JOINT RETIREMENT: EVIDENCE ON THE HETEROGENEITY OF SPOUSAL EFFECTS

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Joint Retirement: Evidence on the Heterogeneity of Spousal Effects*

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Abstract

Evidence abounds to suggest the existence of retirement spillovers among spouses. Using the Survey of Health and Retirement in Europe (SHARE), this paper not only confirms the existence of joint retirement behavior among dual-worker couples around Europe, but also shows that the intensity of retirement coordination varies a lot. The results of the paper are essentially five fold. First, among spouses there is a gender asymmetry: wives are more likely to be influenced by their husbands' decision to retire. Second, a higher labour market attachment (proxied by education, income quartile or self reported quality of work) translates into a lower propensity of retirement coordination. Especially, for men who belong to the highest income quartile or education level there is absence of joint retirement. Third, being a secondary earner increases the propensity of retirement coordination. Fourth, higher age differences between couples generally reduces joint retirement, but in interaction with eligibility rules. Five, there is evidence on the enhancing role of converging preferences in terms of activities practiced by both partners, whereas convergence in philosophical views or personality traits do not have any significant effect. Among the traditionally discussed determinants of joint retirement, leisure complementarities are important for couples' retirement incentives, nevertheless, they are mostly dominated by income effect and feasibility of joint retirement (eligibility for both partners to retire).

Keywords: Retirement, pensions, labour supply of couples
JEL Classification: C23, C26, D10, H31, J14, J16, J26

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1 Introduction

A significant fraction of retirement choices can be explained by financial incentives, individual demographic characteristics, health, and labor market experience (Burtless (1986); Stock and Wise (1990)). However, the empirical evidence indicates that almost a third of dual-earner couples in Europe and the US coordinate their retirement decisions despite age differences between partners. The joint determination of retirement has important implications for policies that are intended to reduce the financial burden of pensions (Hospido, 2015). Policy changes that are targeted at a specific group of individuals can create spillovers on other household members or coworkers so that they ultimately affect a wider set of the population. During the last three decades, there have been a growing interest to provide evidence on spousal spillovers and joint retirement among spouses (Hurd (1990); Gustman and Steinmeier (2000); Michaud (2003)). Nonetheless, the heterogeneity of "spousal" spillovers in retirement has received little attention among economists. Hence, the purpose of this study is to explore the configuration of spousal spillovers, how their intensity vary across different categories of elderly individuals (women vs men, low vs high earners, low vs high educated and so on).

Optimal timing of retirement requires substantial financial knowledge and good planning skills. Existing studies have pointed out that spousal joint retirement could be driven by couples sharing the same household budget "income pooling", willingness to enjoy joint leisure time with the partner "leisure complementarities", or individuals with similar preferences for leisure forming a couple "assortative matching". If leisure is considered complementary so that individuals derive higher utility from it when accompanied by their spouse, retirement of one partner induces a higher marginal utility of leisure for the other, decreasing the work incentives of the working partner and leading to joint retirement. Spouses may sort on leisure preferences, job professions, education levels, or family backgrounds. If this matching leads to homogeneous couples (positive assortative matching) either in terms of leisure preferences or in terms of labor income potentials, we can encounter similar retirement patterns among partners, however, if there is negative correlation in tastes and characteristics (negative assortative matching), we might observe divergence in retirement timing. In addition, income pooling operates through the household budget constraint (Blau (1998), Casanova (2010)). The fact that resources are shared by household members can increase or decrease the probability of joint retirement, for example, when the household has an unpaid debt, such as mortgage, both partners could retire as soon as they repay the debt. In contrast, when one spouse retires, the household income decreases (even dramatically in some countries) which leads to higher marginal utility of consumption in turn increasing the incentives for the working spouse to prolong retirement resulting in non-synchronization of retirement. As a result, income pooling could lead to two opposing effects while the effect of complementarity in leisure and positive assortative matching triggers the synchronization of retirement.

Even though several studies provide evidence on coordination of retirement timing among spouses, there is no consensus on the underlying channel of joint retirement incentives nor any sufficient explanation of how potentially heterogeneous individuals respond to their partners' retirement. It is highly likely that the spousal effects on retirement decisions may depend on various factors such as individual's labor market attachment, job satisfaction, personality characteristics and couple composition. Additionally, retirement policies that affect one's behavior are likely to affect

behavior of her/his spouse, but more importantly, they could as well be affecting her/his social connections', especially when the underlying channel works through reference dependence or social conformity.[1] It is therefore important to account for joint features in modeling retirement not only in the household sense, but also accounting for individuals' social environment. Along these lines, this paper studies spousal and peer effects on retirement using a fixed effects linear probability model with instrumental variables on a panel of 27 countries over 2004-2017 coming from the SHARE survey. The aim of this study is not only to explore the extent of retirement spillovers, but also to understand whether certain individual and couple characteristics entail heterogeneous joint retirement behavior among individuals. The results do not only provide evidence on the existence of joint retirement behavior, but also the asymmetry between men and women. Women are in general more likely to synchronize retirement with their partners, but more so when they live in a country which imposes the same eligibility age for men and women. I also find evidence on divergence of joint retirement behavior in socio-economic status; people living in households with higher household income and assets are less likely to retire conditional on their partner's retirement. Another finding is that individuals who are the principal earner in the household tend to de-synchronize retirement with their partners which highlights the importance of income pooling in the household. Additionally, this paper provides strong evidence that joint retirement is inversely proportional to labour market attachment proxied by the quartile of individual income or highest educational attainment and positive job attributes. Especially, women are less likely to retire if they possess positive views about their jobs relative to those who do not. Furthermore, couples who share common activities more than the sample average tend to coordinate retirement, while having common personality traits and philosophies are not significant predictors of joint retirement behavior. When considering individual personality characteristics, I discover that women who are more extroverted and conscious are less likely to joint retire.

There is a growing literature analyzing retirement choices in the family context and the determinants of joint retirement. In terms of the methodology adopted, the existing literature on spousal effects has taken two distinct approaches. The first branch of literature employs structural estimation models in order to evaluate the extent of leisure complementarities and the correlation in unobserved tastes as sources of spillovers in spouses' retirement decisions by accounting for the underlying financial variables (Maestas (2001), Gustman and Steinmeier (2004)). [2] One potential drawback of structural models is that they rely on distributional assumptions and require a full specification of financial and stochastic variables to eliminate external forces that could lead to the coordination of partners' retirement. Another strand of literature provides reduced form analysis in estimating the effect of an individual's retirement on the retirement status of her/his spouse. The advantage of reduced form models is that they allow for a better exploration of heterogeneity in decisions and preferences since they are less restrictive about the form of the utility function. For example, Bloemen et al. (2015) instruments husbands' retirement status with a policy change of the eligibility status for early retirement using administrative panel data on Dutch population and finds a strong increase in wife's probability to retire conditional on her husband becoming eligible for early retirement. Hospido and Zamarro (2014) employs a cross-country analysis over 11 European countries using the country-specific early and normal retirement ages to instrument the retirement transitions of one's partner. They find evidence of asymmetric response among

[1] The reference point being colleagues' retirement (time) decision.
[2] Blau and Gilleskie (2006) Casanova (2010) Michaud et al. (2019)

men and women; women are on average 21 percent more likely to retire when their husbands stop working whereas men do not have a significant response. On the other hand, Stancanelli and Van Soest (2016) is the first study to explore the extent to which partners spend joint leisure upon retirement. They use a simultaneous-equation approach by instrumenting the partner's retirement status with the legal retirement age in France to estimate the effect of partners' retirement on leisure hours spent and find that wife's retirement significantly increases both her separate leisure time and the couple's joint leisure time. Nevertheless, they note that leisure complementarities in retirement are significant, but not very large. Even though, the common excepted mechanism behind joint retirement of couples is regarded as comlementarities in leisure, there might be several mechanisms at play depending on individuals' financial and occupational situation as well as the country's pension structure. Hence, it is useful to understand how individuals with certain characteristics respond to joint retirement incentives. However, to my knowledge only Lalive and Parrotta (2017) considers the potential heterogeneity behind joint retirement behavior. They find that low educated individuals are more responsive to becoming eligible for a pension while the effect of partner's pension eligibility is strongest among homogamous couples.

This paper contributes to the literature in exploring the extent of heterogeneities in joint retirement behavior in several ways. While previous work has mostly focused on the asymmetries between men and women, I find that it is not only women, but also the secondary earner in the household who more strongly responds to her/his partner's retirement. This may in turn be due to relative opportunity cost of leisure being lower for the secondary earner, or primary earners being more attached to the labor market and deriving lower degrees of utility from leisure. Moreover, spousal retirement spillovers are substantially shaped in nature and magnitude by individual and couple characteristics as well as the eligibility rules for retirement, insofar as the cost of retirement restricts spousal retirement to workers who have less constraints in coordinating retirement.

The rest of this article is structured as follows: Section 2 provides a detailed description of the data used in this study, Section 3 presents the model, estimation results are presented in Section 4 and Section 5 concludes.

2 Data

The data set used in this paper is a retrospective panel and comes from SHARE survey. The SHARE Job Episodes Panel (JEP) is a generated data set based on information of wave 3 and wave 7 of SHARE. The JEP contains the labor market status of each respondent throughout her/his life. Such a retrospective panel is useful as the focus of our analysis is individuals' labor market transitions within a year from their partner and the regular waves of SHARE are in general repeated in every two years which might provide noisy outcomes when trying to capture the joint retirement phenomenon. The JEP dataset includes relatively limited information on time varying variables such as individuals' health, and income however, to some extent it can be complemented by information from the interim waves. Additionally, we obtain information on the legal retirement ages in different countries from OECD and construct a dummy variable for individual's eligibility status taking the value 1 if an individual is older than the official retirement age in a given year.[3]

[3]OECD (2019) Pensions at a Glance provide detailed information on the pension systems of OECD countries.

Table 1: Sample Statistics

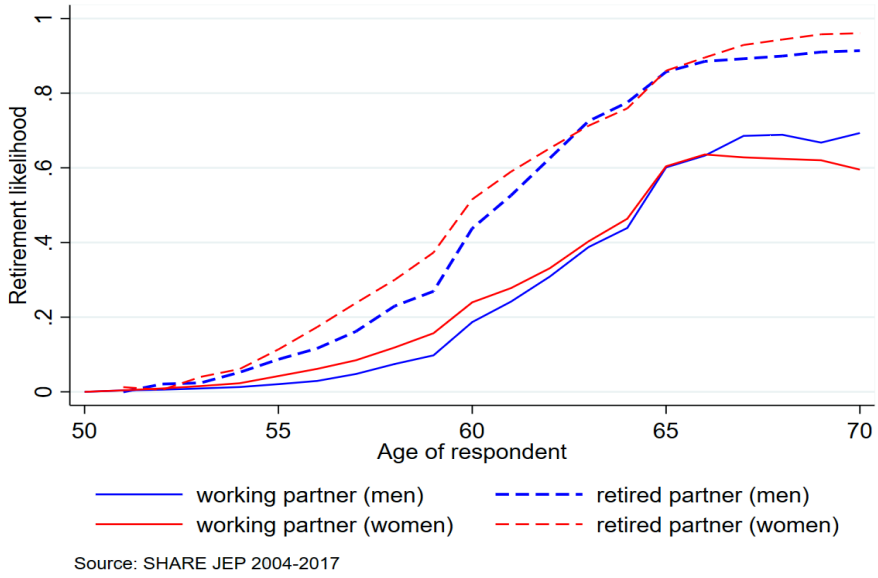
	Male (N = 8491)	Female (N = 8491)
Husband's age- wife's age		
Mean (SD)	2.22 (3.24)	
Husband's retirement-wife's retirement		
Mean (SD)	-0.32 (3.30)	
Education		
None/Primary	1616 (21.0%)	1530 (19.9%)
Secondary	3691 (48.0%)	3616 (47.0%)
Tertiary	2385 (31.0%)	2545 (33.1%)
Sector		
Private	4676 (55.5%)	4484 (53.5%)
Public	2539 (30.1%)	3162 (37.7%)
Self-employed	1217 (14.4%)	740 (8.8%)
Employment Type		
Full-time	8069 (95.7%)	6442 (76.8%)
Part-time	204 (2.4%)	1328 (15.8%)
Various	160 (1.9%)	621 (7.4%)
Retirement		
0	5636 (66.4%)	6446 (75.9%)
1	2855 (33.6%)	2045 (24.1%)
Joint Retirement		
0	7571 (89.2%)	7571 (89.2%)
1	920 (10.8%)	920 (10.8%)

Source: SHARE. Sample consists of 16982 individuals from married or cohabiting, dual-worker couples at any time during the years 2004-2017.

We use individuals' labor market histories to capture the time of transition into retirement. Additionally, we have all the relevant information about individuals' own demographic, financial and household characteristics that would be relevant for her/his retirement decision. The sample is defined as married or cohabiting, dual-worker couples at any time during the years 2004-2017, where both are aged over 50 years, and they are observed until at least age 70 or both of them retire. Should the couple separate, or either one dies, then both members of the couple are observed in the sample for the last time. Each individual in the sample is required to have at least ten years of job market experience over the lifetime. Throughout our analysis, we exclude couples with multiple partners and couples of the same gender. As a result, our sample consists of 8491 couples (16982 individuals) and 132 564 individual year observations from 27 countries. We define retirement as a voluntary exit from employment. This definition differs from labor force participation, excluding individuals who leave the labor force through unemployment, sickness or for looking after home or family which most of the times do not result as an individual choice.[4] Hence, our focus will be on individuals who voluntarily make a choice from employment to retirement. The "dual-working" group of couples in which both husband and wife were employed at the initial period constitutes the primary focus of our analysis. Of these 16982 individuals, 12082 (71%) had not changed state during the panel, among 2045 couples who both made a transition to retirement 920 (45%) moved to retirement within a year of their partner's retirement. Figure 1 presents the evolution over time of labour force participation of the population of married men and women having a working or a retired partner. The phenomenon of joint retirement can be seen clearly, the probability of retiring is higher at every age if the individual has an already retired partner. Interestingly, there is a reversal after 65, women are less likely to retire then men, however this could be due to sample composition as there are fever women then men above age 65 in the sample.

[4]Including involuntary exits could bias the results. For example, someone who retires after a job loss might do so only because s/he does not have much employment opportunities later in life not solely because her/his partner recently retired.

Figure 1: Retirement Patterns of Couples



3 Methodology

The focus of this paper is the identification and estimation of the effect of one's partner on one's own likelihood of retirement. In this regard, we set our focus on the following question; "Does the retirement of one's partner increase the likelihood of his/her own retirement and what are the likely determinants of such a joint retirement effect?" which is difficult to answer with traditional methods. The difficulty in identifying joint retirement incentives lies in the fact that partners share household income, might have similar characteristics due to assortative matching in marriage and might develop similar preferences over time. There have been various attempts in the literature to identify these channels such as, quasi-experimental methods when there is a policy change affecting only one spouse's outcome, instrumental variables using certain policy variables as a tool to account for endogeneity and estimating the preference parameters of husbands and wives under certain assumptions in structural estimation models.[5] However, unless, we have full information on all the factors common to both partners, our estimates are likely to be spurious. As a result, a fixed effects analysis is desirable in our attempt to control for unmeasured, stable factors.[6] Hence, for the purpose of exploring the effect of partner's retirement, we employ a fixed effects linear probability model by incorporating in instrumental variables to tackle a possible endogeneity problem.[7] The retirement status of the partner is instrumented by the eligibility status for full retirement to control for the endogeneity problems resulting from simultaneity and omitted variables bias. In order for the eligibility status to be a valid instrument, it must be exogenous and relevant. We test the relevancy assumption by verifying that the eligibility status is related to the actual retirement behavior by estimating the individual probability of leaving the labor force on the eligibility sta-

[5]For example, Michaud and Vermeulen (2011) assumes that preferences of married men and women differ from those of widows and widowers only by how they value joint leisure with their partners.

[6]After performing a Hausman test, we also find that fixed effects is more favourable for our data.

[7]Estimation of nonlinear models (e.g., logit or probit) with fixed effects can lead to the incidental parameters problem and be severely biased the results. See, Lancaster (2000).

tus however, the exogeneity assumption is not testable.[8] In practice we assume that conditional on observables whether the partner is eligible for retirement pensions only has an impact on the individual's retirement decision through the partner's retirement decision, as opposed to directly having an effect. As a result, our estimates are interpreted as the effect of the partner's retirement, induced through her/his eligibility for retirement pensions, on the individual's retirement decision.

The unit of observation is individual and our sample consists of those who were interviewed for the SHARE JEP along with their partners. Hence, the baseline model to be estimated is the following

$$Y_{it} = \beta_1 D_{it} + \beta_2 Age * D_{it} + \beta_3 Age_{it} + \beta_4 Eligible_{it} + \alpha_i + \eta_t + \epsilon_{it} \quad (1)$$

where, Y_{it} is a binary variable taking the value one if individual i makes a transition from work to retirement in year t, Age_{it} is centered around age 60, $Eligible_{it}$ indicates the eligibility status for full retirement of individual i in year t. α_i is the individual fixed effect which captures time-invariant factors, η_t is the year fixed effect, and ϵ_{it} is the individual disturbance. The impact of partner's retirement transition on the individual's probability of retirement is captured by β_1, the coefficient on the indicator of retirement status of individual i's partner at the reference age, D_{it} and β_2 indicates how it changes by age. Since we have a dummy endogenous variable, the conditional expectation function associated with the first stage, $E[Dij|Xi; Zi]$, is likely non-linear however, estimating the first stage with a non-linear estimator and using the predicted values in the second stage could result in *forbidden regression* problem if we misspecify the non-linear first stage estimator. Only OLS estimation guarantees first-stage residuals that are uncorrelated with fitted values and covariates. Angrist and Pischke (2008) suggests an alternative way to avoid this problem by using the predicted values of the dummy endogenous variable, $\hat{D_{it}}$ as an instrument for the estimation of equation (1) by 2SLS rather than substituting the predicted values in the second-stage equation. As a result, our estimation procedure consists of two steps; first we have a non-linear estimation of partner's retirement status on partner's eligibility for full retirement and the covariates for the main equation, Age_{it} and $Eligible_{it}$, next, we use the predicted values from the first stage to instrument the retirement status of the partner, D_{it} and estimate a fixed effects 2SLS model. [9] The equation estimated separately for husbands and wives and standard errors are clustered at the individual level in order to control for serial correlation.

In order to analyze heterogeneity, we estimate a modified version of the baseline model where the interest variable is interacted with G_i, the type of group that individual i belongs to such as the income quartile, education level etc.

$$Y_{it} = \beta_1 D_{it} * G_i + \beta_2 Age * D_{it} * G_i + \beta_3 Age_{it} + \beta_4 Eligible_{it} + \alpha_i + \eta_t + \epsilon_{it} \quad (2)$$

4 Results

The existing literature provides well documented evidence on the impact of financial factors and health status as crucial mechanisms of retirement behavior however, the data set used in this study has limited information on those variables as some individuals drop out of certain waves. Hence,

[8] The results are presented in the appendix 1

[9] The equation that is estimated in the first stage by probit is: $D_{it} = \theta_1 Instrument_{it} + \theta_2 Age_{it} + \theta_3 Eligible_{it} + \gamma_t$ where $Instrument_{it}$ indicates the eligibility status of individual i's partner at time t.

I instead include time fixed effects to control for variables that are constant across individuals, but vary over time (Columns 2 and 4 for men and women, respectively). The results of the fixed effects linear probability model are presented on Table 2.[10] The first and third columns show the baseline model for men and women, respectively. The reference category is individuals whose partner is still working, and whose age is 60 so that a 60 years old woman whose partner is retired is on average 16% more likely to retire relative to the woman whose partner is still employed. We observe that having a retired partner does not have a significant impact on men at the reference age but, their responses become significant and positive as they age. This asymmetric result could mean either husbands and wives value joint leisure differently, or as Stancanelli and Van Soest (2012) suggests, joint leisure might not be the main driver of joint retirement. Alternatively, it could be the case that the impact of income pooling being realized in two opposite directions for men and women. If the opportunity cost of time is not the same for both partners, the one with lower opportunity cost (mostly the wife) could retire earlier and specialize in home production whereas the other one can specialize in market production. As some demographic characteristics play a role in the determination of pension eligibility and benefit calculations, the direction of the income pooling effect might likely depend on the composition of the couple so that homogeneous couples might be more likely to retire at a shorter distance from each other. All in all, there may be mixed forces behind the outcome of joint retirement and individuals with different demographic characteristics or labor market backgrounds could have varying responses. Hence, I further explore the heterogeneity in response to partner's retirement status by considering different dimensions in the following sections.

Table 2: Linear Probability Model Estimates of Spousal Retirement

	Men		Women	
	(1)	(2)	(1)	(2)
Retired Partner	-0.0256	0.0262	0.1253***	0.1578***
	(0.0358)	(0.0335)	(0.0208)	(0.0206)
AgeXRetired Partner	0.0136*	0.0285***	0.0425***	0.0500***
	(0.0072)	(0.0070)	(0.0054)	(0.0054)
Age of respondent	0.0168***	0.0155***	0.0101***	0.0104***
	(0.0009)	(0.0009)	(0.0008)	(0.0008)
Eligible (Full)	0.2365***	0.2182***	0.1634***	0.1528***
	(0.0119)	(0.0115)	(0.0120)	(0.0119)
Time fixed effects	No	Yes	No	Yes
Number of observations	53121	53121	53895	53895
Number of individuals	8,491	8,491	8,491	8,491

Notes: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Columns 1 and 3 refer to the baseline model and Columns 2 and 4 include 15 year dummies. Standard errors clustered at the couple level are reported in brackets. Source: SHARE, 2004-2017

[10]These results are based on the instrument being the eligibility status for full-retirement. In the appendix, I replicate Table 2 by using the early-retirement eligibility as the instrument.

4.1 The Impact of the Pension Eligibility Rules

A crucial part of retirement decision hinges on social security rules which generally depend on one's age, gender, career length and so on. If partners have a big age gap, when the older partner reaches retirement age the younger may not be able to claim full pensions and hence, they may not be synchronizing retirement even though they enjoy joint leisure, while on the other hand, if husbands and wives are subject to different eligibility ages, couples with age difference might be more tempted to synchronize retirement. As a result, the outcome of joint retirement likely depends on the specific rules of the social security system as well as financial factors and leisure preferences. Among the set of countries we have in our sample, some have the same official eligibility age requirement for men and women, some allow women to retire at earlier ages, whereas others initially have different official ages but equalize them over the span of the panel. In order to explore the potential impact of official eligibility rules, I divide the set of countries into three groups depending on official eligibility ages being the same for both men and women, being lower for women, and being initially lower for women but equalized over time due to reforms. Table 3 depicts that when official retirement ages are lower for women (and stable), women are in general 15% more likely to retire at age 60 if their partners have already retired and more so at older ages. However, in countries where the official retirement age has increased throughout the panel, they appear to be more likely to retire at 60 (20%) which could capture the impact of bunching around the reference age so that when they face an unexpected increase in the official retirement age, they resort to early retirement plans or exit the labor market in accordance with their expectations. Men on the other hand, tend to coordinate retirement at the reference age if their wives face a lower official retirement age, and above the reference age if both partners face the same eligibility age. These results imply that even though there is a certain degree of asymmetry between husbands and wives, both have joint retirement incentives but, the feasibility of retirement coordination depends on several factors and hence we observe a more prominent response from women. In order to make sure that these results are not driven by couples who become eligible during the same year, I replicate these estimations on a sub-sample by removing those couples. These estimation results are in line with Table 3 and presented in the Appendix.

Table 3: Pension Eligibility Rules and Spousal Retirement

	Equal Official Age		Lower Official Age for Women		Equalized Official Age	
	Men	Women	Men	Women	Men	Women
Retired Partner	-0.1307	0.1567***	0.0887**	0.1514***	-0.0202	0.2156***
	(0.0850)	(0.0287)	(0.0409)	(0.0380)	(0.0690)	(0.0489)
AgeXRetired Partner	0.0815***	0.0636***	0.0054	0.0332***	-0.0027	0.0270**
	(0.0155)	(0.0068)	(0.0106)	(0.0113)	(0.0125)	(0.0122)
Age of respondent	0.0173***	0.0084***	0.0124***	0.0095***	0.0175***	0.0104***
	(0.0015)	(0.0011)	(0.0014)	(0.0014)	(0.0020)	(0.0016)
Eligible (Full)	0.2063***	0.1567***	0.3095***	0.2001***	0.2039***	0.1244***
	(0.0171)	(0.0204)	(0.0265)	(0.0195)	(0.0205)	(0.0247)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	25497	26003	13523	13586	13465	13648
Number of individuals	4,022	4,022	2,228	2,228	2,135	2,135

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially over three groups of countries (see Appendix). Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Standard errors clustered at the couple level are reported in brackets. Source: SHARE, 2004-2017

4.2 Association of Joint Retirement with Individual Characteristics

4.2.1 Labor Market Attachment

Individual income, level of education and number of years employed could be representative of how attached an individual is to her/his work, a factor that may reduce the value of (joint) leisure. Workers with higher earnings may have stronger labor force attachment and they may be less likely to retire at younger ages. Moreover, individual earnings are correlated with education levels and those who have higher education might have higher opportunity cost of time which may offset the incentives for joint leisure. In contrast, higher education and earnings could reflect how prepared an individual is for retirement since higher wealth will be accumulated over the years. This acts as a trigger for joint retirement as individuals with high accumulation of wealth can afford to retire (earlier) upon retirement of their partner. Along these lines, I categorize individuals into four groups depending on their position in the income distribution. Results are presented on table 4, the base level corresponds to individuals who are in the bottom quartile of income distribution and individuals who have low levels of education. We observe that at age 60, individuals at the bottom of the distribution are likely to synchronize retirement however, those who belong to higher quartiles do not have any joint retirement behavior. As individuals get older they are more likely to joint retire, but an exception is men who have high education and earnings. It seems that for men, joint leisure incentives are dominated if their earnings and hence the opportunity cost of retirement are high. Beyond age 60, women are likely to coordinate retirement with their partners regardless of their earning quartiles. In contrast, joint retirement behavior of women with different education levels do not differ significantly.

4.2.2 The Quality of Work

When it comes to the decision to retire today versus delaying it for another year individuals do not only consider their financial gain, but also the quality of work plays a role. Siegrist et al. (2007) discovers that poor quality of work is significantly associated with intended early retirement. Workers with jobs characterized by high physical demands, little freedom, and poor security may have a higher probability of withdrawing from the labor force, as compared to workers with intrinsically motivating jobs. Moreover, workers with intellectually challenging and rewarding jobs could be more committed and incentives for joint retirement could be dominated. Additionally, individuals attitudes toward retirement can reflect their preferences for leisure and joint leisure. Hence, it is crucial to explore the relationship between individuals' job quality and leisure preferences. In this regard, I generate an additive index on job strain which contains several items reflecting negative and positive attributes of the job, each ranked on a four point scale and a binary variable is constructed for each individual taking a value 1 if they have more negative (positive) job attributes relative to the sample mean. [11] Additionally, individuals were asked whether they are looking for retirement which was a binary variable (yes/no) and we considered it separately. The results are presented on Table 5, note that sample size is much smaller now compared to the original sample which is a result of individuals not responding all the questions in the survey, so we need to be careful in interpreting the results. The first and fourth columns show that both men and women are likely to coordinate retirement at the reference age if their views regarding their jobs being positive are below the mean (Interaction=0 on table 5) . In particular for women, the

[11] A detailed description of the items used can be found in the Appendix.

Table 4: Labor Market Attachment and Spousal Retirement

	Men		Women	
	Income	Education	Income	Education
Retired Partner X Quartile				
Baseline	0.1909***	0.2429*	0.2644***	0.1225***
	(0.0525)	(0.1274)	(0.0283)	(0.0374)
2nd Quartile	-0.3175***	-0.0472	-0.1638***	0.0655
	(0.0771)	(0.1368)	(0.0380)	(0.0526)
3rd Quartile	-0.2166***	-0.2110*	-0.2384***	0.0811*
	(0.0594)	(0.1246)	(0.0366)	(0.0420)
4th Quartile	-0.2748***	-0.2951**	-0.2362***	-0.0536
	(0.0552)	(0.1273)	(0.0415)	(0.0459)
Age X Retired Partner X Quartile				
Baseline	0.0597***	0.0359	0.0520***	0.0499***
	(0.0148)	(0.0246)	(0.0080)	(0.0111)
2nd Quartile	-0.0160	0.0178	-0.0047	-0.0132
	(0.0271)	(0.0376)	(0.0137)	(0.0187)
3rd Quartile	-0.0192	0.0069	-0.0027	0.0060
	(0.0196)	(0.0273)	(0.0151)	(0.0138)
4th Quartile	-0.0623***	-0.0315	-0.0120	-0.0025
	(0.0186)	(0.0275)	(0.0165)	(0.0159)
Age of respondent	0.0149***	0.0152***	0.0105***	0.0104***
	(0.0009)	(0.0009)	(0.0008)	(0.0008)
Eligible (Full)	0.2027***	0.2094***	0.1529***	0.1527***
	(0.0125)	(0.0125)	(0.0125)	(0.0126)
Time fixed effects	Yes	Yes	Yes	Yes
Number of observations	49344	49344	50152	50152
Number of individuals	7,609	7,609	7,636	7,636
Wald tests				
(Retired Partner X Quartile)				
Base + 2nd Quartile (p)	0.0753	0.0042	0.0042	0.0000
Base + 3rd Quartile (p)	0.5990	0.4043	0.4357	0.0000
Base + 4th Quartile (p)	0.0663	0.2922	0.4734	0.0456
(AgeXRetired Partner X Quartile)				
Base + 2nd Quartile (p)	0.0617	0.0579	0.0000	0.0152
Base + 3rd Quartile (p)	0.0022	0.0003	0.0002	0.0000
Base + 4th Quartile (p)	0.8314	0.7161	0.0073	0.0000
Overall tests				
Retired Partner X Quartile (p)	0.0000	0.0028	0.0000	0.0009
AgeXRetired Partner X Quartile (p)	0.0050	0.0772	0.9063	0.7093

Note: *** p<0.01, ** p<0.05, * p<0.1.

The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Columns 1 and 3 refer to the analysis of income over 4 quartiles, the base level corresponds to the individuals in the bottom quartile of the distribution and Columns 2 and 4 refer to the analysis of education over 4 levels where the base group consists of individuals with isced level 0 and 1. (Group 2 corresponds to isced 2, group 3 to isced 3 and 4, and group 4 to isced 5 and 6 (see Appendix for details)). Standard errors clustered at the couple level are reported in brackets. Wald tests are reported underneath for the specific sub-sample of individuals at and beyond the reference age. Source: SHARE JEP, 2004-2017

impact of above-the-mean positive views is important as it tentatively completely eliminates the propensity to joint retire. Furthermore, if a women is looking for retirement, she is on average 8% more likely to retire at age 60 conditional on her husband's retirement relative to a women who is not looking for retirement, but this gap wanes at older ages. On the other hand, men do not have a significant difference at the reference age rather the difference appears at older ages, those who look for retirement and who believe their jobs have negative attributes are much more likely to coordinate retirement relative to those who do not.

Table 5: The Quality of Work and Spousal Retirement

	Men			Women		
	Positive Job Attributes	Negative Job Attributes	Looking for Retirement	Positive Job Attributes	Negative Job Attributes	Looking for Retirement
Retired Partner	0.1346***	0.0486	-0.0318	0.0962***	0.0029	0.0374
	(0.0521)	(0.0579)	(0.0421)	(0.0301)	(0.0288)	(0.0239)
Retired PartnerXInteraction	-0.0620	0.0669	0.1256**	-0.1096***	0.0734**	0.0831***
	(0.0562)	(0.0579)	(0.0493)	(0.0335)	(0.0340)	(0.0308)
AgeXRetired Partner	0.0280**	0.0041	0.0130	0.0344***	0.0105	0.0348***
	(0.0120)	(0.0111)	(0.0082)	(0.0095)	(0.0094)	(0.0083)
AgeXRetired PartnerXInteraction	-0.0138	0.0330**	0.0658***	-0.0234*	0.0244*	0.0040
	(0.0168)	(0.0168)	(0.0175)	(0.0129)	(0.0129)	(0.0117)
Age of respondent	0.0054***	0.0048***	0.0065***	0.0053***	0.0052***	0.0043***
	(0.0009)	(0.0009)	(0.0008)	(0.0008)	(0.0008)	(0.0006)
Eligible (Full)	0.1403***	0.1358***	0.1179***	0.1199***	0.1094***	0.0878***
	(0.0151)	(0.0152)	(0.0122)	(0.0158)	(0.0158)	(0.0126)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	24042	23330	35253	25214	24470	37431
Number of individuals	3,532	3,390	5,202	3,652	3,522	5,478

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Column titles denote the interaction variable, for example the coefficient of "Retired PartnerXInteraction" in the first column means that a man who has above average positive views about his job is 6% less likely to retire upon retirement of his partner at the reference age relative to a man who has below average positive views.

4.2.3 The Role of Big-5 Personality Traits

Table 6: Personality Traits and Spousal Retirement (Women)

	Extraversion	Agreeableness	Openness	Conscientiousness	Neuroticism
Retired Partner	0.2013***	0.1909***	0.1827***	0.1971***	0.1480***
	(0.0253)	(0.0265)	(0.0272)	(0.0290)	(0.0267)
Retired PartnerXInteraction	-0.0903***	-0.0561**	-0.0387	-0.0646**	0.0183
	(0.0268)	(0.0272)	(0.0278)	(0.0283)	(0.0272)
AgeXRetired Partner	0.0553***	0.0469***	0.0394***	0.0461***	0.0386***
	(0.0079)	(0.0085)	(0.0076)	(0.0087)	(0.0080)
AgeXRetired PartnerXInteraction	-0.0093	0.0054	0.0173*	0.0062	0.0206**
	(0.0102)	(0.0104)	(0.0102)	(0.0106)	(0.0102)
Age of respondent	0.0105***	0.0104***	0.0104***	0.0104***	0.0104***
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Eligible (Full)	0.1515***	0.1522***	0.1528***	0.1515***	0.1534***
	(0.0119)	(0.0119)	(0.0119)	(0.0120)	(0.0119)
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	53895	53895	53895	53895	53895
Number of individuals	8,491	8,491	8,491	8,491	8,491

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Column titles denote the interaction variable, for example the coefficient of "Retired PartnerXInteraction" in the first column means that a woman who has above average extraversion is 9% less likely to retire upon retirement of her partner at the reference age relative to a woman who has below average extraversion.

Previous research shows that personality is correlated with job performance as well as career choice. Angrisani et al. (2013) shows that individuals' perception of their jobs depend on their personality traits and that there is a strong correlation between job characteristics and personality traits,

whereas Becker et al. (2011) studies the association of personality traits with life outcomes – such as labor market success, health status and life satisfaction and concludes that these are rather complementary when it comes to explaining heterogeneity in individual behavior. Hence, personality traits may be associated with one's labor force transition. On the other hand, Brandstätter and Königstein (2001) studies behavioural differences within an ultimatum game and finds that global personality measures contribute significantly to the explanation of bargaining outcomes so that people who are either neurotic and extroverted or emotionally stable and introverted reject a proposal more often than others. Hence, personality traits could play a significant role on the timing of retirement and create divergence between individuals, but also they could have an impact on the bargaining between partners regarding their labor market behavior and indirectly influence partners' retirement behavior. In this respect, I will make use of Big-5 personality data

Table 7: Personality Traits and Spousal Retirement (Men)

	Extraversion	Agreeableness	Openness	Conscientiousness	Neuroticism
Retired Partner	0.0203	-0.0039	0.0060	0.0277	0.0010
	(0.0400)	(0.0378)	(0.0436)	(0.0383)	(0.0419)
Retired PartnerXInteraction	0.0081	0.0610	0.0280	-0.0020	0.0485
	(0.0418)	(0.0426)	(0.0442)	(0.0425)	(0.0421)
AgeXRetired Partner	0.0234***	0.0252***	0.0372***	0.0228**	0.0216**
	(0.0088)	(0.0091)	(0.0109)	(0.0092)	(0.0095)
AgeXRetired PartnerXInteraction	0.0128	0.0077	-0.0142	0.0115	0.0157
	(0.0131)	(0.0131)	(0.0135)	(0.0131)	(0.0131)
Age of respondent	0.0155***	0.0155***	0.0155***	0.0155***	0.0156***
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Eligible (Full)	0.2180***	0.2173***	0.2181***	0.2184***	0.2180***
	(0.0115)	(0.0115)	(0.0115)	(0.0115)	(0.0115)
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	53121	53121	53121	53121	53121
Number of individuals	8,491	8,491	8,491	8,491	8,491

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Column titles denote the interaction variable, for example the coefficient of "Retired PartnerXInteraction" in the first column means that a man who has above average extraversion is 0.8% more likely to retire upon retirement of his partner at the reference age relative to a man who has below average extraversion.

available on SHARE survey and study whether individuals with certain personality characteristics have a tendency to retire in close proximity to their partners. [12] Share collects data on subjective personality characteristics on a scale from 1(low) to 5(high), we define an individual to have a certain characteristics if s/he associates herself/himself with that characteristics more than the average person in the sample. The results are presented on table 6 and 7 for women and men, respectively. We discover that men's personality traits do not have a divergent impact on their retirement probability conditional on their spouse while women who are more extroverted, agreeable and conscious are less likely to synchronize retirement at the reference age relative to those who are less extroverted agreeable and conscious. These results support the arguments put forward in relation to personality traits and economic preferences. For example, evidence suggests that conscientiousness which is associated with being goal-directed and planning ahead predicts a range of socio-economic outcomes (Prevoo and ter Weel (2015)), extraversion is associated with being more social and assertive and it could also reflect being more productive in the market work so that extravert individuals would potentially stay longer in the labor market, and agreeableness is correlated with being cooperative and altruist and hence, they are also more willing to delay retirement.

[12] See appendix for a detailed description of Big-5 personality characteristics.

4.3 Association of Joint Retirement with Couple Characteristics

4.3.1 Age Difference Between Partners

Table 8: The Impact of Age Difference Between Partners and Eligibility Ages

	Equal Official Age		Lower Official Age for Women		Equalized Official Age	
	Men	Women	Men	Women	Men	Women
Retired Partner X Age Diff.						
$Husband - Wife <= 0$ (Base)	-0.0015	0.8009***	0.0802*	0.3272	-0.0295	0.3532
	(0.1134)	(0.2051)	(0.0465)	(0.2597)	(0.0714)	(0.2267)
$0 < Husband - Wife <= 2$	-0.3121	-0.5934***	0.0866	0.0672	0.1147	-0.0821
	(0.3280)	(0.1739)	(0.0780)	(0.2374)	(0.1429)	(0.2037)
$2 < Husband - Wife <= 4$	0.2050	-0.6585***	0.1469	-0.0560	0.3241	-0.0812
	(0.5410)	(0.1835)	(0.1198)	(0.2351)	(0.2533)	(0.2075)
$4 < Husband - Wife$	4.3175*	-0.6980***	1.1791*	-0.2046	-0.3837	-0.2304
	(2.2680)	(0.1905)	(0.6740)	(0.2457)	(0.6025)	(0.2080)
Age X Retired Partner X Age Diff.						
$Husband - Wife <= 0$ (Base)	0.0550***	0.0375	0.0084	0.0958	-0.0475**	0.0848
	(0.0152)	(0.0362)	(0.0139)	(0.0729)	(0.0187)	(0.0685)
$0 < Husband - Wife <= 2$	0.0870	0.0184	-0.0174	-0.1082	0.0146	-0.0886
	(0.0661)	(0.0384)	(0.0275)	(0.0775)	(0.0338)	(0.0736)
$2 < Husband - Wife <= 4$	-0.0176	0.0222	-0.0326	-0.1089	0.0078	-0.0939
	(0.0718)	(0.0394)	(0.0321)	(0.0776)	(0.0471)	(0.0727)
$4 < Husband - Wife$	-0.4333	-0.0139	-0.1109	-0.0695	0.2190**	-0.0730
	(0.2893)	(0.0384)	(0.0957)	(0.0743)	(0.1083)	(0.0697)
Age of respondent	0.0151***	0.0050**	0.0097***	0.0057**	0.0150***	0.0079***
	(0.0039)	(0.0021)	(0.0020)	(0.0028)	(0.0029)	(0.0029)
Eligible (Full)	0.1722***	0.1077***	0.2934***	0.1896***	0.2045***	0.1226***
	(0.0325)	(0.0232)	(0.0301)	(0.0199)	(0.0239)	(0.0266)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	25497	26003	13523	13586	13465	13648
Number of individuals	4,022	4,022	2,228	2,228	2,135	2,135
Wald tests						
(Retired Partner X Age Diff)						
Base + $0 < Husband - Wife <= 2$ (p)	0.4514	0.0172	0.0402	0.0061	0.6272	0.0032
Base + $2 < Husband - Wife <= 4$ (p)	0.7444	0.0098	0.0738	0.0027	0.2968	0.0016
Base + $4 < Husband - Wife$ (p)	0.0640	0.0185	0.0670	0.0291	0.5068	0.0496
(AgeXRetired Partner X Age Diff)						
Base + $0 < Husband - Wife <= 2$ (p)	0.0444	0.0098	0.7093	0.7232	0.2486	0.8983
Base + $2 < Husband - Wife <= 4$ (p)	0.6220	0.0043	0.4044	0.6814	0.3351	0.7295
Base + $4 < Husband - Wife$ (p)	0.1931	0.0232	0.2714	0.0382	0.1034	0.3889
Overall tests						
Retired Partner X Age Diff. (p)	0.0295	0.0037	0.1977	0.1514	0.5163	0.2039
AgeXRetired Partner X Age Diff. (p)	0.1070	0.3907	0.4996	0.3325	0.2453	0.5758

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially over three groups of countries (see Appendix). Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Standard errors clustered at the couple level are reported in brackets. Wald tests are reported underneath representing the p-value for the significance of retired partner at the specific sub-sample of individuals at and beyond the reference age. Retired Partner X Age Diff. corresponds to the overall test of age difference at the reference age and AgeXRetired Partner X Age Diff beyond the reference age. Source: SHARE JEP, 2004-2017

Coordination of couples' retirement timing can produce a variety of positive or negative consequences on personal and household earnings. Especially for those with larger age differences, the age gap between partners can be an important factor determining future economic resources after retirement. For example, if the younger spouse retires earlier, the couple may lose substantial amount of economic resources and also they will be relying on retirement benefits and personal savings for a longer period of time. However, individuals' decision for retirement do not only depend on individual preferences, but also the underlying rules of the pension system may enforce certain behavior. As Seibold (2017) points out many people leave the labor force around the statutory eligibility ages and some countries even impose punishment for work after these ages. In countries where both men and women face the same eligibility conditions, we expect couples who are the same age or are close in age to be the most likely ones to retire jointly. Couples with large age differences can face higher costs of joint retirement either because the younger spouse might need to leave the labor force earlier when the older one reaches retirement age or the older spouse might need to work longer beyond the retirement age. Nonetheless, different eligibility rules might affect

couples differently. For example, in countries where the official retirement age is 5 years lower for women, couples with 5 years age difference could be more likely to joint retire relative to the ones with no age difference. Hence, the effects of couple age composition likely depends on the specific pension rules. The purpose of this section is to investigate the association between age differences and retirement coordination among couples controlling for the institutional differences in eligibility rules. Accordingly, I divide the sample into three depending on the distance between men and women's official eligibility ages and we group the individuals into four depending on the age difference between partners. The age difference between partners is measured by subtracting wife's age from husband's age.

In countries with equal eligibility ages, men do not have joint retirement incentives at the reference age unless they are four or more years older than their wives however, men who are younger than their wives are more likely to synchronize retirement above 60. In contrast, in countries with unequal eligibility ages, men who are younger than their wives are more likely to retire at the reference age upon their wives' retirement. Interestingly, women do not coordinate retirement neither at the reference age nor later when the eligibility ages are unequal or start unequal and then converge over time. This could be for two reasons; first, when women are subject to lower eligibility ages, they are in general able to retire earlier than their husbands and hence, those who are still employed when their husbands retire have high attachment to the labor market which dominates their joint leisure incentives, second, it could be because in couples with some age difference both partners may become eligible for pensions around the same time and they may choose to work until they get full eligibility in order not to incur any financial losses or benefit cuts.

4.3.2 Household Socio-economic status

We expand our analysis in Table 9 over socio-economic status in order to examine the role played by household financial status on the outcome of joint retirement. Without having sufficient financial resources, workers cannot afford to retire. Hence, decision to retire and the timing of retirement is closely linked to the accumulation of wealth. Moreover, there is a certain degree of correlation between household wealth and income, but it is not perfect as household wealth is influenced by political and market factors and higher income households tend to save more. On one hand, couples with higher accumulated wealth could be able to retire earlier as they can afford it financially (income effect), on the other hand, having high labor income creates a substitution effect so that the opportunity cost of retirement is high and hence, individuals with high earning potentials could leave the labor market at later ages. In this regard, I differentiate between the effect of wealth and income to see whether either of that has an influence on couples' tendency to coordinate retirement. The sample has been divided into four quartiles by country over the household income distribution, and net value of household assets in the beginning of the panel. I estimated the baseline model by interacting the interest variable (partner's retirement status) with different quartiles and then with the age variable in order to be able to analyze responses of individuals from different sub-samples at and above the reference age. Table 9 demonstrates that reactions of both men and women from various quartiles of household income are in the same direction however, when we focus on the magnitude of the impact we find out that women from all quartiles have positive joint retirement incentives even though it is less for those in higher quartiles unlike men whose incentives move in the opposite direction when they are among the higher

Table 9: Household Socio-economics status and Spousal Retirement

	Men		Women	
	HH Income	HH Net Worth	HH Income	HH Net Worth
Retired Partner X Quartile				
1st Quartile (Base)	0.1009**	-0.0254	0.1895***	0.1719***
	(0.0486)	(0.0461)	(0.0288)	(0.0289)
2nd Quartile	-0.0715	0.0694	-0.0383	-0.0632*
	(0.0557)	(0.0597)	(0.0352)	(0.0361)
3rd Quartile	-0.1293**	0.0876	-0.0052	0.0104
	(0.0594)	(0.0648)	(0.0468)	(0.0413)
4th Quartile	-0.1608**	0.1263**	-0.1278***	-0.0178
	(0.0711)	(0.0575)	(0.0406)	(0.0407)
Age X Retired Partner X Quartile				
1st Quartile (Base)	0.0554***	0.0464***	0.0542***	0.0479***
	(0.0145)	(0.0135)	(0.0105)	(0.0089)
2nd Quartile	-0.0036	0.0017	-0.0132	-0.0175
	(0.0205)	(0.0194)	(0.0141)	(0.0143)
3rd Quartile	-0.0589***	0.0025	-0.0019	0.0290*
	(0.0188)	(0.0217)	(0.0182)	(0.0157)
4th Quartile	-0.0378*	-0.0687***	-0.0127	-0.0052
	(0.0221)	(0.0198)	(0.0155)	(0.0148)
Age of respondent	0.0156***	0.0151***	0.0104***	0.0103***
	(0.0009)	(0.0009)	(0.0008)	(0.0008)
Eligible (Full)	0.2054***	0.2075***	0.1541***	0.1521***
	(0.0125)	(0.0125)	(0.0127)	(0.0125)
Time fixed effects	Yes	Yes	Yes	Yes
Number of observations	48694	49344	49477	50152
Number of individuals	7,469	7,609	7,490	7,636
Wald tests				
Retired Partner X Quartile				
Base + 2nd Quartile (p)	0.5139	0.4203	0.0000	0.0004
Base + 3rd Quartile (p)	0.5799	0.3069	0.0000	0.0000
Base + 4th Quartile (p)	0.3659	0.0448	0.1069	0.0001
AgeXRetired Partner X Quartile				
Base + 2nd Quartile (p	0.0007	0.0011	0.0000	0.0070
Base + 3rd Quartile (p)	0.7894	0.0057	0.0007	0.0000
Base + 4th Quartile (p)	0.3192	0.1430	0.0005	0.0005
Overall tests				
Retired Partner X Quartile (p)	0.0679	0.1571	0.0123	0.2669
AgeXRetired Partner X Quartile (p)	0.0047	0.0008	0.7482	0.0604

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Columns 1 and 3 refer to the analysis of household income over 4 quartiles, the base level corresponds to the bottom quartile of the distribution and Columns 2 and 4 refer to the analysis of assets (total household wealth) over 4 quartiles. Standard errors clustered at the couple level are reported in brackets. Wald tests are reported underneath for the specific sub-sample of individuals at and beyond the reference age. Retired Partner X Quartile corresponds to the overall test of household income (wealth) quartile at the reference age and AgeXRetired Partner X Quartile beyond the reference age. Source: SHARE JEP, 2004-2017

quartiles of household income. Asymmetries between men and women appear when we consider the distribution of household assets, men from the highest quartile and women from the lowest quartile are more likely to coordinate the timing of retirement with their partners at the reference age. Moreover, for men, in line with the predictions of human capital theory, both income effects and substitution effects are at play for the decision to retire conditional on partner's retirement so that those who have higher household assets are more likely to retire at the reference age relative to those who do not while women with higher household income are less likely to joint retire.

4.3.3 Relative Labor Market Attachment Among Couples

Table 10: Relative Labor Market Attachment and Spousal Retirement

	Men			Women		
	Income Difference	Education Difference	Career Length Difference	Income Difference	Education Difference	Career Length Difference
Retired Partner X Diff.						
Negative Difference (Base)	0.4068**	0.0814	-0.0341	0.2014***	0.2313***	0.1177***
	(0.1715)	(0.0683)	(0.0384)	(0.0460)	(0.0361)	(0.0220)
No Difference	-0.3332**	-0.0783	0.0243	0.0010	-0.0612*	0.0582*
	(0.1656)	(0.0654)	(0.0466)	(0.0444)	(0.0371)	(0.0324)
Positive Difference	-0.4573***	-0.0612	0.1896***	-0.2097***	-0.1580***	0.1817**
	(0.1672)	(0.0715)	(0.0647)	(0.0464)	(0.0403)	(0.0720)
Age X Retired Partner X Diff.						
Negative Difference (Base)	0.0538	0.0185	0.0065	0.0711***	0.0529***	0.0373***
	(0.0474)	(0.0152)	(0.0130)	(0.0149)	(0.0108)	(0.0060)
No Difference	-0.0189	0.0063	0.0253	-0.0224	0.0013	0.0355***
	(0.0485)	(0.0173)	(0.0164)	(0.0169)	(0.0130)	(0.0135)
Positive Difference	-0.0394	0.0268	0.0140	-0.0516***	-0.0150	-0.0196
	(0.0486)	(0.0222)	(0.0182)	(0.0166)	(0.0144)	(0.0241)
Age of respondent	0.0146***	0.0158***	0.0151***	0.0102***	0.0105***	0.0103***
	(0.0010)	(0.0009)	(0.0009)	(0.0009)	(0.0008)	(0.0008)
Eligibility (Full Ret.)	0.2100***	0.2181***	0.2167***	0.1557***	0.1535***	0.1518***
	(0.0131)	(0.0116)	(0.0116)	(0.0134)	(0.0120)	(0.0120)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	45838	50368	53121	45760	51110	53895
Number of individuals	7,069	7,885	8,491	6,967	7,885	8,491
Wald-p (Retired Partner X Diff.)	0.0015	0.5905	0.0096	0.0000	0.0002	0.0147
No Difference-p	0.1173	0.6871	0.8109	0.0000	0.0000	0.0000
Positive Difference-p	0.1322	0.3626	0.0162	0.7319	0.0134	0.0001
Wald-p (AgeXRetired Partner X Diff.)	0.3486	0.5970	0.3022	0.0019	0.2958	0.0168
No Difference-p	0.0038	0.0122	0.0023	0.0000	0.0000	0.0000
Positive Difference-p	0.1835	0.0102	0.1157	0.0104	0.0010	0.4526

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Column titles denote the interaction variable, for example the coefficient of "Retired Partner X Diff." at the base level in the first column means that a man who has lower income than his partner is 40% more likely to retire upon retirement of his partner at the reference age. Income/Education/Career Length differences are calculated by subtracting the partner's value from the individual's. Wald tests are reported underneath the table.

It is theoretically ambiguous whether a fall in labor supply of one spouse would generate a fall or a rise in labor supply of the other spouse Goux et al. (2014). When husbands and wives see their labor supply as substitutable, we may observe specialization in market and home production between partners whereas, if husbands and wives see their work activity as complementary, partners' relative attachment to the labor force can be a significant determinant of retirement synchronization. Primary earners and secondary earners might have different elasticities of labor supply which influences their responsiveness to joint retirement incentives. For example, two married women with the same labor income may not respond the same way to their husbands' retirement if their husbands' incomes are different. Moreover, some countries have different marginal tax rates on primary and secondary earners which may also affect couples' tendency to coordinate retirement. For instance, when the marginal tax rates on secondary earners are high, one could face a higher

opportunity cost of work when her/his partner retires. Hence, it is crucial to examine the impact of relative earnings to better understand the behavior of joint retirement.

Looking at the differences in earnings levels between partners, we encounter two outcomes; women are always more likely to retire if their partners are retired, and joint retirement incentives are highest among the secondary earners for both husbands and wives. In contrast, both male and female primary earners are unlikely to exit the labor market at the reference age if their partner has already retired. Moreover, men do not have any significant reaction to differences in education levels while women who have the same level of education or higher are less likely to retire conditional on their partner's retirement. These findings support the idea that being highly attached to the labor market makes individuals less likely to coordinate retirement, even though both partners actively join the labor force, men are possibly still associated with the breadwinner role. Additionally, asymmetries in gender turns out to be less prominent, men and women respond similarly when compared to their partner's earner role.

4.3.4 The Role of Preference Correspondence

Table 11: Correlated Preferences Between Partners and Spousal Retirement

	Men			Women		
	Activities	Philosophies	Personality	Activities	Philosophies	Personality
Retired Partner	-0.0672	0.0379	-0.0271	0.0966***	0.1052***	0.1500***
	(0.0538)	(0.0530)	(0.0514)	(0.0303)	(0.0334)	(0.0310)
Retired PartnerXInteraction	0.1008**	-0.0020	0.0320	0.0905***	0.0071	0.0109
	(0.0503)	(0.0328)	(0.0502)	(0.0297)	(0.0205)	(0.0305)
AgeXRetired Partner	0.0182*	0.0327**	0.0271**	0.0407***	0.0416***	0.0554***
	(0.0108)	(0.0130)	(0.0130)	(0.0092)	(0.0106)	(0.0091)
AgeXRetired PartnerXInteraction	0.0131	-0.0060	-0.0060	0.0177	0.0045	-0.0081
	(0.0140)	(0.0101)	(0.0151)	(0.0115)	(0.0077)	(0.0116)
Age of respondent	0.0173***	0.0158***	0.0173***	0.0120***	0.0117***	0.0117***
	(0.0010)	(0.0010)	(0.0011)	(0.0009)	(0.0010)	(0.0009)
Eligible (Full)	0.2097***	0.2279***	0.2103***	0.1470***	0.1665***	0.1441***
	(0.0122)	(0.0143)	(0.0122)	(0.0128)	(0.0151)	(0.0128)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	42473	34653	41470	43106	35162	42097
Number of individuals	6,162	5,506	6,006	6,160	5,497	6,006

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table shows results of panel fixed effects IV estimates of retirement conditional on partner's retirement on married or cohabiting respondents where both spouses are employed initially. Dependent variable is a binary variable indicating the retirement status of the individual. Age is centered at 60, hence the intercept corresponds to coefficients at age 60. Column titles denote the interaction variable, for example the coefficient of "Retired PartnerXInteraction" in the first column means that a man who has above average correlation in activities with his partner is about 11% more likely to retire upon retirement of his partner at the reference age relative to a man who has below average correlation.

Under the leisure complementarity assumption, the utility of joint leisure is likely to be higher if the two people have correlated activities, correlated philosophies or correlated personalities.[13] Even though several authors attempted to identify the effect of leisure complementarities on joint retirement, lack of precise data on how partners actually value or spend time together makes it incomplete. In this section, I aim to analyse the correlation of couples preferences and their tendency to coordinate retirement. The SHARE survey collects data on various activities individuals do as well as individuals' religious and political beliefs which could be informative on how an individual allocates her/his leisure time.[14] Additionally, in wave 7 respondents were asked several questions to capture their Big-5 personality characteristics which could reflect the similarities between partners. As before, there are missing observations in some waves, so I consider the first time available

[13]There exists a strand of literature on leisure complementarities within the household (Hamermesh (2003) Goux et al. (2014)).

[14]See Appendix for the variable construction in detail.

responses of couples and construct a variable to identify whether both partners select same activity or philosophy over 7 activities and 3 philosophies, then I take the sample average of the number of activities (philosophies) that both partners practice and the final variable is constructed as a binary variable taking the value one if the couple has above average correlation in activities (philosophies). For the personality characteristics, SHARE survey collects a likert variable from 1(low) to 5(high) on extraversion, agreeableness, openness, neuroticism and conscientiousness. As before we construct a binary variable taking the value one if the couple has above average correlation on personal characteristics in 5 sub-categories. Table 11 demonstrates the outcome for men and women separately. The first thing to notice is that both men and women who have above the average correlation in activities with their partners are more likely to coordinate retirement at the reference age, though we cannot see the same impact at older ages. When it comes to correlation in philosophies and personality, men are rather unresponsive while women are more likely to retire conditional on their partner's retirement whether they have high or low correlation with their partners. All in all, these findings highlight the importance of leisure complementarities on retirement decisions. Even though we cannot verify whether partners enjoy certain activities together, we find out that the higher the number of activities that both partners practice the more likely that they will coordinate retirement with their partners whereas correlation in personality characteristics and philosophies are rather silent for joint retirement incentives.

5 Conclusion

While the existing literature concerns with the identification of the underlying mechanisms of joint retirement behavior of couples, this paper focuses on the role of individual heterogeneity in joint retirement behavior and investigates spillover effects on retirement in a broader context. I find that wives are more likely to coordinate retirement with their husbands at age 60, but their responses converge as they age. Composition of couples is an important determinant of joint retirement behavior, but it also depends on the eligibility conditions husbands and wives encounter; in general there is a negative correlation between age difference and couples' coordination of retirement, especially in countries where men and women face the same eligibility age. Interestingly, when men are the younger partner, they are likely to coordinate retirement with their partners at age 60 in countries where women are allowed to retire at earlier ages, and above 60 in countries where they are both subject to the same statutory age.

Coordination of retirement timing is also associated with one's socio-economic status. Individuals who have lower household income and accumulated wealth tend to have higher joint retirement incentives which potentially reflects the impact of minimum pensions and higher replacement rates for workers with lower earnings. Moreover, not only individuals with high labor market attachment (high individual income and education) are less likely to coordinate retirement with their partners, but also attachment relative to the partner is a crucial determinant of retirement coordination. The principal earner in the household, regardless of gender, has negative joint retirement incentives. This result implies that those partners who have higher opportunity cost of time tend to carry the role of bread-winner. Additionally, the quality of work is another determinant in individuals' likelihood to coordinate retirement, those who possess more positive and/or less negative views about their jobs are more likely to stay in the labor market for a longer time. Our data set does

not allow us to identify the share of time couples spend together but, we can control for what kind of activities both partners practice and the higher the number of activities both partners practice, the more likely they are to retire conditional on their partners' retirement and this could highlight the importance of joint leisure incentives as an underlying channel of joint retirement behavior. Furthermore, I also control for the correlation in philosophies and personality traits between couples, but they do not have a significant impact on couples retirement.

All in all, we could say that there is considerable variation in individuals' joint retirement behavior, nevertheless labor force attachment is a crucial part of one's retirement decision, the ones with lower attachment are more likely to coordinate retirement with their partners regardless of the gender, however the traditional gender roles are still present in some couples and men carry the role of bread winner. Delving deeper into this interesting finding, I find out that the quality of work is another significant component of retirement decision, especially for women which suggests that we can improve women's retirement experience by improving work conditions and earnings. Hence, exploring policy tools that can help correct the asymmetries between men's and women's retirement behavior potentially stemming from labor market outcomes would be an important agenda.

6 Appendix

6.1 First Stage Results

Table 12: First Stage Estimates for Table 2

	1st Step	2nd Step	
	1st Stage Probit Estimates	1st Stage 2SLS Men	1st Stage 2SLS Women
	(1)	(2)	(3)
instrument_p=1	0.8947***		
	(0.0190)		
Age of respondent	0.0627***	0.0120***	0.0205***
	(0.0020)	(0.0007)	(0.0008)
Eligible (Full)	-0.1905***	0.0672***	0.0127
	(0.0230)	(0.0087)	(0.0116)
ret_phat		1.1844***	1.6119***
		(0.0596)	(0.0620)
Constant	-6.6574		
	(129.0186)		
Time fixed effects	Yes	Yes	Yes
Number of observations	114755	53121	53895
Under identification		347.9102	537.7933
Weak identification		395.9128	676.5400

Note: *** p<0.01, ** p<0.05, * p<0.1.
Column (1) presents the probit estimation of partner's retirement status instrumented by partner's eligibility status. Column(2) and (3) present the first stage of 2SLS estimates for men and women, respectively which uses the predicted values from the first stage as instrument for partner's retirement status.

Table 13: First Stage Estimates for Table **??**

	Spouse	Family	Friend/Co-worker
Pr(ret_1)	0.8651***	1.2771***	0.9123***
	(0.0240)	(0.0264)	(0.0418)
Eligible	0.0159	0.0476**	-0.0282
	(0.0201)	(0.0216)	(0.0362)
Age	0.0078***	-0.0146***	0.0028
	(0.0018)	(0.0021)	(0.0034)
Gender	0.0534***	-0.0654***	0.0057
	(0.0108)	(0.0147)	(0.0193)
2nd Quartile	-0.0116	0.0248*	-0.0208
	(0.0146)	(0.0149)	(0.0265)
3rd Quartile	-0.0061	0.0258*	-0.0205
	(0.0145)	(0.0156)	(0.0260)
4th Quartile	-0.0173	0.0447**	-0.0024
	(0.0147)	(0.0191)	(0.0273)
Health Very good	0.0023	0.0021	-0.0211
	(0.0154)	(0.0205)	(0.0288)
Good	-0.0031	0.0063	-0.0142
	(0.0157)	(0.0202)	(0.0273)
Fair	0.0087	-0.0135	-0.0044
	(0.0189)	(0.0223)	(0.0337)
Poor	0.0119	-0.0274	-0.0084
	(0.0366)	(0.0375)	(0.0537)
Constant	-0.0265	0.0436	-0.0315
	(0.0291)	(0.0376)	(0.0527)
Counry fixed effects	Yes	Yes	Yes
Number of observations	4985	1615	1326
Underidentification	671.2405	427.9286	218.5040
Weak identification	1297.8566	2345.4201	476.3092

Note: *** p<0.01, ** p<0.05, * p<0.1.

6.2 Robustness Check

The first robustness check I carry on is using the early retirement eligibility status as an alternative to full retirement eligibility. A drawback is this specification is that the sample size shrinks to almost one half of the original as several countries do not offer early retirement programs and we have limited data for some others. Hence, we re-estimate our baseline model also in this smaller sample to have a better comparison of coefficients. The estimates are reported on the following table. We observe that early retirement eligibility is not as strong of a predictor of retirement as full retirement eligibility. If an individual has a partner who opted for early retirement s/he is more likely to retire relative to someone whose partner opted in for full-retirement, however results are not significant for men.

Table 14: Replication of Table 2

	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
Retired Partner	0.1335	-0.1822**	0.0611**	0.3061***	0.1587***	0.1473***
	(0.0825)	(0.0819)	(0.0299)	(0.0385)	(0.0317)	(0.0176)
AgeXRetired Partner	0.2466***	0.1782***	0.0112**	0.0824***	0.0531***	0.0304***
	(0.0225)	(0.0212)	(0.0045)	(0.0091)	(0.0078)	(0.0035)
Age of respondent	0.0135***	0.0187***	0.0137***	0.0049***	0.0090***	0.0070***
	(0.0015)	(0.0016)	(0.0009)	(0.0012)	(0.0011)	(0.0009)
Eligible (Early)	0.0370***			0.0386***		
	(0.0078)			(0.0068)		
Eligible (Full)		0.2838***	0.2312***		0.2725***	0.1718***
		(0.0219)	(0.0106)		(0.0278)	(0.0109)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	23234	23234	55362	23509	23509	57945
Number of individuals	4,084	4,084	8,385	4,091	4,091	8,385

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table replicates the results in Column (2) and (4) of Table 2 using the early retirement eligibility as instrument. The first column represents the results using the early retirement eligibility as instrument, the sample size is smaller as fewer countries offer early retirement options. In column (2) we report the results with full retirement eligibility on this smaller sample and in column (3) the full sample to contrast the results.

In order to verify the validity of our instrument, we excluded couples who reach retirement eligibility at the same year from our sample and estimated the same model as in Table 3, the results are presented below. Our results overall are in the same line as in Table 3 except men who face the same eligibility ages as their wives have a larger and significant coefficient at the reference age so that they are much less likely to retire at age 60 if their partner has already retired.

Table 15: Replication of Table 3

	Equal Official Age		Lower Official Age for Women		Equalized Official Age	
	Men	Women	Men	Women	Men	Women
Retired Partner	-0.2451**	0.1419***	0.0977**	0.1485***	-0.0202	0.2156***
	(0.0977)	(0.0290)	(0.0414)	(0.0375)	(0.0690)	(0.0489)
AgeXRetired Partner	0.0916***	0.0611***	0.0102	0.0348***	-0.0027	0.0270**
	(0.0178)	(0.0069)	(0.0107)	(0.0114)	(0.0125)	(0.0122)
Age of respondent	0.0204***	0.0087***	0.0118***	0.0099***	0.0175***	0.0104***
	(0.0017)	(0.0012)	(0.0015)	(0.0014)	(0.0020)	(0.0016)
Eligible (Full)	0.1988***	0.1452***	0.3148***	0.1983***	0.2039***	0.1244***
	(0.0177)	(0.0214)	(0.0271)	(0.0198)	(0.0205)	(0.0247)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	21880	22407	12630	12679	13465	13648
Number of individuals	3,510	3,510	2,093	2,095	2,135	2,135

Note: *** p<0.01, ** p<0.05, * p<0.1.
The table replicates the results in Table 3 excluding couples who reach eligibility at the same year.

6.3 Construction of Variables

6.3.1 Group of countries depending on eligibility rules

- Germany, Sweden, Netherlands, Spain, France, Denmark, Ireland, Luxembourg, Hungary, Portugal, Cyprus, Finland, and Slovakia have the same statutory retirement ages for men and women.
- Netherlands, Spain, Luxembourg, Cyprus, Finland, and Slovakia have the same statutory retirement ages for men and women and over time.
- In Austria, Greece, Switzerland, Israel, Czech Republic, Poland, and Lithuania women are eligible to retire at an earlier age.
- Italy, Belgium, Slovenia, Estonia, Latvia and Malta made reforms on the statutory retirement ages and equalized them towards the end of the panel.

6.3.2 Correlation in Preferences

- **Correlation in activities** is a binary variable indicating whether the number of activities that both partners practice among the following four activities is above sample average. i) done voluntary or charity work ii) attended an educational or training course iii) gone to a sport, social or other kind of club iv) taken part in a political or community-related organization
- **Correlation in philosophies** is a binary variable indicating whether the correspondence between partners' responses to the following questions is above sample average. i) Frequency of praying. ii) Trust in other people: on a scale from 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted. iii) Left or right in politics: On a scale from 0 to 10, where 0 means the left and 10 means the right, where would you place yourself?
- **Correlation in personalities** is a binary variable indicating whether the correspondence between partners' responses to the big-5 personality characteristics (extraversion, agreeableness, openness, neuroticism, conscientiousness) questions is above sample average.

6.3.3 Job Attributes

- **Looking for retirement** was assessed by a single yes or no question: "Thinking about your present job, would you like to retire as early as possible?" Even though this question is not representative of individuals retirement behavior, (Henkens and Tazelaar, 1997; Harkonmaki et al., 2009) show that intentions for retirement are highly associated with behavior.
- **Job Characteristics:** Based on individuals' response(from the first wave available) to a set of questions, I generated a variable which indicates on average how much does the individual think that her/his job possesses negative/positive attributes and the final binary variable is constructed based on the individual being over the sample average in thinking that her/his job has negative/positive attributes.
  - The questions considered to reflect the **negative characteristics** of one's job are the following; which are answered on a scale of 1(strongly agree) to 4(strongly disagree).

    * 1: My job is physically demanding. Would you say you strongly agree, agree, disagree or strongly disagree?

    * 2: I am under constant time pressure due to a heavy workload. (Would you say you strongly agree, agree, disagree or strongly disagree?)

    * 3: I have very little freedom to decide how I do my work. (Would you say you strongly agree, agree, disagree or strongly disagree?)

    * 4: My [job promotion prospects/prospects for job advancement] are poor. (Would you say you strongly agree, agree, disagree or strongly disagree?)
    * 5: My job security is poor. (Would you say you strongly agree, agree, disagree or strongly disagree?)

  – The questions considered to reflect the **positive characteristics** of one's job are the following; which are answered on a scale of 1(strongly agree) to 4(strongly disagree).

    * 1: I have an opportunity to develop new skills. (Would you say you strongly agree, agree, disagree or strongly disagree?)

    * 2: I receive adequate support in difficult situations. (Would you say you strongly agree, agree, disagree or strongly disagree?)

    * 3: I receive the recognition I deserve for my work. (Would you say you strongly agree, agree, disagree or strongly disagree?)

    * 4: Considering all my efforts and achievements, my [salary is/earnings are] adequate. (Would you say you strongly agree, agree, disagree or strongly disagree?)

6.3.4 Labor Market Attachment

- Individual Income
- Education: Isced 1997 Coding of Education levels
  - Level 0 – Pre-primary education
  - Level 1 – Primary education or first stage of basic education
  - Level 2 – Lower secondary or second stage of basic education
  - Level 3 – (Upper) secondary education
  - Level 4 – Post-secondary non-tertiary education
  - Level 5 – First stage of tertiary education
  - Level 6 – Second stage of tertiary education
- HH Income: How much was the overall income, after taxes and contributions, that your entire household had in an average month last year?
- HH Net Worth: Total worth of assets that household owns

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