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Bachelor Thesis

Does the spouse influence the individual's retirement decision?

A quantitative study among older people Sweden



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Abstract

The main objective of our essay is to analyze the influence of the spouse on the partner's retirement decision. Drawing on a large sample of older citizens and a combination of a postal survey and register data, we use standard econometric techniques to identify the impact of spouse's characteristics on the partner's decision to retire. The results of our estimations show that cohabiting/married males' decision to retire were negatively affected by their partners' health condition. On the other hand, cohabiting/married women were more likely to retire if their partner had already retired.

Key words

Spouse, Influence, Impact, Retirement decision, Sweden

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1 Introduction

At a time when people are living longer and there is an increased pressure on public finances, pension reform has been debated in many countries, with a focus on delaying the general retirement age. The general retirement age is the earliest age at which a public pension can be claimed. While a higher general retirement age could lead to increased labor market participation, important socio-economic factors that will also affect the extent of this participation cannot be ignored. Several underlying factors affect the individual's retirement decision (Henkens & van Solinge, 2002). It can be argued that individuals decide themselves when to retire, but various studies (Hurd, 1990; Aaron, 1999; Lundberg & Ward-Batts, 2000) have argued that the household influences an individual's decision to retire, and especially the retiree's spouse.

The decision to retire is complex and might be affected by various factors. In this paper, we investigate the effect of family-related factors, particularly those related to the spouse, on the decision to retire. This topic is interesting in light of previous empirical results. In traditional economic models, the household is often treated as an individual unit. Traditional economic models do not take into consideration the influence of other family members on the individual decision to retire. The models show the own individual decisions over life issues, which would be the case when an individual is alone. However, many households are larger, involving more household members. Therefore, one should consider the interactions between all household members and not only the individual themselves (Lundberg & Ward-Batts, 2000). In previous decades, models of intra-household and family decision-making have been



developed. These include two bargaining models – the unitary and collective models – that have received substantial empirical support (Aaron, 1999).

This essay focuses on the spouse's influence on the individual's decision to retire. Previous studies have shown that this decision is indeed affected by the individual's spouse (Henkes & van Solinge, 2002; Jimenez-Martin, Labeaga & Martínez-Granado 2000; Johnson & Favreault 2001). In this essay, we address how the spouse affects an individual's retirement behavior, in terms of the spouse's health, the age difference between spouses, and the spouse's labor market status.

In order to answer the research question, we used a unique Swedish postal survey regarding older people's working lives and well-being, which was linked to register data (Anxo et al. 2017). Using ordinary least squares estimation, (Linear probability model) we find a negative relationship between a man's decision to retire and his spouse's health, which means that men are more likely to retire if their spouse suffers from health issues. Furthermore, age differences between spouses negatively affect the decision to retire, although this effect is small. Regarding the spouse's labor market status, individuals, and especially women, are more likely to retire if their spouse has already retired.

Our essay is structured in seven sections. The second section presents empirical results from the existing literature, followed by the theoretical framework based on previous studies. The third section presents the data and some descriptive statistics. The fourth section describes the methodology for the regressions we conducted. The fifth section explains and interprets the



results. The sixth section discusses the results and relates them to previous research thesis. Finally, the last section concludes the thesis.

2 Literature Review

2.1 Empirical studies

The decision process in relation to retirement starts long before individuals have the opportunity to retire, and many factors influence an individual's decision to retire. Retirement is deemed to be a function of marital status, household size, health, job characteristics, and financial variables related to budget constraints (Henkens & van Solinge, 2002). The family or household is often claimed to have a significant impact on an individual's decision to retire, although household sizes vary in terms of the presence of a spouse and/or children. Henkens & van Solinge (2002) is one of the papers that have investigated the spouse impact on the individual's retirement decision. These authors focus on married couples with and without children. They found that the household's most significant impact on the decision to retire came from the spouse, no matter the household's size. However, although the spouse is often expected to have a significant effect on this decision, this effect varies across studies. This variance is often claimed to be due to differences in household bargaining power among couples. The research question regarding the spouse's impact on the individual's decision to retire is therefore assumed to be an empirical one. As done in previous studies, we investigate this topic in terms of the spouse's health and labor market status and the age difference between spouses (see Appendix 1).

Our research and studies such as Legendre et al. (2018), Johnson & Favreault (2001) and Jimenez-Martin et al. (1999) focus on the spouse's health condition and its influence on the individual's decision to retire. These studies analyze



individuals' retirement behavior and investigate it in relation to whether the spouse has health problems. Legendre et al. (2018) examined this topic in Sweden and concluded that the probability of retirement increases for wives and husbands when their spouse suffers from poor health. They show a strong positive significant effect on the likelihood of an individual retiring, where this likelihood increases from 2.7% for husbands and 7.1% for wives when their spouse is in poor health. Jimenez-Martin et al. (1999) conducted a study of 12 European countries, focusing on older couples' retirement behavior in terms of the health of the spouse. Their study shows a significant negative result, where an individual is more likely to retire if their spouse has already retired or is absent from the labor market because of poor health. The authors argue that couples value their time spent together over financial income, and that physical health has a stronger effect on the decision to retire than financial health in households. The results show that when the spouse is in poor health, it is more likely for both the individual and the spouse to favor early retirement. In contrast, another study from the United States by Johnson & Favreault (2001) shows that when their spouse has retired because of health problems, the probability of an individual retiring decreases. In these findings, the individual is more likely to retire if their spouse's health is good, especially if the spouse is not yet eligible for Social Security retirement benefits. The authors argue that, in these circumstances, the individual chooses to stay in the labor market because they must compensate for the financial losses caused by their spouse's health issues.

McGeary (2009) found that changes in the spouse's health condition influence both men and women's employment status, but that husbands and wives respond differently to a spouse's health problem. When their wife's health condition worsens – in terms of reduced ability to carry out daily tasks and routines such as eating, bathing, dressing, and walking – men are significantly less likely to continue working. McGeary offers evidence that the increased



probability of the man retiring is because they are caring for their ailing spouse, and that men value their spouse's health over the responsibility to generate income. Females, on the other hand, are significantly more likely to continue working when their husband is less able to perform daily tasks. This result suggests that women are likelier to take care of the income responsibilities when their spouse has health problems (McGeary, 2009). Szinovacz & DeViney (2000) show similar results, where husbands are more likely to withdraw from the labor force to become the caregiver when their wives struggle with health issues. They argue that this is because husbands are not prepared to combine caregiving responsibilities with work compare to wives. The authors explain this by pointing to wives' previous experience of a life filled with a combination of problems related to family, caregiving and paid work. The authors claim that their previous problem-solving history makes women more prepared to combine their work with caring for their husband (Szinovacz & DeViney, 2000).

Smith & Moen (1998) conducted a study in the United States of the spouse's influence on the individual's decision to retire. The authors collected information from both the individuals and their spouses to investigate all perceptions of the individual's retirement decision. The authors argue that a couple's retirement behavior is determined by ideologies about gender roles, which relate to decision making within a household and bargaining power between couples. To determine how gender roles were separated between husbands and wives, the authors examined how the couples had made previous life decisions. In addition to previous decision-making, variables such as work history, retirement planning, preretirement work conditions, and spouse's behavior were added to the equation to determine whether the spouse influenced the individual's decision to retire. The authors found a significant positive result, indicating that husbands influence the retirement decisions of their wives. They also found that wives do not significantly influence



husbands' decisions to retire. These findings suggest that wives' retirement decisions are tied to their husbands' retirement and his influence. Wives are affected by their husbands and their decision-making, but husbands are less affected by their wives' decision-making.

Szinovacz & Deviney (2000) argue that a couple's retirement decision is related to their joint economic resources. They show that wives tend to adjust their retirement according to the couple's income, while husbands tend to adjust their retirement according to their wives' pension eligibility, that is, the availability of financial support. Husbands often delay their retirement until their wives are eligible for social security. The authors argue that husbands and wives differ in their retirement behavior because of differences in gender roles. The gender difference can be seen as a reflection of the traditional division of labor or the ideology of gender roles, where the husband is usually the breadwinner of the household and has more bargaining power.

Gustman & Steinmeier (2004) investigated household retirement decisions and reasons for interdependence in the retirement of each member of a couple. They created a measure of an individual's preferences to determine how each member views leisure with their spouse in retirement, or, in other words, the extent to which each member values time with their spouse. The main focus of this model was on the investigation of the labor supply effect to find alternative social security policies. The authors show that the measure of preferences explained much of the evident interdependence in retirement within the household. The finding from their previous research that husbands are more influenced than wives by when their spouse had retired is upheld. They found a significant positive effect of the wife having already retired on a husband's retirement. Husbands' retirement propensity almost doubled when they valued leisure with their wives in retirement. The wives only showed a



significant positive effect of their husbands' retirement when they valued leisure time with their husbands.

Hurd (1990) investigated the correlation between the retirement dates of individuals in couples. His main finding is that husbands and wives usually retire at the same time in life, no matter the age difference between them. He argues that spouses' influence on each other would coordinate their retirement decisions so that they retire at the same time. For example, if the older spouse retires at age 65, it is more likely that the other spouse, who is five years younger, will retire at the same time (i.e. at age 60) rather than waiting five more years. The retirement age varied greatly, depending on the couple's individual ages and the year in which they both wanted to retire. Legendre et al.'s (2018) study in Sweden confirms this statement. They found that husbands were on average three years older than their wives, and the retirement ages for couples showed a three-year difference, indicating a dominant joint retirement behavior among Swedish couples. It is possible that this is due to the public family policy in Sweden, which indirectly encourages the joint retirement of couples. For example, the older spouse is allowed to transfer funded pension rights to the younger spouse. The older spouse's transfer of its funded pension impacts the younger spouse's retirement decision. The simple access through this pension policy indirectly encourages joint retirement among couples. (Legendre et al., 2018).

2.2 Theoretical studies and household bargaining models

Traditional economic models often refer to the household as a single individual and describe the individual's life-cycle behavior in terms of retirement, savings, and consumption (Lundberg & Ward-Batts, 2000). In order to understand the spouse's impact on an individual's retirement decision, the underlying assumptions about the household must be clarified. Individuals'



retirement decisions tend to differ significantly depending on whether they are cohabiting or not (Aaron, 1999). The household and all its members and their preferences are consequently essential factors in the individual's decision-making process (Hurd, 1990., Cahuc et al., 2014). These issues must be analyzed using models of saving and labor supply decisions that allow husbands and wives to have independent preferences (Aaron, 1999).

Household bargaining models assume that spouses interact with each other, and the preferences of both the husband and wife are of interest. Bargaining models tend to vary depending on the context. However, the standard format contains a combination of all household members' preferences and characteristics to create utility maximization. Household members' characteristics are factors such as health and employment status (Lundberg & Ward-Batts, 2000).

The household's combined utilities will affect the individual's retirement decision. Initially, bargaining models compute the tradeoff between leisure and consumption of goods along with various essential elements that influence the labor supply. The bargaining results for a household of several members show the outcome of labor supply for each member. Household bargaining models are developed from the individual model, which must be adapted in order to account for the influences of family structures. The developed household model goes beyond the individual frame and focuses on the description of the household behavior of all family members. Negotiations between family members, such as to spend or save and to remain in or leave the labor market, are examples of intra-household bargaining. Two types of family models of intra-household decisions have been developed (Cahuc et al., 2014).



The first intra-household model is the *unitary model*, which explains the family as a single unit with all of its decisions. Regardless of income differences, the model assumes a standard set of preferences and income, where the household maximizes its utility. Decisions and their outcome are equally beneficial for all of the household's members, because bargaining power is equally distributed (Cahuc et al., 2014., Beninger & Laisney, 2003). The second intra-household model is the *collective model*, which takes each individual's preferences and combines them to form a weighted sum, where each individual's identity of controlling resources affects the household decision. Bargaining power depends on the control of resources. The family only works as a framework that enlarges (or constrains) the variety of choices each family member takes (Cahuc et al., 2014., Beninger & Laisney, 2003).

2.2.1 Unitary model

To simplify, we imagine a family composed of two persons, that is, an individual and their spouse. The model postulates that the couple's individual preferences can be represented by a utility function $U(C, L_1, L_2)$, where C refers to the household's total consumption of goods and L to the leisure of each individual. The model assumes that the satisfaction the couple attains of goods consumption depends solely from the couple's total amount, and not from each spouse's individually income. The family's optimal choice is written below, where the individual's income in terms of labor income is denoted as (w) and non-labor income as (R) . The single budget constraint expresses the utility maximization of the entire household (Cahuc et al., 2014). The joint household budget constraint is written as:

$$\text{Max: } U(C; L_1; L_2) \text{ s. c.}$$

$$C + w_1L_1 + w_2L_2 \leq R_1 + R_2 + (w_1 + w_2)L_0$$



The joint utility maximization indicates that the sum of R_1 and R_2 is the crucial factor, rather than the individual's income. In the literature, this formula is known as "income pooling," referring to the irrelevance of which person in the household is the breadwinner. The household budget constraint explains that it is the joint income and the couple's preferences that creates their utility (Cahuc et al., 2014). However, some empirical studies do not agree with the concept of the unitary model and claim that it is too simplistic to explain the reality of households. Many studies further claim that gender roles and bargaining power are the crucial factors (Szinovacz & Deviney, 2000., Smith & Moen, 1998., Johnson & Favreault, 2001). The unsatisfactory nature of the unitary model leaves room for another model that describes the household's decisions, namely the collective model (Cahuc et al., 2014).

2.2.2 Collective model

The collective model focuses on individual's preferences and income differences in a household, which result in differences in bargaining power. The model's egoistic and rational design imposes the allocation of Pareto optimality. Pareto optimality assumes that the available resources within a household cannot be redistributed by making one member better off without the outcome that the other member becomes worse off. The model's main focus is on the individual's preferences, which each spouse defines according to their consumption and leisure. Pareto optimality allows for various restrictions regarding the labor supply functions, and these restrictions are sufficient to observe individual preferences and income sharing (Cahuc et al., 2014). The preferences of each individual create the following utility function; $U_i(C_i; L_i)_{i=1,2}$. Still assuming a household with two individuals, the solution of the actual allocations expressed is presented below:



$$\text{Max: } U_1(C_1; L_1)$$

$$\text{s. c. } U_2(C_2; L_2) \geq U_2^{GL}$$

$$C_1 + C_2 + w_1L_1 + w_2L_2 \leq R_1 + R_2 + (w_1 + w_2)L_0$$

This function assumes that U_2^{GL} represents a given level of utility concerning wage (w) and non-labor income (R). Then, the efficient allocation shows each spouse's consumption and leisure individually. Taken together, the overall income for the household is represented. The individual program takes the following form:

$$\text{Max } U_i(C_i; L_i) \text{ s. c. } C_i + w_iL_i \leq w_iL_i + \phi_i$$

The last parameter (ϕ) represents the “sharing rule,” which depends on the wage and non-labor income parameters. It indicates that every household member receives a portion of the total non-labor income. The use of this specified approach strengthens the basic model between consumption and leisure, for the individual's budget constraint and the composition of the non-labor income. A change in the sharing rule will adjust the household's consumption and saving decisions. For example, if the husband is the breadwinner and the wife's relative wage increases, her bargaining power in the household might increase as well. It is also possible to expand this model by adding to the equation the “public” goods, relating to the household and the production of its members.

Traditional gender roles refer to how household chores have been divided among couples throughout history. Lundberg & Ward-Batts (2000) have argued that households are never the same due to differences in how each spouse influences the other. They influence each other differently in terms of preferences, ideas, and values. These characteristics will affect the spouses' relative bargaining power. Johnson & Favreault (2001) have argued that men



expect to provide more financially for the household, while women are responsible for more chores at home. Household chores such as women caring for children are factors based on gender expectations. Women's childcare usually lowers their employment opportunities, due to the women's perceived need to be available for their children or grandchildren (Dentinger & Clarkberg, 2002). Hence, one should be aware of the different private interests. Considering the assumption that wives are usually younger than their husbands, and the life expectancy of women exceeds that of men, wives should favor a higher net worth close to retirement (Legendre et al. 2018). Therefore, she considers her savings for future retirement due to a more extended period in retirement (Lundberg & Ward-Batts, 2000). However, wives may not only prefer a higher savings rate across the lifespan. Wives may have lower saving rates than their husbands; for example, wives may spend more money on children's goods than their husbands. Anyway, the authors assume that in the period close to retirement, the net worth of household net in which the wife has higher bargaining power. That her bargaining power will be more extensive than in households that retains the same total lifetime resources, but in which the wife has less power (Lundberg & Ward-Batts, 2000).



3 Data

3.1 Data

We were able to utilize a unique data set. The microdata set is a cross-sectional postal survey, designed by Anxo et al. (2017) and conducted between November 2014 and January 2015 by Statistics Sweden. Each respondent was linked to Swedish register data from the Longitudinal Integration Database for Health Insurance and Labor Market Studies (LISA).

The main aim of this questionnaire survey was to investigate older individuals' working lives and well-being. Due to the Statistic Sweden's lack of information about the current labor market status of older people, two questionnaires were designed and sent out to individuals born between 1938 and 1949. The labor market status of the individuals at the time of the survey determined which questionnaire they answered; they were either active in the labor market (stayer) or retired (leaver). In this paper, answers from both questionnaires are used. The survey was designed to provide further information on individual characteristics that could affect the retirement decision that was not available in the LISA database. The survey provided information about the individual's characteristics, such as age, marital status, educational attainment and income, and was answered by individuals aged between 65 and 76. Twenty thousand individuals were randomly selected to complete the survey. Some questionnaires were not completed accurately or were not completed at all. Therefore, the final sample included 12,140 observations (Anxo et al., 2017).

As previously mentioned, our essay focuses on the influence of the spouse on an individual's retirement decision, and therefore only married individuals (or individuals with a partner) are included in our sample. After applying this restriction, we were left with a total of 7,545 observations.



The rich information from the survey combined with data on individual characteristics from LISA makes it possible for the present study's research question to be answered. The disadvantage of this dataset is that it is possible that respondents may re-enter the labor market. We assume that if individuals had left the labor market at the time of the survey, they will never return. This becomes problematic, because we do not know whether they will return in the future.



3.2 Descriptive statistics

Table 2: Descriptive Statistics

Variables	Obs	Mean	Std.Dev.	Min	Max
Dependent variables					
Stayers	7545	.315	.465	0	1
Actual Retirement Age	2646	63.458	2.493	44	65
Preferred Retirement Age	1028	69.501	3.982	65	99
Explanatory variables					
<u>Spouse Characteristics</u>					
Health of Spouse	7545	.465	.499	0	1
Age Difference	7545	.996	4.751	-24	37
Pensioner	7545	.672	.469	0	1
Employed	7545	.272	.445	0	1
Unemployed	7545	.013	.115	0	1
Other ¹	7545	.042	.201	0	1
<u>Motivation question</u>					
Q1: "retire due to my spouse's neither worked" ²	2646	.075	.264	0	1
Q2: "retire due to my spouse's state of health" ³	2646	.258	.438	0	1
Q3: "continue working due to my spouse worked" ⁴	1028	.375	.484	0	1
<u>Individual Characteristics</u>					
Age	7545	68.684	3.196	65	76
Male	7545	.616	.486	0	1
Health of Individual	7545	.512	.5	0	1
Low Educated	7545	.249	.433	0	1
Medium Educated	7545	.375	.484	0	1
High Educated	7545	.376	.484	0	1
Experience ⁵	7545	44.103	7.803	0	68
Average Income ⁶	7545	.31	.19	0	4.956
Region	7545	3.093	1.454	1	5

¹ Long term sickness and other reasons

² Question 1: "My decision to retire was determined mainly by my spouse/partner neither worked".

³ Question 2: "My decision to retire was determined mainly by my spouse's/partner's state of health. ".

⁴ Question 3: "My decision to continue working after 65 was largely determined by whether my spouse/partner worked".

⁵ Restrictions: Experience \leq 69

⁶ (Average Income) /10 000



The total number of is 7,545 (4,648 males and 2,897 females), the variable Stayers is a dummy variable that indicates whether the individual is still in the labor market after the age of 65. It takes a value of 1 if the individual is a currently working and 0 if the individual is retired, an older stayer, a bridge worker, or if the individual answered the wrong questionnaire. Bridge workers are individuals who have returned to the labor market after age 65, having previously retired prior to or at age 65 (Anxo et al., 2017).

The returned to the labor market. The restriction of only including the pure leavers was applied to create a more significant contrast between the stayers and the leavers. Pure leavers have no work experience after age 65. Individuals who continued to work after age 65 (not pure leavers) and are now retired are referred to as previous stayers. Applying these restrictions enables a comparison between the individuals who have no experience of retirement and the individuals who have left the labor market and never returned. These groups can be seen as opposites, and therefore they are compared. The actual retirement age ranges from age 44 to 65, with a mean value of 63.458 (Anxo et al., 2017).

The preferred retirement age has 1,028 observations, which are responses only from individuals who were still in the labor market when the survey was carried out (Anxo et al., 2017). In the survey, those people who were still working were asked to report their preferred retirement age. The preferred retirement age ranges from 65 to 99 and has a mean value of 69.501 (see Appendix 2, for variable description).

The variable Health of Spouse describes the general health condition of the individual's spouse. Information on the spouse's health is based on the individual's answer provided in the questionnaire. The questionnaire asked: "How do you assess your spouse's general health today?". The variable Age



Difference indicates the age difference between the individual and their spouse and ranges from -24 to 37 years. This indicates that the respondents were at most 24 years younger or 37 years older than their spouses (Anxo et al., 2017).

The question about the spouse's current employment status was divided into six answers in the questionnaire: retiree, wage-employed, self-employed, unemployed, long-term sickness and other. Based on this response, pensioners were classified as Pensioner, wage workers and self-employed individuals were classified as Employed, unemployed individuals were classified as Unemployed and individuals with a long-term sickness or other employment status were classified as Other. Based on this classification, three dummy variables were created, indicating Pensioner, Employment and Other. The reference group is Unemployed individuals. Pensioners are the largest group in the sample, representing 67.2%. Employed individuals represent 27.2% of the sample, unemployed individuals 1.3% of the sample, and other 4.2% of the sample. In order to obtain another perspective on individuals' retirement decisions, the motivation questions from the survey were added to the equation (Anxo et al., 2017). We included these questions to observe how the spouse influences the individual's retirement behavior.

1: My decision to retire was largely determined by my spouse/partner neither worked.

2: My decision to retire was largely determined by my spouse's/partner's state of health.

3: My decision to continue working after 65 was largely determined by whether my spouse/partner worked.

The leavers answer the first and second questions; the stayers answer the third. These observations are in line with the observations for the variables actual retirement age and preferred retirement age. Three possible responses were



provided for these questions: totally agree, partly agree, disagree and no opinion. The dummy takes a value of 1 if the individual totally agrees or partly agrees and 0 otherwise.

We control for other socio-economic and demographic characteristics in the regression, which are important factors in the retirement decision. Those variables include *Age*, *Gender*, *Education*, *Health condition*, *Years of experience*, and *Average income before retirement*.

The ages of the respondents in the sample range from 65 to 76, and the mean age is 68.7. The variables describing the individual's health and their spouse's health are both dummies, taking a value of 1 for good health and 0 for bad health. In the questionnaire, five possible responses to this question were provided: excellent, very good, good, bad, and very bad. Individuals were classified as having good health (dummy=1) when they responded to the question with excellent or very good. The health of the individuals in the regression measuring actual retirement age was measured at the time the individual retired. The other health variables were defined as the individual's current health when the survey was carried out (Anxo et al., 2017).

Regarding educational attainment, more educated individuals tend to stay in the labor market longer compared to less educated individuals. This is assumed to be because more educated individuals tend to have more work opportunities than less educated individuals (Legendre et al., 2018). In the questionnaire, the individual's education was divided into five categories: elementary school, practical high school, theoretical high school, university, and postgraduate studies (Anxo et al., 2017). Based on the responses, individuals were classified as Low Educated for elementary school, Medium Educated for practical high school and theoretical high school and High Educated for university or higher. Based on this classification, two dummy variables were created, one indicating



Medium Educated and the other High Educated. Low Educated is the reference group.

The maximum years of experience in the data are 68 years, and the mean years of experience is 44.1 years. We also control for the individual's disposable income before retirement, which ranged from 0 to 49,560 SEK. The average disposable income before retirement is 3,100 SEK, and the average wage difference is 1,900 SEK. The region variable is a categorical variable, with the values of Stockholm, Småland, Scania, North, Middle, and West. In the regressions, region is controlled for as a fixed effect (Anxo et al., 2017).

4 Methodology

In order to estimate the spouse's impact on an individual's decision to retire, a linear probability model was used to investigate how the spouse's characteristics affect the retirement decision. The choice of statistical method in Regression 1 is based on the binary nature of the dependent variable. The binary outcome describes whether the individual is a stayer or leaver in relation to the labor market. Therefore, a linear probability model is used for two reasons: it is easier to interpret the coefficient, as we are only interested in the average effect, and since the dependent variable can be either binary and continuous, we use ordinary least square (OLS) estimation to keep the estimation consistent throughout the paper, and because it is a standard model and extensively used in regression analysis. It is debatable whether the probability of the estimation increases linearly (Gujarati & Porter 2009: 58. 544- 547). An alternative to the linear probability model is the probit or logit model, which is also used when the dependent variable is binary and the aim is to estimate probability. One advantage of the probit model compared to the linear probability model is that the former model cannot generate a probability



value outside the interval [0,1]. (Gujarati & Porter 2009:571). In this paper, we use the linear probability model.

The linear probability model was selected instead of the probit model based on interpretability, as the coefficient of the probit model cannot be interpreted without further estimations (marginal effects). The drawbacks of the linear probability model are that it assumes a constant marginal effect, which is not reasonable in every situation. For example, the effect of an increase of one year in age on the probability of staying in the labor market will not be the same for 65-year-old and 75-year-old individuals. Another drawback is that it is possible for the linear probability model to generate predicted values outside the interval [0,1]. (Gujarati & Porter 2009:571). We found it more reasonable and uncomplicated to use the linear probability model, and, as mentioned, to use a consistent method throughout the paper.

The independent variables of interest are the health of the spouse, the age difference between spouses and the current employment status of the spouse. In the first regression we estimate the impact of the spouse characteristics, on the likelihood to be currently working after age 65. The independent variables of interest are the health of the spouse, the age difference between spouses and the current employment status of the spouse. The control variables are individual characteristics and region. The individual characteristics are age, gender, education, health, experience, and average income before retirement.

Regression 1

Stayer =

$$\begin{aligned} &\beta_0 + \beta_1(\text{Health of spouse}) + \beta_2(\text{Age difference}) \\ &+ \beta_3(\text{Employment of the spouse}) + \beta_4(\text{Individual characteristics}) \\ &+ \beta_5(\text{Region}) + \varepsilon_i \end{aligned}$$



A traditional OLS is used to measure how the spouse characteristics affect the *actual retirement age*, conditional on the sample of pure leavers. Regression 2 shows that the independent variables of interest are motivation questions 1 and 2, the same individual characteristics used in Regression 1, as well as region as a fixed effect.

Regression 2

Actual retirement age

$$= \beta_0 + \beta_1(\text{Motivation question}^7)_1 + \beta_2(\text{Motivation question}^8)_2 \\ + \beta_3(\text{Individual characteristics}) + \beta_4(\text{Region}) + \varepsilon_i$$

In the third model, we also use OLS to estimate how the spouse characteristics affect the *preferred retirement age*, conditional on the sample of stayers. What distinguishes regression 3.1 and 3.2 are the independent variables of interest. In regression 3.1, the independent variables of interest are the spouse characteristics, the health of the spouse, the age difference between spouses, and the current employment of the spouse. In Regression 3.2, motivation question 3, “*My decision to continue working after 65 was largely determined by whether my spouse/partner worked*”, is included instead of the spouse characteristics. The same individual characteristics as in Regression 1 and 2 are used, as well as region as a fixed effect.

Regression 3.1

Preferred retirement age

$$= \beta_0 + \beta_1(\text{Health of spouse}) + \beta_2(\text{Age difference}) \\ + \beta_3(\text{Employment of the spouse}) + \beta_4(\text{Individual characteristics})$$

⁷ “*My decision to retire was determined mainly by my spouse/partner neither*”

⁸ “*My decision to retire was determined mainly by my spouse's/partner's state of health.*”



$$+\beta_5(\text{Region}) + \varepsilon_i$$

Regression 3.2

Preferred retirement age

$$= \beta_0 + \beta_1(\text{Motivation question}^9)_3 + \beta_2(\text{Individual characteristics}) \\ + \beta_3(\text{Region}) + \varepsilon_i$$

⁹ "My decision to continue working after 65 was largely determined by whether my spouse/partner worked."



5 Results

Main results

Table 1: *Probability to stay at the labor market after age 65*

VARIABLES	(1) All Stayers	(2) Stayer (Male)	(3) Stayer (Female)
<u>Spouse characteristics</u>			
Health of Spouse	-0.00619 (0.00844)	-0.0233* (0.0125)	0.0120 (0.0106)
Age Difference	-0.00421*** (0.00120)	-0.00395** (0.00183)	-0.00338*** (0.00128)
Pensioner	-0.208*** (0.0641)	-0.185** (0.0745)	-0.243** (0.118)
Employed	-0.00984 (0.0640)	0.0162 (0.0739)	-0.0641 (0.119)
Other	-0.0993 (0.0685)	-0.0925 (0.0789)	-0.114 (0.130)
<u>Individual characteristics</u>			
Age	-0.0151*** (0.00121)	-0.0190*** (0.00202)	-0.0125*** (0.00137)
Gender	0.0461*** (0.00982)		
Medium Educated	0.0125 (0.00886)	0.0396*** (0.0133)	-0.00693 (0.0106)
High Educated	0.0968*** (0.0111)	0.164*** (0.0192)	0.0522*** (0.0139)
Health of Individual	0.0379*** (0.00845)	0.0389*** (0.0127)	0.0296*** (0.0102)
Experience	0.00637*** (0.000615)	0.0115*** (0.00136)	0.00319*** (0.000596)
Average Income	0.0551* (0.0298) (0.103)	0.0362 (0.0337) (0.155)	0.170*** (0.0615) (0.149)
Observations	7,545	4,649	2,896
R-squared	0.145	0.152	0.122
Region FE	Yes	Yes	Yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations based on questionnaire survey by Anxo et al (2017) and Swedish register data (LISA).



Table 1 displays the spouse's characteristics and how they affect the individual's decision to stay at the labor market. In column 1, we observe that the spouse's health condition is not significant and therefore does not affect the individual's retirement decision. The next variable, age difference, has a significant effect on the individual's decision. The coefficient is interpreted as indicating that a one-year increase in the age difference between spouses decreases the probability of the individual staying in the labor market by 0.421 percentage points. The following three variables regarding the spouse's employment status are significant for already retired spouses. This is interpreted as indicating that if the spouse is already retired, the individual's probability of staying in the labor market decreases by 20.8 percentage points. The spouse being currently employed or other (=long-term sickness or other reasons) does not affect the individual's retirement decision, as the estimated coefficients are not statistically significant.

The individual characteristics show that age is significant for both males and females, which indicates that the older the individual is, the lower the probability of them remaining in the labor market. A one-year increase in age decreases the probability of the individual remaining in the labor market by 1.51 percentage points. Gender (male=1) is significant, and the coefficient is interpreted as indicating that males are 4.61 percentage points more likely than females to stay in the labor market.

The following variables relate to overall educational attainment. The retirement decision is only affected if the individual is highly educated (=university or higher). The probability of staying in the labor market increases by 9.68 percentage points if the individual is highly educated. The following variable represents the health of the individual, which is significant and interpreted as indicating that good health increases the probability of the individual staying in the labor market by 3.79 percentage points. The variable



of average income is significant, which indicates that if the individual's income increases by 10,000 SEK, the probability of them staying in the labor market after age 65 increases by 5.51 percentage points.

In column 2, the spouse's health is significant, which indicates that males are 2.33 percentage points less likely to stay in the labor market if their spouse is in bad health. The age difference is significant and indicates that a one-year increase in the age difference between spouses decreases the probability of males staying in the labor market by 0.395 percentage points. The spouse's current employment status is significant and is interpreted as indicating that if the spouse is already retired, the individual's probability of staying in the labor market decreases by 18.5 percentage points. If the spouse is currently employed or other, it has no significant effect on the individual's retirement decision.

In column 3, the impact of the spouse's health on female retirement decision is not significant. The coefficient for the age difference is significant and is interpreted as indicating that a one-year increase in the age difference between spouses decreases the probability of females staying in the labor market by 0.338 percentage points. If the spouse is already retired, it decreases the female's probability of staying in the labor market by 24.4 percentage points. If the spouse is currently employed or other, it has no significant effect on the female's retirement decision.

Further results

The present section presents separate results for stayers and leavers. Table 2 shows the results regarding the actual retirement age from the leavers sample and Table 3 shows the estimation results regarding the preferred retirement age from the stayers' sample.



Table 2: *The actual retirement age for the individual (leavers)*

VARIABLES	(1) Actual Retirement Age	(2) Actual Retirement Age (Male)	(3) Actual Retirement Age (Female)
<u>Motivation Question</u>			
Q1: “retire due to my spouse’s neither worked” ¹⁰	0.277* (0.165)	0.567** (0.229)	0.0823 (0.221)
Q2: “retire due to my spouse’s state of health” ¹¹	0.469** (0.234)	0.132 (0.411)	0.717*** (0.269)
<u>Individual Characteristics</u>			
Age	0.0185 (0.0241)	-0.0147 (0.0332)	0.0459 (0.0350)
Gender	-0.105 (0.187)		
Medium Educated	0.288 (0.188)	0.761*** (0.259)	-0.0227 (0.275)
High Educated	0.846*** (0.228)	1.332*** (0.385)	0.665** (0.295)
Health of Individual at Retirement	0.303* (0.155)	0.156 (0.239)	0.367* (0.203)
Experience	0.117*** (0.0137)	0.171*** (0.0295)	0.0923*** (0.0157)
Average Income	-1.919** (0.748)	-2.188** (0.930)	-0.734 (1.163)
Observations	2,646	1,318	1,328
R-squared	0.103	0.148	0.089
Region FE	Yes	Yes	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations based on questionnaire survey by Anxo et al (2017) and Swedish register data (LISA).

Instead of looking at spouse characteristics directly, we use the motivation questions about the extent of the spouse’s influence on the retirement decision.

¹⁰ “My decision to retire was determined mainly by my spouse/partner neither worked.”

¹¹ “My decision to retire was determined mainly by my spouse’s/partner’s state of health.”



The motivation questions based on the spouse's employment and health condition indicate the effect of these factors on the individual's retirement decision. First, individuals responded to the statement *My decision to retire was determined mainly by my spouse/partner neither worked*. The second motivation statement was *My decision to retire was determined mainly by my spouse's/partner's state of health*.

In column 1, motivation question 1 is significant. This indicates that if the individual agreed to the statement, their actual retirement age increased by 3.3 months¹². Motivation question 2 is also significant, indicating that actual retirement age increased by 5.6 months¹³ if the individual agreed. For males, in column 2, question 1 is significant, showing that if they agreed to the statement, the actual retirement age increased by 6.8 months¹⁴. For females, in column 3, question 2 is significant, showing that if their spouse had health problems, the individual's retirement age increased by 8.6 months¹⁵.

¹² Calculation: $0.277 \times 12 = 3.3$

¹³ Calculation: $0.469 \times 12 = 5.6$

¹⁴ Calculation: $0.567 \times 12 = 6.8$

¹⁵ Calculation: $0.717 \times 12 = 8.6$



Table 3: The preferred retirement age of the individual

VARIABLES	(1) Preferred Retirement age	(2) Preferred Retirement age
<u>Spouse Characteristics</u>		
Health of Spouse	0.377 (0.275)	
Age Difference	-0.0418 (0.0364)	
Pensioner	-0.0506 (0.413)	
Employed	0.766** (0.344)	
Other	0.483 (0.381)	
<u>Motivation Question</u>		
Q3: "...continue working due to my spouse worked" ¹⁶		0.165 (0.307)
<u>Individual Characteristics</u>		
Age	0.998*** (0.137)	0.953*** (0.139)
Gender	0.730*** (0.240)	0.739*** (0.218)
Medium Educated	0.0867 (0.509)	0.0299 (0.547)
High Educated	1.319*** (0.510)	1.353** (0.531)
Health of Individual	0.690** (0.286)	0.866*** (0.261)
Experience	0.113** (0.0485)	0.117** (0.0503)
Average Income	-0.251 (0.509)	-0.197 (0.546)
Regional	0.0292 (0.0936)	0.0403 (0.100)
Observations	1,028	1,028
R-squared	0.491	0.482
Region FE	Yes	Yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations based on questionnaire survey by Anxo et al (2017) and Swedish register data (LISA).

¹⁶ "My decision to continue working after 65 was largely determined by whether my spouse/partner worked."



Table 3 presents two separate regressions regarding the preferred retirement age. Column 1 takes into account the spouse's characteristics, such as the health of the spouse, the age difference between spouses, and the spouse's employment status. We observe that having a spouse that is still active in the labor market has a significant effect on the individual's preferred retirement age. This shows that if the spouse is still employed, the individual's preferred retirement age increases by 9.19 months¹⁷. In other words, the individual is less likely to retire if their spouse is currently working.

Column 2 focuses on the motivation for the individual to retire. The motivation question is based on the spouse's employment and its effect on the individual's retirement decision. The individual responded to the statement *My decision to continue working after 65 was determined mainly by whether my spouse/partner worked*. Column 2 shows a different result compared to column 1, and the estimation shows no significant result of the spouse's employment on the individual's retirement decision. This finding is explained further in the discussion. In Appendix 3, we provide the result of the estimation by genders.

6 Discussion

In our data, the spouse's characteristics have a significant effect on the individual's retirement decision, as found in previous studies (Henkes & van Solinge, 2002; Jimenz-Martin, Labeaga & Martínez-Granado 2000; Johnson & Favreault 2001). Retirement is confirmed to be an intrahousehold decision and not only a decision based on the life-cycle model. We confirmed that characteristics of the spouse have an impact on the individual's decision to

¹⁷ Calculation: $0.766 * 12 = 9.19$



retire, in terms of the spouse's health status, the age difference between spouses, and whether the spouse is retired.

The health of the spouse was only significant for males. Men's retirement decision is negatively affected by their spouse's health condition. If the spouse is in poor health, the probability of retirement increases. Legendre et al (2018) found that husbands are on average three years older than their wives, suggesting that husbands are closer to the general retirement age than wives. This implies that the husband is likely to withdraw from the labor force earlier than the wife, but the probability of withdraw from the labor force will change significantly if the husband's spouse experiences serious health issues (Legendre et al, 2018). Szinovacz & Deviney (2000) have argued that the husband is more likely to withdraw from the labor force to become a caregiver, because they are not willing to combine caregiving responsibilities with work. Henkens & van Solinge (2002) have argued that health condition is a key determinant of the individual's retirement decision, but the result in Table 1 shows that this only holds for men. This contradicts the findings of McGeary (2009), who concluded that the health of the spouse has a stronger effect on the female labor force. Szinovacz & Deviney (2000) and Legendre et al. (2018) have also shown that husbands generally retire at a later age than their spouses. This is equivalent to our result that men are likely to stay in the labor market longer than their wives.

Jimenez-Martin et al.'s (1999) results highlighted that whether the spouse is already retired affects the individual's decision to retire. According to our results, if the spouse has already retired, the individual's retirement decision is affected. Women tend to be more strongly influenced by whether their husbands have already retired compared to the reverse situation. Smith and Moen (1998) have stated that having a husband who has retired does not tend to influence a woman's retirement decision, but having a wife who is retired



tends to influence a man's retirement decision. This suggests the existence of gender roles within the household, in which wives and husbands are treated differently depending on their bargaining power, which results in different levels of influence inside the household. In this case, one could suggest that husbands have greater bargaining power than wives.

The selection argument is suggested as an explanation of why the health of the spouse does not affect stayers' preferred retirement age. The stayers are the more selected groups in terms of individual health. Pienta & Hayward's (2002) findings have shown that individuals are more likely to work after 65 if the health condition of their spouse is good. The employment of the spouse has a significant positive effect on the individual's preferred retirement age. Further, in the column to, the motivation question "*My decision to continue working after 65 was determined mainly by whether my spouse/partner worked*" is not significant, but it still has a positive effect. We would expect the motivation question to also have a significant effect. A possible explanation for the non-significance of this effect could be that this motivation question was one of a large number of such questions in the questionnaire, which were asked in sequence. When the individual considers the other motivation questions, an attenuating effect may result, compared to if the question had been asked individually. Taking a question out of the context of the rest of the questions may not create a representative and true result. The question is also formulated as "was determined mainly by", which also could have an attenuating effect in this case, compared to if one had asked whether the spouse had an "influence or no influence."



7 Concluding remarks

The aim of this paper was to investigate how the individual's retirement decision is influenced by their spouse's characteristics. We used a unique combination of postal survey data and Swedish registered data (LISA) collected by Anxo et al. (2017). Our main focus was on the spouse's characteristics, in terms of their health, the age difference between spouses, and the spouse's employment status, in which we explored different effects from the gender dimension. Males tend to be affected by their spouse's health condition when they are considering retirement: the probability that they will retire increases if their spouse has health issues. Furthermore, we found a small effect of the age difference between spouses. An increase in the age difference between spouses increases the probability of the individual retiring. We also found that the spouse's employment status is an important factor in the retirement decision of the individual. If the spouse has already retired, the probability of the individual retiring increases. The female shows a stronger effect, meaning that wives are likelier to retire if their husbands is already retired. We suggest that the result differs because of the difference in bargaining power between husbands and wives.

Earlier studies have found different results regarding the spouse's influence on the individual's decision to retire. This paper has contributed results for further investigation of the topic. Future research should attempt to capture the socio-economic characteristics of both the individual and their spouse individually and not rely on the individual's subjective view. As policy-makers are responsible for the Social Security and retirement policies, it is important for them to reflect on how the household reaches the interdependent retirement decision. Regarding increases in life expectancy ratio and the general retirement age, it is essential for policy-makers to have knowledge of the factors that determine retirement decisions in order to be able to predict older people's retirement behavior.



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Appendices

Appendix 1: Literature Overview

Studies	Data	Empirical Method	Main Results
Gustman & Steinmeier (2004)	Health and Retirement Study (HRS), United States	Joint retirement model	(+) Wife has greater impact on husband's retirement compare to the opposite.
Jimenez-Martin et al. (1999)	European Community Household Panel (ECHP)	Parametric Model	(-) Health and employment of the spouse affect individual's retirement decision.
Johnson & Favreault (2001)	Health and Retirement Study (HRS), United States: 1992-1998	Multivariate model	(-) Health and employment of the spouse affect individual's retirement decisions.
Legendre et al. (2018)	Survey on Health, Ageing and Retirement in Europe (Sweden)	Probit model	(+/-) Age difference affect retirement decision (male/female) (+) Spouse's bad health has positive effect on being retired for the individual.
McGeary (2009)	Health and Retirement Study (HRS), United States	Empirical model of changes in an individual's labor supply	(+) Probability of retirement increase for a male when his spouse suffers from health issues. Care for ailing spouse. (-) Probability of retirement decreases for a female when her spouse suffers from health issues. Some evidence for greater responsibilities for income.
Smith & Moen (1998)	Cornell Retirement and Well-Being Study	Ordinary least squares (OLS)	(+) The husband is influenced by his spouse. Not the opposite.
Szinovacz & Deviney (2000)	National Survey of Families and Households	Cox proportional hazard regressions	(+) Wife's health affects the husband retirement, increases the probability to exit the labor force. No effect for the wife



Appendix 2: Definitions of Variables used in this Study

Variable	Definition
Dependent variables	
Stayer	Current workers age 65 or older, dummy Stayer=1
Actual Retirement Age	Retired at time of the survey
Preferred Retirement Age	Currently working at time of the survey
Explanatory variables	
<u>Spouse Characteristics</u>	
Health Spouse	Current health of spouse, dummy Good=1
Age difference	Difference in age between the spouses in years
Pensioner	Currently retired
Employed	Currently employed
Unemployed	Currently unemployed
Other	Currently long-term sick or away from labor market for other reasons
<u>Motivation question</u>	
Question 1: <i>My decision to retire was determined mainly by my spouse/partner neither</i>	Motivation question for the individual to retire, dummy Agree=1
Question 2: <i>“My decision to retire was determined mainly by my spouse’s/partner’s state of health.”</i>	Motivation question for the individual to retire, dummy Agree=1
Question 3: <i>My decision to continue working after 65 was largely determined by whether my spouse/partner worked.</i>	Motivation question for the individual to continue working, dummy Agree=1
<u>Individual Characteristics</u>	
Age	Age in years
Male	Male, dummy Male=1
Low Educated	Compulsory school or less, dummy
Medium Educated	High school education, dummy
High Educated	College, University or higher, dummy
Health Individual	Current health of individual, dummy Good=1
Regional	
Experience	Work experience in years
Average Income	Average disposable income



Appendix 3: Preferred retirement age, comparison between gender

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Preferred Retirement Age	Preferred Retirement Age	Preferred Retirement Age (Male)	Preferred Retirement Age (Female)	Preferred Retirement Age (Male)	Preferred Retirement Age (Female)
<u>Spouse Characteristics</u>						
Health of Spouse	0.377		0.459	0.0651		
	(0.275)		(0.393)	(0.242)		
Age Difference	-0.0418		-0.0478	0.0117		
	(0.0364)		(0.0466)	(0.0268)		
Pensioner	-0.0506		-0.455	0.944***		
	(0.413)		(0.565)	(0.306)		
Employed	0.766**		0.528	0.996***		
	(0.344)		(0.462)	(0.329)		
Other	0.483		0.233	0.998***		
	(0.381)		(0.491)	(0.332)		
<u>Motivation Question</u>						
Q3: "...continue working due to my spouse worked"		0.165			0.165	0.181
		(0.307)			(0.384)	(0.274)
<u>Individual Characteristics</u>						
Age	0.998***	0.953***	0.984***	1.156***	0.921***	1.158***
	(0.137)	(0.139)	(0.155)	(0.0811)	(0.148)	(0.0798)
Gender	0.730***	0.739***				
	(0.240)	(0.218)				
Medium Educated	0.0867	0.0299	0.295	-0.297	0.232	-0.304
	(0.509)	(0.547)	(0.620)	(0.335)	(0.670)	(0.347)
High Educated	1.319***	1.353**	2.005***	-0.269	2.083***	-0.272
	(0.510)	(0.531)	(0.665)	(0.299)	(0.684)	(0.302)
Health of Individual	0.690**	0.866***	0.742*	0.354	0.974***	0.381*
	(0.286)	(0.261)	(0.395)	(0.220)	(0.341)	(0.194)
Experience	0.113**	0.117**	0.151***	-0.0103	0.156***	-0.00939
	(0.0485)	(0.0503)	(0.0486)	(0.0177)	(0.0502)	(0.0178)



Average Income	-0.251	-0.197	-0.646	0.822	-0.627	0.776
	(0.509)	(0.546)	(0.533)	(1.470)	(0.581)	(1.511)
Regional	0.0292	0.0403	0.0555	-0.0364	0.0744	-0.0345
	(0.0936)	(0.100)	(0.122)	(0.0710)	(0.133)	(0.0714)
Observations	1,028	1,028	728	300	728	300
R-squared	0.491	0.482	0.469	0.627	0.459	0.626
Region FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations based on questionnaire survey by Anxo et al (2017) and Swedish register data (LISA).