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*Why life gets better after age 50, for some: mental well-being and the social norm of work**

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Why life gets better after age 50, for some: mental well-being and the social norm of work*

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Abstract

We provide evidence that the social norm (expectation) of work has a detrimental causal effect on the mental well-being of individuals not able to abide by it. Using SHARE data on men aged 50+ from 10 European countries, we identify the social norm of work effect in a difference-in-differences (DiD) model that compares mental well-being scores of unemployed / disabled individuals (the treatment group) with those of employed / retired individuals (the control group) at varying levels of the fraction of retirees of comparable age. The initial mental well-being gap at age 50 is large, with unemployed / disabled men experiencing lower levels of mental well-being. Beyond age 50, the mental well-being of unemployed and disabled men improves as peers of comparable age retire, and full convergence occurs generally at an age that is slightly above the normal retirement age, when everyone has retired. We estimate the social norm of work effect to be comparable to the benefit of tertiary education, the detriment of being widowed, and the benefit of having a household income of 2,000,000 Euros. We explore income-security and leisure-coordination channels as alternative interpretations of the effect to show that these cannot explain our findings.

Keywords: mental well-being; social norm of work; retirement institutions
JEL Classification: I10, I31, J60, D63

*The title is inspired by a popular book by Rauch (2018), titled "The Happiness Curve: why life gets better after age 50."

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1 Introduction

Keynes predicted in 1930 that by the early 21st century we would only work 15 hours per week, with advances in technology and productivity providing the means to increasingly substitute work for leisure. Instead, work seems to have taken an ever more prominent role in how we define ourselves. Politicians across the political spectrum routinely claim to stand up for the rights of "hard-working families" and governments continuously redesign institutions in their attempt to optimize labor markets for economic growth. Their efforts materialize in ever-changing sets of laws and regulations to increase labor-market participation and reduce unemployment. Finding oneself without a formal job can be a stressful experience in such work-centered societies, with potentially serious mental well-being consequences for those unable to (find) work.

In this paper we provide evidence (i) that improvements in mental well-being in older age are driven by unemployed and disabled individuals and that they are gradual, (ii) that the inability to conform to the social norm of work - the commonly held belief that able-bodied adults ought to work - is an important channel explaining this pattern, and (iii) that these mental well-being improvements are substantial. Working is the appropriate behavior of working-age individuals and violation of this norm comes with a social stigma. The social stigma associated with inactivity may be higher for a fifty year old, whose peers of comparable age are usually at work, than for a sixty-four year old, whose peers are mostly retired. As the social norm of work relaxes with peers in age retiring, the mental well-being of unemployed and disabled men improves.

A persistent finding in social surveys is that mental well-being is U-shaped: better among the young and old and worse during prime working ages. See for instance, Blanchflower and Oswald (2008, 2016), Stone et al. (2010), Ulloa et al. (2013) and recent evidence for 132 countries by Blanchflower (2020). Frijters and Beatton (2012) have shown that the decline in mental well-being in early adulthood (the left-hand side of the U) disappears when accounting for individual fixed effects, suggesting that it reflects selection. Yet there exists no compelling explanation for improvements in mental well-being at older ages, i.e. the right-hand side of the U (Stone et al., 2010, 2017). We here provide evidence that improvements in mental well-being at older ages are driven by the unemployed and disabled and that it reflects a relaxation of the social norm of work as individuals approach statutory retirement ages.

Fehr and Gächter (2000) define a social norm as:

> "[...] 1) a behavioral regularity; that is 2) based on a socially shared belief of how one ought to behave; which triggers 3) the enforcement of the prescribed behavior by informal social sanction."

In the context of the labor market and of mental well-being the idea is that: 1) individuals generally work, 2) it is commonly believed that this is appropriate behavior for working age adults, and 3) a violation of this behavioral regularity carries with it social stigma. Conceptually, the social norm of work can operate in three primary domains. First, an internalized norm can affect how an individual perceives and judges his/her own identity or labor market status and thereby affect well-being (Akerlof and Kranton, 2000). Second, stigma may result from others imposing the norm through social interactions. For example, family and friends may express their disapproval towards an individual without work. Third, public policy and formal institutions such as job search requirements for the unemployed may impose a norm, increase stigma and reduce well-being. All three aspects are part of a *"social norm against living off other people and a corresponding normative pressure to earn one's income from work"* (Elster, 1989).

Direct measurement of social norms is difficult as it requires the ability to measure beliefs. A literature in economics, psychology and medicine takes the pragmatic approach of using aggregate measures of behavior as a proxy for the prevalent social norm, such as the unemployment rate in a locality (e.g., Clark, 2003; Clark et al., 2010; Powdthavee, 2007; Shields et al., 2009). It finds higher unemployment rates to have a positive effect on the mental well-being of the unemployed.[1] For example, Clark (2003) finds that unemployment no longer has a detrimental effect on mental well-being for prime-age men in the UK, if at least 20% of individuals in one's locality are unemployed. Other social norm measures have been used, besides the unemployment rate, such as, e.g., "living of public funds" (Chadi, 2014), regional results from a referendum on cuts in unemployment benefits (Stutzer and Lalive, 2004), and whether a cohabiting partner or other household member is also unemployed (Clark, 2003; Gathergood, 2013). These studies point to the importance of conforming to the social norm of work to one's mental well-being, or more generally, of conforming to a certain working behavior that is common among one's reference group.

[1] See, e.g., Cohn (1978); Jackson and Warr (1987); Warr et al. (1988); Clark and Oswald (1994); Clark (2003); Clark et al. (2010); Powdthavee (2007); Shields et al. (2009); Gathergood (2013).

Most relevant to our study is the work by Hetschko et al. (2014), who find, using a difference-in-differences (DiD) framework, that the life satisfaction of unemployed Germans improves upon entering a retirement scheme, and does so beyond any retirement effects experienced by the employed. They interpret this as a social norm of work effect: upon entering retirement, the unemployed restore norm conformity, which improves mental well-being.

Instead of focusing on transitions into retirement, we follow a different approach, tracking mental well-being changes with age in the second half of working life. We use data from the Survey for Health, Aging and Retirement (SHARE) from 10 European countries, focusing on men[2] between the ages of 50 and 70, and using the 12-item EURO-D scale – with scores ranging from 0 (best mental well-being) to 12 (worst mental well-being) – as our measure of mental well-being.

As a result of our approach, we obtain three *distinct* and *novel* findings. First, we find that improvements in mental well-being with age are driven by unemployed and disabled individuals of working age,[3] and that they are gradual: they start in mid-life and are not limited to the actual transitioning into retirement (as in Hetschko et al., 2014). We establish from the raw data as well as from fixed-effects regressions that mental well-being is stable for employed and retired men, but improves gradually with age for the unemployed and disabled, whose mental well-being eventually converges with that of the employed and retired. Full convergence takes place at an age that is slightly above the statutory retirement age, which differs by country and cohort.

Second, we provide evidence that the inability to conform to the social norm of work provides a promising explanation for these patterns. Our finding of mental well-being convergence near the retirement age suggests that norm restoration is gradual and relates to country specific retirement institutions. We therefore conceptualize that the social norm of work is empirically better captured by the fraction of retirees of comparable age (than, say the unemployment rate or the moment of transition into a formal retirement scheme). The fraction of retirees varies with age and depends on cohort- and country-specific retirement institutions that arguably reflect the extent to which it is considered acceptable for an individual of a certain age not to be working. We validate the social norm of work proxy by demonstrating that it is strongly associated with country- and age-specific self-reports on the importance of work in life, which we obtain from the European Values Study.

[2]Patterns in well-being for women are distinct from those of men (see, e.g., Van de Kraats et al., 2022). We return to this in section 2.1.

[3]See section 2.1.1 for our precise definition of the group of unemployed and disabled men.

In our microdata we further validate our proxy by using self-reported retirement status. Specifically, we define employment status on the basis of the reported source of income and use self reports on perceived retirement status as an indication of the extent to which individuals feel they are meeting the social norm (or not). This interpretation is consistent with the identity economics framework of Akerlof and Kranton (2000), where self-identity is seen as an indication of the individual's perceived social category. We find that a growing number of individuals who are unemployed or disabled, self-report being retired as the fraction of retired peers of similar age increases. Thus, as it becomes more common for older individuals to be retired, the unemployed / disabled increasingly appear to self-identify as meeting the norm, i.e., as being retired. In fact, we uncover a very strong linear relationship between our measure of the social norm of work (the age-, cohort- and country-specific fraction of retirees) and self-reported retirement by the unemployed and disabled. Further, the employed should identify as being employed and retirees should identify as being retired, since for them there is no social stigma. Indeed, this is what we find. This suggests that, as the social norm of work changes, perceptions of one's labor-market status also change, but only among those that do *not* conform to the social norm of work, and not for those that *do* (consistent with our hypothesis).

Third, we uncover sizeable social norm of work effects for the unemployed and disabled. To identify, and estimate the size of, the social norm of work effect, we employ a DiD model, with the age-, survey wave- and country-specific fraction of retirees as the treatment, to compare unemployed / disabled men ("treated") with employed / retired men ("control"). The intuition is that as more peers retire, the social stigma of unemployment / disability is reduced so that the mental well-being gap between the unemployed / disabled and the employed / retired becomes smaller. From our DiD estimates we obtain a quantitatively important role for the social norm of work. Specifically, we confirm the stable mental well-being of employed and retired men and the substantial improvements in mental well-being of unemployed and disabled men. Further, we confirm that the mental well-being of the unemployed / disabled fully converges with that of the employed / retired. The initial mental well-being gap is substantial and differs between countries, ranging from 0.74 to 1.43 EURO-D points. Convergence occurs generally at an age when everyone has retired. The improvements are large, suggesting there is substantial "untapped well-being potential" among the unemployed / disabled during mid-life. A one EURO-D unit improvement is larger than the benefit of tertiary

education (0.53 units), the detriment of being widowed (0.69 units) and the benefit of having a household income of 2,000,000 Euros (0.78 units).

We test alternative specifications and find our result to be robust, address concerns about endogenous stratification into labor-market groups, provide evidence for the assumption of common pre-trends, conduct falsification tests, and rule out alternative explanations, such as income-security and leisure-coordination channels. Exploiting variation in exogenous early retirement eligibility ages across countries and cohorts to construct an alternative social norm proxy yields similar estimates of the social norm of work effect. Since, arguably, retirement institutions reflect, and/or influence, a society's social expectation for individuals of a certain age to work (or not), this constitutes further evidence in support of our social norm of work hypothesis. Together, the evidence suggests that the social norm of work is an important determinant of the mental well-being of those that do not abide by it.

Our findings are relevant to the literature that seeks to understand the improvements in well-being and happiness at older ages and more generally is informative about the determinants of mental health. They are also policy relevant. Our research suggests important trade-offs between the well-being of unemployed and disabled individuals and the need for societies to have working age individuals be productive. We discuss these considerations briefly in the concluding section 7.

The remainder of this paper is structured as follows. Section 2 describes the SHARE data and sample construction. Section 3 provides descriptive evidence. Section 4 presents our formal empirical approach to identify the social norm of work effect in a difference-in-differences model. Section 5 presents our baseline results, tests for the common trend assumption, and addresses endogeneity concerns about the fraction of retirees by using exogenous retirement eligibility ages to construct an alternative social norm proxy. Section 6 conducts robustness checks and falsification tests, and evaluates the evidence for competing explanations of our findings. Section 7 concludes.

2 Data

We use the harmonized version of the Survey for Health, Aging and Retirement (SHARE) (Börsch-Supan et al., 2013; Gateway to Global Aging Data, 2017). SHARE, modeled after the US Health and Retirement Survey (HRS), is designed to gather data on a wide range of topics as individuals age,

including work and retirement, assets, income and consumption, health and health-care utilization, family life and social networks. We use data from the first six waves, but exclude wave 3 as it does not include mental well-being measures. The first wave was collected in 2004/2005 and subsequent follow ups have been timed at approximately two-year intervals. Data for wave 6 was gathered in 2015. The exact timing of each survey wave differs slightly across countries.[4]

2.1 Sample construction and restrictions

To ensure a sufficient number of consecutive waves for each country, allowing us to exploit the panel dimension of the survey, we include ten countries that were part of SHARE's first wave: Austria, Belgium, Denmark, France, Germany, Italy, The Netherlands, Spain, Sweden, and Switzerland.[5]

We restrict our analysis to men. Mental well-being and its correlates differ substantially by gender (e.g., see the review by Kessler and Bromet, 2013). Consistent with gender roles, which reduce female labor-market participation (e.g., Bertrand et al., 2015), we expect the social norm of work to be stronger for men. Indeed, previous research finds significant positive mental well-being effects of reductions in social norm of work measures for men but not for women (Clark, 2003; Clark et al., 2010; Gathergood, 2013; Hetschko et al., 2014). For the more traditional household task divisions among the older cohorts studied here, gender differences may be particularly important.[6]

We include individuals between ages 50 (the youngest age to participate in SHARE) and 70, to capture the age range in which (early) retirement transitions take place.

2.1.1 Labor-market definitions

We use income-based as well as self-reported measures of labor-market status. Self-reports are useful as they may reflect how an individual self identifies, whereas income-based measures represent a more objective classification of an individual's "true" (i.e. official) labor-market status.

Income-based measures: In our main analysis we apply the following labor-market status categorization using reported income sources and hours worked:

[4] Wave 1 roughly corresponds to 2004/5, Wave 2 to 2006/7, Wave 4 to 2011/12, Wave 5 to 2013 and Wave 6 to 2015. See `http://www.share-project.org/data-documentation/waves-overview.html` for detail.

[5] We exclude Greece because of sample selection issues (Mazzonna and Peracchi, 2016).

[6] E.g., see Bianchi et al. (2000) for trends in the gender division of household labor and work for pay.

- **Retired:** If the individual reports any retirement income (public or private) and less than 10 working hours per week (i.e. retirement income $> 0 \cap$ weekly work hours < 10),
- **Employed:** If the individual reports no retirement income, but does report income from work or self-employment and 10 or more working hours per week (i.e. retirement income $= 0 \cap$ earnings *or* self-employment income $> 0 \cap$ weekly work hours ≥ 10),
- **Unemployed and disabled:** If the individual reports no retirement income and less than 10 working hours per week (i.e. retirement income $= 0 \cap$ weekly work hours < 10). This definition captures a broader group of non-retired and non-employed individuals than for example the OECD definitions of unemployment and disability.[7] The most crucial aspect for our analysis is that these are individuals who mostly do not work nor receive a retirement income, so that they do not conform to the social norm of work while they are of working age.
- **Other:** Not in any of the above categories.

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, home maker, don't know or refuse to answer.

2.1.2 Analysis samples

Pooled sample: We base our descriptive analyses on a *pooled sample* of all person-wave observations. These analyses do not exploit the longitudinal dimension of the data. We classify individuals as employed, retired, unemployed/disabled, or as other, according to our income-based measure of labor-market status (see previous section 2.1.1). The full pooled sample consists of 51,485 person-wave observations. Table 1 shows a cross-tabulation of self-reported versus income-based labor-market status for men aged 50-70. According to our income-based labor-market status measure, a total of 6,076 person-wave observations (or 12%), 19,776 observations (or 38%), and

[7] For example, the OECD definition of unemployment is a working age individual without work but available for and actively seeking work, which we do not observe. Moreover, our definition does not allow us to distinguish between unemployed and disabled individuals. Last, we cannot define unemployed and disability on the basis of receiving unemployment or disability benefits. After a benefit program runs out individuals are still effectively unemployed or disabled and therefore remain exposed to the social norm of work.

20,213 observations (or 39%) are classified as unemployed / disabled, employed, and retired, respectively. Just under 11% of person-wave observations in the pooled sample are classified as other (i.e. not classified as retired, employed or unemployed / disabled). In robustness tests we show that our results remain unchanged when we allocate individuals classified as *other* to one of the three labor market status categories. Note that about 30% of those defined as unemployed / disabled, according to the income-based definition, perceive themselves as retired. We return to this in section 3.3. Panel A of Table 2 provides summary statistics for the pooled sample and Appendix Table B.1 details the number of men by country and wave between ages 50 and 70.

Stacked sample: To exploit the longitudinal dimension of the data and reduce potential selection biases in our DiD approach, we construct a *stacked sample* for our regression analyses. For each individual, we use observations from pairs of two consecutive waves.[8]

We classify individuals as being employed, retired or unemployed / disabled on the basis of their income-based labor-market status in the first of the two consecutive waves (Period 1 in Table 3). We drop those consecutive pairs for which the individual's labor-market status is defined as other in the first wave, but allow for transitions to the other group in the second wave. Table 3 shows 238 (1.2%) such transitions for the unemployed / disabled, 1,453 (7.5%) for the employed and 218 (1.1%) for the retired. Panel B of Table 2 provides summary statistics for the stacked sample averaged over the two consecutive waves. Observed characteristics of the unemployed / disabled and the employed / retired in the stacked sample are very comparable to those in the pooled sample (Panel A).

2.2 Mental well-being score: EURO-D scale

The EURO-D scale, a 12-item screening instrument for depression, was developed specifically to enable cross-country comparisons of risk profiles for older Europeans (Prince et al., 1999). The 12 items consist of yes (1) / no (0) responses to survey questions in the following domains: depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment,

[8] In essence we change the format of our data set such that each row consists only of two consecutive waves, and each individual is represented by stacked rows of wave pairs. Thus, the first row for an individual contains waves 1 and 2, the second row contains waves 4 and 5, and the third row contains waves 5 and 6 (wave 3 cannot be used as it does not contain mental well measures).

and tearfulness. 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. Appendix A.1 provides more detail.

The EURO-D scale has been validated and shown to perform well as a screening instrument for depression in SHARE data (Castro-Costa et al., 2008) but also in other contexts, e.g., in developing nations (Guerra et al., 2015). A total score of 4 or higher is considered to be indicative of a mood disorder, such as depression (Prince et al., 1999; Castro-Costa et al., 2007; Fonseca et al., 2014). Figure 1a shows that 27.3%, of unemployed / disabled individuals in the stacked sample have a score of 4 or higher, while this is the case for only 6.9% of the employed / retired individuals. Figure 1b shows substantial wave-to-wave variation in EURO-D scores for both the unemployed / disabled and the employed / retired, although the latter group has somewhat more stable EURO-D scores (narrower distribution).

2.3 The social norm of work proxy

According to our social norm of work hypothesis, the mental well-being of unemployed and disabled individuals should improve as people of the same age and gender retire. We define a reference group of "relevant others" for the unemployed and disabled, as employed or retired individuals of a similar age a, in the same country c, and survey wave (calendar time) w. For this reference group, we calculate an age-(a), country-(c) and wave-(w) specific fraction of retirees Ret_{acw} and use this as a proxy for the social norm.

Specifically, consider the total (pooled) sample of male SHARE respondents from ages 50 to 70. For each age a, country c, at time/wave w we observe N_{acw} individuals who are either employed or retired on the basis of their income-based labor-market status measure (see section 2.1.1). 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:

$$Ret_{acw} = \frac{\sum_{i=1}^{N_{acw}} I_{iacw}}{N_{acw}}, \tag{1}$$

i.e. the ratio of retirees to the sum of retirees and employed of age a in country c and wave w. We next assign to each unemployed / disabled individual i of age a, from country c at time w the proxy for the social norm of work, Ret_{acw}. This proxy is for an important part determined by country

specific (early) retirement eligibility conditions that vary for birth cohorts. The notion is that a higher fraction Ret_{acw} of retired individuals of the same age is associated with less social stigma.

Our social norm of work proxy has some important methodological advantages over previously used proxies such as the local unemployment rate. First, differences exist in retirement institutions across cohorts and countries that arguably reflect differences in the social expectation that an individual works. By contrast, the unemployment rate is sensitive to business-cycle fluctuations, which are more volatile and arguably less reflective of changes in the social norm. Second, in contrast to the local unemployment rate, our proxy does not directly depend on decisions made by the unemployed. Instead, it reflects aggregate retirement decisions of *employed* individuals driven by country specific labor-market institutions such as early retirement schemes. It is therefore plausibly more exogenous. Third, the local unemployment rate is subject to the confounding mechanism that a higher unemployment rate reduces the probability of returning to work and therefore likely negatively affects the mental well-being of the unemployed (e.g., see Ruhm, 2000, 2003, 2005; Chadi, 2014). Our proxy does not include the unemployed and is therefore less sensitive to such confounding.

In our main analyses, we include in the calculation of Ret_{acw} those individuals j who are up to one year younger or older than individual i. This three year moving age band is motivated by a desire for a sufficient number of observations yet sufficient accuracy to capture the effect of age-dependent retirement policies. In section 6.1 we perform sensitivity analyses using different bandwidths and find that results are robust.

Figure 2 plots the fraction of retirees using the three year age band, for each country and wave over the 50-70 age range as well as the age of early retirement eligibility (vertical line/shaded area).[9] The figure shows how the fraction of retirees Ret_{acw} increases with age, with a gradual pattern for some countries (e.g., Belgium and Italy) and a sharper pattern for others (e.g., France, Sweden, Switzerland). In all countries the fraction of retirees is close to one at the normal retirement age (age 65 in most countries, except for France where it is 60; see Appendix Table B.2). For some countries (e.g., Austria, Belgium, Denmark, France, Germany, Italy, The Netherlands) the profiles shift to the right for later waves, indicating that people retire later. This reflects recent policy

[9]For some countries the age of eligibility (see also Appendix Table B.2) changes over time. For these countries shaded areas indicate the range of eligibility ages.

reforms that put in place stronger incentives to delay retirement. According to our hypothesis, these shifts in retirement patterns should also shift the view of society towards (non-)work. We exploit this variation in institutional retirement eligibility ages in section 5.3.

To validate the fraction of retirees as a proxy for the social norm of work, we test whether it correlates with self-reports about the importance of work in life. The idea is that if the social norm of work is high/low (fraction of retirees low/high), individuals will also report work to be more/less important in their lives. Because SHARE does not have such self-reports, we use instead aggregated data from the European Values Study (EVS), a large-scale, repeated cross-sectional survey on ideas, beliefs, preferences, attitudes, values and opinions of citizens in Europe (EVS, 2021). Specifically, EVS asks respondents about work: *"Please say how important [work] is in your life."* Respondents can state that work is (1) very important, (2) rather important, (3) not very important, or (4) not at all important. We calculate for all men from all countries in the sample data, the fraction that reports either that work is "not very important" or "not at all important", for the ages 50-70.

Figure 3a shows that the fraction of men reporting that work is not important (left-hand y-axis) follows an age pattern that is remarkably similar to that of the average fraction of retirees (right-hand y-axis). At age 50, when almost all men are working, only 5% of individuals in the EVS report that work is not important, which increases to just over 23% at age 70, when practically all men have retired. Figure 3b plots the fraction of men reporting work is not important (y-axis) against the fraction of retirees (x-axis). A strong correlation can be seen: as the fraction of retirees increases, men report that work is relatively less important in their lives. Appendix Figure C.1 shows these figures per country, showing similar, but noisier, results. Thus the fraction of retirees correlates strongly with self-reports of the importance of work, supporting our interpretation that the fraction of retirees is a useful proxy for the social norm of work.

2.4 Control variables

Table 2 provides descriptive statistics for the pooled and stacked sample's characteristics, respectively. Household income is measured in Euros as the sum of all income, after taxes and contribu-

tions, of the respondent and the spouse (if there is a spouse).[10]

We use two physical health measures: the number of 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 0 if the individual did not report any problems with the (instrumental) activity and 1 otherwise. We sum the ADL and IADL measures so that scores range from 0-5, with higher scores representing worse physical health.

For educational attainment, we use the 1997 International Standard Classification of Education (ISCED-97) codes. Respondents reported their highest obtained degree. SHARE then asked educational experts in each country to map educational achievements to the ISCED-97 codes. This results in seven categories of educational attainment: no education, primary education, lower secondary education, upper secondary education, post-secondary non-tertiary education, first stage of tertiary education, and second stage of tertiary education.

Finally, marital status is one of the strongest correlates of mental well-being, with a higher prevalence of mental disorders for those who are divorced, separated or widowed (Kessler and Bromet, 2013; Rai et al., 2013; Weissman et al., 1996). We distinguish among several categories: being married, partnered, separated, divorced, widowed and never having been married.

Table 2 shows that besides having worse mental well-being than the employed, the unemployed / disabled are worse off across the board: their household income is about half that of the employed, they suffer from more limitations in (instrumental) activities of daily living, have lower levels of education, and are less likely to be married.

3 Mental well-being and the social norm of work

Can the social norm of work explain improvements in mental well-being of the unemployed / disabled in later-life? We here provide descriptive evidence for our social norm of work hypothesis, using data on all 10 SHARE countries. First, we establish that improvements in mental well-being

[10] In SHARE wave 1 income variables were collected before taxes and social contributions while subsequent waves collected only after-tax income variables. To solve this issue Bertoni et al. (2016) have estimated harmonized post-tax estimates for SHARE wave 1, which we use in this paper.

in older age are driven by unemployed and disabled men, that their mental well-being eventually converges to that of the employed and retired, and that full convergence occurs at an age slightly above the normal (statutory) retirement age when everyone has retired (section 3.1). Second, we show that mental well-being changes associated with transitions between labor-market states that abide (employed / retired) and those that do not abide (unemployed / disabled) by the social norm of work are large when the norm is strong, and small when the norm is weak (section 3.2). Third, we demonstrate that, as the norm relaxes as one approaches the normal cohort- and country-specific age of retirement, a growing share of the unemployed and disabled (on the basis of source of income) starts viewing themselves as being retired (on the basis of self-reports; section 3.3). We view this as suggestive evidence that mental well-being improvements by the unemployed / retired are, at least in part, related to changing perceptions of self-identified labor-market identity. Finally, we provide tentative evidence that the social norm of work effect is substantial by providing a first rough estimate of its size (section 3.4).

3.1 Life only gets better for the unemployed and disabled

Figure 4 plots for each country the unconditional average EURO-D score over the 50-70 age range for the unemployed / disabled (with crosses) and the employed / retired (with triangles) and the fraction of retirees Ret_{acw}, averaged over the survey waves (right-hand scale). The EURO-D axis (left-hand scale) has been inverted so that upward movements represent improvements in mental well-being. The figure also plots linear age profiles based on a regression of the EURO-D score on a set of standard control variables and a linear age function (with their corresponding 95% confidence intervals for both groups; shaded areas).[11] The estimated age coefficients for both groups and their standard error are reported at the top of each figure.

The most striking pattern is the overall convergence of the mental well-being of the unemployed / disabled with that of the employed / retired.[12] The mental well-being of the employed / retired is fairly stable in most countries, as can also be seen from the small and precisely estimated age coefficients for the employed / retired. Italy and Spain show a slight worsening with age. By

[11] Specifically, we use the following regression: $MH_i = \alpha + \beta_1 age_i + \beta_2 I(UD_i) + \beta_3 age_i \times I(UD_i) + \gamma X_i + \varepsilon_i$, where $I(UD_i)$ is an indicator variable for being unemployed or disabled. The regressions control for household income (in thousands of Euros), educational attainment, marital status and wave. In the regression model we use age in months. The reported coefficients in Figure 4 have been multiplied by 12 to obtain the coefficient for age in years.

[12] The vertical axis is adjusted for each country to visually capture the full extend of mental well-being convergence.

contrast, the mental well-being of the unemployed / disabled improves steadily and this appears to coincide with the increase in the fraction of retirees (dashed line). For most countries, full convergence in mental well-being between the employed / retired and unemployed / disabled seems to occur a few years after the full retirement age. Table 4 confirms this by presenting for each country the estimated age and the corresponding fraction of retirees at which full convergence occurs. For all countries convergence occurs at a fraction of retirees that is precisely one.[13] Thus, the mental well-being of the unemployed / disabled appears to fully catch up with that of the employed / retired when everyone is in retirement.

3.2 Transitions into unemployment / disability come with a mental well-being penalty and more so when the social norm of work is strong

Table 5 shows mental well-being by age group and type of transition for individuals observed in consecutive SHARE survey waves, i.e. at time $t-1$ and t. We distinguish four main patterns. First, on average, mental well-being improves over time (i.e. scores at time t are lower than at $t-1$; where Δ indicates the change) among those who remain unemployed / disabled (UD $\Rightarrow$ UD). This is particularly true for the age category 55-59, the ages where individuals increasingly start to retire and, according to our hypothesis, the social norm of work weakens. Second, those who transition from employment / retirement into unemployment / disability (ER $\Rightarrow$ UD) have worse mental well-being at time t compared with $t-1$, especially in the age-group 50-54 when the social expectation of work is still strong, and differences are smaller for ages 55-59, and disappear for ages 60^{+}, when the social norm of work is weaker. Third, those who leave unemployment / disability (UD $\Rightarrow$ ER) improve in mental well-being and the improvement is greater for younger ages 50-54 when the expectation of work is still strong. Fourth, mental well-being is excellent (low scores) with negligible changes among those who remain employed / retired (ER $\Rightarrow$ ER), consistent with the social norm of work hypothesis as the employed / retired always conform to the social norm (the employed work and the retired are not expected to work). This descriptive evidence suggests that unemployment / disability comes with a mental well-being penalty, as transitioning into (or out of) employment / retirement increases (decreases) mental well-being, and more so when the

[13] Switzerland is the only exception where the estimated fraction of retirees at convergence, while one, is imprecisely determined due to the large error in its estimated age of convergence.

norm is strong. Yet, this analysis does not take into account potential reverse causality, whereby mental health changes affect labor market states.

3.3 With age the unemployed and disabled self-identify as being retired

Unemployed / disabled individuals may increasingly self-identify as being retired as a growing share of peers in age are no longer working and this may positively affect their mental well-being. A plausible indication of whether an individual "feels" as if he were retired is whether the individual self-reports as being retired. In the identity economics framework of Akerlof and Kranton (2000), such self-reporting provides an indication of the social category the individual identifies with. Table 1 shows that our income-based labor-market categories of being retired or employed almost exclusively pick up individuals who also self report such a labor-market status (95% and 97% self-report being retired and employed, respectively). On the other hand, and consistent with our hypothesis, among the 6,076 individuals who are classified as unemployed or disabled on the basis of their income source, only 58% self-report such a labor-market status. Instead, a large share of the unemployed / disabled self-identify as retired, a more socially accepted category that also captures that one is not working.

One would expect to observe growing rates of self-identified retirement status by the unemployed / disabled as retirement becomes more prevalent, i.e. as the share of retirees increases, and it becomes more acceptable not to be working. Figure 5 plots for each country the age- and wave-specific fraction of individuals that self-report being retired (black dots), but who are, based on their income source, unemployed / disabled (see section 2.1.1), against the fraction of retirees (Ret_{acw}, in 10% bins of the data). The figure also shows the individual-level linear best fit to a regression of self-reported retirement status Ret^{self}_{iacw} on a constant and the age- and wave-specific fraction of retirees Ret_{acw}. The plots, the estimated coefficients of the linear best fit, and the small errors in these estimated coefficients (reported for each country above each plot) demonstrate that self-reported retirement among the unemployed / disabled is strongly associated with the fraction of their retired peers Ret_{acw} (t-stats range across countries from 7.2 to 16.8). The last panel shows the result combining all countries (t-stat of 36.2). Thus, unemployed / disabled individuals seem to increasingly self-identify as being retired as the fraction of retirees increases.

3.4 Tentative estimate of the social norm of work effect

To identify and quantify the size of the social norm of work effect, we will employ a differences-in-differences (DiD) identification strategy. A rough first estimate can be obtained from the data by a simple comparison of the mental well-being of the unemployed / disabled (treatment) group with the employed / retired (control) group in: (i) a "high" social norm of work state, where retirement prevalence rates are very low (the fraction of retirees is less than 10%) and (ii) a "low" social norm of work state, where retirement prevalence rates are very high (the fraction of retirees exceeds 75%).[14]

Table 6 shows average EURO-D scores for unemployed / disabled and employed / retired individuals exposed to both the high and the low social norm of work states. The mental well-being of the unemployed / disabled is worse than that of the employed / retired, regardless of being in the high or the low state. This may reflect composition effects whereby individuals with worse mental well-being are more likely to be unemployed / disabled. For the unemployed / disabled, mental well-being improves substantially (the EURO-D score decreases) as the social norm relaxes (i.e. moving from the high to the low state), while there is a slight worsening for the employed / retired. Under the assumption that, in the absence of a social norm of work, the increase in mental well-being is the same for the unemployed / disabled and the employed / retired (common trends), the difference in these differences can be interpreted as a first (tentative) estimate of a social norm of work effect on the mental well-being of the unemployed / disabled. Thus, in this illustration, exposure to a high social norm of work has a detrimental effect on the mental well-being of an unemployed / disabled individual of about 0.68 EURO-D points ($S.E. = 0.07$).

This tentative estimate of a social norm of work effect does not exploit the longitudinal nature of the data, account for gradual changes in the social norm of work (i.e. the fraction of retirees), control for observed and unobserved individual characteristics and country and time fixed effects, or deal with potential reverse causality. This may confound our initial reading of the data. In the next section we present our empirical model, which is designed to overcome these concerns.

[14] The "high" and "low" groupings are conveniently chosen for reasons of power and for illustrative purposes (representing two extremes). Figure 2 shows that for most countries the fraction of retirees starts to accelerate with age after reaching 10%.

4 Empirical model

Motivated by the descriptive analyses of sections 3.1, 3.2, and 3.3, as well as the rough estimate obtained in section 3.4, we start with the following DiD model to more rigorously test the social norm of work hypothesis:

$$\begin{aligned} MH_{iacw} &= \alpha + \gamma_1 I\left(UD_{iacw}\right) + \gamma_2 Ret_{acw} + \gamma_3 I\left(UD_{iacw}\right) \times Ret_{acw} \\ &+ \gamma_4 X_{iacw} + \tau_w + \eta_i + \varepsilon_{iw}, \end{aligned} \tag{2}$$

where i, a, c and w are indices for the individual, age, country and survey wave (time), respectively, MH_{iacw} denotes mental well-being, $I\left(UD_{iacw}\right)$ is an indicator for being unemployed or disabled, and Ret_{acw} is the fraction of retirees. The vector of controls X_{iacw} includes linear functions for age and household income, and a full set of dummies for educational attainment and marital status, and physical health measures (ADL and IADL). We control for wave fixed-effects τ_w to capture broad trends in macroeconomic and other conditions that may affect mental well-being in similar ways across countries.[15] Finally, we include individual-specific fixed effects η_i to control for unobserved individual characteristics that do not vary over time.[16] In this way we also reduce potential biases resulting from endogenous selection into the treatment (unemployment / disability) and control (employment / retirement) groups (more on this below).

The parameter γ_1 in equation (2) captures level differences in mental well being of unemployed / disabled and employed / retired individuals before the social norm kicks in (i.e. the initial gap in mental well-being). The social norm of work effect, represented by γ_3, is identified by a comparison of the mental well-being MH_{iacw} of unemployed / disabled individuals (the treatment group) with those of employed / retired individuals (the control group) at varying levels of the fraction of retirees Ret_{acw}. The intuition is that as more peers retire, the social stigma of unemployment / disability is reduced so that the mental well-being gap between the unemployed / disabled and the employed / retired becomes smaller.

Crucial for the identification of this social norm of work effect is that we also control for common

[15] In analyses with individual fixed effects we include three time-variant wave dummies to capture average time trends in mental well-being for transitions between waves 1 and 2, waves 4 and 5, and waves 5 and 6 (see section 2.1).

[16] We also provide OLS estimates without individual fixed effects. In those cases we control for country fixed effects κ_c to capture structural differences between countries.

retirement trends (Ret_{acw}) and age effects (included in X_{iacw}). The common retirement trend effect γ_2 represents the counterfactual trend that would have applied to everyone in our sample, in the absence of a social norm of work effect. This reflects, for example, the possibility that both groups may similarly benefit from increased leisure time of retired family members or friends. Further, controlling for age effects is crucial for the identification of the social norm effect. If there are age effects of mental well-being, as some of the literature suggests (e.g., Blanchflower and Oswald 2008; Stone et al. 2017; Blanchflower and Oswald 2017), not adequately controlling for age effects may confound the estimates. For this reason we also estimate extensions of the baseline model where we replace the linear age function with flexible age $\times$ country dummies (see section 6). As in Hetschko et al. (2014) we make the assumption that the age trend is the same for the unemployed / disabled (treated) as it is for the employed / retired (controls). Thus we assume that any remaining age-related changes in mental well-being not captured by the common retirement trend, for instance due to biology, are common to both groups. Finally, note that our social norm of work proxy Ret_{acw} captures variation in a three-dimensional space, i.e. age, country and survey wave (see Figure 2). Thus, even after separately and flexibly controlling for any of these three dimensions, there remains variation in the fraction of retirees that we can exploit to identify the social norm of work effect.

There are two potential sources of endogeneity that may bias our DiD estimates. First, the stratification into a treatment (unemployed / disabled) and a control group (employed / retired) is based on endogenous labor-market status. For example, one may be concerned about self-selection, whereby those who are more susceptible to stigma exert more effort to find or keep work. Estimating equation 2 with individual fixed effects η_i removes time invariant composition effects, but does not address time variant changes in the composition of the treatment and control groups that occur when individuals transition between the treatment and control groups. We reduce this source of potential bias by discarding observations from the stacked sample (see Table 3) that relate to such transitions (280 transitions from unemployment / disability to employment [1.4%], and 320 transitions from employment to unemployment / disability [1.6%]). We consider retirement to be an absorbing state and therefore drop transitions of individuals who switch back to either employment (36 switches, 0.2%) or unemployment / disability (326 transitions, 1.7%). However, we do allow for transitions from unemployment / disability into retirement as part of the treatment as retirement constitutes restoration of norm conformity (i.e. not working is expected behavior for

retired individuals). Removing these 962 observations (280+320+36+326) – less than 5% of our final stacked sample of 18,474 transitions – reduces the risk of confounded estimates due to time varying shocks. In section 6.1 we provide sensitivity analyses, showing that the results are robust to these sample restrictions.

Second, endogeneity of our social norm of work proxy, the fraction of retirees Ret_{acw}, may bias the results due to reverse causality. For example, when an aggregate mental health shock, e.g., an economic recession, reduces the mental well-being of the employed and thereby induces earlier retirement, affecting the fraction of retirees Ret_{acw}. We address this concern in section 5.3.

In section 6.1 we present eight variations to the baseline model: inclusion of flexible age $\times$ country dummies, differences in the estimation sample, various definitions of labor market states, differences in the calculation of Ret_{acw}. In section 6.2 we also demonstrate the statistical power of our inferences by conducting falsification tests where we randomly assign Ret_{acw} to each individual in the sample. These additional analyses confirm the findings of our baseline model. What remains to be discussed is whether we can confidently interpret the effect of Ret_{acw} as an effect of the social norm of work on mental well-being. In section 6.3 we provide additional evidence to support our interpretation by examining the plausibility of alternative competing interpretations.

5 Results

We begin this section by presenting our baseline estimates of the social norm of work effect (section 5.1). Next, we provide support for our identification assumption by assessing the validity of the common "retirement-trend" assumption in our data (section 5.2). Finally, we address endogeneity concerns about our social norm of work proxy by replacing Ret_{acw} with a variable that directly captures retirement eligibility rules: we use the time passed since reaching the legally determined early retirement eligibility age as an alternative proxy for the social norm of work (section 5.3). In all analyses we cluster standard errors at the individual level.

5.1 Baseline estimates

Columns 1-3 of Table 7 present OLS estimates of the DiD regression for the stacked sample of all countries. In line with equation 2 we use $I(UD_{iacw})$ to refer to the estimate for γ_1, Ret_{acw} for γ_2,

and $I(UD_{iacw}) \times Ret_{acw}$ for γ_3. Column 1 presents the result of a basic regression of the EURO-D score on unemployment / disability status $I\left(UD_{iacw}\right)$, the fraction of retired peers Ret_{acw}, and the interaction between the two. The reference category are the employed / retired (controls). Their mental well-being score is 1.206 ($S.E. = 0.050$) on average. Being unemployed / disabled carries a highly statistically significant mental well-being penalty of 1.324 ($S.E. = 0.079$) EURO-D units compared with the employed / retired, when almost none of one's peers in age are in retirement ($Ret_{acw} = 0$; pre-treatment). Contrast this with the situation where almost everyone else is retired ($Ret_{acw} = 1$; post-treatment): the mental well-being gap reduces to $1.324 - 0.956 = 0.368$, which is substantially smaller but still statistically significant from zero ($S.E. = 0.148$). Column 2 adds age and column 3 adds controls for education, marital status and health. Adding additional controls reduces the mental well-being penalty, $I\left(UD_{iacw}\right)$, somewhat, and this gap is significantly reduced when almost everyone else is retired ($1.015 - 0.788 = 0.227$, $S.E. = 0.146$). Note, that the estimate of γ_3 ($I(UD_{iacw}) \times Ret_{acw}$) in column 3 is close to the simple descriptive estimate of -0.68 obtained from the raw data (see Table 6 in section 3.4).

Columns 4-6 of Table 7 repeat the steps in columns 1-3 but include individual fixed-effects. These analyses confirm the results of columns 1-3, demonstrating a strong relationship between the fraction of retired peers in age and the mental well-being of the unemployed / disabled. Importantly, the estimates of the social norm of work effect in columns 4-6 are of similar size as those in columns 1-3. Our preferred estimate of -1.026 ($S.E.$ 0.286) EURO-D units (column 6) accounts for both individual fixed effects and a rich set of controls. Throughout the remainder of the paper we use this as our point of reference. Thus, even when exploiting within-individual variation we find evidence for the hypothesized social norm of work effect, suggesting it is not the result of changes in the composition of the unemployed / disabled group with age.

These findings suggest there are significant social benefits to the unemployed / disabled, in terms of reduced stigma associated with not working, if others of similar age are also no longer working. Stigma does not appear to be present for the employed / retired. Their mental well-being is very good and stable, experiencing only a small and statistically insignificant change in mental well-being over the age range 50-70 (-0.11 [$S.E. = 0.12$] and 0.29 [$S.E. = 0.66$] EURO-D based on, respectively, columns 3 and 6 of Table 7).[17] Further, column 3 shows that only a small difference

[17] Multiply the age coefficient by 20 to account for the 50 to 70 age range and add the coefficient $\hat{\gamma}_2$ of Ret_{acw}.

in the mental well-being of the unemployed / disabled and that of the employed / retired remains when all peers of similar age are retired ($Ret_{acw} = 1$; 1.015 - 0.788 = 0.227 [$S.E.$ = 0.146] Euro-D units). This finding basically confirms the patterns by country in Figure 4. The estimated social norm of work effect is quantitatively large: a one EURO-D unit improvement is larger than the benefit of tertiary education (0.53 units), the detriment of being widowed (0.69 units) and the benefit of having a household income of 2,000,000 Euros (0.78 units), see column 3 of Table 7.

Figure 4 shows variation in convergence patterns across countries. We therefore repeat the OLS analyses of column 3 by country. Figure 6 visualizes these DiD analyses and is consistent with convergence. The estimates of these regressions, in particular $\hat{\gamma}_1$ (the initial gap in mental well-being) and $\hat{\gamma}_3$ can be used to calculate for each country the age at which full convergence takes place. The initial mental well-being gap $\hat{\gamma}_1$ differs between countries, ranging from 0.736 ($S.E.$=0.204) EURO-D points in Belgium to 1.434 ($S.E.$=0.193) EURO-D points in Spain (see Appendix Table B.3). When all same aged peers are retired, $Ret_{acw} = 1$, full convergence ($\hat{\gamma_3}/\hat{\gamma_1} = 1$) takes place in all countries, with the exception of Italy and Switzerland. However, Italy and Switzerland are consistent with convergence as we expect about three outliers, conducting essentially 10 tests.[18] Figure 7 shows this visually.

5.2 Common trend assumption

The DiD estimator requires that in the absence of treatment, the difference in mental well-being between the unemployed / disabled and the employed / retired is constant over the fraction of retirees, i.e. that they share a common "retirement trend". We provide a simple test of this common "retirement trend" assumption along the age-dimension.

Figure 2 shows that for most countries and waves the fraction of retirees Ret_{acw} starts to accelerate around the age it reaches 10%. This acceleration coincides with ages when workers start to become eligible for early retirement schemes. We therefore construct a set of age dummies that are centered around the age at which the fraction of retirees first reaches 10%. For example, in Austria the fraction of retirees in the first survey wave reaches 10% at age 53, age 55 in Belgium and age 59 in Denmark. We take these ages as a benchmark to redefine age for each country. Thus,

[18] Italy lies within 1.1 and Switzerland within 1.6 standard deviations. Note that with 10 estimates we expect about three country estimates to lie outside of the one-standard deviation interval, so that the results are overall consistent with convergence in all countries.

taking Austria as an example, redefined age for Austria is set to 0 at age 53, age 52 becomes -1, age 51 becomes -2, etc. Likewise, age 54 becomes age 1, age 55 becomes age 2, etc. Similarly, for Denmark, redefined age is set to 0 at age 59 and set to -1 at age 58, 1 at age 60, etc. We assume that, at ages prior to this 10% threshold, the social norm for males is to work, since at these ages only a few people have retired. This constitutes our pre-trend. At later ages the perception that work is the (social) norm decreases as a greater share of peers in age are retired. Next, we regress mental well-being on these age dummies, age dummies interacted with unemployment / disability, our full set of control variables, and individual fixed-effects.

The interactions between the redefined age dummies and unemployment / disability test for significant differences in the trends in mental well-being between the unemployed / disabled and the employed / retired. Their estimates are plotted in Figure 8. The figure shows no significant differences in mental well-being scores for ages prior to reaching the 10% threshold (redefined age equals 0). However, after reaching the threshold when retirement starts to accelerate, the mental well-being of the unemployed / disabled follows a different trajectory from that of the employed / retired. Thus, both groups share a common pre-trend in the fraction of retirees at younger ages and the trends start to diverge when retirement becomes more prevalent, i.e. when the social norm of work is relaxed.

5.3 Endogeneity concerns: time since earliest possible retirement

A concern with our identification strategy is the potential endogeneity of the fraction of retirees Ret_{acw}, which could bias our estimates. From the perspective of the unemployed / disabled, the fraction of retirees Ret_{acw} is exogenous: it is based on aggregated behavior of the employed and retired, which in turn depends on retirement institutions. However, for the control group of employed / retired individuals, the fraction of retirees may not be exogenous: poor mental well-being may affect their retirement decision, thereby influencing the fraction of retirees Ret_{acw}. Further, aggregate shocks that affect the mental well-being of the employed may also affect the fraction of retirees Ret_{acw}. For instance, an economic downturn may worsen the well-being of workers and at the same time induce workers to retire from work.

We address endogeneity concerns with the fraction of retirees Ret_{acw} by using an alternative proxy for the social norm of work that is based on plausibly exogenous early retirement eligibility

eligibility ages (ERAs) that vary by country and over time. We refer to Appendix A.2 for more details. These ERAs have successfully been used to instrument the retirement decision (Coe and Zamarro, 2011; Mazzonna and Peracchi, 2016). Similar to Bonsang et al. (2012) and Mazzonna and Peracchi (2016), we construct a variable $TimeRet_{icw}$ that measures the time that has passed since individual i's age exceeded the early retirement eligibility age in country c at time (wave) w (ERA_{icw}). Specifically, the time since earliest possible retirement is defined as $TimeRet_{icw} = max\{0, Age_{icw} - ERA_{ic}\}$.

Table 8 reports the results of a regression that uses $TimeRet_{icw}$ as a proxy for the social norm of work. These estimates confirm the baseline results reported in Table 7. The relevant point estimate in column 1, the effect of $I\left(UD_{iacw}\right) \times TimeRet_{icw}$, suggests the mental well-being of the unemployed / disabled improves at a rate of -0.165 ($S.E. = 0.034$) EURO-D points for each year past the early retirement eligibility age. With an average early retirement eligibility age of approximately 60.5, this implies a total effect of about $4.5 \times -0.165 = -0.74$ ($S.E. = 0.15$) EURO-D units by age 65 (the most common normal retirement age for these cohorts, see Appendix A.2) and $7.5 \times -0.165 = -1.24$ ($S.E. = 0.26$) EURO-D units by age 68 (when virtually everyone is retired in our sample, see Figure 2). Our baseline effect of the social norm of work of -1.026 ($S.E.$ 0.286) EURO-D units in Table 7 lies in the middle of this range. The results from the two approaches are therefore consistent. In column 2, we omitted Italy and the Netherlands from the sample as they do not have clear legally determined ERAs.[19] Overall, these results corroborate the findings of our baseline estimates.

6 Additional analyses

We conduct a series of sensitivity tests to demonstrate that our main results do not depend on the particular set-up we have chosen. Specifically, we explore the robustness of our results to alternative definitions of our income-based measure of labor-market status and of the fraction of retirees (section 6.1). Next, we verify our identification assumptions and demonstrate the statistical power of our inferences by conducting falsification tests (section 6.2). Last, we investigate the relevance of

[19] For Italy and the Netherlands, early retirement eligibility ages ERA_{icw} often depend on how many years an individual has contributed to the social security system, their sector of work, and sometimes their occupation (see Appendix A.2 for further details).

competing channels that may drive the strong association between the fraction of retirees and the mental well-being of the unemployed / disabled (section 6.3). These analyses further corroborate the interpretation of our result as a social norm of work effect.

6.1 Sensitivity

We take as our baseline, the individual-specific fixed effects regression that includes the set of standard controls (column 6 in Table 7) and its estimated effect of the social norm of work of -1.026 ($S.E.$ 0.286) EURO-D units. Table 9 presents the results of eight variations to this baseline model. The estimated social norm of work effect is robust to these variations: it ranges between -0.887 and -1.196 EURO-D units (i.e. differences with the baseline are in all cases not statistically significant).

First, we allow for more flexible age patterns in our vector of controls X_{iacw}. In column 1 of Table 9 we replace the linear age function by a flexible set of age dummies instead of a linear age function (coefficient -0.989 [$S.E.$ = 0.286]). In column 2 we include a full set of country × age dummies (coefficient -0.891 [$S.E.$ = 0.290]). Second, instead of using a three-year age band to calculate the fraction of retirees Ret_{acw}, columns 3 and 4 use one- and five-year age bands (coefficients -0.887 [$S.E.$ = 0.259] and -1.196 [$S.E.$ = 0.306]), respectively. Third, one may be concerned about potential misclassification of labor-market status. In most countries, unemployment and disability status is automatically converted into retirement status upon reaching the statutory retirement age, so that unemployment and disability no longer apply after this age. Column 5 estimates the model on a sample that only includes individuals below the normal retirement eligibility ages (coefficient -0.950 [$S.E.$ = 0.351]). In column 6 we adjust the control group of employed / retired individuals by excluding those who work after the statutory retirement age and excluding those who retire before the statutory retirement age (coefficient -1.088 [$S.E.$ = 0.295]). Last, in the main analyses we removed observations of individuals who switch between the treatment (unemployed / disabled) and the control (employed / retired) groups and considered retirement to be an absorbing state, to minimize the effects of changes in the composition of the treatment and control groups that may confound our estimates (see section 4). In column 7 we no longer drop individuals who switch between the treatment and control group (coefficient -1.019 [$S.E.$ = 0.283]). In column 8 we adjust the definition of income-based labor-market status to also assign the group of *other* individuals to a specific labor-market state using the following sequential steps. First, if we observe positive

retirement income, the individual is defined as retired. Next, the individual is defined as employed if we observe some employment income. Last, all remaining individuals are defined as unemployed / disabled. This also does not substantially alter our findings (coefficient -1.135 [$S.E. = 0.280$]).

6.2 Falsification tests

We verify our identification assumptions and demonstrate the statistical power of our inferences by conducting two falsification tests where we randomly assign Ret_{acw} to each individual in the sample. We then confront our baseline estimates with the results from the pseudo-samples.

First, we assign at random a fraction of retirees Ret_{acw} to each individual in the sample, keeping the distribution of the fraction of retirees within the pseudo-sample equal to the distribution in the actual sample. We repeat this 5,000 times to obtain 5,000 pseudo-samples. Figure 9a gives the distribution of t-statistics for the estimated social norm of work effect from 5,000 estimated pseudo-treatment effects. As expected (random assignment), we find the distribution to be centered around zero. Only 0.08% of the pseudo-treatments have a t-statistic that exceeds the absolute value of our baseline estimate of the t-statistic (column 6 of Table 7), indicated by the vertical (red) line in Figure 9a. Thus, if the fraction of retirees had no meaning, only in 0.08% of cases our baseline result could have been attributed to "luck".

We also conduct a more stringent falsification test, where we randomize the fraction of retirees Ret_{acw} *within each age cell*, i.e. we randomize the fraction of retirees among all individuals aged 50 across countries and waves, and do the same for individuals aged 51, 52, etc. Because retirement takes place at similar (yet not identical) ages across countries (see Figure 2), the fraction of retirees within age cells will be correlated across countries. As a result we expect the distribution of t-statistics to be centered around a value smaller than zero. Indeed this is what Figure 9b, based on 5,000 pseudo-treatment samples, shows. Still, only 5.22% of pseudo-treatments have a t-statistic that exceeds that of our baseline estimate. This demonstrates that variation in the fraction of retirees by country and survey wave explains variation in the mental well-being of the unemployed / disabled.

6.3 Competing interpretations

In the previous sections we provided evidence for our social norm of work hypothesis. Here, we examine the plausibility of alternative (competing) interpretations. To validate our estimates as a social norm of work effect we will need to exclude competing channels that may drive the relation between the fraction of retirees Ret_{acw} and the mental well-being of the unemployed / disabled. We examine two alternative interpretations: an income-security effect and a leisure-coordination effect.

An income-security effect: In the European countries included in our sample, reaching the normal retirement age generally implies that individuals start receiving a secure old-age pension. Therefore, a concern may be that our estimates for the social norm of work effect in fact (also) pick up a positive mental well-being effect of income security for unemployed / disabled individuals. This income security effect could in particular play a role in low income households. Poorer households are more often subject to economics shocks and have more difficulties to cushion 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 in two ways.

First, we estimate equation (2) on the employed only and define the bottom 20% of the household income distribution within each country (mean income of 15,278 euros) as "placebo unemployed / disabled." The idea is that if income security plays an important role in mental well-being improvements, this should also hold for low-income employed individuals and therefore one would expect to find a significant treatment effect (γ_3). The estimate of the interaction effect in column 1, row 2 of Table 10 is very small and insignificantly different from zero (0.097 [$S.E. = 0.383$]).

Second, if income security effects are important, then one would also expect that the treatment effect in Table 7 is largely driven by low income unemployed / disabled individuals. Therefore, we split the stacked sample in two: the bottom 20% and the other 80% of the household income distribution. We report the results for these two groups in columns 2 and 3 of Table 10. For both groups, we find significant and similar sized estimates for the interaction effect that are also very similar to our baseline estimate of -1.026 (Table 7). Note further that in column 2, the reference group consists of similarly poor employed / retired individuals, so that the estimated effect implies that poor unemployed / disabled individuals experience substantially higher mental

well-being improvements than similarly poor employed / retired individuals. So, income security, hypothesized to play a more substantial role for lower income households, does not provide a good alternative interpretation of our main findings.

A leisure-coordination effect: With more peers in age in retirement, it may be easier to coordinate leisure activities, increasing the experienced 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). Indeed, 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 that they do not gain as much from their extra free time during the workweek.

This leisure-coordination effect 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 / disabled and the employed / retired, it is differenced out in the DiD model. However, the unemployed / disabled have on average more free time than the employed / retired, because a large portion of the latter group is still at work. Hence, the unemployed / disabled may benefit more from leisure time coordination than do the employed / retired, so that potentially our analyses reflect a leisure time synchronization effect.

We test this leisure channel using data on social activities. In waves 1 and 2 of the SHARE survey, individuals were asked about a range of social activities and the frequency they engage in them. We use an indicator variable for weekly social activities,[20] and include the indicator in our DiD model as a control. If our baseline estimate were in fact driven by a leisure channel, we would expect much of the effect to be absorbed by the indicator for weekly social activities.

Table 11 provides results from the DiD analysis. Column 1 presents OLS estimates for the subsample from survey waves 1 and 2, for which we have data on weekly social activities. The coefficient estimate for the interaction between unemployment / disability and the fraction of retirees $I(UD_{iacw}) \times Ret_{acw}$ is highly significant, and at -0.777 similar to our OLS estimate of

[20]The indicator 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.

-0.788 for the full sample in our baseline analysis including controls (see Table 7). Column 2 replaces the fraction of retirees Ret_{acw} by weekly social activities. The point estimate for the social activities variable is marginally significant and negative, indicating that social activities are associated with better mental well-being. However, the coefficient estimate for the interaction between unemployment / disability and social activities $I(UD_{iacw}) \times$social activities is insignificant, i.e. we do not find evidence for an additional leisure effect for the unemployed / disabled. Column 3 adds the social activities variable to our baseline OLS estimate with controls (column 1). Also here, we do not find a significant coefficient estimate for this interaction and the coefficient estimate for the interaction between unemployment / disability, and the fraction of retirees $I(UD_{iacw}) \times Ret_{acw}$ remains highly significant and unchanged.

Columns 4-6 repeat columns 1-3 using individual fixed-effects. Column 4 shows that for the smaller subsample we lose substantial power as now the coefficient estimate for the interaction between unemployment / disability and the fraction of retirees $I(UD_{iacw}) \times Ret_{acw}$ is only marginally significant. Nevertheless, after controlling for weekly social activities in columns 5 and 6, the estimate for the social norm of work effect remains similar in size. Overall, these results do not support the notion that the mental well-being improvements in our baseline analysis are driven by better coordination of leisure activities.

7 Conclusion

In a best-selling book, titled "The Happiness Curve: Why Life Gets Better After 50," Rauch (2018) popularized the notion that mental well-being improves in the second half of life.[21] The well-being literature has suggested that a biological, or other age-related mechanism, may explain improvements in well-being at later ages, e.g., age-related changes in self-reporting of well-being or *"cognitive and behavioral changes in older people that lead to enhanced emotional regulation and stability"* (e.g., Stone et al., 2017). 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, i.e., the unemployed and disabled. Our findings may be disappointing to those in mid-life who have recently been promised that life was getting better after 50, as they suggest only the unemployed

[21] Frijters and Beatton (2012) have shown that the decline in mental well-being in early adulthood (the left-hand side of the U-shape) disappears when accounting for individual fixed effects, suggesting that it reflects selection.

and disabled enjoy these benefits.

Using SHARE data on men aged 50+ from 10 European countries, we identify the social norm of work effect in a difference-in-differences (DiD) model that compares mental well-being scores of unemployed / disabled individuals (the treatment group) with those of employed / retired individuals (the control group) at varying levels of the fraction of retirees of comparable age. We find that the initial mental well-being gap at age 50 is large, with unemployed / disabled men experiencing lower levels of mental well-being. As peers of comparable age retire, the mental well-being of unemployed and disabled men improves, and full convergence occurs generally at an age that is slightly above the normal retirement age, when everyone has retired. We demonstrate that variation across country, time and age in the share of retirees, determined in large part by country- and cohort-specific retirement institutions, explains the mental well-being of the unemployed and disabled. We conduct several robustness tests, address a variety of threats to our identification, such as concerns about endogeneity of our proxy for the social norm of work, and rule out alternative interpretations of the effect.

Since these effects are large, why were they not uncovered earlier? Two important factors may explain this. First, while the observed improvements in mental well-being at older ages are large, they affect only the small subgroup of unemployed / disabled men. Indeed, the unemployed / retired make up 11.8% (OLS) and 14.6% (FE) of the sample used in our main analysis (see Table 2). Using our baseline effects of -0.788 ($S.E.$ = 0.124) (OLS) and -1.026 ($S.E.$ = 0.286) (FE) EURO-D units in mental well-being convergence (see columns 3 and 6 of Table 7) the initial mental well-being gap averaged across all groups would be too small to identify, at 0.09 (OLS) and 0.15 (FE) EURO-D units, respectively. This may also explain why, despite these well-being effects being substantial, the U-shape is not always observed in the subjective well-being literature, requiring substantially large data sets. Second, the evidence we provide that the social norm of work itself changes is crucial. As a result, controlling for unemployment / disability status, as is typically done in the extensive "U-shape" literature, removes only an average effect but not the age pattern. Thus, in such analyses, unemployment / disability status does not appear to be a smoking gun worthy of further exploration.

Our results point to the importance of social policies and societal change. First, we find evidence of substantial "untapped well-being potential" among the unemployed and disabled in mid-life: the

effects of social stigma from the inability to work are larger than the benefit of tertiary education, having a household income of 2,000,000 Euros, and the detriment of being widowed. Second, recent technological change has not only detrimentally affected wages and incomes (Autor, 2015, 2019) but also participation rates and job opportunities (Tüzemen, 2018). Increased labor-market flexibility in certain sectors, e.g., the rise of temporary work contracts, reduce overall job security and expose people to (the risk of) temporary unemployment and its negative mental well-being consequences. Governments have rolled out programs that impose job search or job training requirements on the unemployed to increase labor-market participation, often supported by theoretical arguments and research from labor economists (e.g., see Heckman et al., 1999; Sianesi, 2004; Pavoni and Violante, 2007; Schochet et al., 2008; Kluve, 2010; Bolhaar et al., 2019 and papers cited therein). Such policies and research agendas may shape societal norms and have potential mental well-being consequences for individuals that have difficulty abiding by them.

But, policies may also reduce social stigma. For example, a Universal Basic Income, may reduce the need to work and lower the social expectation of formal work in society. Also, companies and governments have started experimenting with shorter work weeks to improve workers' well-being and productivity (e.g., see Savage 2017; Chappell 2019; Barnes 2020; Haraldsson and Kellam 2021). If a shorter work week relaxes the social norm of work, it can have well-being benefits for those not able to work. However, policy does not necessarily have to change the social norm of work itself. It can also target individuals that are without work in ways that reduce stigma. For example, since 2012, Dutch local authorities are authorized to demand unpaid work at civil society organizations from welfare recipients (e.g., Kampen et al., 2019). If the individual and society have a positive view of the volunteering activities, then perhaps the welfare recipient may benefit in terms of mental well-being.

Regardless of the chosen policy instrument, efforts aimed at reducing the social stigma of inactivity have welfare implications. On the one hand, there may be a trade-off between economic activity and mental well-being. Unemployment may become more attractive at the margin as stigma is reduced and mental well-being is improved for those previously stigmatized. Yet, lower economic output and higher social security expenditures may be welfare depleting for society as a whole. On the other hand, as a result of better mental well-being due to less stigma, some unemployed and disabled individuals may be able to return to work more quickly. In this way, a

reduced social norm of work may increase both levels of economic activity *and* mental well-being, boosting social welfare. The quantitative importance of these effects and their welfare implications are interesting empirical questions for future research.

Our social norm of work hypothesis can also be used to make predictions for other groups and contexts. For example, the social expectation that women work was lower in the past than it is today (as a result of increasing female labor-force participation) and in general remains lower than that of men. The social norm of work hypothesis predicts that improvements in mental well-being at older ages should be less pronounced for older unemployed / disabled women compared to younger generations of women and relative to men. Further, in societies with higher unemployment, the mental well-being penalty is expected to be smaller, and the mental well-being improvements after age 50 less pronounced. An analysis of these predictions is beyond the scope of this paper but suggests fruitful avenues to further test our hypothesis.

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Tables

Table 1: *Cross-tabulation of number of observations (N) by self-reported and income-based labor-market status for men between aged 50 - 70*

	Income-based				
Self-reported	Retired	Employed	Unemployed / Disabled	Other	Total
(Self-)employed	60	19,165	306	3,132	22,663
Unemployed	105	140	1,789	384	2,418
Retired	19,248	278	1,818	1,471	22,815
Disabled	413	98	1,749	142	2,402
Homemaker	28	9	113	8	158
Other	359	86	301	283	1,029
Total	20,213	19,776	6,076	5,420	51,485

Notes: Cross-table of the number (N) of men in each self-reported vs. income-based labor-market status cell in the pooled sample of men aged 50-70 (see section 2.1 for detail on the pooled sample). Self-reported and income-based labor-market status are defined in section 2.1.1.

Table 2: *Summary statistics for the pooled (panel A) and stacked (panel B) samples of men aged 50-70*

	Panel A: Pooled sample				**Panel B: Stacked sample**		
	Unemployed / Disabled	Employed	Retired	Other	Unemployed / Disabled	Employed	Retired
Outcome							
EURO-D	2.61	1.50	1.72	1.62	2.43	1.51	1.69
	[2.45]	[1.67]	[1.89]	[1.79]	[2.35]	[1.68]	[1.86]
Characteristics							
Age	58.8	56.4	65.2	60.5	59.6	57.4	65.0
	[4.7]	[3.9]	[3.7]	[5.4]	[4.5]	[4.1]	[3.6]
HH income (EUR)	22,015	44,589	36,771	37,126	24,992	45,464	37,564
	[31,932]	[35,101]	[87,133]	[49,964]	[50,928]	[38,385]	[95,895]
ADL	0.27	0.04	0.13	0.07	0.25	0.04	0.12
	[0.82]	[0.25]	[0.55]	[0.38]	[0.76]	[0.27]	[0.54]
IADL	0.20	0.01	0.09	0.04	0.17	0.017	0.083
	[0.72]	[0.17]	[0.48]	[0.37]	[0.67]	[0.20]	[0.48]
Education (ISCED-97)							
No	0.06	0.02	0.04	0.02	0.06	0.02	0.03
Primary	0.21	0.07	0.19	0.12	0.20	0.077	0.17
Lower secondary	0.21	0.15	0.16	0.16	0.20	0.14	0.16
Upper secondary	0.33	0.38	0.34	0.34	0.34	0.38	0.36
Post-secondary	0.02	0.05	0.03	0.05	0.02	0.05	0.03
First stage tertiary	0.16	0.32	0.23	0.29	0.17	0.32	0.23
Second stage tertiary	0.005	0.016	0.009	0.014	0.006	0.016	0.010
Marital Status							
Married	0.67	0.77	0.81	0.76	0.69	0.77	0.81
Partnered	0.08	0.09	0.05	0.09	0.07	0.09	0.05
Separated	0.015	0.009	0.008	0.012	0.015	0.009	0.007
Divorced	0.097	0.064	0.045	0.058	0.095	0.067	0.047
Widowed	0.015	0.009	0.036	0.028	0.015	0.012	0.036
Never married	0.12	0.05	0.05	0.06	0.12	0.06	0.05
Number of observations	6,076	19,776	20,213	5,420	5,666	18,544	14,662
Percent share of sample	11.8	38.4	39.3	10.5	14.6	47.7	37.7

Notes: Summary statistics for the pooled and stacked samples of men aged 50-70 (see section 2.1) by income-based labor market status (see section 2.1.1). Standard deviations in parentheses.

Table 3: *Stacked sample: labor-market transitions in consecutive survey waves*

Group	Status	Time	
		Period 1	Period 2
Unemployed / Disabled (treatment group)	Retired*	.	1,072
	Employed	.	280
	Unemployed / Disabled*	2,833	1,243
	Other*	.	238
Employed (control group)	Retired*	.	886
	Employed*	9,272	6,613
	Unemployed / Disabled	.	320
	Other*	.	1,453
Retired (control group)	Retired*	7,331	6,751
	Employed	.	36
	Unemployed / Disabled	.	326
	Other*	.	218
Total		19,436	19,436

Notes: Transitions between income-based labor-market status (see section 2.1.1) groups in consecutive survey waves. Transitions marked with an asterisk (*) are included in the stacked sample. The stacked sample includes individuals that are observed in consecutive survey waves, i.e. wave 1 to 2, wave 4 to 5 and wave 5 to 6 (wave 3 cannot be used as it does not contain mental health measures). Consecutive pairs for which the individual's labor-market status is defined as other in the first wave, are dropped, but we allow for transitions to the other group in the second wave.

Table 4: *Mental health convergence of unemployed / disabled men with employed / retired men*

	Age at convergence (1 S.E. interval)	Normal retirement eligibility age (range)	Fraction of retirees (1 S.E. interval)
Austria	68.8 ± 2.0	65.0	$0.998^{+0.002}_{-0.009}$
Belgium	68.1 ± 2.1	65.0	$0.997^{+0.001}_{-0.011}$
Denmark	72.0 ± 4.5	65.0	$1.000^{+0.000}_{-0.030}$
France	70.3 ± 4.2	60.0 - 61.6	$0.996^{+0.004}_{-0.013}$
Germany	70.9 ± 3.0	65.0 - 65.3	$0.997^{+0.001}_{-0.006}$
Italy	89.7 ± 16.5	65.0 - 66.3	$1.000^{+0.000}_{-0.002}$
Netherlands	67.5 ± 2.2	65.0 - 66.3	$1.000^{+0.000}_{-0.042}$
Spain	77.5 ± 5.5	65.0	$0.996^{+0.004}_{-0.003}$
Sweden	73.1 ± 5.1	65.0	$1.000^{+0.000}_{-0.012}$
Switzerland	107 ± 91	65.0	$1.000^{+0.000}_{-1.000}$

Notes: The age of convergence is calculated using the estimated linear age patterns shown in Figure 4. Using propagation of errors from the regression estimation we calculate the error in the age of convergence. Next, we relate the age at full convergence, as well as the lower and upper bound of a 1 standard error interval in the age of convergence, to the corresponding fraction of retirees. We constructed the fraction of retirees by age in full years (see section 2). To obtain the fraction of retirees for fractional ages, we use a weighted average of the fractions of retirees that correspond to ages in full years on both sides of the fractional age. For example, for Austria we find that the age patterns converge at age 68.796. We calculate the corresponding fraction of retirees by taking the fraction of retirees at age 68 with weight (1-0.796) and the fraction of retirees at age 69 with weight 0.796. Normal retirement eligibility ages are taken from Table B.2 over the period 2004 to 2015. A single number indicates no changes occurred over the time period.

Table 5: *EURO-D score by labor-market status transition for men aged 50 - 70*

Age group	Transition	UD ⇒ UD t-1	UD ⇒ UD t	ER ⇒ UD t-1	ER ⇒ UD t	UD ⇒ ER t-1	UD ⇒ ER t	ER ⇒ ER t-1	ER ⇒ ER t
50-54	EURO-D	3.346	3.251	2.869	3.295	2.866	1.988	1.620	1.572
	Δ	-.094		.426		-.878***		-.049	
	S.E.	(.188)		(.309)		(.294)		(.043)	
	N	191		61		82		1,739	
55-59	EURO-D	3.137	2.739	2.455	2.556	2.631	2.204	1.557	1.490
	Δ	-.398***		.101		-.427***		-.067**	
	S.E.	(.116)		(.164)		(.144)		(.030)	
	N	452		178		255		3,466	
60+	EURO-D	2.776	2.545	2.064	2.051	2.129	1.910	1.564	1.575
	Δ	-.231**		-.012		-.219***		.011	
	S.E.	(.098)		(.118)		(.069)		(.019)	
	N	606		408		1,016		9,179	

Notes: Transitions between unemployment / disability (UD) and employment / retirement (ER) for different age groups. Labor-market status is defined in section 2.1.1 using income-based measures. Data is restricted to individuals that are observed in consecutive survey waves, i.e. wave 1 to 2, wave 4 to 5 and wave 5 to 6 (wave 3 cannot be used as it only contains life history questions). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: *Tentative evidence of a social norm of work effect using "high" and "low" states of the social norm*

	Social norm of work		
Labor-market status	High	Low	*Difference*
Unemployed / Disabled	2.93	2.37	-0.56***
	(0.06)	(0.06)	(0.09)
Employed / Retired	1.56	1.68	0.12***
	(0.02)	(0.01)	(0.02)
Difference	1.37***	0.69***	-0.68***
	(0.04)	(0.05)	(0.07)

Notes: Means of EURO-D scores with standard errors in parentheses. A "high" social norm of work is defined as a fraction of retirees between 0.00-0.10, and a "low" social norm of work as a fraction of retirees between 0.75-1.00. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Table 7: *Baseline estimates for the social norm of work effect*

	OLS			Fixed effects		
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Outcome	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D
I(UD$_{iacw}$)	1.324***	1.324***	1.015***			
	(0.079)	(0.079)	(0.077)			
Ret$_{acw}$	0.040	0.051	-0.005	-0.060	-0.063	-0.035
	(0.034)	(0.089)	(0.093)	(0.128)	(0.133)	(0.148)
I(UD$_{iacw}$) × Ret$_{acw}$	-0.956***	-0.957***	-0.788***	-0.859***	-0.859***	-1.026***
	(0.125)	(0.125)	(0.124)	(0.262)	(0.263)	(0.286)
Age		-0.001	-0.005		0.003	0.016
		(0.006)	(0.007)		(0.030)	(0.034)
Educational attainment						
Primary			-0.180***			
			(0.106)			
Lower secondary			-0.352***			
			(0.104)			
Upper secondary			-0.459***			
			(0.102)			
Post-secondary			-0.458***			
			(0.121)			
First stage tertiary			-0.559***			
			(0.102)			
Second stage tertiary			-0.526***			
			(0.155)			
Marital status						
Partnered			0.120***			0.037
			(0.054)			(0.229)
Separated			0.431***			0.120
			(0.158)			(0.318)
Divorced			0.392***			0.385*
			(0.062)			(0.228)
Widowed			0.687***			1.538***
			(0.102)			(0.255)
Never married			0.201***			-0.577
			(0.063)			(0.399)
ADL			0.667***			0.357***
			(0.045)			(0.057)
IADL			0.287***			0.192***
			(0.056)			(0.068)
HH income ('0 000 EUR)			-0.0039***			-0.0003
			(0.0024)			(0.0014)
Constant	1.206***	1.250***	1.861***			
	(0.050)	(0.339)	(0.365)			
Observations	36,948	36,948	32,522	36,948	36,948	30,730
Adjusted R^2	0.048	0.048	0.109	0.483	0.483	0.492
Country dummies	Yes	Yes	Yes	No	No	No
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: DiD regression of mental health on the fraction of retirees (Ret_{acw}) as in equation 2. In line with equation 2 we use $I(UD_{iacw})$ to refer to the estimate for γ_1, Ret_{acw} for γ_2, and $I(UD_{iacw}) \times Ret_{acw}$ for γ_3. Both the OLS estimates and the fixed effects estimates use the stacked sample as defined in section 2.1. Estimates for educational attainment are relative to individuals with no education and estimates for marital status are relative to married individuals. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Table 8: *Social norm of work estimates using time since earliest possible retirement with individual fixed effects*

Outcome	EURO-D (1)	EURO-D (2)
TimeRet_{icw}	0.044***	0.046***
	(0.015)	(0.016)
$\text{I(UD}_{iacw}) \times \text{TimeRet}_{icw}$	-0.165***	-0.176***
	(0.034)	(0.039)
Age	-0.005	-0.005
	(0.034)	(0.036)
Marital status		
Partnered	0.028	-0.100
	(0.229)	(0.238)
Separated	0.122	0.085
	(0.320)	(0.333)
Divorced	0.391*	0.334
	(0.227)	(0.222)
Widowed	1.524***	1.554***
	(0.254)	(0.282)
Never married	-0.584	-0.733*
	(0.402)	(0.413)
ADL	0.358***	0.329***
	(0.057)	(0.058)
IADL	0.188***	0.234***
	(0.068)	(0.072)
HH income ('0 000 EUR)	-0.0002	-0.0003
	(0.0014)	(0.0015)
Observations	30,730	26,030
Adjusted R^2	0.492	0.496
Wave dummies	Yes	Yes
Individual fixed-effects	Yes	Yes

Notes: DiD regression of mental health on time since earliest possible retirement $TimeRet_{icw}$ as a proxy for the social norm instead of the fraction of retirees (Ret_{acw}) in equation 2. Regressions use the stacked sample. Column 1 includes all 10 countries and column 2 drops Italy and the Netherlands. In line with equation 2 we use $I(UD_{iacw})$ to refer to the estimate for γ_1, $TimeRet_{icw}$ for γ_2, and $I(UD_{iacw}) \times TimeRet_{icw}$ for γ_3. The estimates for the marital status dummies are relative to married individuals. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Table 9: *Sensitivity analysis of the social norm of work effect (fixed effects estimator)*

	Age function		Fraction of retirees		Age-range		Labor-market status	
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Outcome	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D
Ret_{acw}	-0.048	-0.136	0.000	-0.071	-0.141	0.043	-0.035	-0.020
	(0.201)	(0.379)	(0.125)	(0.166)	(0.201)	(0.172)	(0.147)	(0.153)
$\text{I(UD}_{iacw}) \times \text{Ret}_{acw}$	-0.989***	-0.891***	-0.887***	-1.196***	-0.950***	-1.088***	-1.019***	-1.135***
	(0.286)	(0.290)	(0.259)	(0.306)	(0.351)	(0.295)	(0.283)	(0.280)
Age			0.014	0.019	0.042	0.012	-0.010	-0.002
			(0.033)	(0.034)	(0.043)	(0.035)	(0.033)	(0.033)
Marital status								
Partnered	0.034	0.048	0.036	0.038	-0.108	0.071	0.055	-0.021
	(0.228)	(0.230)	(0.229)	(0.229)	(0.250)	(0.244)	(0.225)	(0.225)
Separated	0.111	0.119	0.120	0.121	0.392	0.185	0.222	0.104
	(0.317)	(0.316)	(0.319)	(0.318)	(0.363)	(0.332)	(0.306)	(0.297)
Divorced	0.385*	0.361	0.385*	0.384*	0.547**	0.440*	0.466**	0.339
	(0.228)	(0.227)	(0.228)	(0.228)	(0.242)	(0.239)	(0.217)	(0.218)
Widowed	1.521***	1.513***	1.538***	1.540***	0.984***	1.498***	1.509***	1.441***
	(0.254)	(0.250)	(0.255)	(0.255)	(0.332)	(0.273)	(0.250)	(0.239)
Never married	-0.583	-0.561	-0.578	-0.573	-0.377	-0.544	-0.572	-0.802**
	(0.398)	(0.384)	(0.400)	(0.398)	(0.435)	(0.404)	(0.387)	(0.391)
ADL	0.354***	0.353***	0.357***	0.356***	0.467***	0.342***	0.349***	0.352***
	(0.057)	(0.056)	(0.057)	(0.057)	(0.077)	(0.058)	(0.056)	(0.055)
IADL	0.194***	0.185***	0.192***	0.193***	0.177*	0.196***	0.196***	0.196***
	(0.068)	(0.069)	(0.068)	(0.068)	(0.096)	(0.070)	(0.068)	(0.069)
HH income ('0 000 EUR)	-0.0003	0.0000	-0.0003	-0.0003	-0.0071	-0.0002	0.0000	-0.0002
	(0.0014)	(0.0013)	(0.0015)	(0.0015)	(0.0047)	(0.0014)	(0.0013)	(0.0014)
Observations	30,730	30,730	30,730	30,730	19,150	27,928	32,338	31,796
Adjusted R^2	0.492	0.493	0.492	0.492	0.489	0.492	0.493	0.496
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age dummies	Yes	No	No	No	No	No	No	No
Country × age dummies	No	Yes	No	No	No	No	No	No

Notes: DiD regression of mental health on the fraction of retirees (Ret_{acw}) as in equation 2. All regressions include individual fixed effects. In line with equation 2 we use $I(UD_{iacw})$ to refer to the estimate for γ_1, Ret_{acw} for γ_2, and $I(UD_{iacw}) \times Ret_{acw}$ for γ_3. Columns 1-4 use the stacked sample as defined in section 2.1, columns 5-8 impose restrictions on the stacked sample as defined in section 6.1. Estimates for marital status are relative to married individuals. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Table 10: *Analysis of income security channel*

Outcome	Placebo EURO-D	Bottom 20% EURO-D	Top 80% EURO-D
Specification	(1)	(2)	(3)
Ret_{acw}	-0.132	0.590	-0.205
	(0.200)	(0.395)	(0.159)
$\text{I(UD}_{iacw}) \times \text{Ret}_{acw}$	-0.0972	-1.115**	-0.958***
	(0.383)	(0.511)	(0.355)
Age	0.0313	0.0416	0.0105
	(0.0455)	(0.0803)	(0.0365)
Marital status			
Partnered	0.0679	-0.408	0.113
	(0.249)	(0.506)	(0.257)
Separated	0.387	-0.371	0.256
	(0.372)	(0.528)	(0.395)
Divorced	0.231	-0.228	0.534**
	(0.256)	(0.529)	(0.250)
Widowed	1.545***	1.225***	1.597***
	(0.416)	(0.471)	(0.296)
Never married	0.00659	-1.083	-0.469
	(0.340)	(0.714)	(0.518)
ADL	0.523***	0.365***	0.351***
	(0.108)	(0.0957)	(0.0698)
IADL	0.0384	0.139	0.226**
	(0.165)	(0.103)	(0.0893)
HH income ('0 000 EUR)	-0.0114**	0.0180*	-0.000473
	(0.00518)	(0.00986)	(0.00154)
Constant	-0.233	-0.304	1.031
	(2.559)	(4.764)	(2.165)
Observations	14,420	6,038	24,692
Adjusted R^2	0.434	0.518	0.474
Wave dummies	Yes	Yes	Yes

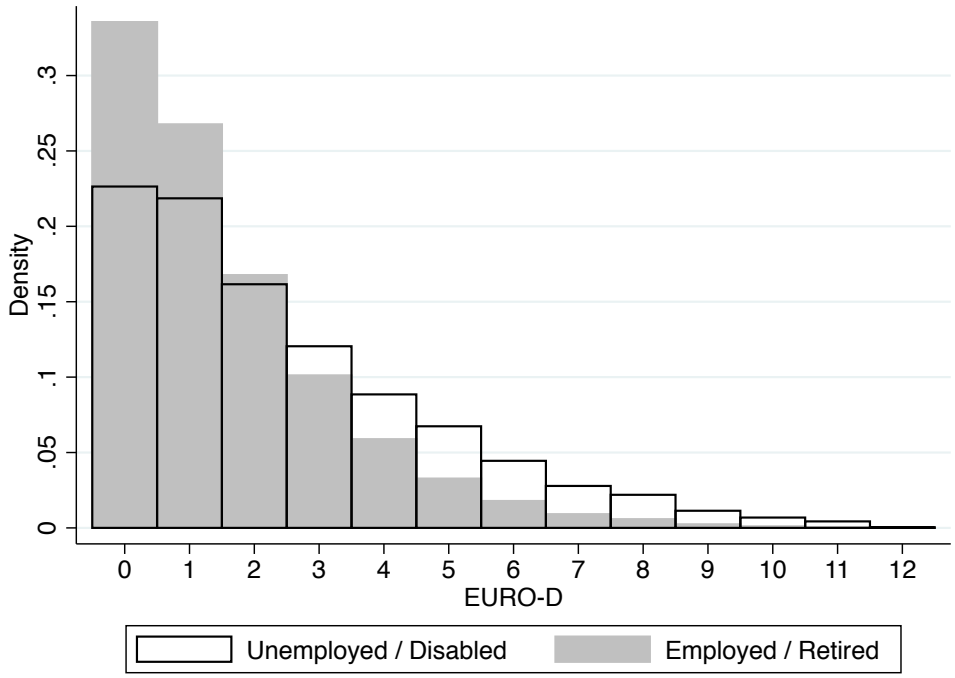
Notes: DiD regression of mental health on the fraction of retirees (Ret_{acw}) as in equation 2 with individual fixed effects. In line with equation 2 we use $I(UD_{iacw})$ to refer to the estimate for γ_1, Ret_{acw} for γ_2, and $I(UD_{iacw}) \times Ret_{acw}$ for γ_3. Column 1 conducts a placebo test, whereby we drop unemployed / disabled and retired individuals from the stacked sample and define employed individuals from the bottom 20% as "placebo unemployed / disabled". Columns 2 and 3 investigate heterogeneity in the social norm of work effect by household income by separately considering unemployed / disabled individuals in the bottom and top half of household incomes for each country. Therefore, we split the sample into two, by selecting the bottom 20% (column 2) and the top 80% (column 3) of the full sample's income distribution. The estimates for the marital status dummies are relative to married individuals. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Table 11: *Analysis of leisure channel*

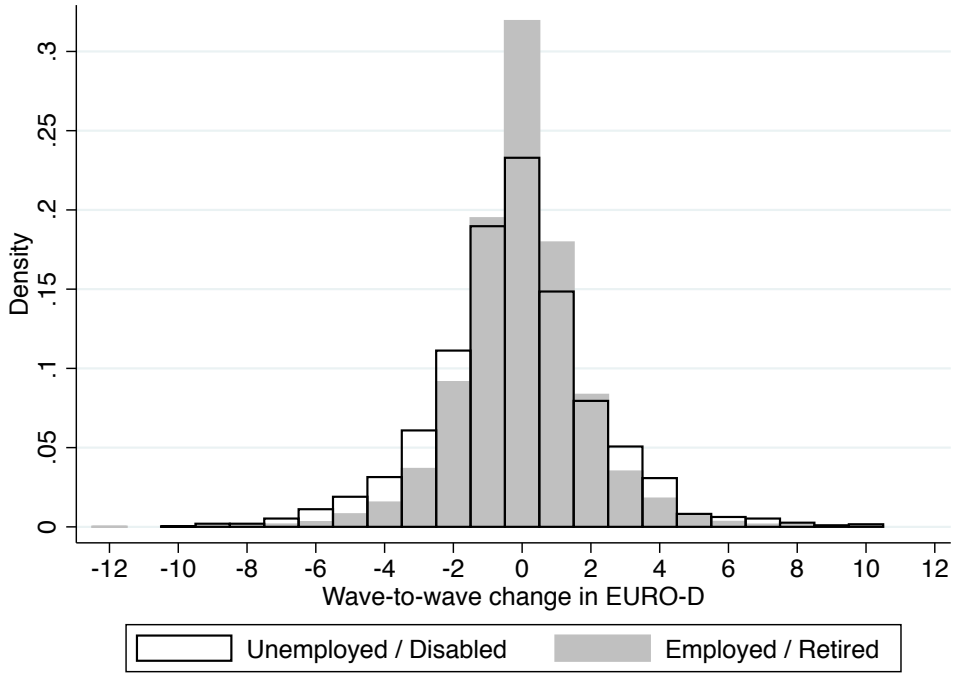
	OLS			Fixed effects		
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Outcome	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D	EURO-D
I(UD$_{iacw}$)	0.845***	0.498***	0.903***			
	(0.132)	(0.0969)	(0.147)			
Ret$_{acw}$	-0.148		-0.136	0.00115		-0.0364
	(0.177)		(0.178)	(0.267)		(0.269)
I(UD$_{iacw}$) × Ret$_{acw}$	-0.777***		-0.808***	-0.671*		-0.563
	(0.213)		(0.214)	(0.395)		(0.392)
Social activities		-0.0803*	-0.0781*		0.0172	0.0174
		(0.0443)	(0.0443)		(0.0566)	(0.0566)
I(UD$_{iacw}$) × social activities		-0.128	-0.138		-0.200	-0.202
		(0.138)	(0.137)		(0.165)	(0.166)
Age	0.0122	-0.00333	0.0117	-0.0164	-0.0412	-0.0339
	(0.0127)	(0.00457)	(0.0127)	(0.0536)	(0.0518)	(0.0534)
Educational attainment						
Primary	-0.292	-0.264	-0.288			
	(0.187)	(0.190)	(0.190)			
Lower secondary	-0.286	-0.257	-0.276			
	(0.189)	(0.194)	(0.194)			
Upper secondary	-0.444**	-0.408**	-0.420**			
	(0.184)	(0.189	(0.189)			
Post-secondary	-0.510**	-0.448**	-0.488**			
	(0.211)	(0.216)	(0.215)			
First stage tertiary	-0.513***	-0.463**	-0.476**			
	(0.185)	(0.190	(0.190)			
Second stage tertiary	-0.768***	-0.687**	-0.677**			
	(0.295)	(0.311)	(0.310)			
Marital status						
Partnered	0.092	0.100	0.091	0.488	0.495	0.502
	(0.099)	(0.101)	(0.100)	(0.462)	(0.469)	(0.468)
Separated	0.554*	0.568**	0.556*	-0.957	-0.980	-0.968
	(0.292)	(0.288)	(0.291)	(1.040)	(1.043)	(1.040)
Divorced	0.340***	0.355***	0.347***	0.325	0.269	0.256
	(0.110)	(0.110)	(0.110)	(0.438)	(0.448)	(0.449)
Widowed	0.676***	0.674***	0.681***	1.519***	1.498***	1.504***
	(0.167)	(0.167)	(0.168)	(0.455)	(0.462)	(0.462)
Never married	0.219*	0.255**	0.219*	-0.372	-0.426	-0.399
	(0.118)	(0.120)	(0.119)	(0.745)	(0.754)	(0.748)
ADL	0.671***	0.664***	0.660***	0.545***	0.503***	0.502***
	(0.079)	(0.081)	(0.081)	(0.114)	(0.117)	(0.116)
IADL	0.501***	0.552***	0.544***	0.180	0.369**	0.366**
	(0.111)	(0.120)	(0.120)	(0.161)	(0.147)	(0.147)
HH income ('0 000 EUR)	-0.010	-0.009	-0.008	-0.009	-0.011	-0.010
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
Constant	1.038	1.864***	1.064			
	(0.688)	(0.353)	(0.690)			
Observations	8,013	7,950	7,950	7,294	7,184	7,184
Adjusted R^2	0.116	0.111	0.115	0.501	0.505	0.505
Country dummies	Yes	Yes	Yes	No	No	No
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: DiD regression of mental health on the fraction of retirees (Ret_{acw}) as in equation 2 with individual fixed effects. Columns 2 and 5 replace the fraction of retirees (Ret_{acw}) with an indicator variable for weekly social activities and columns 3 and 6 add the indicator variable for weekly social activities to the baseline specification in columns 1 and 4, respectively. In line with equation 2 we use $I(UD_{iacw})$ to refer to the estimate for γ_1, Ret_{acw} for γ_2, and $I(UD_{iacw}) \times Ret_{acw}$ for γ_3. We only use survey waves 1 and 2 of SHARE because information on social variables is only available in those survey waves. The estimates for the educational attainment dummies are relative to individuals with no education and the estimates for the marital status dummies relative to married individuals. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Figures



(a) *EURO-D scores*



(b) *Changes in EURO-D scores between consecutive survey waves*

Figure 1: *Distribution of EURO-D scores (panel a) and changes in EURO-D scores between consecutive survey waves (panel b) for men aged 50-70 in the stacked sample.*

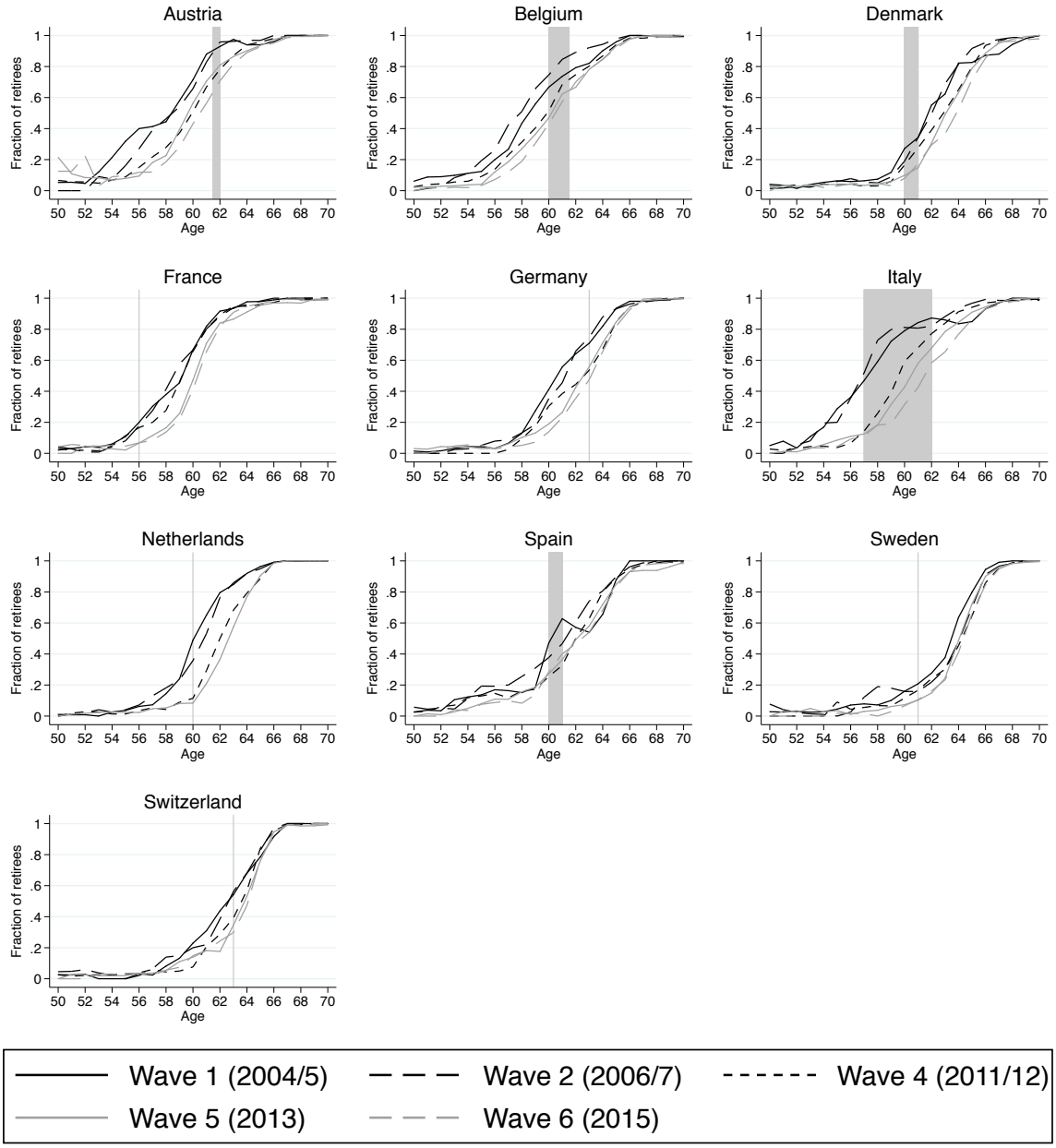
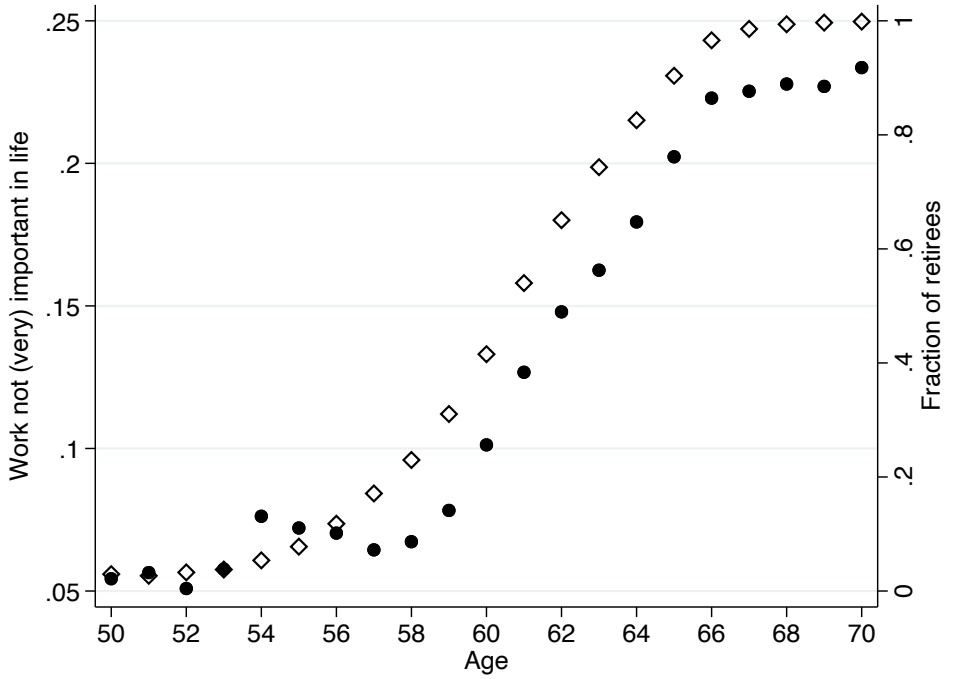
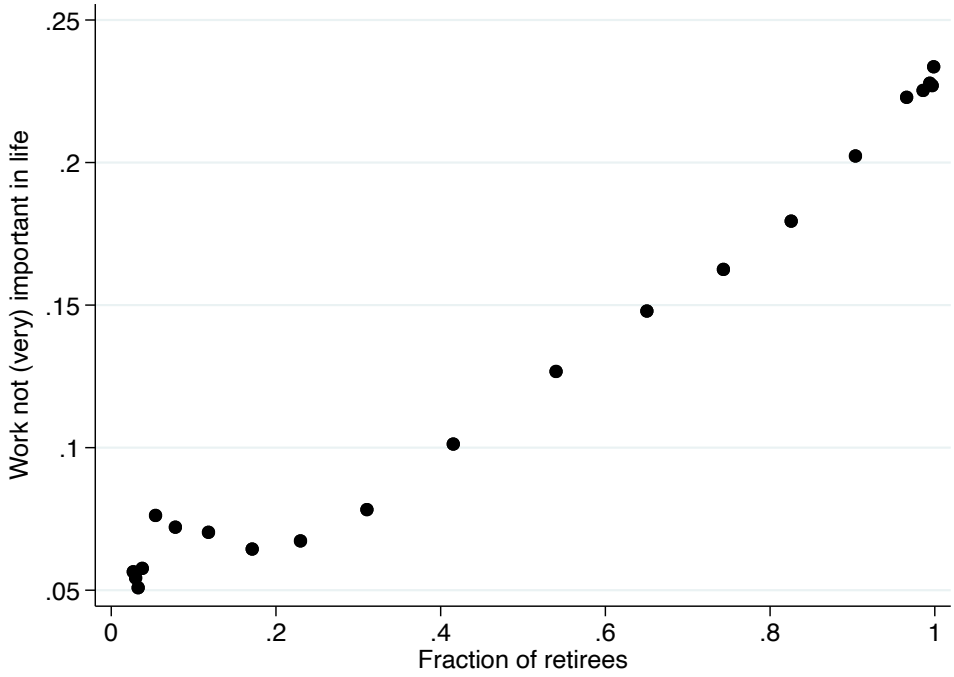


Figure 2: *Fraction of retirees Ret_{acw} by country and wave over ages 50-70*

Notes: Fraction of retirees Ret_{acw} variable as used in our main regression specification (see equation 1). Grey lines/areas indicate the (range of) early retirement eligibility age(s) in the survey years (see Table B.2). The figure uses the pooled sample (see section 2.1).



(a) *Self-reports about the importance of work (solid dots; left-hand y-axis) and the fraction of retirees (hollow diamonds; right-hand y-axis)*



(b) *Correlation of self-reports about the importance of work and the fraction of retirees*

Figure 3: *Validation of the social norm of work proxy*

Notes: Figures use data from SHARE and the European Values Study to validate the fraction of retirees as a social norm of work proxy. The figure uses SHARE and EVS data collected in roughly the same time period: SHARE data from waves 2 (2007/7) and 4 (2011/12) and EVS data from waves 4 (2008-2010) and 5 (2017-2020) for the 10 European countries in the sample. Both the fraction of retirees and the fraction of men reporting that work is not important are calculated using a three-year moving age band.

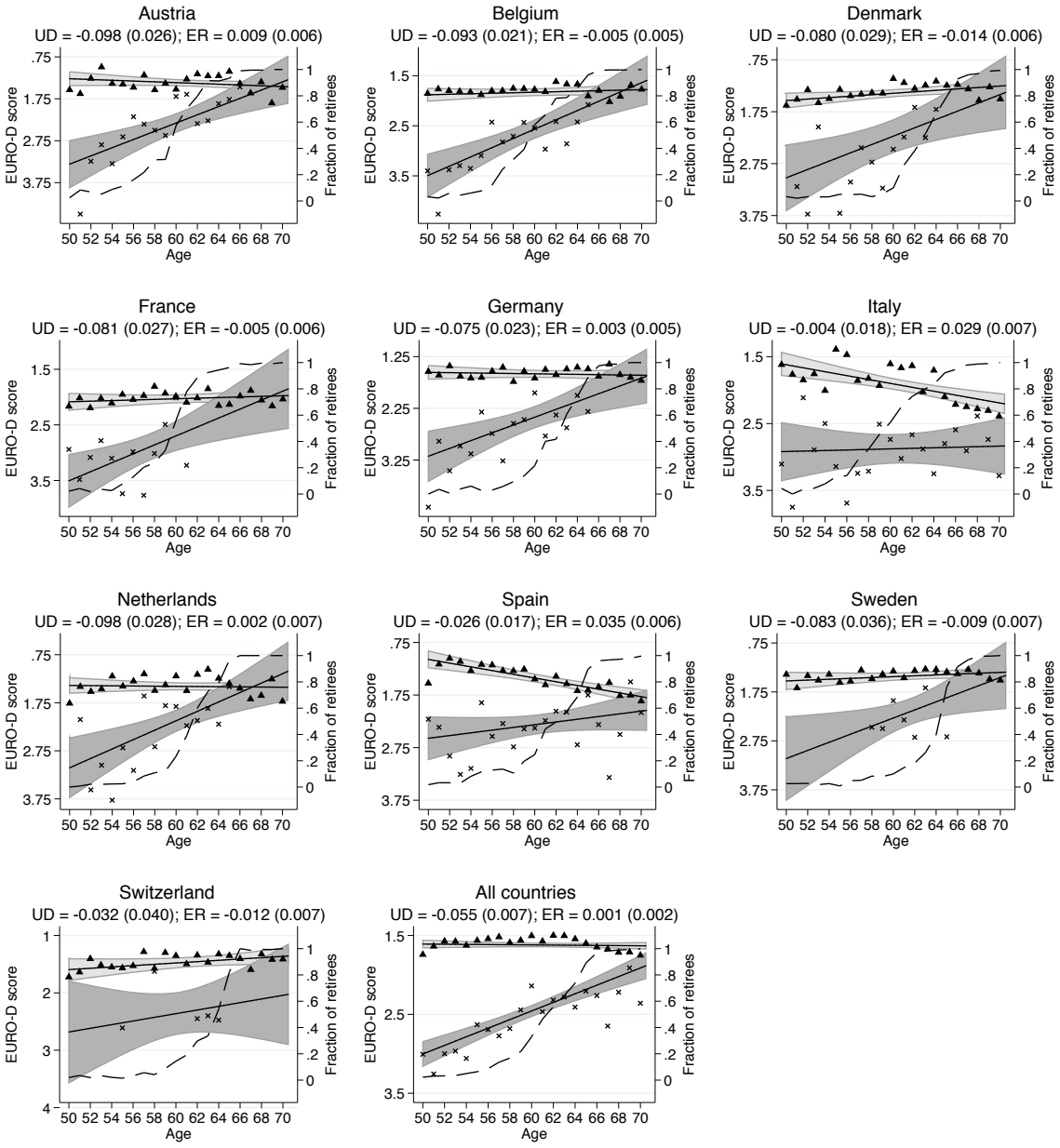


Figure 4: *Mental well-being convergence of unemployed / disabled and employed / retired men*

Notes: Fraction of retirees (dashed line, vertical axis on the right) and EURO-D scores (vertical axis on the left) for unemployed / disabled (crosses) and employed / retired individuals (triangles) by country and age in years. The EURO-D score ranges from 0 (best mental well-being) to 12 (worst mental well-being). Average EURO-D scores are plotted for age groups with a minimum cell size of 15. Linear fits and their 95 percent confidence intervals are based on individual-level data, controlling for educational attainment, marital status and labor-market status. All plots are averaged over the five survey waves in the pooled sample (section 2.1). Estimated linear age coefficients with their standard errors in brackets are reported above each country plot for the unemployed / disabled (UD) and employed / retired (ER). The vertical axis has been adjusted for each country to visually capture the full extent of mental well-being convergence (to reflect that the initial mental well-being gap differs across countries). Standard errors are clustered at the individual level.

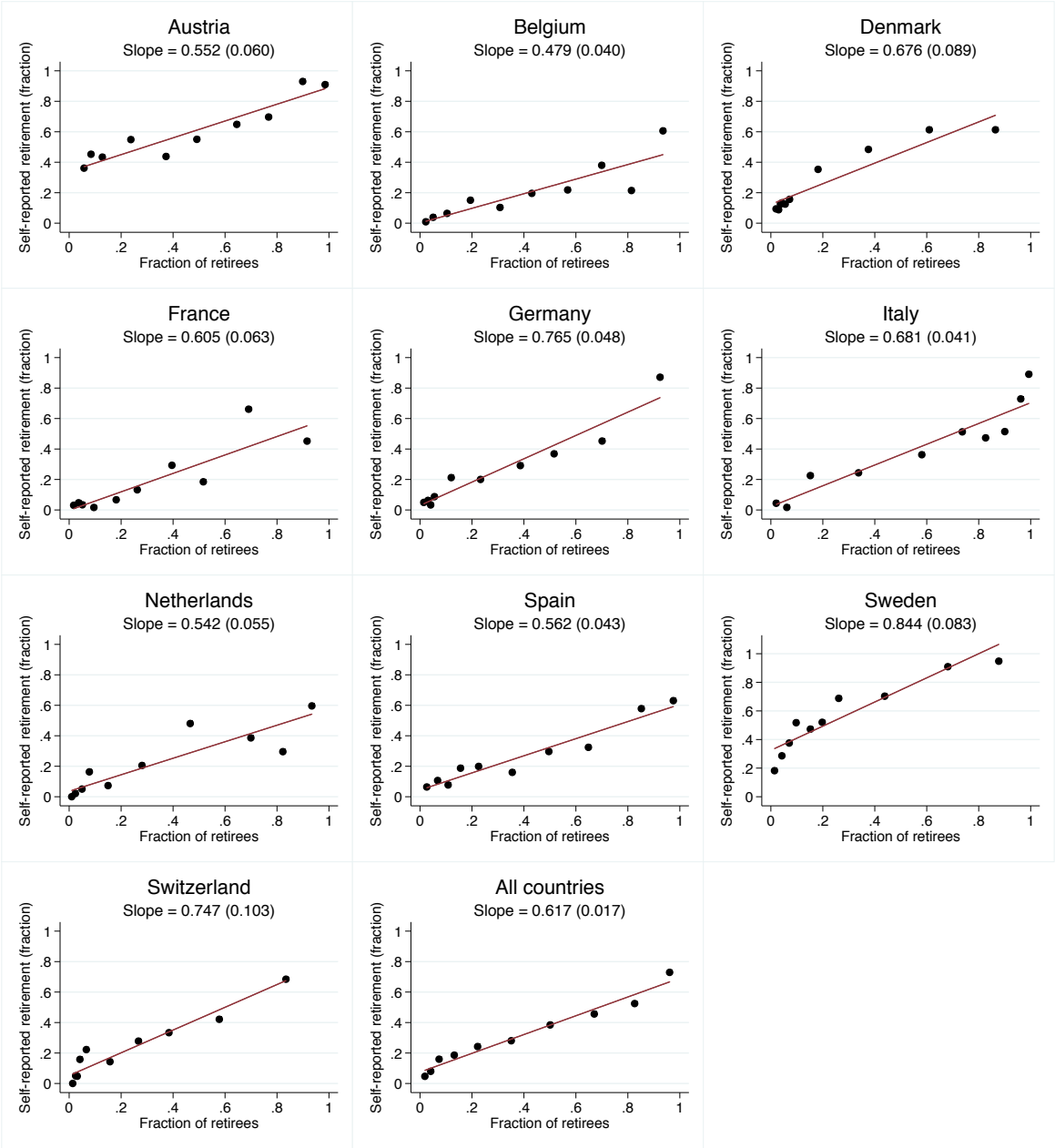


Figure 5: *Self-reported retirement of unemployed / disabled individuals by fraction of retirees* Ret_{acw}

Notes: Self-reported retirement as a function of the age, wave and country specific fraction of retirees Ret_{acw} *for men aged 50-70 based on the pooled sample (see section 2.1). Each point plots the fraction of unemployed / disabled individuals (based on their income source) who self-report to be retired within 10 percent of the data ("deciles") along the fraction of retirees* Ret_{acw}*. The red line represents a linear regression based on individual level data and its slope coefficient is reported above each of the plots with standard errors in parentheses.*

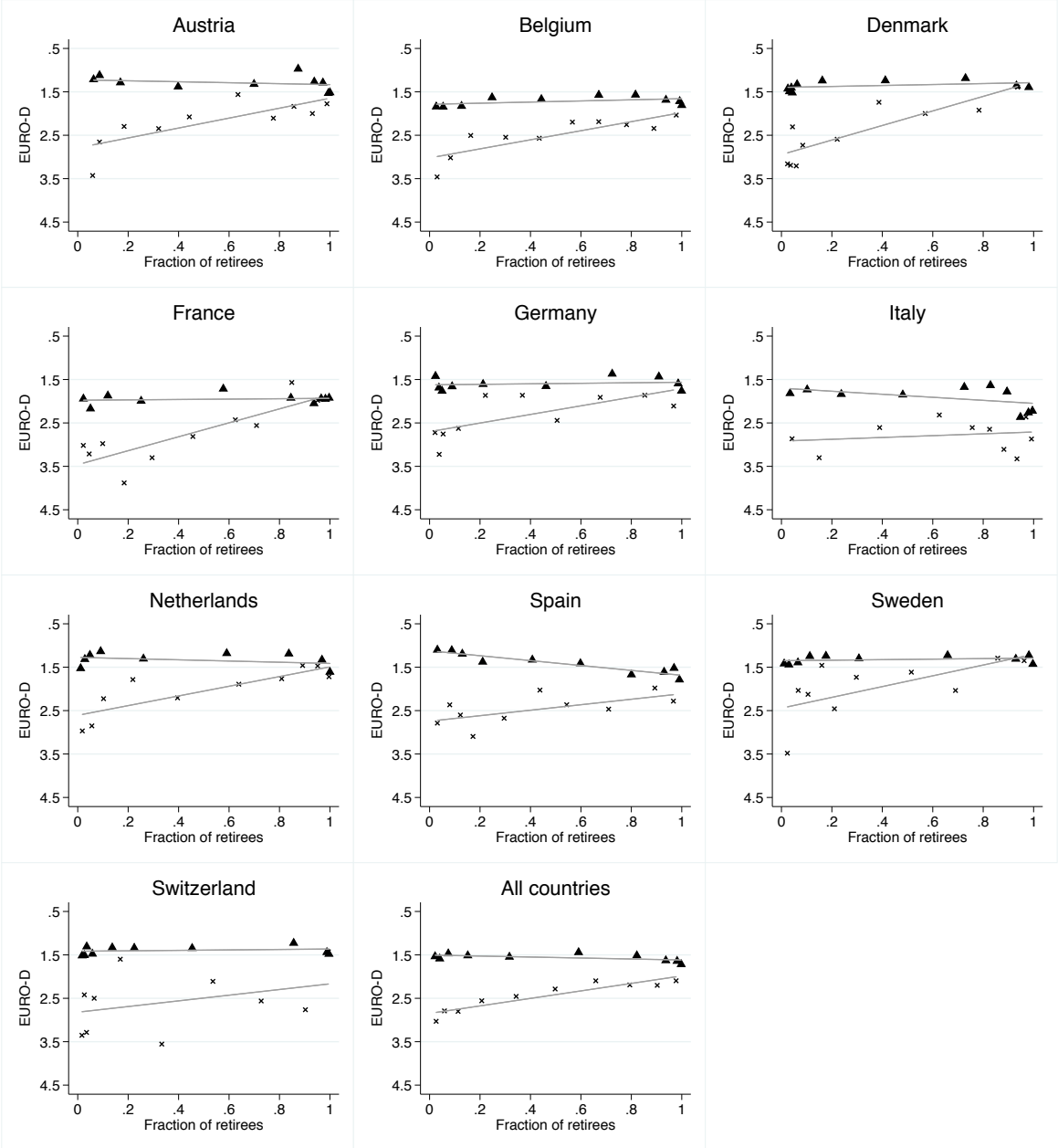


Figure 6: *Mental well-being convergence in the fraction of retirees* Ret_{acw}

Notes: Binned scatter plot of the mental well-being (EURO-D) of the unemployed / disabled (crosses) and the employed / retired (triangles) as a function of the fraction of retirees Ret_{acw}*, averaged over survey waves. Each point plots the average EURO-D score and fraction of retirees* Ret_{acw} *within a decile (10%) of the data along the fraction of retirees* Ret_{acw}*. The linear fits visualize the DiD analyses by country as in equation 2. The figure is based on data from the stacked sample as described in section 2.1.*

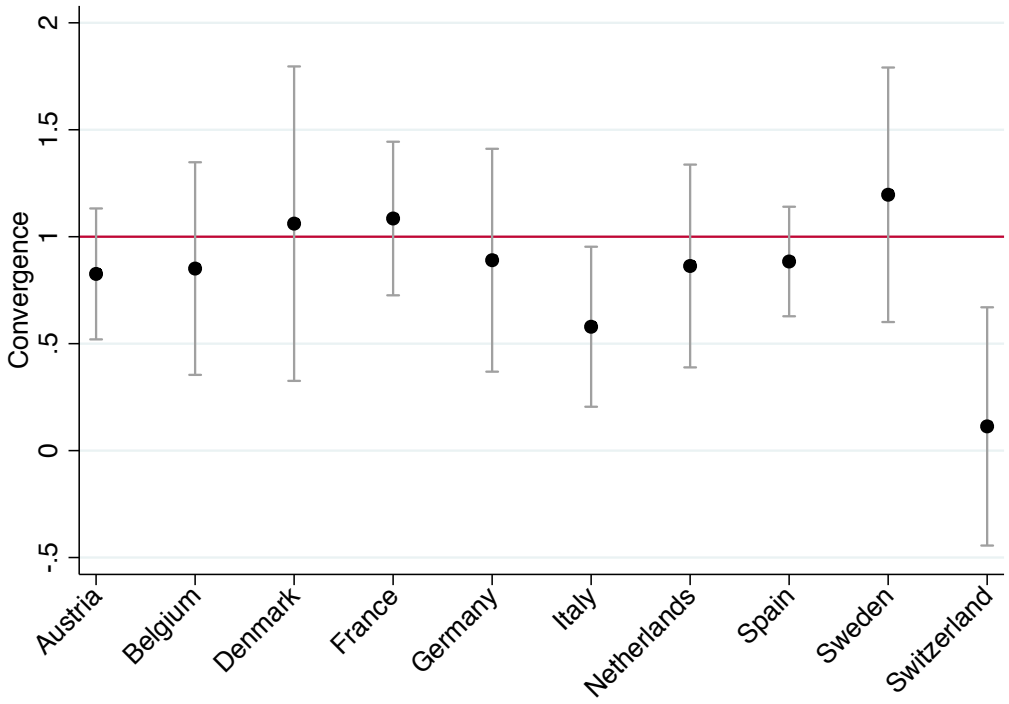


Figure 7: *Estimated mental well-being convergence by country*

Notes: Estimates and one standard error from country regressions of the degree of convergence $\hat{\gamma}_3/\hat{\gamma}_1$ *(where 1 equals full convergence) for each of the ten countries. Appendix Table B.3 provides more detail on the estimations by country. The figure is based on data from the stacked sample as described in section 2.1. Standard errors are clustered at the individual level. Italy lies within 1.1 and Switzerland within 1.6 standard deviations.*

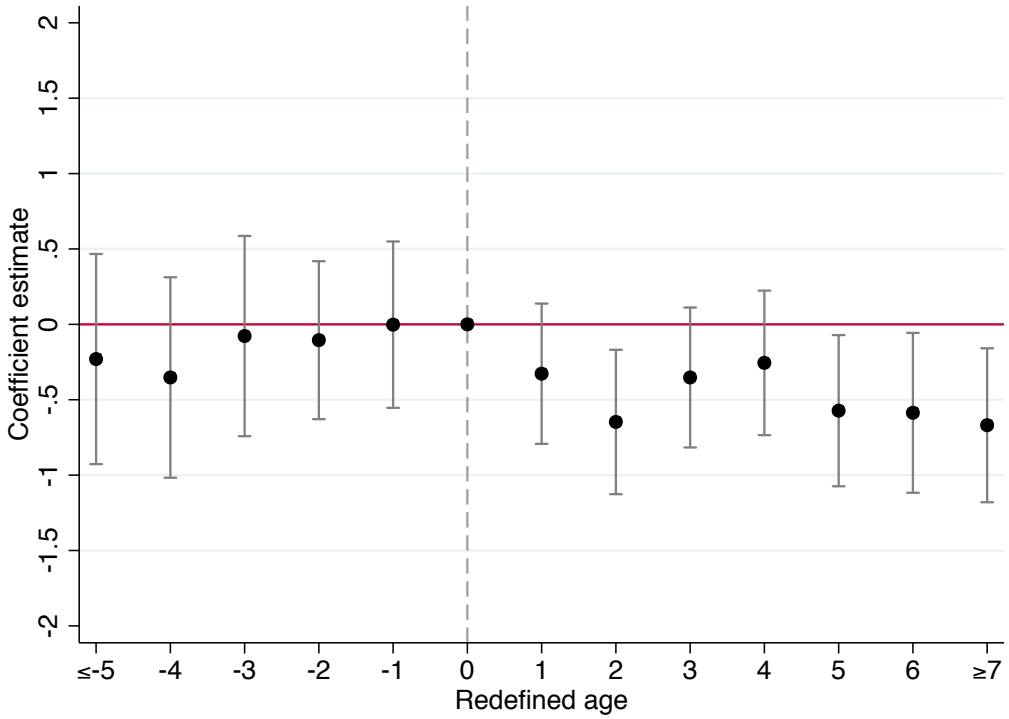
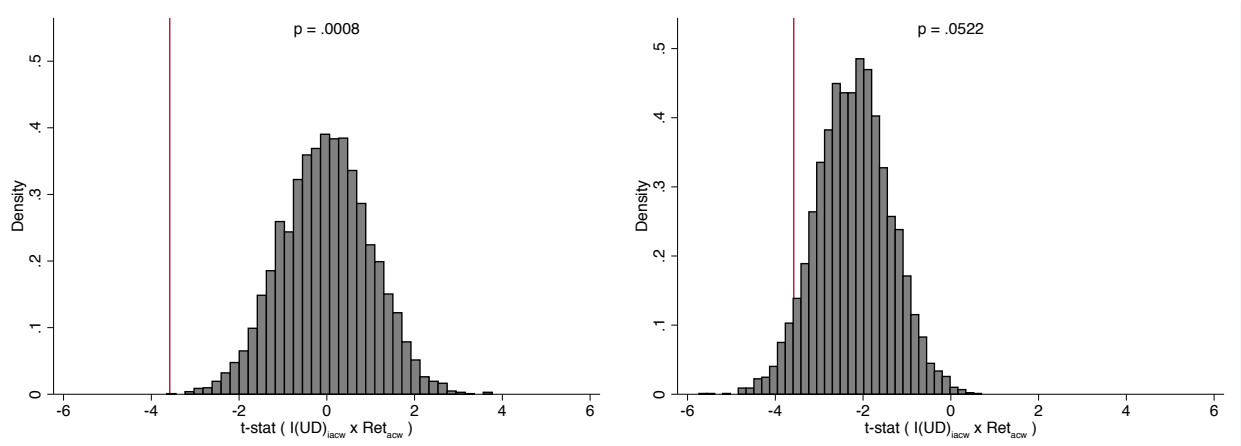


Figure 8: *Analysis of the common retirement trend*

Notes: Analysis of the common retirement trend using redefined age dummies centered around the age at which the faction of retirees Ret_{acw} first reaches 10%, which we redefine as age 0. We assume that, at ages prior to this 10% threshold, the social norm for males is to work, so that this constitutes our pre-trend. We regress mental well-being on the rescaled age dummies, age dummies interacted with unemployment / disability, our full set of control variables (see column 6 of Table 7), and individual fixed-effects. The plot shows the estimates and 95% confidence intervals for the interactions between the age dummies and the treatment status (being unemployed / disabled). Standard errors are clustered at the individual level.



(a) *Pseudo-treatment within full sample*

(b) *Pseudo-treatment within age cells*

Figure 9: *Placebo tests of the social norm of work effect*

Notes: Distribution of t-statistics of 5,000 pseudo-treatments and t-statistic of 3.58 from actual treatment (red line). The p-values report the fraction of pseudo-treatment t-statistics that is in absolute value larger than the actual t-statistic. Figure 9a assigns at random a fraction of retirees Ret_{acw} to each individual in the data set, keeping the distribution of the fraction of retirees variable within the pseudo-sample equal to the distribution in the actual stacked sample. Figure 9b applies the same method but randomizes the fraction of retirees Ret_{acw} within each age cell. Regressions are as in column 6 of Table 7. Standard errors are clustered at the individual level.

A Appendix

A.1 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

A.2 Comments on retirement ages

Below we provide a brief overview of the relevant policies that affect the normal retirement age (NRA) and early retirement age (ERA) for the countries and cohorts included in the SHARE data. Our main sources for the retirement eligibility ages are MISSOC (2017) and OECD (2005, 2007, 2009, 2011, 2013, 2015), supplemented by additional sources per country as referenced below.

In calculating the time since earliest possible retirement $TimeRet_{icw}$ variable we always use the ERA that is relevant for individual i's birth year and month. First, we calculate time since earliest possible retirement $TimeRet_{icw}$ in months based on the birth month and year of the individual

and the early retirement eligibility age ERA_{ic} in months. However, early retirement eligibility ages ERA_{ic} are determined with substantial error, e.g. because countries often have various rules about minimum years of contributions to the pension system, and therefore we expect substantial measurement error in the time since earliest possible retirement $TimeRet_{icw}$ in months. To reduce the noise from such measurement error we convert time since earliest possible retirement $TimeRet_{icw}$ from months to years, i.e. divide by twelve, and take the integer value of the resulting outcome.

- Austria:
  - NRA is 65 for men and 60 for women.
  - ERA has been reformed in 2000 and 2003 (see Staubli and Zweimüller (2013) for details). Although there are various retirement paths, we use the ERAs that apply to the largest fraction of the population, which means we follow the reform as described in Staubli and Zweimüller (2013): Before 2000 the ERA was 60 for men and 55 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. However, the government introduced a "corridor pension" on January 1 2005, essentially capping the ERA for men at 62. 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. Due to the stepwise increase the ERA changes within calender years. Therefore the ERAs described in Table B.2 are rounded of to 1 decimal for men in 2004 and women over the entire 2004-2015 time period.
- Belgium:
  - NRA for men is 65. For women the NRA has gradually increased from 63 to 65 over the 2004-2015 period.
  - ERA used to be 60 for both men and women. Since 2012 it is increasing by 0.5 years each year to reach 63 in 2018 (Belgian Federal Pension Service, 2018).
- Denmark:

- NRA was lowered from 67 to 65 in 2004, affecting individuals born 1 July 1939 or later (Mazzonna and Peracchi, 2016).
- For individuals born before 1-1-1954 the ERA is 60 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 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:
  - NRA was lowered from 65 to 60 in 1983. Gradual increases in NRA for birth cohorts born on 1 July 1951 or later. First increase for 1951 is of 4 months (relevant in 2011). Since then the NRA increases by 5 months per birth year to reach 62 for persons born in 1955 or later (MISSOC, 2017). Table B.2 reports the ages that are relevant to the largest fraction of individuals in 2011 (age 60) and 2015 (age 61.6) Leimer (2017).
  - ERA is set at age 56 for individuals with a sufficiently long career (MISSOC, 2017).

- Germany:
  - NRA was set at 65 in 1965 for both men and women. Under the Pension Insurance Retirement Ages Act (RV-Altersgrenzenanpassungsgesetz) of 20 April 2007 the NRA will gradually increase from 65 to 67 between 2012 and 2029, first affecting those born in 1947. First the retirement age will increase by 1 month per year until it reaches 66, followed by a 2 month per year increase until it reaches 67 (MISSOC, 2017).
  - ERA is 63 years for men although under various conditions (e.g. unemployment) it was already possible at age 60 in earlier years (e.g. see Berkel and Börsch-Supan (2004)). For women born before 1952 the ERA is 60, thereafter 63.

- Italy:
  - NRA was 65 for men and 60 for women. In 2012 this increased to 66 for men and 62 for women, continuing to increase to 66 years and 3 months for men and 62 years and 3

months for women in 2013. For women the increase continued to 63 years and 9 months in 2015 (MISSOC, 2017). (There are some differences between the public and private sector, we follow private sector retirement ages as private sector workers can retire at earlier ages.)

  - We use 57 years as the ERA for cohorts born before 1-1-1951. After that ERA of 58 years for individuals born in 1951, 59 years for individuals born in 1952, and 60 years for individuals born on or after 1-1-1953. However, in general the ERA is based on years of contribution, sometimes in combination with an age threshold. There have been numerous policy reforms and differences between occupations (e.g. see Brugiavini and Peracchi 2012), making it difficult to determine ealry retirement ages for individuals in the SHARE data.

- The Netherlands

  - NRA was 65 for both men and women until 2012. Starting in 2013 it increased by 1 month each year (MISSOC, 2017).
  - The Netherlands has never had an official ERA. However, there there have been various pathways to early retirement including lenient DI and UI policies. Overall, most pension funds offered the option of early retirement at age 60 for individuals born before 1-1-1950 (although this was age 61 for those working in the public sector) but no such arrangement for individuals born later. Hence, we only apply the early retirement age of 60 to individuals born before 1-1-1950 (for details on early retirement in the Netherlands see (Kapteyn et al., 2010; Kalwij et al., 2018)).

- Spain:

  - NRA is 65 for both men and women (MISSOC, 2017).
  - ERA was 60 for prior to 2011 and 61 from 2011 onward for both men and women(OECD, 2005, 2007, 2009, 2011, 2013, 2015).

- Sweden:

  - NRA is 65 for both men and women (OECD, 2005, 2007, 2009, 2011, 2013, 2015).

  - ERA is 61 for both men and women (OECD, 2007, 2009, 2011, 2013, 2015).

- Switzerland:

  - NRA is 65 for men and 64 for women (OECD, 2005, 2007, 2009, 2011, 2013, 2015).

  - ERA is 63 for men and 62 for women (OECD, 2005, 2007, 2009, 2011, 2013, 2015).

B Appendix Tables

Table B.1: *Number of observations (N) by country and wave for men aged 50-70*

	Wave					
Country	1	2	4	5	6	Total
Austria	493	339	1,523	1,182	821	4,358
Belgium	1,231	1,025	1,687	1,764	1,780	7,487
Denmark	559	880	757	1,359	1,203	4,758
France	967	886	1,709	1,263	1,095	5,920
Germany	1,068	907	450	1,852	1,323	5,600
Italy	829	917	1,020	1,318	1,475	5,559
Netherlands	1,020	891	860	1,291	0	4,062
Spain	628	670	1,001	1,838	1,400	5,537
Sweden	978	839	498	1,270	962	4,547
Switzerland	316	467	1,198	921	755	3,657
Total	8,089	7,821	10,703	14,058	10,814	51,485

Notes: Pooled sample of men aged 50-70 (see section 2.1).

Table B.2: *Early (E) and normal (N) retirement eligibility ages for men by country and wave*

	2004		2005		2006		2007		2011		2012		2013		2015	
	E	N	E	N	E	N	E	N	E	N	E	N	E	N	E	N
Austria	61.5	65	62	65	62	65	62	65	62	65	m	m	62	65	62	65
Belgium	60	65	60	65	60	65	60	65	60	65	m	m	60.5	65	61.5	65
Denmark	60	65	60	65	60	65	60	65	60	65	m	m	60	65	61	65
France	56	60	56	60	56	60	56	60	56	60	m	m	56	60.75	56	61.58
Germany	63	65	63	65	63	65	63	65	63	65	63	65.08	63	65.17	63	65.33
Italy	57	65	57	65	57	65	57	65	60	65	m	m	60	66.25	62	66.25
Netherlands	60	65	60	65	60	65	60	65	.	65	m	m	.	65.08	.	65.25
Spain	60	65	60	65	60	65	60	65	61	65	m	m	61	65	61	65
Sweden	61	65	61	65	61	65	61	65	61	65	m	m	61	65	61	65
Switzerland	63	65	63	65	63	65	63	65	63	65	m	m	63	65	63	65

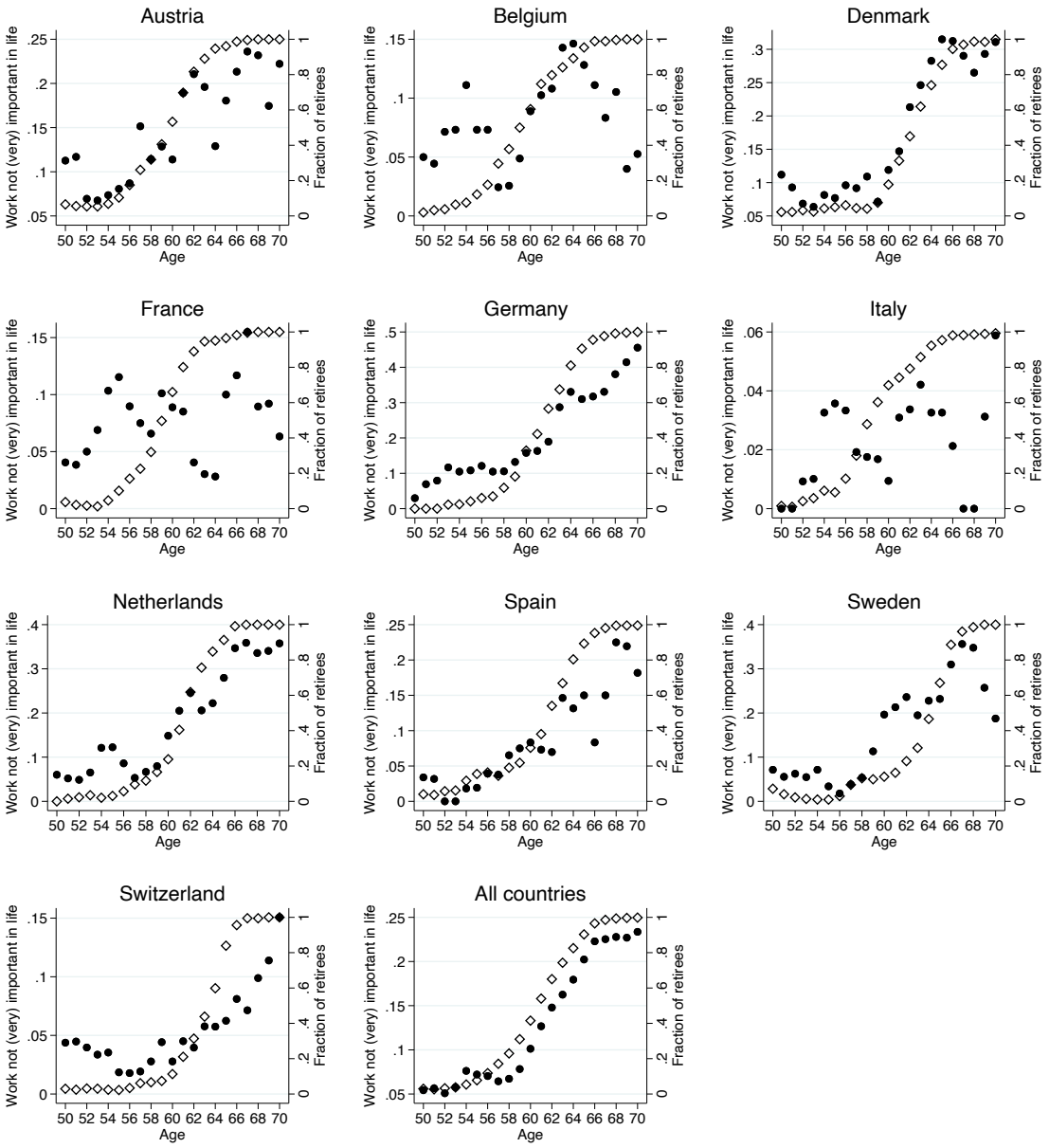
Notes: Most common early (E) and normal (N) retirement age by country and year. A full stop indicates there is no option for early retirement and "m" indicates missing (for 2012 SHARE data was only collected for Germany). To determine the exact retirement eligibility age for an individual one needs to consider the individual's birth year and sometimes additional information such as contributions to the social security system and occupation. See section A.2 for further detail. *Sources*: MISSOC (2017) and OECD (2005, 2007, 2009, 2011, 2013, 2015).

Table B.3: *Mental health convergence associated with the fraction of retirees by country*

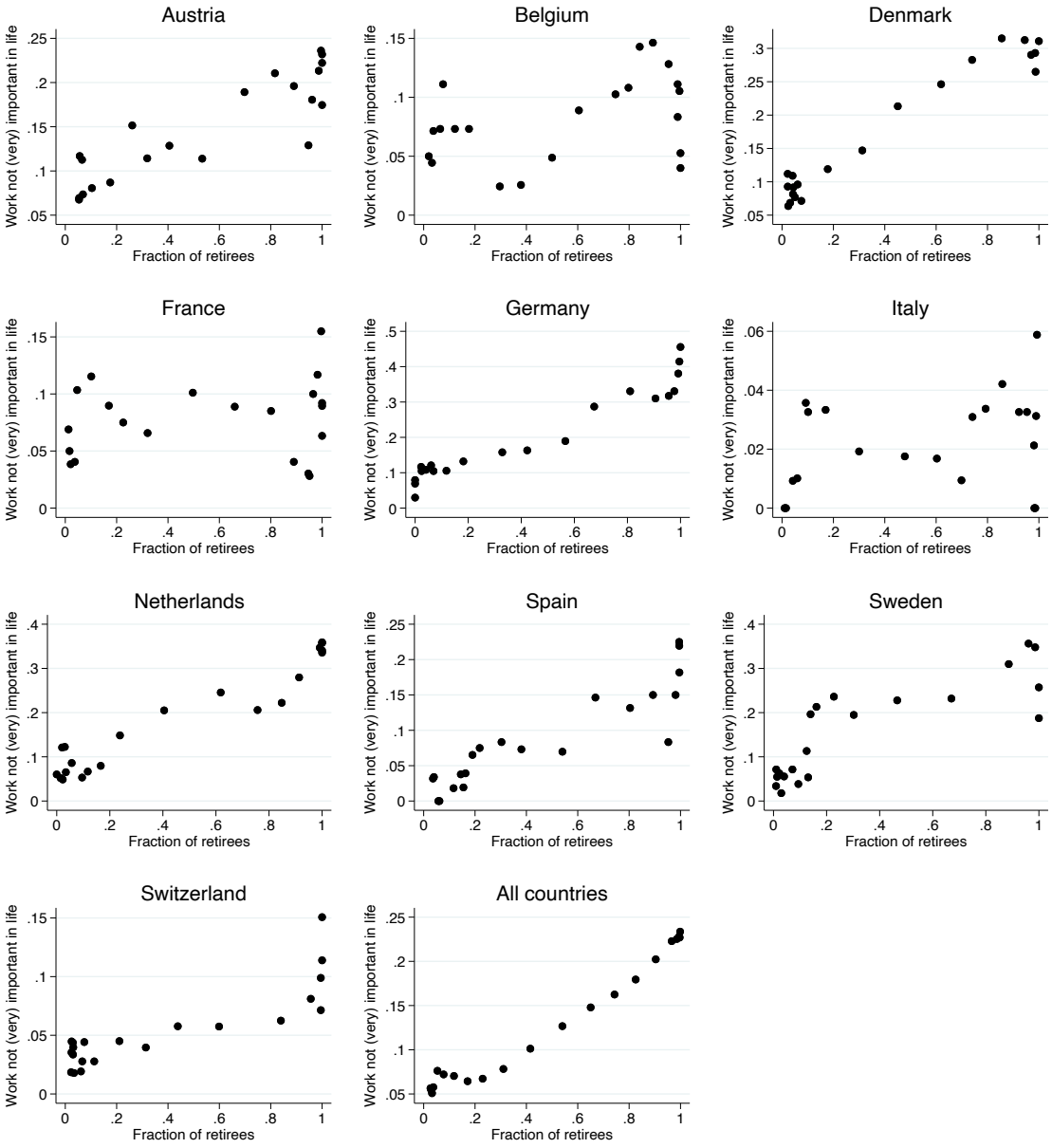
	$\hat{\gamma_1}$	$\hat{\gamma_2}$	$\hat{\gamma_3}$	Adj. R^2	N	Convergence $\hat{\gamma_3}/\hat{\gamma_1}$
Austria	1.303	-.273	-1.077	.119	3,476	.826
	(.241)	(.342)	(.345)			(.306)
Belgium	.736	-.365	-.626	.124	5,290	.851
	(.204)	(.348)	(.322)			(.497)
Denmark	.756	.063	-.802	.115	3,152	1.061
	(.271)	(.234)	(.476)			(.735)
France	1.254	-.129	-1.36	.086	4,002	1.085
	(.234)	(.310)	(.370)			(.359)
Germany	.801	.257	-.713	.101	3,272	.89
	(.210)	(.299)	(.373)			(.521)
Italy	1.171	-.829	-.678	.098	3,123	.579
	(.280)	(.470)	(.407)			(.374)
Netherlands	.996	.292	-.86	.095	1,849	.863
	(.280)	(.288)	(.405)			(.474)
Spain	1.434	-.052	-1.267	.113	3,399	.884
	(.193)	(.385)	(.325)			(.256)
Sweden	.774	.206	-.926	.065	2,517	1.196
	(.223)	(.198)	(.375)			(.595)
Switzerland	1.031	.155	-.117	.080	2,442	.113
	(.351)	(.250)	(.573)			(.557)

Notes: OLS DiD regression of mental health on the fraction of retirees (Ret_{acw}) as in equation 2 using the stacked sample separately for each of the 10 countries. Regressions are as in column 3 of Table 7 and include controls for age (linear), household income, education, marital status, health and country and wave dummies. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

C Appendix Figures



(a) *Self-reports about the importance of work (solid dots; left-hand y-axis) and the fraction of retirees (hollow diamonds; right-hand y-axis)*



(b) *Correlation of self-reports about the importance of work and the fraction of retirees*

Figure C.1: *Validation of the social norm of work proxy*

Notes: Figures use data from SHARE and the European Values Study to validate the fraction of retirees as a social norm of work proxy. The figure uses SHARE and EVS collected in roughly the same time: SHARE data from waves 2 (2007/7) and 4 (2011/12) and EVS data from waves 4 (2008-2010) and 5 (2017-2020) for the 10 European countries in the sample. Both the fraction of retirees and the fraction of men reporting that work is not important are calculated using a three year moving age band.