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**Economic consequences of widowhood:
some lessons for survivor pension reform in France?**

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(Preliminary draft)

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Economic consequences of widowhood: some lessons for survivor pension reform in France?

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Preliminary version – Please do not quote

I. Introduction

During retirement, several shocks could jeopardize financial security of the elderly (growing health care expenditures, vulnerability to inflation). Loss of a spouse is one of them as it could induce a drop in resources and then a drop in consumption of the surviving spouse (see Hurd, 1989, Hurd and Wise, 1989, Holden and Kim, 2001, Weir, Willis and Sevak, 2002, Burkhauser and alii, 2005). This could happen if the public pension system does not offer sufficient survivor's pensions and if the household did not save enough to smooth consumption. We consider this question in the French case, where public survivor's pension represent roughly 14 % of the total pension expenditures in 2005 (i.e. € 28.6 billion), so that welfare state already makes an important effort towards widows.

This question is all the most important as populations age and as many countries are reforming their retirement pension systems. One aspect of the debate is how to provide for surviving family members, whether children or spouses. Major demographic changes have occurred in the last forty years that raise questions about the systems of family and conjugal rights, mostly set up many decades earlier. (Favreault, Steuerle, 2007; Iams, Sandell, 1998; Favreault, Sammartino, Steuerle, 2002). The survivor pension, which gives the surviving spouse a fraction of the deceased spouse's pension is one of these systems. Implemented in France in the years following 1945, at a time when the male breadwinner pattern was the most frequent, it was intended to prevent widows falling into poverty on the death of their husbands. Women's increasing labour force participation, higher rates of divorce and European regulations that have extended survivor pension to men without conditions raise the question of whether this system is still appropriate, when it accounts for nearly 14% of total retirement pension costs.

This article proceeds as follows. First of all, we raise a number of theoretical points concerning the concept of living standards and we question the standard equivalence scale : does it fit to widows ? (Section II). Then, we set up some theoretical cases to understand the kind of situations where survivor pensions do or do not ensure equal living standards (Section III). Section IV focuses on the empirical results concerning variations in living standards following the death of a spouse, using the Income tax surveys 1996-2001, a matched dataset of administrative and survey data. Section V concludes and discusses further research.

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We use two different methods to assess the income variation following the spouse's death. In the first one, the longitudinal one, we compare the economic situation before and after the calendar year of death (by using three years panels). In a second approach, using two-years panels, we compare the economic situation of couples about to encounter the death of one of its member and the economic situation of recently widowed. We show that for nearly half of widows, their own resources and survivor's pension are sufficient to maintain (or even increase) their adjusted income. This may suggest that for some of them, survivor's pension could be considered as too high, as soon as the objective of survivor's pension is to maintain the adjusted income of the surviving spouse. Rethinking the rules of survivor's pension could be a way to improve the system in a context of financial constraints. On the contrary, we highlight that for nearly 60 % of women being widowed during 1998 and 2001, public survivor's pensions are not sufficient to maintain the well-being of the surviving spouse. The decrease is on average 3 %. Using multivariate analysis, we highlight the differences in economic consequences depending on gender, on female pension relative to male pension, on income groups, and previous job status of the dead spouse (survivor's pension rules may differ between public and basic general schemes).

II. How much income should be guaranteed to the surviving spouse?

When one of two retired spouses dies, the survivor's household income is theoretically lower than the couple's before the death. First, the total retirement pensions received by the household is reduced by a death, since the survivor pension paid to the survivor in the French pension system is at most 60% of the deceased spouse's own direct pension rights. Second, the deceased spouse's assets are generally shared between the surviving spouse and any children, according to variable rules, so that the household's asset income is lower after the death than before.

The question is therefore what loss of income may be seen as acceptable.

A. Objectives of the survivor pension

The survivor pension is a system that is historically bound to the model of a couple in which the employed man is the main source of income and the woman, staying at home, is concerned with domestic work and children's upbringing. Originally, therefore, the basic general scheme³ made receiving a survivor pension conditional on having no pension rights of one's own, thus reserving the survivor pension to the woman, who was totally "dependent" on her husband. This condition in the basic general system was later relaxed, by introducing rules limiting the combination of own and survivor pension rights. Since 2003, survivor pensions are means-tested, which in practice reduces the total of the survivor's personal and public survivor pensions. The objective pursued by the public survivor pension thus remains that of guaranteeing a pension for women who have not gone out to work at all or very little.

³ The structure of the French pension system is complex. For a large part of the population, wage earners in the private sector, pensions rely on two pillars : the basic general scheme (so-called *Regime Général*) and complementary schemes, organized on an occupational basis. Civil servants are affiliated to the public sector scheme. Self-employed contribute to their own schemes, which could be different regarding their occupational status. For more information on the French pension system, see Walraet and Mahieu (2002).

There has never been a means test either in the complementary pension schemes or the public sector special schemes (public employment and others). A widow or widower receives a survivor pension equal to 50% (public sector scheme) or 60% (private sector complementary schemes) of the deceased spouse's pension, whatever their own means (personal pension, asset income, earned income, etc.). The philosophy behind these schemes is a different one. Survivor pensions are seen as a succession to the deceased spouse's personal pension and therefore as an entitlement in return for the contributions the deceased spouse had paid. Survivor pension is considered in these schemes as a virtually inheritable entitlement.

Neither the underlying principle of the basic general scheme (guaranteeing a pension for widows who have never participated in the labour market or very little) nor the asset principle of the public and complementary schemes in the private sector corresponds to an objective of particular living standards. First, neither principle guarantees a standard of living equal to that enjoyed before the death. As we shall see in Section III, the surviving spouse sees their living standards drop if they have no personal pension rights, but sees their living standards rise if they have substantial personal pension rights. Second, neither principle seeks to prevent poverty among widows. One might suppose that the introduction of means-testing to the public system corresponds to an objective of preventing poverty among widows, but this is not the case⁴.

Although the various survivor pension systems do not explicitly aim to guarantee each widow a standard of living equal to that before the death, it may be seen as desirable that the parameters for calculating the amount of the survivor pension, particularly the survivor pension rate, should be set so as to ensure on average roughly equal living standards to before. If widows had a lower standard of living than couples, it would appear desirable to raise survivor pensions as a matter of equality. Conversely, if their standard of living turned out to be higher than before the death, it would be appropriate to reduce the size of the survivor pension, given current difficulties in funding pensions.

In support of this desire to maintain the living standards of the surviving spouse, two major reasons may be put forward:

- The idea that the survivor pension is designed to support and promote married couples as systems of family solidarity (that benefits to the whole society), or as systems for raising children (or wishing to if there are none⁵). Participating in the labour market may have been chosen within the couple, and the aim is that these choices should not adversely affect the living standards of the surviving spouse. Women in older cohorts “invested” in marriage, via domestic work, rather than in having their own careers to insure for old age, and it seems fair for them to enjoy the same living standards as their husbands when they are old.
- One may consider that the pension system guarantees a proportional replacement of previous income, including when the spouse has died.

⁴ A widow who has never gone out to work and live alone receives in practice the whole of the survivor pension, even if the deceased husband had a large pension or the couple had substantial assets. The basic general pension scheme may well, therefore, pay survivor pension to widows with high living standards. Conversely, the minimum survivor pension (€261 per month in 2008), which is applicable when the deceased spouse had a small pension, is well below the poverty threshold.

⁵ Although the survivor pension compensates for lower investment in paid employment because of children, it is not clear why it should be paid to surviving spouses who have never had children.

B. Choosing the right equivalence scale

Once the objective is adopted of maintaining living standards after the death of a spouse, the problem arises of choosing the right scale of equivalence. The surviving spouse becomes a one-person household that requires less consumption than the former couple. Maintaining the same living standards will thus mean a certain loss of income. The equivalence scale defines the relationship between the requirements of a couple and those of a single person. It therefore also implicitly defines the acceptable loss of income after a death.

Taking the standard OECD modified scale, which considers that a childless couple needs to consume 1.5 times as much as a single person to achieve an equivalent standard of living⁶, a widow(er) maintains their standard of living if they receive 2/3 of the income of the couple before the death. The acceptable loss of income is thus 1/3 of the couple's income.

Our default scale in Sections III and IV below is the standard one. However, it must be borne in mind that the principle of a standard equivalence scale is a convention adopted at international level by statisticians, and that other conventions could also be adopted. For example, before the 1990s, statisticians habitually used the Oxford scale (or "old OECD scale"), which applied 0.7 cu (rather than 0.5) to the second adult in a household. With the Oxford scale, a widowed person maintains their previous standard of living if they receive 10/17 of the couple's income before the death. The acceptable loss of income is thus 41% of the couple's income. Another commonly used scale is the square root scale ($m = \sqrt{N}$), where N is the household size, implying that maintaining living standards would mean a loss of income of 29%.

Apart from the sensitivity of the results to the convention adopted, a more basic question for this study is the appropriateness of a general equivalence scale for the situation we examine, namely widowhood. A general equivalence scale reflects the ratio between the requirements of couples and single persons in the population as a whole. Such a scale may not be appropriate for the particular case of widowhood for a number of reasons. First, older people, whether living alone or in a couple, have specific requirements and therefore consumption patterns, because of ageing or no paid employment anymore. Second, a general equivalence scale assumes that single people live in smaller accommodation than couples; however, the widowed tend to keep the accommodation they had before their spouse's death, so that their housing costs do not diminish. Third, an older person who is disabled or dependent loses the assistance of their spouse when the latter dies, so that they are more likely to use paid services.

The analysis below provides some evidence on the two first points. However, we have not been able at this stage to collect statistical data relating to the third point⁷. Our assessment of living standards is therefore valid only for people in good health.

⁶ The requirements of the first adult account for one consumption unit (cu) (or equivalent adult), other adults or adolescents for 0.5 cu, and children under 14 for 0.3 cu.

⁷ For that purpose, use would need to be made, for example, of Household Budget Surveys (INSEE).

1. Consumption patterns and equivalence scale

An equivalence scale evaluates the size of the scale economies achieved by a couple who share common expenditure. The goods consumed by a household may be divided into private goods and public goods⁸. A private good is used only by one person in the household: clothes, medicine, cinema seats, etc. Conversely a public good is used by all members of the household: bathroom, television, etc. It can be shared and lead to economies of scale. The larger the proportion of public goods in a household's consumption, the greater the economies of scale and the lower the equivalence scale value (ratio between requirements of a couple and a single person). This was the justification for replacing the Oxford scale (couple = 1.7 cu) by the current standard scale (couple = 1.5 cu) in the 1990s, because housing expenses were an increasing proportion of household consumption.

However, the consumption patterns of older people differ from those of the rest of the population: their expenditure is less on external goods (transport, leisure, holidays, clothing, etc.) and more on home life and health (electricity and heating, medical care, domestic help, etc.). If public goods are a larger proportion of the consumption of older people, then an equivalence scale adapted to the requirements of older people will be flatter than the standard scale.

To evaluate the proportion of public goods, one method is to use the Prais-Houthakker model. This model assumes that there is a specific equivalence scale $m_k[N]$ for each consumption good that reflects the increase in expenditure on the good k according to the size of household N , for a given living standard. The reason is that most consumption falls somewhere between the private good and the public good. A car, for example, is sometimes a private good and sometimes a facility used by the whole family. According to the use made of them, various types of consumption can be ordered on an axis from the pure public good $m_k[N]=1$ to the pure private good $m_k[N]=N$. The model can be used to calculate the overall equivalence scale $m[N]$ expressing how the household's total consumption varies with its size for a given living standard, as a linear combination of the specific scales weighted by consumption pattern.

A Prais-Houthakker model was estimated by Hourriez and Olier (1997) using data from the family budgets surveys of 1984, 1989 and 1994. In that study, the scales were specified in the form $m_k[N]=N^{\alpha_k}$ and $m[N]=N^\alpha$. The parameter α of the overall scale was then obtained by calculating the average of the parameters α_k , weighted by the average budget proportions ω_k of each consumption good:

$$\sum_{k=1}^K \omega_k \cdot \alpha_k = \alpha \quad (I)$$

Table 1 gives the estimated values for the specific scales on the basis of the three family budget surveys in 1984, 1989 and 1994. The values are fairly stable from one survey to another and confirm intuitive findings. Of the six major categories of consumption, clothing is an entirely private good⁹. The parameters α_k associated with the other categories range from 0.4 to 0.9. The category that provides the most economies of scale is housing. For a given standard of living, a couple spends 1.33 times more on occupying and heating their accommodation than a single person. With a coefficient of roughly 0.6, the "transport-

⁸ We use the term "public good" by analogy with public good economics. In this case, they are public goods within the household.

⁹ This automatically follows from the hypothesis required for the identification of the model (Hourriez and Olier, 1997), which is that adults' clothing is a private good.

telecommunications” category, mainly cars, is also one of the expenditures providing the most economies of scale. This is also true for domestic facilities (furniture, white goods, household equipment, domestic help). Conversely, leisure consumption is virtually entirely private (coefficient 0.9), as are miscellaneous goods and services (restaurant, hairdressing, financial services, jewellery, etc.). Food is also rather a private good, but it enables economies of scale when large families can buy in bulk (coefficient 0.7).

Table 1. Prais-Houthakker model, value of parameters α_k

	1984	1989	1994	Average of 3 surveys
Food	0.74	0.67	0.72	0.71
Clothing	1.03	0.95	0.99	0.99
Housing	0.46	0.38	0.39	0.41
Domestic facilities	0.60	0.55	0.71	0.62
Health	0.56	0.40	0.80	0.59
Transport -Telecommunications	0.73	0.49	0.57	0.60
Leisure	0.92	0.90	0.94	0.92
Misc. goods and services	0.90	0.72	0.97	0.86

Source: Hourriez and Olier, 1997

It is then possible to calculate the appropriate equivalence scale for each consumption pattern by applying formula (I). Older people achieve greater economies of scale than younger households, because housing is a larger proportion of their consumption¹⁰ (see Table 2), since they tend to keep oversized housing once their children have left. However, the lower proportion of transport expenditure (mainly a common consumption) and the larger proportion of health expenditure (individual) have an opposite effect.

Table 2. Consumption pattern of older people compared with the general population

	General population	Households of 65 years and over
Food	17,6	21,4
Clothing	7,7	5,0
Housing	15,7	17,6
Domestic facilities	7,1	8,0
Health	3,5	5,1
Transport-Telecommunications	18,9	13,6
Leisure	11,9	11,4
Misc. goods and services	17,5	17,9
Total	100,0	100,0

Source: INSEE, Household Budget Survey 2006

¹⁰ Rent expenditure is relatively low because older people are mainly owners. But the “energy for housing” item is particularly high.

In all, the overall scale is estimated to be $N^{0.69}$ for the consumption pattern of older people, compared with $N^{0.70}$ for the general population. Older people achieve slightly more economies of scale by living as a couple, so the equivalence scale for older people is slightly flatter than the general equivalence scale. However the gap is a negligible one and does not invalidate the choice of the standard equivalence scale for examining widowhood.

Note that housing (in practice associated costs such as heating) is a high proportion of widows' expenditure. First, housing is a relatively high proportion of the consumption of older people. Second, public goods such as housing represent a higher proportion of the budget of people living alone, whereas private goods weigh more in the budget of couples than of single people. One consequence of this impact of housing on widows' budgets is that they may well feel more constrained financially than other types of household, particularly as energy costs are now rising. The reason is that housing costs occur regularly and are hard to reduce. This may explain the financial difficulties of some widows. But the notion of budget constraint is not the same as living standard¹¹.

2. Moving after the death of a spouse and equivalence scale

The specific equivalence scale for housing (whereby the housing requirements of a couple are 1.33 times those of a single person) corresponds to the fact that people living alone occupy rather smaller accommodation than couples. But for a household's housing expenditure to vary according to the specific scale (and the household's total expenditure to vary according to the general scale) when the size of the household changes, the household has to move house when it changes size. In the case of widowhood, the standard equivalence scale is only appropriate if the widowed person moves into smaller accommodation after the loss of a spouse. But older people are less mobile than others and widows rarely do move: 13% change their accommodation in the four years following their husband's death (Bonnet, Gobillon and Laferrère, 2008).

Consequently it is useful to calculate an equivalence scale appropriate for a widow who stays in the same accommodation after her husband's death. For that purpose we return to the Prais-Houthakker model and recalculate parameter α with expression (I), neutralising the specific housing scale (α_k set at zero for housing). Using the consumption pattern of those over 65, the overall scale with no move is estimated to be $N^{0.62}$. This is significantly flatter than the overall scale with a move, estimated above at $N^{0.69}$. Consequently, compared with a widow who moves after the loss of a spouse, the requirements of a widow who stays in her accommodation are 1.05 times higher ($2^{0.07}$). If we refer to the standard scale, maintaining one's standard of living if one moves corresponds to a loss of income of 33%. But if the widow does not move, maintaining her standard of living corresponds to a loss of income of $1 - (2,3) \times 1.05$, namely 30%; the standard scale is consequently no longer completely appropriate, which needs to be borne in mind when interpreting the results of Section IV.

Note that, apart from housing, the above reasoning could be extended to other consumption goods. When the demographic structure of a household changes, the equivalence scale only correctly reflects the household's changing requirements if the household changes its way of life to optimize its consumption according to its size. For example, when choosing forms of transport, a single person is better off taking public transport, whereas a couple or family are

¹¹ For example, a household that is highly indebted to buy a spacious house or luxury care is financially constrained, but its standard of living is very high.

better off with a car; someone who is living alone after a divorce or the death of a spouse ought therefore to sell their car and take public transport. This adaptation in way of life may take a certain time, particularly for older people whose consumption behaviour is bound by habit. Consequently, widows do not immediately feel any reduction in their requirements after the spouse's death.

III. How does economic well-being change after the death of a spouse ? Some theoretical points

A. Survivor pension: current legislation

Following the death of a spouse, the survivor receives a fraction of the deceased spouse's retirement pension. The survivor pension consists therefore of a part of the retirement pension provided to the surviving spouse. All pension schemes pay survivor pensions, but these vary considerably, whether in terms of the objective of this benefit (see section II) or in the parameters for calculation¹². There is consequently a wide variety between schemes both in eligibility to a survivor pension (age, means-testing, etc.) and in the conditions for combining this benefit with an own pension. Here we give only the rules of the basic general scheme and those of the public sector scheme (see table 3).

- The most restrictive conditions are to be found in the basic general scheme, which require. Survivor pension is means tested. The threshold is fairly low (roughly 1.2 times the minimum wage for a person living alone), although it does not include either resources from the spouse's estate or any survivor pension from complementary schemes. The survivor pension rate is 54%. The effects of more restrictive rules in the basic pension schemes for private sector employees are partly tempered by more flexible conditions in the complementary schemes. In these schemes, the survivor pension rate is 60% and is not means-tested.
- In the public sector, survivor pensions are granted with no means test at a rate of 50%, with no restriction on accumulating with an own pension.

Almost all pension schemes base the survivor pension on marriage.

Table 3 – Survivor pension rules according to the category of the deceased spouse

Category of the deceased spouse		Survivor pension rate	Means-testing
Civil servant		50 %	No
Private sector	Basic scheme	54 %	Yes (own pension + survivor pension)
	Complementary schemes	60 %	No

¹² For an overview of the rules regulating the grant of survivor pensions under the various schemes, see COR (2007).

B. Theoretical points

1. Survivor pension rate and living standards maintain

In order to identify the main parameters that affect changes in living standards after the death of a spouse, we assume the simple case of a married couple of retired people living together until one of them dies, whose only resources are their own pensions. We examine the consequences of one spouse's death on the living standard of the survivor¹³, assuming that the latter lives alone after her (his) spouse died.

Let P_D and P_S be the own pensions of the deceased and the surviving spouse, N_1 and N_2 the household's standard of living before and after the death of the spouse, x the ratio P_S/P_D , *rate* the survivor pension rate and *cu* (consumption unit) the proportion of income needed to maintain the standard of living when a second adult is present in the household.

The household's living standard before and after the death of the spouse are expressed as follows:

$$N_1 = \frac{(P_D + P_S)}{(1 + cu)} \text{ and } N_2 = (rate \times P_D + P_S)$$

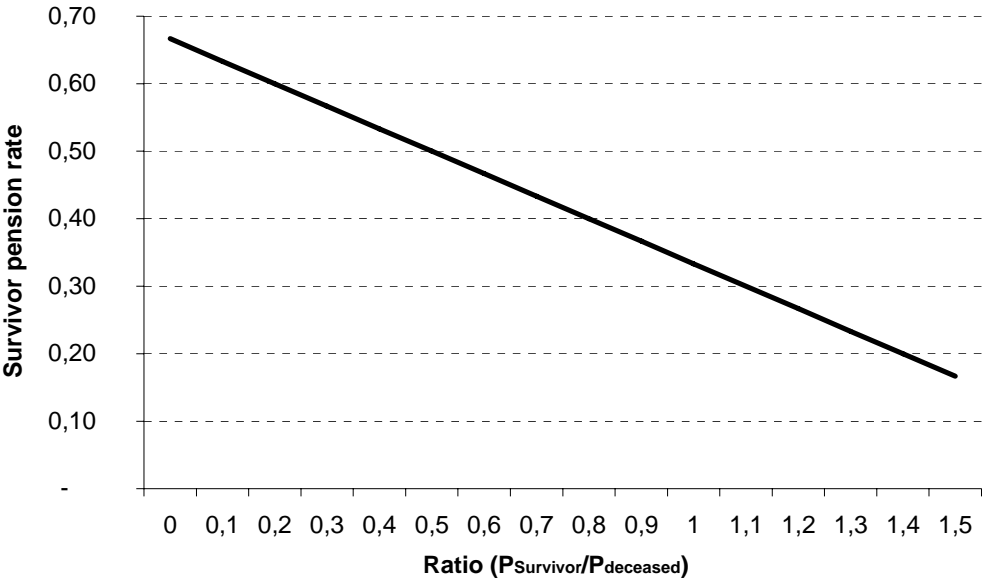
The variation in living standard, N_2/N_1 , is equal to $(1 + cu) \times \frac{(x + rate)}{(x + 1)}$. Choosing an equivalence scale of 0.5 for the second adult (Section II), living standards are maintained as long as $\frac{P_S}{P_D} = 2 - (3 \times rate)$.

The survivor pension rate that would maintain living standards is $rate = \frac{2}{3} - \left(\frac{1}{3} \times \frac{P_S}{P_D} \right)$.

In particular, a woman with no pension rights could maintain her living standard after the death of her spouse with a survivor pension rate of $2/3$. The lower the own pension rights of the survivor compared with those of the deceased, the higher the survivor pension rate needs to be to achieve the objective of an equal standard of living (see figure 1). In the extreme case of a survivor whose pension was twice that of the deceased, the rate would be zero. If we assume a survivor pension rate of 50% (as in force in the public sector), the survivor's living standard is maintained when her own pension is half that of the deceased.

¹³ In estimating living standards, we do not consider neither welfare payments nor income tax, even if taxation is lighter for the widowed.

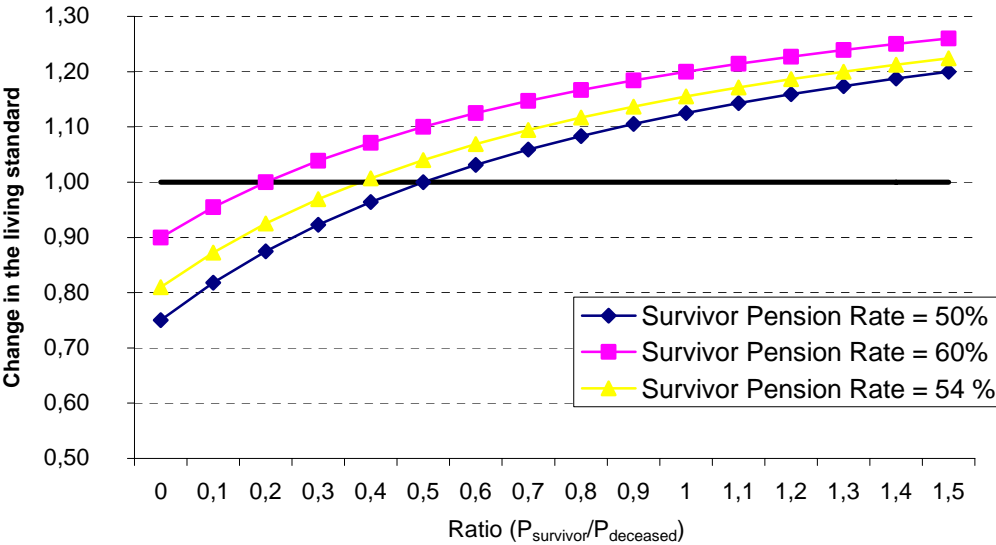
Figure 1. Rate of survivor pension needed to maintain the living standard according to P_S/P_D , with no means test.



Note : if the survivor’s own pension is 10% of that of the deceased person, a survivor pension rate of nearly 63% is needed to maintain the survivor’s former standard of living. When the survivor’s pension is half the deceased’s, their standard of living is maintained by a survivor pension rate of 50%.

Beyond that point, if the survivor’s pension is more than half the deceased’s, this survivor pension rate more than maintains living standards. For example, if the two spouses received the same own pension, the survivor’s standard of living increases by 12.5% after the death of a spouse (see figure 2). Conversely, if the survivor has no own pension, her living standard decreases by 25%.

Figure 2. Ratio of survivor’s current to previous living standard according to P_S/P_D and the survivor pension rate, no means test



A higher survivor pension rate, such as 60% (in force in the complementary pension schemes of the private workers), reduces the decrease in the living standard after the death of a spouse. The survivor with no own pension suffers a 10% drop in living standard. Once the survivor's pension reaches at least 20%, her living standard does not fall at all (see figure 2). For survivors who receive relatively high own pensions compared with the deceased's, their living standard rise after the spouse's death. The latter case occurs frequently when the survivor is the husband, but was long restricted by the fact that survivor pensions were reserved for women or, as a result of different eligibility principles, more restrictive for men.

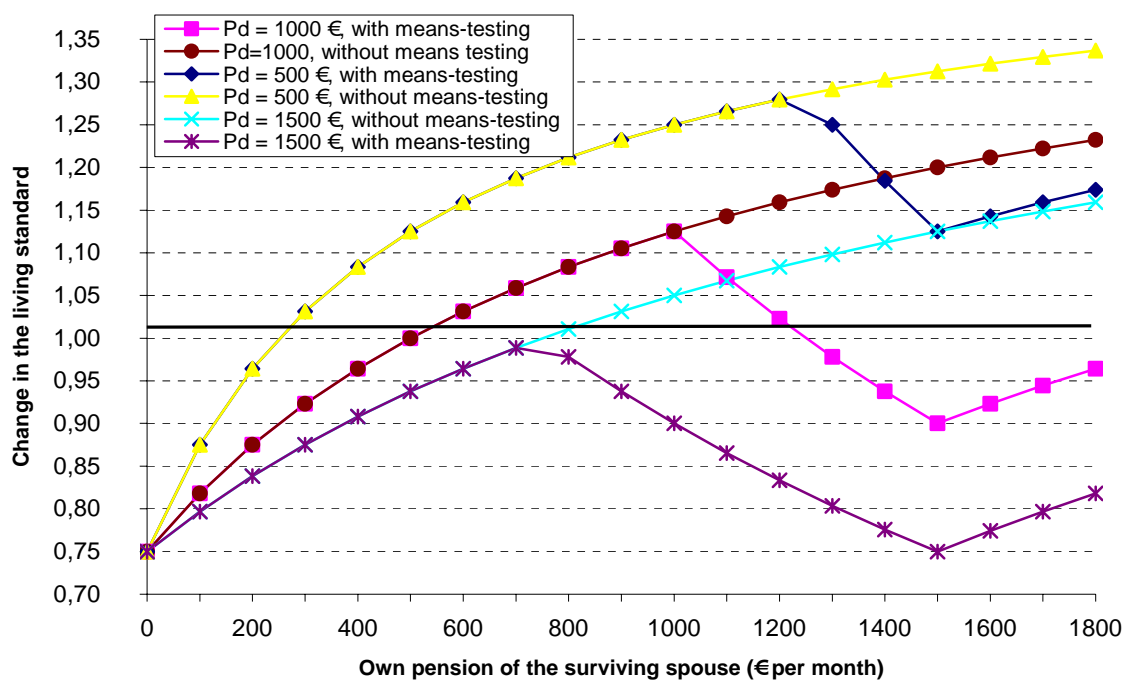
2. What is the impact of means-testing of survivor pension ?

Means testing of survivor pension benefit makes the analysis a bit more complex. It is then difficult to compute the survivor pension rate that would insure on average the maintain of the living standard without using standard cases or microsimulation models.

Introducing means-testing of survivor pension benefit limits the possible increase in the living standard following the death of a spouse. Indeed, as soon as the sum of the own pension of the surviving spouse and the survivor pension is higher than the threshold, the survivor pension is reduced accordingly.

We report on figure 3 the change in the living standard according to different pension levels of the deceased spouse and the introduction of a means test. We assume a theoretical pension scheme with a survivor pension rate of 50 %.

Figure 3. – Ratio of survivor's current to previous living standards according to the own pension of the surviving spouse, a survivor pension rate equal to 50 %, and a means-testing or not – Theoretical pension scheme.



Three situations could be observed corresponding to the three different parts of the curve :

- if the own pension of the surviving spouse is higher than the threshold, then the survivor pension is equal to zero (second inflexion point). To maintain the living standard, the own pension of the surviving spouse must represent a high share of the couple resources before the death of one of the spouse.
- if the sum of the own pension of the surviving spouse and the survivor pension is higher than the threshold, then the survivor pension is reduced accordingly (first inflexion point). The increase in the living standard we would observe in case of no means test is restricted.
- while the threshold is not reached (first part of the curve), we observe the same pattern as in the previous section (theoretical pension scheme with no means test).

3. How to adapt the rules to achieve the maintain of the living standard of the surviving spouse whatever her own pension ?

Assume that the objective pursued is to maintain the living standard after the death of a spouse, whatever the own pension of the survivor. Then, going back to the calculations of section B.1., the survivor pension (*SP*) should be equal to :

$$SP = \frac{2}{3} \times P_D - \frac{1}{3} \times P_S \quad (\text{using the OECD modified equivalence scale})$$

- if the surviving spouse has no own pension, then the survivor pension rate must be equal to 2/3, higher than those currently in force in the different pension schemes.
 - as soon as the own pension of the surviving spouse is higher than twice those of the deceased's, the survivor pension would be equal to zero.
 - If the own pension lies between zero and twice those of the deceased, the means test would apply at a marginal tax rate of one third (for one euro increase of the own pension of the surviving spouse, the survivor pension is reduced by 33 cents).

IV. Changes in the living standard following the death of a spouse – An empirical analysis

Previous investigations in Section III show that the death of a spouse may lead either to a fall or a rise in living standards. For that reason we have made an empirical study to determine whether in the recent past widows (and widowers) have on average seen their living standards decline on the death of their husbands (wives).

A. Data used

One difficulty in examining the economic consequences of a spouse's death is the availability of data. Data are required to follow individual over time and we need sufficiently detailed

data on income. In addition, since being widowed is a “rare” event¹⁴, a sufficiently large population sample is needed. In France there are few panel data on income, except the French section of the European Community Household Panel (ECHP).

Theoretically, the ECHP is the best database for examining variations in income following a spouse’s death, since people are interviewed year by year for eight years, even if they move, with a comprehensive questionnaire on income and living conditions. Unfortunately the ECHP has two failings. First, the size of the sample is limited (it attempts to monitor a sample of some 11,000 adults initially living in 7,000 households), so that there are few events (257 cases of the death of a man or a women over eight years in all the couples surveyed, according to Ahn, 2004). Second, the measurement of income for each household surveyed is subject to considerable observational noise¹⁵. When an interviewer asks a household about its resources, a number of random errors may arise: a source of income may be overlooked or counted twice (potentially frequent among retirees, who often receive pensions from more than one scheme); confusion (monthly, quarterly, annual income, euros, francs [pre- and post-1960]); errors in the definition of income (gross, net, taxable); variable accuracy of sources of information (income may be given to the interviewer from a document such as a pension statement or tax declaration, or from memory with rounding errors); imperfect information within a household (when one spouse answers for the other). These random measurement errors are not specific to the ECHP, because they affect all surveys that directly question households¹⁶. But they loom large when data are analysed longitudinally¹⁷. One solution to reduce the noise would be to compare the average income observed over at least three consecutive years after a spouse’s death with the average income observed for three years before. But that would considerably reduce the sample of usable deaths: since income is monitored for eight calendar years from 1993 to 2001, only those deaths occurring in 1996 and 1997 (roughly 70) would be available for a reasonably acceptable measurement of variations in living standards after the death of a spouse.

We turned therefore to another source: the Income Tax Surveys. Since 1996, the Income Tax surveys (IT) have matched INSEE’s Labour Force Survey files with the general tax department (DGI)’s files on income and residence tax. It is a statistical matching, because the survey and DGI files contain no common identifiers and matching by names has not been authorised by the data protection agency CNIL¹⁸ (INSEE, 2003).

The French Labour Force Survey (LFS) is conducted yearly. It is a rotating panel survey with a third of the sample replaced each year. It makes possible to follow 50 000 individuals over three years. In practice, for 1996 income, matching was done with the middle third of the March 1997 LFS (for the employment survey, addresses are surveyed in three successive years, and the middle third corresponds to addresses surveyed for the second time), some

¹⁴ According to French demographic data, the likelihood of losing a spouse for women is 1.1% at the age of 60, 2.8% at 70 and 8% at 80. For men, the probability is 0.3%, 0.8% and 2% respectively.

¹⁵ It is a main concern when dealing with research on income mobility.

¹⁶ On the basis of Income Tax surveys, Hagneré and Lefranc (2006) compare wage declarations made within the Labour Force surveys with wages entered on tax declarations. They conclude that “although the quality of the wage declarations is particularly good, the differential data are much noisier, which would seem to induce serious econometric biases”.

¹⁷ If we assume that the standard deviation of random error is roughly 20% of the average income measured, the variation in a household’s income from one year to the next is measured with an error whose standard deviation is equal to $20\% \times 1.41 = 28\%$ of average income (assuming that the random errors are independent from one year to the next). Since the variation in living standards we are interested in rarely exceeds 10%, the measurement error is often larger than the variation one is attempting to measure.

¹⁸ It would indeed be difficult to do so since names are not kept in the employment survey files.

25,000 households. For 1997 income, the matching was with the middle and final thirds of the March 1998 LFS (some 50,000 households). The income tax surveys for 1998 and subsequent years (until tax income 2001) cover the entire LFS sample, or 75,000 households.

At this stage we used the income tax surveys from 1996 to 2001. Since 2002, a continuous LFS has replaced the traditional March employment surveys. The subsequent income tax surveys needed to be adapted.

The Income Tax Surveys (IT) possess the major advantage of recording administrative income data, theoretically less noisy than survey responses. The tax data may be biased as a result of legislation (omission of non-taxable items of income, such as pension supplements for three children, or veterans' pensions, etc.) or tax evasion, but these errors are systematic and do not unduly distort longitudinal analysis, unlike the measurement noise affecting responses to household surveys. In addition, the employment surveys provide a large sample. Last point, it includes a detailed description of the various types of income, even if income from financial assets is under-estimated (Legendre, 2004).

At the same time, a number of difficulties arise with their use. In some cases, the matching between the LFS and the tax files fails because the tax declaration for year n cannot be found for an individual present in the March employment survey in year $n+1$. On average the matching failure rate is between 8% and 9%, leading to possible bias. Non-matching is slightly more common for the widowed (especially women). This may be due to the fact that some older people with few resources do not always complete their tax declarations¹⁹. Since they are not subject to taxation, pay no taxes and receive no housing or family benefits, these people fail to complete their declarations. This would lead to a slight over-estimation of the average living standards of older people and particularly the widowed.

In addition, the LFS panel is a panel of dwellings rather than individuals. A second cause of "losing" individuals is that they may move to another dwelling or into an institution. They thus go missing between one employment survey and the next. At this stage, the results given below have not been corrected for possible biases arising from unmonitored individuals. However, it is possible to evaluate this attrition in a qualitative manner. The bias due to residential mobility would be induced by a correlation between moving after the death of a spouse and living standard. It seems not to be the case. Although residential mobility is increased for newly widowed, income level has no influence on the probability of moving (Bonnet, Gobillon and Laferrère, 2008).

B. Widows' economic well-being currently slightly below average

Unlike in the past, widows are not on average a disadvantaged group anymore, although their living standards are still slightly below average. The much smaller number of widowers have living standards slightly above the average. If we take as reference the median living standard of married older couples of 65 and over, the median living standard of older widows living alone is 13% lower, while that of widowers living alone is 5% higher (see table 4). It is quite

¹⁹ No published data are available on this point, but it would appear that in all some 2% of households do not complete a tax declaration, a proportion that has greatly declined in the last twenty years.

clear that these average results conceal a diversity of situations including possible deprivation²⁰.

Table 4. Mean and median living standards of those over 65, by family status

Family status		mean living standards		median living standards	
		€/cu per year	comparative	€/cu per year	comparative
Women and men over 65, living as a married couple with no children at home		15 848	(base) 100	13 783	(base) 100
Women over 65 living alone	widowed	13 333	84	11 963	87
	divorced	13 074	82	11 859	86
	single	14 419	91	13 076	95
Men over 65 living alone	widowed	17 226	109	14 530	105
	divorced	15 820	100	13615	99
	single	11 949	75	10 696	78

Source: pooled Income Tax surveys 1999-2001, INSEE-DGI

Notes: individuals with a positive living standard. Living standards are computed using the OECD modified equivalence scale. Income is measured in year 2000 euros.

In the rest of this paper, we only consider married individuals with no coresiding children and the widowed, aged 65 and over, living alone. To simplify, we shall call them couples and widowed. It is important to bear this restriction in mind, since the loss of a spouse can occur in other types of household²¹.

Widowers' living standards are on average 9% higher than those of married couples. Widows' living standards are on average 16% lower than those of married women over 65. Controlling for various sociodemographic variables, such as age, socio-occupational category, father's socio-occupational category²² and educational qualifications, the living standard gap between widows and married women with similar characteristics is still 12.5% (OLS log regression of living standards).

Two reasons may be put forward for this gap:

- variation in resources due to the death of the spouse. This is of particular interest to us because it is linked to the survivor pension issue.

²⁰ The poverty rate of widows over 75 living alone is slightly above that of the general population: 6.3% compared with 5.3% for the usual poverty threshold (50% of median income), or 14% compared with 10% for a higher threshold (60% of median), if one uses a measurement of income that does not include imputed rent.

²¹ The issue of the death of a spouse with dependent children is a recurring problem that is not addressed in this paper.

²² We do not have the socio-occupational category of widows' deceased spouse. It is assumed that the father's SOC gives some indication of the social environment in which the woman lives.

- unobserved heterogeneity, due notably to differential mortality by social class. Life expectancy at age 35 for a senior manager or professional is 6 years longer than for a manual worker in the case of men, but only 2 years in the case of women (Cambois *et al.*, 2008). Consequently, it may be expected that working-class women will be widowed earlier and longer than professional-class women. This would cause a likely over-representation of manual workers' wives among widows. Widows would thus on average come from disadvantaged backgrounds. In the transversal data, this is an unobserved characteristic, since we do not know the socio-occupational category of widows' deceased husbands. The question of widow selection due to differential mortality is often mentioned in the literature (McGarry and Schoeni, 2005; Weir, Willis and Sevak, 2002 and 2003). Another probable cause of lower widow living standards due to unobserved heterogeneity is early death of a spouse : older women whose husband died while he was still working receive lower survivor pensions that are based on the husband's incomplete working life. This is another unobserved heterogeneity in the transversal data, because we do not know the date of death of widows' husbands.

We shall now attempt to determine whether unobserved heterogeneity is sufficient to explain the observed gap in a transversal cross-section between the average living standards of widows and married couples. In order to measure the variation in the resources of a married couple of older people when one spouse dies, we propose two competing approaches. One, known as longitudinal, is to use three years of the Income Tax Survey panel to directly compare household incomes before and after the loss of a spouse. The other, known as cross-sectional, is to measure selection bias by comparing for a given year the average income of widows (or married couples) by whether or not their spouse died the previous (or following) year.

C. Evaluation of economic well-being variation after the death of a spouse : a longitudinal approach

Because the LFS panel is renewed by a third each year, it is possible to follow household income during three years. The available data can be used to follow the income of two samples of 25,000 households for three years, by monitoring the first sample over the 1998-2000 period, and the second over the 1999-2001 period. For married couples who experienced the death of one member during the middle year, we compare the couple's income for the preceding calendar year and the survivor's income for the following year. Using figures for three years makes it possible to get an income for the widowed person over a whole year.

Although the small sample size urges caution in interpretation, widows' living standards appear to be 3% lower after their husband's death than before. Widowers' living standards are on average 18% higher²³ (see table 5).

²³ Comparisons with other countries are difficult. Variations in living standards depend on the type of household considered, the structure of the survivor pension system and the distribution of men's and women's pensions within the couple. Burkhauser *et al.* (2005), however, show a decrease in living standards for widows whose husbands die after the age of 70 by approximately 7% in the United States, 4% in Canada and 20% in the United Kingdom. In Germany, adjusted income is virtually the same as before the spouse's death. The equivalence scale used in this research is somewhat higher (and equal to D/\sqrt{S} , with D the total disposable income and S the household size). These figures for reductions in living standards would be significantly higher if calculated with OECD modified equivalence scale.

Table 5. Variations in disposable income and living standards before (*t-1*) and after the death of a spouse (*t+1*)

	Variation	Men	Women
Disposable income $_{(t+1)}$ / Disposable income $_{(t-1)}$	Q1	0.69	0.61
	Q2	0.79	0.65
	Q3	0.87	0.71
	Mean	0.77 (0.04)	0.65 (0.02)
Living standards $_{(t+1)}$ / Living standards $_{(t-1)}$	Q1	1.04	0.92
	Q2	1.18	0.98
	Q3	1.31	1.06
	Mean	1.17 (0.05)	0.97 (0.03)
Number of observations		45	102

Source: Income tax Surveys, 1998-2001.

Note 1 : married couples with no children in year (*t-1*) and widowed living alone in year (*t+1*), aged 65 and over. Outlying values have been removed from the distribution of living standard variations.

Note 1. In brackets, standard deviation²⁴

Note 2. Since only married couples with no children and widowed persons living alone are considered, the variation in living standards equals the variation in disposable income multiplied by 1.5 (value of the equivalence scale used).

Widowers almost always enjoy a higher standard of living after their spouse's death, whereas 58% of widows experience a loss and 42% a gain.

In line with the evidence given in Section I, having own resources (mainly a retirement pension) that were a high proportion of the household's income before the death of a spouse reduces the likelihood of suffering a reduction in living standards (see table 6).

Table 6 – Probability of a decrease in the living standard following the death of a spouse

Variables	Parameters
Constant	1.279*** (0.446)
Deceased spouse status	
Public sector employee	-0.0149 (0.505)
Private sector employee	ref.
Self-employed	-0.862* (0.521)
Share of wife's income in the total household income $_{(t-1)}$⁽¹⁾	-2.837** (1.296)
Number of observations	102

Source: Income tax Surveys, 1998-2001.

Note: sample of recently widows (during 1998-2002 period), aged 65 years and over, living alone.

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

(1) when computing this share, we only consider the part of the income easily individualised.

Note : Logit regression

²⁴ The standard deviation is calculated on the assumption of a design effect of 2 (in the light of the sample design of the LFS). It may be observed that, despite the small sample size, accuracy is acceptable.

$$\bullet \frac{N^n_{couple_{M(n+1)} \text{ and } widow(er)_{M(n+2)}}}{N^n_{couple_{M(n+1)}}} :$$

ratio between the living standard of the couples about to encounter the death of one of its member (going to die between March $(n+1)$ and March $(n+2)$) and the living standard of all couples in march $(n+1)$.

$$\bullet \frac{N^n_{widow(er)_{D(n-1)} \text{ in } couple_{M(n-1)}}}{N^n_{couple_{M(n+1)} \text{ and } widow(er)_{M(n+2)}}$$

This last ratio, deducted from the three others terms, compares the living standard of people in couple in March $(n-1)$ and widowed in December $(n-1)$ to the living standard of couples about to encounter the death of one of its member between March $(n+1)$ and March $(n+2)$. It is another way to assess the variation in the living standard following the death of a spouse. We evaluate it separately for women (see table 7a) and men (see table 7b). This ratio is corrected from the growth of pensions between the two dates considered.

Table 7a - Break down of the living standard ratio (Widows/ Couples)

	Living standard (mean) (€2000)	Living standard (median) (€2000)
$\frac{N^n_{widow_{D(n-1)}}}{N^n_{couple_{M(n+1)}}}$ (1)	0,84	0,86
$\frac{N^n_{widow_{D(n-1)}}}{N^n_{widow_{D(n-1)} \text{ in } couple_{M(n-1)}}$ (*) (2)	0,97	1,00
$\frac{N^n_{couple_{M(n+1)} \text{ and } widow_{M(n+2)}}}{N^n_{couple_{M(n+1)}}$ (**) (3)	0,94	0,95
$\frac{N^n_{widow_{D(n-1)} \text{ in } couple_{M(n-1)}}}{N^n_{couple_{M(n+1)} \text{ and } widow_{M(n+2)}}$ (4) = [1 / (2× 3)]	0,92	0,91

Source: Authors' computation from the Income Tax surveys, 1996-2001, INSEE-DGI.

Note: Sample of households where living standard is positive.

Term 1 : Sample of widows aged 65 years and over (28 201 observations) and couples where the wife is 65 years old and over (35 440 observations).

Term 2 : widows are aged 65 years and over in March $(n+1)$ and their living standard is positive.

(*) Sample of "newly widows" (persons living in couple in March $(n-1)$ and widowed and living alone in March $(n+1)$: 311 observations).

Term 3 : Definition of couples on the verge of widowhood : married couples in March $(n+1)$, the husband dies and the widow (aged 65 years old and over) lives alone in March $(n+2)$ (670 observations).

According to table 7a, we break down the 16 % gap between the living standards of widows compared to married couples (term 1). One third could be explained by the variation of resources following a spouse's death (term 4). Half of the gap reflects the living standards

differences between all married couples and couples about to encounter the death of one of its member.

Table 7b - - Break down of the living standard ratio (Widowers/ Couples)

	Living standard (mean) (€2000)	Living standard (median) (€2000)
$\frac{N^n_{widower_{D(n-1)}}}{N^n_{couple_{M(n+1)}}}$ (1)	1,06	1,05
$\frac{N^n_{widower_{D(n-1)}}}{N^n_{widower_{D(n-1)} \text{ in } couple_{M(n-1)}}}$ (*) (2)	0,90	0,87
$\frac{N^n_{couple_{M(n+1)} \text{ and } widower_{M(n+2)}}}{N^n_{couple_{M(n+1)}}}$ (**) (3)	1,02	0,98
$\frac{N^n_{widower_{D(n-1)} \text{ in } couple_{M(n-1)}}}{N^n_{couple_{M(n+1)} \text{ and } widower_{M(n+2)}}$ (4) = [1 / (2 × 3)]	1,15	1,23

Source: Authors' computation from the Income tax Surveys, 1996-2001, INSEE-DGI.

Note: Sample of households where living standard is positive.

Term 1 : Sample of widowers aged 65 years and over (5 165 observations) and couples where the husband is 65 years old and over (33 225 observations)

Term 2 : widowers are aged 65 years and over in March (n+1) and their living standard is positive.

Sample of “newly widowers” (persons living in couple in March (n-1) and widowed and living alone in March (n+1) : 129 observations

Term 3 : Definition of couples on the verge of widowhood : married couples in March (n+1), the wife dies and the widower (aged 65 years old and over) lives alone in March (n+2) (670 observations)

To investigate the different covariates playing a role on the ratio $\frac{N^n_{widow(er)_{D(n-1)}}}{N^n_{couple_{M(n+1)}}$, we estimate

the following equations on two independent sub-samples :

$$\log(N^n_{widow(er)_{D(n-1)}}) = f(X\beta) + u \quad \text{et} \quad \log(N^n_{couple_{M(n+1)}}) = g(X\gamma) + v$$

in order to compute the following ratio :

$$\log\left(\frac{N^n_{widow(er)_{D(n-1)}}}{N^n_{couple_{M(n+1)}}}\right) = \log(N^n_{widow(er)_{D(n-1)}}) - \log(N^n_{couple_{M(n+1)}}) = f(X\beta) - g(X\gamma) + (u - v)$$

X is a vector of sociodemographic variables : age, occupational status of the deceased spouse, past participation in the labor market of the surviving spouse.

No covariates do have a significant impact on the change in the living standards following the death of a spouse, excepted the dummy “has never worked” for the surviving spouse. This is consistent with the theoretical results indicating that the decrease in the living standard was

higher when the surviving spouse has low own pension benefits compared to those of the deceased spouse (see table 8).

Table 8 – Regression results

	$\log(N_{widow(er)_{D(n-1)}}^n)$ (1)	$\log(N_{couple_{M(n+1)}}^n)$ (2)	$\log\left(\frac{N_{widow(er)_{D(n-1)}}^n}{N_{couple_{M(n+1)}}^n}\right)$ (1)-(2)
Constant	10,80*** (2.94)	9,54*** (1.72)	1,26 (3.32)
Age	0,02 (0.07)	0,05 (0.04)	-0,03 (0.09)
Age squared	-0,01 (0.05)	-0,03 (0.03)	0,02 (0.06)
(Spouse) never worked	-0,19** (0.07)	-0,045 (0.04)	-0,15* (0.09)
Deceased spouse status			
Public sector employee	0,04 (0.06)	0,08** (0.04)	-0,04 (0.07)
Private sector employee	Ref	ref	ref
Self-employed	-0,27*** (0.06)	-0,30*** (0.04)	0,04 (0.07)
Number of observations	295	663	

Authors' computation from the Income tax Surveys, 1996-2001, INSEE-DGI.

Note: sample of recently widows aged 65 years and over, living alone

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

V. Discussion and conclusion

It seems that French survivor pension schemes, overall, manage to maintain widows' living standards, whatever their own socio demographic characteristics, except their own resources. Indeed, the reduction in income for a retired married couple when one of them dies is higher when the survivor has no personal pension rights. Widowers who have high personal pensions even do better than maintain their living standards. It may be supposed that this will also be true for future cohorts of retired women, who will have more often gone out to work and acquired their own pension rights, but still less than men. To improve the situation of older women, it would not, therefore, appear appropriate to make great changes to the survivor pension rate, but it may be interesting to focus on the minimum pension.

To estimate the mean or median loss of income, two different methods have been used in this paper, relying on the Income Tax surveys. They give very similar results, with insignificant differences. For women, the variation in living standards after the death of a spouse is small but slightly negative in both mean and median terms: between -9% and -2%. For men, the mean or median variation is clearly positive: between +15% and +23%.

The above results were calculated using the standard equivalence scale, which considers that maintaining living standards corresponds to a reduction of 33% in household income. However, for a widowed person who does not move into a smaller home after the death of a spouse, as is most often the case, the appropriate equivalence scale is somewhat flatter than the standard one: maintaining living standards would correspond to a reduction of 30% in

household income. Since for women the loss is estimated to be between 35% and 39%, it may be considered that a widow who wants to keep her accommodation sees her standard of living fall by an average of some 10%. Survivor pensions are consequently not entirely adequate to enable a widow to maintain her former living standard while keeping her existing accommodation. However, it is not necessarily the role of the pension system to enable older people to keep their accommodation and this policy is a normative and political one.

Looking ahead, three main directions will be followed.

First of all, we hope to have a larger sample, using the Income Tax surveys since 2002, based on the new continuous employment survey. The main difficulty we have to deal with is the methodological changes in this survey in 2003.

Nor have we at this stage addressed the question of asset income in a precise manner. The Income Tax survey measures income from property and it would be instructive to examine how this varies following the death of a spouse. As for financial income, we know from other research that this is under-estimated in the survey and other sources would need to be used, such as the capital assets survey (Enquête Patrimoine). The underlying question is whether couples for whom the survivor's pension will not be sufficient to maintain previous living standards save differently (amount and portfolio allocation) from the others.

Finally, we have omitted the important question of a possible rise in the demand for paid domestic services caused by the spouse's loss, particularly for the disabled or dependent who have to live alone. Further analysis based on the Household Budget surveys would probably give a clearer idea of the specific needs of the widowed in this respect. However, compensating for the specific needs of a small proportion of older people living alone is not necessarily part of the role of the retirement pension system.

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