slight worsening. Indeed column 4 of Table 3 shows a marginally significant 4.3pp increase in the prevalence of depression (but not in EURO-D).

In column 5 we provide triple difference-in-differences (triple DiD) results that directly compare the unemployed with the employed. The employed are a suitable comparison group, if the main difference between the two is that a relaxation of the social norm of work affects

the unemployed, but not the employed. In addition to two separate common age-trends *within* each of the two labor-market groups,[8] our triple DiD assumes that *between* unemployed and employed men there exists a common trend in how mental well-being changes due to factors other than age or the social norm of work.[9] This can reflect, for example, that both groups may similarly benefit from increased leisure time of retired family or friends after the ERA. The results indicate significant well-being improvements for unemployed men – i.e., a reduction of 26pp in the prevalence of depression (panel A) and 0.78 EURO-D points (panel B), respectively (consistent with the difference between columns 3 and 4).

Together, our analyses uncover statistically significant and economically meaningful improvements in mental well-being for the unemployed after the ERA.

4.3 Additional analyses

4.3.1 Disabled men, women, and the social norm of work

Next, we investigate two remaining groups for which we expect no, or a weaker, social norm of work effect: disabled men and women. Below we report the main findings (see Appendix C for more detail).

Disabled men: Receiving DI income designates disabled individuals as unable to work, i.e. as not *able-bodied*. Societal expectations that disabled adults work may therefore not be as strong as for the unemployed. Further, while becoming unemployed can be the consequence of bad luck (e.g., firm closures), disability is more likely to be related to (severe) health issues that may affect well-being directly. For both reasons, we expect disabled individuals' well-being to be less responsive to a relaxation of the social norm of work. Indeed, we do not find improvements in the mental well-being of the disabled after they reach the ERA.

Women: Traditional gender roles can reduce women's labor-force participation (e.g., see Bertrand et al. 2015; Bertrand 2020). At the start of the SHARE survey in 2004, labor-force participation in the youngest SHARE cohort (ages 50-54), ranged between 86.0-93.4% for men versus 51.0-84.7% for women (OECD, 2023) in the 10 countries in our sample. If not working for pay is socially more accepted for women, the social norm effect on their mental

[8] Age effects of mental well-being could differ between groups. Alternatively, if the underlying age effects are the same across groups, the mental health improvement may be expressed differently using ordinal subjective well-being scales (see Bond and Lang, 2019). For example, those with worse initial mental well-being (the unemployed) may report a larger improvement on the EURO-D scale than those with better initial mental well-being (the employed).

[9] Strictly speaking triple DiD does not require separate common trend assumptions for unemployed and employed men to have a causal interpretation, see Olden and Møen (2022).

well-being may be smaller. Indeed, when we repeat our ETWFE regression analysis we do not find evidence of improving mental well-being after the ERA. Given the lower labor-force participation of women, this is consistent with our social norm of work hypothesis.

4.3.2 Competing mechanisms

Our estimates can be regarded as intention-to-treat effects in a hypothetical setting where we directly observe the social norm of work and instrument the norm using ERAs. To validate our estimates as a social norm of work effect we need to exclude competing channels – i.e., possible violations of the exclusion restriction – that may drive the relation between the ERA and the mental well-being of unemployed men.

We examine three alternative interpretations: (i) a benefit-generosity effect, (ii) an income-security effect, and (iii) a leisure-coordination effect. The benefit-generosity effect relates to the idea that the generosity and stringency of social security programs may be related to the ERA. For example, it could be that unemployed individuals in some treatment groups g receive more generous unemployment benefits in post-treatment periods, which positively affect their mental well-being.

The income-security effect refers to the concern that as unemployed individuals pass the ERA, they also get closer to the statutory retirement age. Anticipation of a secure and stable income stream from future pension payments may positively affect well-being.

Leisure-coordination may pose a threat to the interpretation of our results if, with more peers in age in retirement, it becomes easier to coordinate leisure activities for the unemployed and disabled, increasing the utility of free time.

In Appendix D we present analyses that show that mental well-being improvements in our main analysis are unlikely to be driven by these competing mechanisms.

4.3.3 Robustness

We conduct sensitivity tests of our main analysis and provide falsification tests to corroborate the robustness of our main results. Appendix E presents these results. We conclude that our results are robust: the well-being of unemployed men improves as they pass the ERA and social norm effects are likely to be an important driver of these improvements.

5 Conclusion

We use a sample of 10 European countries from SHARE and find evidence for substantial improvements in mental well-being of unemployed men after the early retirement age (ERA).

We offer a social — as opposed to biological — explanation for this pattern: prime-age unemployed men suffer substantially in their mental well-being because they do not meet the societal expectation (norm) that able-bodied men ought to work. Several pieces of evidence support this interpretation. First, we find that employed peers increasingly start to retire after eligibility for early retirement programs. Second, we find an increasing fraction of unemployed men who self-report to be retired after the ERA, suggesting they restore norm conformity in their own perception. Third, we do not find mental well-being improvements after the ERA for employed men, disabled men, and unemployed women, all of whom meet the norm for their social category to various degrees. Finally, we do not find support for competing explanations for the relation between mental well-being of unemployed men and the ERA.

Our findings point to the importance of social policies for well-being, and to potentially unintended externalities of labor-market policies on well-being through norm enforcement. On the one hand, active labor market policies (ALMP) such as job search and job training requirements may help unemployed individuals restore norm conformity and improve their well-being. On the other hand, such policies strengthen the social norm of work with detrimental well-being effects for individuals unable to find work. Worse mental health may, in turn, make it more difficult to return to work. Hence, through a reinforced social norm of work, ALMP may also harm well-being and economic output for those who remain unable to find work. The quantitative importance of such externalities and their welfare implications are interesting empirical questions for future research.

With our findings we contribute a new perspective to the debate on the U-shape in well-being over the life cycle. The social norm of work hypothesis also raises new questions and makes predictions for a fruitful research agenda on age patterns in well-being. For example, future research can explore whether the social norm of work has explanatory power in understanding the decline in well-being in the first half of life. Also, the social norm of work hypothesis predicts that recent cohorts of women with higher rates of labor-force participation than earlier cohorts should be more susceptible to social norm of work effects. Finally, there may be a connection between the social norm of work and the alarming phenomenon of deaths of despair – high deaths from suicide, drug overdose, and alcohol-related liver disease among, in particular, unemployed males in midlife in areas lacking opportunities (Case and Deaton, 2020; Walsh et al., 2021) – that is worth exploring.

Data acknowledgments

This analysis uses data or information from the Harmonized SHARE dataset and Codebook, Version D as of September 2017 developed by the Gateway to Global Aging Data. For more information, please refer to www.g2aging.org.

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Tables

Table 1: *Number of observations for unemployed men by country and Early Retirement Age*

	Early Retirement Age (ERA)									
Country	56	57	58	59	60	61	62	63	64	Total
Austria	0	0	0	0	235	0	0	0	0	235
Belgium	0	0	0	0	190	81	69	250	0	590
Denmark	0	0	0	0	77	9	11	32	38	167
France	297	0	0	0	0	0	0	0	0	297
Germany	0	0	0	0	24	12	10	358	0	404
Italy	0	26	10	10	230	0	0	0	0	276
Netherlands	0	0	0	0	63	0	136	0	0	199
Spain	0	0	0	0	74	288	202	18	0	582
Sweden	0	0	0	0	0	111	0	0	0	111
Switzerland	0	0	0	0	0	0	0	137	0	137
Total	297	26	10	10	893	501	428	795	38	2,998

Notes: Cross-tabulation of the number of observations for unemployed men aged 50-62 by country and Early Retirement Age (ERA). The number of observations corresponds to the sample used in the main regression analysis, as in columns 1-3 of Tables 2 and 3.

Table 2: *Estimated effects of reaching the Early Retirement Age (ERA) on retirement and self-reported retirement for men*

Method	(1) TWFE	(2) ETWFE	(3) ETWFE
Panel A: Retirement among all men			
ERA	0.073***	0.12***	0.10***
	(0.012)	(0.015)	(0.017)
Mean Outcome	0.14	0.14	0.14
Observations	18,980	18,980	18,980
Panel B: Self-reported retirement among unemployed men			
ERA	0.061*	0.098***	0.21***
	(0.036)	(0.034)	(0.048)
Mean Outcome	0.10	0.10	0.10
Observations	2,998	2,998	2,998
Control Group	Not-yet	Not-yet	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) using the sample of men aged 50-62. Column 1 reports results from estimating the TWFE model specified in equation 1. Columns 2 and 3 report results from estimating the ETWFE models specified in equations 2 and 3, respectively. Point estimates in columns 2 and 3 are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Panel A uses the full sample, irrespective of labor-market status, with income-based retirement status as the dependent variable. Here we define retirement as an absorbing state: once an individual is classified as retired, in all subsequent waves we also consider the individual to be retired. Panel B only uses men who are unemployed according to the income-based labor-market status, with self-reported retirement as the dependent variable. The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

Table 3: *Estimated effects of reaching the Early Retirement Age (ERA) on the mental well-being of men*

Method	(1) TWFE	(2)	(3)	(4) ETWFE (Wooldridge, 2021)	(5)
Sample	Unemployed	Unemployed	Unemployed	Employed	Triple-diff (3)-(4)
Panel A: Depression					
ERA	-0.12**	-0.15***	-0.23***	0.043*	-0.26***
	(0.050)	(0.052)	(0.071)	(0.025)	(0.081)
Mean Outcome	0.27	0.27	0.27	0.11	0.14
Observations	2,998	2,998	2,998	11,331	14,329
Panel B: EURO-D score					
ERA	-0.50**	-0.66***	-0.73**	0.19	-0.78**
	(0.23)	(0.25)	(0.35)	(0.12)	(0.39)
Mean Outcome	2.40	2.40	2.40	1.46	1.66
Observations	2,998	2,998	2,998	11,331	14,329
Control Group	Not-yet	Not-yet	Never	Never	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on mental well-being using men aged 50-62. Column 1 reports results from estimating the TWFE model specified in equation 1. Columns 2 and columns 3-5 report results from estimating the ETWFE models specified in equations 2 and 3, respectively. Point estimates in columns 2-5 are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Panel A uses the depression indicator as the dependent variable. Panel B uses the total EURO-D score as the dependent variable. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). To avoid that individuals are used in both the subsamples of unemployed and employed men, we use for employed men only those who are employed in all survey waves that they participate in SHARE. Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

Figures

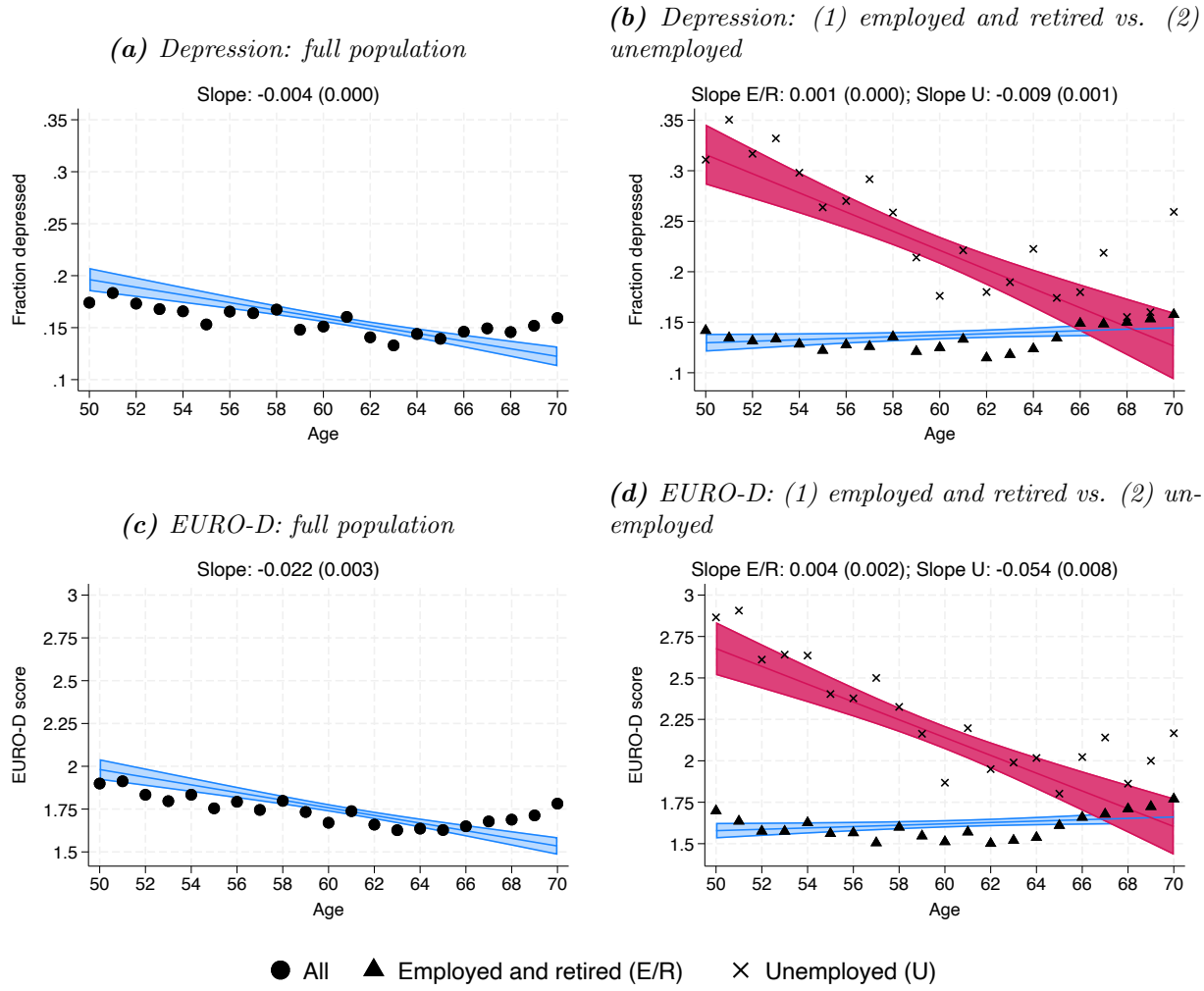

Figure 1: *Mental well-being of men between ages 50-70*

Notes: Mental well-being outcomes for men aged 50-70. Panels (a) and (b) use the depression indicator, panels (c) and (d) use the EURO-D score as the measure of mental well-being. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). Scatter plots show the unconditional average of the mental well-being outcome for each age bin. Linear fits and their 95 percent confidence intervals are based on a regression of the outcome variable on a linear age function and a set of standard controls in the U-shape literature (e.g., see Blanchflower, 2021): educational attainment, marital status, labor-market status, household income, and wave and country fixed effects. The corresponding estimated linear age coefficients with their standard errors in parentheses are reported above each figure; Slope E/R refers to the coefficient for employed and retired individuals while Slope U refers to the coefficient for unemployed individuals. Standard errors are clustered at the individual level.

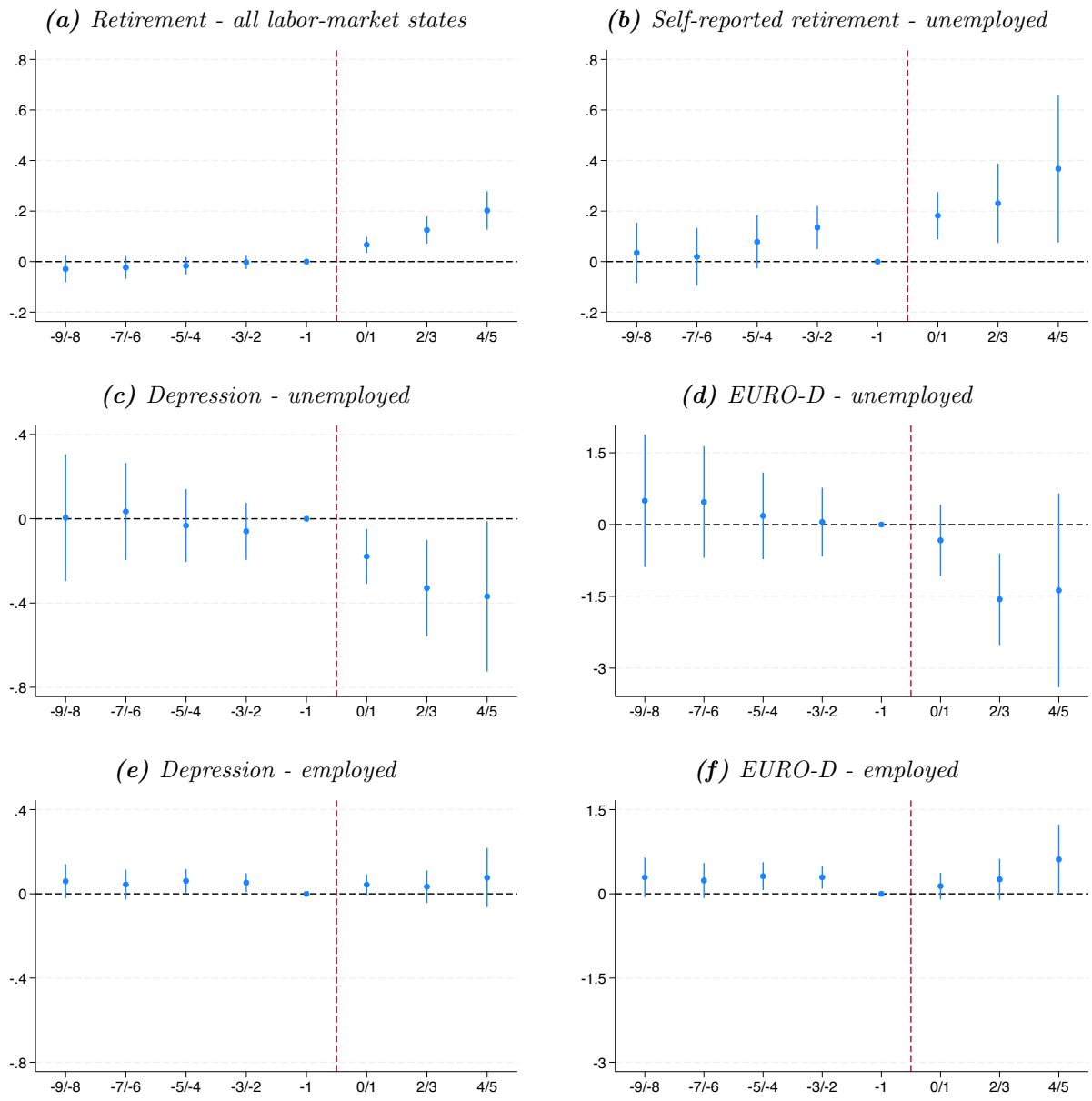

Figure 2: *Event studies for men*

Notes: Event-study analyses using the ETWFE estimator from equation 3. Regressions are estimated using only the control group of never treated individuals. The figures present event-time-specific treatment effects that are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Regressions control for calendar month-of-survey fixed effects. Vertical lines report the 95% confidence interval using standard errors clustered at the group (ERA) level. Panel (a) uses the full sample, irrespective of labor-market status. In this panel we define retirement as an absorbing state: once an individual is classified as retired, in all subsequent waves we also consider the individual to be retired. Panels (b)-(d) and panels (e)-(f) only use men who are, according to the income-based labor-market status, unemployed and employed, respectively. To avoid that individuals are used in both the subsamples of unemployed and employed men, we use for employed men only those who are employed in all survey waves that they participate in SHARE. While we estimate ATTs using age in years, we present aggregations for two-year bins because the SHARE survey is conducted at approximately two year intervals. We restrict presentation of event-time-specific treatment effects to 9 years before and 5 years after the ERA because of the low number of observations outside that window.

Appendices

A EURO-D scale survey items

1. **Depression:** "In the last month, have you been sad or depressed?"

   0 No

   1 Yes

2. **Pessimism:** "What are your hopes for the future?"

   0 Any hopes mentioned

   1 No hopes mentioned

3. **Suicidality:** "In the last month, have you felt that you would rather be dead?"

   0 No such feelings

   1 Any mention of suicidal feelings or wishing to be dead

4. **Guilt:** "Do you tend to blame yourself or feel guilty about anything?"

   0 No such feelings

   1 Obvious excessive guilt or self-blame, mentions guilt or self-blame, but it is unclear if these constitute obvious, or excessive guilt or self-blame

5. **Sleep:** "Have you had trouble sleeping recently?"

   0 No trouble sleeping

   1 Trouble with sleep or recent change in pattern

6. **Interest:** "In the last month, what is your interest in things?"

   0 No mention of loss of interest, non-specific or uncodeable response

   1 Less interest than usual mentioned

7. **Irritability:** "Have you been irritable recently?"

   0 No

   1 Yes

8. **Appetite:**"What has your appetite been like?"

   0 No diminution in desire for food, non-specific or uncodeable response

   1 Diminution in desire for food

9. **Fatigue:** "In the last month, have you had too little energy to do the things you wanted to do?"

   0 No

   1 Yes

10. **Concentration:** "How is your concentration?" (Difficulty in concentrating on entertainment or reading)

    0 No such difficulty mentioned

    1 Difficulty in concentrating on entertainment

11. **Enjoyment:** "What have you enjoyed doing recently?"

    0 Mentions any enjoyment from activity

    1 Fails to mention any enjoyable activity

12. **Tearfulness:** "In the last month, have you cried at all?"

    0 No

    1 Yes

B Overview of retirement eligibility ages

We collect information on retirement eligibility ages from Gateway to Global Aging Data (2024a,b,c,d,e,f,g,h); MISSOC (2017); OECD (2005, 2007, 2009, 2011, 2013, 2015); Celidoni et al. (2017); Mazzonna and Peracchi (2017) and country-specific literature that uses retirement eligibility rules. We use SHARE data collected in the time period 2004-2015 and focus on individuals between the ages of 50 and 70. This implies we focus on retirement ages of individuals from birth cohorts 1934-1965.

We assign a unique ERA to each individual based on the individual's (i) country, (ii) gender and (iii) birth cohort. In some countries there exist paths to early retirement that take into account additional eligibility requirements. For example, eligibility may depend on an individual's industry, work experience or years of contribution to the social security system. Since (1) we do not have all this information and (2) we use ERAs to proxy a relaxation of the social norm of work, our primary focus is to determine at a more aggregate level the earliest age at which a significant number of individuals in a certain country-gender-birth cohort group begin to retire, and not to prospectively determine the ERA for each specific individual. Therefore, in cases where for individuals from a given country-gender-birth cohort

group there exist early retirement paths with different ERAs, we select ERA that applies to a large enough fraction of the population to arguably weaken the social norm of work.[10]

Below we provide a brief overview of the relevant policies that affect the normal retirement age (NRA) and early retirement age (ERA) for individuals in our sample by country, gender and birth cohort.

- Austria:
  - **NRA:** 65 years for men and 60 years for women.
  - **ERA:** Austria has implemented several reforms of the ERA and has multiple paths into early retirement. The most significant reforms were enacted in 2000 and 2003 (see Staubli and Zweimüller (2013) and Manoli and Weber (2016) for details). These reforms can be summarized as follows: Before 2000 the ERA was 60 years for men and 55 years for women. For men born starting in the fourth quarter in 1940 until the second quarter in 1942 the ERA increased by 2 months for every birth quarter, followed by a 1 month increase per birth quarter until the fourth quarter of 1952. The government introduced a "corridor pension" on January 1 2005 allowing early retirement at age 62 for men with at least 37.5 insurance years. For women there was a similar increase of 2 months per birth quarter for women born starting in the fourth quarter of 1945 until the second quarter of 1948, followed by a 1 month increase per birth quarter until the fourth quarter in 1957, eventually raising the ERA to 60 years.

    However, as documented by Manoli and Weber (2016) there exists a group of individuals *"who have the potential of reaching an exemption from the reforms by remaining continuously employed up to the pre-reform ERA at which they can still claim benefits."* These exemptions applied to men with at least 45 contribution years and women with at least 40 contribution years, so that they could still retire at ages 60 and 55, respectively. Using administrative data, Manoli and Weber

[10]We note that there are several reasons why for some individuals retirement may begin before reaching the ERA. For example, employers may offer early retirement windows that are financially attractive, incentivizing retirement before an individuals reaches the ERA (Brown, 2003; Coe and Lindeboom, 2008; Messe, 2011). Moreover, countries may have formal policies that allow particular groups, such as the long-term unemployed, disabled, or workers of sectors affected by economic downturns and plant closures to benefit from benefit programs that effectively allow them to retire earlier (e.g., see Kuhn et al. 2020). We do not consider such paths that only affect a small fraction of the general population and for which the retirement options may be endogenously correlated with (mental) health. Instead, we focus on the retirement paths that affect a substantial part of the population and are therefore likely to shift general work norms of the birth cohort. In panel A of Figure 2 we show that indeed retirement – defined as receiving public or private pension payments and working less than 10 hours per week – significantly increases once individuals reach the ERA but does not yet do so in periods prior to that.

(2016) show in their Figures 3-5 and Table 1 that this exemption applies to a a large fraction of individuals, especially among men. The jump in retirement becomes even stronger at age 60 for men from post-reform cohorts compared to pre-reform cohorts. Consequently, in the general population there remains a sharp increase in retirement at age 60. Hence, we apply age 60 as the ERA for men for all birth cohorts in our analysis. For women, Manoli and Weber (2016) show similar results so that we set the ERA to 55 years (although there are less women with long contribution years that qualify for the exemption).

- Belgium:
  - **NRA:** For men born in or before January 1960 the NRA is 65 years, for men born in February 1960 - January 1964 the NRA is 66 years, for men born in or after February 1964 the NRA is 67 years. For women born before July 1937 the NRA is 60 years, for women born in July 1937 - December 1938 the NRA is 61 years, for women born in January 1939 - December 1940 the NRA is 62 years, for women born in January 1941 - December 1942 the NRA is 63 years, for women born in January 1943 - December 1944 the NRA is 64 years, for women born in January 1945 - January 1960 the NRA is 66 years, for women born in February 1960 - January 1964 the NRA is 66 years, for women born in or after February 1964 the NRA is 67 years.
  - **ERA:** Since 1987 (for women) and 1991 (for men), workers can freely choose the age of retirement without reduction of benefits as soon as they reach 60 years of age, provided they have sufficient contribution years (Jousten et al., 2010). As of 2013 this ERA increased by 0.5 years each calendar year to reach 63 in 2018 (Belgian Federal Pension Service, 2018). This maps to the birth cohorts in the following way: For individuals born in or before 1952 the ERA is 60 years; for individuals born in January - June 1953 the ERA is 60.5 years; for individuals born in July - December 1953 the ERA is 61 years; for individuals born January - June 1954 the ERA is 61.5 years; for individuals born July - December 1954 the ERA is 62 years; for individuals born January - June 1955 the ERA is 62.5 years; for individuals born in or after July 1955 the ERA is 63 years. However, there is a transitional measure that allows individuals born before 1956 to still retire at age 62 years provided they have 37 contribution years. Hence, we set the ERA at 62 years for individuals born in 1955.

    We note that numerous exceptions to the ERA of 60 years existed at least until the early-mid 2000s through collective bargain agreements within industries, allowing

for even lower retirement ages. Jousten et al. (2010) write that *"[a]s a result, there ultimately exists a variety of different regimes with different career requirements, minimum ages, replacement of the worker, and so forth, for different sectors and companies."* This is reflected in SHARE data where Belgium has one of longest left tails of retirement age distributions. The Belgium government has since 2005 responded by tightening up the conditions for early retirement in 2005 with the Intergenerational Solidarity Pact.

- Denmark:
  - **NRA:** As of a policy reform in 2011 the following NRAs apply to both men and women: for individuals born before July 1, 1934 the NRA is 67 years; for individuals born between July 1934 - December 1953 the NRA is 65 years; for individuals born between January - June 1954 the NRA is 65.5 years; for individuals born between July - December 1954 the NRA is 66 years; for individuals born between January - December 1955 the NRA is 66.5 years; for individuals born in or after July 1955 the NRA is 67 years (Gateway to Global Aging Data, 2024c).
  - **ERA:** The main pathway to an early retirement is the Efterløn. This requires employees to have a significant number of contribution years and membership in a unemployment insurance scheme. For individuals born before 1-1-1954 the ERA is 60 years years. For each 6-month cohort born as of 1-1-1954 the ERA increases by an additional 6 months until it reaches 62.5 years for individuals born between 1-1-1956 and 30-6-1956. Then it increases to 63 years for individuals born between 1-7-1956 and 31-12-1958, 63.5 years for individuals born between 1-1-1959 and 30-6-1959 and 64 years for individuals born after 1-7-1959 (Retsinformation, 2018; HK Danmark, 2018).
- France:
  - The retirement system in France is dependent on the pension scheme the individual is assigned to. The private sector pension consists of a two-tiered benefit system consisting of the national retirement scheme (Caisse nationale d'assurance vieillesse – CNAV) and the occupational scheme (Association des Régimes de Retraites Compleémentaires [AGIRC] and l'Association Geéneérale des Institutions de Retraite des Cadres [ARRCO]) which covers almost all employees in industry, commerce, services and agriculture. In the public sector, permanent staff of the central government are covered by the general budget, while non-permanent staff

and staff of local authorities are covered by separated programs (Gateway to Global Aging Data, 2024d).

  - **NRA:** The NRA depends on whether an individual has contributed the minimum number of required years to CNAV. If so, as of 2012 the following NRAs apply to both men and women: for individuals born before July 1951 the NRA is 60; for individuals born July - December 1951 the NRA is 60 years and 4 months; for individuals born in 1952 the NRA is 60 years and 9 months; for individuals born in 1953 the NRA is 61 years and 2 months; for individuals born in 1954 the NRA is 61 years and 7 months; for individuals born in 1955 or later the NRA is 62. For individuals without sufficient contribution years the NRA is determined by adding 5 years to this scheme (Gateway to Global Aging Data, 2024d).
  - **ERA:** Early retirement options exist for a variety of sectors, occupations and other groups, e.g., for those starting work before age 16, disabled, working mother and war veterans and victims (Gateway to Global Aging Data, 2024d). A path with a low ERA that affects a substantial fraction of the population concerns the long-career early retirement scheme (*retraite anticipée pour carrière longue* [RACL]) introduced in 2003 (before the start of the SHARE survey Messe and Wolff (2019); MISSOC (2017); OECD (2005, 2007, 2009, 2011, 2013). This introduced an early retirement age of 56 years for individuals who started working before the age of 16 and had sufficient contribution years. According to Messe and Wolff (2019) *"[i]mplementation of the RACL scheme led to a high number of demands. According to official statistics, it is estimated that from 2004 to 2008, more than 550,000 individuals used the RACL scheme: 114,790 in 2004, 101,462 in 2005, 107,903 in 2006, 114,382 in 2007 and 119,620 in 2008."* The RACL scheme was reformed in 2010 to gradually increase the ERA to 60 years (Hamblin, 2013; Denayrolles and Guilain, 2015; l'Assurance Retraite, 2019; Messe and Wolff, 2019; Rabaté and Rochut, 2020). However, other legislation ensured that the ERA of 56 remained in place for certain groups of civil servants for at least cohort born until 1960 (Légifrance, 2012). Since individuals born in 1960 will become 55 years by the end of the observation window in 2015, we use 56 years as the ERA for all birth cohorts.

- Germany:

  - **NRA:** Under the regular old-age pension (Regelaltersrente) the following NRA applies: for individuals born before 1947 the NRA is 65 years; for individuals born between 1947 - 1957 the NRA follows the formula y months $+ 65$ years, where y is

the number of years a person was born after 1956; for individuals born in 1958 the NRA is 66 years; for individuals born between 1959 - 1963 the NRA follows the formula $2 \times y$ months $+ 66$ years, where y is the number of years a person was born after 1956; for individuals born after 1963 the NRA is 67 years.

- **ERA:** There are several tracks that enable individuals to retire earlier than the above NRA, see Gateway to Global Aging Data (2024e) and the online appendix of Seibold (2021) for details. One such track that applies to a fraction of the workforce is the track for particularly long-term insured individuals (Altersrente für besonders langjährig Versicherte, requiring 45 years of contributions). The ERA for this track is 63 years for individuals born before 1953, then increases by two months per year for individuals born in 1953-1963 and is 65 years for individuals born after 1963 (Gateway to Global Aging Data, 2024e).

  However, in Germany, a large portion of the ERA for men is realized by the unemployment pathway (Altersrente wegen Arbeitslosigkeit oder nach Altersteilzeitarbeit). For example, Seibold (2021) shows that, for the 1941 cohort this pathway made up 20% of their sample. This is also corroborated by Berkel and Börsch-Supan (2004) and Mazzonna and Peracchi (2017) who note the ease of access to unemployment benefits in years leading up to the ERA incentivizing early labor market exits. We follow the scheme detailed in both Seibold (2021) and Table 10 of Gateway to Global Aging Data (2024e): for individuals born before 1946 the ERA is 60 years, for individuals born between January 1946 - November 1948 the ERA increases by one month for each month of birth, for individuals born between December 1948 - December 1951 the ERA is 63 years, for individuals born after 1952 the program no longer applies. Hence, for the latter cohorts the ERA is 63 years in line with the ERA for particularly long-term insured individuals (see above).

  For women, the ERA was set at age 60 years until a 1999 pension reform abolished the early retirement program, so that the ERA was raised for women born after 1951 to 63 (Geyer and Welteke, 2021; Seibold, 2021).

- Italy:

  - **NRA:** There have been several policies reforms affecting the NRA in Italy. For men the following scheme applies: for individuals born before 1934 the NRA is 60 years; for individuals born in 1934 the NRA is 61 years; for individuals born in 1935 the NRA is 62 years; for individuals born in 1936 the NRA is 63 years; for individuals born in 1937 the NRA is 64 years; for individuals born in 1938 -

1945 the NRA is 65 years; for individuals born in 1946 the NRA is 66 years; for individuals born in January 1947 - September 1949 the NRA is 66 years and 3 months; for individuals born in October 1949 - May 1952 the NRA is 66 years and 7 months; for individuals born in or after June 1952 the NRA is 67 years (see Tables 2 and 18 of Gateway to Global Aging Data, 2024f).

For women the following scheme applies: for individuals born before 1939 the NRA is 55 years; for individuals born in 1939 the NRA is 56 years; for individuals born in 1940 the NRA is 57 years; for individuals born in 1941 the NRA is 58 years; for individuals born in 1942 the NRA is 59 years; for individuals born in 1943 - 1951 the NRA is 60 years; for individuals born in January - March 1952 the NRA is 63 years and 9 months; for individuals born in April 1952 - May 1953 the NRA is 65 years and 7 months; for individuals born after May 1953 the NRA is 67 years (see Tables 2 and 18 of Gateway to Global Aging Data, 2024f).

– **ERA:** Italy has a long left tail in early retirement because pathways to early retirement open depending on either a high number of contribution years (irrespective of age) or combination of a relatively lower number of contribution years and age requirements. Moreover, differences exists across sectors and occupations (e.g. see Brugiavini and Peracchi 2012) and there are differences in retirement ages between the public and private sector (private sector workers can retire at earlier ages). Since age requirements do exist, we assume they have bite for a significant fraction of the labor force, in line with Mazzonna and Peracchi (2017) and Celidoni et al. (2017). We use 57 years as the ERA for men born before 1951; 58 years for men born in 1951; 59 years for men born in 1952; 60 years for men born in 1953 or later (OECD, 2011; Mazzonna and Peracchi, 2017). Throughout the sample period, women had the possibility to retire at age 57 (if they accrued 35 contribution years; *Opzione Donna*). However, determining the ERA for Italy remains relatively imprecise due to a large number of regulations and non-binding age requirements (i.e., for some individuals the option to retire early only depends on contribution years; OECD, 2011). Therefore, we also provide robustness tests where we drop Italy from the sample.

- The Netherlands

  – **NRA:** The Dutch pension system consists of three pillars. The NRA is set in the first pillar, which is the state pension system. The NRA used to be 65 but began to increase as of 2013. This results in the following scheme of NRAs for both men and women: for individuals born between 1927 - 1947 the NRA is 65

years; for individuals born between January 1948 - November 1948 the NRA is 65 years and 1 month; for individuals born between December 1948 - October 1949 the NRA is 65 years and 2 months; for individuals born between November 1949 - September 1950 the NRA is 65 years and 3 months; for individuals born between October 1950 - June 1951 the NRA is 65 years and 6 months; for individuals born between July 1951 - March 1952 the NRA is 65 years and 9 months; for individuals born between April 1952 - December 1952 the NRA is 66 years; for individuals born between January 1953 - August 1955 the NRA is 66 years and 4 months; for individuals born between September 1955 - May 1956 the NRA is 66 years and 7 months; for individuals born between June 1956 - February 1957 the NRA is 66 years and 10 months; for individuals born between March 1957 - December 1960 the NRA is 67 years; for individuals born between January 1961 - September 1966 the NRA is 67 years and 3 months (see Table 15 of Gateway to Global Aging Data 2024g).

– **ERA:** The Netherlands has never had an official ERA, which makes it generally hard to determine the ERA. However, there have been various pathways to early retirement, mostly through the second pillar of the Dutch system (the second pillar consists of supplementary occupational collective pension schemes, which are mostly sector- and firm-specific; the third pillar consists of individual savings for retirement to supplement the public and sector pensions). The variation in rules across individual pension funds makes it difficult to determine general rules that apply to the Dutch work force. However, early retirement (Vervroegde Uittreding, VUT) at age 60 years (age 61 for those working in the public sector) was introduced in most sectors in the 1970s, which *"[i]n most cases [...] entailed an offer too good to refuse"* because *"[t]he ER benefit usually amounted to 80% of previous earnings without actuarial adjustment for later take-up"* (De Vos et al., 2018). Similarly, Hengel et al. (2021) write that *"[a]s contributions to the sectoral pensions were tax deductible, early retirement was the social norm among Dutch workers before the policy reform."* In 2005 higher taxation requirements were introduced into the early retirement system, effectively making it obsolete for individuals born in or after 1950 (Hengel et al., 2021; Gateway to Global Aging Data, 2024g). Hence, for individuals born in or after 1950 it is difficult to determine the ERA, although data shows a substantial amount of individuals still retire before the NRA and occupational pension funds have their own rules to retire early at lower benefits. We proxy the ERA for individuals born in 1950 or later by using 62 years. This is consistent with (i) the analysis of Lindeboom and Montizaan (2020), that

individuals born in 1950 had to work an additional 13 months to obtain the 70% replacement rate of individuals born in 1949 and (ii) the observation in SHARE data (Figure G.1) that the age-profile in retirement shifts approximately 2 years to the right between SHARE wave 2 and 4 (i.e. years 2006/7 and 2011/12). Because the ERA is imprecisely determined in the Netherlands for cohorts born in 1950 or later, we also provide robustness tests where we drop the Netherlands from the sample.

- Spain:
  - **NRA:** 65 years for both men and women (MISSOC, 2017; Gateway to Global Aging Data, 2024h).
  - **ERA:** Involuntary early retirement (e.g., due to a layoff) is available with the ERA being 60 years if workers started contributions prior to 1967 and 61 years otherwise (Vegas Sánchez et al., 2013; Gateway to Global Aging Data, 2024h). This age further increases from 2013 to reach age 63 by 2027 (see Table 18 in Gateway to Global Aging Data, 2024h). This maps to the following ERAs: for individuals born in or before 1950 the ERA is 60 years (assuming they contributed before 1967); for individuals born in January - June 1951 the ERA is 60 years and 6 months; for individuals born in July 1951 - April 1952 the ERA is 60 years and 8 months; for individuals born in May - November 1952 the ERA is 61 years and 1 month; for individuals born in December 1952 - October 1953 the ERA is 61 years and 2 months; for individuals born in November 1953 - September 1954 the ERA is 61 years and 3 months; for individuals born in October 1954 - August 1955 the ERA is 61 years and 4 months; for individuals born in September 1955 - July 1956 the ERA is 61 years and 5 months; for individuals born in August 1956 - June 1957 the ERA is 61 years and 6 months; for individuals born in July 1957 - April 1958 the ERA is 61 years and 8 months; for individuals born in May 1958 - February 1959 the ERA is 61 years and 10 months; for individuals born in March 1959 - December 1959 the ERA is 62 years; for individuals born in January 1960 - October 1960 the ERA is 62 years and 2 months; for individuals born in November 1960 - August 1961 the ERA is 62 years and 4 months; for individuals born in September 1961 - June 1962 the ERA is 62 years and 6 months; for individuals born in July 1962 - April 1963 the ERA is 62 years and 8 months; for individuals born in May 1963 - February 1964 the ERA is 62 years and 10 months; for individuals born after February 1964 the ERA is 63 years.

- Sweden:
  - **NRA:** 65 years for both men and women.(OECD, 2005, 2007, 2009, 2011, 2013, 2015).
  - **ERA:** Earnings-related pension benefit withdrawal is possible from age 61 in the national pension scheme for both men and women (OECD, 2007, 2009, 2011, 2013, 2015).
- Switzerland:
  - **NRA:** For men the NRA is 65 years. For women the NRA is 62 years for cohorts born in 1938 or before, 63 years for cohorts born between 1939 and 1941, and 64 for cohorts born in 1942 or later (Lalive and Staubli, 2015; OECD, 2005, 2007, 2009, 2011, 2013, 2015).
  - **ERA:** For men born in 1936 or before the ERA is 64 years, for men born thereafter the ERA is 63 years. For women the ERA is 62 years (Celidoni et al., 2017; OECD, 2005, 2007, 2009, 2011, 2013, 2015).

C Disabled men, women, and the social norm of work

Disabled men: Disabled individuals have the worst average mental well-being scores of all labor-market groups: among men aged 50-70 we observe a depression prevalence of 39% compared to 24% among the unemployed (Appendix Table F.2). Appendix Figure C.1 shows that average mental well-being of disabled men improves substantially in the raw data between ages 50-70, although a larger gap remains with the employed at ages 65-70.

Appendix Figure C.2 and Appendix Table C.1 provide event-study and single point estimates from estimating the ETWFE models in equations 2 and 3 for disabled men. In line with our expectation, we do not find that mental well-being of the disabled improves after they reach the ERA. Instead, we find that their mental well-being worsens when we consider the depression margin, although estimates are not consistently significant when we consider the point estimates.

Women: We repeat our analysis for women and highlight three main points that support our expectation that the social norm of work does not substantially improve well-being of women in the second half of working life.

First, the raw data does not show a similar pattern of strongly converging mental well-being between ages 50-70 for unemployed versus employed / retired women. Appendix Figure

C.3 is the equivalent of Figure 1 for women, plotting average mental well-being scores for unemployed women and employed / retired women by age. The mental well-being gap between unemployed and employed / retired individuals is much smaller for women than for men in their early 50s. Moreover, compared to men, mental well-being improvements with age are approximately three times smaller for unemployed / disabled women so there is less mental well-being convergence.[11]

Second, we replicate the ETWFE analysis for women. Appendix Figure C.4 presents event-study analyses for women. Panel (a) shows that, just as for men, retirement increases significantly after the ERA. However, panel (b) shows that unemployed women (based on their income sources) do not self-report retirement after the ERA. Panels (c) and (d) show that both when using the depression indicator and the EURO-D score there is a significant pre-trend of improving mental well-being for unemployed women. Post-treatment estimates are generally insignificant and have a positive sign, opposite of the direction for unemployed men. Also, the point estimates for unemployed women in columns 1 and 2 in panel A of Appendix Table C.2 have the opposite sign of the estimates for men and do not reach conventional levels of statistics significance. Overall, results for unemployed women are very different from the results for men. The significant pre-trend and the insignificant point estimates prevent us from giving any meaningful interpretation to these estimates.

Third, a concern with directly replicating our analysis of men for women is that we cannot distinguish between homemakers – a prevalent social category among women but not men[12] – and unemployed individuals. We define individuals as unemployed if they had no retirement income, no public disability income and worked less than 10 hours per week (section 2.1). As a result, the group of women that we define as unemployed in fact may also consists of women who are homemakers, for whom different norms may apply. To address this concern, we also provide estimates where we remove women who self-report to be homemakers from the sample. Removing homemakers in panels (e) and (f) of Appendix Figure C.4 yields event-study estimates for which we no longer find a significant pre-trend. However, the estimates for post-treatment periods also generally remain positive and are all insignificantly different from zero. Similarly, point estimates for unemployed women without homemakers, reported in panel B of Appendix Table C.2, are positive, small, and insignificant.

In sum, we do not find evidence of improving mental well-being due to a relaxation of work norms for unemployed women. Given the low labor-force participation of women, this is consistent with our social norm of work hypothesis, whereby the social expectation to

[11] Average EURO-D scores among employed / retired women are lower than among employed / retired men, consistent with overall worse mental health outcomes for women (Kessler and Bromet, 2013).

[12] This largely affects the analyses of women: while only 0.3% of men report being homemakers (Table F.3), 19.3% of all women and 63.6% of unemployed women do (Table F.4).

work operates through norm-setting behavior of relevant others of the same gender. It is also consistent with previous literature that finds significant correlations between other social norm of work measures and mental well-being for men, but generally not for women (Clark, 2003; Clark et al., 2010; Gathergood, 2013; Hetschko et al., 2014).

(a) *Depression: (1) employed and retired vs. (2) disabled*

(b) *EURO-D: (1) employed and retired vs. (2) disabled*

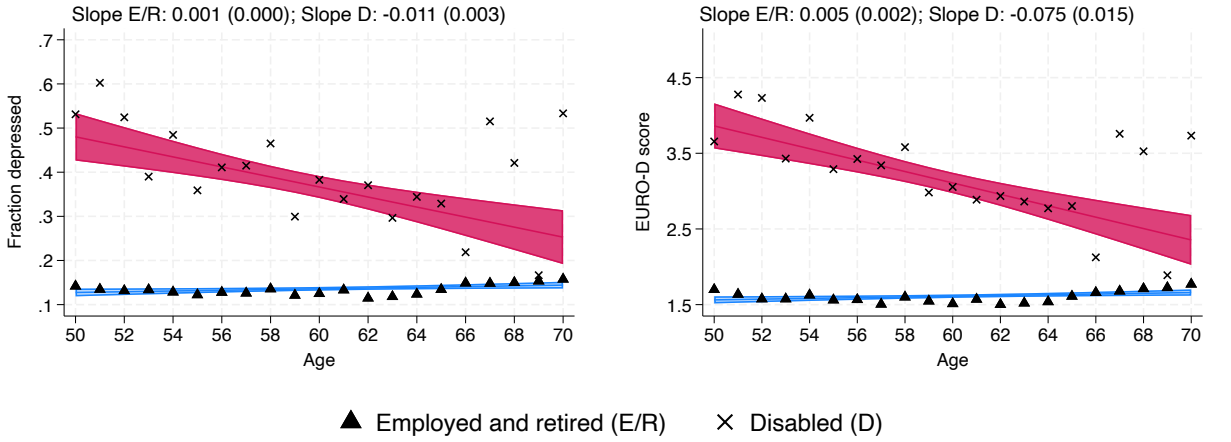

Figure C.1: *Mental well-being of disabled men between ages 50-70*

Notes: Mental well-being outcomes for disabled men aged 50-70. Panel (a) uses the depression indicator, and panels (b) uses the EURO-D score as the measure of mental well-being. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). Scatter plots show the unconditional average of the mental well-being outcome for each age bin. Linear fits and their 95 percent confidence intervals are based on a regression of the outcome variable on a linear age function and a set of standard controls in the U-shape literature (e.g., see Blanchflower, 2021): educational attainment, marital status, labor-market status, household income, and wave and country fixed effects. The corresponding estimated linear age coefficients with their standard errors in parentheses are reported above each figure; Slope E/R refers to the coefficient for employed and retired individuals while Slope D refers to the coefficient for unemployed individuals. Standard errors are clustered at the individual level.

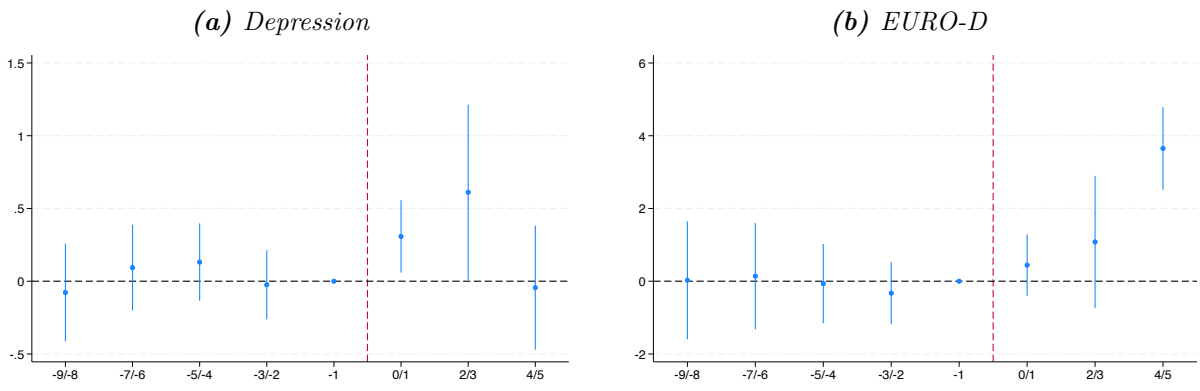

Figure C.2: *Event studies - Disabled men*

Notes: Event-study analyses using the ETWFE estimator from equation 3. Regressions are estimated using only the control group of never-treated individuals. The figures present event-time-specific treatment effects that are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Regressions control for calendar month-of-survey fixed effects. Vertical lines report the 95% confidence interval using standard errors clustered at the group (ERA) level. The panels only use men who are, according to the income-based labor-market status, disabled. While we estimate ATTs using age in years, we present aggregations for two-year bins because the SHARE survey is conducted at approximately two year intervals. We restrict presentation of event-time-specific treatment effects to 9 years before and 5 years after the ERA because of the low number of observations outside that window.

Table C.1: *Estimated effects of reaching the Early Retirement Age (ERA) on the mental well-being of disabled men*

Outcome	(1) Depression	(2) EURO-D	(3) Depression	(4) EURO-D
ERA	0.11	0.23	0.36**	0.62
	(0.080)	(0.36)	(0.14)	(0.45)
Mean Outcome	0.41	3.42	0.41	3.42
Observations	1,274	1,274	1,274	1,274
Control Group	Not-yet	Not-yet	Never	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on mental well-being using disabled men aged 50-62. Columns 1-2 and 3-4 report results from estimating the ETWFE models specified in equations 2 and 3, respectively. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Columns 1 and 3 use the depression indicator as the dependent variable. Columns 2 and 4 use the total EURO-D score as the dependent variable. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

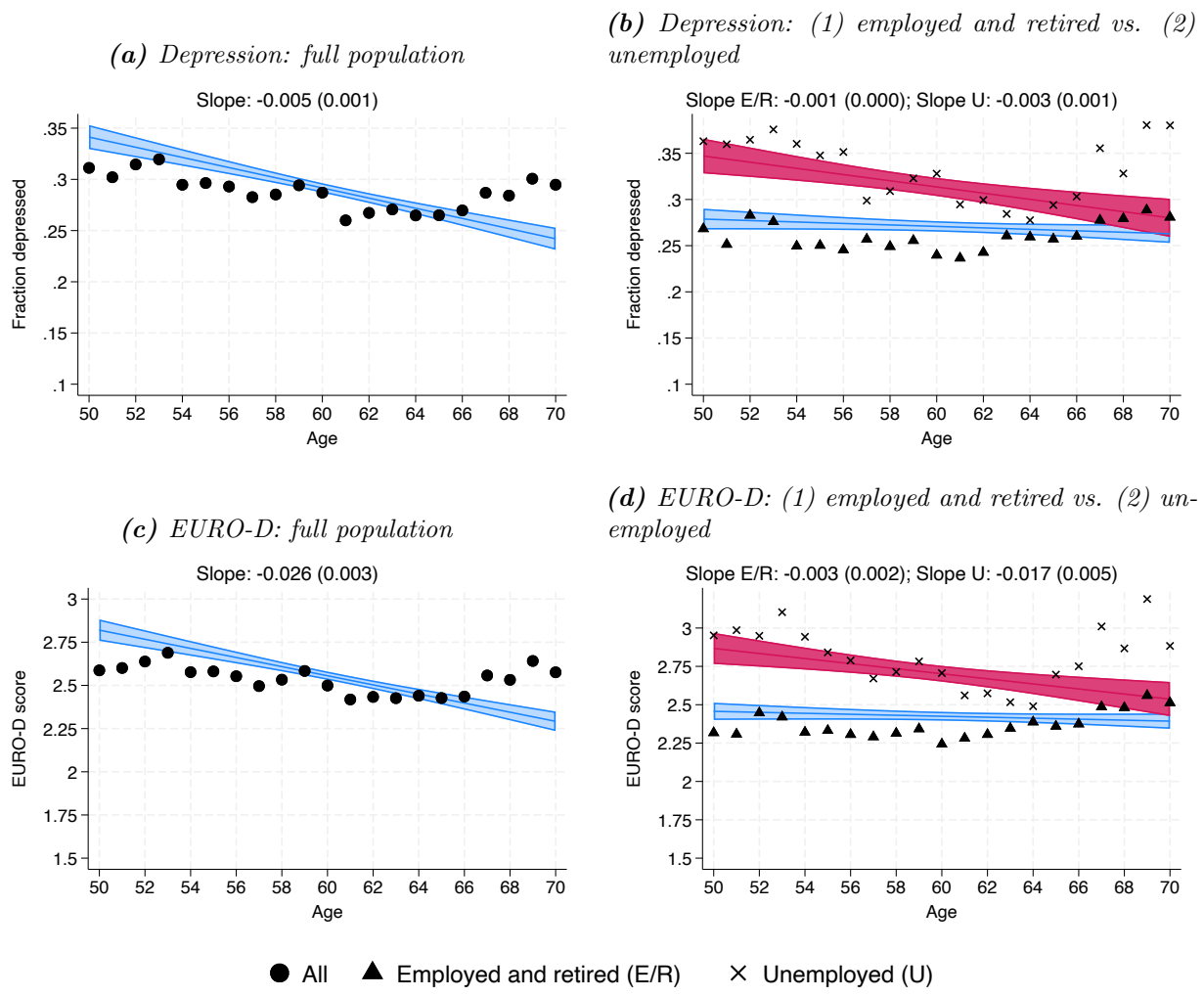

Figure C.3: *Mental well-being of women between ages 50-70*

Notes: Mental well-being outcomes for women aged 50-70. Panels (a) and (b) use the depression indicator, panels (c) and (d) use the EURO-D score as the measure of mental well-being. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). Scatter plots show the unconditional average of the mental well-being outcome for each age bin. Linear fits and their 95 percent confidence intervals are based on a regression of the outcome variable on a linear age function and a set of standard controls in the U-shape literature (e.g., see Blanchflower, 2021): educational attainment, marital status, labor-market status, household income, and wave and country fixed effects. The corresponding estimated linear age coefficients with their standard errors in parentheses are reported above each figure; Slope E/R refers to the coefficient for employed and retired individuals while Slope U refers to the coefficient for unemployed individuals. Standard errors are clustered at the individual level.

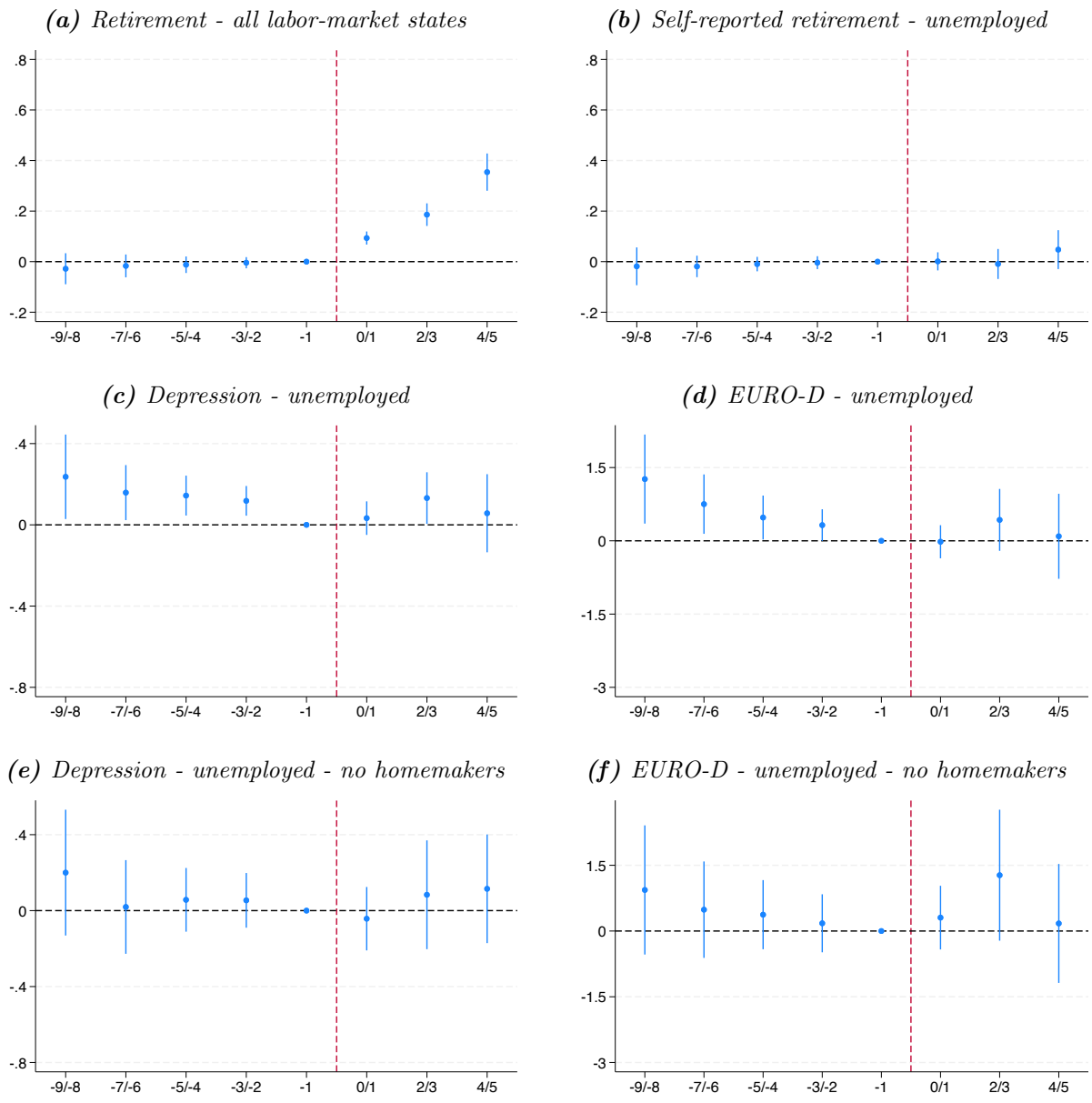

Figure C.4: *Event studies for women*

Notes: Event-study analyses using the ETWFE estimator from equation 3. Regressions are estimated using only the control group of never treated individuals. The figures present event-time-specific treatment effects that are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Regressions control for calendar month-of-survey fixed effects. Vertical lines report the 95% confidence interval using standard errors clustered at the group (ERA) level. Panel (a) uses the full sample, irrespective of labor-market status. In this panel we define retirement as an absorbing state: once an individual is classified as retired, in all subsequent waves we also consider the individual to be retired. Panels (b)-(d) and panels (e)-(f) only use women who are, according to the income-based labor-market status, unemployed and employed, respectively. To avoid that individuals are used in both the subsamples of unemployed and employed women, we use for employed women only those who are employed in all survey waves that they participate in SHARE. While we estimate ATTs using age in years, we present aggregations for two-year bins because the SHARE survey is conducted at approximately two year intervals. We restrict presentation of event-time-specific treatment effects to 9 years before and 5 years after the ERA because of the low number of observations outside that window.

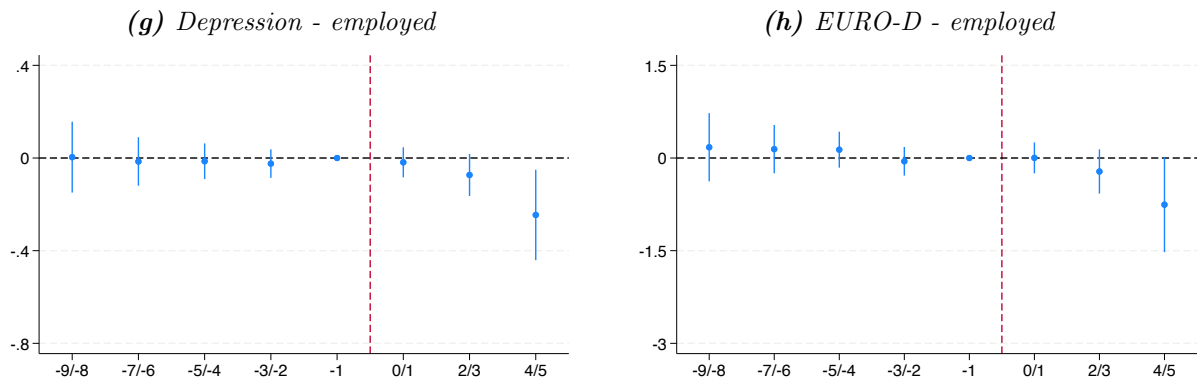

Figure C.4: *Event studies for women (continued)*

Notes: Event-study analyses using the ETWFE estimator from equation 3. Regressions are estimated using only the control group of never treated individuals. The figures present event-time-specific treatment effects that are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Regressions control for calendar month-of-survey fixed effects. Vertical lines report the 95% confidence interval using standard errors clustered at the group (ERA) level. Panel (a) uses the full sample, irrespective of labor-market status. In this panel we define retirement as an absorbing state: once an individual is classified as retired, in all subsequent waves we also consider the individual to be retired. Panels (b)-(d) and panels (e)-(f) only use women who are, according to the income-based labor-market status, unemployed and employed, respectively. To avoid that individuals are used in both the subsamples of unemployed and employed women, we use for employed women only those who are employed in all survey waves that they participate in SHARE. While we estimate ATTs using age in years, we present aggregations for two-year bins because the SHARE survey is conducted at approximately two year intervals. We restrict presentation of event-time-specific treatment effects to 9 years before and 5 years after the ERA because of the low number of observations outside that window.

Table C.2: *Estimated effects of reaching the Early Retirement Age (ERA) on the mental well-being of women*

Outcome Sample	(1) Depression Unemployed	(2) EURO-D Unemployed	(3) Depression Employed	(4) EURO-D Employed	(5) Depression Triple-diff (1)-(3)	(6) EURO-D Triple-diff (2)-(4)
Panel A: Women						
ERA	0.064	0.11	-0.047	-0.10	0.13	0.21
	(0.045)	(0.20)	(0.032)	(0.12)	(0.061)	(0.26)
Mean Outcome	0.34	2.82	0.23	2.17	0.27	2.44
Observations	8,339	8,339	11,256	11,256	19,595	19,595
Panel B: Women without homemakers						
ERA	-0.0071	0.49	-0.047	-0.11	0.068	0.55
	(0.086)	(0.40)	(0.032)	(0.13)	(0.090)	(0.41)
Mean Outcome	0.39	3.16	0.23	2.17	0.26	2.39
Observations	3,134	3,134	11,195	11,195	14,329	14,329
Control Group	Never	Never	Never	Never	Never	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on mental well-being using women aged 50-62. All columns report results from estimating the ETWFE model specified in equation 3. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Panel A uses the labor-market status definitions as detailed in section 2.1. Panel B removes women who self-report to be homemakers. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table C.3). To avoid that individuals are used in both the subsamples of unemployed and employed women, we use for employed women only those who are employed in all survey waves that they participate in SHARE. Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

Table C.3: *Number of observations for women by country and early retirement age in years.*

	Early Retirement Age (ERA)								
Country	55	56	57	60	61	62	63	64	Total
Austria	299	0	0	0	0	0	0	0	299
Belgium	0	0	0	607	114	143	742	0	1,606
Denmark	0	0	0	93	21	32	51	54	251
France	0	602	0	0	0	0	0	0	602
Germany	0	0	0	285	0	0	624	0	909
Italy	0	0	1,261	0	0	0	0	0	1,261
Netherlands	0	0	0	303	0	673	0	0	976
Spain	0	0	0	315	834	486	85	0	1,720
Sweden	0	0	0	0	138	0	0	0	138
Switzerland	0	0	0	0	0	577	0	0	577
Total	299	602	1,261	1,603	1,107	1,911	1,502	54	8,339

Notes: Cross-tabulation of the number of observations for unemployed women aged 50-62 by country and Early Retirement Age (ERA). The number of observations corresponds to the sample used in the main regression analysis, as in columns 1-3 of Table C.2.

D Competing interpretations

Benefit-generosity: Social security programs (e.g., regarding unemployment benefits, social assistance, disability insurance, etc.) vary in their generosity and stringency across countries and over time. In theory, the generosity or stringency of benefit programs could also be related to an individual's age. If programs become more generous at or after the ERA, the strong mental well-being improvements that we uncover in post-ERA periods may be driven by more generous social security programs instead of a relaxation of the social norm of work. For example, it could be the case that some treatment groups g receive more generous unemployment benefits in post-treatment periods. The additional income they obtain may have a direct and positive effect on their mental well-being.

We investigate this concern using data from SHARE respondents on income from government transfers other than public pensions and disability insurance (the unemployed do not receive public pensions or disability insurance by definition, see section 2.1). In particular, we use information on the after-tax value of income from government transfers received in the previous year that relate to public unemployment benefit or insurance, public social assistance, or public sickness benefits.

An event-study analysis of government transfers – at both the extensive and intensive margins – does not provide support for a benefit-generosity interpretation of our main results.

Panel (a) of Figure D.1 analyzes whether unemployed men received any government transfers (i.e., the extensive margin). None of the estimates are significantly different from zero, both in the pre- and post-treatment periods. If anything, post-treatment estimates point to a somewhat lower fraction of men who receive other government transfers after the ERA. Next, panel (b) of Figure D.1 investigates the intensive margin of other government transfers using the after-tax value expressed in 2010 Euros. For this analysis we remove one extreme outlier from the sample, who reports to have government transfers of 999,999 Euros.[13] Again, none of the estimated event-time-specific treatment effects significantly differ from zero. Panel (c) repeats the same analysis but removes individuals who report very large government transfers by only using the bottom 99 percent of government transfers (i.e. below the 99th percentile of 97,391.30 Euros). This reduces the standard errors of the estimated event-time-specific treatment effects but results generally remain the same as in panel (b). In particular, there is no indication of increasing government transfers in the post-treatment periods.

Table D.1 provides the corresponding point estimates. First, both column 1 (using not-yet treated controls) and column 2 (using never-treated controls) show that we do not find evidence for a larger fraction of unemployed men to receive other government transfers after they pass the ERA. We also do not find an increase in the intensive margin in columns 3 and 4, which use the full sample except the outlier with government transfers of 999,999 Euros. Similarly, we do not find this when we consider the bottom 99 percent of government transfers in columns 5 and 6.

In sum, based on the evidence we can provide, we do not expect that increasing generosity in social security benefits at the ERA provides a likely alternative interpretation of our results.

Income-security: Reaching the normal retirement age generally implies that individuals start receiving a secure old-age pension. Therefore, a concern may be that our ETWFE estimates of passing the ERA in fact (also) pick up a positive mental well-being effect of income security for unemployed individuals: as an unemployed individual passes the ERA he gets closer to the normal retirement age and thus closer to a secure and stable income stream from pension payments. This could in particular play a role in financially vulnerable households. Poorer households are more often subject to economic shocks and have more difficulty cushioning the impact of such shocks than richer households (who are more financially secure due to higher savings and other sources of wealth).

We investigate this concern using a heterogeneity analysis of household wealth. Within

[13]This value is probably a coding mistake in the harmonized SHARE data set. However, for completeness we note that including this observation does not qualitatively change the results but makes standard errors much larger.

each country, we split the sample of unemployed men into above and below median wealth subsamples based on total non-housing wealth at the household level observed in the initial survey wave that a respondent participates in SHARE. Panel A of Table D.2 provides point estimates based that result from aggregating the ATTs from estimating equations 2 and 3 for above median wealth individuals. Panel B provides the same for below median wealth individuals.

The results for unemployed men in columns 1-4 of Table D.2 do not indicate that our estimates are driven by low-income unemployed men. Overall, the point estimates between Panels A and B are similar in magnitude, and while precision is reduced because of the lower sample size, the confidence intervals of the point estimates overlap. Focusing on the depression score in our preferred specification of column 3 we find estimates of 0.24 and 0.25 for above and below median wealth individuals, respectively. These estimates are almost identical to each other and to the main result in Table 3. We would not expect this is income security played an important role in explaining our results.

Columns 5 and 6 report results for employed men, whom we also split into above and below median wealth groups. If income security improves mental well-being, this should also be true for low-wealth employed individuals. However we find that estimates for below median wealth employed individuals remain small, positive, and insignificant.

Finally, we note that if income security drives the main estimates, we would not necessarily expect the timing of the mental health improvement to be related to the ERA. Instead, it would be reasonable that mental health improvements were gradual as individuals approach the normal retirement age, but unrelated to the ERA. Hence, our finding that mental well-being for unemployed men improves precisely at the ERA – coinciding with the uptake in retirement – as reported in Figure 2 is more consistent with a social norm of work interpretation. Thus, taking stock of the results we conclude that income security does not provide a likely alternative interpretation of our main findings.

Leisure-coordination: With more peers in age in retirement after the ERA, it may be easier to coordinate leisure activities for unemployed men, increasing the utility of free time. In general, people report higher levels of positive affect when interacting with others and on weekends and holidays (Kahneman et al., 2004b,a; Helliwell and Wang, 2014). Young and Lim (2014) argue that time is a network good, as its value depends on an individual's ability to coordinate time with others. They find that *"[t]he unemployed look forward to weekends much the same as workers"* and do not gain as much from their free time during the workweek.

Leisure-coordination may pose a threat to the interpretation of our results as a social

norm of work effect. To the extent that better leisure time coordination is the same for the unemployed and employed, it is differenced out in the triple difference-in-differences estimation in column 5 of Table 3. However, the unemployed generally have more free time than employed individuals. Hence, the unemployed may benefit more from leisure time coordination.

We test this leisure channel using data on social activities from SHARE. In waves 1 and 2 of the survey, individuals were asked about a range of social activities and the frequency they engage in them. The harmonized SHARE data includes an indicator that is set to one if the individual indicates participating either "daily" or "almost every week" in one of the following social activities: (1) voluntary and charity work, (2) caring for a sick and disabled adult, (3) provided help to family, friends or neighbors, (4) attended an educational or training course, (5) gone to a sport, social or other kind of club, (6) taken part in a religious organization (church, synagogue, mosque, etc.), (7) taken part in a political or community-related organization. In waves 4-5 of the harmonized SHARE data includes an indicator that is set to one if individuals participated in any social activities in the past 12 months. Social activities include: (1) done voluntary or charity work, (2) attended an educational or training course, (3) gone to sport, social or other kind of club, (4) taken part in activities of a religious organization (church, synagogue, mosque, etc.) (5) taken part in a political or community-related organization. In wave 6 the same question was asked but the response about participation in religious activities or organizations (option 4) was no longer collected. Although the information collected from respondents varies over the survey waves, we combine the variables on social activities to create a single indicator on participation in social activities as a best possible approach to include social activities in our longitudinal analysis.

We use the indicator on participation in social activities as our outcome and estimate equations 2 and 3. If our baseline estimate were driven by a leisure-coordination channel, we would expect to see a significant increase in participation in social activities among the unemployed in the post-treatment periods. Figure D.2 shows the event-study analysis for unemployed men. None of the coefficients are significantly different from zero. This indicates that compared to the control group of never-treated individuals, we do not find a significant difference in participation in social activities in both in pre- and post-treatment periods among unemployed men that reach the ERA. Similarly, the point estimates for unemployed men reported in columns 1 and 2 of Table D.3 show small and insignificant coefficients. Moreover, the sign is negative, indicating less involvement in social activities, which is the opposite of what we would expect if our main results could be explained by leisure coordination.

Overall, these results do not support the notion that the mental well-being improvements

for unemployed men uncovered in our baseline analysis are driven by better coordination of leisure activities.

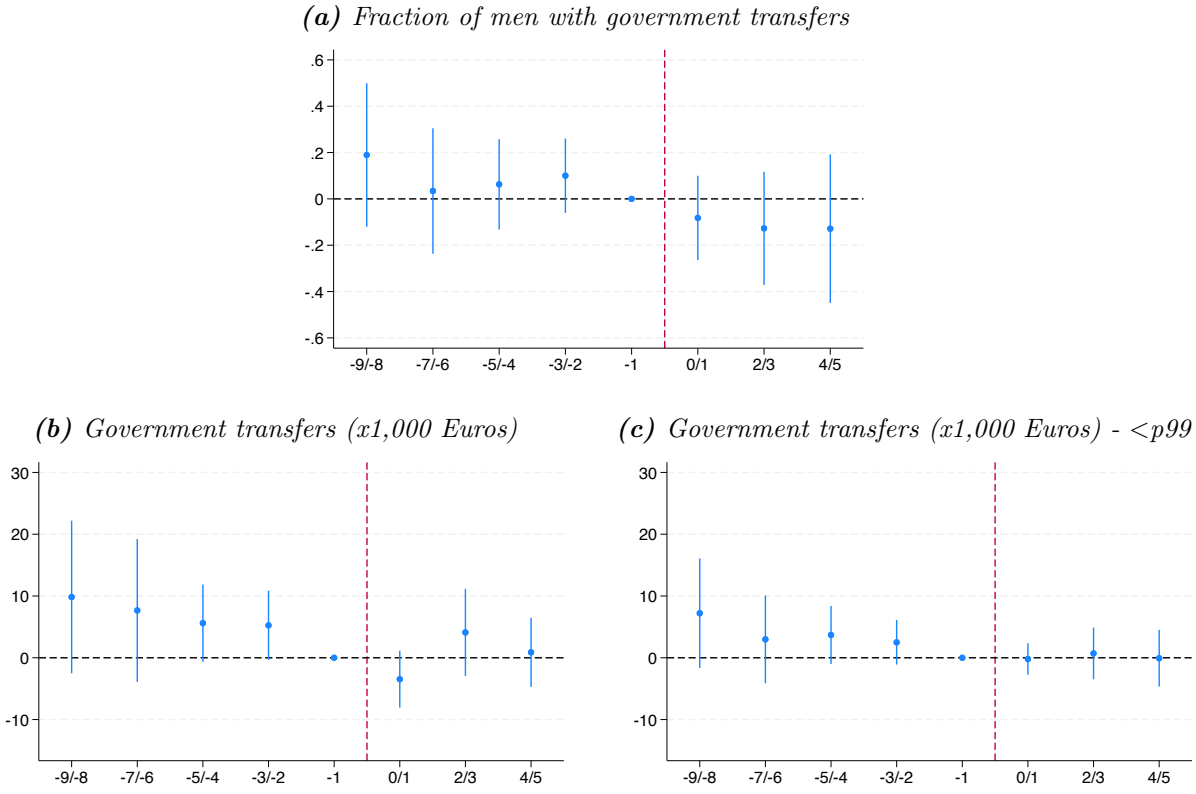

Figure D.1: *Event studies for government transfers of unemployed men*

Notes: Event-study analyses using the ETWFE estimator from equation 3. Regressions are estimated using only the control group of never treated individuals. The figures present event-time-specific treatment effects that are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Regressions control for calendar month-of-survey fixed effects. Vertical lines report the 95% confidence interval using standard errors clustered at the group (ERA) level. The figure only uses men who are, according to the income-based labor-market status, unemployed. While we estimate ATTs using age in years, we present aggregations for two-year bins because the SHARE survey is conducted at approximately two year intervals. We restrict presentation of event-time-specific treatment effects to 9 years before and 5 years after the ERA because of the low number of observations outside that window.

Table D.1: *Estimated effects of reaching the Early Retirement Age (ERA) on government transfers of unemployed men*

	(1)	(2)	(3)	(4)	(5)	(6)
Margin	Extensive	Extensive	Intensive	Intensive	Intensive	Intensive
Sample	All	All	All	All	<p99	<p99
ERA	-0.046	-0.093	-1825.8	-1093.7	1471.4	94.5
	(0.062)	(0.085)	(2083.2)	(2099.8)	(1271.1)	(1357.5)
Mean Outcome	0.41	0.41	5232.0	5232.0	3973.8	3973.8
Observations	2,998	2,998	2,997	2,997	2,965	2,965
Control Group	Not-yet	Never	Not-yet	Never	Not-yet	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on government transfers for unemployed men aged 50-62. Columns 1, 3, and 5 report results from estimating the ETWFE model specified in equations 2. Columns 2, 4, and 6 report results from estimating the ETWFE model specified in equations 3. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Columns 1-2 use an indicator variable for receiving any government transfers other than public pensions or disability insurance as the dependent variable. Columns 3-6 use the after-tax value of government transfers in 2010 Euros as the dependent variable. Columns 3-4 remove an outlier who reports government transfers of 999,999 Euros. Columns 5-6 use the bottom 99 percent of the distribution of government transfers. The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

Table D.2: *Heterogeneity analysis of the effects of reaching the Early Retirement Age (ERA) on the mental well-being of men*

Outcome	(1) Depression Unemployed	(2) EURO-D Unemployed	(3) Depression Unemployed	(4) EURO-D Unemployed	(5) Depression Employed	(6) EURO-D Employed
Panel A: above median wealth						
ERA	-0.20***	-0.49	-0.24**	-0.64	0.054	0.28
	(0.072)	(0.32)	(0.094)	(0.49)	(0.034)	(0.17)
Mean Outcome	0.21	2.04	0.21	2.04	0.10	1.40
Observations	1,393	1,393	1,393	1,393	5,630	5,630
Panel B: below median wealth						
ERA	-0.12*	-0.86***	-0.25**	-0.75	0.041	0.18
	(0.064)	(0.33)	(0.098)	(0.52)	(0.037)	(0.18)
Mean Outcome	0.32	2.71	0.32	2.71	0.12	1.53
Observations	1,605	1,605	1,605	1,605	5,701	5,701
Control Group	Not-yet	Not-yet	Never	Never	Never	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on mental well-being using men aged 50-62. Columns 1-2 and columns 3-6 report results from estimating the ETWFE models specified in equations 2 and 3, respectively. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Panels A and B use men above and below median wealth men, respectively. The wealth split is made at the country level and based on total non-housing wealth at the household level observed in the initial survey wave that a respondent participates in SHARE. Columns 1, 3, and 5 use the depression indicator as the dependent variable. Columns 2, 4, and 6 use the total EURO-D score as the dependent variable. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). To avoid that individuals are used in both the subsamples of unemployed and employed men, we use for employed men only those who are employed in all survey waves that they participate in SHARE. Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

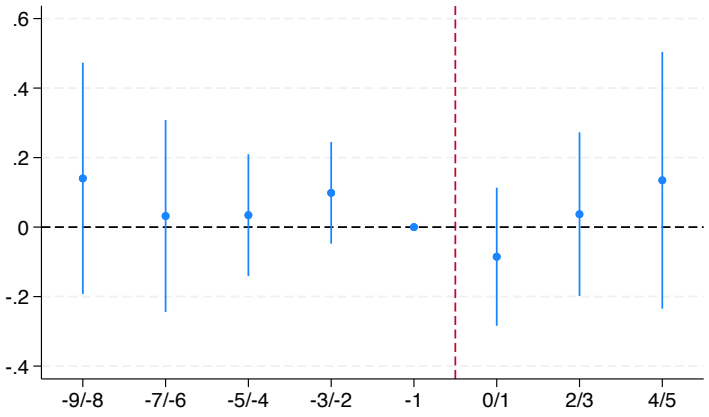

Figure D.2: *Event study of participation in social activities by unemployed men*

Notes: Event-study analysis using the ETWFE estimator from equation 3. The regression is estimated using only the control group of never treated individuals. The figure presents event-time-specific treatment effects that are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. The regression controls for calendar month-of-survey fixed effects. Vertical lines report the 95% confidence interval using standard errors clustered at the group (ERA) level. The figure only use men who are, according to the income-based labor-market status, unemployed. While we estimate ATTs using age in years, we present aggregations for two-year bins because the SHARE survey is conducted at approximately two year intervals. We restrict presentation of event-time-specific treatment effects to 9 years before and 5 years after the ERA because of the low number of observations outside that window.

Table D.3: *Estimated effects of reaching the Early Retirement Age (ERA) on participation in social activities by unemployed men*

Sample	(1) Unemployed	(2) Unemployed
ERA	-0.038	-0.040
	(0.072)	(0.088)
Mean Outcome	0.38	0.38
Observations	2,998	2,998
Control Group	Not-yet	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on participation in social activities by unemployed men aged 50-62. Columns 1 and report results from estimating the ETWFE models specified in equations 2 and 3, respectively. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

E Robustness

Appendix Table E.1 provides results from several robustness test. Columns 1 and 2 provide estimates for unemployed men using the control group of not-yet treated individuals and the depression indicator and EURO-D score as outcomes, respectively. Columns 3 and 4 do the same but only use the never treated group as controls. Columns 5 and 6 provide similar estimates for employed men. The panels provide results from different robustness tests.

First, Panel A provides standard errors clustered at the country level (bottom line in square brackets) in addition to the standard errors clustered at of the group g level from our main specification (top line in round brackets, identical to Table 3). While clustering at the group level is conservative, we would not necessarily expect observations from individuals with the same ERA from different countries to be correlated so that clustering at the country level seems appropriate. This results in much smaller standard errors, substantially increasing the precision of the estimates so that all coefficients become significant at the 1% level.

Second, Panel B omits the Netherlands and Italy from the sample because they have less precisely determined ERAs (see Appendix B). ERAs in these two countries to a larger extent depend on the sector of work or occupation. All estimates remain highly similar to our main results.

Third, in panel C we investigate the sensitivity of our baseline result to sample restrictions related to individuals with an undefined *other* labor market status category (see section 2.1), who are not included in the main analysis. We assign individuals classified as other to a specific labor-market state as follows. First, if we observe positive retirement income, the individual is classified as retired. Next, if we observe positive disability insurance income for the remaining individuals, we classify them as disabled. Finally, all remaining individuals are defined as unemployed. This increases our sample of unemployed men but results in columns 1-4 remain effectively the same as in our baseline analysis.

Fourth, we test the sensitivity of the EURO-D cut-off score for depression. Instead of a cut-off of 4 we use 3 and 5 as the EURO-D cut-off score. We find coefficient estimates of 0.26 ($S.E = 0.094; p\text{-}value = 0.005$) and 0.14 ($S.E = 0.061; p\text{-}value = 0.016$), respectively (comparable to column 3 in Table 3).

Finally, we conduct a falsification test to demonstrate the statistical power of our inferences. We randomly assign the ERA to each individual in the sample, keeping the distribution of the ERAs within the pseudo-sample equal to the distribution in the actual sample. We repeat this 1,000 times to obtain 1,000 pseudo-samples. Appendix Figure E.1 gives the resulting distribution of t-statistics for the estimated social norm of work effect from 1,000 estimated pseudo-treatment effects (equivalent to column 3 in Table 3). As expected (random

assignment), we find the distribution to be centered around zero both when using the depression indicator and the EURO-D score as outcomes. Using the depression indicator as the outcome, we find that only 2.3% of the pseudo-treatments have a t-statistic that exceeds the absolute value of our baseline estimate of the t-statistic, indicated by the vertical red line in panel A of Appendix Figure E.1. Using the total EURO-D score, this is only the case in 0.6% of the pseudo-treatments (panel B of Appendix Figure E.1). Thus, if the ERA had no meaning as a treatment onset, only in 2.3% or 0.6% of cases our baseline result could have been attributed to "luck".

Table E.1: *Robustness tests*

Outcome	(1) Depression Unemployed	(2) EURO-D Unemployed	(3) Depression Unemployed	(4) EURO-D Unemployed	(5) Depression Employed	(6) EURO-D Employed
Panel A: Standard errors clustered at the group versus country level						
ERA	-0.15	-0.66	-0.23	-0.73	0.043	0.19
	(0.052)***	(0.25)***	(0.071)***	(0.35)**	(0.025)*	(0.12)
	[0.027]***	[0.11]***	[0.046]***	[0.12]***	[0.012]***	[0.012]***
Mean Outcome	0.27	2.40	0.27	2.40	0.11	1.46
Observations	2,998	2,998	2,998	2,998	11,331	11,331
Panel B: Drop NL and IT						
ERA	-0.17***	-0.59**	-0.27***	-0.79**	0.044*	0.22*
	(0.053)	(0.26)	(0.076)	(0.38)	(0.027)	(0.13)
Mean Outcome	0.26	2.38	0.26	2.38	0.11	1.47
Observations	2,523	2,523	2,523	2,523	9,461	9,461
Panel C: Assign individuals with labor-market state "other"						
ERA	-0.14***	-0.68***	-0.19***	-0.55*	0.043*	0.19
	(0.043)	(0.20)	(0.055)	(0.28)	(0.025)	(0.12)
Mean Outcome	0.22	2.12	0.22	2.12	0.11	1.46
Observations	4,262	4,262	4,262	4,262	11,331	11,331
Control Group	Not-yet	Not-yet	Never	Never	Never	Never

Notes: Regression estimates for the effect of reaching the Early Retirement Age (ERA) on mental well-being using men aged 50-62. Columns 1-2 and columns 3-6 report results from estimating the ETWFE models specified in equations 2 and 3, respectively. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. Panel A provides standard errors clustered at the country level (bottom line in square brackets) in addition to the standard errors clustered at of the group g level (top line in round brackets, as in Table 3). Panel B drops Italy and the Netherlands from the sample. Panel C assign individuals with labor-market status classified as "other" (see section 2.1 to retirement, disability or unemployment. The control group of not-yet treated individuals consists of all individuals who have not yet reached the ERA. The control group of never treated individuals is a subset of the set of not-yet treated individuals and defined as individuals whose ERA is 63 or 64 years (see Table 1). To avoid that individuals are used in both the subsamples of unemployed and employed men, we use for employed men only those who are employed in all survey waves that they participate in SHARE. Regressions control for calendar month-of-survey fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the group (ERA) level.

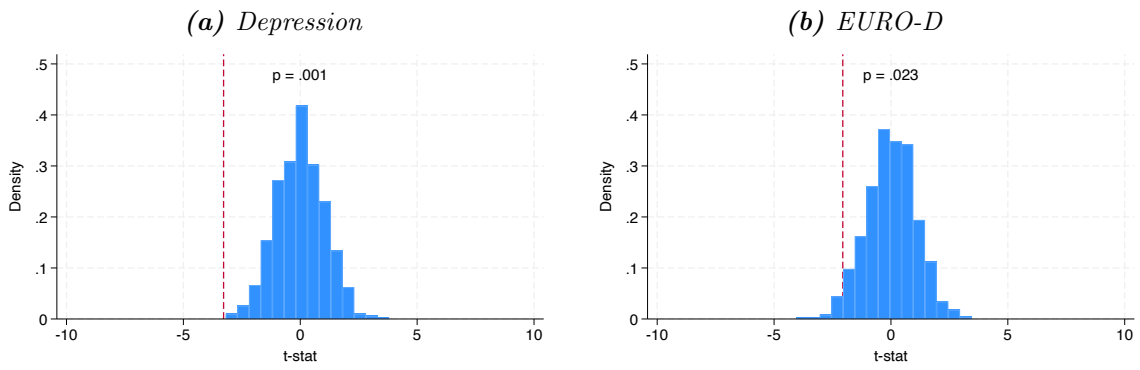

Figure E.1: *Falsification tests*

Notes: Distribution of-statistics of 1,000 pseudo-treatments where we randomly assign the ERA to each individual in the sample, keeping the distribution of ERAs within the pseudo-sample equal to the distribution in the actual sample. Estimations use the ETWFE model specified in equations 3, as in column 3 of Table 1. Point estimates are obtained from aggregating the estimated ATTs of the ETWFE estimator as detailed in section 4.1. The red lines correspond to the t-statistic from the main estimation of actual treatment in column 3 of Table 1. The p-values report the fraction of pseudo-treatment t-statistics that is in absolute value larger than the t-statistic from our main estimate.

F Appendix Tables

Table F.1: *Estimated linear age coefficients for mental well-being of men between ages 50-70*

	Austria	Belgium	Denmark	France	Germany	Italy	Netherlands	Spain	Sweden	Switzerland
Panel A: Depression										
Employed/Retired × Age	0.0016	0.00043	-0.0017	-0.0011	0.00066	0.0044***	0.0013	0.0055***	-0.0015	-0.0029**
	(0.0011)	(0.0010)	(0.0011)	(0.0013)	(0.00098)	(0.0013)	(0.0012)	(0.0011)	(0.0012)	(0.0014)
Unemployed × Age	-0.020***	-0.013***	-0.0079	-0.014***	-0.0057	-0.0052	-0.015**	-0.0069**	-0.011*	-0.014
	(0.0065)	(0.0040)	(0.0067)	(0.0049)	(0.0042)	(0.0036)	(0.0061)	(0.0028)	(0.0061)	(0.0089)
Unemployed	1.37***	0.87***	0.48	0.83***	0.45*	0.71***	1.03***	0.80***	0.60	0.79
	(0.39)	(0.24)	(0.40)	(0.29)	(0.26)	(0.22)	(0.37)	(0.17)	(0.38)	(0.54)
Constant	-0.15*	0.20**	0.22***	0.29***	0.38***	0.017	0.26	-0.15**	0.41	0.081
	(0.084)	(0.095)	(0.080)	(0.081)	(0.12)	(0.079)	(0.17)	(0.074)	(0.30)	(0.096)
Observations	3,484	5,689	3,639	4,871	4,407	4,405	2,929	4,279	2,955	2,494
Panel B: EURO-D score										
Employed/Retired × Age	0.0099	-0.0024	-0.013**	-0.0044	0.0024	0.028***	0.0052	0.037***	-0.0075	-0.010
	(0.0064)	(0.0053)	(0.0060)	(0.0063)	(0.0052)	(0.0069)	(0.0065)	(0.0064)	(0.0068)	(0.0073)
Unemployed × Age	-0.10***	-0.068***	-0.064**	-0.071***	-0.057***	-0.018	-0.083***	-0.038**	-0.044	-0.078**
	(0.033)	(0.022)	(0.032)	(0.025)	(0.022)	(0.018)	(0.031)	(0.016)	(0.034)	(0.039)
Unemployed	7.40***	4.37***	3.58*	4.48***	4.06***	3.51***	5.63***	4.90***	2.52	4.67**
	(1.98)	(1.32)	(1.91)	(1.47)	(1.32)	(1.13)	(1.90)	(1.01)	(2.10)	(2.37)
Constant	0.092	2.41***	2.20***	2.42***	2.97***	0.73*	2.56**	-0.23	3.11***	2.05***
	(0.47)	(0.50)	(0.43)	(0.40)	(0.76)	(0.42)	(1.00)	(0.42)	(1.00)	(0.76)
Observations	3,484	5,689	3,639	4,871	4,407	4,405	2,929	4,279	2,955	2,494

Notes: Regression of the outcome variable on linear age functions for the employed/retired and unemployed and a set of standard controls in the U-shape literature (e.g., see Blanchflower, 2021): educational attainment, marital status, labor-market status, household income, and wave and country fixed effects. Panel A uses the depression indicator as the dependent variable. Panel B uses the total EURO-D score as the dependent variable. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the individual level.

Table F.2: *Summary statistics by labor-market status for men aged 50-70*

	Retired	Employed	Unemployed	Disabled	Other
Outcome					
Depression (EURO-D≥4)	0.15	0.11	0.24	0.39	0.13
EURO-D	1.72	1.49	2.26	3.23	1.55
	[1.89]	[1.66]	[2.27]	[2.59]	[1.71]
Characteristics					
Age	65.2	56.4	58.7	59.0	60.6
	[3.74]	[3.93]	[4.65]	[4.49]	[5.53]
Hh income (EUR)	36,771	44,592	22,092	26,252	39,512
	[87,133]	[35,152]	[31,176]	[33,860]	[51,949]
Activities of daily living (ADL)	0.13	0.034	0.15	0.51	0.064
	[0.55]	[0.24]	[0.58]	[1.09]	[0.35]
Instrumental ADL (IADL)	0.085	0.012	0.093	0.42	0.025
	[0.48]	[0.16]	[0.49]	[1.04]	[0.26]
Education (ISCED-97)					
No	0.036	0.019	0.058	0.062	0.020
Primary	0.19	0.073	0.19	0.22	0.12
Lower secondary	0.16	0.15	0.19	0.24	0.17
Upper secondary	0.34	0.38	0.34	0.33	0.34
Post-secondary	0.032	0.045	0.026	0.018	0.052
First stage tertiary	0.23	0.33	0.19	0.13	0.29
Second stage tertiary	0.0089	0.017	0.0072	0.00048	0.014
Marital Status					
Married	0.81	0.78	0.71	0.60	0.76
Partnered	0.053	0.089	0.075	0.081	0.091
Separated	0.0078	0.0090	0.013	0.015	0.012
Divorced	0.045	0.064	0.081	0.12	0.058
Widowed	0.036	0.0089	0.013	0.021	0.029
Never married	0.048	0.054	0.10	0.16	0.052
Number of observations	20,213	19,281	5,128	2,080	4,783
Share of sample	39.3%	37.4%	10.0%	4.0%	9.3%

Notes: Summary statistics for men aged 50-70 by income-based labor market status (see section 2.1). ADL and IADL refer to two measures of physical health: limitations in activities of daily living (ADL) and in instrumental activities of daily living (IADL). ADLs consist of bathing, dressing, eating, getting in/out of bed and walking across a room. IADLs consist of using the phone, taking medications, managing money, shopping for groceries, and preparing meals. Each survey item is set to 1 if the individual reports to have problems with the (instrumental) activity and 0 otherwise. We sum the scores of the ADL and IADL items. Standard deviations in parentheses.

Table F.3: *Cross-tabulation of the number of observations (N) by self-reported and income-based labor-market status for men between ages 50 - 70*

	Income-based					
Self-reported	Retired	Employed	Unemployed	Disabled	Other	*Total*
Retired	19,248	252	1,412	640	1,263	22,815
(Self-)employed	60	18,745	490	22	3,346	22,663
Unemployed	105	139	2,057	73	44	2,418
Disabled	413	57	594	1,259	79	2,402
Homemaker	28	9	112	8	1	158
Other	359	79	463	78	50	1,029
Total	20,213	19,281	5,128	2,080	4,783	51,485

Notes: Cross-tabulation of the number (N) of men in each self-reported vs. income-based labor-market status cell in the sample of men aged 50-70. Self-reported and income-based labor-market status are defined in section 2.1.

Table F.4: *Cross-tabulation of the number of observations (N) by self-reported and income-based labor-market status for women between ages 50 - 70*

	Income-based					
Self-reported	Retired	Employed	Unemployed	Disabled	Other	*Total*
(Self-)employed	147	18,186	882	21	3,288	22,524
Unemployed	140	132	1,928	59	42	2,301
Retired	18,170	174	1,361	644	759	21,108
Disabled	530	43	678	1,373	54	2,678
Homemaker	1,976	157	9,494	218	44	11,889
Undefined	411	115	583	74	57	1,240
Total	21,374	18,807	14,926	2,389	4,244	61,740

Notes: Cross-tabulation of the number (N) of women in each self-reported vs. income-based labor-market status cell in the sample of women aged 50-70. Self-reported and income-based labor-market status are defined in section 2.1.

Table F.5: *Correlates of mental well-being*

Specification	(1)	(2)
Outcome	Depression	EURO-D
Gender (female=1)	0.111***	0.665***
	(0.00325)	(0.0171)
HH income ('0 000 EUR)	-0.000815	-0.00349
	(0.000514)	(0.00262)
Educational attainment		
Primary	-0.0588***	-0.383***
	(0.0106)	(0.0599)
Lower secondary	-0.0946***	-0.634***
	(0.0105)	(0.0593)
Upper secondary	-0.116***	-0.778***
	(0.0103)	(0.0579)
Post-secondary	-0.110***	-0.777***
	(0.0131)	(0.0705)
First stage tertiary	-0.132***	-0.870***
	(0.0105)	(0.0587)
Second stage tertiary	-0.127***	-0.819***
	(0.0188)	(0.0997)
Marital status		
Partnered	0.0350***	0.220***
	(0.00667)	(0.0342)
Separated	0.0925***	0.612***
	(0.0158)	(0.0888)
Divorced	0.0748***	0.477***
	(0.00637)	(0.0336)
Widowed	0.0975***	0.628***
	(0.00750)	(0.0394)
Never married	0.0493***	0.325***
	(0.00740)	(0.0400)
Labor-market status		
Retired	0.0622***	0.365***
	(0.00493)	(0.0260)
Unemployed	0.0952***	0.585***
	(0.00497)	(0.0260)
Disabled	0.274***	1.701***
	(0.00926)	(0.0495)
Other	0.0277***	0.158***
	(0.00537)	(0.0271)
Constant	0.170***	1.813***
	(0.0144)	(0.0773)
Observations	98,640	98,640
Adjusted R^2	0.073	0.105
Age dummies	Yes	Yes
Country dummies	Yes	Yes
Wave dummies	Yes	Yes

Notes: Regression of the outcome variable on a full set of age dummies and a set of socioeconomic characteristics: gender, household income, educational attainment, marital status, labor-market status, and wave and country fixed effects. Panel A uses the depression indicator as the dependent variable. Panel B uses the total EURO-D score as the dependent variable. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses are clustered at the individual level.

G Appendix Figures

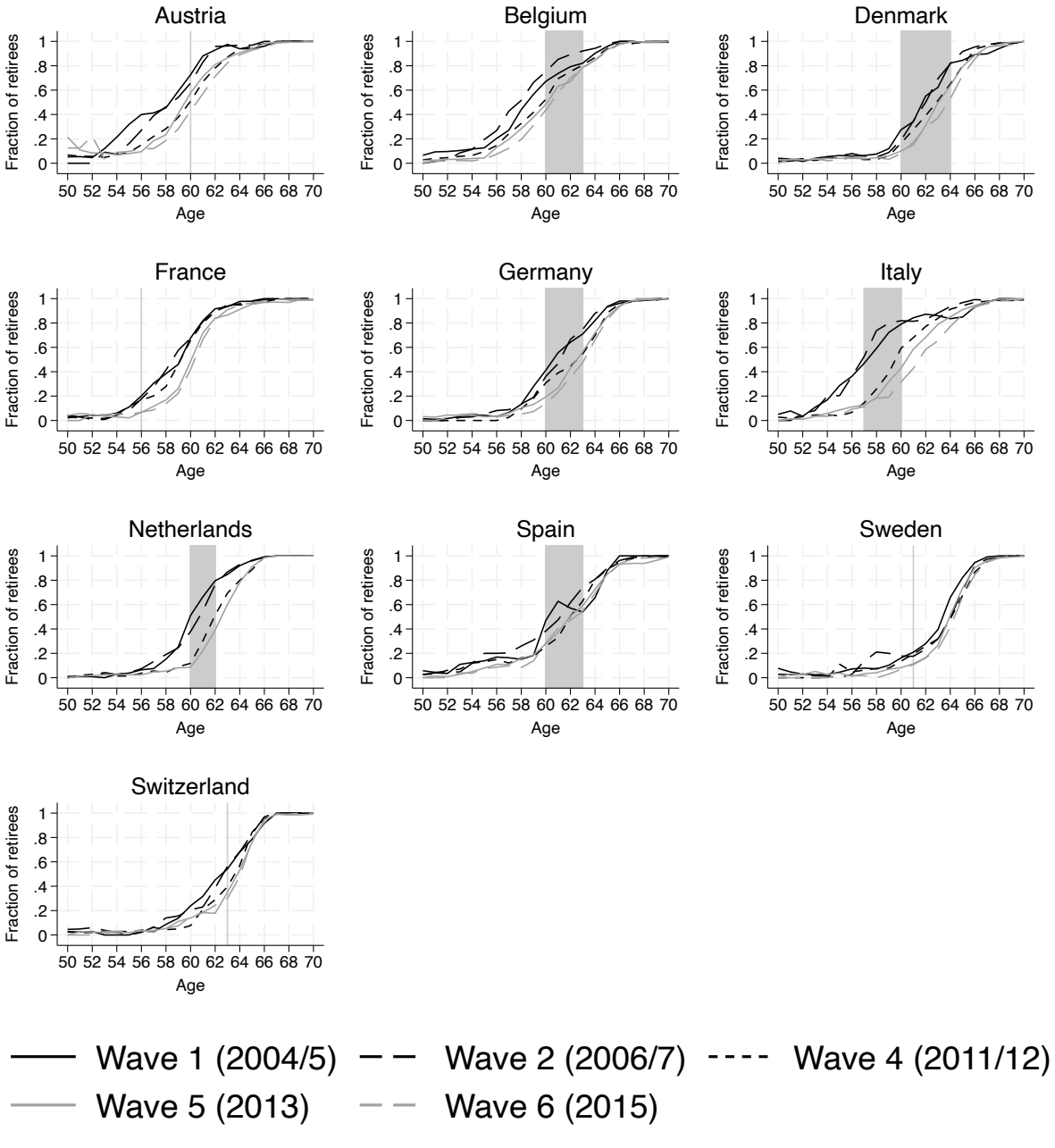

Figure G.1: *Fraction of retirees by country and survey wave over ages 50-70 for men*

Notes: Fraction of retirees by country, survey wave, and age. For each age a, country c, in survey wave w we observe N_{acw} men who are either employed or retired on the basis of their income-based labor-market status measure. Let I_{iacw} be an indicator variable that is set to 1 if individual i of age a in country c and wave w is retired. Then the fraction of retirees Ret_{acw} is: $Ret_{acw} = \frac{\sum_{i=1}^{N_{acw}} I_{iacw}}{N_{acw}}$, i.e. the ratio of retirees to the sum of retirees and employed of age a in country c and wave w. Grey lines/areas indicate the (range of) early retirement eligibility age(s) included in the ETWFE analysis for men (see Table 1 and Appendix B).

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