

ABSTRACT

JINJING, WANG. Joint Retirement Decisions between Husbands and Wives. (Under the direction of Melinda Sandler Morrill).

This thesis uses data obtained from the Rand Health and Retirement Study (HRS) to examine whether husbands and wives will decide to retire jointly or separately. This paper uses the new data from 1992 to 2006 to show the current prevailing retirement patterns of older couples and estimates a joint retirement function to find out factors that would affect the retirement decisions. This thesis shows 24.29% of couples with each spouse having career jobs prefer retiring jointly. Besides this paper finds both wives' earnings before retirement and husbands' incomes after retirement have negative effects on the decision to jointly retire, while wives' retirement incomes have positive effects.

Joint Retirement Decisions between Husbands and Wives

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CHAPTER 1 INTRODUCTION

Retiring is one of the most significant decisions made by people along their entire life roads. People approaching retirement usually have already achieved the peak of their careers and accumulated substantial lifecycle wealth. At the same time, these people have less intense pressure of earning money to afford the family's expenditures including children's education investment, housing mortgage, and other necessary expensive spending since they have already accomplished their responsibilities at this time. Thus the conditions on which retirement decisions of the senior are based are very different from those based on which labor supply decisions are made in their earlier career time. Additionally, physical diseases may also play an undeniable objective role in the retirement decisions, even though people still have a strong willingness to work in old age. Therefore, retirement decisions should attract our special attention, in the sense that less economic stimulus, as well as more health limitations made the retirement decisions significantly different from other decisions in the life.

Retirement decisions are no longer unique things of husbands in a family context as more and more wives participate into the labor market. Due to the family financial structure reform in recent years, the retirement decisions of husband and wife within family may be correlated with each other instead of being made separately. In the past, husbands made their own retirement decisions without considering their wives' work status since they are the main economic supporter of the family. Nowadays, however, as more and more wives began to share the economic burdens of the family, especially, in the dual workers family, the retirement decisions may no longer be made by one person only. Besides, whether the work

status of one spouse affects that of the other will also matter that whether the family, viewed as the smallest economic unit of the whole social economy, was set up efficiently. Joint retirement decisions, instead of separate decisions, may maximize the welfare of the family unit because it considers interrelationship between the two family earners who may share the same budget constraint and face the correlated utility function. Therefore it may hurt the results when neglecting the interaction role of decisions making between spouses.

It is a useful question whether the spouses would like to make joint retirement decisions when they are phasing into the senior years. First of all, one factor affecting one spouse's retirement decisions may also alter the other spouse's through the interaction path between the spouses. Neglecting this joint role between each other may underestimate the effects of the determinants or relevant policies. Secondly, this joint decision within family contributes to predict the retiring activity trend more precisely. Without considering the joint retirement decisions, it may lead to omit the power of women's labor force participation. Moreover, it is significant to find a balanced way to choose the most appropriate retirement age reducing the economic friction between the spouses and maximizing the welfare of the whole family.

The existing literature provides great insight into retirement of older men and older married women separately, and the dynamics of retirement behavior between older couples based on the study of relatively earlier generations. However, do current people approaching retirement follow the similar behavior patterns? If so, what factors might affect older couples' retirement pattern choice?

This paper contributes to the literature in two main ways. First, this paper estimates the behavior of one spouse given the retirement status of the other using the newer longitudinal

data from Health and Retirement Study (HRS), to test whether one spouse's retirement status will influence the other one. Previous work, such as that of Blau (1998), shows there exists a 30.3% incidence of joint retirement based on the behavior that occurred during the 1960s and 1970s from the Retirement History Survey, and that of Hurd (1990), finds 25% of older couples retired within one year based on the behavior occurring during 1981 and 1982. An important task is to test whether the joint retirement patterns are still prevalent or whether other patterns have developed. Thus, Health and Retirement Study Rand Data documenting the behavior information of people from 1992 to 2006, used in this paper draws a newer picture of the older couples' retirement patterns, which is similar to the conclusions of previous studies (Blau, 1998 and Hurd, 1990). Besides, the longitudinal models applied in this paper not only test the partner's behavior status, but also examine other characteristics of the partner which might affect people's retirement decisions.

Second, this paper, based on the joint retirement patterns of the older couples, tries to find some factors which might affect people's decisions whether to retire at approximately same time or separately. Previous works, such as Blau (1998), and Gustman and Steinmeier (2000), estimate the behavior of husbands or wives separately. However, what types of factors will determine the couple's retirement patterns? Thus this paper will fill this gap by using logistic model to estimate whether one spouse's characteristics or both would influence their retirement patterns. This paper finds that the each spouse's economic variables play significant roles in determining the spouses' retirement patterns. In sum, both wives' earnings before retirement and husbands' incomes after retirement have negative effects on the decision to jointly retire, while wives' retirement incomes have positive effects.

The remainder of this paper is organized as follows: the next section presents an overview of literature related to joint retirement. The third section briefly introduces the data of HRS and defines the meaning of working and retiring used in this paper. The fourth part describes the data selection steps used to set up my sample. The fifth section presents the methods used to analyze the one spouse's possible labor force behavior given the labor force status of the other and the factors that may affect older couple's retirement patterns choice. The sixth section demonstrates the descriptive results of the data. The seventh section presents the empirical results of the regressions. The last section gives the conclusion.

CHAPTER 2 LITERATURE REVIEW

Retirement is a significant phenomenon in life-cycle labor supply. How individuals make their retirement decisions is mainly based on economic status of the family in retirement such as social security and pension payments and also based on health conditions (Henretta and O’Rand, 1983). Henretta and O’Rand (1983) think that different roles of family behavior will affect the effects of determinants of the retirement. Their empirical study based on the data of the Current Population Survey indicated that the wife’s age and socioeconomic status as well as the husband’s health, will affect married women’s retirement decisions given the husband’s characteristics and retirement status. These factors had been proved to play a significant role in determining retirement time of individual both men and women (Henretta and O’Rand, 1980).

As the trends of a great increase in labor force participation rate of older married women turn up, more and more studies begin to focus on the labor exit of older married women. The investigations of Henretta and O’Rand (1980) support the results that married women’s retirement decisions might be more complex than men’s and are powerfully influenced by both economic variables (such as wages and pension eligibility) and non-economic variables (such as having a husband in poor health). The empirical analysis of Clark and Johnson (1980) further proves the results of the Henretta and O’Rand’s study that married women are more likely to work when their own wages are high and husbands are still working. Fields and Mitchell (1984) put the women’s retirement behavior into a lifecycle frame work through valuing current as well as future income and leisure opportunities. Pozzebon and Mitchell (1989) casts women’s behavior into a lifecycle frame work and concludes wives’ own

economic opportunities tend to be insignificant determinants of retirement patterns while husband's own economic opportunities tend to play more powerful roles, but in contrast, other variables are more important for women. They find that married women appear to value non-work years highly, if their spouse is much older than them and having a husband in poor health appears to increase rather than impede the wife's continued working time, but the presence of dependent children has no discernable impact.

Growth in the labor force participation of married women makes their retirement decisions significant within family. For a dual working couple, the retirement decisions will be made within a family context. Will they decide to retire together or make their decisions separately? Whether they will combine their spouse's health status to decide their own retirement timing? Will their taste of leisure affect each other? Within the dual-working family structure, maybe a number of family factors will affect timing of retirement (Henretta and O'Rand 1983).

According to Henretta and O'Rand (1983), if one spouse is much older, then couple is more likely to follow the joint pattern instead of the pattern in which one spouse works longer. The lower the wage of one spouse, the more likely is the couple to follow the pattern in which the spouse with higher wage works longer. Lack of pension coverage is associated with the pattern in which the spouse without a pension works longer, instead of the joint pattern. Hurd (1990), using the data from New Beneficiary Survey, gives empirical evidence on the correlation between husband and wife's retirement dates, and proved the hypothesis of joint retirement within couples that is 6.1% couples retired in the same month and 24.6% retired in the same year. Blau (1998), using the longitudinal data from the Retirement History

Survey, estimates a model that can account for the transitions among a set of discrete joint labor force states. His empirical results reveal strong associations between the labor force transition probabilities of one spouse and the labor force status of the other: a positive effect of non-employment of one spouse on the labor force exit rate of the other spouse; and a negative effect of non-employment of one spouse on the labor force entry rate of the other spouse.

If one spouse's retirement decisions are made based on the labor force status of the other, the retirement statuses are all endogenous rather than exogenous. Gustman and Steinmeier (1986) estimate the structural model of husbands' and wives' retirement decisions, and find that the correlation of retirement preferences is a significant factor in increasing the joint retirement of spouses. They also conclude that the wives' retirement decisions are not strongly affected by their husbands, while husbands' decisions are more strongly affected by their wives. According to Gustman and Steinmeier (1986), joint retirement is due to preference and not to the budget sets. Gustman and Steinmeier (2000) use the more recent data of the National Longitudinal Survey of Mature Women, 1968-89, which reflect the newer trend in the retirement patterns than their previous study. Gustman and Steinmeier (2002), using the data from 1992 wave of Health and Retirement Study, show that no matter the age difference between the husbands and wives, there is a cluster in the same year of retirement. Gustman and Steinmeier (2001) view that enjoying leisure time together with spouses at old age can increase greatly each individual's utility.

As more and more women participate into the job market, they have more similar experience with their husbands; both of them will more value the time spent together which

can contribute to the joint retirement. Thus, different labor market environment may show different trends of the family's retirement decisions.

This paper expands the focus of the existing literature, using the data from all 8 waves of HRS, to test whether the joint retirement patterns are still prevalent among current couples approaching retirement. I find that the joint retirement patterns between husbands and wives are still prevailing and both wives' earnings before retirement and husbands' incomes after retirement have negative effects on the decision to jointly retire, while wives' retirement incomes have positive effects.

CHAPTER 3 DATA

In this paper, I use the data from RAND Health and Retirement Survey (HRS) a user-friendly version of subsets of HRS. The RAND HRS contains all the cohorts of respondents combining 8 survey waves from 1992 to 2006.

The total observations of the whole data are 30,405 individuals, which covers rich information and all families of different structures. In order to focus on the interaction between older husbands and wives, we will use some sample selection criterions to get the target sample and then I provide the definitions of work and retirement appeared in this paper, because the concept of retirement is not very well defined for individuals who have not had much labor force experience. (Blau, 1998).

In this paper, I use information on the respondents' labor force status at each wave to define whether people are retired or not. I define people to be retired the first time they are reported to be retired. Since HRS are conducted every two years, I approximate retirement year as the year of the wave conducted if people reported they were working in the former wave but retired in current wave. But among people who reported that they have already retired in 1992 wave, I use the retirement year given by respondent at that wave instead of the year 1992 in order to have a relatively exact retirement time. Besides, I view other types of labor force status as not retired status, such as full time, part time and not in working status but looking for jobs.

In order to restrict the sample to the family with wives in a career job, I use the job history information given by respondents who have to report whether they have had a job, or whether the job last 5 years above or below to define a career job. If they never report that

they had a job in his job history information then I view that they do not have career jobs, otherwise I will view them as having career jobs.

CHAPTER 4 SAMPLE SELECTION

The following are the sample selection steps:

First of all, this paper, in order to follow the dynamics between spouses and make plenty use of the longitudinal data, only concentrated on the HRS cohorts who were born from 1931 to 1941 and first interviewed in 1992 and subsequently every two years. In this case, each couple will have many time varied information documenting the characteristics changes of each spouse over 8 waves of the study. Thus total observations of cohort 1992 are 13,434 individuals.

Secondly, this paper is aiming to study the joint retirement within dual-career family, so I have to focus on the couples rather than individuals. Thus the individuals are reported as couples among cohorts 1992 are 9,736.

Thirdly, I only focus on those couples who have stable marriages. Families, as the smallest economic form, would reach a higher total level of utility for both the spouses than that they would reach separately. An unstable marriage may hurt the base of the joint retirement that family is an efficient organization maximizing both the couples' welfare. Only couples with stable marriages could satisfy the assumption of joint retirement. Thus the number of the observations is 4,311 (individuals) after ruling out the people without a stable marriage especially during the HRS survey time.

Fourthly, since this paper is going to study the activities within family, we require the people in our sample to be in married status when they are interviewed. The analysis of retirement behavior of older people might lead to quite different results if people in the

sample are not in married status. Thus the number of the remaining individuals is 4,260 after dropping the people who are not in married status before year 2006.

Fifthly, we need the sample observations are reported based on a family unit. Due to the structure of the HRS that is every spouse in the family are reported once, we need to get rid of the repeated observation of the family. We drop the repeated observations in this step because of the convenience of data process. Thus the sample has 2,130 couples.

Additionally, we need both spouses having career jobs, which reflect the new trends, different from the past that both husbands and wives have career jobs have to arrange the time when they will exit from the labor market. Dual workers serve as another necessary assumption of joint retirement. Based on the sample with 2,130 couples, 0.14% of the men never had a job, and 1.08% of the men once had a no more than 5 years job, and 98.17% had at least a more than 5 years job. At the same time, 4.23% of women never had a job, 8.83% once had a no more than 5 years job and 79.81% had at least a more than 5 years job. Thus if one spouse of the couple never reported they had a job, then I drop them to set up a sample of 2,014 dual career couples.

Moreover, in order to estimate the logistic regression of retirement patterns on other possible factors, this paper have to narrow the sample within those couples at least one of whom has already reported to retire in the last survey wave to know their retirement patterns. There are both the expected retiring data at first survey wave and the exact retiring data if the respondent reported that they have been in retired status. Narrowing sample within both retired spouses could provide us more accurate information about the retirement decisions

rather than the expectation. Thus there are 1,873 couples at least one spouse of whom has already retired at or before 2006.

Finally, among people who reported that they have already retired in 1992 wave, I use the retirement year given by respondent at that wave instead of the year 1992 in order to have a relatively exact retirement time. After cutting the respondents who have already retired in 1992 but do not report their retirement year, the size of the final sample used to do further analysis and regression is 1,617.

CHAPTER 5 METHODS

First of all, this paper is going to test whether joint retirement patterns are still prevalent or whether other patterns have developed. Blau (1998) showed that 30.3% of the couples retired within the same year on the basis of the behavior that occurred during the 1960s and 1970s from the Retirement History Survey. An important task is needed to test whether this feature still prevails in current older people's behavior. Thus in this paper, I regress one spouses' labor force status on the other one's status as well as the other possible demographic and economic factors of each spouse, based on the analysis of dynamics between husbands and wives (Blau, 1998) and the longitudinal data from the recent 8 waves of HRS, through simplifying the labor behavior into just two statuses: work or retired.

In order to test one spouse's retirement choice given the other spouse's labor force status, I try to estimate two longitudinal equations for husbands and wives separately. First, I would like to separate retired people into husbands' group and wives' group in order to test the interaction between husbands and wives. Separation between husbands and wives could break the influence of one spouse away from that of the other. Then I create two dummy variables (HUSREI and WIFEREI) as dependent variables indicating the labor force status of husband or wife at each wave. The two variables are defined based on the question about respondents' labor force status. If the respondents do not mention to be retired, I will view them still working no matter if they had part time jobs, or full time jobs or even no job but searching on the market. Once they have reported to be retired, then I will view them as retired forever. Whether husbands or wives would like to choose retire if they know their

spouse's choice could reflect whether they would like to retire at the same time.¹

Equivalently, given husbands' retirement status, whether wives are more likely to retire at the same period would magnify the willingness whether to retire at the same time with their wives. So less likelihood presents that less probability to retire at the same time.

The next step is to define some independent variables, in order for differences in retirement behavior according to observable characteristics. I will add each spouse's education level as part of the independent variables. Education might affect people's attitudes toward work or preference of leisure, and therefore influence people's labor supply decisions especially in old age.

Pozzebon and Mitchell (1989) conclude wives' own economic opportunities tend to be insignificant in determining retirement patterns while husband's own economic opportunities tend to play a more powerful role. But in contrast, other variables are more important for women, such as having a husband in poor health that appears to increase rather than impede the wife's continued working time, because women work as substitution of their husbands in poor health to support the family. This paper will also examine whether their own or spouse's health conditions are significant factors one have to pay special attention to when making labor supply decisions at old age. We expect that if the factors are significant determinants, then the defects in body condition will impede the people's labor supply This paper uses the

¹ Given other conditions equal, the odds ratio of husbands exiting the labor market at certain period if wives are going to retire at that period is 13.1% more than the odds if wives are still working. Similarly, the odds ratio of wives retiring at certain period if husbands are going to retire at that period is 12.4% more than the odds if wives have retired at that period.

variables (HUSHEALCAI, WIFEHEALCAI, HUSHEALCCI, WIFEHEALCCI,) indicating the health change compared to the past two years given by the respondent.²

Economic characteristics are undeniable factors affecting peoples' retirement decisions. Pozzenbon and Mitchell (1986) found that economic factors have less affect on married women's retirement decisions than on their husband's, which is based on the assumption that wife's decisions is subsequent to her husband's. So this paper, compared the differences of various determinants' roles in retirement decisions making, some of which may have an influence on husband's decisions, and some of which may have an impact on wife's decisions, and also some may affect both of their decisions. The comparison reflects that same factors may have different roles in the process of retirement decisions making. The variables (HUSEARNI, WIFEEARNI) of the annual earnings before retirement indicate the opportunity costs of retirement and the variables (HUSREINCI, WIFEREINCI) of the annual income after retirement including the social security and pension incomes represents the future income determinants (Pozzebon and Mitchell, 1989). The values of the economic variables are based on 10,000 dollars.

Would spouses in dual-career family like to retire at the same time if the age difference between them is very large? Gustman and Steinmeier (2002) show that no matter the age differences between the husbands and wives there is a cluster in the same year of retirement, using the data from National Longitudinal Survey of Mature Women as well as the cross

² The HUSHEALCAI variable which is equal to 1 indicates the husbands' health conditions are much better or somewhat better than two years ago. HUSHEALCBI which is equal to 1 indicates the husbands' health conditions are the same as two years ago. The baseline variable is the husbands' health conditions are much worse or somewhat worse than two years ago. The WIFEHEALCAI variable which is equal to 1 indicates the wives' health conditions are much better or somewhat better than two years ago. WIFEHEALCBI which is equal to 1 indicates the wives' health conditions are the same as two years ago. The baseline variable is the wives' health conditions are much worse or somewhat worse than two years ago.

chart of the age differences and retirement year differences. However, the charts only cannot provide confident proof that there is no significant relationship between age difference and whether to retire at same year. Thus this paper is aiming to set up two logistic functions to test whether age differences play significant roles in husbands' or wives' retirement decisions. Thus I create a variable (AGEDIFF) of age differences.

Besides, people's age also matters the retirement decisions a lot. Whether to receive social security at an early age with income reduction or wait until the normal age or later ages to have a full retirement income is necessary to be considered when analyzing the retirement behaviors. Thus we add the husbands' age and the square of husbands' age in the regression functions.

Therefore the regression functions are as follows:

$$\begin{aligned} \log \frac{P(husrei_{it} = 1)}{1 - P(husrei_{it} = 1)} = & \alpha_0 + \alpha_1 wiferei_{it} + \alpha_2 huscol_i \\ & + \alpha_3 hussomecol_i + \alpha_4 hushigh_i + \alpha_5 wifecol_i + \alpha_6 wifesomecol_i \\ & + \alpha_7 wifehigh_i + \alpha_8 hushealcai_{it} + \alpha_9 hushealcbi_{it} + \alpha_{11} wifehealcai_{it} \quad (1) \\ & + \alpha_{11} wifehealbi_{it} + \alpha_{12} husearni_{it} + \alpha_{13} wifeearn_i + \alpha_{14} husreinci_{it} \\ & + \alpha_{15} wifereinci_{it} + \alpha_{16} husagei_{it} + \alpha_{17} husage2i_{it} + \alpha_{18} agediff_i \end{aligned}$$

$$\begin{aligned} \log \frac{P(wiferei_{it} = 1)}{1 - P(wiferei_{it} = 1)} = & \alpha_0 + \alpha_1 huserei_{it} + \alpha_2 huscol_i \\ & + \alpha_3 hussomecol_i + \alpha_4 hushigh_i + \alpha_5 wifecol_i + \alpha_6 wifesomecol_i \\ & + \alpha_7 wifehigh_i + \alpha_8 hushealcai_{it} + \alpha_9 hushealcbi_{it} + \alpha_{10} wifehealcai_{it} \quad (2)^3 \\ & + \alpha_{11} wifehealcbi_{it} + \alpha_{12} husearni_{it} + \alpha_{13} wifeearn_i + \alpha_{14} husreinci_{it} \\ & + \alpha_{15} wifereinci_{it} + \alpha_{16} wifeagei_{it} + \alpha_{17} wifeage2i_{it} + \alpha_{18} agediff_i \end{aligned}$$

³ Huscol=1 indicates husband's education level is above college. Hussomecol=1 indicates husband's education level is some college. Hushigh=1 indicates husband's education level is high school. The baseline is husband's education level is below high school. Wifecol=1 indicates wife's education level is above college. Wifesomecol=1 indicates wife's education level is some college. Wifehigh=1 indicates wife's education level is high school. The baseline is wife's education level is below high school.

We expect that holding other conditions constant, knowing one spouse has retired, the other spouse would prefer exiting the labor market as well, if the joint retirement patterns are still prevalent based on the behaviors from 1992 to 2006. If it is the case, then the second purpose of this paper is trying to find out what factors might increase the chance of retiring jointly.

This paper also estimated the logistic model to explore the possible determinants people who are willing to retire jointly with their spouses. First, I also use the definition of retire as in the first stage and run the regression for sample of couples with both spouses having retired at 2006. Thus the retirement year are the time when they first reported they have already retired no matter what other status reported in the latter waves. But for those who reported to have been retired at the first wave, then retirement year variable are based on the question about the respondent's reported retirement year rather than the year 1992. Then if the retirement occurs within 2 subsequent years, I define it as the joint retirement (retype=1), otherwise, couples choose to retire at different time (retype=0). Then I run second regression use the definition of retype as retiring at the same survey year for the same sample of couples. In this case, if both spouses are reported to retire at the same survey year, then retype=1, else retype=0. The two sets of regression show similar results. Thus here I define joint retirement as retiring within two subsequent years because this definition can reflect the relationships between different factors and choice of joint retirement.

Similarly as former parts, I will add the education variables (huscol, hussomcol, hushigh, wifecol, wifesomcol, and wifehigh) which are from the 1992 wave survey as it is time independent, variables relevant to health change compared to two years ago. (hushealc,

wifehealc) which are from the year at which respondents first reported to be retired, economic variables (husearn, wifearn, husreinc, wifereinc) including the each spouse's annual earning before retirement as well as the social security and pension income after getting retired which also come from the year at which respondents first reported to be retired, and also husband's age at the time of retirement (husage) as well as the square of the age. I also, using regression which covers the covariate of age differences between husband and wife (agediff), test whether age difference between couples would significantly affect retirement patterns within family. The logistic model I attempt to estimate is

$$\begin{aligned}
 \log \frac{P(\text{retype}_i = 1)}{1 - P(\text{retype}_i = 1)} = & \alpha_0 + \alpha_1 \text{huscol}_i \\
 & + \alpha_2 \text{hussomecol}_i + \alpha_3 \text{hushigh}_i + \alpha_4 \text{wifecol}_i + \alpha_5 \text{wifesomecol}_i \\
 & + \alpha_6 \text{wifehigh}_i + \alpha_7 \text{hushealca}_i + \alpha_8 \text{hushealcb}_i + \alpha_9 \text{wifehealca}_i \\
 & + \alpha_{10} \text{wifehealcb}_i + \alpha_{11} \text{husearn}_i + \alpha_{12} \text{wifearn}_i + \alpha_{13} \text{husreinc}_i \\
 & + \alpha_{14} \text{wifereinc}_i + \alpha_{15} \text{husage}_i + \alpha_{16} \text{husagesqr}_i + \alpha_{17} \text{agediff}_i
 \end{aligned} \quad (3)$$

CHAPTER 6 DESCRIPTIVE ANALYSIS

Using the sample selection steps described above, table 2 provides four types of retirement dynamics between the husband and wife. In 1992, only 4.23% couples are both retired, and 78.90 % couples are both working. And in 2002, the couples who are both retired increased to 56.55% while who are both working only take up 12.71%. The proportion of the family in which husband works but wife retires has increased from 5.91% in 1992 to 12.76% in 2006, and the proportion of the family in which husband retires but wife still works increases from 10.87% in 1992 to 17.97% in 2006.

Figure 1 and Figure 2 compare the differences of retirement age distributions of husbands and wives. The peaks of retirement age for husbands and wives are both 64, but the retirement age of wives tends to be much younger than that of husbands, which indicates that on average wives prefer to retire at early age and therefore to keep up with husbands' behavior. One possible reason is that wives need to undertake lots of family responsibilities and have to exit labor market earlier; the other possible reason might be that they highly value the shared retirement leisure with their husbands especially if they know their husbands already retired. This corresponds to Table 2. From 1992 to 2006, along with couples in Type I gradually becoming other three types one period after another, couples in Type III and Type IV also become Type II. Thus the growth of Type II increases at a much higher speed than the growth of Type III and Type IV, which indicates one spouse of the couple are more likely to retire if they know the other spouse are going to retire or has retired. The following part will use regression functions to test this correlation between spouses' labor supply decisions at old age. In other words, whether the chance of wives' exit from the labor market is

significantly increase if they know their husbands are going to retire, and also whether the same effects happen to husbands?

Figure 3 indicates the age differences between husbands and wives are quite irrelevant to the differences between the retirement years of husbands and wives. However, figure 4 suggests that age differences and retirement age differences follow kind of similar frequency distribution. Table 3 demonstrates that if the husbands are on average 3.19 years older than their wives, the retirement age of husbands on average is also 2.40 years older than their wives. The similar trend between age differences and retirement age differences indicates that the couples are going to retire at the same year even though they are born in different years. Table 4 and Table 5 show that the correlation between the age differences and retirement age differences is much higher than the retirement year differences.⁴ Thus we can expect that older couples would like to retire at the same year rather than at the same age, which is consistent with the literatures.

Table6 shows that the average retirement age of husbands is 64.67 while the average retirement age of wives is 61.92. About 68.03% of men reported their health conditions at retirement year are the same as two years and 67.90% of the women have the same health reports, representing that the health status of both husband and wife remain the same as the year before they get retired. The average economic incomes of husband are much greater than that of wife both before and after they retire. Besides, the average education allocations of men are higher than women.

⁴ The correlation coefficient between the age differences and retirement age differences that is 0.417 and the correlation coefficient between the age differences and the retirement year differences is 0.209.

In Table 7, comparing husbands' income reductions after retirement with that of wives, I find that on average husbands' income reduces about 48.03% after retirement while wives' income reduces about 58.02%,⁵ which indicates that reduction might have a larger income effect for women than for men.

⁵ The reduction percentages are calculated after ruling out people who do not reported their earnings before retirement and retirement incomes.

CHAPTER 7 RESULTS

The estimates of longitudinal regression are given in Table 8.

First of all, one spouse's retirement status will have a significantly positive influence on that of the other one. It is shown that wife's retirement status has a statistically significant influence on husband's retirement choice and also husband's retirement status has symmetric effects. Thus the estimated results show that both husband and wife would like to retire at the same time interval. Given other conditions equal, the odds ratio of husbands exiting the labor market at certain period if wives are going to retire at that period is 13.1% more than the odds if wives are still working. Similarly, the odds ratio of wives retiring at certain period if husbands are going to retire at that period is 12.4% more than the odds ratio if wives have retired at that period. Therefore, the estimates show that no matter for husbands and wives, given one spouse's retirement status in one period, they are more likely to choose the same labor force status in that period. In other words, the joint retirement patterns within family are still prevalent based on the relatively newer behavior.

Secondly, both husbands and wives own health conditions have significantly negative effects on the decision to retire. Both husbands and wives are less likely to retire if their health conditions are better than two years ago. However, one spouse's health conditions have a positive influence on the other spouse's decision to retire. Men are less likely to retire if their wives' health conditions are worse than two years ago and so are women, which is consistent with the investigations of Henretta and O'Rand (1980) that is having a husband with poor health will increase wives working time to earn more money and support the family. In this case, the family follows substitute retirement pattern (Henretta and O'Rand,

1983) rather than joint retirement pattern⁶. However, in my sample the cross health effects between husbands and wives are not statistically significant.

Thirdly, for both husbands and wives economic characteristics, some of them play significant roles in determining the behavior of working or not. For husbands, the incomes before retirement of both themselves and their wives have negative effects on their decisions to retire, but only their own income before retirement and their wives retirement income are statistically significant. For example, the average odds ratio of the leaving job market is 0.4% lower if husbands' annual income is 10,000 dollars higher and is 0.1% lower if their wives annual income before retirement is 10,000 dollars higher. For wives, their own economic factors have negative effects on their decisions to retire which is similar to their husbands, but the husbands' economic characteristics are not statistically significant while only wives' own incomes before retirement are significant. Table 8 shows for women the average odds ratio of exiting job market is 1% higher for every 10,000 dollars increase in their own retirement income, For both husbands and wives, the negative coefficients of own income before retirement reflect the economic opportunity works when people are making their labor supply decisions at old age. The higher annual income before retirement, the higher opportunity costs, and the less likely the husband and wife would like to exit the labor market. Besides, wives' retirement incomes have negative effects on the husbands' decision to retire. This is probably because women with higher retirement incomes are more likely to

⁶ There are three retirement patterns: joint pattern, substitute pattern and secondary pattern. Joint pattern is the case that the couple chooses to retire almost the same time, substitute pattern is that the wife will work after retired in which instance wife works instead of husband and beyond husband's retirement, and secondary pattern is husband working after wife retired since the husband is the primary worker in the family. (Henretta and O'Rand, 1983).

retire, which might cause a 50% reduction in the income after retirement. And husbands are more likely to work longer to make up the income reduction.

Finally, the age difference plays a statistically significant role in husbands' retirement determination at the 10% confidence level, but not statistically significant in wives retirement decision making. Husbands are 0.2% more likely to retire earlier if they are one year older than their wife, and similarly, Wives are 0.1% less likely to retire if they are one year younger than their husbands which is not statistically significant.

The above regression results have proved the prevalence of joint retirement between husbands and wives at modern times. Then I run two sets of the logistic regression to find the determinants of joint retirement pattern. The estimates of logistic regression are given in Table 9.

First of all, the economic characteristics of both husbands and wives play statistically significant roles in determining the decision to joint retirement. In this paper, I find that Husbands' incomes both before retirement are not significant. But both husbands' retirement incomes and wives' earning before retirement negatively affect the decision to joint retirement, while the wives' retirement incomes positively affect. For both wives, higher incomes before retirement greatly increase the opportunity costs of retirement, and make them work longer. The willingness to retire earlier is greater than the willingness to retire jointly, which makes wives with higher earnings before retirement less likely to retire jointly. However, higher of husbands retirement income will reduce the husbands' opportunity costs of retirement, which makes the willingness to retire earlier greater than the willingness to retire jointly. However, wives' retirement incomes positively affect the joint retirement

decisions. Even though their own higher retirement incomes drives women to retire earlier, the reduction of incomes after retirement might have great income effects to offset the incentive to retire earlier and couples might more would like to retire at the same time.

Secondly, wives' health conditions do not have statistically significant negative effects on the decision to retirement patterns. Health conditions might be one consideration of individual people's own retirement decisions making, but does not play significant role in joint retirement decisions making.

Thirdly, the coefficient of the age differences is not statistically significant at 90% confidence level while husbands' retirement age more significantly affects people's retirement patterns. Holding other things constant, thus if the husbands are much older when they retired, they are much less likely to retire at same time. But the age differences between spouses might not affect the retirement patterns choice.

CHAPTER 8 CONCLUSION

This paper advanced the current study of joint retirement via its utilization of the labor force exit behavior based on the newer wave of HRS. This paper makes mainly two contributions to the existing literature. Firstly, this paper estimated the current trends of retirement pattern between husband and wife using the new data from HRS from 1992 wave to 2006 wave. Secondly, this paper further explored the factors determining the joint retirement patterns which fill the gap where previous studies only estimate the behavior using separate equations.

Consistent with previous study, the new empirical longitudinal estimates proved that the joint retirement patterns of older couples still hold. Given one spouse's labor force status, the other spouse is more willing to follow the same status, which might derive from their same leisure taste. Another newer feature of dual working family is both spouses tend to retire early before the normal retirement age according to Figure 1 and Figure 2. The same leisure tastes would lead couples to retire early and enjoy their leisure time together.

At the same time, the substitution effects between more leisure time and higher earning income at old ages also play a significant role in determining the retirement status. Both Husbands retirement incomes and wives' earnings before retirement negatively affect the while the wives' retirement incomes positively affect the decisions.

Besides, having wives with poor health conditions, the dual worker families are less likely to retire together. This might be because the health conditions' effects on each individual's retirement decisions, but the cross effects of health conditions are not significant so that the health problem may hurt the decisions to joint retirement.

Therefore, both husbands and wives would like to retire jointly. One spouse's retirement status has positive effects on retirement decisions of the other spouse and economic factors statistically significantly affects their decisions to retire jointly.

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APPENDICES

Figure 1: Histogram of Husbands' Retirement Age

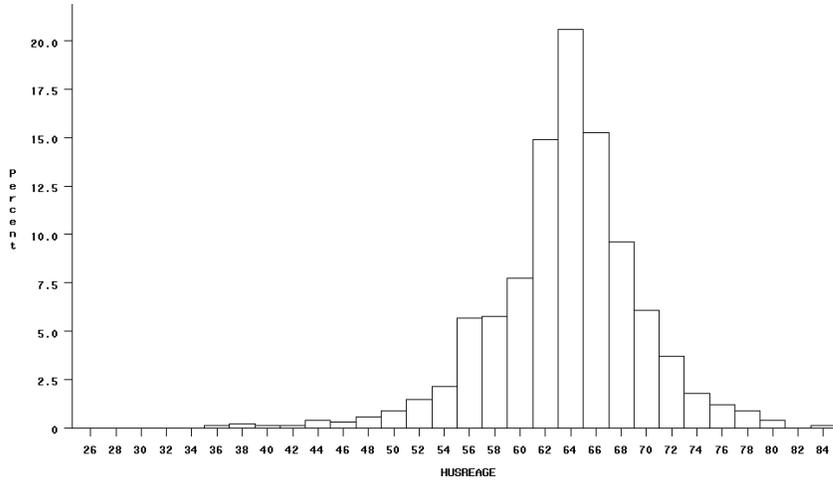


Figure 2: Histogram of Wives' Retirement Age

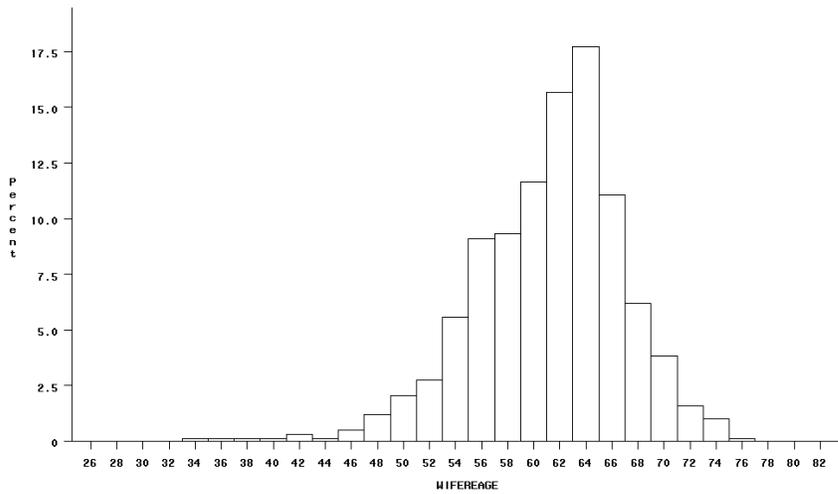
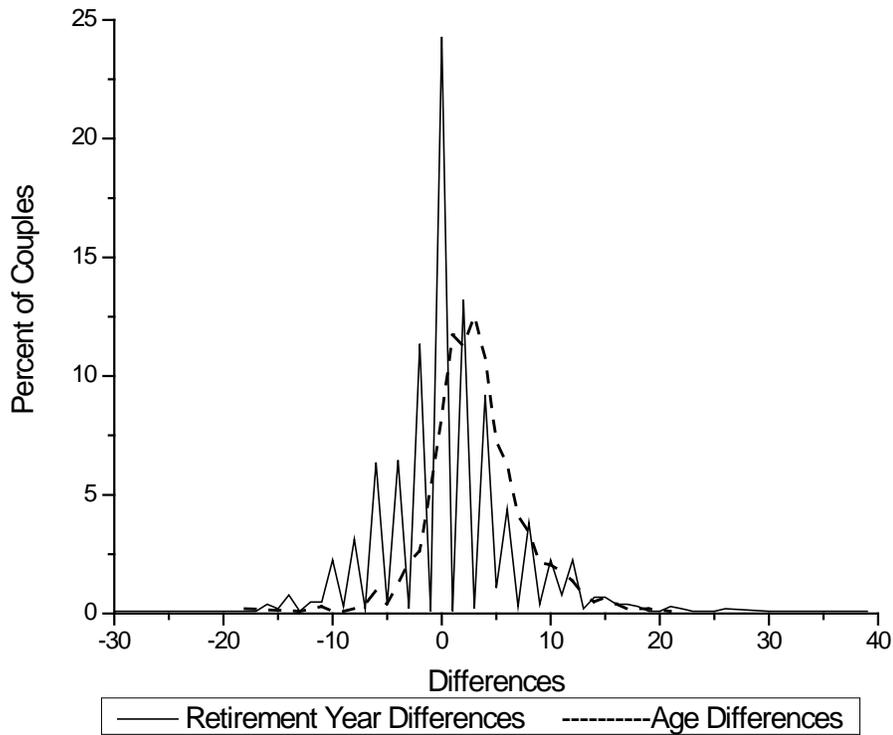
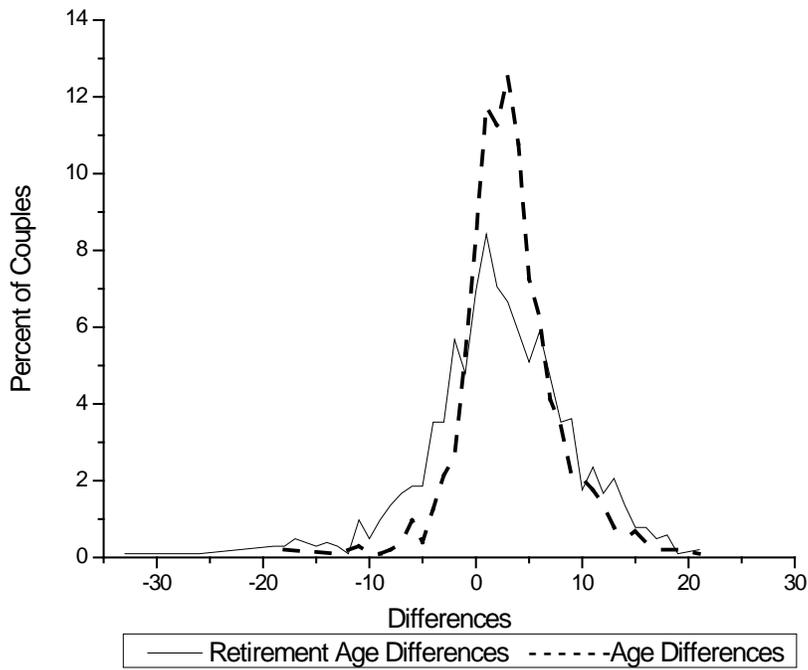


Figure 3: Distributions of Age Differences and Retirement Year Differences



Note: Age differences indicate how many years husbands are older than their wives. So positive number means husbands are older than their wives, and negative number means husbands are younger than their wives. Retirement year differences= husbands' retirement year- wives' retirement year. Thus positive number means husbands retired after wives, and negative number means husbands retired before wives.

Figure 4: Distributions of Age and Retirement Age Differences



Note: Age differences indicate how many years husbands are older than their wives. So positive number means husbands are older than their wives, and negative number means husbands are younger than their wives. Retirement age differences= husbands' retirement age- wives' retirement age. The positive number means husbands retired at an older age compared to their wives while negative number means husbands retired at an earlier age than their wives.

Table 1: Sample Selection

Sample Selection	Observations Deleted	Observations Remaining
Individuals		
Cohort 1992		13,434
Couples with Both Spouses Interviewed	3,537	9,736
Both Spouses Have a Stable Marriage	5,425	4,311
Both Spouses are Still in Married Status	51	4260
Couples		
Both Spouses are Still in Married Status		2,130
Both Spouses Once Worked	116	2,014
At Least One Spouse has Retired at 2006	141	1,873
After Deleting the Spouses Without Clear Retirement Year	256	1,617
Both Spouses have Retired at 2006	476	1,139
After Deleting the Spouses Without Clear Retirement Yea	118	1,021

Note: HRS cohorts are interviewed at the initial wave of 1992, repeated every two years and have the largest information than other cohorts. This thesis, aiming to analyze the behaviors of older couples, only focuses on married couples with stable marriage and still in married status. Besides, I need every couple to have a career job in during their whole life. For people who are already retired in the first wave, I use their reported retirement year instead. The final samples I will use have 1,617 couples

Table 2: The Labor Force Status of Husbands and Wives from 1992 to 2006 (total size are 2,014)

Year	Husband Works and Wife Works Type I	Husband Retires and Wife Retires Type II	Husband Works and Wife Retires Type III	Husband Retires and Wife Works Type IV				
1992	1,589	78.90%	87	4.32%	119	5.91%	219	10.87%
1994	1,343	66.68%	207	10.28%	193	9.58%	271	13.46%
1996	1,105	54.87%	332	16.48%	249	12.36%	328	16.29%
1998	907	45.03%	473	23.49%	282	14.00%	352	17.48%
2000	720	35.75%	641	31.83%	279	13.85%	374	18.57%
2002	526	26.12%	816	40.56%	269	13.36%	404	20.01%
2004	371	18.42%	985	48.91%	274	13.60%	384	19.07%
2006	256	12.71%	1,139	56.55%	256	12.76%	362	17.97%

Note: This table is based on the sample with 2, 014 couples. The following analysis focuses on type II, III and IV. Due to the missing of retirement years of either husbands or wives, the final sample size for the later analysis is 1, 617.

Table 3: Some Descriptive Results

Variable	N	Mean	Std Dev	Minimum	Maximum
Age Difference	1, 021	3.194	4.314	-18.000	21.000
Retirement year difference	1, 021	0.791	6.548	-30.000	39.000
Retirement age difference	1, 021	2.403	7.046	-33.000	35.000

Note: The results in this table are based on type II people without missing retirement year in Table 2. Age differences indicate how many years husbands are older than their wives. So positive number means husbands are older than their wives, and negative number means husbands are younger than their wives. Retirement year differences= husbands' retirement year- wives' retirement year. Thus positive number means husbands retired after wives, and negative number means husbands retired before wives. Retirement age differences= husbands' retirement age- wives' retirement age. The positive number means husbands retired at an older age compared to their wives while negative number means husbands retired at an earlier age than their wives.

Table 4: Correlation Coefficients between Age Differences and Retirement Year Differences

	Age Differences	Retirement year differences
Age Differences	1.000	0.209 (<0.001)
Retirement year differences	0.209 (<0.001)	1.000

Note1: The results in this table are based on type II people without missing retirement year in Table 2.

Note2: P values are shown in parentheses.

Note3: Age differences indicate how many years husbands are older than their wives. So positive number means husbands are older than their wives, and negative number means husbands are younger than their wives. Retirement year differences= husbands' retirement year- wives' retirement year. Thus positive number means husbands retired after wives, and negative number means husbands retired before wives.

Note3: The correlation coefficients between age differences and retirement year differences are relatively low. Thus the retirement year differences between spouses are less likely to be positively correlated with their age differences.

Table 5: Correlation Coefficients between Age Differences
and Retirement Age Differences

	Age Differences	Retirement age differences
Age Differences	1.000	0.417 <0.001
Retirement age differences	0.417 <0.001	1.000

Note1: The results in this table are based on type II people without missing retirement year in Table 2.

Note2: P values are shown in parentheses

Note3: Age differences indicate how many years husbands are older than their wives. So positive number means husbands are older than their wives, and negative number means husbands are younger than their wives. Retirement age differences= husbands' retirement age- wives' retirement age. The positive number means husbands retired at an older age compared to their wives while negative number means husbands retired at an earlier age than their wives.

Note4: The correlation coefficients between age differences and retirement age differences are much higher than the correlation between age differences and retirement year differences. Thus the retirement age differences between spouses are more likely to be positively correlated with their age differences. The correlation between age differences and retirement age differences indicates wives are more likely to retire at an earlier age in order to retire at a closer time as their husbands.

Table 6: Statistics Summary

Variable	Variable Name	N	Mean	Std Dev	Min	Max
HUSEARN	Husband's earnings before retirement	1,617	34,720.944	3.565	0	220,000
WIFEEARN	Wife's earnings before retirement	1,617	18,046.767	1.946	0	200,000
HUSREINC	Husband's retirement income	1,617	22,297.095	1.588	0	305,030
WIFEREINC	Wife's retirement income	1,617	9,359.941	0.764	0	87,110
HUSAGE	Husband's age at retirement	1,617	64.676	5.269	49.000	87.00
WIFEAGE	Wife's age at retirement	1,617	61.918	5.495	36.000	75.00
AGEDIFF	Age differences between spouses	1,617	3.494	4.665	18.000	21.00

Variable	Variable Name	N	Freq	Percent
HUSCOL	=1 if husbands have college or above	1,617	415	25.66%
HUSSOMCOL	=1 if husbands have some college	1,617	297	18.73%
HUSHIGH	=1 if husbands have high school	1,617	591	36.55%
WIFECOL	=1 if wives have college or above	1,617	282	17.44%
WIFESOMCOL	=1 if wives have some college	1,617	371	22.94%
WIFEHIGH	=1 if wives have high school	1,617	714	44.16%
HUSHEALCA	=1 if husbands' health is much better or somewhat better than two years ago	1,617	193	11.94%
HUSHEALCB	=1 if husbands' health is the same as two years ago	1,617	1,100	68.03%
WIFEHEALCA	=1 if wives' health is much better or somewhat better than two years ago	1,617	201	12.43%
WIFEHEALCB	=1 if wives' health is the same as two years ago	1,617	1,098	67.90%

Note: AGEDIFF=husbands' age – wives' age

Table 7 Comparison between Incomes before and after Retirement

Variable	Mean	Std Dev	Differences	Percent
Husbands' Annual Income before Retirement	34,720.944	4.379	Husbands' Average Income Reduction after Retirement	48.023%
Husbands' Retirement Income	18,046.767	1.607		
Wives' Annual Income before Retirement	22,297.095	2.416	Wives' Average Income Reduction after Retirement	58.022%
Wives' Retirement Income	9,359.941	0.871		

Note 1: The average annual incomes of husbands and wives both before and after retirement remove the bias caused by missing values.

Note 2: The income reduction percentage after retirement is equal to the reduction of income after retirement over the average annual income before retirement. For example: $(16,674.177/34,720.944)*100%=48.023%$, $(12,937.154/22,297.095)*100%=58.022%$. The results indicate that the reduction of husbands' income is relatively smaller than that of wives' income. Thus the own income effects for husbands are smaller than the own income effects for wives because the volatility of husbands income before and after retirement are smaller than that of wives.

Table 8: Longitudinal Regression Estimates

Dependent Variables=HUSREI				Dependent Variable=WIFEREI			
Parameter	Estimate	Odds Ratio	Pr>Chi sq	Parameter	Estimate	Odds Ratio	Pr>Chi sq
Intercept ⁺⁺⁺	-2.015	--	<.0001	Intercept ⁺⁺⁺	-1.227	--	<.0001
WIFEREI ⁺⁺⁺	0.123	1.131	<.0001	HUSREI ⁺⁺⁺	0.117	1.124	<.0001
HUSCOL	0.002	1.002	0.877	HUSCOL	0.005	1.005	0.622
HUSSOMCOL	0.001	1.001	0.878	HUSSOMCOL	-0.003	0.997	0.760
HUSHIGH	0.002	1.002	0.777	HUSHIGH	-0.002	0.998	0.831
WIFECOL	-0.008	0.992	0.485	WIFECOL	0.019	1.020	0.078
WIFESOMCOL	0.002	1.002	0.823	WIFESOMCOL	0.007	1.007	0.436
WIFEHIGH	0.004	1.004	0.617	WIFEHIGH	0.005	1.005	0.511
HUSHEALCAI	0.010	1.010	0.319	HUSHEALCAI	-0.001	0.998	0.905
HUSHEALCBI ⁺⁺⁺	-0.018	0.982	0.011	HUSHEALCBI	0.005	1.005	0.439
WIFEHEALCAI	0.006	1.007	0.524	WIFEHEALCAI	0.005	1.005	0.586
WIFEHEALCBI	0.011	1.011	0.124	WIFEHEALCBI ⁺⁺	-0.018	0.983	0.011
HUSEARNI ⁺⁺⁺	-0.004	0.996	<.0001	HUSEARNI	0.001	1.001	0.224
WIFEEARNI	0.001	1.001	0.393	WIFEEARNI ⁺⁺⁺	-0.010	0.990	<.0001
HUSREINCI	-0.001	0.999	0.656	HUSREINCI	0.001	1.001	0.538
WIFEREINCI ⁺⁺⁺	-0.010	0.990	0.004	WIFEREINCI	0.002	1.002	0.551
HUSAGEI ⁺⁺⁺	0.067	1.069	<.0001	WIFEAGEI ⁺⁺⁺	0.045	1.046	<.0001
HUSAGE2I ⁺⁺⁺	-0.001	1.000	<.0001	WIFEAGE2I ⁺⁺⁺	-0.001	1.000	<.0001
AGEDIFF ⁺⁺⁺	0.002	1.002	0.007	AGEDIFF	-0.001	0.999	0.280

⁺⁺⁺ indicates $p \leq 0.01$, ⁺⁺ indicates $p \leq 0.05$, ⁺ indicates $p \leq 0.10$

The regressions are based on the sample having 1,617 couples. The meanings of the variables are same as in Table 6.

Table 9: Logistic Regression Estimates

(1) Dependent Variable=retype				(2) Dependent Variable=retype			
Parameter	Estimate	Odds Ratio	Pr>Chi sq	Parameter	Estimate	Odds Ratio	Pr>C hisq
Intercept ⁺⁺⁺	35.633	--	<.0001	Intercept ⁺⁺⁺	26.482	--	0.005
HUSCOL	-0.293	0.746	0.214	HUSCOL ⁺⁺	-0.611	0.543	0.025
HUSSOMCOL	-0.162	0.850	0.477	HUSSOMCOL ⁺⁺	-0.552	0.575	0.036
HUSHIGH	-0.061	0.941	0.747	HUSHIGH	-0.060	0.942	0.794
WIFECOL	0.051	1.053	0.856	WIFECOL	0.268	1.307	0.414
WIFESOMCOL	-0.105	0.899	0.652	WIFESOMCOL	0.329	1.390	0.243
WIFEHIGH	-0.099	0.906	0.623	WIFEHIGH	0.011	1.011	0.964
HUSHEALCA	0.092	1.096	0.696	HUSHEALCA	0.261	1.299	0.354
HUSHEALCB	0.083	1.087	0.624	HUSHEALCB	0.015	1.015	0.939
WIFEHEALCA	-0.312	0.732	0.182	WIFEHEALCA	-0.316	0.729	0.244
WIFEHEALCB	-0.041	0.960	0.808	WIFEHEALCB	-0.171	0.843	0.407
HUSEARN	-0.033	0.967	0.200	HUSEARN	0.010	1.010	0.736
WIFEEARN ⁺⁺	-0.110	0.896	0.019	WIFEEARN ⁺⁺	-0.092	0.912	0.046
HUSREINC ⁺	-0.092	0.912	0.052	HUSREINC	-0.013	0.987	0.774
WIFEREINC ⁺⁺	0.192	1.212	0.043	WIFEREINC	0.054	1.056	0.621
HUSAGE ⁺⁺⁺	-1.115	0.328	<.0001	HUSAGE ⁺⁺⁺	-0.797	0.451	0.007
HUSAGESQR ⁺⁺⁺	0.009	1.009	<.0001	HUSAGESQR ⁺⁺⁺	0.006	1.006	0.007
AGEDIFF	0.015	1.015	0.332	AGEDIFF	-0.011	0.989	0.532

Note 1:+++indicates $p \leq 0.01$, ++indicates $p \leq 0.05$, +indicates $p \leq 0.10$

Note 2: The first regression is based on the sample having 1,021 couples. The dependent variable (retype) is equal to 1 if the two spouses retire within two subsequent survey years and else is equal to 0. The second regression is based on the sample having 1,617 couples. The dependent variable (retype) is equal to 1 if the two spouses retire at the same survey year. The outliers do not affect the final results. The meanings of other independent variables are same as in Table 6.