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Do Pension Reforms Affect Migrants Differently? Evidence from Germany and Spain

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Abstract

This paper examines whether migrants and native-born workers respond differently to pension reforms that encourage longer working lives. Using longitudinal data from SHARE Waves 4–9 for Germany and Spain, we construct individual reform exposure based on country-specific reform timing, birth-cohort eligibility, and proximity to retirement age, and estimate models with individual and survey-wave fixed effects. Reform exposure is associated with a lower probability of retirement, with suggestive evidence of an additional decline among migrants. This migrant differential is particularly pronounced in Spain, while the corresponding estimate is small and statistically insignificant in Germany, although formal cross-country tests do not establish a statistically significant difference between the two countries. Complementary analyses indicate that adjustment is concentrated around retirement ages rather than reflecting a broad increase in employment, while evidence for effects on mental health and generalized trust is limited. Overall, the findings suggest that migrants may respond differently to pension reform, but that these differences are concentrated at specific retirement margins and depend on the institutional context.

JEL classification: J14, J15, J26, H55

Keywords: Migration, Retirement, Mental Health, Generalized Trust, SHARE

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1 Introduction

Population aging and international migration are among the two most important demographic changes confronting European welfare states (Berger et al., 2016). Rising life expectancy and persistently low fertility have substantially increased old-age dependency ratios, placing growing financial pressure on public pension systems (Lee et al., 2014). In response, many European countries have implemented a series of pension reforms, including increases in statutory retirement ages, tighter eligibility requirements, and reductions in early retirement pathways, with the objective of improving fiscal sustainability and encouraging longer working lives (Mastrobuoni, 2009; Coile, 2016). At the same time, international migration has transformed the demographic composition of Europe's labor force. As large migrant cohorts approach retirement age, understanding how pension reforms affect migrants has become increasingly important for both the sustainability and the equity of public pension systems (Heisig et al., 2018; Veldman et al., 2026). If migrants respond differently from native-born workers, reforms that appear successful on average may generate unequal consequences across population groups.

Retirement decisions respond strongly to the financial incentives embedded in public pension systems. Raising retirement ages and restricting access to early retirement delay labor market exit and increase employment among older workers (Mastrobuoni, 2009; Staubli and Zweimüller, 2013; Atalay and Barrett, 2015; Manoli and Weber, 2016; Nivalainen and Ilmakunnas, 2025). Changes in benefit generosity and the financial return to continued employment similarly produce substantial labor-supply responses (Laun and Palme, 2025). These effects are not uniform across the population but vary with individuals' socioeconomic characteristics, including income, wealth, education, and household circumstances (Morris, 2022; Gallo et al., 2018). Nevertheless, existing studies have primarily examined heterogeneity along these dimensions, while little is known about whether pension reforms affect migrants and native-born workers differently.

Migrants are one of the groups most likely to respond differently to pension reforms because they typically enter retirement with fewer financial resources than native-born workers. Across Western Europe, migrants receive lower pension income and accumulate less pension wealth than comparable natives, reflecting disadvantages accumulated throughout the life course (Heisig et al., 2018; Veldman et al., 2026). These disadvantages arise from the imperfect transferability of foreign human capital, language barriers, lower lifetime earnings, fragmented employment histories, and weaker access to occupational pension schemes (Friedberg, 2000; Chiswick and Miller, 2002; Dustmann et al., 2013; Basilio et al., 2017; Adda et al., 2022; Gorshkov, 2024; Albert et al., 2026). In addition, migrants often accumulate pension rights across multiple countries, making retirement incentives dependent not only on employment histories but also on the coordination of different pension systems (Holzmann and Koettl, 2015; Jousten, 2015; Adda et al., 2022). Consequently, pension reforms may affect migrants differently from native-born workers. Lower pension wealth may strengthen incentives to postpone retirement, whereas weaker labor-market attachment and fragmented careers may reduce migrants' ability to remain employed until higher retirement ages. Although the migration literature has documented these disadvantages extensively, little evidence directly examines whether they translate into different

behavioral responses when pension systems are reformed.

Pension reforms may also affect outcomes beyond retirement behavior. Changes in retirement timing influence physical and mental well-being by altering work-related stress, financial security, daily routines, and expectations about later life (Eibich, 2015; Bertoni et al., 2018; Barschkett et al., 2022; Bertoni et al., 2023). Pension reforms may similarly shape broader social attitudes by changing individuals' economic security and perceptions of institutional fairness, which are closely related to generalized trust and confidence in pension institutions (Alesina and La Ferrara, 2002; Mangan et al., 2025). These broader consequences may be particularly important for migrants, who generally possess lower pension wealth and more fragmented employment histories. If pension reforms affect migrants differently from native-born workers, the resulting disparities may extend beyond labor-market behavior to psychological well-being and social trust. However, evidence on these broader distributional consequences remains scarce.

This paper investigates whether migrants respond differently to pension reforms than native-born workers and whether any differences extend beyond retirement behavior to mental health and generalized trust. We use longitudinal data from the Survey of Health, Aging and Retirement in Europe (SHARE) covering Waves 4-9. The main analysis focuses on Germany and Spain, while Italy is considered as an exploratory extension. We exploit differences in reform timing, retirement-age proximity, and cohort eligibility to examine whether reform exposure is associated with differential adjustment among migrants and native-born individuals.

Germany and Spain provide particularly relevant institutional settings for this analysis, as both countries have progressively increased incentives for longer working lives through changes in statutory retirement ages and early-retirement rules. In Germany, the statutory retirement age has been gradually increased from 65 to 67 since 2012, with the transition varying by birth cohort. Spain followed a similar path, with the normal retirement age gradually increasing toward 67 by 2027, alongside tighter early-retirement conditions. These institutional changes generate variation in individuals' exposure to pension reforms according to their age and birth cohort, providing the basis for our empirical measure of reform exposure (OECD, 2025).

The results point primarily to changes in labor-market behavior around retirement ages. Reform exposure is associated with substantial employment adjustment at age 60 and above, whereas the evidence for a broad migrant-specific response is considerably more limited. The estimates for mental health and generalized trust are less systematic, and the heterogeneity analysis provides only limited evidence that differential responses are concentrated among lower-educated individuals, respondents in poor health, or women. Taken together, the findings suggest that the main margin of adjustment is labor supply around retirement ages rather than a large and uniform migrant-specific response across all outcomes.

The remainder of the paper is organized as follows. Section 2 reviews the related literature and discusses the institutional mechanisms through which pension reforms may affect migrants and native-born workers differently. Section 3 describes the SHARE data, sample construction, and main variables. Section 4 presents the empirical strategy. Section 5 reports the main retirement,

labor-supply, mental-health, trust, and dynamic results. Section presents robustness checks and additional extensions. The final section concludes.

2 Literature Review

2.1 Pension Reforms and Retirement Behavior

Retirement decisions are strongly shaped by the incentives embedded in public pension systems. By changing the relative payoff from continued work and labor market exit, reforms that raise retirement ages, tighten eligibility conditions, or reduce early retirement incentives tend to delay retirement and increase employment among older workers. This relationship has been documented using a range of empirical designs and across different institutional settings, including the United States, Austria, Australia, and Finland (Mastrobuoni, 2009; Staubli and Zweimüller, 2013; Atalay and Barrett, 2015; Manoli and Weber, 2016; Coile, 2016; Nivalainen and Ilmakunnas, 2025). Pension reforms therefore operate not only as fiscal adjustments but also as important determinants of retirement behavior.

Despite substantial evidence on average policy effects, comparatively less is known about whether pension reforms affect population groups differently. This question is particularly relevant for migrants, whose employment histories, contribution records, and exposure to pension institutions may differ from those of native-born workers. These differences may generate distinct responses to otherwise similar pension reforms. Examining migrant-native heterogeneity therefore extends the existing literature beyond average retirement responses.

2.2 Economic Challenges Faced by Migrants

In Europe, population aging has coincided with sustained international migration, making migrant retirement increasingly relevant for assessing the distributional consequences of pension reforms. Heisig et al. (2018) document substantial immigrant–native inequalities in retirement income across sixteen Western European countries: even after accounting for age, education, and occupational position, immigrant men receive approximately 28 per cent lower retirement income than comparable native men, with a corresponding gap of 29 per cent among women. The magnitude of these gaps varies across countries, indicating that pension institutions can mitigate or reinforce disadvantages accumulated over the life course. These disparities reflect differences in migration histories, labor-market trajectories, household circumstances, pension-system design, and retirement planning (Veldman et al., 2026).

A life-course perspective is therefore particularly important for understanding migrant retirement. Retirement resources reflect cumulative employment histories, earnings trajectories, and institutional arrangements rather than circumstances immediately preceding retirement (Dannefer, 2003; Ferraro and Shippee, 2009; Veldman et al., 2026). Because pension entitlements depend on lifetime earnings and accumulated contributions, disadvantages experienced earlier in the working life can persist even when migrants' later labor-market outcomes converge towards those of natives (Coile, 2016).

One important source of this disadvantage is migrants' labor-market position after arrival. Qualifications and work experience acquired abroad are often imperfectly transferable, while

limited language proficiency can further reduce returns to human capital (Friedberg, 2000; Chiswick and Miller, 2002; Dustmann et al., 2013). Migrants may consequently begin with lower earnings and follow different earnings trajectories, depending on migrant selection, arrival cohort, country of origin, and duration of residence (Borjas, 1985; Borjas, 1995; Chiswick and Miller, 2009; Basilio et al., 2017; Adda et al., 2022; Lee et al., 2022; Gorshkov, 2024; Albert et al., 2026). Even where earnings subsequently converge, early income losses can leave migrants with lower lifetime contributions and pension wealth.

Differences in employment continuity can reinforce these disadvantages. Migrants are more likely to experience unemployment, temporary employment, transitions between employment and non-employment, and employment in sectors with greater cyclical instability (Adsera and Chiswick, 2007; Dustmann and Frattini, 2014; Gorshkov, 2024). Employment interruptions reduce pension contributions, while temporary or marginal employment may generate lower contributions and weaker access to occupational pensions. Migrants may therefore approach retirement with fewer statutory and supplementary resources than comparable native workers.

These disadvantages have ambiguous implications for retirement responses to pension reform. On the one hand, lower pension entitlements, limited savings, and weaker access to occupational pensions may make continued employment financially necessary, potentially increasing migrants' responsiveness to reforms that delay or restrict retirement. On the other hand, weaker labor-market attachment may make remaining employed until a higher retirement age more difficult. In this case, reforms may increase time spent in unemployment, inactivity, sickness benefits, or other forms of non-retirement exit rather than extending employment. Pension reforms may therefore prolong employment for some migrants while primarily delaying access to retirement income for others.

Evidence on immigrant retirement patterns is consistent with these competing mechanisms. Using population-wide administrative data from Sweden, Åslund et al. (2024) show that immigrants have a higher probability of retiring than natives from approximately age 50 onwards, yet migrants from more marginal labor-market groups are more likely to remain economically active as they approach the conventional retirement age of 65. These patterns suggest that disadvantaged labor-market attachment may push some migrants toward earlier exit, while incomplete pension accumulation and financial necessity may induce others to work longer. Average immigrant–native differences may therefore conceal substantial heterogeneity by employment history, origin, education, health, gender, and age at migration (Veldman et al., 2026).

2.3 Institutional Challenges Faced by Migrants

Institutional arrangements provide an additional reason why migrants may respond differently to pension reforms. Whereas native workers typically accumulate pension rights within a single national system, migrants often divide their contribution histories across countries, requiring coordination across different retirement ages, contribution rules, and benefit formulas (d'Addio and Cavalleri, 2015; Jousten, 2015; Holzmann and Koettl, 2015). Although EU social-security coordination and bilateral agreements preserve many acquired pension rights, they do not eliminate the complexity associated with fragmented contribution records (Holzmann and Koettl,

2015; Holzmann, 2016). Migrants may therefore qualify for pensions in several countries while receiving benefits from each system based primarily on contributions accumulated within that jurisdiction.

Retirement outcomes consequently depend on the interaction between migration histories and national pension institutions. Simulating common intra-European migration trajectories, Bridgen and Meyer (2019) show that retirement income varies substantially with both migration patterns and pension-system design. Cross-country evidence similarly indicates that immigrant retirement-income gaps differ across welfare states, suggesting that pension institutions can mitigate or reinforce disadvantages accumulated over the life course (Heisig et al., 2018; Veldman et al., 2026).

These institutional differences may become particularly important when reforms raise retirement ages, tighten contribution requirements, or restrict early retirement. Migrants who entered the destination country later or accumulated part of their careers abroad may face different incentives from workers with complete domestic contribution histories. Although foreign contribution periods may count towards eligibility, pension amounts generally remain linked to contributions accumulated within individual national systems (d'Addio and Cavalleri, 2015; Jousten, 2015). Reform responses may therefore vary with migration histories, contribution records, and access to international coordination arrangements, although existing evidence focuses more on these institutional differences than on their behavioral consequences.

Institutional complexity may also create informational barriers to retirement planning. Financial literacy and pension knowledge are positively associated with retirement planning in Germany and the Netherlands (Van Rooij et al., 2011; Bucher-Koenen and Lusardi, 2011), while Topa et al. (2012) show that retirement planning among European immigrants is related to expected pension income, employment status, health, and migration-related characteristics. Migrants may therefore face additional informational challenges when adjusting to pension reforms, although direct evidence on their behavioral importance remains limited.

2.4 Individual Heterogeneity among Migrants

Household circumstances and gender provide additional sources of heterogeneity in responses to pension reforms. Retirement decisions are often made within households and depend on household income, a partner's employment and retirement status, and care responsibilities (Gustman and Steinmeier, 2000). For migrants, these considerations may extend across national borders, as spouses can have different migration histories and pension entitlements, while family members may remain in the country of origin. Retirement decisions may therefore also be linked to return migration and transnational family arrangements (Bolzman et al., 2006; Bijwaard et al., 2014).

Gender may further shape these responses. Migrant women are more likely to experience career interruptions, part-time employment, caregiving responsibilities, and lower lifetime earnings (Ginn, 2003). Combined with migrant-specific labor-market disadvantages and shorter contribution histories, these patterns may result in particularly limited pension entitlements (Heisig et al., 2018; Veldman et al., 2026). The implications for pension reform are nevertheless ambiguous:

greater financial vulnerability may strengthen incentives to remain employed as retirement ages rise, while care responsibilities, poorer health, and weaker labor-market opportunities may limit the ability to do so (Coile, 2016; Andersen et al., 2020). Heterogeneous retirement responses may therefore reflect the interaction of financial resources, household circumstances, and work capacity.

2.5 Broader Consequences of Pension Reforms

Beyond retirement behavior, pension reforms may affect mental health by altering the timing of labor-market exit and exposure to work-related stress and financial insecurity. Exploiting changes in retirement eligibility in Germany, Eibich (2015) show that retirement improves several dimensions of health through increased physical activity, better sleep, and reduced work-related stress. The effects of extending working lives are nevertheless heterogeneous. While Bertoni et al. (2018) find that longer expected working lives encourage healthier behaviors before retirement, Barschkett et al. (2022) show that increases in the statutory retirement age worsen stress-related and mental-health outcomes among affected women, and Bertoni et al. (2023) find increased depressive symptoms among workers in occupations highly exposed to automation risk. These findings suggest that the health consequences of pension reforms depend on employment conditions and workers' capacity to adapt to longer working lives. Such mechanisms may be particularly relevant for migrants, for whom extended employment may improve financial security but also increase psychological strain when suitable employment opportunities are limited.

Pension reforms may also have broader social consequences. Economic insecurity and adverse labor-market experiences are associated with lower generalized trust (Alesina and La Ferrara, 2002), while perceived fairness and trust in pension institutions can shape support for pension reforms and retirement-saving behavior (Van Dalen and Henkens, 2022; Mangan et al., 2025). If migrants are differentially affected by pension reforms because of weaker labor-market attachment or fragmented pension histories, these differences may extend beyond retirement and mental health to generalized trust. Direct evidence on migrant–native differences in this dimension remains limited.

Taken together, the literature provides several reasons to expect heterogeneous responses to pension reforms. Lower pension wealth may strengthen migrants' financial incentives to remain employed, while weaker labor-market attachment, health constraints, and institutional complexity may limit their ability to extend working lives. Despite extensive evidence on migrant disadvantages in retirement resources and growing evidence on immigrant retirement patterns, relatively little is known about whether pension-reform exposure is associated with systematically different retirement responses between migrants and natives. Even less is known about whether such differences extend beyond retirement behavior to mental health and generalized trust. These gaps motivate the empirical analysis that follows.

2.6 Pension Reforms in Germany and Spain

Germany and Spain both reformed their public pension systems to extend working lives by gradually increasing the statutory retirement age, rather than imposing an immediate and

uniform shift on all workers. In Germany, the 2007 reform raised the retirement age from 65 to 67 through a cohort-based phase-in beginning in 2012, initially by one month and later by two months per birth cohort, such that different cohorts faced different statutory retirement ages (Coppola and Wilke, 2014; Geyer et al., 2023). Spain's 2011 reform similarly phased in an increase from 65 to 67 between 2013 and 2027, while linking retirement eligibility to contribution histories; workers with sufficiently long careers, notably at least 38.5 years of contributions, could still retire at 65 (De la Fuente and Doménech, 2013). These institutional features are important for empirical identification because reform exposure varies by birth cohort, calendar year, and eligibility conditions rather than simply before and after the reform date. Accordingly, an indicator of potential exposure identifies respondents subject to the new rules but does not capture the exact month- or year-specific increase in retirement age faced by each individual (Serrano-Alarcón et al., 2023).

3 Data

3.1 Data Source and Sample Construction

The empirical analysis uses Waves 4-9 of the Survey of Health, Aging and Retirement in Europe (SHARE), a longitudinal survey of individuals aged 50 and older. SHARE provides repeated information on employment, retirement, demographics, education, health, mental well-being, and social attitudes. Its panel structure allows us to follow individuals over time and account for time-invariant individual heterogeneity.

Table 1: Sample Construction

Sample restriction	Observations
Merged SHARE person-wave observations	591,873
Germany, Spain, and Italy, ages 50–70	42,799
Main age range, ages 55–67	29,761
Germany–Spain main sample	20,066
Italy extension sample	9,695
Germany–Spain analysis samples	
Non-missing migrant status	15,257
Non-missing retirement status	19,940
Non-missing education	19,771
Mental-health (EURO-D) sample	11,857
Generalized-trust sample	5,983

Notes: The table summarizes the construction of the analytical samples from SHARE Waves 4-9. The main analysis focuses on respondents aged 55-67 in Germany and Spain. Italy is retained as an exploratory extension. Outcome-specific samples differ because of missing information on migrant status, retirement, education, metntal health, and generalized trust. Observations are at the person-wave level.

The analysis focuses primarily on Germany and Spain, with Italy used as an additional institutional comparison in extensions. The initial merged dataset contains 591,873 person-wave observations. Restricting the sample to Germany, Spain, and Italy yields 110,726 observations, which falls to 42,799 when restricting respondents to ages 50–70. Our main analytical window is ages 55-67, resulting in 29,761 observations before variable-specific missing-data restrictions.

The main analytical sample is further restricted to respondents aged 55-67. This age window is chosen to concentrate the analysis on individuals for whom retirement decisions and changes in pension incentives are most relevant while retaining observations on both sides of conventional retirement ages. The resulting sample contains 29,761 person-wave observations before variable-specific missing-data restrictions.

Table 1 summarizes the sample construction. The Germany–Spain main sample contains 20,066 person-wave observations before variable-specific restrictions. Migrant status is available for 15,257 observations, retirement status for 19,940, and education for 19,771. The final mental-health and trust samples contain 11,857 and 5,983 observations, respectively. These differences should be kept in mind when comparing the precision of estimates across outcomes.

3.2 Variables

Table A1 in Appendix A summarizes the construction of the principal variables used throughout the analysis. The primary labor-market outcome is an indicator for retirement status, equal to one when the respondent reports being retired as the current employment status. We complement this measure with an employment indicator and an indicator for employment at age 60 and above. These outcomes allow us to distinguish changes in reported retirement from continued labor-force participation around retirement ages.

Migrant status is constructed using information from the SHARE Demographics module. Specifically, we use the variable DN004, which records whether respondents were born in the country where they are interviewed. We define a binary indicator, Migrant, equal to one for respondents born outside their country of residence and zero for respondents born in that country. To maintain a consistent classification across survey waves, we use the first available non-missing response for each individual.

In the Germany–Spain sample, migrant status is available for 15,257 of the 20,066 person-wave observations. Among these, 13,955 observations are classified as native-born and 1,302 as migrants. Migrant status is missing for the remaining 4,809 observations, which are excluded from analyses requiring this indicator. The classification is time invariant within individuals and therefore does not vary across the survey waves.

The analysis additionally considers receipt of an old-age pension. Pension receipt is identified from the employment and pensions module and equals one when the respondent reports receiving an old-age pension. Because pension receipt is not observed as consistently as the principal employment-status variables, it is used primarily as a descriptive measure rather than as the central outcome of the fixed-effects analysis.

Mental health is measured using the EURO-D depression scale available in SHARE's generated health variables. Higher values correspond to a greater number of depressive symptoms. Generalized trust is obtained from the SHARE social-attitudes module. The measure captures respondents' generalized interpersonal trust and ranges from low to high trust.

The remaining individual characteristics include age, gender, educational attainment, and self-

reported health. Education is based on the harmonized ISCED classification. Low education is defined as ISCED levels 0-2. Poor health is an indicator identifying respondents reporting poor self-assessed health, while the female indicator identifies female respondents. Age enters the empirical specifications both linearly and quadratically to accommodate the pronounced nonlinear relationship between age and retirement.

3.3 Descriptive Statistics

Table 2 reports descriptive statistics for the Germany-Spain main analysis sample. The two country samples are similar in average age with the mean age is 61 in Germany and 61.3 in Spain. The female share is also similar, at 54.5 percent in Germany and 53.9 percent in Spain.

The prevalence of migrants differs more substantially across countries. Migrants account for approximately 10.0 percent of the German sample and 6.8 percent of the Spanish sample. Labor-market outcomes also differ. The retirement rate is 33.7 percent in Germany and 28.8 percent in Spain, while the employment rate is 48.8 percent in Germany and 35.6 percent in Spain.

Differences in educational attainment are particularly pronounced. Only 8.5 percent of the German sample is classified as low educated, compared with 69.6 percent in Spain. Poor self-reported health is more similar across the two countries, at 34.5 percent in Germany and 32.1 percent in Spain. Average mental health scores are 2.30 in Germany and 2.15 in Spain, while average generalized trust is 5.46 and 5.47, respectively.

These unconditional differences provide useful descriptive context but should not be interpreted as consequences of pension reform. The subsequent analysis therefore focuses on within-individual changes and on whether adjustment associated with reform exposure differs between migrants and native-born respondents.

Table 2 also reveals substantial differences between Germany and Spain, particularly in labor-market outcomes and educational attainment. To assess more formally whether pooling the two countries is appropriate, Table 3 reports differences in observable characteristics between Germany and Spain for the full sample and separately for native-born and migrant respondents, together with two-sample tests of equality of means.

The results indicate that Germany and Spain are not descriptively homogeneous, particularly with respect to education and labor-market outcomes. The pooled estimates are therefore complemented by country-specific regressions and formal tests of country heterogeneity.

Table 3 indicates that Germany and Spain differ significantly along several observable dimensions, particularly educational attainment and labor-market status. These differences caution against treating the countries as homogeneous. For this reason, the pooled analysis is complemented below by country-specific estimates and a specification that explicitly allows reform responses to differ between Germany and Spain.

The differences are particularly relevant when the sample is separated by migrant status. Among native-born respondents, Germany has higher employment and slightly higher retirement rates than Spain, while average trust and the female share remain very similar. Among migrants, the

Table 2: Descriptive Statistics by Country and Migrant Status

	Germany					Spain				
Variable	*N*	Mean	SD	Min	Max	*N*	Mean	SD	Min	Max
Panel A: All respondents										
Age	10,538	61.0	3.67	55	67	9,528	61.3	3.65	55	67
EURO-D	8,889	2.30	2.03	0	11	7,815	2.15	2.38	0	12
Female	10,538	0.545	0.498	0	1	9,528	0.539	0.499	0	1
Low education	10,457	0.085	0.279	0	1	9,314	0.696	0.460	0	1
Poor health	10,538	0.345	0.475	0	1	9,528	0.321	0.467	0	1
Retired	10,474	0.337	0.473	0	1	9,466	0.288	0.453	0	1
Trust	3,595	5.46	2.40	0	10	3,692	5.47	2.30	0	10
Working	10,474	0.488	0.500	0	1	9,466	0.356	0.479	0	1
Panel B: Native respondents										
Age	7,434	60.8	3.68	55	67	6,521	61.0	3.65	55	67
EURO-D	6,018	2.31	2.02	0	11	5,046	2.09	2.34	0	12
Female	7,434	0.529	0.499	0	1	6,521	0.519	0.500	0	1
Low education	7,400	0.076	0.264	0	1	6,387	0.698	0.459	0	1
Poor health	7,434	0.338	0.473	0	1	6,521	0.302	0.459	0	1
Retired	7,392	0.307	0.461	0	1	6,472	0.286	0.452	0	1
Trust	2,751	5.45	2.40	0	10	2,834	5.46	2.30	0	10
Working	7,392	0.521	0.500	0	1	6,472	0.387	0.487	0	1
Panel C: Migrant respondents										
Age	823	60.4	3.70	55	67	479	59.8	3.48	55	67
EURO-D	646	2.52	2.16	0	11	346	2.01	2.23	0	10
Female	823	0.553	0.498	0	1	479	0.543	0.499	0	1
Low education	815	0.168	0.374	0	1	475	0.579	0.494	0	1
Poor health	823	0.426	0.495	0	1	479	0.271	0.445	0	1
Retired	820	0.270	0.444	0	1	477	0.105	0.307	0	1
Trust	315	5.41	2.49	0	10	196	6.02	2.22	0	10
Working	820	0.511	0.500	0	1	477	0.480	0.500	0	1

Notes: The table reports descriptive statistics for respondents aged 55–67 in Germany and Spain using SHARE Waves 4–9. Panels A, B, and C report statistics for the full sample, native-born respondents, and migrant respondents, respectively. mental health measures depressive symptoms on a 0–12 scale, with higher values indicating more depressive symptoms. Generalized trust ranges from 0 to 10, with higher values indicating greater trust. Female, low education, poor health, retired, and working are binary indicators. Low education is defined as ISCED levels 0–2. Poor health identifies respondents reporting poor self-assessed health. Sample sizes vary across variables because of item non-response. Because migrant status is missing for some respondents, the native-born and migrant subsamples do not sum to the full sample in Panel A.

employment rate and female share are not statistically different across the two countries, but retirement, EURO-D, trust, age, low education, and poor health differ significantly. Accordingly, the main analysis accounts for country-specific reform timing and examines whether the estimated migrant differential differs between Germany and Spain. Country-specific estimates are additionally used to assess the robustness of the pooled results.

Table 3: Germany–Spain Differences in Observable Characteristics

Variable	Germany Mean	Spain Mean	Difference	p-value
Panel A: All respondents				
Retired	0.337	0.288	0.050	< 0.001
Working	0.488	0.356	0.132	< 0.001
Mental Health	2.30	2.15	0.152	< 0.001
Trust	5.46	5.47	-0.003	0.957
Age	61.0	61.3	-0.232	< 0.001
Female	0.545	0.539	0.007	0.353
Low education	0.085	0.696	-0.611	< 0.001
Poor health	0.345	0.321	0.024	< 0.001
Panel B: Native respondents				
Retired	0.307	0.286	0.022	0.005
Working	0.521	0.387	0.134	< 0.001
Mental Health	2.31	2.09	0.220	< 0.001
Trust	5.45	5.46	-0.003	0.958
Age	60.8	61.0	-0.217	< 0.001
Female	0.529	0.519	0.010	0.254
Low education	0.076	0.698	-0.622	< 0.001
Poor health	0.338	0.302	0.036	< 0.001
Panel C: Migrant respondents				
Retired	0.270	0.105	0.165	< 0.001
Working	0.511	0.480	0.031	0.284
Mental Health	2.52	2.01	0.509	< 0.001
Trust	5.41	6.02	-0.614	0.004
Age	60.4	59.8	0.559	0.006
Female	0.553	0.543	0.010	0.725
Low education	0.168	0.579	-0.411	< 0.001
Poor health	0.426	0.271	0.155	< 0.001

Notes: The table reports differences in mean characteristics between Germany and Spain for respondents aged 55–67 in SHARE Waves 4–9. Panels A, B, and C report comparisons for the full sample, native respondents, and migrant respondents, respectively. The difference is defined as the German mean minus the Spanish mean. The reported p values are from two-sample tests of equality of means. Mental health measures depressive symptoms, and trust is measured on a 0–10 scale. Female, low education, poor health, retired, and working are binary indicators. Differences are calculated as the Germany mean minus the Spain mean. The table compares mean characteristics between Germany and Spain for the full sample, native-born respondents, and migrant respondents. Differences are calculated as the Germany mean minus the Spain mean. The reported p-values are from two-sample tests of equality of means between Germany and Spain. Observation counts may vary across variables because of item non-response.

3.4 Descriptive Evidence

We begin by documenting the evolution of retirement behavior in Germany and Spain before turning to the fixed-effects estimates. In particular, retirement varies strongly with age, country, survey year, and migrant status, while reform exposure is itself constructed using calendar time, birth cohort, and proximity to retirement age.

Figure 1 plots average retirement rates over time separately for Germany and Spain. Retirement

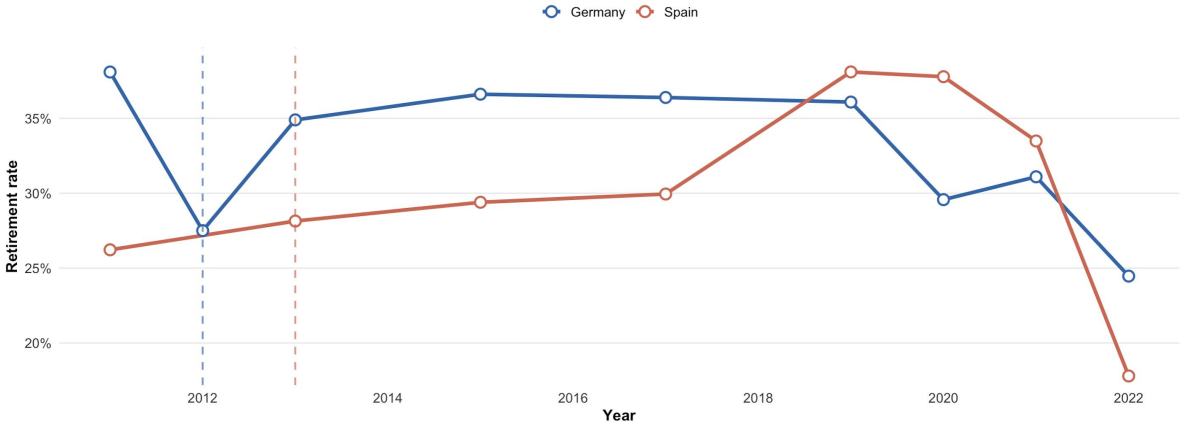


Figure 1: Retirement Rates by Country Over Time

Notes: The figure presents average retirement rates by survey year for Germany and Spain using SHARE Waves 4–9. Retirement status is defined according to respondents' self-reported current employment status. The vertical dashed lines indicate the beginning of the gradual implementation of the statutory retirement-age reforms in Germany (2012) and Spain (2013), respectively. These dates mark the commencement of the reform transitions rather than the completion of the increases in statutory retirement age.

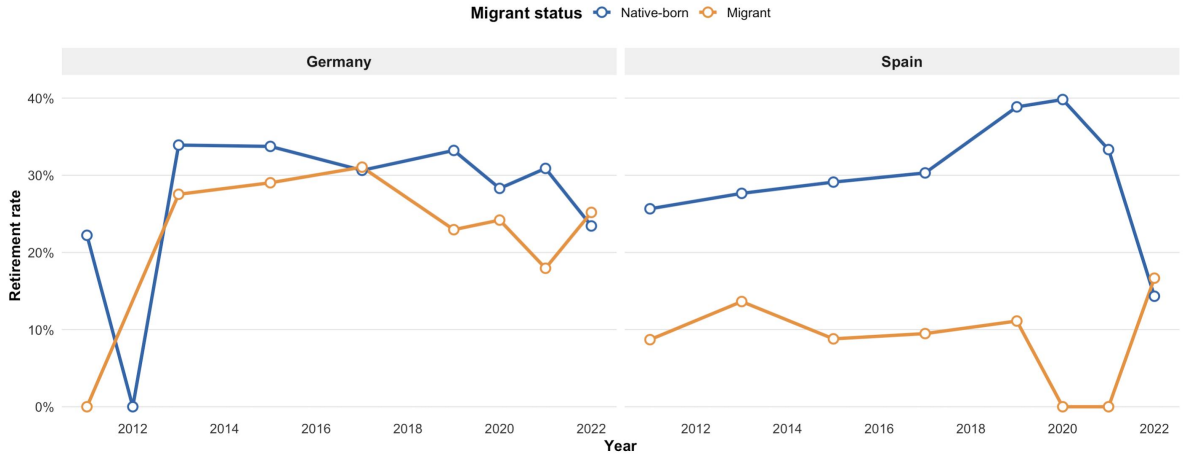


Figure 2: Retirement Rates by Migrant Status

Notes: The figure presents mean retirement rates by migrant status and survey year for Germany and Spain using SHARE Waves 4–9. Migrant status is defined according to respondents' country of birth. The zero retirement rates observed among migrants in Spain in 2020 and 2021 are based on 20 and 10 observations, respectively, with no respondents reporting retirement in either year. These estimates should be interpreted cautiously given the small subgroup sample sizes.

rates vary considerably across survey years, and their evolution differs between the two countries. The absence of a common unconditional time profile provides descriptive motivation for allowing reform timing to differ across countries and for including survey-wave fixed effects in the regression analysis.

Figure 2 separates retirement rates by migrant status within each country. The figure reveals visible differences between migrant and native-born respondents, particularly in Spain. These differences are consistent with the descriptive statistics reported in Section 3, where migrants have a lower unconditional retirement rate than native-born respondents. However, the raw migrant–native gaps cannot be attributed to pension reforms because the two groups differ in

age, education, health, employment histories, and their distribution across countries and survey waves.

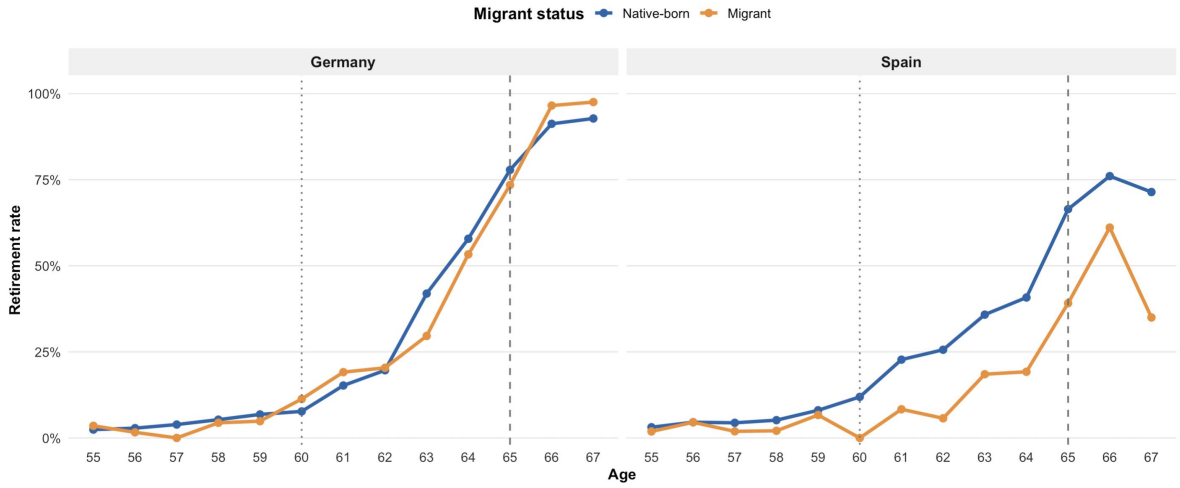


Figure 3: Retirement Probability by Age

Notes: The figure reports mean retirement rates by age for Germany and Spain. The sample is based on SHARE Waves 4–9.

The retirement rate among migrants in Spain falls to 0 in 2020 and 2021. An examination of the underlying SHARE observations indicates that these values reflect the absence of respondents reporting retirement within the observed migrant subsample, rather than missing retirement-status information. Specifically, none of the 20 migrant observations in 2020 or the 10 observations in 2021 is classified as retired. Given the relatively small number of migrant observations in these survey periods, the corresponding retirement rates are sensitive to sample composition and should be interpreted with caution. In particular, these descriptive zero values should not be interpreted as indicating an absence of retirement among migrants in the broader Spanish population.

The importance of age is shown explicitly in Figure 3. Retirement probabilities increase sharply as respondents move through their early and mid-sixties. The relationship is strongly nonlinear in both Germany and Spain, confirming that age is a central determinant of retirement behavior and supporting the inclusion of both age and age squared in the empirical specifications.

A more direct descriptive comparison is presented in Figure 4, which distinguishes respondents according to both migrant status and reform exposure. Retirement probabilities differ between exposed and non-exposed observations in both countries. These differences nevertheless combine the influence of pension-reform timing with differences in age and cohort composition. The figure should therefore be interpreted as descriptive evidence motivating the regression analysis rather than as a treatment-control comparison.

Taken together, Figures 1-4 document substantial descriptive variation in retirement behavior across countries, migrant status, reform exposure, and age. These patterns should not be interpreted causally, but they motivate an empirical specification that accounts for individual heterogeneity, survey-wave effects, nonlinear age profiles, and country-specific reform exposure.

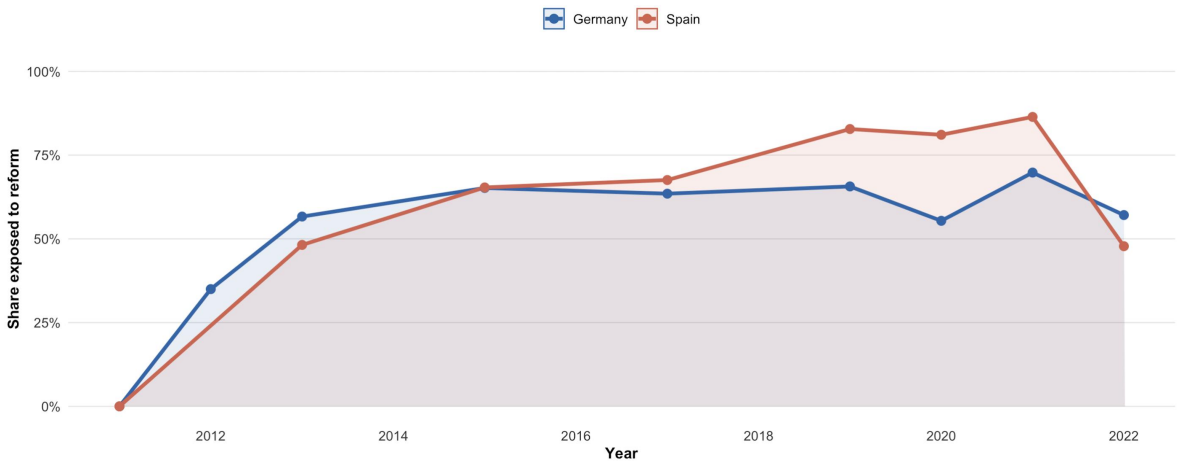


Figure 4: Retirement Rates by Reform Exposure and Migrant Status

Notes: The figure reports retirement rates according to migrant status and the baseline reform-exposure indicator. Reform exposure combines country-specific reform timing, birth-cohort eligibility, and the retirement-age window defined in Section 4.1.

The next section formalizes this empirical strategy.

4 Empirical Strategy

4.1 Baseline Specification

The empirical analysis examines whether migrants and native-born individuals respond differently to pension reform exposure. The baseline specification pools observations from Germany and Spain while allowing reform exposure to reflect country-specific reform timing and eligibility rules. We estimate

$$\begin{aligned} Y_{it} = {} & \beta_1 ReformExposure_{it} + \beta_2 \left(Migrant_i \times ReformExposure_{it}\right) \\ & + \gamma' X_{it} + \alpha_i + \lambda_t + \varepsilon_{it}, \end{aligned} \tag{1}$$

where Y_{it} denotes the retirement outcome of individual i at time t, $ReformExposure_{it}$ captures exposure to the relevant pension reform, and $Migrant_i$ indicates migrant status. X_{it} contains the individual-level controls, while α_i and λ_t denote individual and survey-wave fixed effects, respectively. Although the migrant indicator is included in the conceptual specification, its standalone coefficient cannot be separately estimated because migrant status is time invariant and is absorbed by the individual fixed effects. The interaction between migrant status and reform exposure remains identifiable because reform exposure varies over time within individuals.

Our main coefficient of interest is β_2, which captures the differential association between reform exposure and retirement for migrants relative to native-born individuals. A negative coefficient indicates that reform exposure is associated with a larger decline, or a smaller increase, in retirement among migrants than among natives. The coefficient β_1 captures the corresponding association for the native-born reference group.

Reform exposure combines country-specific reform timing, proximity to retirement age, and birth-cohort eligibility:

$$ReformExposure_{ict} = PostReform_{ct} \times NearRetirement_{ict} \times AffectedCohort_{ic}. \quad (2)$$

The reform-exposure indicator is constructed to capture individual-level variation in potential exposure to changes in pension eligibility arising from the German and Spanish pension reforms. Specifically, the measure combines three dimensions: the timing of reform implementation, proximity to statutory retirement ages, and birth-cohort eligibility. The indicator $PostReform_{ct}$ takes the value one for observations from 2012 onward in Germany and from 2013 onward in Spain, and zero otherwise. The indicator $NearRetirement_{ict}$ identifies respondents aged 60–67 at the time of observation, while $AffectedCohort_{ic}$ identifies individuals born in 1947 or later in Germany and in 1948 or later in Spain. Accordingly, $ReformExposure_{ict}$ equals one when all three conditions are simultaneously satisfied and 0 otherwise.

This operationalization reflects the institutional features of pension reforms in both countries, particularly their gradual implementation across successive birth cohorts. Rather than introducing an immediate and uniform increase in statutory retirement ages, the reforms established transition arrangements under which pension eligibility conditions varied according to birth cohort and, in Spain, contribution history. Consequently, individuals observed during the same post-reform period may face different statutory retirement ages and eligibility requirements. The exposure indicator therefore identifies respondents belonging to demographic and temporal groups potentially affected by the reforms, without assigning an identical change in pension eligibility to all exposed individuals.

The resulting measure should be interpreted as an indicator of potential reform exposure rather than a direct measure of the precise increase in statutory retirement age applicable to each respondent. In particular, it does not capture variation in the number of additional months or years of required working life across birth cohorts, nor does it fully account for differences in contribution histories or alternative retirement pathways. This distinction is important for interpreting the empirical findings: the estimated coefficients describe associations between the constructed reform-exposure indicator and retirement outcomes, rather than the causal effect of a uniform increase in statutory retirement age. The empirical analysis therefore accounts for individual and survey-wave fixed effects and examines the robustness of the results using alternative exposure definitions and country-specific specifications.

4.2 Heterogeneity

Regarding to Country heterogeneity. Germany and Spain could differ in their pension institutions, reform timing, and several observable characteristics. We therefore assess country heterogeneity in two complementary ways. First, we estimate the baseline specification separately for Germany and Spain using the same controls, fixed effects, and clustering structure. Second, we estimate a pooled specification that interacts reform exposure with migrant status and an indicator for Spain. The pooled specification includes all relevant lower-order interaction terms, and Germany serves as the reference country. The triple interaction between migrant status, reform exposure, and the Spain indicator provides a direct test of whether the migrant-specific reform association differs

between Spain and Germany. This pooled test is important because differences in statistical significance across separate country regressions do not by themselves establish that the underlying coefficients differ statistically.

As for socioeconomic heterogeneity. We further examine whether migrant-native differences in reform responses vary across groups defined by education, health, and gender. For each characteristic, we augment the baseline specification with interactions between the subgroup characteristic, migrant status, and reform exposure, including all relevant lower-order interaction terms. The corresponding triple interaction captures whether the migrant-native differential associated with reform exposure varies across the relevant subgroup. Time-invariant main effects are absorbed by the individual fixed effects.

4.3 Alternative Outcomes and Mechanisms.

To examine whether the baseline patterns extend beyond retirement, we re-estimate the baseline framework using current employment, employment at age 60 or above, employment at age 65 or above, and the mental health depressive-symptom score as alternative dependent variables. The estimation framework, controls, and fixed-effects structure otherwise remain unchanged. In the mental-health specification, retirement status is additionally included as a control. mental health ranges from 0 to 12, with higher values indicating more depressive symptoms.

As a complementary analysis of broader social outcomes, we examine generalized interpersonal trust, measured on a scale from 0 to 10, with higher values indicating greater trust. We first examine the association between mental health and generalized trust, controlling for retirement status and the baseline co-variates. We then interact mental health with migrant status to assess whether the relationship between mental health and trust differs between migrants and native-born individuals, additionally controlling for reform exposure. Individual and survey-wave fixed effects are included throughout. Although the main effect of migrant status is absorbed by the individual fixed effects, its interaction with mental health remains identified through within-individual variation in mental health. These trust specifications are interpreted as complementary associational evidence rather than as direct causal estimates of the pension reforms.

5 Results

5.1 Pension-Reform Exposure and Retirement

Table 4 reports the principal fixed-effects estimates. The coefficient of primary interest is the interaction between migrant status and reform exposure. Because migrant status is time invariant, its standalone level effect is absorbed by the individual fixed effects.

Column (1) reports the baseline specification. Reform exposure is associated with a 3.5 percentage-point reduction in the probability of being retired. The interaction between migrant status and reform exposure is also negative, at -0.045, and is statistically significant at the 10 percent level. This provides suggestive evidence that the decline in retirement associated with reform exposure is larger among migrants than among native-born respondents. However, the migrant-specific differential is estimated less precisely than the average exposure effect and should therefore be interpreted cautiously.

Table 4: Pension-Reform Exposure and Retirement

	(1) Baseline	(2) Ages 63–67	(3) Country heterogeneity
Reform exposure	−0.035***		−0.036***
	(0.010)		(0.012)
Older reform exposure		0.081***	
		(0.016)	
Migrant × Reform exposure	−0.045*		−0.018
	(0.024)		(0.033)
Migrant × Older reform exposure		−0.054	
		(0.039)	
Reform exposure × Spain			0.001
			(0.018)
Migrant × Reform exposure × Spain			−0.071
			(0.046)
Individual fixed effects	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes
Age and age squared	Yes	Yes	Yes
Education control	Yes	Yes	Yes
Observations	14,994	14,994	14,994
R^2	0.767	0.768	0.767
Within R^2	0.112	0.115	0.112

Notes: The dependent variable is retirement status. Column (1) reports the baseline reform-exposure specification. Column (2) uses the narrower retirement-age exposure definition based on ages 63–67. Column (3) allows the association between reform exposure and retirement to differ between Germany and Spain. All specifications include individual and survey-wave fixed effects, a quadratic in age, and education. Standard errors are clustered at the individual level and reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Column (2) uses the narrower exposure definition based on ages 63-67. Under this specification, older reform exposure is positively associated with retirement, with an estimated coefficient of 0.081 . The corresponding migrant interaction is −0.054 but is not statistically significant. Thus, concentrating exposure closer to conventional retirement ages changes the estimated average association but does not produce a precisely estimated migrant-specific differential.

The country-specific estimates reveal a marked difference in the pattern of reform associations across Germany and Spain, as shown in Table 5. In Germany, reform exposure is associated with a significant decline in retirement, while there is little evidence of an additional differential effect for migrants −0.017. In Spain, by contrast, the average reform association is small and statistically insignificant, whereas the migrant-specific interaction is negative, economically sizable, and statistically significant −0.101. These estimates therefore point to a substantially stronger migrant-specific retirement response in Spain than in Germany.

Therefore, Column (3) in Table 4 allows the migrant differential to vary between Germany and Spain. The interaction between reform exposure and the Spain indicator is small and statistically insignificant, while the migrant-reform-Spain triple interaction is −0.071. The latter is also

not statistically significant at conventional levels. Accordingly, the evidence does not support a precisely estimated difference in the migrant-specific reform response between Germany and Spain.

These estimates should be interpreted as reform-exposure associations rather than as effects generated by a sharp treatment assignment. Reform exposure combines country-specific reform timing, retirement-age proximity, and cohort eligibility, and therefore does not correspond to a single experimental cutoff.

Table 5: Country-Specific Estimates of Pension-Reform Effects

	Germany	Spain
Reform exposure	-0.0693^{***}	0.0091
	(0.0124)	(0.0171)
Migrant × Reform exposure	−0.0168	-0.1014^{***}
	(0.0329)	(0.0328)
Age	-1.0531^{***}	-0.8029^{***}
	(0.0408)	(0.0517)
Age^2	0.00893^{***}	0.00706^{***}
	(0.00032)	(0.00041)
Education	−0.0539	0.0460
	(0.0911)	(0.0566)
Observations	8,177	6,817
Individuals	3,872	3,147
Individual FE	Yes	Yes
Wave FE	Yes	Yes
Within R^2	0.1546	0.0743

Notes: The table reports country-specific individual fixed-effects estimates for Germany and Spain. The dependent variable is retirement status. Reform exposure combines country-specific reform timing, proximity to retirement age, and birth-cohort eligibility. All specifications include individual and survey-wave fixed effects and the baseline control variables. Standard errors clustered at the individual level are reported in parentheses. Statistical significance in one country but not in the other does not by itself imply that the coefficients differ significantly across countries; cross-country differences are formally assessed using the pooled country-interaction specification reported below. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$

5.2 Labor-Supply Responses

We next examine whether the retirement patterns are accompanied by changes in continued employment. This distinction is important because a reduction in retirement need not imply a proportional increase in employment: individuals may instead move into unemployment, inactivity, or other non-retirement states. Table 6 therefore compares overall employment with employment at older-age margins.

The first column shows that reform exposure has essentially no association with overall employment. The estimated coefficient is −0.001 and is not statistically significant. There is therefore little evidence that reform exposure generates a general increase in employment throughout the entire age range considered in the analysis.

A substantially different pattern emerges at age 60 and above. The reform-exposure coefficient is

Table 6: Pension-Reform Exposure and labor-Supply Outcomes

	(1) Working	(2) Working, age 60+	(3) Working, age 65+
Reform exposure	−0.001	0.583***	−0.019***
	(0.012)	(0.013)	(0.002)
Migrant × Reform exposure	0.050	0.065*	0.009
	(0.034)	(0.037)	(0.008)
Individual fixed effects	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes
Age and age squared	Yes	Yes	Yes
Education control	Yes	Yes	Yes
Observations	14,994	15,025	15,061
R^2	0.793	0.687	0.535
Within R^2	0.037	0.359	0.018

Notes: The table reports individual fixed-effects estimates for alternative labor-supply outcomes in the Germany–Spain sample. Column (1) uses current employment as the dependent variable. Column (2) uses the indicator for working at age 60 or above, and column (3) uses the indicator for working at age 65 or above. All specifications include individual and survey-wave fixed effects, a quadratic in age, and education. Standard errors are clustered at the individual level and reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

0.583 and is statistically significant at the 1 percent level. This is the strongest labor-market association in the analysis and indicates that exposure is concentrated at the ages at which retirement decisions become particularly relevant. The corresponding migrant interaction is 0.065 and is significant at the 10 percent level. Migrants therefore display some additional employment adjustment at this margin, although the magnitude of the differential is much smaller than the overall reform-exposure coefficient.

The pattern changes again at age 65 and above. The estimated reform-exposure coefficient is −0.019 and is statistically significant at the 1 percent level. Taken together, the negligible association with overall employment, the large positive association at age 60 and above, and the small negative association at age 65 and above do not suggest a uniform extension of working lives at all older ages. Instead, they are more consistent with a shift in the timing of labor-market exit around institutionally relevant retirement thresholds.

Overall, the employment estimates provide the clearest evidence on the margin through which reform exposure is associated with behavior. Adjustment is concentrated around retirement ages rather than appearing as a broad increase in employment across the full sample. The positive migrant interaction at age 60 and above suggests somewhat stronger adjustment among migrants, but its magnitude and statistical significance indicate a relatively modest migrant–native differential.

5.3 Mental Health and Generalized Trust

We next consider whether the labor-market adjustment documented above is accompanied by changes in psychological well-being. Figure 5 shows the distribution of mental health

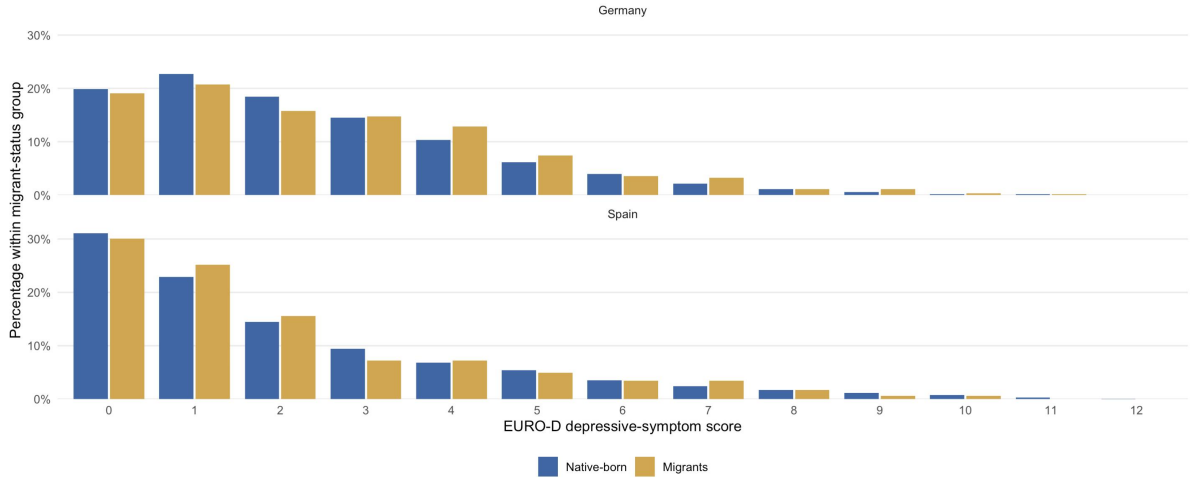


Figure 5: Distribution of Mental Health Depressive Symptoms

Notes: he figure presents the distribution of EURO-D depressive-symptom scores separately for native-born and migrant respondents in Germany and Spain. For each score, adjacent columns report the percentage of observations within the corresponding country and migrant-status group. Higher EURO-D scores indicate more depressive symptoms. The distributions are based on nonmissing EURO-D observations.

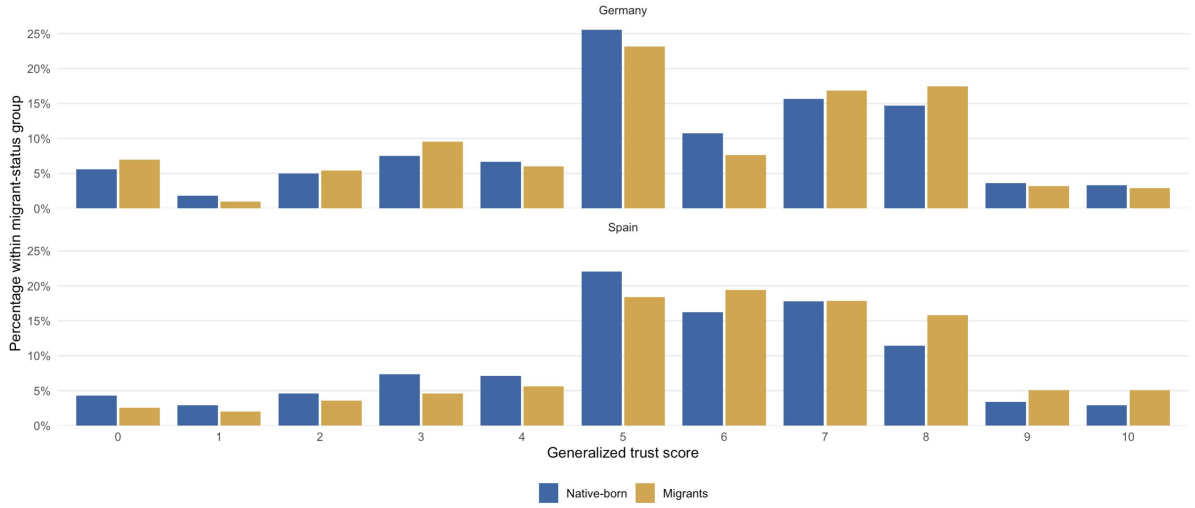


Figure 6: Distribution of Generalized Trust

Notes: The figure presents the distribution of generalized interpersonal trust scores separately for native-born and migrant respondents in Germany and Spain. For each trust score, adjacent columns report the percentage of observations within the corresponding country and migrant-status group. Higher values indicate greater generalized trust. The distributions are based on nonmissing trust observations.

depressive-symptom scores separately for Germany and Spain. In both countries, observations are concentrated toward the lower end of the scale, although there is considerable heterogeneity in mental-health outcomes.

The fixed-effects estimates provide substantially weaker evidence for mental health than for labor supply. Using the narrower retirement-age exposure measure, the estimated coefficient on reform exposure is -0.072 and is not statistically significant. The interaction between migrant status and the narrower reform-exposure measure is also statistically insignificant, with an estimated coefficient of -0.028.

Retirement status itself enters the mental-health specification with a small positive coefficient of 0.015, which is likewise imprecisely estimated. Taken together, these estimates provide little evidence of a systematic relationship between reform exposure and depressive symptoms in the Germany–Spain sample.

This contrast with the labor-supply results is informative. While reform exposure is associated with observable employment adjustment around retirement ages, the same exposure does not appear to generate a precisely estimated average change in psychological well-being.

Figure 6 presents the distribution of generalized interpersonal trust in Germany and Spain. Trust exhibits substantial within-country variation, with observations concentrated around intermediate and relatively high values. As with mental health, however, descriptive variation in the outcome does not establish that it responds systematically to pension-reform exposure.

5.4 Socioeconomic Heterogeneity

Table 7: Heterogeneity in Retirement Responses

	(1) Low education	(2) Poor health	(3) Female
Reform exposure	-0.026^{**}	-0.034^{***}	-0.001
	(0.012)	(0.011)	(0.014)
Migrant × Reform exposure	-0.046^{*}	-0.070^{**}	-0.058
	(0.028)	(0.029)	(0.039)
Reform exposure × Subgroup	-0.026	-0.005	-0.064^{***}
	(0.018)	(0.016)	(0.016)
Migrant × Reform exposure × Subgroup	-0.002	0.069	0.026
	(0.055)	(0.052)	(0.049)
Individual fixed effects	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes
Age and age squared	Yes	Yes	Yes
Education control	Yes	Yes	Yes
Observations	14,994	14,994	14,994
R^2	0.767	0.767	0.767
Within R^2	0.113	0.112	0.114

Notes: The subgroup variable is low education in column (1), poor health in column (2), and female status in column (3). The coefficient of primary interest is the triple interaction between migrant status, reform exposure, and the relevant subgroup indicator. All specifications include individual and survey-wave fixed effects, a quadratic in age, and education where applicable. Standard errors are clustered at the individual level and reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

The baseline estimates characterize average differences in retirement responses across migrant status, but these averages may conceal important heterogeneity across individuals. The ability to adjust retirement behavior in response to changes in pension incentives may depend on socioeconomic resources, health constraints, and lifetime employment histories. We therefore examine whether the migrant differential varies along three dimensions: educational attainment, health status, and gender.

For each dimension, we augment the baseline specification with interactions between migrant status, reform exposure, and the relevant subgroup characteristic. The coefficient of primary interest is the corresponding triple interaction, which indicates whether the migrant–native differential associated with reform exposure varies systematically across the subgroup.

Column (1) in Table 7 examines heterogeneity by educational attainment. The estimated interaction between migrant status, reform exposure, and low education is −0.002. The estimate is close to 0 and is not statistically significant. Column (2) considers health status. The corresponding triple-interaction coefficient is 0.069. Although positive, it is not statistically significant at conventional levels. Column (3) examines gender. The interaction between migrant status, reform exposure, and the female indicator is 0.026 and is statistically insignificant.

Taken together, the heterogeneity analysis provides limited evidence that the migrant-native differential associated with reform exposure is systematically concentrated among lower-educated respondents, individuals in poor health, or women. None of the three principal triple-interaction coefficients is statistically significant at conventional levels.

6 Robustness Checks

6.1 Dynamic Evidence Around Reform Timing

The baseline specification summarizes the association between pension-reform exposure and retirement using a single exposure indicator. While this provides a parsimonious estimate of the average migrant–native differential, it does not reveal how this differential evolves around the implementation of the reforms. Examining the temporal pattern is particularly important in the present setting because the German and Spanish reforms were introduced gradually across birth cohorts rather than through a single sharp treatment date, and the baseline exposure measure combines reform timing with age and cohort eligibility. We therefore complement the baseline estimates with an event-study analysis that traces the migrant–native retirement differential over observed periods relative to the country-specific reform dates. This exercise allows us to assess whether the baseline differential reflects a broader pattern of adjustment around the reforms or is concentrated in particular post-reform survey periods. Rather than summarizing reform exposure with a single indicator, the event-study specification traces retirement outcomes over observed periods relative to each country's reform:

$$\begin{aligned} Retired_{ict} = & \sum_{k \neq k_c^{ref}} \delta_k \mathbf{1}\{RelYear_{ict} = k\} + \sum_{k \neq k_c^{ref}} \beta_k \left[\mathbf{1}\{RelYear_{ict} = k\} \times Migrant_i\right] \\ & + \gamma' X_{ict} + \alpha_i + \lambda_t + \varepsilon_{ict}. \end{aligned} \tag{3}$$

Relative event time is defined as $RelYear_{ict} = Year_{ict} - ReformYear_c$, where $ReformYear_c$ is 2012 for Germany and 2013 for Spain. Because SHARE is conducted in discrete survey waves rather than annually, the same pre-reform relative year is not observed in both countries. We therefore estimate the event-study models separately by country and normalize the coefficients to the last observed pre-reform period available in each country. The reference period k_c^{ref} is $k = -1$ for Germany and $k = -2$ for Spain.

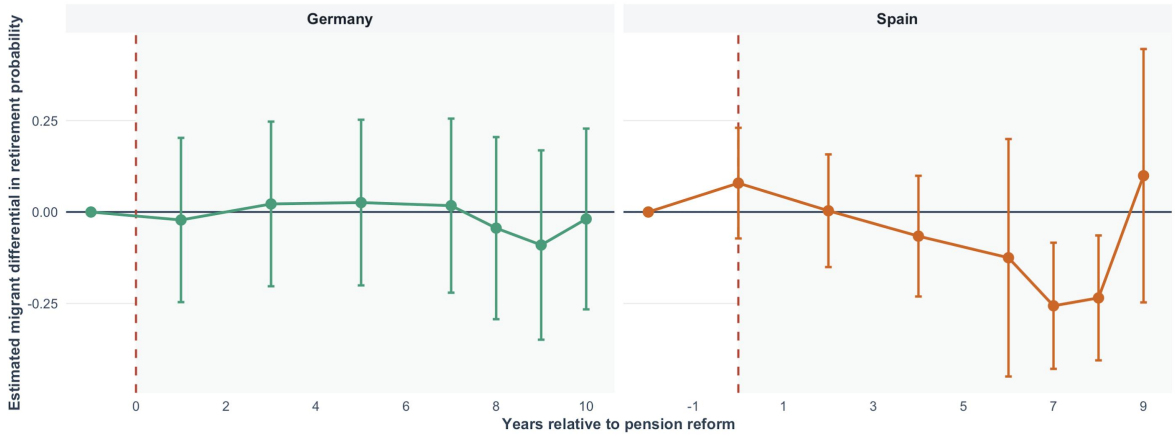


Figure 7: Migrant–Native Retirement Differential Around Reform Timing

*Notes:*The figure reports country-specific event-study estimates of the migrant–native differential in retirement around the pension reforms. Because SHARE observations are available only in discrete survey waves, the last observed pre-reform period differs across countries. The country-specific event studies are therefore normalized to $k = -1$ for Germany and $k = -2$ for Spain, corresponding to the last observed pre-reform period available in each country. Points report coefficient estimates and vertical bars indicate 95 percent confidence intervals. All models include individual and survey-wave fixed effects together with age, age squared, and education controls. Standard errors are clustered at the individual level.

The coefficients δ_k capture changes in retirement among native-born respondents relative to the relevant country-specific reference period, while β_k captures the additional migrant–native differential in each observed relative period. The event-study specifications include individual and survey-wave fixed effects together with age, age squared, and education controls. Standard errors are clustered at the individual level.

The baseline exposure measure combines reform timing, cohort eligibility, and retirement age. To examine the temporal pattern more directly, Figure 7 plots the estimated migrant-native retirement differential relative to the country-specific reform year. The year immediately preceding the reform is omitted and serves as the reference period.

The event-study coefficients vary across relative years and several confidence intervals are wide. The figure therefore does not provide evidence of a simple discontinuous change in the migrant-native retirement gap exactly at the reform date. Rather, it indicates that the differential evolves around the reform period and is estimated with substantial uncertainty in individual relative years.

This evidence reinforces the need for a cautious interpretation of the baseline estimates. The empirical design does not rely on a single sharp assignment threshold, and the event-study does not transform the reform-exposure measure into an experimental treatment. We therefore interpret the estimates as documenting differential behavioral adjustment around pension-reform exposure rather than as identifying an unconditional causal effect of the reforms.

6.2 Robustness and Alternative Specifications

Table 8 reports a set of robustness exercises designed to assess whether the migrant-specific response is sensitive to the definition of the relevant age margin, migrant status, labor-market

outcome, health composition, or educational controls. Rather than simply reproducing the baseline coefficient, these exercises also provide additional insight into the economic margin through which pension-reform exposure affects migrants and native-born individuals.

Table 8: Robustness Checks

	(1) Baseline	(2) Ages 58–65	(3) Non-citizen	(4) Working	(5) Poor health	(6) No education
Reform exposure	-0.035^{***}	0.041^{*}	-0.034^{***}	-0.001	-0.034	-0.037^{***}
	(0.010)	(0.023)	(0.010)	(0.012)	(0.024)	(0.010)
Migrant × Reform exposure	-0.045^{*}	-0.053^{**}	–	0.050	-0.030	-0.040^{*}
	(0.024)	(0.027)	–	(0.034)	(0.056)	(0.024)
Non-citizen × Reform exposure	–	–	-0.068^{*}	–	–	–
	–	–	(0.037)	–	–	–
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Age and age squared	Yes	Yes	Yes	Yes	Yes	Yes
Education control	Yes	Yes	Yes	Yes	Yes	No
Observations	14,994	9,414	14,973	14,994	4,881	15,161
R^2	0.767	0.761	0.768	0.793	0.811	0.764

Notes: Column (1) reproduces the baseline specification. Column (2) restricts the sample to respondents aged 58–65. Column (3) replaces migrant status based on country of birth with non-citizenship status. Column (4) uses current employment as the dependent variable. Column (5) restricts the sample to respondents reporting poor health. Column (6) excludes education from the set of controls. All specifications include individual and survey-wave fixed effects and a quadratic in age. Standard errors are clustered at the individual level and reported in parentheses.
$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

The first robustness exercise concerns proximity to retirement. Restricting the sample to respondents aged 58–65 yields a somewhat larger and more precisely estimated migrant differential. The coefficient on migrant status interacted with reform exposure changes from -0.045 in the baseline specification to -0.053. This pattern is consistent with the idea that pension incentives become more salient as individuals approach the retirement margin. Such incentives may be particularly relevant for migrants, who may enter later life with lower accumulated pension wealth and therefore face stronger financial incentives to postpone retirement when early exit becomes less attractive. At the same time, the coefficient on reform exposure changes from -0.035 to 0.041, indicating that the overall retirement response is sensitive to the age window considered, whereas the migrant-native differential is comparatively stable. This distinction is economically meaningful because individuals further from the retirement threshold may have less immediate incentive to adjust their retirement timing in response to changes in pension rules.

Column (3) replaces the migrant indicator based on country of birth with an indicator for non-citizenship. The interaction between non-citizen status and reform exposure is -0.068, which is somewhat larger in magnitude than the baseline migrant differential. The persistence of the negative sign under this alternative definition suggests that the result is not driven by the particular way migrant status is measured. The larger estimate is consistent with the possibility that the differential response is more pronounced among individuals whose institutional and labor-market trajectories remain more distinct from those of native-born workers. At the same

time, the alternative definition changes the composition of the migrant group, so the difference in magnitude should be interpreted cautiously rather than as evidence that citizenship status itself causes a stronger response.

Column (4) uses current employment rather than retirement as the dependent variable. The interaction between migrant status and reform exposure is positive but statistically insignificant, at 0.050. The absence of a precisely estimated effect on overall employment does not necessarily contradict the retirement results. Retirement represents a specific margin of labor-market exit, whereas the broad employment indicator aggregates individuals across different ages and across potentially different non-employment states. A pension reform that changes the timing of retirement near institutionally relevant thresholds need not generate a proportional increase in employment over the entire age range. This interpretation is consistent with the main labor-supply analysis, which shows a much stronger employment response among individuals aged 60 and above. Taken together, the results suggest that pension-reform exposure primarily affects the timing of labor-market exit rather than producing a broad increase in employment.

Column (5) restricts the sample to respondents reporting poor health. The migrant interaction remains negative, at -0.030, but is statistically insignificant. The reduced precision partly reflects the smaller effective sample. From an economic perspective, however, the result is also consistent with the coexistence of two opposing forces. On the one hand, migrants with lower pension wealth may face stronger financial incentives to postpone retirement. On the other hand, poor health may reduce their ability to remain employed until a higher retirement age. For individuals facing health constraints, the financial incentive to continue working may therefore be partly offset by a weaker capacity to do so. The absence of a precisely estimated migrant-specific effect in this subsample is consistent with this competing-mechanism interpretation.

Finally, Column (6) removes education from the specification. The coefficient on migrant status interacted with reform exposure changes only slightly, from -0.045 in the baseline specification to -0.040. Education is closely related to lifetime earnings, occupational sorting, employment stability, and pension accumulation. The stability of the migrant interaction after removing education therefore suggests that the migrant-specific reform response is not primarily driven by differences in educational composition. Instead, the persistence of the coefficient is more consistent with other dimensions of migrants' retirement position, including accumulated pension wealth, contribution histories, and labor-market trajectories.

Taken together, the robustness exercises reveal a consistent economic pattern rather than simply reproducing the baseline coefficient. The migrant-native differential is more precisely estimated when the analysis focuses on individuals closer to retirement, survives an alternative definition of migrant status, and is not replicated by a broad employment outcome. The results therefore suggest that the migrant-specific response is concentrated at the retirement margin, where pension incentives are most directly relevant. At the same time, the weaker and imprecisely estimated response among individuals in poor health is consistent with the possibility that stronger financial incentives to postpone retirement are partly offset by constraints on continued employment. Overall, the evidence supports an interpretation in which migrant-specific differences in pension-

reform responses reflect differences in the economic constraints surrounding retirement rather than a uniform difference in labor-market attachment.

7 Conclusion

This paper examines whether migrants and native-born workers adjust differently to pension-reform exposure and whether these differences extend beyond retirement behavior to mental health and generalized trust. Using longitudinal SHARE data for Germany and Spain, we construct reform exposure from country-specific reform timing, proximity to retirement age, and birth-cohort eligibility and estimate individual fixed-effects models that absorb time-invariant individual heterogeneity.

Three findings emerge. First, reform exposure is associated with meaningful changes in retirement behavior. In the baseline specification, exposure is associated with a 3.5 percentage-point reduction in the probability of being retired. The migrant interaction is also negative, at 4.5 percentage points, although it is estimated less precisely. The evidence therefore suggests some additional retirement adjustment among migrants, but not a large or uniformly estimated migrant-specific effect.

Second, the clearest behavioral response appears in labor supply around retirement ages. Reform exposure has essentially no association with the broad employment indicator but is strongly positively associated with employment at age 60 and above. The corresponding migrant interaction is positive and marginally statistically significant. At age 65 and above, however, the association becomes small and negative. These patterns are more consistent with a change in the timing of labor-market exit than with a uniform extension of employment across all older ages.

Third, the evidence for broader non-labor consequences is considerably weaker. The mental-health specifications provide little evidence of a systematic relationship between reform exposure and mental health depressive symptoms, while the trust models do not reveal precisely estimated changes in generalized interpersonal trust. Similarly, the heterogeneity analysis does not identify statistically significant migrant-specific differences by education, poor health, or gender.

The robustness exercises broadly support a cautious interpretation of the main results. The negative migrant differential in retirement persists under a narrower age window, an alternative non-citizen definition, and the exclusion of education controls, although the magnitude and precision of the estimates vary across specifications. The event-study evidence also shows substantial uncertainty around individual relative years and does not support a simple discontinuous interpretation at the reform date.

These findings have two broader implications. First, evaluations of pension reforms should distinguish between average labor-supply responses and the distribution of those responses across population groups. Migrants may face different retirement constraints because of shorter contribution histories, lower pension wealth, and more fragmented employment trajectories, but the present evidence suggests that these differences do not translate into uniformly larger responses across all outcomes or subgroups. Second, labor-market adjustment does not necessarily imply corresponding changes in psychological well-being or social attitudes.

The empirical design nevertheless has important limitations. Reform exposure combines policy timing, age, and cohort eligibility rather than relying on a single sharp treatment threshold, and the estimates should therefore be interpreted primarily as reform-exposure associations. In addition, the migrant samples are comparatively small and the mental-health and trust outcomes are available for substantially fewer observations. Future work using administrative contribution histories or sharper policy discontinuities could provide stronger evidence on how pension reforms interact with migrant employment histories and pension entitlements.

Overall, the results indicate that pension-reform exposure is associated mainly with changes in labor-market behavior around retirement ages. Migrants show some additional adjustment at particular margins, but the evidence does not support a broad conclusion that they respond fundamentally differently from native-born workers across retirement, mental health, trust, or socioeconomic subgroups.

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A Variable Definitions

Table A1: Variable Definitions

Variable	Definition
Retired	Indicator equal to one if current employment status is retired.
Working	Indicator equal to one if current employment status is working.
Working, age 60+	Indicator equal to one if the respondent is aged 60 or older and working.
Working, age 65+	Indicator equal to one if the respondent is aged 65 or older and working.
Migrant	Indicator equal to one if the respondent was born outside the current country.
Non-citizen	Indicator equal to one if the respondent is not a citizen of the current country.
Mental Health	Mental health depression scale; higher values indicate more depressive symptoms.
Trust	Generalized interpersonal trust measure ranging from 0 to 10.
Low education	Indicator equal to one for ISCED levels 0–2.
Poor health	Indicator equal to one for poor self-reported health.
Female	Indicator equal to one for female respondents.
Post-reform	Indicator equal to one if the observation occurs after the relevant country-specific reform.
Near retirement	Indicator equal to one if the respondent is aged 60–67.
Older retirement	Indicator equal to one if the respondent is aged 63–67.
Affected cohort	Indicator equal to one if the respondent belongs to a birth cohort classified as potentially affected by the country-specific reform.
Reform exposure	Post-reform × near-retirement × affected-cohort indicator.
Older reform exposure	Post-reform × older-retirement × affected-cohort indicator.

B Italy Extension

Italy is analysed separately as an exploratory extension of the main Germany–Spain analysis. We do not pool Italy with the baseline estimates because its pension-reform timing and institutional setting differ from those of Germany and Spain, while the effective migrant sample is also comparatively small. The Italian evidence should therefore be interpreted as complementary rather than as part of the main identification strategy.

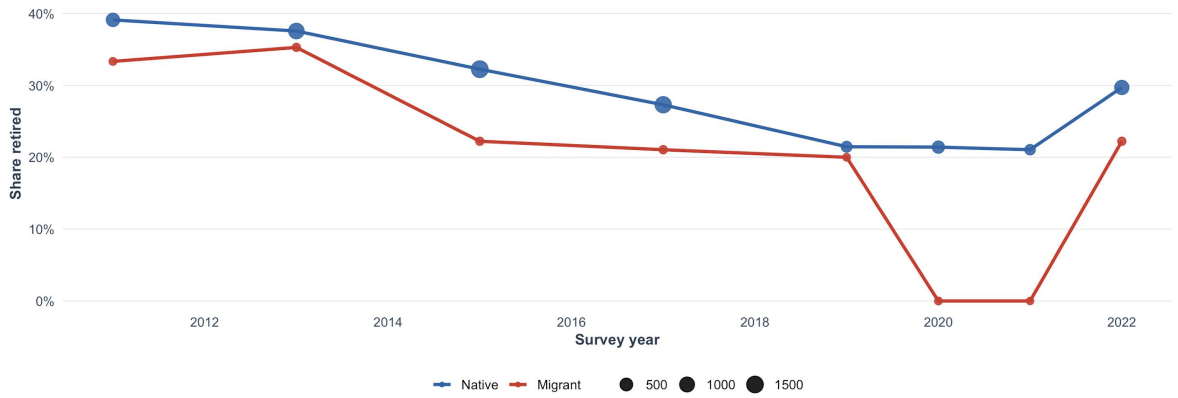


Figure B1: Retirement Rates by Migrant Status in Italy

Notes: The figure reports observed retirement rates by migrant status in Italy. The zero migrant retirement rates in 2020 and 2021 reflect extremely small migrant subsamples rather than missing observations: only four migrant observations are available in 2020 and two in 2021, with no respondent classified as retired in either year. These year-specific migrant estimates should therefore be interpreted with substantial caution.

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