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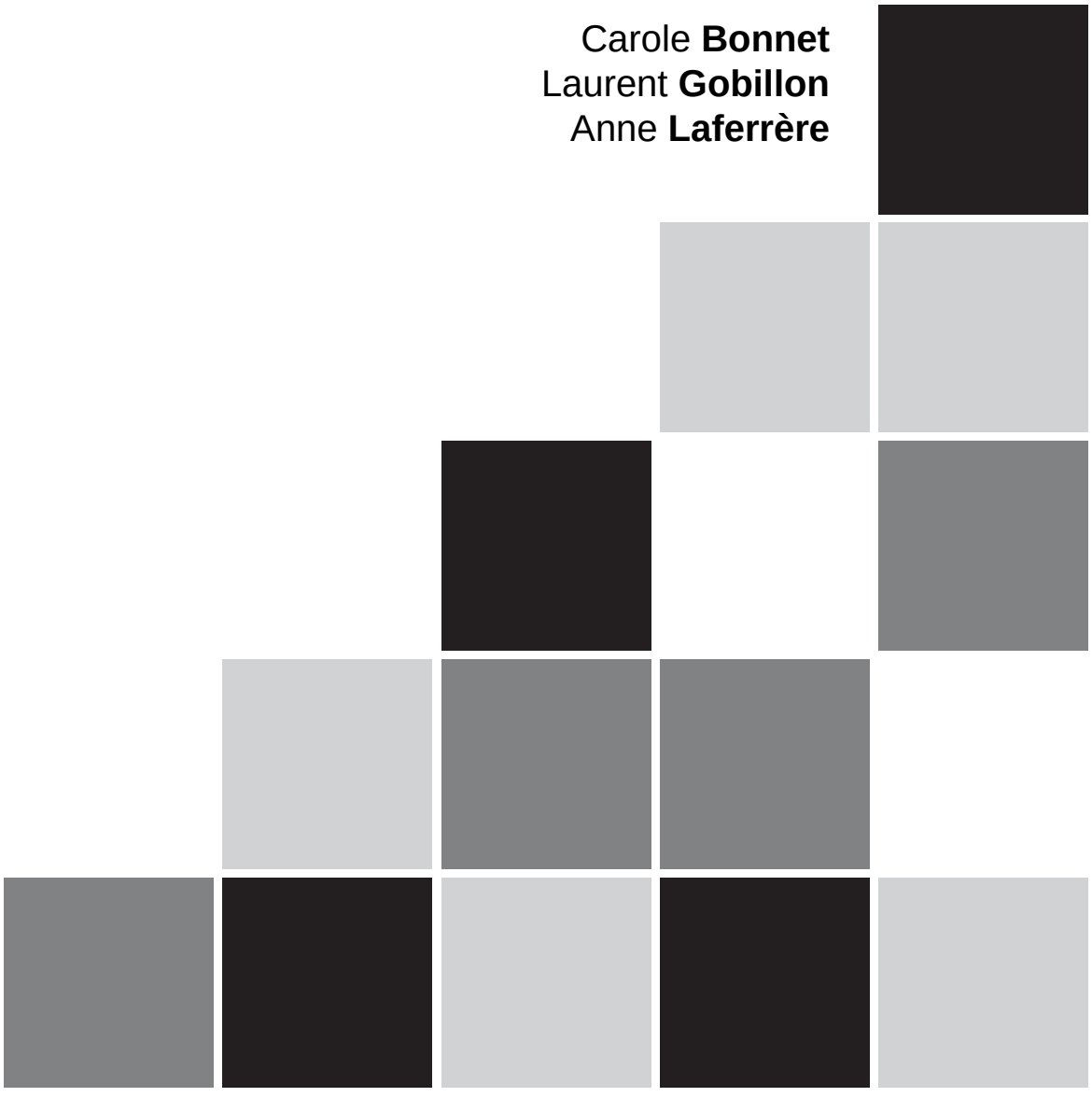

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The effect of widowhood on housing and location choices*

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Abstract

The number of widows is increasing with population ageing and their influence on the housing market is getting larger. This paper investigates the effect of widowhood on housing and location choices. A partner's death induces a decrease in income which may lead to downsizing. Widowhood may also reveal new preferences, such as the need to be close to care givers and health services. We estimate the effect of a transition to widowhood on housing consumption and location choices using the French Housing Surveys. Widowhood significantly increases residential mobility, especially at older ages and when having children. Mobile recent widows tend to live closer to their relatives but do not move to co-reside with a child. Housing and location adjustments are consistent with new widows moving to dwellings that are smaller, more often appartments and in the rental sector, and on average located in larger cities where services are more accessible.

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1 Introduction

As the population is ageing, governments are concerned with the financing of pensions, as well as the costs of health and care services. In this context, widowhood is getting important with the arrival of large baby-boom cohorts at the age of widowhood (Kalogirou and Murphy, 2006). Widowhood affects welfare in many ways. It affects income and living standards as the survivor's pension is smaller than the partner's income. Housing accounts for an important share of the budget and its consumption presents economies of scales that are lost when the partner dies. For this reason a surviving spouse may want to downsize. Widowhood also affects living arrangements. It is well documented that a fair amount of care to disabled elderly people is provided by a spouse, who is most often the wife (Chappell, 1991, Freedman, 1996). Obviously a widow has no care-providing spouse in case of need. She has to turn to other family members or to professionals financed by private or public insurance. The issue of long term care is linked to the housing choices of the oldest old, as they choose between accommodation in nursing homes or personal care in their own dwelling. As the number of widows is expected to increase in the near future, the consequences on the housing market may be important. We study the residential mobility, housing and location choices of recent widows and widowers. Do they downsize? Do they relocate? Our goal is to get some indirect evidence on the impact of the residential mobility of widows on the housing market and to what extent widows may rely on kinship for support.

Quite surprisingly, the mobility and housing choices of the elderly have not often been analyzed in the economic literature except in a few empirical papers (Venti and Wise, 1989; Ermisch and Jenkins, 1999; Venti and Wise, 2001; Tatsiramos, 2004; Laferrère, 2005 and 2006). These studies adopt a broad view, looking at the effect of all shocks - job change, retirement, widowhood - on mobility. They also analyze the variations in housing characteristics and location as a move occurs. However, they do not usually disentangle the various causes of mobility. Hence, the results are generated by a mix of several economic and socio-demographic effects. Conversely, the literature on widowhood does not look much at mobility (with the exception of Chevan, 1995) and housing choices. It mostly studies the living arrangement of widows at a given point in time and not its dynamics (Macunovich et al., 1995, Costa, 1999, Iacovou, 2000). The present paper tries to reconcile the two approaches and explain how widowhood can lead to mobility, housing

adjustments and relocation.

We propose a two-period model to show how the changes in income and preferences due to widowhood may affect housing and location choices. In fact, when a partner dies, the loss of income is only partly compensated by a survivor pension, while the housing cost per capita doubles. This encourages downsizing. Besides, as a widow cannot benefit from the help of a partner, she may anticipate the need to get a better access to care especially at an older age. This can be done by getting closer to her children or to places where services are easily available such as large cities. We assess the importance of these mechanisms in an empirical section using data from the French Housing Surveys.

We find that a transition to widowhood has a significant positive impact on residential mobility, especially at older ages. Ceteris paribus, when one of the spouses dies, the probability of moving within the next four years is nearly 90% higher than if no death occurred. A widow is more likely to be mobile if she has children than if she is childless. Mobile widows tend to live closer to their relatives even if moves to co-reside with a child are extremely rare. Compared to mobile couples, mobile recent widows are more likely to decrease their number of rooms and to choose the rental sector. They also switch more often from a single family house to an apartment. Finally they move more often to larger cities. These results on housing and location adjustments are consistent with moves to get closer to health services and care for single elderly people.

Section 2 provides descriptive statistics and discusses some institutional features of widowhood in France. In section 3, we present the two-period model that analyzes the effect of a transition to widowhood on housing and location choices. We then test some of the mechanisms on data from the 1996 and 2002 French Housing Surveys, which are described in section 4. Section 5 delineates our empirical findings. Section 6 concludes.

2 The French setting

We now present some stylized facts on widowhood after age 60. Figure 1 shows the proportion of widows and widowers by age, for five birth cohorts. The proportion increases with age, and is always much larger for women than for men. The difference can be explained by the higher death rate of men and by the age difference between spouses, as wives are on average 2.5 years younger

than their husbands. For instance, for women born in 1920, the rate of widowhood at age 80 is 60 percent, more than 3 times the rate for men (17 percent). This means that a large majority of married men live with their spouses until death whereas a large majority of women spend part of their life as widows. This justifies our use of the word *"widow"* instead of *"widow or widower"* in this paper. At a younger age, the rate of widowhood also decreases from one cohort to the other. This is due to the general increase in life expectancy which makes widowhood occur later in the life-cycle.[1]

[*Insert Figure* 1]

The death of a spouse induces a fall in the household resources as it goes with the loss of the partner's income. To compensate for this loss, widows in many countries are eligible for social security benefits in the form of a survivor pension (see Burkhauser and alii, 2005). In France the average survivor pension is roughly 55 percent of the deceased spouse's pension. Hence, in many cases, the survivor pension would not fully compensate for the income loss related to widowhood.[2] It is not possible to compute the change in income due to widowhood using the French Housing Surveys. Nevertheless, we can recover some indirect information from the average income of cohorts as a function of the age of the household head (see Figure 2).

[*Insert Figure* 2]

A striking fact is that the average income does not decrease after age 70. This is surprising at a first glance because many couples experience the death of one partner at that age (see Figure 1). This income stability may be generated by three main mechanisms:

- First, as we mentioned above, the surviving spouse gets a survivor pension that is designed

[1] Deaths among non legally married couples are not recorded as widowhood. The bias in negligible for the current cohorts aged 60 or more. But for the future generations where lasting partnerships exist outside marriages, a new word may have to be found for widowhood.

[2] Suppose for example that the husband receives a pension P_H and the wife has no pension. After the husband's death, the survivor pension will be 55 percent of P_H. With the most commonly used equivalence scale, the living standard of the surviving spouse will decrease from $0,7P_H$ (ie. $\frac{P_H}{\sqrt{2}}$) to $0,55\ P_H$, that is to say by about 21%. If we assume that the woman received P_F equal to one third of P_H, the decrease in the living standard will be roughly 10%.

to help him/her keep the same living standards. This survivor pension may be complemented with the extraction of income from assets after the partner's death.

- Second, mortality rates at older ages vary with education and income level. The life expectancy of the lowest income groups is lower and on average they die first (Jusot, 2004). Hence, there is a selection effect as the proportion of high income households increases with age.

- Third, some poor widows may move to sheltered housing or nursing homes. They are excluded from our sample.[3] Delbès and Gaymu (2005) find that entry in retirement home is more likely for low-income groups.

Actually, living in an institution is rare below age 80, and so is co-residing with children (Flipo, Le Blanc and Laferrère, 1999). Widows aged between 60 and 85 years old mainly live independently (see Figure 3). Above 85, entries into nursing homes increase quickly. Nearly one third of widows between 90 and 94 years old are institutionalized (Delbès and Gaymu, 2005).

[*Insert Figure* 3]

Widowhood can also influence a surviving spouse's wealth because of the rules governing marriage property and inheritance. Under the French marriage law,[4] all assets acquired during marriage are held in common, that is, half of them belong to each spouse. Hence after a death, half of the couple's common property belongs to the surviving spouse, but the other half is transmitted by bequest. In the presence of children, a surviving spouse is not the only one to inherit her partner's property, as the children also inherit the property. Consequently, a surviving spouse may have to share with her children the property of the dwelling that she used with her husband. Usually, the transfer of ownership rights to the children does not change much for the widowed mother who can go on using her home. But depending on the overall size of the bequest, she can be forced out of her home. Typically if the couple's only asset was the home, the children might put some pressure

[3] More precisely, only part of retirement homes and dwellings for the elderly are categorized as ordinary homes and included in the French Housing Surveys used for Figure 2. These are mainly dwellings for non-disabled elderly.

[4] As was applied until 2001. The law is now more favorable to the surviving spouse. See Laferrère (2001) for more details on French marriage contracts, and Arrondel and Laferrère (2001) on inheritance rules.

on their surviving parent to sell the home and divide the money among the heirs, if only to pay inheritance tax. Besides, an altruistic surviving mother may agree to sell the dwelling to help her liquidity constrained children. This awkward state of affair can be prevented if the deceased spouse has made a will which gives the surviving spouse a formal life interest in the home (the usufruct) as long as she lives.[5] Due to this feature of the French law, we expect that the more children a widow has, the more likely she is to move from her home.

3 A theoretical model

3.1 The effect of widowhood on housing choices

Leaving aside the issue of inheritance sharing, we propose a very simple two-period model to illustrate how various factors may affect mobility, housing and location choices after the death of a spouse. In the first period, two identical retired individuals live together and choose their consumption of a composite good and housing. At the end of the period, one partner (say the husband) dies. In the second period, the widow chooses between two options: staying and moving. If she stays, she cannot adjust her housing consumption. If she moves, she can make such adjustments but she incurs a moving cost. We analyze the trade-offs determining her choices.

Each spouse's utility function $\overline{U}$ depends on the flow of services derived from housing F and on the consumption of a composite good C chosen as a numeraire: $\overline{U} = \overline{U}(C, F)$. A uni-dimensional index K summarizes all the features of housing related to quality and quantity. For simplicity, we label it *housing quantity*. The flow of housing services is denoted $\lambda_c(K)$, where the subscript c stands for life in couple. The flow is an increasing function of the quantity index. This function also accounts for many characteristics of housing consumption as explained in Nelson (1988). Firstly, it captures economies of scale in consumption, as housing is a partially public good. Secondly, there can be increasing returns in the household production of goods and services. For instance, cooking for two takes less than twice the time of cooking for one.[6] Thirdly, there can be some

[5] For a dwelling, the usufruct is the right to use it. For a financial asset or a housing investment, it is its return. Since 2001, the survivor has a life interest in the deceased spouse's property even in the absence of a will.

[6] Another type of scale economies mentioned by Nelson (1988) are scale economies in price. They exist when the marginal cost of dwelling is a decreasing function of its quantity. In our framework (as in Nelson, 1988 from

positive complementarity effects from sharing a home. One may enjoy watching television with a partner more than alone. Moreover, some tasks, like gardening, may be performed better by one of the spouses rather than the other one.

The utility function can be rewritten: $U_c(C,K) = \overline{U}(C, \lambda_c(K))$. The function U_c is supposed to be increasing in its two arguments and strictly concave. The additional assumption that $\frac{\partial^2 U_c}{\partial C \partial K} \geqslant 0$ will be used in comparative statics. It is verified for usual utility functions such as Cobb-Douglas and CES, as well as for separable utility functions. We also assume that U_c verifies the Inada conditions to get an interior solution.

In the first period, each spouse gets a retirement pension I that is used to consume C in composite good and to pay for housing. Housing consumption is characterized by a non negative housing cost π. For owners, the user cost includes the opportunity cost of money invested in the house and the maintenance costs (see Henderson and Ioannides, 1983). For tenants it is the rent.[7] The couple chooses a dwelling without fully anticipating the death of one partner. For simplicity, there is no transaction cost in period 1. The two partners have the same bargaining power so that their respective levels of welfare count equally in the household's choices. We also assume that they share equally the composite good. The maximization program of the couple is then:

$$\begin{aligned} & \max_{C,K} \; 2U_c(C,K) \\ slc \quad : \quad & 2C + \pi K = 2I \end{aligned} \tag{1}$$

Rewriting the budget constraint as $C + \frac{\pi}{2}K = I$, we can see that the program gives the same optimal quantities as for a single individual with utility U_c endowed with income I and facing a housing cost twice lower than the couple's cost. We denote the optimum housing capital: $K_c = K_c\left(\frac{\pi}{2}, I\right)$ where the first argument is the housing cost per capita and the second is income.

At the end of the first period, the husband dies. His widow receives a survivor pension $R(I)$ indexed on her husband's retirement pension. The housing cost per capita doubles taking the

which it is very close), scale economies in price are formally equivalent to scale economies in consumption. We do not insist on them as they remain the same when one partner dies. By contrast, scale economies in consumption disappear.

[7] Owners may get a positive return from housing if the housing prices increase enough: $\pi < 0$. In that case, housing should be thought of as an asset entering a portfolio (see Bruekner, 1997; Flavin and Yamashita, 2002). This case is not taken into account here as we focus only on mechanisms related to a transition to widowhood.

value π. The housing service flow changes. The new service flow function is denoted $\lambda_w(K)$ where the subscript w stands for widowed. It is still an increasing function of the housing quantity index. There are several reasons why λ may change after widowhood. On the one hand, possible congestion disappears. Extra rooms may also yield additional benefits if the widow needs visitors to overcome loneliness. These mechanisms have a positive effect on the service flow for a given housing quantity. On the other hand, complementarity effects with the partner, scale economies in consumption, and increasing return in housing production disappear. These have a negative effect on the service flow for a given housing quantity. We conjecture that, overall, negative effects usually prevail. We thus assume that the marginal rate of substitution MRS between housing and the composite good is reduced after widowhood: $MRS_w < MRS_c$.

In the second period, the widow chooses between staying in the dwelling and moving. If she stays, she cannot adjust her housing consumption to her new preferences and constraints. If she moves, she can make such adjustments but she incurs a moving cost D. This cost includes monetary costs like transportation or brokers' fees. It also includes the utility decrease, assumed to have a monetary equivalent, arising from the loss of a local social network, the loss of local information, and the pain of leaving a familiar environment.

We denote by $U_w(C,K) = \overline{U}(C, \lambda_w(K))$ the widow's utility function with the same standard assumptions as for U_c. The widow maximizes her utility under the budget constraint. We assume that the user cost is the same as in the first period.[8] The maximization program can be decomposed in two stages. For each option, staying and moving, the widow computes her optimal utility. She then chooses the option yielding the highest utility.[9] If she stays, her housing consumption index remains at K_c and her consumption of the composite good is given by the second-stage budget constraint: $C = I + R(I) - \pi K_c$. This option is valid only if the widow can pay for the housing cost with her new income: $\pi K_c < I + R(I)$. In some cases, the survivor cannot bear the housing cost anymore, so she has to move. This occurs when the income $I + R(I)$ is between $\pi K_c/2$ and πK_c. It is an important policy issue for the low income elderly. In case of ownership, the elderly

[8] The extension of the model to a change in user cost is straightwforward and yields additional price effects.

[9] For simplicity, we do not model the tenure choice as it has been studied extensively in the literature and is not specific to widowhood. This tenure choice rests mainly on the relative user costs and utility benefits of ownership and rental, as well as the existence of borrowing constraints (see Gobillon and Le Blanc, 2004, for a modelization in a two-period framework similar to ours). We keep these mechanisms in mind for the empirical section.

may try to decrease the maintenance costs to avoid being income constrained. Evidence for the US suggests that the elderly spend less money in maintenance costs than younger homeowners (Davidoff, 2006). This type of mechanism is not included in our model but it could be taken into account by assuming that the owner's user cost is endogenous.

In case of a residential move, the maximisation program writes:

$$\begin{aligned} & \max_{C,K} U_w(C,K) \\ slc \quad : \quad & C + \pi K = I + R(I) - D \end{aligned} \tag{2}$$

The optimal housing quantity is denoted: $K_w = K_w(\pi, I + R(I) - D)$.

The moving decision follows a (s,S) rule when the moving cost is small enough and variations in housing quantity can yield significant changes in utility.[10] In that case, there is an inaction band around the housing consumption of the first period. If the optimal housing consumption of the widow stands within this band, it is not worth adjusting housing because of moving costs. If the optimal housing consumption stands outside the band, moving allows to make a housing adjustment that more than compensates the moving cost.

We now focus on the change in the housing consumption index in case of mobility. The difference in optimal housing quantity between the two periods can be decomposed as follows:

$$\begin{aligned} K_w - K_c \quad = \quad & \underbrace{[K_w - K_w(\pi, I + R(I))]}_{\text{moving cost effect: } <0} + \underbrace{[K_w(\pi, I + R(I)) - K_w(\pi, I)]}_{\text{survivor pension effect: } >0} \\ & + \underbrace{\left[K_w(\pi, I) - K_w\left(\frac{\pi}{2}, I\right)\right]}_{\text{user cost effect: } <0} + \underbrace{\left[K_w\left(\frac{\pi}{2}, I\right) - K_c\right]}_{\text{preference effect: } <0} \end{aligned} \tag{3}$$

The signs of the effects are easy to derive (see Appendix 1). First, there is a negative income effect due to moving costs. This effect is usually larger for owners than for renters as their moving costs are usually higher. These is also an impact of the decrease in resources from $2I$ to $I + R(I)$ that can be decomposed into two parts. There is a positive income effect as the survivor pension increases the income per head from I to $I + R(I)$. There is also a negative price effect arising from

[10] The (s,S) rule in not peculiar to housing and arises more generally when studying the consumption of durable goods in the presence of fixed costs. Also, it is not specific to widowhood. For a more detailed analysis of this rule, see Grossman and Laroque (1990), Martin (2003), Gobillon and Le Blanc (2004), Flavin and Nakagowa (2004).

the fact that the user cost of housing per head doubles from $\frac{\pi}{2}$ to π. The sum of these two effects is likely to be negative as income per head less than doubles whereas housing cost per head doubles. Finally, the preference effect is negative as the service flow from housing decreases and housing becomes less valuable after widowhood. The difference $K_w - K_c$ is likely to be influenced by other factors not included in the model. First, couples may anticipate the death of one partner and choose their home as a compromise between their optimal choice when living together as a couple and when living alone. The model can be extended to integrate this feature in an inter-temporal framework. The utility function in the first period would be a weighted sum of the utility of the couple and the utility of a widow. In that case, housing adjustments in the second period are less likely.[11]

The decomposition (3) and the analysis which goes along suggest that downsizing is likely. We test it empirically below.

3.2 Location decision

So far, we have assumed that housing consumption could be summarized by a single index K. However housing has many dimensions. A major aspect is location. Places differ in amenities such as climate, or cultural goods. More importantly in our context, they differ in access to services. When living together, the two partners choose a common location according to their preferences. When one of them dies, the survivor may relocate according to her own new preferences and constraints. Among changes in preferences, an important aspect is closeness to friends and relatives, as well as access to services and care providers. We now extend the model to jointly study the housing and location adjustments.

Consider two locations a and b with different housing costs. In our context, a can be thought of as a rural area or a small town, and b as a large city providing services and shops, or as the place where the children live. For location $\ell \in \{a, b\}$, the housing cost is denoted $\pi(\ell)$. In the first period, the couple chooses the consumption of housing and of the composite good, as well as a location. Each partner's utility depends on the location ℓ and writes $\overline{U}_c(C, K, \ell)$. For a

[11] Also, partners may have different preferences and different bargaining power in the decisions taken within the couple. Then, a transition to widowhood might reveal the individual's own preferences and change the optimal housing index in the second period.

fixed ℓ, the utility function is strictly concave in (C, K) and verifies the Inada conditions. The maximization program can be decomposed in two stages. First, the couple computes its optimal utility in each location ℓ:

$$\begin{aligned} V_c(\ell) &= \max_{C,K} 2\overline{U}_c(C, K, \ell) \\ slc &: 2C + \pi(\ell) K = 2I \end{aligned} \tag{4}$$

Then, the couple chooses the location ℓ_c yielding the highest utility. Without loss of generality, we suppose that the location at optimum is a (the small town).

In the second period, the widow may stay in her dwelling or move depending on the welfare provided by the two options. If she stays, she cannot adjust her housing quantity (see the previous section). If she moves, she can choose both her location and housing quantity. For simplicity, we suppose that the moving costs are the same whatever the location she chooses. Denote $\overline{U}_w(C, K, \ell)$ the widow's utility function in a given location ℓ.[12] For this location, the optimal utility is given by:

$$\begin{aligned} V_w(\ell) &= \max_{C,K} \overline{U}_w(C, K, \ell) \\ slc &: C + \pi(\ell) K = I + R(I) - D \end{aligned} \tag{5}$$

The optimal location when moving is the one yielding the highest utility.

In this setting, the transition to widowhood reveals the new individual preferences for housing and location. The widow may relocate if her new preferences make her prefer b to a. The location b could be closer to her family or could become more attractive because of better service accessibility. Interestingly, the location choice itself may induce a decrease in the housing quantity. This happens if the widow wants to relocate to a large city and the housing cost in the rural area is lower than in the large city: $\pi(a) < \pi(b)$.

Location is only one of many dimensions of housing. Other dimensions are the number of rooms, equipment, and whether the dwelling is an apartment or a house. Besides, the local housing market is different in a rural area and in a large city. There are usually more apartment buildings and less single-family houses in cities, and dwellings are more often for rent. Hence, a new widow located in a rural area who owns a house is likely to rent an apartment if she moves to a city. Note that

[12] For a fixed ℓ, this function is supposed to be strictly concave in (C, K) and to verify the Inada conditions.

choosing to own may be less attractive as one ages, as one has less time to recover the cost of investment. This would induce older movers, widowed or not, to choose to rent rather than own. The empirical section will investigate the housing adjustments in location, size, dwelling type and tenure status.

4 The data

Our theoretical model has several empirical implications for mobility and housing adjustments after widowhood. To test them, we need information on residential and family history, as well as on the characteristics of the former and current accommodation. Not many datasets provide such information. Panel data would seem well adapted to study transitions. However their sample size is small. For instance in the European Community Household Panel, only 65 males and 192 females became widowed over the 1994-2001 period (Ahn, 2004).[13] Besides, panel attrition is likely to be endogenous as mobile households are more difficult to retrieve. For those reasons we use the 1996 and 2002 French Housing Surveys (FHS) that offer large representative samples of the population. These cross-section surveys are designed to study residential mobility. They offer a large choice of retrospective questions on the housing situation four years before the survey date, as well as questions on whether a move occurred within the last four years and the reasons for this move. The data also include some information on the usual socio-demographic characteristics of individuals and their detailed income. Importantly, the 2002 Housing survey also provides the total number of children outside the parents' home, which is likely to be an important element of preferences and constraints.

We define a mobile household as one who changed homes within the last four years before the survey date. We restrict the sample to households whose head is retired or inactive and was aged between 60 and 85 four years before the survey date. The exclusion of those who are employed is meant to decrease transitions on the labor market that can lead to residential mobility without any

[13] In the US Panel Study on Income Dynamics (1980-1997), the German Socio-Economic Panel (1984-2000), the British Household Panel (1991-2000) and the Canadian Survey of Labour and Income Dynamics (1993-2000), roughly 571, 345, 197 and 633 females aged 50 years old and over experience a transition to widowhood (Burkhauser and alii, 2005).

link to widowhood.[14] The exclusion of the oldest old is meant to minimize entries in nursing and elderly homes that increase after age 80 but are not frequent before age 85 (Delbès and Gaymu, 2005, and Figure 3). We impose this exclusion because most of those living in institutions are excluded from the sample.

The surveys provide no direct information on matrimonial status four years before the survey date, but current status and the number of household members are known. Hence, a transition to widowhood is defined in the following way: a person is widowed and lives alone at the survey date, and the number of household members decreased from two to one during the four years before the survey.

This definition ignores recently widowed moving to live with their children. However their number is negligible and ignoring them does not induce any significant bias (See Appendix 2). Neither do we study widowhood when it occurs in a couple living with children. This type of transition represents less than 10 percent of recent widowhood in 2002.

Our final sample consists of 14,257 households (6,610 in the 1996 FHS and 7,647 in the 2002 FHS) among whom 1,016 individuals experience a transition to widowhood (441 in the 1996 FHS and 575 in the 2002 FHS).[15] As mentioned above, the size of our sample is an attractive feature of the FHS compared to some alternative panel datasets. Descriptive statistics are presented in Table 1.[16]

[*Insert Table* 1]

Table 2 gives the rates of transition to widowhood among couples for the 1996 and 2002 FHS. They are increasing with age. Between 1998 and 2002, some 30 percent of couples aged 80-84 experienced the loss of a spouse. Note that widowhood is less frequent at earlier ages but is more frequent at later ages in the 2002 FHS than in the 1996 FHS. As was noted for the cohort effect in Figure 1, these differences are related to the fast increase in life expectancy that makes widowhood

[14] This exclusion does not avoid the effect of retirement on mobility that would occur after retirement. However only 8 mobile households gave this reason for their move in our sample (see Table 9).

[15] In the 1996 FHS, 103 males and 338 females experience widowhood. In the 2002 FHS, the corresponding figures are 144 males and 431 females.

[16] Also, the period covered by longitudinal surveys is often longer and behaviors may change over time.

happen later in the life cycle.

[*Insert Table* 2]

In what follows, the date of the survey (1996 or 2002) is labeled t and the date four years before is labeled $t-1$. We define six non-overlapping types of family situations from marital status and shocks on household composition:

(1) "Couples": two people living together in $t-1$, whether they are legally married or not[17] and still living together in t.

(2) "Single or divorced": a person living alone in $t-1$, and single or divorced in t.

(3) "Widows": a person living alone in $t-1$, and widowed and living alone in t.

(4) "3 people and more": households with more than two members in $t-1$.[18]

(5) "Recently widowed": a person living with a partner as a couple in $t-1$, and widowed and living alone in t.

(6) "Recently separated": a person living with a partner as a couple in $t-1$, and divorced and living alone in t.

Whereas couples are the largest group and account for 42 percent of the sample in 2002, stable widows are the second largest group at 26 percent. The percentage of recently widowed is 8 percent.[19] Table 3 gives the residential mobility rates for each of the six types. Leaving aside the few who have recently divorced, recently widowed have the highest mobility rate. Indeed their rate is 13.3 percent in 2002, more than twice the rate of couples. Interestingly, the mobility rate of stable widows is also far smaller (7.9 percent) than when widowhood is recent. It suggests that when widowhood induces mobility, it is mostly in the four years after the partner's death.

[*Insert Table* 3]

[17] Most of the time, two people over 60 years old living together are married.

[18] This group includes some couples with children who experience the death of one of the partners. We do not distinguish them as we focus on transitions to widowhood for households with only two members.

[19] We exclude the couples who recently separated in the rest of the analysis, as they represent only 1 percent of our sample, which is too small to identify specific effects for them.

5 Empirical results

5.1 Mobility

The theoretical section suggested several mechanisms which can make recently widowed more mobile than couples. We now assess empirically the effect of being recently widowed on mobility. We estimate a probit model of mobility where the dependent variable is a dummy equal to one in case of a move and zero otherwise. Differences in mobility between family types are captured by four dummies, each corresponding to one of the family categories (2)-(5) defined in the previous section. Couples in category (1) are the reference. The theory suggests the importance of children both as possible providers of care and help, and as possible claimants to the inheritance of the parental home. We thus introduce a dummy for the existence of children living outside the parents' home in our regressions.[20] Beside the usual socio-demographic preferences shifters (age, sex and education), we include housing and location variables. Housing tenure and housing type are used as proxies for mobility costs, dwelling quality, and long term adequation to needs. The population size of the municipality (less than 1,000 inhabitants; 1,000-5,000; 5,000-10,000; 10,000-50,000; and more than 50,000) captures effects related to the structure of the housing market.

Finally, the theory suggests that the income level after the partner's death may affect mobility.[21] On the one hand, income can have a positive effect as it helps to finance moving costs. On the other hand, it can have a negative effect because low-income recently widowed may be unable to pay for their housing expenditure and are then forced to downsize. The overall effect on mobility is an empirical issue and the theoretical arguments given above suggest that it may be non linear. We first introduced income and its square in our probit regression. The effect of income was found to be inverse U-shaped with the vast majority of observed households being on the increasing part of the parabola (the maximum of the parabola being as high as $86,000$ euros). Hence, the

[20] As the only FHS to provide information on the number of independent children is the one conducted in 2002, we only use that survey.

[21] Theory would suggest studying the effect of the variation in income due to the partner's death on the mobility of recently widowed. However, we only have information on income at the survey date and not four years before. We thus cannot compute the variation in income from the data. This means that the dummy for being recently widowed will capture the effect of the income variation on mobility.

income effect is positive and nearly linear, and we stick to a linear specification (in log). Income after widowhood might be endogenous since new mobile widows may sell a dwelling, invest in a financial asset and get some extra income. To overcome this difficulty, we instrument income after widowhood with the overall pension of the recently widowed, that includes both her own pension and the survivor pension. This pension is fixed by the law from the level of incomes of the two partners before retirement and is thus exogenous. Table A in Appendix 3 reports the results of the first-stage instrumental equation. Our final specification is an IV probit.

Our first specification tests for differences in mobility between family categories (Table 4, column 1). Single or divorced, as well as recently widowed, are found to be more mobile than couples. In fact, recently widowed are the most mobile. Ceteris paribus, their probability of moving is nearly 90% higher than for couples. Note that those who have been widowed for more than four years have a propensity to move similar to couples. This suggests that if a move occurs because of widowhood, it is likely to happen just after the death of the partner. This result is in line with that obtained on the US Panel Study of Income Dynamics (Chevan, 1995).

Mobility is also found to be decreasing with age, except at older ages where it levels off. Education has no significant effect. This is not surprising since residential mobility related to the education choices would have occurred sooner in the life-cycle. The positive effect of income on mobility is in line with the need to pay for moving costs but not with liquidity constraints that would force a move to reduce housing costs. Note that income is only weakly endogenous since all coefficients are very similar whether instrumenting or not (see the results of a simple probit in Table B in Appendix 3 for comparison). Interestingly, those who have children are significantly more mobile than those who are childless. This result is consistent with a story where parents would relocate closer to their children either to get some support (Ogg and Renaut, 2005, Glaser and Tomassini, 2000, Laditka and Laditka, 2001) or to take care of their grand-children. The effect of tenure is also in line with expectations. Owners are less mobile than tenants, probably because they have to incur large transaction costs and because ownership allows to better customize the occupied dwelling. We also find the usual result for France that private-sector tenants are more mobile than public housing tenants (Gobillon, 2001). Indeed, public housing tenants pay rents that are lower than in the private sector and would loose this benefit when moving. Living in a single family house has a negative effect on mobility, probably because it usually goes along with

higher quality. There is also a positive effect of living in a large municipality (more than 50,000 inhabitants) on mobility, maybe because it makes easier to find an accommodation more adapted to new needs close to the previous dwelling. Finally the number of excess rooms, defined as the number of rooms minus the number of persons, has no significant effect on mobility.

To shed more light on the specific behavior and constraints of the newly widowed, we then run separate probits for three different family categories: couples, stable and single widows, and newly widowed (Table 4, columns 2 to 4). Interestingly, the age profile and the effect of children are very different for the recently widowed. Recently widowed are more mobile when they get above 80, contrary to couples and stable widows. This is consistent with housing adjustments triggered by health problems after the age of 80. While someone living in couple can rely on a spouse for care and stay at home, an older widow may have to move to get care. She may want to relocate closer to her children or to a place where health services and medical care are more accessible.

Having children has a positive effect on the propensity to move (significant at 10%) only for recently widowed, and has no effect for couples and stable widows. It is hard to disentangle the reasons for this positive effect: it may point to the need for family support at close range, or to some pressure by children at the time of inheritance. Indeed, some of the moves may be due to the necessity of sharing the deceased parent's bequest. The pressure is likely to be more important for widows than for widowers because the women of the cohorts we studied might own fewer personal assets than their husbands. Consistent with this idea, we find that widows are more likely to move than widowers. A more convincing test would be to interact the children dummy with the sex dummy. Unfortunately the sample has not enough recent childless widowers to get convincing results. Females are more affected by disabilities than males of the same age (Cambois et al., 2003). The significant positive effect of the female dummy is thus also compatible with their having, or anticipating, more health problems.

The number of excess rooms has a positive effect for widows but not for couples. This may be a sign of the financial burden of a large dwelling. The next subsection analyzes the housing choices of movers and will bring some additional elements pointing at widows being income constrained.

[*Insert Table* 4]

5.2 Housing choices of mobile widows

The theoretical model shows that recent widowhood can lead to an adjustment in housing consumption and possible downsizing. A means to downsize is to reduce the number of rooms. To get a large enough sample of movers, we now use both the 1996 and 2002 surveys. While 30 percent of moving couples increase the number of rooms, 39 percent decrease it. By contrast, only 9 percent of mobile recent widows increase their number of rooms, while 74 percent decrease it. Moreover, half of those who downsize do it by two rooms or more. To get more insight into the determinants of downsizing, we estimate a multinomial logit model where the dependant variable takes three values: no change in the number of rooms (reference), an increase, or a decrease. Explanatory variables remain the same as in the last section, except for the number of children outside home which is excluded since it is not available in the 1996 Survey. Results are reported in Table 5. Conditionally on moving, the number of excess rooms has a positive effect on downsizing and a negative effect on upsizing. Hence, the disequilibrium in number of rooms tends to be corrected by the move.[22] More income induces upsizing (significant at 10%). This might be a hint that the wealthiest are less forced into decreasing their housing consumption because of a budget constraint. Whereas mobile recent widows are more likely to downsize than moving couples, there is no significant difference for upsizing. This result is consistent with our theoretical expectations.

[*Insert Table* 5]

We also examine the change in the dwelling type (apartment/house) for moving households. The proportion of recent widows living in an apartment doubles after a move. Whereas only 36 percent of them lived in an apartment four years before the survey date (i.e. before the move), they are 73 percent at the survey date (i.e. after the move). By comparison, the increase is negligible for couples: 45 percent of them live in an apartment before the move and 47 percent after the move. We check that this result still holds when controlling for our set of explanatory variables. We define two subsamples depending on the dwelling type (apartment or house) before the move. For each subsample, we estimate a logit model of housing type after the move (i.e. at the survey date). Results are reported in Table 6. As expected, among house occupiers, recently widowed are more likely to get into an apartment than couples. So are stable widows, as well as single and

[22] This finding is similar to that obtained for retiring French households by Gobillon and Wolff (2007).

divorced individuals. Moves towards apartments significantly increase with age until 80. This is not surprising as living in a house usually goes along with more costs and maintenance tasks to be performed individually, while they are taken care of collectively in apartment buildings. As one ages, such tasks become more difficult to perform. Also, single family houses in France are mostly located far from town centers where shops and health services are usually located. Moving from a house to an apartment may grant the elderly living on their own better access to these services.

[*Insert Table* 6]

In the same line, we investigate the effect of being widowed on a change in housing tenure for movers. Among moving owners, we expect recent widows to switch more often to the rental sector than couples as owning is harder to deal with for a single person because of maintenance tasks and paperwork. Indeed, among recent widows, 51 percent of owners switch to renting when they move. Conversely, only 18 percent of renters switch to owning. The proportions for couples are respectively 19 percent and 29 percent. As previously, we test whether our results are robust when controlling for our set of explanatory variables. For each tenure mode before the move (renting or owning), we estimate a logit model of housing tenure after the move. The results confirm that widows, whether recent or not, switch more often from owning to renting than couples. This is consistent with widows desiring to simplify housing management and with moves toward town centers where the rental market is more developed. It could also result from estate sharing following the spouse's death (see section 2 on the influence of inheritance laws). We also find that both for previous tenants and owners, having excess rooms increases the propensity to be the owner of the new dwelling. This suggests that households with excess rooms are wealthier and can afford to own (remember that we control only for income and not for wealth). For tenants, income has a negative effect on remaining in the rental sector, which suggests that access to ownership is still possible for the elderly who have enough income.

Interestingly, among recent widows who move from owning to renting, one third chooses the public sector. In fact, the public sector is quite attractive as it provides some homes adapted to the elderly.

[*Insert Table* 7]

Finally, we test whether recent widows are likely to move to larger municipalities where health and other services are more easily available. Municipality size is measured by the 1999 Census

population which was added to our dataset using a restricted access municipality code. We expect recent widows to move more often to larger cities than couples. In fact, among movers, 40% of recent widows move to a larger municipality whereas this proportion is only 28% for couples. Conversely, only 17% of recent widows move to a smaller municipality whereas this proportion climbs to 28% for couples. We test whether these results still hold *ceteris paribus* by estimating a multinomial logit on the subsample of movers with three categories: moving within the current municipality (reference), moving to a larger municipality and moving to a smaller municipality. As expected from the theory, recent widows move more often to larger cities than couples. Interestingly, this is not the case for widows, and single or divorced individuals. They may have adjusted their location to living on their own earlier. We also find that being a recent widow decreases the chances to move to a smaller municipality compared to couples, but the effect is not significant. Overall, the results are consistent with widows moving to larger municipalities where there are more services. Using a file linking each municipality with local services (the so-called 1998 Municipal Inventory), it was possible to check that a larger size of the municipality goes along with more shops, care and health services.[23]

[*Insert Table* 8]

According to the theoretical section, being widowed can lead to a relocation for reasons related to preferences. These reasons can be investigated empirically by using the direct questions on the motives for moving which recent movers were asked in the survey. More than one reason could be given. Among identifiable reasons (i.e. answers different from "other reason"), recently widowed give two main reasons for their move: they wanted to live close to relatives or to their birthplace (25.9 percent), and they wished to reduce the dwelling size (17.5 percent) (see Table 9). By contrast, getting closer to relatives or birthplace is far less mentioned by couples (12.1 percent) and stable widows (15.3 percent). These two groups rather mention reasons related to the environment, or the size and quality of the dwelling. However, whereas stable widows still want to downsize quite often (12.1 percent) this is not the case of couples (4.9 percent). It must be noted that more than one fifth of mobile recently widowed declared moving for "another reason". Laferrère (2005) observes that this type of answer increases with age and suggests that it could

[23] Descriptive statistics on this topic are available upon request.

reflect health-related reasons.

[*Insert Table* 9]

If living closer to the relatives is the main reason given by recent widows for moving, we may wonder how close widows get to their children. This can be investigated using the 2002 Housing Survey which asks for the distance from the independent children. We find that mobile recent widows usually live very close to their children at the survey date. 84.5 percent of mobile recent widows live less than 25 kilometers from a child (Table 10). Recent widows who did not move are fewer in that case (71.8 percent). By contrast, the figures are lower for couples (at 61.1% and 69.6% respectively). This suggests that recent widows want to live close to their children.[24] We could verify that *ceteris paribus*, mobile recent widows live closer to a child than mobile couples (Table 10). Living closer to a child is a means to get more care. Using European data from SHARE, Fontaine et al. (2007) have stressed the importance of children to a widowed parent. They show how the siblings step in to take care of a widowed disabled parent.

[*Insert Table* 10]

6 Conclusion

We studied the effect of widowhood on mobility, housing and location choices. As the number of widows is going to increase with the baby-boomers getting older, their choices are likely to have an impact in the near future both on the housing market and on the way care to the elderly is financed and delivered. We first tried to disentangle the factors which can affect the behaviour of new widows with a simple theoretical model. In fact, widowhood has an effect both on income and housing preferences. Indeed, the loss of the spouse's income is only partly compensated for by the survivor pension whereas housing cost per capita doubles. Moreover, a widow looses the housing externalities and the care from her partner. These two types of mechanisms can trigger mobility. Preferences for locations also change as widows may want to get closer to their children or to large cities where health services are more easily accessible. As the housing markets in cities

[24]Note however that we cannot look at the effect of mobility on the variation of distance from the closest child as the distance before the move is not available.

are different, with more rental appartments and less owner occupied houses, movers are likely to change the type of their dwelling.

Empirical tests using the French Housing Surveys show that the residential mobility of recent widows is indeed some 90 percent higher than for couples. It is also higher than for stable widows, which suggests than housing adjustments related to widowhood would occur soon after the loss of the spouse. Besides, the mobility of recent widows increases after age 80 and is more likely when they have children, which is not the case for couples. More income always helps to move, including recent widows. When they move, recent widows are more likely than couples to downsize, switch from owning to renting, exchange a single family house for an apartment, and go to a larger municipality. Finally, mobile recent widows tend to live closer to their children than non-mobile ones and couples, even if they seldom co-reside with their children.

Overall, these results suggest that widows downsize to adjust their dwelling to the income loss due to widowhood and to their current or future need for care. Indeed, downsizing usually goes along with a reduction in both the housing costs and housing maintenance tasks. Appartments are also easier to manage than houses, and so is renting compared to owning. Living closer to a child and in a larger city are a means to get more care. The higher residential mobility of the oldest recent widows in our study may point to a need for more care as their health weakens and disabilities increase. The number of mobile widows is going to get larger in the near future and this will have an important effect on the housing market. Indeed, the housing choices of mobile widows will affect the housing supply as more houses will be vacant. They will also affect housing demand for smaller urban apartments.

A limit to our analysis is that we could not separately identify the various channels by which the existence of children may affect the mobility and housing choices of their widowed parent. Indeed, a widow may move either to get closer to care-providing children, or because she has to move out to share the bequest. We found many indirect hints pointing towards care by children. However, it would be interesting to measure how the rules of intergenerational transfer may trigger mobility. This is left for future research.

References

Ahn N. (2004), "Economic consequences of widowhood in Europe: cross-country and gender differences", Working paper, FEDEA, 27.

Arrondel L. and A. Laferrère (2001), "Taxation and Wealth transmission in France", *Journal of Public Economics*, 79, 3-33.

Börsch-Supan A. (1990), "Elderly Americans: A Dynamic Analysis of Household Dissolution and Living Arrangement Transitions", in D.A. Wise (ed.), Issues in the Economics of Aging, University of Chicago Press: Chicago.

Brueckner J. K. (1997), "Consumption and Investment Motives and the Portfolio of Homeowners", *Journal of Real Estate Finance and Economics*, 15(2), 159-180.

Burkhauser R.V., Giles P., Lillard D.R. and J. Schwarze (2005), "Until Death Do Us Part: An Analysis of the Economic Well-Being of Widows in Four Countries", *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 60, 238-246.

Cambois E., Désesquelles A. and J.F. Ravaud (2003), "The gender disability gap", *Population and Societies*, 386, 1-4.

Chappell N.L. (1991), "Living arrangements and sources of caregiving", *Journal of Gerontology*, 46(1), 1-87.

Chevan A. (1995), "Holding on and letting go. Residential mobility during widowhood", *Research on Aging*, 17(3), 278-302.

Costa D. (1999), "A House of Her Own: Old Age Assistance and the Living Arrangements of Older Nonmarried Women," *Journal of Public Economics*, 72(1), 39-59.

Davidoff T. (2006), "Maintenance and the Home Equity of the Elderly", Working paper, University of California.

Delbès C. and J. Gaymu (2005), "Qui vit en institution?", *Gérontologie et Société*, 112, 13-24.

Ermisch J. F. and S. P. Jenkins (1999), "Retirement and housing adjustment in later life: evidence from the British Household Panel Survey", *Labour Economics*, 6, 311-333.

Flavin M. and S. Nakagawa (2004), "A model of Housing in the Presence of Adjustment costs: a Structural Interpretation of Habit Persistence", NBER Working Paper Series 10458.

Flavin M. et T. Yamashita (2002), "Owner-Occupied Housing and the Composition of the Household Portfolio", *American Economic Review*, 92(1), 345-362.

Flipo A., Le Blanc D. and A. Laferrère (1999), "De l'histoire individuelle à la structure des ménages", *Insee Première*, 649.

Fontaine R., Gramain A. and J. Wittwer (2007), "Les configurations d'aide familiales mobilisées autour des personnes âgées dépendantes en Europe", *Economie et Statistique*, 403-404, 77-98.

Freedman (1996), "Family structure and the risk of nursing home admission", *Journals of Gerontology*, Series B: Psychological Sciences and Social Sciences, 51(2), S61-S69.

Glaser K. and C. Tomassini (2000), "Proximity of older women to their children. A comparison of Britain and Italy", *The Gerontologist*, 40, 729-737.

Gobillon L. (2001), "Emploi, logement et mobilité résidentielle", *Economie et Statistique*, 349-350, 77-98.

Gobillon L. and D. Le Blanc (2004), "L'impact des contraintes d'emprunt sur la mobilité résidentielle et les choix entre location et propriété", *Annales d'Economie et de Statistique*, 74, 15-46.

Gobillon L. and F.C. Wolff (2007), "Housing and Location Choices of Retiring Households, Theory and Evidence", Working paper.

Grossman S. and G. Laroque (1990), "Asset pricing and optimal portfolio choice in the presence of illiquid durable consumption goods", *Econometrica*, 58(1), 25-52.

Henderson V. and Y. Ioannides (1983), "A model of housing tenure choice", *The American Economic Review*, 73, 98-113.

Iacovou M. (2000), "The living arrangements of Elderly Europeans", Working Paper, Institute for Social and Economic Research.

Jusot F. (2004), "Mortalité et inégalités de revenu en France", Working paper, 2004-32, DELTA.

Kalogirou S. and M. Murphy (2006), "Marital Status of people aged 75 and over in nine EU countries in the period 2000-2030", *European Journal of Ageing*, 3(2),74-81.

Laditka J.N. and S.B. Laditka (2001). "Adult Children Helping Older Parents", *Research on Aging*, 23(4), 429-456.

Laferrère A. (2001), "Marriage Settlement ", *Scandinavian Journal of Economics*, 103, 485-504.

Laferrère A. (2005), "Old age and housing: dissaving, adjusting consumption, and the role of children", Working Paper.

Laferrère A. (2006), "Vieillesse et logement: désépargne, adaptation de la consommation et rôle des enfants", *Retraite et Société*, 47, 66-108.

Macunovich, D., R. Easterlin, C. Schaeffer, and E. Crimmins (1995). "Echoes of the Baby Boom and Bust : Recent and Prospective Changes in Living Alone among Elderly widows in the United States", *Demography*, 32(1), 17-28.

Martin R. F. (2003), "Consumption, Durable Goods and Transaction Costs", Board of Governors of the Federal Reserve System, International Finance Discussion Papers 756.

Nelson (1988), "Household Economics of Scale in Consumption: Theory and Evidence", *Econometrica*, 56(6), 1301-1314.

Ogg J. and S. Renaut. (2005), "Le soutien familial intergénérationnel dans l'Europe élargie", *Retraite et Société*, 46, 30-57.

Tatsiramos (2004), "Residential Mobility and the Housing Adjustment of the Elderly: Evidence from the ECHP for 6 European Countries", Working Paper.

Venti S.F. and D.A. Wise (1989), "Aging, Moving, and Housing Wealth", NBER Working Paper, 2324.

Venti S.F. and D.A. Wise (2001), "Aging and Housing Equity: Another Look", NBER Working Paper, 8608.

Table 1 - Descriptive statistics

Variables	Total sample 2002	Number of movers	Mobility rate (1998-2002) in percent
Number of observations	7577	604	7.8
Age group in t-1			
60-64 years old	1776	170	9.4
65-69 years old	2112	170	7.8
70-74 years old	1889	134	6.8
75-79 years old	1302	83	6.0
80-84 years old	498	47	10.3
Sex			
Male	4636	312	6.6
Female	2941	292	9.6
Education			
Primary school	4953	400	7.8
Secondary School, Technical, High School	2028	153	7.5
=2 years at University	131	13	9.4
>2 years at University	465	38	7.7
Children outside household			
No	1239	77	5.9
Yes	6338	527	8.1
Housing Tenure in t-1			
Homeowner	5552	279	4.8
Private Renter	815	194	22.7
Public Renter	804	93	11.0
Rent free	406	38	9,4
Population in municipality in t-1			
Less than 1.000	1412[(1)]	73	5.2
1.000 – 5.000	1824	138	6.7
5.000 – 10.000	731	49	6.0
10.000 – 50.000	1636	164	8.9
More than 50.000	1241	175	11.5
Income (Quartiles) in t			
Q1	1859	162	8.4
Q2	1930	148	7.3
Q3	1906	154	8.1
Q4	1882	140	7.1
Housing type in t-1			
House	5320	314	5.6
Apartment	2257	290	12.3
Family Type in t-1 and t			
Couple in t-1 and t	3224	203	6.1
Single or divorced in t-1 and t	774	91	11.5
Widow in t-1 and t	1965	163	7.9
Three people and more in t-1 and t	1039	71	6.3
Family Shocks			
Couple in t-1 widowed in t	575	76	13.3
	7580	604	8.0

Source: Authors' computation from the 2002 Housing Survey, INSEE.

Note: Sample of households where head is retired or inactive and aged 60 to 84 in 1998, excluding recently separated (60 observations). Mobility rate is weighted.

[(1)] Sample size for Population in municipality is smaller (6844 observations), due to missing values

Table 2: Transitions to widowhood by age group

Age group	1992-1996		1998-2002	
	Rate	Number of observations	Rate	Number of observations
60 – 64	11.5%	98	8.3%	81
65 – 69	11.7%	115	14.2%	157
70 – 74	15.0%	112	17.4%	164
75 – 79	18.4%	63	20.6%	123
80 – 84	23.3%	53	29.8%	50
All	14.4 %	441	15.6 %	575

Source: Authors' computation from the 1996 and 2002 Housing Surveys, INSEE.
Note: The rate of transitions to widowhood is defined for the sample of couples (with head aged 60 to 84 and retired or inactive four years before the survey date), as the ratio between the number of couples experiencing a transition to widowhood to the total number of couples. This rate is weighted.

Table 3: Residential mobility rate by previous family types and family shocks

Family Type in t-1 and t	1996		2002	
	Mobility Rate	Number of observations	Mobility Rate	Number of observations
Couple in t-1 and t	5.5%	2666	6.2%	3224
Single or divorced in t-1 and t	8.1%	634	11.6%	774
Widow in t-1 and t	6.3%	1754	7.9%	1965
Three people and more in t-1 and t	6.8%	1050	6.4%	1039
Couple in t-1 widowed in t	15.7%	441	13.3%	575
Couple in t-1 Separated in t	28.3%	65	28.2%	60
All	7,1 %	6608	8,0%	7640

Source: Authors' computation from the 1996 and 2002 Housing Surveys, INSEE.
Note: Sample of households where head is retired or inactive and aged 60 to 84 four years before the survey. See the end of section 4 for the definition of family types and transitions.

Table 4: Probability of moving between 1998 and 2002 (IV probit)

Variables	(1) Whole sample	(2) Stable Couple	(3) Single, widows	(4) Recently widowed
Constant	-3.828***	-3.876***	-3.738***	-4.563***
	(0.543)	(0.866)	(0.841)	(1.744)
Age group in t-1				
60-64 years old	ref.	ref.	ref.	ref.
65-69 years old	-0.140**	-0.177*	-0.132	0.287
	(0.061)	(0.096)	(0.144)	(0.249)
70-74 years old	-0.231***	-0.210**	-0.311**	-0.032
	(0.065)	(0.100)	(0.144)	(0.261)
75-79 years old	-0.320***	-0.258**	-0.398***	0.088
	(0.075)	(0.124)	(0.150)	(0.270)
80-84 years old	-0.119	-0.096	-0.187	0.579*
	(0.097)	(0.200)	(0.166)	(0.307)
Sex				
Male	ref.	ref.	ref.	ref.
Female	0.095	-	0.089	0.405**
	(0.071)		(0.132)	(0.198)
Education				
Primary school	ref.	ref.	ref.	ref.
Secondary School, Technical, High School	-0.105*	-0.170*	-0.057	-0.381*
	(0.056)	(0.090)	(0.111)	(0.199)
=2 years at University	-0.048	-0.040	-0.101	0.548
	(0.161)	(0.256)	(0.369)	(0.438)
>2 years at University	-0.168	-0.204	-0.257	-0.909
	(0.106)	(0.156)	(0.281)	(0.632)
Children outside household				
No	ref.	ref.	ref.	ref.
Yes	0.243***	0.055	0.207	0.491*
	(0.070)	(0.134)	(0.142)	(0.274)
Housing Tenure in t-1				
Homeowner	ref.	ref.	ref.	ref.
Private Renter	0.916***	1.063***	0.745***	1.124***
	(0.064)	(0.111)	(0.121)	(0.206)
Public Renter	0.349***	0.423***	0.102	0.486*
	(0.079)	(0.148)	(0.150)	(0.277)
Rent free	0.396***	0.309	0.244	0.664**
	(0.096)	(0.189)	(0.160)	(0.285)
Population in municipality in t-1				
Less than 1,000	ref.	ref.	ref.	ref.
1,000 – 5,000	0.112	0.187	0.035	0.168
	(0.074)	(0.114)	(0.155)	(0.242)
5,000 – 10,000	0.010	-0.043	0.319*	-0.142
	(0.095)	(0.160)	(0.174)	(0.333)
10,000 – 50,000	0.122	0.092	0.201	0.242
	(0.078)	(0.127)	(0.155)	(0.266)
More than 50,000	0.222***	0.199	0.205	0.285
	(0.084)	(0.139)	(0.168)	(0.272)
Housing type in t-1				
House	ref.	ref.	ref.	ref.
Apartment	0.131**	0.090	0.219*	-0.015
	(0.064)	(0.109)	(0.120)	(0.205)
Log-income in t	0.191***	0.218**	0.188**	0.202
	(0.055)	(0.087)	(0.085)	(0.179)
Number of Excess Rooms in t-1	0.023	0.003	0.055*	0.114**
	(0.017)	(0.029)	(0.033)	(0.057)
Family Type in t-1 and t				
Couple in t-1 and t	ref.	ref.	ref.	ref.
Single or divorced in t-1 and t	0.239**			
	(0.096)			
Widow in t-1 and t	0.058			
	(0.087)			
Three people and more in t-1 and t	-0.046			
	(0.079)			
Family Shocks				
Couple in t-1 widowed in t	0.404***			
	(0.097)			
Number of observations	7434	3172	1924	569

Source: Authors' computation from the 2002 Housing Survey, INSEE.
Note: Sample of households where head is retired or inactive and aged 60 to 84 in 1998.
***: significant at 1%; **: significant at 5%; *: significant at 10%.

Table 5: Variation in the number of rooms when moving, multinomial Logit

Variables	Downsizing	Upsizing
Constant	-2.312**	-0.793
	(0.997)	(1.060)
Age group in t-1		
60-64 years old	ref.	ref.
65-69 years old	-0.390*	-0.020
	(0.230)	(0.226)
70-74 years old	0.053	-0.660**
	(0.240)	(0.261)
75-79 years old	1.028***	-0.207
	(0.309)	(0.338)
80-84 years old	1.105***	-0.093
	(0.364)	(0.400)
Sex		
Male	ref.	ref.
Female	0.013	-0.042
	(0.262)	(0.279)
Education		
Primary school	ref.	ref.
Secondary School, Technical, High School	-0.064	0.088
	(0.213)	(0.219)
=2 years at University	0.130	-0.006
	(0.650)	(0.709)
>2 years at University	-0.737*	0.492
	(0.420)	(0.381)
Housing Tenure in t-1		
Homeowner	ref.	ref.
Private or Public Renter	0.355*	-0.258
	(0.199)	(0.203)
Population in municipality in t-1		
Less than 1,000	ref.	ref.
1,000 – 5,000	-0.101	-0.400
	(0.330)	(0.362)
5,000 – 10,000	0.194	-0.477
	(0.402)	(0.433)
10,000 – 50,000	0.075	-0.389
	(0.333)	(0.361)
More than 50,000	-0.128*	-0.537
	(0.347)	(0.371)
Housing type in t-1		
House	ref.	ref.
Apartment	-0.002	0.056
	(0.225)	(0.240)
Log-income in t	-0.008	0.172*
	(0.085)	(0.091)
Number of Excess Rooms in t-1	1.169***	-0.384***
	(0.098)	(0.102)
Family Type in t-1 and t		
Couple in t-1 and t	ref.	ref.
Single or divorced in t-1 and t	0.035	-0.115
	(0.339)	(0.325)
Widow in t-1 and t	0.147	0.108
	(0.325)	(0.352)
Three people and more in t-1 and t	1.766***	-0.888***
	(0.310)	(0.335)
Family Shocks		
Couple in t-1 widowed in t	1.449***	-0.361
	(0.360)	(0.414)
Number of observations	1099	

Source: Authors' computations from the 1996 and 2002 Housing Survey, INSEE.
Note: Sample of households which head is retired or inactive and aged 60 to 84 in (t-1).
***: significant at 1%; **: significant at 5%; *: significant at 10%.

Table 6: Choosing an apartment when moving, by previous housing type

Variables	Apartment in t-1	House in t-1
Constant	-0.371	-1.144
	(1.451)	(1.027)
Age group in t-1		
60-64 years old	ref.	ref.
65-69 years old	0.131	-0.032
	(0.289)	(0.246)
70-74 years old	0.082	0.641**
	(0.323)	(0.257)
75-79 years old	0.469	0.963***
	(0.426)	(0.340)
80-84 years old	0.750	0.516
	(0.553)	(0.378)
Sex		
Male	ref.	ref.
Female	1.079***	0.017
	(0.352)	(0.283)
Education		
Primary school	ref.	ref.
Secondary School, Technical, High School	-0.100	0.077
	(0.263)	(0.236)
=2 years at University	0.132	0.372
	(0.709)	(0.758)
>2 years at University	1.140**	0.497
	(0.558)	(0.444)
Housing Tenure in t-1		
Homeowner	ref.	ref.
Private or Public Renter	0.523**	0.138
	(0.254)	(0.216)
Population in municipality in t-1		
Less than 1,000	ref.	ref.
1,000 – 5,000	0.354	0.014
	(0.727)	(0.264)
5,000 – 10,000	1.596**	0.806**
	(0.803)	(0.351)
10,000 – 50,000	1.516**	0.723**
	(0.676)	(0.286)
More than 50,000	1.620**	0.817**
	(0.671)	(0.332)
Housing type in t-1	-0.048	-0.029
	(0.114)	(0.092)
House	-0.337*	0.014
	(0.104)	(0.062)
Apartment		
Log-income in t	ref.	ref.
Number of Excess Rooms in t-1	0.173	1.146***
	(0.402)	(0.414)
Widow in t-1 and t	0.415	1.029***
	(0.438)	(0.345)
Three people and more in t-1 and t	-0.003	0.331
	(0.374)	(0.300)
Family Shocks		
Couple in t-1 widowed in t	0.575	1.189***
	(0.559)	(0.349)
Number of observations	536	563

Source: Authors' computation from the pooled 1996 and 2002 Housing Surveys, INSEE.
Note: Sample of households where head is retired or inactive and aged 60 to 84 four years before the survey date.
***: significant at 1%; **: significant at 5%; *: significant at 10%.

Table 7: Choosing to be a tenant when moving, by previous housing tenure

Variables	Tenant in t-1	Owner in t-1
Constant	3.811***	-1.809
	(1.397)	(1.131)
Age group in t-1		
60-64 years old	ref.	ref.
65-69 years old	0.816***	0.585**
	(0.320)	(0.282)
70-74 years old	0.468	1.140***
	(0.341)	(0.291)
75-79 years old	0.833*	1.208***
	(0.445)	(0.353)
80-84 years old	0.268	1.111***
	(0.530)	(0.370)
Sex		
Male	ref.	ref.
Female	0.677**	0.268
	(0.355)	(0.300)
Education		
Primary school	ref.	ref.
Secondary School, Technical, High School	-0.752***	-0.481**
	(0.282)	(0.240)
=2 years at University	-1.540**	-0.687
	(0.760)	(0.817)
>2 years at University	0.045	-1.042**
	(0.571)	(0.500)
Housing Tenure in t-1		
Homeowner	ref.	ref.
Private or Public Renter	-0.208	-0.383
	(0.343)	(0.271)
Population in municipality in t-1		
Less than 1,000	ref.	ref.
1,000 – 5,000	0.056	0.476
	(0.555)	(0.321)
5,000 – 10,000	1.517*	0.331
	(0.885)	(0.403)
10,000 – 50,000	0.385	0.050
	(0.563)	(0.335)
More than 50,000	-0.267	0.208
	(0.568)	(0.355)
Housing type in t-1	-0.243**	0.007
	(0.122)	(0.099)
House	-0.277**	-0.121*
	(0.111)	(0.068)
Apartment		
Log-income in t	ref.	ref.
Number of Excess Rooms in t-1	0.533	1.354***
	(0.431)	(0.429)
Widow in t-1 and t	0.181	1.360***
	(0.445)	(0.367)
Three people and more in t-1 and t	0.320	0.589*
	(0.403)	(0.343)
Family Shocks		
Couple in t-1 and widowed in t	0.278	0.975***
	(0.500)	(0.381)
Number of observations	528	571

Source: authors' computation from the pooled 1996 and 2002 Housing Surveys, INSEE.
Note: sample of mobile households with a head aged 60 to 84 and retired or inactive four years before the survey date.

Table 8: Variation in the municipality size when moving, multinomial Logit

Variables	Smaller size	Bigger size
Constant	-3.871***	0.074
	(1.076)	(0.980)
Age group in t-1		
60-64 years old	ref.	ref.
65-69 years old	-0.098	-0.418*
	(0.214)	(0.232)
70-74 years old	-0.128	0.135
	(0.233)	(0.241)
75-79 years old	0.363	0.410
	(0.278)	(0.300)
80-84 years old	-0.108	-0.532
	(0.328)	(0.353)
Sex		
Male	ref.	ref.
Female	-0.022	-0.396
	(0.254)	(0.263)
Education		
Primary school	ref.	ref.
Secondary School, Technical, High School	0.453**	0.677***
	(0.188)	(0.218)
=2 years at University	-0.159	0.739
	(0.638)	(0.609)
>2 years at University	0.216	1.231***
	(0.344)	(0.416)
Housing Tenure in t-1		
Homeowner	ref.	ref.
Private or Public Renter	0.488**	0.394*
	(0.214)	(0.233)
Population in municipality in t-1		
Less than 1,000	ref.	ref.
1,000 – 5,000	-0.795***	-0.990***
	(0.185)	(0.200)
5,000 – 10,000		
10,000 – 50,000	ref.	ref.
More than 50,000	1.204*	-0.871***
	(0.644)	(0.267)
Housing type in t-1	1.462**	-1.513***
	(0.671)	(0.337)
House	1.435**	-2.463***
	(0.630)	(0.300)
Apartment	1.571**	-4.234***
	(0.634)	(0.422)
Log-income in t	0.172**	0.114
	(0.080)	(0.087)
Number of Excess Rooms in t-1	0.081	-0.014
	(0.063)	(0.063)
Family Type in t-1 and t		
Couple in t-1 and t	ref.	ref.
Single or divorced in t-1 and t	-0.534	0.182
	(0.317)	(0.350)
Widow in t-1 and t	-0.396	0.354
	(0.313)	(0.325)
Three people and more in t-1 and t	-0.468*	-0.110
	(0.276)	(0.289)
Family Shocks		
Couple in t-1 widowed in t	-0.323	0.944***
	(0.345)	(0.339)
Number of observations	1099	

Source: authors' computation from the 1996 and 2002 Housing Survey, INSEE.
Note: sample of households which head is retired or inactive and aged 60 to 84 in (t-1).
***: significant at 1%; **: significant at 5%; *: significant at 10%.

Table 9: Reasons for moving, by family type or transition

	Transition to widowhood		Couple		Single, widow	
Type of reason						
Retirement	-		3.9		0.6	
Personal or family reasons[1]	**27.2**		13.1		16.5	
Among them: get closer to family or friends, went back to birthplace		25.9		12.1		15.3
Environment or location[2]	12.8		**20.6**		16.0	
Dwelling size or comfort[3]	18.9		19.9		**27.2**	
Among them; the dwelling quality was too bad		0.9		7.9		11.1
wanted a smaller dwelling		**17.5**		4.9		12.1
Type of dwelling[4]	7.1		6.7		4.7	
Housing tenure[5]	6.9		6.8		7.4	
Income constraint[6]	1.0		1.2		1.8	
Obligation to move[7]	3.5		7.0		6.4	
Other reason	23.6		20.8		20.4	
Number of observations	78		168		117	

Source: Authors' computation from the 1996 Housing Survey, INSEE.
Note: Sample of mobile households where head is retired or inactive and aged 60 to 84 in 1992.

[1] Separated from partner, got closer to family or friends, went back to birthplace, looked for a better climate (this item cannot be separated from the preceding reason).

[2] Unattractive or insecure neighbourhood, neighbours were unsuitable (too noisy, behavioural problems), too far from town centre and community facilities, wanted to get closer to town centre, wanted to live in a less urbanized place.

[3] Wanted a larger/smaller dwelling, the dwelling quality was too bad

[4] Wanted to live in a house/in an apartment.

[5] Wanted to become owner/tenant, found accommodation that could be used for free

[6] Wanted to reduce housing expenses (rent, utilities, maintenance cost)

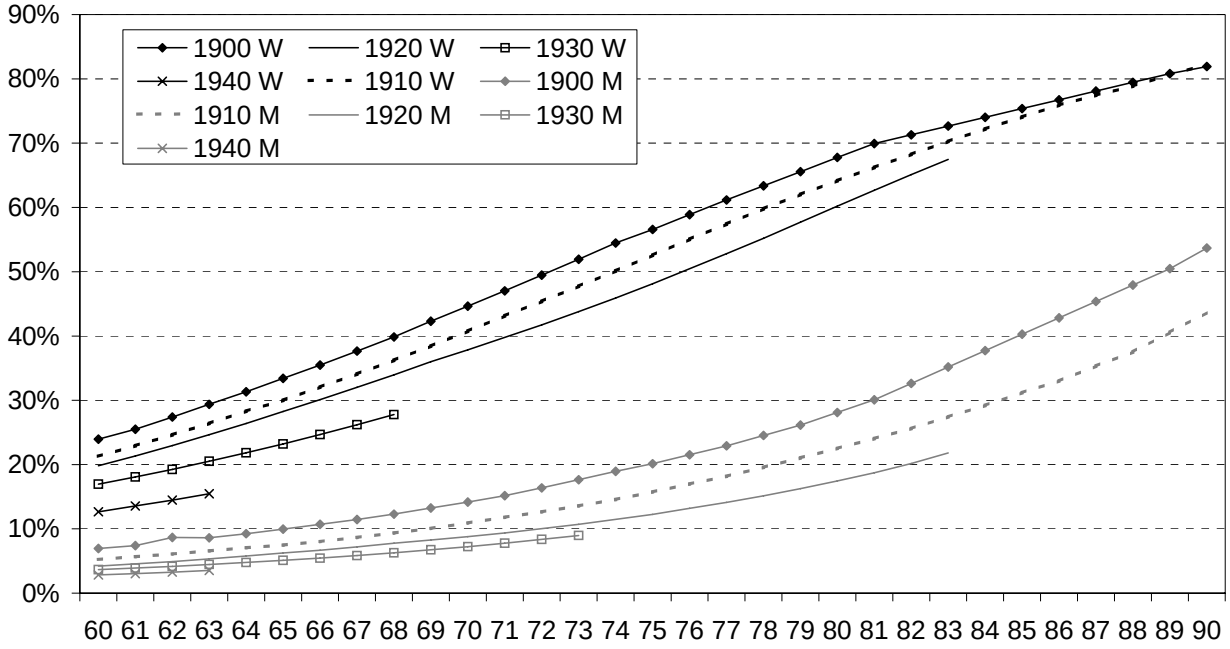
[7] Lived temporarily in the dwelling, was expelled by the owner

Table 10: Living less than 25 kilometres from closest independent child, by family type, for mobile and non mobile households

Family Type in t-1 and t		estimated parameter
Couple in t-1 and t	Mobile	ref.
	Non mobile	0.476***
		(0.163)
Widow in t-1 and t	Mobile	-0.160
		(0.336)
	Non mobile	-0.278
		(0.214)
Single or divorced in t-1 and t	Mobile	0.334
		(0.270)
	Non mobile	0.205
		(0.189)
3 people or more in t-1 and t	Mobile	0.706*
		(0.365)
	Non mobile	0.649***
		(0.180)
Couple in t-1 widowed in t	Mobile	0.827**
		(0.377)
	Non mobile	0.166
		(0.206)

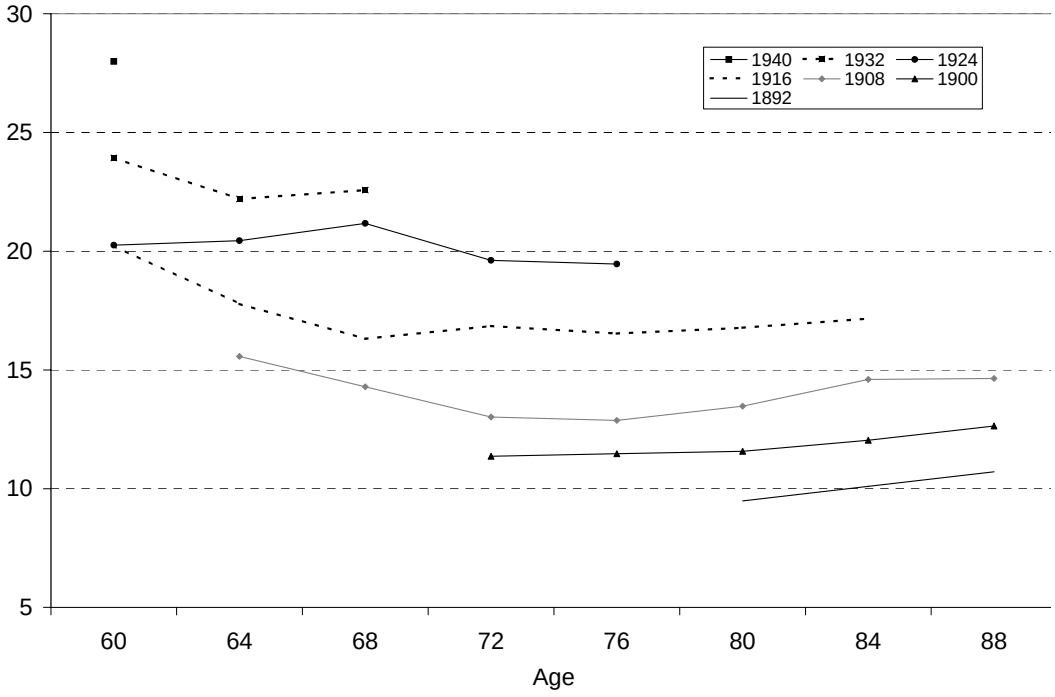
Source: Authors' computation from the 2002 Housing Survey, INSEE.
Note: Sample of households where head is retired or inactive and aged 60 to 84 in 1997 with at least one child who lives independently, and no child at home. We estimate a logit model of having a child living less than 25 kilometres from the household. Other controls are age groups in t-1, sex, education level, housing type and tenure in t-1, population in municipality in t-1 and log income in t.

Figure 1 – Percentage of widows (W) and widowers (M) by age for five birth cohorts



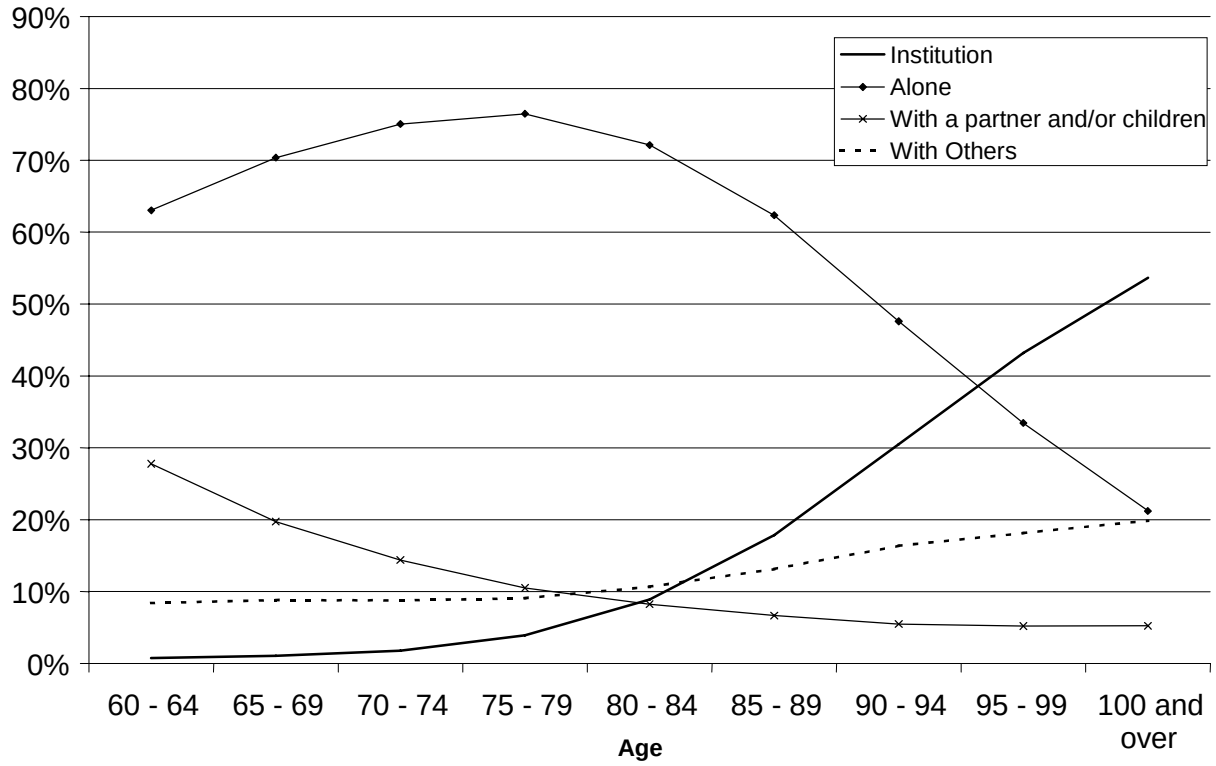
Source: French register of civil status (*Etat Civil*).

Figure 2 – Average household income by age and birth cohort



Source: Laferrère (2005), computation from the 1973, 1978, 1984, 1988, 1992, 1996 and 2002 Housing Surveys, INSEE.
Note: income is expressed in thousands of 2001 euros. Cohorts are four-year cohorts. For instance, the 1940 cohort includes all the households born during the 1937-1940 period.

Figure 3 – Living arrangements of widows by age, in 1999



Source: constructed from the 1999 French Census.
Note: the sample excludes widowers.
"With others" describes households with at least two members, other than a child or a partner.

Appendix 1: comparative statics

In this appendix, we establish the signs of the different effects in the decomposition of optimal housing consumption difference between staying and moving (see equation 3). The first-order condition for the marginal rate of substitution $MRS = \frac{\partial U}{\partial K} / \frac{\partial U}{\partial C}$ is given by:

$$MRS = \pi \tag{6}$$

We conduct some comparative statics. Deriving the first order conditions, we get:

$$A \begin{pmatrix} dC \\ dK \end{pmatrix} = B \begin{pmatrix} d\pi \\ dI \end{pmatrix}$$

with $A = \begin{pmatrix} \frac{\partial^2 U}{\partial C \partial K} - \pi \frac{\partial^2 U}{\partial C^2} & \frac{\partial^2 U}{\partial K^2} - \pi \frac{\partial^2 U}{\partial C \partial K} \\ 1 & \pi \end{pmatrix}$ and $B = \begin{pmatrix} \frac{\partial U}{\partial C} & 0 \\ -K & 1 \end{pmatrix}$. We have:
$\det A = -\left(\pi^2 \frac{\partial^2 U}{\partial C^2} + \frac{\partial^2 U}{\partial K^2} - 2\pi \frac{\partial^2 U}{\partial C \partial K} \right) > 0$. Using the Cramer's method, we obtain:

$$\begin{aligned} \frac{\partial K}{\partial I} &= \frac{1}{\det A} \left(\frac{\partial^2 U}{\partial C \partial K} - \pi \frac{\partial^2 U}{\partial C^2} \right) > 0 \\ \frac{\partial K}{\partial \pi} &= \frac{1}{\det A} \left(\pi K \frac{\partial^2 U}{\partial C^2} - K \frac{\partial^2 U}{\partial C \partial K} - \frac{\partial U}{\partial C} \right) < 0 \end{aligned}$$

These two conditions are sufficient to prove the sign of the income and price effects. It is possible to determine the sign of the preference effect using the first-order condition ($MRS = \pi$). This sign depends on the relative position of the marginal substitution rate when living as a couple and when living in widowhood. It is straightforward to determine this sign using the assumption that: $MRS_w < MRS_c$ where MRS_w (resp. MRS_c) is the marginal rate of substitution when being widowed (resp. living in couple).

Appendix 2: Widows do not move to live with their children

We want to appraise whether moves of recent widows to co-reside with a child are frequent. Indeed, these moves are ignored in our study but living with kinship could be a way to adjust one's housing consumption (Börsch-Supan, 1990). We identify a household possibly containing a widow that moved to her children's place using three criteria. First, the household must include a $60-84$ year-old widow that is not the reference person. Second, the household size must increase by one in the four-year period before the survey date. Third, this increase should not be due to obvious demographic reasons that are not related to the arrival of a widow like a birth or household formation.

In fact, 258 households include a widow who is between 60 and 84 years old in the 2002 Housing Survey (first criterion). Among them, only 13 percent experience a one-person increase in the size of the household (second criterion). Finally, among the remaining households, only 41 percent may have experienced the arrival of a widow (third criterion). Overall, there are only 14 households meeting the three criteria. This is very few considering that not all may have experienced widowhood recently. In conclusion, only very few widows move to their children's places after their spouse's death and use kinship to adjust their housing consumption.

Appendix 3

Table A: First-stage regressions of log-income (instrumental equations of IV probit)

Variables	(1) Whole sample	(2) Stable Couple	(3) Single, widows	(4) Recently widowed
Constant	2.041***	1.431***	1.589****	1.134***
	(0.058)	(0.071)	(0.096)	(0.173)
Age group in t-1				
60-64 years old	ref.	ref.	ref.	ref.
65-69 years old	-0.015*	-0.037***	-0.025	0.019
	(0.009)	(0.010)	(0.019)	(0.027)
70-74 years old	-0.029***	-0.055***	-0.026	0.002
	(0.009)	(0.010)	(0.019)	(0.027)
75-79 years old	-0.032***	-0.078***	-0.009	0.004
	(0.010)	(0.012)	(0.019)	(0.029)
80-84 years old	-0.029**	-0.053***	-0.010	-0.030
	(0.014)	(0.020)	(0.022)	(0.036)
Sex				
Male	ref.	ref.	ref.	ref.
Female	0.021**	-	-0.019	-0.020
	(0.010)		(0.016)	(0.020)
Education				
Primary School	ref.	ref.	ref.	ref.
Secondary School , Technical, High School	0.044***	0.024***	0.058***	0.027
	(0.008)	(0.009)	(0.014)	(0.021)
=2 Years at university	0.087***	0.055*	0.090*	0.138**
	(0.024)	(0.028)	(0.050)	(0.062)
2 years at university	0.131***	0.083***	0.164***	0.068
	(0.014)	(0.015)	(0.033)	(0.059)
Children outside household				
No	ref.	ref.	ref.	ref.
Yes	-0.045***	-0.008	-0.062***	-0.028
	(0.009)	(0.013)	(0.016)	(0.025)
Housing Tenure in t-1				
Homeowner	ref.	ref.	ref.	ref.
Private Renter	-0.035***	-0.008	-0.030*	-0.049*
	(0.011)	(0.015)	(0.017)	(0.028)
Public Renter	-0.045***	-0.062***	-0.045**	-0.058*
	(0.012)	(0.017)	(0.018)	(0.034)
Rent free	-0.070***	-0.038*	-0.053***	-0.055
	(0.014)	(0.020)	(0.019)	(0.037)
Population in municipality in t-1				
Less than 1,000	ref.	ref.	ref.	ref.
1,000 – 5,000	-0.016*	-0.036***	-0.002	-0.025
	(0.009)	(0.010)	(0.017)	(0.025)
5,000 – 10,000	-0.014	-0.032**	0.002	-0.065*
	(0.012)	(0.014)	(0.021)	(0.033)
10,000 – 50,000	0.013	-0.014	-0.010	-0.041
	(0.010)	(0.012)	(0.018)	(0.029)
More than 50,000	0.026**	0.012	-0.001	0.008
	(0.011)	(0.014)	(0.020)	(0.030)
Housing Type in t-1				
House	ref.	ref.	ref.	ref.
Apartment	0.016*	0.028**	0.034**	-0.010
	(0.009)	(0.012)	(0.015)	(0.024)
Number of excess rooms in t-1	0.017***	0.016***	0.024***	0.007
	(0.002)	(0.003)	(0.004)	(0.007)
Log-income from retirement pensions in t	0.801***	0.864***	0.838***	0.892***
	(0.006)	(0.007)	(0.010)	(0.018)
Family Type in t-1 and t				
Couple in t-1 and t	ref.			
Single or divorced in t-1 and t	-0.146***			
	(0.013)			
Widow in t-1 and t	-0.129***			
	(0.012)			
Three people and more in t-1 and t	0.304***			
	(0.010)			
Family Shocks				
Couple in t-1, widowed in t	-0.112***			
	(0.014)			
Ln(σ)	-1.330***	-1.597***	-1.472***	-1.632***
	(0.008)	(0.013)	(0.016)	(0.030)
Arcth(ρ)	-0.064**	-0.058	0.018	-0.026
	(0.030)	(0.044)	(0.047)	(0.089)
R^2	0.828	0.867	0.834	0.868
Number of observations	7434	3172	1923	569

Source: Authors' computation from the 2002 Housing Survey, INSEE.

Note: Sample of households with a head aged 60 to 84, and retired or inactive in 1998.

***: Significant at 1%; **: significant at 5%; *: significant at 10%.

Table B: Probability of moving between 1998 and 2002 (simple probit)

Variables	(1) Whole sample	(2) Stable Couple	(3) Single, widows	(4) Recently widowed
Constant	-3.194***	-3.391***	-3.738***	-4.319***
	(0.454)	(0.786)	(0.841)	(1.535)
Age group in t-1				
60-64 years old	ref.	ref.	ref.	ref.
65-69 years old	-0.142**	-0.182*	-0.132	0.290
	(0.061)	(0.096)	(0.144)	(0.248)
70-74 years old	-0.234***	-0.212**	-0.311**	-0.034
	(0.065)	(0.100)	(0.144)	(0.261)
75-79 years old	-0.326***	-0.266**	-0.398***	0.088
	(0.075)	(0.124)	(0.150)	(0.270)
80-84 years old	-0.124	-0.103	-0.187	0.577*
	(0.097)	(0.201)	(0.166)	(0.307)
Sex				
Male	ref.	ref.	ref.	ref.
Female	0.085		0.089	0.399**
	(0.071)		(0.132)	(0.196)
Education				
Primary school	ref.	ref.	ref.	ref.
Secondary School , Technical, High School	-0.086	-0.158*	-0.057	-0.374*
	(0.056)	(0.090)	(0.111)	(0.198)
=2 Years at university	-0.023	-0.011	-0.101	0.556
	(0.162)	(0.254)	(0.369)	(0.436)
2 years at university	-0.125	-0.175	-0.257	-0.889
	(0.105)	(0.155)	(0.281)	(0.627)
Children outside household				
No	ref.	ref.	ref.	ref.
Yes	0.242***	0.051	0.207	0.485*
	(0.070)	(0.134)	(0.142)	(0.273)
Housing Tenure in t-1				
Homeowner	ref.	ref.	ref.	ref.
Private Renter	0.910***	1.057***	0.745***	1.125***
	(0.064)	(0.111)	(0.121)	(0.206)
Public Renter	0.338***	0.413***	0.102	0.482*
	(0.079)	(0.148)	(0.150)	(0.276)
Rent free	0.380***	0.296	0.244	0.655**
	(0.096)	(0.190)	(0.160)	(0.284)
Population in municipality in t-1				
Less than 1,000	ref.	ref.	ref.	ref.
1,000 – 5,000	0.118	0.190*	0.035	0.174
	(0.074)	(0.114)	(0.155)	(0.241)
5,000 – 10,000	0.020	-0.037	0.319*	-0.138
	(0.095)	(0.160)	(0.174)	(0.333)
10,000 – 50,000	0.137*	0.100	0.201	0.252
	(0.078)	(0.127)	(0.155)	(0.264)
More than 50,000	0.242***	0.214	0.205	0.296
	(0.084)	(0.139)	(0.168)	(0.270)
Housing Type in t-1				
House	ref.	ref.	ref.	ref.
Apartment	0.136**	0.097	0.219*	-0.011
	(0.064)	(0.109)	(0.120)	(0.204)
Log-income in t	0.125***	0.168**	0.188**	0.175
	(0.045)	(0.079)	(0.085)	(0.155)
Number of excess rooms in t-1	0.027	0.005	0.055*	0.116**
	(0.017)	(0.029)	(0.033)	(0.057)
Family Type in t-1 and t				
Couple in t-1 and t	ref.	ref.	ref.	ref.
Single or divorced in t-1 and t	0.204**			
	(0.094)			
Widow in t-1 and t	0.032			
	(0.086)			
Three people and more in t-1 and t	-0.030			
	(0.078)			
Family Shocks				
Couple in t-1 widowed in t	0.385***			
	(0.096)			
Number of observations	7440	3172	1924	569

Source: Authors' computation from the 2002 Housing Surveys, INSEE.
Note: Sample of households with a head aged 60 to 84, and retired or inactive in 1998.
***: Significant at 1%; **: significant at 5%; *: significant at 10%.