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Work in Progress

The non-take-up of nursing home public benefits: Theory and empirics from France†

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Abstract: Cost-sharing measures between users and the State are a way to reduce public budgets allocated to LTC financing. However, they could also provide incentives to the non-take-up of LTC public benefits. Our paper investigates the effect of two specific cost sharing measures, estate recovery and compulsory financial assistance on the non-take up decision. It studies theoretically and empirically how these two measures affect the decision not to take up a French public benefit entitled *Aide Sociale à l'Hébergement* (ASH), which is a public subsidy covering nursing home costs for low-income individuals. Our theoretical findings show that the main drivers of the non-take-up decision are low nursing home costs, the amount of cost-sharing, the individual's wealth and family composition. Our empirical results confirm the theoretical findings.

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1. Introduction

The current demographic trend in most industrialised countries, characterised by an increase in the number of old people, creates increasing needs for long term care (LTC)[1], which expenses are mainly publicly financed (Colombo, 2012). Such trend is putting many countries under pressure to find solutions to finance LTC.

Cost-sharing measures between users or their family and the State are a way to reduce public budgets allocated to LTC financing; the most common instrument for cost-sharing being co-payments, under which the care user bears a proportion of his/her total LTC expenses. Two other and less frequent cost-sharing instruments, linked to intergenerational phenomena, are estate recovery and compulsory financial assistance. Estate recovery consists of recovering part of the public LTC benefits from the estates of deceased beneficiaries. Such policy exists in the U.S. and France, and its implementation is currently under discussion in Switzerland, England and Wales[2]. Compulsory financial assistance consists of the legal obligation for children and other family members to provide financial assistance to their elderly in need either when they have spent down their own resources or as a condition for the elderly parents to have access to publicly-funded LTC. Compulsory financial assistance exists in many European countries such as Austria, Germany and France.

Although cost sharing measures can improve public LTC budgets, they could also provide incentives to the non-take-up of LTC public benefits for different reasons. People with low economic resources might not apply for LTC benefits if co-payments represent a very high proportion of their income as stressed by Ramos-Gorand (2016) for France. Altruistic parents, wishing to leave a bequest, may be discouraged to ask for public benefits in the presence of an estate recovery program as discussed by Dick (2006) in the case of Medicaid for the U.S.

Better understanding non-take-up decisions is important as non-take up reinforces horizontal inequity, i.e. inequality of access to LTC between citizens with the same needs and rights but with different characteristics. In addition, non-take-up may lead to a substitution of formal LTC by informal LTC, leading for instance spouses and children, the main providers of informal care, to reduce their labour market participation (Moussa, 2018) or to experience lower physical or mental health (Schulz and Beach, 1999) as they have to provide informal care.

The effect of cost-sharing instruments on non-take up decisions has recently been addressed empirically by Arrighi et al. (2015) in the case of co-payments for France. However, no formal research to the best of our knowledge has investigated the effects of estate recovery and compulsory financial assistance on the non-take up decision. Our paper tries to fill this gap, both theoretically and empirically, by focusing on a French public benefit entitled *Aide Sociale à l'Hébergement* (ASH), which is a public subsidy covering nursing home costs for low-income individuals and which eligibility is tied to both estate recovery and financial assistance. In a first step, we theoretically study the effects of estate recovery and compulsory financial assistance on the decision of non-take up public LTC benefits. In particular, we study the conditions under which individuals entering in nursing home institutions decide not to take up a public nursing home benefit similar to the ASH. In a second step, we empirically test these results using French data of potential recipients of the ASH. In particular, we use data from the

[1] LTC is defined as "a range of services required by persons with a reduced degree of functional capacity, physical or cognitive, and who are consequently dependent for an extended period of time on help with basic activities of daily living" (Colombo et al., 2011).

[2] See ATS (2018) and Cremer et al. (2016) for more details about the discussions in Switzerland and England and Wales respectively.

CARE Institutions survey, which includes detailed information about a representative sample of people residing in nursing homes in France comprising whether or not they receive the ASH.

Our theoretical findings show that the main drivers of the non-take-up decision are the level of nursing home costs, the rates of estate recovery and of financial assistance, and the wealth and income of both institutionalised parents and their offspring. Our empirical results confirm the theoretical findings as the expected and realized length of stay in institution, the degree of dependency, the individuals' family composition and wealth are among the main drivers of ASH non-take up in practice.

This paper is structured as follows. In section 2 we briefly review the economic literature related to the non-take up of public benefits. Section 3 describes how the ASH is organised in practice. The theoretical part, including the set-up of the model and the theoretical results is introduced in section 4. Section 5 contains the empirical analysis, which includes the presentation of the database, the variables used and the econometric specification as well as the empirical results. The last section offers a conclusion.

2. Literature review

The literature on the topic of the non-take-up of public benefits is rather extensive and mainly focuses on means-tested social assistance benefits.

Moffit (1983) analyses the take-up of social assistance by considering the fact that claiming and receiving welfare benefits might have psychological costs such as stigma (i.e. negative self-characterization from participation in welfare) or physical and time costs. He provides empirical evidence from the U.S. that the decision to go on welfare, but not the amount of benefits received, has significant stigmatizing effects. Duclos (1995) presents a general methodology for modelling the take-up of social assistance benefits. He finds that the accuracy of take-up estimates can be quite sensitive to the presence of entitlement assessment errors made by the government. Information about the existence of public benefits and low transaction costs have been found to have a significant positive effect on the take-up of minimum pension benefits in Greece and Spain (Matsaganis et al., 2010). The degree of needs, measured by the amount of benefit and by the expected duration of eligibility, is the key determinant of the take-up of social assistance in Finland and Germany (Bargain et al., 2009; Bruckmeier and Wiemers, 2012). Dick (2006) discusses the effect of the estate recovery program on discouraging potential beneficiaries of Medicaid benefit to ask for public help.

In the field of health economics, the phenomenon of non-take-up has been less studied. Guthmuller et al. (2014) analyse the take up of subsidized complementary-health-insurance from an experiment in France. They find that the main reason behind the non-take-up of this type of insurance is the lack of information concerning the program and the complexity of the application process. Arrighi et al. (2015) study the non-take-up of public LTC benefits in France and they find that claiming for the APA, the main LTC public allowance in France, is positively related to lower co-payment rates. This coincides with the conclusions of Ramos-Gorand (2016) who finds, from interviews of different LTC providers, that co-payments are among the causes of the non-take-up of the APA and force people with low revenues to ask for a lower amount of help than the one they are entitled to.

Our work complements the current literature in several aspects. First, together with Arrighi et al. (2015), it is one of the few academic studies on the non-take up of public LTC benefits. Second, it is the first study examining the roles of estate recovery and compulsory financial

assistance, two potential alternative measures to reduce LTC spending, on the non-take-up of public LTC support. Finally, it provides theoretical evidence for the mechanisms behind the *a priori* intuitive negative relationship between cost-sharing and LTC benefits take-up.

3. Eligibility criteria of the French nursing home public benefit (ASH)

The *Aide Sociale à l'Hébergement* (ASH) is a social assistance benefit in France which aim is to help elderly dependent people with limited resources to fund the costs of a nursing home. More specifically, the ASH covers the lodging costs of the nursing home, the personal care costs being partially funded by the *Allocation Personalisée d'Autonmie* (APA), the main LTC benefit, and the medical costs by the social security and health insurance. The ASH is financed and managed on a decentralised basis by the departments, i.e. the level of government between the regions and the municipalities (IGAS, 2011).

Social assistance in France is regulated by the *Code de l'Action Sociale et des Familles*. One of the main principles of this law is that the reception of social assistance benefits is a right, but only for those people who are really in need (art. 111-2). If an individual faces financial difficulties but can be supported by his family, the law might not consider this individual to be eligible to social assistance anymore (art. 132-6). Moreover, if the wealth of the individual in difficulties can cover his needs or if his financial condition improves, the law allows the authorities to recover, partially or totally, the amount of benefits granted (art. 132-8).

In the spirit of social assistance, the ASH is a means-tested benefit as it can only be granted if the beneficiary's income is lower than a predetermined threshold[3]. Moreover, three additional conditions are imposed to grant the ASH (IGAS, 2011).

First, the dependent individual has to contribute to nursing home costs through a given proportion of his income (usually 90%). Second, his spouse and his children (and in some departments his grand-children and children-in-law too) have also to contribute to nursing home costs through a specific proportion of their income. Such contribution is called compulsory financial assistance (*obligation alimentaire* in French). The amount of nursing home public benefit received by the beneficiary, i.e. the ASH, is the difference between the nursing home cost and both the individual's and children's contributions. The third condition tied to being granted the ASH is subject to estate recovery, i.e., the government recovers a proportion of the amount of public benefit, the ASH, from the estate of the beneficiary after his death.

The ASH has retained, much more than any other social assistance benefit, the original characteristics of social assistance. Indeed, in any other social assistance allocation in France compulsory financial assistance is required. Moreover, concerning state recovery, in the other social assistance benefits there exist downward ceilings which is not the case for the ASH (IGAS, 2011) which is fully recovered.

While compulsory financial assistance and estate recovery allow for departments to lessen their LTC financial burden, they are often accused of being the main reason for the observed high rates of non-take-up of the ASH. Indeed, even if 75% of residents are eligible to this benefit, only 20% of them receive it (IGAS, 2011).

[3] In some departments, the eligibility criterion includes income and assets.

4. The theoretical model

4.1. The benchmark model with one child

We consider a parent and a child. The parent is severely dependent and has to enter into a nursing home. The parent or the child needs to decide whether or not to request the *Aide Sociale à l'Hébergement* (ASH), to fund nursing home costs. If the public benefit is not requested, nursing home costs are fund exclusively by the parent's wealth, for example, by selling the parent's assets.

We consider the child as the decision maker, i.e. the one deciding to request the ASH. We make that assumption on two grounds. First, since the parent is severely dependent, he is not in full capacity to request public benefits. Second, and more importantly, the child is financially impacted by the ASH take up through his income due to compulsory financial assistance and through his bequest due to estate recovery and the loss of the parent's assets if they are used to pay for the nursing home.

Let $u(.)$ be the utility function of the child representing his preferences which depend only on wealth. If the child does not decide to request the ASH, his utility is:

$$u(x_1) = u\big(z_0 + \omega \ + \beta s(w_0 + r - N)\big)$$

where z_0 is the child's initial wealth and ω his wage. The child can expect an inheritance amounting to a share s of the parent's final wealth with $0 < s < 1$. The parent's final wealth is composed by his initial wealth w_0 plus his income r minus total nursing home cost N. For the sake of simplicity, we assume nursing home costs (and thus the length of the parent stay in nursing home) to be known with certainty by the child. Besides, we implicitly assume that the parent's wealth, $w_0 + r$, is higher than the nursing home cost *N*. This assumption is relaxed in the next section. Let β be the child's intertemporal discount factor to account for impatience with $0 < \beta < 1$.

If the child decides to request the ASH, his utility is:

$$u(x_2) = u\big(z_0 + (1 - \alpha)\omega \ + \beta s(w_0 + (1 - \eta)r - \psi A)\big)$$

where α corresponds to the rate of compulsory financial assistance, η to the 90% taken from the parent's income, ψ to the estate recovery rate and A to the amount of the public benefit.

4.1.1. The non-take up decision

The child does not take-up the ASH whenever $u(x_1) > u(x_2)$. If $u(x_1) < u(x_2)$ he requests it and if $u(x_1) = u(x_2)$ he is indifferent between requesting it or not.

The non-take up decision is therefore equivalent to:

$$u(x_1) > u(x_2) \leftrightarrow x_1 > x_2 \leftrightarrow \beta s(r - (1 - \eta)r) - \beta sN + \beta s\psi A + \alpha\omega > 0$$

By simplifying the above condition we get:

$$N < \eta r + \frac{1}{\beta s}\alpha\omega + \psi A \quad (1)$$

The child does not take-up the ASH whenever the nursing home cost is lower than the sum of the parent's and the child's contributions, this second element being weighted by the coefficient $\frac{1}{\beta s}$, and estate recovery.

Hence, the more likely the child does not take up the ASH if the parent's income r, the child's wage ω and the cost-sharing parameters η, α and ψ are high[4] relative to the nursing home cost N. Interestingly, if the share of the inheritance received by the child or the discount factor are low, the child is also more likely to not take up the public benefit[5].

In the case where there is no cost-sharing, i.e. $\psi = 0$, $\alpha = 0$ and $\eta = 0$, the child always requests the ASH as Eq. (1) never applies.

In France, estate recovery starts from the first euro, i.e., $\psi = 1$. Hence, according to Eq. (1), the child does not take-up the ASH whenever:

$$A > N - \eta r - \frac{1}{\beta s}\alpha\omega \quad (2)$$

By definition of the ASH, it is equal to the nursing home cost minus the parent's and the child's contribution, i.e., $A = N - \eta r - \alpha\omega$. Thus, as $\frac{1}{\beta s} > 1$, then Eq. (2) always applies. Hence, according to our model, if the parent's wealth is large enough to cover nursing home costs, the child is always better off not taking up the ASH and paying the nursing home by using the parent's resources. The rate of non-take-up is, thus, equal to 1.

This result is rather natural. The ASH can be viewed in this case as an "intergenerational credit". The child is always worse-off when taking-up the public benefit because of compulsory financial assistance. Indeed, the child's contribution to nursing care costs makes his inheritance increase, by reducing nursing home expenses by $\alpha\omega$. However, the child's contribution $\alpha\omega$ is only partially recovered from a higher inheritance because $\beta s < 1$.

Actually, our model shows that the way the ASH is built provides strong disincentives to request the ASH to families with one child who can afford to pay nursing home costs. This is in line with the current policy makers' objectives, as the ASH is nowadays considered as social assistance, which is a right only for those people who are really in need. Therefore, only those families with one child who are not wealthy enough to pay for a nursing home may have incentives to request the ASH. This is what we are investigating in the following section.

4.1.2. Non-take up decision with low parental wealth

We now assume the parent's wealth is not sufficient to pay for all nursing home costs, i.e. $N > w_0 + r$. In this case, whether or not the ASH is requested, the child contributes to nursing

[4] Considering η depending on the parent's income and α on the child's wage would amplify the effects of r and ω on the non-take up decision.

[5] Additional costs could exist when taking-up a public subsidy, for example, psychological costs such as stigma (Moffit, 1983) and transaction costs through the application process (Matsaganis et al., 2010). These additional costs could tend to increase the non-take-up of the ASH by the child.

home costs. Indeed, in France, children are legally obliged to provide financial assistance to parents who spent down their own resources and therefore for their parent's nursing home costs.

If the ASH is not requested, the child has to pay for the part of nursing home costs not paid by the parent's wealth and the bequest is equal to zero. If the ASH is requested, the only difference with respect to the previous case is that the amount of public benefit recovered from the parent's estate cannot exceed the parent's wealth. We can now express the child's utility of these two decisions.

If the child does not decide to request the ASH, his utility is:

$$u(x_1) = u\big(z_0 + \omega - (N - w_0 - r)\big), \text{ with } N > w_0 + r$$

If the child decides to request the ASH, his utility is:

$$u(x_2) = u(z_0 + (1-\alpha)\omega + s\beta\, max\{w_0 + (1-\eta)r - \psi A\,; 0\})$$

It can be easily shown that $u(x_1) > u(x_2)$ is equivalent to:

$$N < w_0 + r + \alpha\omega - s\beta\, max\{w_0 + (1-\eta)r - \psi A\,; 0\} \qquad (3)$$

The child does not take-up the ASH whenever the nursing home cost is lower than the sum of the parent's wealth and the child's contribution, minus the inheritance if any.

In the case of France, where $\psi = 1$, and since $A = N - \eta r - \alpha\omega$, Eq. (3) becomes:

$$N < w_0 + r + \alpha\omega \qquad (4)$$

Contrary to the previous case, it could happen that the child requests the ASH even with full estate recovery. The reason is that the ASH cannot be viewed as an intergenerational credit anymore. Indeed, the public benefit is now not fully recovered from the parent's estate for those individuals who are not wealthy enough to pay for a nursing home. From Eq. (4), the more likely the child takes up the ASH if the parent's wealth and the child's wage are low relative to the nursing home cost N.

4.2. The case with multiple children

In this subsection, we depart from the hypothesis of only one child and consider the case of multiple children. We first consider the case when only one child decides on behalf of all the children to request or not public benefits. Second, we consider that children decide together whenever their aggregate utility is maximised.

4.2.1. Only one child as decision maker

Let us now consider n children with $n > 1$ where each child is subject to compulsory financial assistance. If the parent's wealth is larger than the nursing home cost, the child's i utility if the ASH is not requested is:

$$u\big(x_{1,i}\big) = u\left(z_{0,i} + \omega_i + \beta_i s_i (w_0 + r - N)\right)$$

with the subscript i relating the variable considered to the child i.

The child's i utility if the ASH, now labelled A', is requested is:

$$u(x'_{2,i}) = u\left(z_{0,i} + (1-\alpha_i)\omega_i + \beta_i s_i(w_0 + (1-\eta)r - \psi A')\right)$$

with

$$A' = N - \eta r - \alpha_i\omega_i - \sum_{j\neq i}^{N}\alpha_i\omega_j \qquad (5)$$

In this case, if $\psi = 1$, the child i does not take-up the ASH if $A' > N - \eta r - \frac{1}{\beta_i s_i}\alpha_i\omega_i$. By replacing A' in Eq. (5), we get the following condition:

$$\sum_{j\neq i}^{N}\alpha\omega_j < \frac{1}{\beta_i s_i}\alpha_i\omega_i \qquad (6)$$

This condition might not necessarily hold contrary to the case with only one child given by Eq. (2). Therefore, with multiple children, the decision to take-up the ASH by child i could be rational even for families with parents who can afford to pay the nursing home costs. This is the case as with multiple children contributing to compulsory financial assistance, the amount of public subsidy A' (which is equivalent to estate recovery for $\psi = 1$) is reduced. Thus, a child earning a relatively low wage, i.e. contributing less to compulsory financial assistance, might be willing to request the subsidy if the contributions of the other children are relatively high, since they protect his inheritance.

We additionally see from Eq. (6) that the effect of an increase in the number of children on the non-take-up decision is ambiguous. On the one hand, more children increase non-take up as the child's i share of the total inheritance is reduced. On the other hand, with additional children, estate recovery is reduced and consequently the non-take up.

Let us know consider the case where the parent's wealth is not sufficient to pay for all nursing home costs. The child's i utility when the ASH is not requested is:

$$u(x'_{1,i}) = u\left(z_{0,i} + \omega_i - \sigma_i(N - w_0 - r)\right), \text{ with } N > w_0 + r$$

where σ_i is the proportion of the parent's out-of-pocket nursing home costs covered by child i.

When the ASH is requested, the child's i utility is:

$$u(x_{2,i}) = u(z_0 + (1-\alpha_i)\omega_i + s\beta\, max\{w_0 + (1-\eta)r - \psi A' ; 0\})$$

If inheritance equals zero when the ASH is taken-up (the amount of estate recovery exceeds the parent's wealth), the child i does not take-up the ASH whenever:

$$N < w_0 + r + \frac{\alpha_i}{\sigma_i}\omega \qquad (7)$$

If the proportion σ_i is very small, the child *i* does not request the ASH as he does not have to pay much for his parent's out-of-pocket medical expenses in that case. Inversely, if σ_i is large, i.e. close to one, the child *i* has more incentives to request the ASH.

However, with multiple children, the probabilities of having a positive inheritance when taking-up the ASH increase as estate recovery is reduced. In such as a case, if $\psi = 1$ and given that $A' = N - \eta r - \alpha_i \omega_i - \sum_{j \neq i}^{N} \alpha_j \omega_j$, the child's i non-take up condition is given by:

$$N < w_0 + r + \frac{1-\beta_i s_i}{\sigma_i - \beta_i s_i} \alpha_i \omega_i - \frac{\beta_i s_i}{\sigma_i - \beta_i s_i} \sum_{j \neq i}^{N} \alpha_j \omega_j \qquad (8)$$

This last condition is more difficult to interpret depending on whether $\sigma_i - \beta_i s_i < 0$ or $\sigma_i - \beta_i s_i > 0$.

4.2.2. Aggregate welfare

In the previous section, we made the assumption that the decision to request public benefits is made by only one of the children, i.e. child *i.*, and that all other children follow that decision and behave the same way. It is not always realistic to assume that the optimal choice of child *i* is the final choice of the family.

Alternatively, we could imagine that children decide together on the best solution that maximises their total utility, i.e. the aggregate utility of children. If we assume a utilitarian social welfare function, we have that the aggregate utility if the ASH is not requested is $U(X_1) = \sum_{i=1}^{n} u(x_{1,i})$. If the ASH is requested then $U(X_2) = \sum_{i=1}^{n} u(x_{2,i})$.

The non-take up decision is therefore equivalent to:

$$U(X_1) > U(X_2) \leftrightarrow \sum_{i=1}^{n} u(x_{1,i}) > \sum_{i=1}^{n} u(x_{2,i}) \leftrightarrow \sum_{i=1}^{n} \Delta u_i > 0 \qquad (9)$$

with $\Delta u_i = u(x_{1,i}) - u(x_{2,i})$.

The individual case of child *i* has already been studied in section *4.1.*, i.e. the child i requests the benefit if $\Delta u_i > 0$ and does not request it if the opposite holds.

For the sake of simplicity, we now assume that there are two children. In this case, three scenarios are possible. Children agree together not to request the benefit, i.e. $\Delta u_i > 0 \ \forall \ i$. Children agree together to request the benefit, i.e. $\Delta u_i < 0 \ \forall \ i$. Children disagree between each other of whether or not requesting the benefit.

4.2.2.1.Non-take-up with large parental wealth

Assuming equal discount factors, according to Eq. (6), child i does not request the benefit if $\alpha_j \omega_j < \frac{1}{\beta s} \alpha_i \omega_i$ and child j if $\alpha_i \omega_i < \frac{1}{\beta(1-s)} \alpha_j \omega_j$.

If $\omega_i \approx \omega_j$, the two conditions hold as $0 < s < 1$. Consequently, children decide not to request the ASH.

If $\omega_i \gg \omega_j$ the first condition holds but the second does not. Child i is better-off without the ASH and child j with it. Requesting the ASH is preferred by child j as he is relatively poorer. Therefore, he can free-ride on the other child's financial help and obtain a higher inheritance without participating much to compulsory financial assistance. It's worth noting that a situation where both children are better-off with the ASH is impossible in this model.

The ASH is requested if child's i marginal increase in utility when not requesting the ASH is lower than child's j marginal utility when requesting the ASH. If marginal utility is decreasing, we expect $\Delta u_i < -\Delta u_j$ (as child i is richer) and therefore, the ASH is requested. However, this type of situations might be a reason for the non-take up as well, given that it has been empirically shown that compulsory financial assistance is an important source of conflicts between parents and children, having a negative effect on take-up (IGAS, 2011).

With n children the analysis becomes less straightforward. Intuitively, we can expect the ASH not to be requested if there is wage equality between children (in the sense of the Gini coefficient / Lorenz curve). This is the case as few opportunities for "free-riding" exist. However, if few children have considerably more wealth than the majority, we can expect children to request the ASH as the utilitarian rule implies that the poorer impose their preferences over the richer.

4.2.2.2. Non-take-up with low parental wealth

If inheritance equals zero when the ASH is requested (i.e., $w_0 + (1-\eta)r < \psi A'$) we know from Eq. (7) that child's i non-take-up condition is $N < w_0 + r + \frac{\alpha}{\sigma_i}\omega$. In the case of a family with two children, child's i decision is independent from child's j wage and there are no possibilities of free-riding. The conclusions are the same as in the case of one child (the only change is now, that σ_i can vary across siblings).

5. Empirical analysis

5.2. The Data

We use the CARE-institutions database to analyse the determinants of the ASH take-up in France. This survey looks at the living conditions of elderly people living in nursing homes in France. It contains information about health-related variables, socio-economic variables and family related variables of institutionalized seniors. It also includes information about the public allocations received by the interviewed, their children and their main caregivers.

The survey was performed by the DREES, a public research organism working for the French ministries of Economy and Finance, Health and Social Affairs and Employment. The interviews took place from September to December 2016. 3'300 individuals aged 60 or more from 700 institutions participated to the interviews, corresponding to a response rate of 88% (DREES, 2016; Besnard and Costa, 2018).

5.3. Descriptive statistics

Table 1 below contains a short description of the set of variables studied in the empirical analysis including their mean value, for all the sample and conditional on the reception of ASH benefits.

Table 1
Variables' description and descriptive statistics

Variable	Description	N	Mean (all)	Mean (ASH = 1)	Mean (ASH = 0)
ASH	1 if the individual benefits from the ASH.	2 800	0.187	1	0
APA	1 if the individual benefits from the APA.	2 800	0.828	0.874	0.817
Female	1 if the individual is a woman	2 800	0.748	0.685	0.762
Owner	1 if the individual reports to own a property.	2 800	0.441	0.174	0.502
Age	The individual's age.	2 800	86.721	81.967	87.812
GIR	The individual's degree of dependency, according to the French GIR scale.	2 800	2.811	2.725	2.831
Years resident	The number of years the individual has been institutionalized.	2 800	3.715	6.937	2.975
Public	1 if the individual lives in a public institution.	2 800	0.503	0.671	0.464
Private lucrative	1 if the individual lives in a private for-profit institution.	2 800	0.195	0.053	0.227
Single	1 if the individual declares to be single	2 800	0.166	0.413	0.110
Married	1 if the individual declares to be married	2 800	0.127	0.057	0.143
Widow	1 if the individual declares to be widow	2 800	0.632	0.388	0.688
Child binary	1 if the individual has children	2 800	0.751	0.503	0.809
N children	The number of children of the individual	2 800	1.813	1.273	1.938
Child executive	1 if the individual has a child working as an executive	2 015	0.180	0.049	0.215
Child in couple	1 if the individual has a child who is in couple	2 015	0.547	0.260	0.621

18.7% of our sample declares to be beneficiary of the ASH. Therefore, 81.3% of the resident do not benefit from this subsidy. The proportion of beneficiaries of the APA (which requires neither state recovery nor compulsory financial assistance) is much higher and reaches 82.2% of the sample. Interestingly, the proportion of APA beneficiaries is larger among the beneficiaries of the ASH, suggesting that the two types of benefits are rather complements.

Our sample is mainly feminine (74.8% of women), as it is normally the case for older populations, but the group of ASH beneficiaries has a lower proportion of women (68.5%). Owning a property is much more common across the individuals who do not receive the ASH (50.2% vs. 17.4% in the case of the beneficiaries).

The average individual in our sample is relatively old (86.72 years old). However, the beneficiaries of the ASH are much younger in average (around 5 years younger). The ASH beneficiaries are also slightly more dependent (lower GIR) than the non-beneficiaries, but the

difference is only weakly significant. The average ASH recipient resides 2.3 times more years in institution than the average non-recipient (7 vs 3 years).

Concerning the civil state, while in the whole sample and in the sample of non-beneficiaries widow are predominant (63% and 68% respectively), the sample of ASH beneficiaries is characterized by a relatively large proportion of single individuals (never married nor in a registered partnership) that reaches 41%. In addition, individuals receiving the ASH are less likely to have children and logically, have also less children in average.

5.4. Econometric specification and empirical results

In order to test the effects of the different variables introduced in Table 1 on the probability to take-up the ASH, we assume this probability to be a function of a set of explanatory variables. This corresponds to the following model:

$$P(\,ASH_i = 1 \mid X_i\,) = \; F(X_i'\beta)$$

where ASH_i is a variable equal to 1 if the individual i benefits from the ASH. X_i is a vector of individual characteristics (e.g. APA recipient, gender, owner, etc.), likely to have an impact on the ASH take-up. Assuming $F(.)$ to be the cumulative distribution function of a logistic distribution, the abovementioned specification can be estimated by using a logit model.

The following table presents the results of two different logit models. In the first column, we present the results of a model which does not include information about the individuals' children. Our aim is to minimize the number of missing values, as unfortunately, our dataset including the children's information is less complete. In the second column we present the results of the full specification.

Table 2
Results of the logit models

Dependent variable: ASH	Logit I Only parent's information	Logit II Includes children information
Intercept	-0.310	-0.272
	(0.284)	(0.326)
APA	0.087^{*}	0.116^{**}
	(0.049)	(0.058)
Female	-0.130	-0.160
	(0.132)	(0.157)
Owner	-1.529^{***}	-1.544^{***}
	(0.183)	(0.207)
Owner = Refusal	-0.930^{**}	-1.458^{**}
	(0.466)	(0.654)
Owner = I don't know	-0.152	-0.253
	(0.137)	(0.182)
Age = (80 ; 90]	-0.905^{***}	-0.900^{***}
	(0.142)	(0.170)
Age = (90 ; 110]	-1.299^{***}	-1.330^{***}
	(0.157)	(0.189)
GIR	-0.133^{***}	-0.142^{***}
	(0.045)	(0.052)

Years resident	0.085^{***}	0.088^{***}
	(0.012)	(0.014)
Public	0.562^{***}	0.694^{***}
	(0.127)	(0.152)
Private lucrative	-1.206^{***}	-1.342^{***}
	(0.232)	(0.285)
Single	0.805^{***}	0.701^{***}
	(0.181)	(0.198)
Single = I don't know	1.238^{***}	1.990^{***}
	(0.463)	(0.710)
Child binary	-0.589^{***}	-0.056
	(0.163)	(0.242)
Child executive	–	-0.927^{***}
		(0.296)
Child in couple	–	-0.537^{**}
		(0.220)
Observations	2 797	2 013
Pseudo R^2 †	0.244	0.294

*Robust standard errors are reported in parentheses. The significance levels of the two-tailed hypothesis test are coded as follows: * significance at 10% level, ** significance at 5% level, *** significance at 1% level.*
† *Mc. Fadden's pseudo R*

The results of the logit models are globally in line with the descriptive statistics. In the first regression, we observe that benefiting from the APA is positively related to receiving the ASH but this effect is only significant at the 10% level. In the second regression this coefficient is significant at the 5% level. Being a woman is not significantly related with receiving the ASH after including the control variables. The effect of owning a property is negative and highly significant, being the coefficient with the largest effect (in absolute value) and t-statistic. This is in line with the theoretical results relative to the effects of wealth and state recovery on ASH non-take-up found section 3. Indeed, individuals owning properties are more likely to be able to pay for the totality of nursing home costs by using their savings and wealth. Thus, they would be more prone to not take-up the ASH (see Eq. 2 and the effect of w_0 in Eq. 4). Interestingly, refusing to answer the question of owning a property is also negatively related to ASH reception at the 5% level.

Being relatively old and a low degree of dependency (high GIR) are also negatively and strongly related to the reception of ASH benefits. The number of years the individual has been residing in an institution is, instead, a strong predictor of ASH take-up. Furthermore residing in a public institution is strongly positively related to receiving the ASH while residing in a private for-profit residence has the opposite effect. Therefore, if we consider elderly people to have a lower expected length of stay, a low degree of dependency as a proxy of low nursing-home costs and the number of years resident as a measure of the realised length of stay, these figures also confirm the previous theoretical findings, implying that low nursing home costs have a positive effect on non-take-up.

Moving to the effect of family composition, being single (i.e. never married) is strongly positively associated with ASH take-up. This is consistent with the fact that large families want to be protected from the burden that represents compulsory financial assistance to spouses and children. This is also consistent with the fact that families, composed by individuals obliged to contribute to nursing home costs but having different interests, might want to avoid the conflicts related to compulsory financial assistance by not taking up the benefit. The variables *Married* and *Widow* were not considered for the regression as being single was found to be the strongest

determinant of ASH take-up among the family composition variables. Finally, having children is significantly negatively correlated with ASH reception in the first regression. However, in the second regression, where children characteristics are included as additional controls, the effect of having children vanishes and only their characteristics remain significant. Having a child working as an executive is negatively and very significantly related to ASH take-up. One explanation could be that children working as executives are the ones that are forced to pay the highest compulsory contributions to nursing home costs. The coefficient corresponding to a child being in couple has also a negative sign. The reason could be that children's spouses can also be forced to contribute to the nursing home costs of their in-laws, but their willingness to do so is likely to be lower than the children's. However, this last effect is significant at the 5% but not at the 1% level. These results suggest that, concerning compulsory financial assistance, the characteristics of children might play a more important role on the non-take-up decision than just the presence of children by itself.

6. Discussion and conclusion

Cost-sharing policies, which aim is to make the user or his family to participate to the financing of public LTC benefits, can be seen as a potential solution to LTC financing. However, these policies incentivize the non-take-up of public benefits, which has various negative individual and social consequences. In this article we study, from a theoretical and empirical perspective, how two specific cost-sharing measures, i.e. estate recovery and compulsory financial assistance, affect the non-take-up of the ASH, a public LTC benefit covering nursing home expenditures in France.

Our theoretical findings show that the main drivers of the non-take-up decision are low nursing home costs, the amount of cost-sharing, the individual's wealth and family composition. Interestingly, we find that the way the ASH is built in practice provides strong disincentives to request it to families with one child. In particular, because of the presence of full estate recovery and compulsory financial assistance, this public benefit can be seen as an *intergenerational credit* for those dependent individuals whose wealth is large enough to cover nursing home costs. This is in line with the current policy makers' objectives, as the ASH is considered as social assistance nowadays. Our empirical results confirm the theoretical findings. Indeed, low expected nursing home costs (measured by age and a low degree of dependency) increase the probabilities of not receiving the ASH and high nursing home costs have a positive impact on ASH take-up. Additionally, owning a property increases the probabilities of not benefiting from the ASH. We also find that, among the different types of families, singles are the main group to benefit from the ASH and that the characteristics of children might play a more important role in the non-take-up decision than the presence of children themselves.

The current version of our paper has several limitations. First, as we lack full information about individuals' income and since eligibility criteria are complex, we might have included in our empirical analysis some individuals not eligible for receiving ASH benefits. Hence, the coefficient of owning a property in the empirical results could be biased upwards, leading to a potential overestimation of the effect of estate recovery on ASH take-up. The same problem is also likely to affect the coefficient corresponding to *Child Executive*. Further work on this issue is currently being done. Finally, the non-take-up rate might depend on the trade-off between the decision to be cared at home and the one of entering in a nursing home. We have not considered this issue, but this could be an interesting topic for future research.

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