DOCUMENTS DE TREBALL

DE LA FACULTAT

DE CIÈNCIES ECONÒMIQUES

I EMPRESARIALS

Col·lecció d'Economia

Willingness to Pay for Long-Term Care Coverage: the Role of Private Information and Self-Insurance*

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Abstract

Both public and private insurance for long-term care is undeveloped in some European countries such as in Spain and empirical evidence is still limited. This paper aims at examining the determinants of the demand for Long Term Care (LTC) coverage in Spain using contingent valuation techniques. Our findings indicate that only one-fifth of the population is willing to pay to assure coverage for LTC expenditures although we find high price elasticity. LTC coverage decisions are significantly affected by private information asymmetry and housing tenure in giving rise to self-insurance reduces the probability of insurance being hypothetically purchased.

Key words: Long-term care; willingness to pay; long-term care insurance.

JEL classification: D63, D78, I11, and H43.

Resum.

Tant l'assegurament públic com el privat per a cobrir els riscos financers associats a la dependència està poc desenvolupat en els països Europeus com ara Espanya, i la evidència empírica al respecte és limitada. Aquest article pretén examinar els determinants de la demanda de cobertura de l'atenció de llarga durada PLLD (lligades a la dependència) a Espanya utilitzant la metodologia de valoració contingent. Els nostres resultats indiquen que només una cinquena part de la població esta disposada a pagar per assegurar la cobertura de les PLLD tot i que l'elasticitat al preu es elevada. Les decisions de cobertura de les PLLD està significativament afectada per l'existència d'informació asimètrica així com la propietat d'un pis, atesa la possibilitat d'autoassegurament.

Paraules clau: prestacions de llarga durada, disponibilitat a pagar, assegurança de dependència.

1. Introduction

The financing of long-term care (LTC) for older people is at the top of the social policy agenda in Europe. The ageing of the European population is becoming increasingly apparent to policy-makers and in some countries such as Spain, the size of the dependant elderly population is expected to double in the next 50 years (Comas et al., 2003). This feature is accompanied by changes in family structures (e.g., a smaller number of children per family and the integration of female workers in the labour market) that indicate an ostensible reduction of potential informal caregivers and thus, anticipate a higher demand on financing mechanisms funding nursing home and community care services.

European Commission supported research (Pacolet *et al*., 2000) concludes that there is inadequate insurance against the risks of long-term care in the European Union. Indeed, whereas in most EU countries treatment for acute illness is fully funded by public bodies, public support for the long-term care of individuals is scarce in all but a few countries (e.g., Germany and Austria have set up social insurance schemes). Even when publicly funded support is available, it normally tends to be means tested and potential consumers are faced significant consumer co-payments (Comas et al., 2003). Thus, the cost of paying out-of-pocket for long-term care is a major concern for many middle-income couples who might not qualify for state help but that has no access to alternative insurance schemes. This lies in the fact that costs of LTC can be individually 'catastrophic' when severe dependency requires long term assistance for personal and domestic care if family members are unable to provide such care. Therefore, although no insurance entitlement exists in Spain — or in other countries in Europe — to cover long-term care, there is space for some insurance schemes to be developed.

All policy initiatives currently in place in Spain regarding LTC coverage refer to the LTC insurance market in the USA. Interestingly, studies based on the US LTC insurance market find that only around 10-20 per cent of the elderly can afford private long-term care insurance (Rafferty and McBride; 1992; Capitman and Leutz, 1992; Wiener et al, 1994). However, evidence of affordability is often regarded as being flawed because does not measure the consumer's willingness to pay (Wiener et al., 1994). Indeed, those studies do

not take into account the fact that some people might be willing to increase their working hours in order to pay future LTC expenses. On the other hand, current LTC insurance products have been shown to exhibit slow market development (Cohen et al., 1993 and Kumar et al., 1995). Some authors find evidence in the US market of a significant reluctance among middle age individuals to purchase LTC insurance (Merril, 1992). While a 65 year-old US citizen has a 39 per cent chance of entering a nursing home, less than five per cent of senior citizens purchase private insurance. That is, LTC insurance as an ex-ante means of paying for institutional care is a 'least preferred' option (Sloan and Norton, 1997). In a seminal article, Pauly (1990) argues that Medicaid crowds-out LTC insurance by creating incentives to exhaust one's individual savings to be eligible for public funding. Furthermore, intra-family moral hazard operates in the form of children being induced to provide care in the form of 'informal insurance', which is envisaged as inhibiting adverse selection, lowering monitoring of LTC and reduing individuals' opportunistic behaviour (Pollak, 1985).

As some authors point out, the size of the LTC insurance market is not well understood (Norton, 2000), especially in countries where social protection for LTC is limited. Some explanations for the lack of LTC insurance development point to the existence of asymmetric information (Sloan and Norton, 1997). Finkelstein and McGarry (2003) find that although there is no evidence of a positive correlation between risk occurrence and insurance coverage, unobserved preference-related characteristics have an opposite correlation with insurance coverage, which are regarded as offsetting the positive correlation between insurance coverage and risk occurrence. Interestingly, using sample data, Lindrooth et al (2000) find for a sample of elderly individuals that an underestimation of the risk of nursing home entry does influence the purchase of LTC insurance. Therefore, taken toughuether results suggest that risk underestimation might affect younger cohorts, which strengthens the hypothesis of individuals' early 'myopia' in anticipating the financial needs of long-term care (Wiener et al 1994). Furthermore, socioeconomic factors appear to be important determinants of LTC insurance. Indeed, McCall et al. (1998) find that education and knowledge are the primary factors explaining LTC insurance among middle-income subjects.

In the light of previous evidence, it would appear to be important to measure whether consumers once informed about the need for long-term care would be willing to pay for covering LTC financial risks. This appears as especially relevant where the market for LTC insurance is undeveloped, and there is no public insurance scheme to cover old age dependency (Costa and Patxot, 2004). In doing so, we examine the role of private information as well as that of individual wealth (e.g., in the form of housing tenure), which arguably provides an incentive for self-insurance. Finally, from a policy standpoint, it is relevant to elucidate whether LTC insurance is a price-elastic good. One might argue that if that is the case, then tax-incentives might play a role in the expansion of potential LTC insurance coverage.

The purpose of this paper is to examine the willingness to pay for eluding the financial risks associated with the use of long-term care (resulting from old age dependency) in Spain. As there is no market for LTC insurance, a single bounded ('take it or leave it') willingness to pay exercise is used, where the 'contingent market' is replicated. Our contributions are the following. First, we estimate the share of the population that would be willing to purchase LTC insurance at different premium bids. This issue is important considering that public financing is only 30 per cent of total LTC expenditure and is means-tested on the basis of income and needs (Costa and Patxot, 2004). Second, we examine the influence of risk perceptions of disability in old age in the probability of a hypothetical LTC insurance bid being accepted. If risk perceptions, which are unobserved preference-related characteristics, are found to explain purchase decisions, this would provide suggestive evidence in line with Finkelstein and McGarry (2003). Third, we provide evidence on the price bids of LTC insurance and the role of housing wealth in influencing hypothetical insurance purchase decisions.

The paper is organised as follows. In section two we examine the previous literature on the determinants if LTCI purchase. Section three gives an outline of the empirical model and methods. In section four we describe the source of the data used, and finally in section five we present the results on the basis of the hypothesis set in the empirical model. The paper ends with some concluding remarks.

2 The LTC Insurance Purchase Determinants

The lack of development of LTC insurance has received ample attention in the economic literature over the last few decades. Some authors argue that the insurer fails on pricing intertemporal risks (Cutler and Sheiner, L.M, 1993), adverse selection whereby the elderly and their relatives may miss out on the efforts to prevent the need for LTC (Sloan and Norton, 1997), and that the interaction of public insurance programs arguably crowds out private insurance (Pauly, 1990). Additionally, some evidence indicates the possible presence of moral hazard, whereby those covered by LTC insurance would have strong incentives to consume LTC. However, Finkelstein and McGarry (2003) find no evidence of a positive correlation between risk occurrence and insurance coverage, although unobserved preference-related characteristics have an opposite correlation with insurance coverage, offsetting the positive correlation between insurance coverage and risk occurrence. Therefore, this evidence indicates the need for further exploration of the determinants of LTC insurance, looking at individual-related determinants.

The main determinants of LTC insurance purchase include the role of price, income and wealth. As for any other good, the lower the price the more likely individuals are to purchase LTC insurance. However, LTC insurance affects the individual's income and the wealth they might expect both for themselves and for their relatives. The purchase of LTCI would be expected to vary directly with income and inversely with the premium offered, which in turn might increase with age and thus influence the role of age in predicting whether LTCI will be purchased. While individual willingness to pay is normally associated with individual income, for those who do not expect to have significant assets or a substantial income at the time when they might need LTC, the potential payouts of LTC policies would make little difference as without them they might be eligible for publicly funded community care. One important determinant is wealth since the costs of a nursing home might exhaust wealth, therefore it has been argued that LTCI is a tool to protect wealth from declining.

An additional reason for wealth playing a role is linked to the willingness of parents to pass on their wealth in the form of inheritance. Sloan and Norton (1997) found no evidence of any relationship between insurance purchase and the belief that passing on money in the form of inheritance was somehow important. However, the probability of self-insurance through one's own assets might be higher among those individuals. Therefore, the effect of income is expected to be ambiguous. However, of all the different types of wealth, a person's home is the largest capital asset and way to 'invest for the future'. In countries where means testing is extensive people see capital assets as a means to fund long-term care if the public sector does not develop specific mechanisms. Parker and Clarke (1998) find that in the UK some 20 per cent of the population consider that they may sell their houses should they need residential or nursing home care.

A third determinant of such a decision is one's o*wn expectation with regard to years of disability and attitudes towards the future*. Disability risk perception refers to the perception of one's chances of experiencing disability, which are conditional on surviving until a specific age at which disability is most likely to occur.[1] As in most insurance studies, the probability of experiencing losses is not directly observed and thus risk perception studies are employed to approximate the probability of loss, which is proxied by age, gender and pre-existing conditions (Showers and Shotick, 1994). Perceptions of loss are dependent on income, education, gender, employment and projected earnings. McCall *et al*. (1998) suggests that a lack of accurate perceptions of the risk of needing long-term care inhibits consumers from considering insurance or alternatively may distort the calculations that individuals make. Furthermore, another important constraint is the perception of years of survival in a state of chronic health, since individuals generally underestimate the years that they may survive in a chronic health state and, therefore, the associated costs. Some individuals might not be aware of their own ageing process, giving rise to some sort of myopic preferences. *Attitudes towards the future* hypothetically determine the purchase of this set of benefits, in particular the traditional variable to be

[1] The financial costs are not only deferred over time (people pay for the service over a long period), since survival probability (π^s) acts as a constraint; i.e, an individual may expect not to survive until a determined age. Therefore, since a reduction in the survival probability reduces the expected utility increase for insuring LTC, this could lead to a sufficiently reduced conception of utility, offsetting the insurance premium costs.

included is education. Indeed, older individuals may underestimate their life expectancy whereas young individuals overestimate their life expectancy. *Therefore, if younger individuals expect to live longer, then age should be a negative predictor of LTC insurance.*

Moreover, an additional argument for this feature is found in the relationship between age and the probability of death. Experimental evidence suggests that individuals usually estimate very low probabilities of proximate death, although the probabilities rise with age (Reed *et al*., 1998). Therefore, the elderly reveal a reduced need for LTC insurance compared to the non-elderly as they have already survived to an advanced age, which means that the expected costs associated with LTC disability should occur would be lower than those facing the non-elderly. Following other studies (Mellor, 2001) considered that the need for LTC might be approximated by health status and disability. Finally, another argument explaining this pattern is closely related to life cycle choice. Whereas the elderly may have yet saved some income in order to meet the costs of LTC, the non-elderly should show a greater willingness to pay for LTC.

One of the factors stimulating the demand for LTC insurance is the willingness to substitute formal services with informal care. It is argued that greater female participation in the workforce; rising rates of divorce and marital disruption potentially decrease the availability and willingness of informal care-givers to meet the need of an increasing population. According to Bernard and Parker (1995) marital status is an important determinant of whether or not those disabled in old age will enter nursing homes. There is some evidence that the number of hours spent providing care increases with the number of care-givers (Soldo et al., 1989). If having family members available to provide care significantly explains the probability of LTCI purchase, then this would be evidence of intra-family moral hazard. Indeed, Zwiefeld and Stuwe (1998) find in a two-generation model that more insurance purchased by parents leads to the less care giving by their children

Empirical evidence (Mellor, 2001) finds no evidence that the availability of care-givers discourages parents from obtaining market-purchased long-term care insurance.

Therefore, if the number of household members might approximate the availability of care-givers within the family, it seems that having potential substitutes for LTCI is not a good explanation for low LTCI coverage. In addition, the existence of family financial interactions may lead some families to provide care to prevent a decline in intergenerational wealth transactions. The literature on LTC insurance suggests that the provision of LTC is to some extent dependent on family interactions. While there may be a *use value* for those perceiving that they would consume LTC, they also have a value for those household members that otherwise would themselves have to meet the costs of LTC. Therefore, if family interactions appear to be significant predictors of the WTP estimates, we hypothesise that the overall value should distinguish between those that *benefit directly* (individuals insured) and others that *benefit indirectly* (family members) from LTC insurance[2].

3. Empirical model

Consider a household with a state dependent utility depending on whether disability occurs $U^d(q^i, Z)\, or\, U^{nd}(q^i, Z)$. Ex ante the consumer chooses the consumption and its associated expenditure based on the expected utility value given of marketable goods (Z)[3] and non-market goods consumed when disability occurs (q^i), e.g., a nursing home. Utility functions are additively separable defined for both commodities. The solution to the utility maximisation problem yields the following indirect (expected) utility function[4]:

$$U(q^i, y, Z, \pi^{ds}, \varepsilon) = V(q^i, y, Z, \pi^{ds}) + \varepsilon_i \qquad (1)$$

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[2] Moreover, there may also be an option value for those that although they do not consume LTC are assured future consumption by the purchase of a LTC insurance.

[3] It also reflects the attributes of the market goods and the attributes of the individual.

[4] $Max_Z\, \pi^{ds} U^d(q^i, Z) + (1 - \pi^{ds}) U^{nd}(q^i, Z)$

$st \quad pZ \leq y$

where (y) refers to income. Utility function is unknown, however, following Haneman (1984) we can assume a random utility specification where (ε) is a stochastic component with $E(\varepsilon) = 0$ and V(·) is the deterministic part of the indirect utility function.

The perceived probability of becoming disabled (π^{ds}) and therefore requiring LTC is a function of health status (H), age (a) and information (I) :

$$\pi^{ds} = \pi(H, a, I) \tag{2}$$

We assume that $\frac{\partial \pi^{ds}}{\partial H} \leq 0, \frac{\partial \pi^{ds}}{\partial a} \geq 0;$ that is, improved health status reduces the probability of becoming disabled, whereas improved life expectancy increases the probability of becoming disabled.

Suppose that LTC is something that provides utility to the individuals, therefore we define q^0 if individuals do not have any personal coverage for LTC and q^1 if they have the option of receiving LTC should disability occur which means that

$$U(q^1, y, Z, \pi^{ds}, \varepsilon) > U(q^0, y, Z, \pi^{ds}, \varepsilon). \tag{3}$$

The equivalent variation is captured by the WTP that equates with the indirect utility maximisation for an income decrease for receiving LTC in the future. That is:

$$U(q^1, y - WTP, Z, \pi^{ds}) = U(q^0, y, Z, \pi^{ds}) \tag{4}$$

therefore $WTP = \phi(q^1, q^0, y, Z, \pi^{ds}, \varepsilon)$ is the maximum WTP to forgo LTC expenses.

Since we adopt a discrete yes / no referendum WTP, a bid (insurance premium) is offered to respondents in order to avoid the financial consequences of LTC, costing $A(PTAs)$, and they are asked whether they are willing to buy the insurance policy. According to the logical assumption of the maximisation process, consistent respondents

would answer affirmatively if $U(q^1, y - A_i, Z, \pi^{ds}) \geq U(q^0, y, Z, \pi^{ds})$. and therefore the Pr(YES)= $\Pr\left[U(q^1, y - A_i, Z, \pi^{ds}, \varepsilon) \geq U(q^0, y, Z, \pi^{ds}, \varepsilon)\right]$. In this case, the probability of the offer being rejected is Pr(NO)= $\Pr\left[U(q^1, y - A_i, Z, \pi^{ds}, \varepsilon_1) < U(q^0, y, Z, \pi^{ds}, \varepsilon_0)\right]$. An equivalent formalisation would be: if respondent says YES then $WTP \geq A_i$ whereas if the respondent says NO then $WTP < A_i$. Therefore, $\Pr(WTP \geq A) = 1 - F_{WTP}(A)$, where $F_{WTP}(\cdot)$ is the distribution function of WTP. The willingness to purchase LTC insurance (YES response) may be written as $\Pr(\Delta v \geq \eta)$, where $\Delta v = V(q^1, y - A_i, Z, \pi^{ds}) - V(q^0, y, Z, \pi^{ds})$ is the deterministic component of the utility difference and $\eta = \varepsilon_1 - \varepsilon_0$ refers to its random component.

If indirect utility function is additive separable in LTC and income then the utility associated with covering LTC is:

$$V(q^1 = 1, y - A_i, Z, \pi^{ds}) = \mu(1) + \pi^{ds}\mu(1) + \phi(y - A) - \pi^{ds}\mu(0) \quad (5)$$

and without coverage is:

$$V(q^0 = 0, y, Z, \pi^{ds}) = \mu(0) - \pi^{ds}\mu(0) + \phi(y) + \pi^{ds}\mu(1) \quad (6)$$

where sub-utility functions are $\mu(\cdot) > 0, \phi(\cdot) > 0$. In addition, three additional specifications are made: the differential utility function Δv will reduce if the premium required increases, $\frac{\partial \Delta v}{\partial A} < 0$ is expected to increase when income and perceived risk increase $\frac{\partial \Delta v}{\partial y} > 0 \frac{\partial \Delta v}{\partial \pi^{ds}} > 0$ [5].

Assuming a linear approximation, $U(q^i, y, Z, \pi^{ds}, \varepsilon) = \alpha_i + \beta_i y + \gamma_i Z + \delta\pi^{ds} + \varepsilon_i$ then the change in the indirect utility function yields the following:

$$\Delta v = (\alpha_1 - \alpha_0) + (\beta_0 - \beta_1) y - \beta_0 A + (\gamma_1 - \gamma_0) Z + (\delta_1 - \delta_0) \pi^{ds} + \varepsilon_i \qquad (7)$$

The first term reflects the change in utility caused by changes in uncontrolled effects, the second term reflects the change in income due to the payment, the third term reflects individual characteristics and the fourth term reflects changes due to individual disability risk perceptions. Assuming probit specification where the $pr(YES) = pr(\Delta v + \varepsilon \geq 0)$, one would obtain the probability of an individual accepting the bid. Furthermore, given the characteristics of the data and the variables employed, some econometrics should be applied. These focused on how to deal with protest responses (P_i), insofar as the survey contained a follow up question whereby individuals could state the reasons for their specific response. Furthermore, one might well argue that answers to the WTP question might systematically provide a zero response resulting from lack ok perceive the risk (π^{ds}) to themselves ('individual opimism') which would lead them not to purchase LTCI in such a case. If this is the case, one might argue that the WTP for LTCI is likely to be jointly determined with risks perceptions. Yet, both to correct potential protest response problem and the potential endogeneity of the risk perception question we estimate auxiliary equations (12) and (13)

$$\pi_i = Z_i^{'} \delta + u_i \qquad (12)$$

$$P_i = W_i^{'} \gamma + v_i \qquad (13)$$

where *Z* and *W* are the vectors of individual characteristics included as repressors in these auxiliary equations and *u* and *v* are the error terms, which are assumed to be normally distributed. We estimate risk perceptions these equations using a two-stage probit model (van der ven and van Praag, 1981) including a correction term (ρ) to control for the potential sample selection.

[5] We assume that the marginal utility of income is positive but diminishes with additional income.

4. Data and methods

4.1 Data

The data of this empirical study are based on representative telephone interviews with a random sample of 400 Catalan heads of families over the age of 18. The surveys were undertaken in June–August 1999 by a professional survey firm. The study area covered the four Catalan provinces and the response rate was 81 per cent. However, prior to the survey two focus groups were carried out to obtain qualitative information as well as to guide the survey design. The reasons given for (not) purchasing LTC insurance were heterogeneous and brought to light some determinants such as age, misperception of public coverage and protest responses, as well as a lack of individual need.[6]

The *insurance premium question* was framed as follows:

> *'Suppose that you could contract a long- term care insurance policy covering the services of an elderly residence or nursing home due to physical or psychological disability. This situation would occur due to some protracted disease, such as Alzheimer or senile dementia, the consequences of which tend to emerge at an advanced age. Would you choose to buy this policy if its monthly premium would be* A_t *PTAs to be paid from now on? □Yes □No".*

[Insert Table 1 about here]

We designed a set of 40 different bids (questionnaires) in order to estimate the willingness to pay by means of a contingent valuation survey representative of the Catalan population

[6] Some qualitative responses were the following: 'I am too young to think about LTC insurance' (#1), others stated that they were not willing to pay for something when they don't know whether they will use it (#2, #328). Others expressed that in the event of dependency they would rely on informal care, that their own family would take care of them when old and dependent (#13, #14, #59, #66, #72, #117, #126, #136, #171, #208, #303). Some rejected the whole idea, stating that they do not need it (#160, #165, #168), most of these referring to the fact that 'the public sector should provide coverage for this event'. Uncertainty with regard to need was often cited: 'I don't know whether I will need it (#18)'. Other noteworthy responses reflected a lack of knowledge on the existence of LTCI (#38). As expected, some people expressed 'myopic preferences', in that they stated that such a situation was too far off in time to think about it (#60, #212) and that they would think about it when they needed it (#233, #308, #310). Finally some people expressed mistaken beliefs and stated that they had already insurance coverage (#11, #25, #27, #28, #69, #202, #203, #219, #303, #313).

(Table 1). Those 40 bids (A_t) were obtained from the previous focus group experiment, and ranged from 500 PTAs to 17,000 PTAs. Two additional follow up questions were drawn up, the first asking the maximum amount the subject would be willing to pay for the proposed coverage and the second asking those reporting a zero willingness to pay the reason for their answer. Participants were not provided with information on how an insurance policy works and how would the premium evolve with time. The reason for this lies in potential biases that additional information might cat in the results[7]. The questionnaire also contained a specific question on individual disability risk perceptions as follows:

'Do you think you will be disabled at the age of 80?'

And another question on the individual's perceptions of longevity:

'How long do you expect to live?'

In addition, the survey contained information on the subject's socioeconomic and health status, risk attitudes, education, health utilisation, housing and income, as displayed in Table 2. Table 2 provides information on the variables employed based on a review of the literature, as well as the preliminary evidence from analysis of the focus groups. We specify two WTP models, one including the effects of already being disabled and education, and the other including health status, health care utilisation and perceptions of risk, as well as risk attitudes. The reason for using two different specifications is based upon the expected correlation between explanatory variables. Overall, the variables included in our models captured the effect of a) current need, such as health status, healthcare use, disability, age, household size and gender; b) expected need, such as perceptions of the probability of disability in old age and of survival over the age of 80, and risk attitudes; c) other socioeconomic and social position determinants such as education or housing tenure.

[7] Our main research interest was to estimate the responses to a potential insurance intake rather than the sensitivity to changes in the insurance policy design. It is important to note, that LTC covers risks of old age dependency, and therefore the fact that some individuals are disabled does not imply that they are dependent. Finally, it should be noted that disability appearing before retirement is already covered by the pension system in Spain.

[Insert Table 2 about here]

4.2 The methods

Following the NOAA guidelines[8] we employed the WTP rather than the willingness to accept (WTA) approach[9] within a closed-ended single bound format[10]. We employed a single-bounded approach based on the original format of Bishop and Heberlein (1979), where respondents were presented with a specific monetary cost to obtain LTC insurance coverage and asked whether they would be willing to pay that amount. That is, we based our analysis on a discrete single-bounded WTP model, offering by means of a one period bid (A_t) a new benefit, in this case LTC coverage, at a given price/cost to different sub-samples. Responses — agreement or refusal to pay — were analysed as discrete choices. The WTP to avoid the costs associated with LTC at an advanced age are described in an explicit risk context where LTC needs are probabilistic in terms of survival. In answering the WTP question, people make choices based on perceived risk of facing disability when they are 80 years old, depending on survival. This approach has been advocated by Gafni (1991) and more recently by Johanesson (1996) as an appropriate way of eliciting values for health benefits.[11] Finally, we believed that contingent valuation methods as a generalised framework by which to value non-market goods were relevant for our study given the lack of public LTC insurance. Indeed, it seemed plausible to expect responses not

[8] That is, the 1992 National Oceanic and Atmospheric Administration (NOAA) panel of prominent social scientists guidelines to assess the reliability of natural resource damage estimates derived from contingent valuation (CV).

[9] Empirical findings demonstrate that WTA estimates exceed the WTP estimates, since WTP measures are usually bounded by the individual's budget constraints.

[10] The main advantage of this method is that it approximates *real daily market purchases*, since the interviewer acts as if they will supply a good at a reference price and the respondent acts as if they are demanding this good, accepting or rejecting the offer. Moreover, it avoids the *starting point bias* usually appearing as a result of open-ended questionnaires, since there is one unique price offered. The main problem of this method is that requires very large samples since the main sample has to be divided into different sub-samples, in which the individuals are offered a different price.

to be biased by the existence of a current private market for health insurance. Furthermore, because no specific mechanism was revealed to participants, the payment instrument is hypothesised to estimate the willingness to pay, regardless of the funding LTC mechanism used.[12] However, inevitably a well known payment bias could still be expected to arise from the payment instrument, which will be tested using the Van der Ven and Praag (1981) sample selection mechanism.

The payment mechanism considered is the insurance context, since the considerable experience that is acquired in coming up with this mechanism enables the 'contingent market' scenarios interpreted as offering a supplementary benefit to be provided. Theoretically *correct choices concerning longevity aim to be made by means of an ex ante framework*, before the resolution of uncertainty (Reed *et al*., 1998). The elicitation of the willingness to pay an insurance premium in exchange for a new programme conditional on having survived until 75 years old was employed in Johannesson and Johansson (1997).[13] A similar method was employed in Johanesson (1996) on the valuation of future quality of life. The latter study showed that respondents tended to be pessimistic with respect to their future quality of life, that is they perceived a reduced expected quality of life at an advanced age and the analysis revealed a sizeable and significant correlation between anticipated life expectancy and the WTP for the proposed programme. Finally, one of the main criticisms made of contingent valuation is that the resulting WTP is not sensitive to the scope of the benefit offered (Diamond and Hausman, 1994). The impact to the scope in this study can be tested if examining the role of the perceived own disability at an advanced age can control the WTP in the context of LTC insurance.

5 . Results

[11] Although there is some evidence that people would like to allocate more health care resources to the young rather than the old population, within a perfect insurance market, people could allocate their resources over their life span, purchasing an insurance covering a set of expected future LTC needs.

[12] Although the willingness to pay can be used for both private and public decision making purposes, since in general direct WTP expressed in monetary terms displays the trade-off between a particular benefit and money (say euros) that the consumer forgoes and therefore could assign to other alternative goods.

[13] Since LTC and the hypothetical programme proposed in the former paper both serve to increase the quality of life at an advanced age.

5.1 Preliminary evidence

Some four per cent of respondents refused to answer the WTP question. The 41 per cent of respondents who were offered the opportunity to purchase the insurance for less than 3,000 PTAs (18 euros) accepted the offer, however only three per cent accepted the offer at the highest bid (more than 12,000 PTAs or 72 euros), as shown in Figure 1. As we hypothesised of those who declared a null WTP one might wish to distinguish protest responses from purely 'economic responses'. The follow-up question included in the questionnaire measured for such a response. Interestingly, 74 per cent provided an economic response 'I have no resources to pay LTC insurance', while 23 per cent answered that they were not willing to pay anything, what is *a priori* to indicate that there may be bias in individual responses (e.g., an ideological motivation) associated with the payment instrument. Table 3, examines using a conventional t-test possible significant differences in socioeconomic characteristics between protest and economic zeros compared to the rest of the sample. Those registering protest zeros appear as those less likely to have visited the doctor and are more likely to be women. Those registering economic zeros are relatively young although less healthy individuals are more likely to be women and record higher education levels. Furthermore, Table 4 exhibits the distribution of the individual's own disability risk perceptions. Interestingly, risk perceptions increase with age and are higher for females than for males. Furthermore, on average about 20 per cent state that they expect to be disabled at the age of 80. The average individual age was 53 and 18 per cent already exhibit some disability (Table 2).

[Insert Table 3 and 4 about here]

5.2 Willingness to pay determinants

Table 5 displays the results from the two probit model specification to estimate the WTP. In addition, having corrected for protest responses and the possible selectivity of those who perceive the risk of old age disability, the closeness of the fit is acceptable and the third

column at the end indicates that ρ is not significant suggesting no evidence that protest responses might have biased the WTP estimates. Protest respondents were relatively young and mostly female, which might suggests that there is some payment system bias (Bishop and Heberlein, 1979) as well as disagreement with paying additional funds for LTC. Furthermore, the same applies to the perceptions of risk of old age disability, suggesting that the same results would have been achieved if the models had been independently estimated. The individual's own disability risks are largely perceived by females, those displaying poor health and the relatively more risk averse (as suggested from Table 5).

[Insert Table 5 about here]

The estimation of the WTP is obtained from individual responses to the different bids offered, which is modelled as a continuous distribution function $F(A_r) = \Pr(WTP \leq A_r)$ where A_r is the premium offered. Therefore $F(A)$ yields the proportion of individuals who are willing to pay no more than A_r for the insurance offered. As expected, Table 5 reveals that the bid was highly significant in influencing the WTP estimated using a standard probit. The coefficient effect of the maximum insurance premium suggests that the average respondent's (monthly) willingness to pay is approximately 3,390 PTAs or 20.3 €, which is lower than the insurance premiums insurance companies offer at the average age of our sample. The price elasticity's evaluated for the average sample suggests a price elasticity of 2.34 (although varied between 1.5 to 2.85), which indicates that possible subsidies in the market for LTC insurance might boost individuals' coverage.

Interestingly, the perceived risks of the individual's own disability were strongly significant and therefore predict individual willingness to pay for LTC insurance. Consistent with Finklestein and McGarry (2003), we find evidence of 'preference-based' selection in insuring for LTC in Spain. Indeed, unobserved preferences, which take the form of disability risk perceptions positively, correlate with the purchase of LTC insurance. These results suggest that there is unobservable private information that explains the slow development of the LTC insurance market. Those individuals that would purchase LTC

insurance are expected to be those who perceive higher LTC risks. However, the effect of those who are at higher risk seems to be mixed. Correlation with health status is negative suggesting that the lower the individual's health status the more likely they are to purchase LTC insurance. However, individual's disability – referring to specific chronic conditions – was not significant suggesting that it is unlikely for disabled individuals to report a different market response than the rest of the sample. The same applies when examining healthcare utilisation, those people that have visited a doctor are more likely to purchase LTC insurance, although the coefficient for disability is not significant Therefore, these results might be interpreted as preliminary evidence of potential adverse selection, consistently with Sloan and Norton (1997). Risk attitudes were not significant predictors of the probability of the subject purchasing LTC insurance This results is not totally unexpected as far as whilst higher risk aversion would lead to a higher probability of insurance in general, a larger risk aversion might be associated with a larger probability of insuring through other means such as protective savings and self-insurance mechanisms. Finally, perceptions of survival until the age of 80 were not significant.

Some previous research (Johanesson and Johansson, 1996) indicates that WTP increases with age. However, we found evidence that middle-aged individuals are those that are most likely to purchase insurance. This result is striking in that LTC insurance is regarded to be of the highest value at that age, as one could hypothesise that the older one is, the more one would benefit from LTC insurance at average premiums. If these results are taken as a proxy of time preference as in Johansesson (1996), they suggest a reduced level of time preference, whereby a 45 year-old individual is willing to pay more than a 65 year-old. These findings are consistent with those of previous studies indicating that the older population are not more likely to reveal a higher probability of purchasing cancer insurance (Nielsen et al., 2001). Furthermore, one explanation for this result could come from the lack of informal care anticipated by that generation should they become disabled in old age, and the awareness of the complexity of future marital structures that might blur the lines of responsibility of future generations.

Interestingly, gender does not affect the probability that an individual will purchase hypothetical LTC insurance and nor does household size. This could result from the fact

that part of the gender effect is captured by the effect of the individual's own disability risk perceptions. Furthermore, because household size might not be a good proxy of the availability of informal care, it does not display a significant coefficient. In addition, a variable measuring whether the individual lives in the capital city was not significant, although income as expected from the theoretical model exhibits the expected sign, indicating that LTC insurance is normal good.

Although in some studies based on the real US real market for LTC insurance (McCall et al., 1998) education and knowledge appears to be the most significant variable in explaining the purchase of long-term care insurance, education does not display a significant coefficient, while housing tenure is significant and the negative coefficient indicates the presence of individual self-insurance. Indeed, the availability of assets suggests that wealth, and specifically housing tenure, reduces the probability of LTC insurance as the individual might self insure by expending their own assets.

6. Conclusion

This study has sought to undertake an exploratory analysis of the WTP for LTC insurance. This was undertaken in a context where there is currently no public or private coverage for LTC apart from a limited network of social assistance that is means tested (Costa and Patxot, 2004). Thus, Spain stands as many other countries as an interesting base case from which to study the effects of introducing an insurance scheme in order to draw initial conclusions and to identify some patterns in the demand for a certain type of private welfare insurance. We have estimated the reservation price individuals are willing to pay for coverage against the future costs of chronic illness at an advanced age. Furthermore, we draw upon a contingent market methodology to simulate a market transaction using the private health insurance as an elicitation mechanism. The estimates of the WTP are the highest for middle aged individuals, varying with housing tenure and location, and were shown to be highly price elastic. The role of housing tenure in determining the LTC coverage indicates the possibility that some individuals might be able to self-insure or might have been saving to do so, and thus insurance would be a means to protect their assets.

When the individual is old enough the willingness to pay starts to decline. Interestingly, risk perceptions were significant predictors of the WTP for long-term care, suggesting that there is private information, which might determine the insurance decision. However, some measures of individual risk (e.g., health status) appear to be significant as well, pointing out that some evidence of adverse selection (Sloan and Norton, 1997). On the other hand, being disabled did not influence the WTP decision. Finally, the significance of the perceptions of risks might be argued to conduct pact of the adverse selection effect, as it refers to the individual knowledge on future dependency at old age (Finklestein and McGarry ,2003). Altogether, the results suggest the need explore the issue of adverse selection further by examining specific old age dependency indicators (e.g., Activity Daily Living (ADL)). of d further in future research The significance of perceptions of the risks of needing LTC suggests that some efforts might have to be taken to communicate relevant information to the individuals on how LTC should be covered

The implications of these results are as follows. Financing for long-term care is likely to depend on the values of each specific society. Spanish society departs from a tradition of family care and is now faced with inadequate LTC financing mechanisms. Insofar as individuals seem to behave rationally with the existing information constraints when they shift long term risks there is no reason to assume that there is myopic behaviour guiding the individual perceptions of disability risks. From the methodology applied we have been able to elucidate to what extent individuals are willing to reduce their current wellbeing to cover future risks. Even though a considerable share of the population is not willing to purchase LTC insurance, a significant share does show a positive willingness to pay and particularly individuals of about 40–50 years old. Moreover, the price elasticity for LTC insurance suggests that these types of insurance would be sensitive to public subsidies.

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Appendix 1. The Expected utility of LTC insurance

Assume that individual utility is $U = U(C_t, H_t)$, twice continuously differentiable, strictly increasing and concave. *C* refers to consumption and *H* refers to health state. Health state can be measured as a range running from death that is assumed to be 0 — despite being a restrictive assumption — and maximum health $H_t \in (0, H_{xax})$. Old age disability can be measured as an intermediate health state H_d, $0 \le H_d < H_{nd}$ and is assumed to appear with a probability $\pi^d(t)$, which is taken to increase with age. If disability occurs, then some kind of specific LTC would be required (e.g., a nursing home involving large costs D_t to provide adequate treatment). Assuming that $C_t > D_t$ and that no insurance exists, then the expected utility at time t_0 would be:

$$EU_{t<t_0} = \pi^d U(C_t - D_t, H_d) + (1 - \pi^d) U(C_t, H_{nd}) \qquad \text{(A.1)}$$

that is, individuals would have to assume the expenses associated with disability. However an individual could die before that event. Thus ,the probability of survival until that age is $\pi^s(t)$ and $1 - \pi^s(t)$ is the probability of dying before and therefore not requiring LTC. Therefore, the expected utility of an individual below the age of 60:

$$EU_{t<t_0} = \pi^{ds} U(C_t - D_t, H_d) + (1 - \pi^{ds}) U(C_t, H_{nd}) \qquad \text{(A.2)}$$

where π^{ds} is the disability probability conditional on survival which that is an increasing function with age; $-\pi^{ds}(t)/\pi^{ds}$ increases with age. Accordingly, the individual's expected utility can be obtained by weighting the utility payoffs in the states of 'disabled' and 'not disabled' subject to being alive at the point of time t. Therefore the desired marginal rate of substitution (marginal WTP) for avoiding D_t is:

$$MRS(\pi^{ds}, C_t) = \frac{U(C_t, H_t) - U(C_t - D_t)}{\pi^{ds} U_c(C_t - D_t, H_d) + (1 - \pi^{ds}) U_c(C_t, H_{nd})} \ge 0 \qquad \text{(A.3)}$$

where U_c is the partial derivative of utility with respect to consumption. This result shows the marginal valuation of a change in the probability of becoming disabled.

Table 1.
Bid Design and Affirmative Response Rate

Bid reference	1–10	11–20	21–30	31–40
	500	3000	7000	12000
	700	3200	7500	12500
	1000	3500	8000	13000
	1200	3700	8500	13500
	1500	4000	9000	14000
	1700	4500	9500	14500
	2000	5000	10000	15000
	2200	5500	10500	15500
	2500	6000	11000	16000
	2700	6500	11500	17000
Questionnaire	1–100	101–200	201–300	301–400
Mean bid	1600	4490	9250	14300
Pr (Yes) %	41	29	21.33	16.5

Table 2.
Variable Definitions and Summary Statistics (means and standard errors)

Variable	Variable definition	Variable type	Mean (s.e)
Disabled	Respondent has some disability	Dummy	0.180 (0.02)
Income	Monthly Income in PTAS	Numerical	193.36 (93.91)
Health status	Self perceived health status (1=bad health to 5=excellent health)	Categorical	3.470 (0.06)
High Education	Respondent at least has finished high school	Dummy	0.188 (0.02)
Capital	Respondent lives in the capital	Dummy	0.397 (0.03)
Bid (PTAs)	Bid offered to the respondent (table 1)	Numerical	7445 (257)
Gender	Male=1	Dummy	0.509 (0.03)
Age	Years old	Numerical	54.397 (0.87)
Survival at 80	Perception of survival beyond the age of 80	Dummy	0.530 (0.03)
Risk averse	Risk attitude (1=avoids all risks to 10=dismiss risks)	Categorical	2.924 (0.09)
Perceived Own Disability	Disability perception at age 80=1	Dummy	0.196 (0.02)
Visit to doctor	Number of visits to the doctor last month	Numerical	0.426 (0.03)
Household members	Number of cohabiting family members	Numerical	2.653 (0.06)
Household income (PTAs)	Monthly household income	Numerical	190313 (4600)
Housing tenure	Respondent owns a flat or a house	Dummy	0.817 (0.04)

Table 3.
Comparisons between Protest and Economic Bidders and the Rest of the Sample

	Protest zeros	Economic zeros	Rest of the sample	T-value (protest)	T-value (economic)
	Mean (s.e)	Mean (s.e)	Mean (s.e)	T-test	T-test
Age	49.25	60.04	49.83	5.92	5.30
	(1.79)	(1.20)	(1.36)		
Income	179.23	186.13	198.53	1.13	0.574
	(10.97)	(7.15)	(7.14)		
Health status	3.65	3.27	3.62	1.82	10.84
	(0.12)	(0.09)	(0.08)		
Visit to doctor	0.20	0.43	0.51	17.02	0.05
	(0.05)	(0.04)	(0.04)		
Household members	2.85	2.48	2.80	1.54	7.47
	(0.15)	(0.10)	(0.09)		
Gender	0.34	0.57	0.49	8.23	6.01
	(0.06)	(0.04)	(0.04)		
Low education	0.52	0.77	0.46	1.78	39.56
	(0.06)	(0.03)	(0.04)		
Sample size	63	252	68		

Table 4
Disability Risk Perceptions

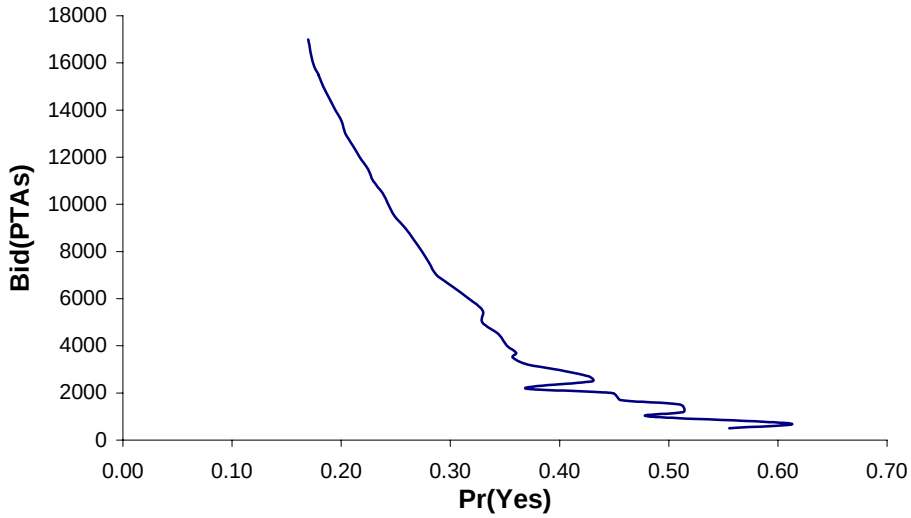
	Total		Male		Female	
	Mean	s.e	Mean	s.e	Mean	s.e
Age 1	0.102	0.044	0.111	0.062	0.091	0.063
Age 2	0.143	0.038	0.114	0.055	0.163	0.053
Age 3	0.252	0.038	0.200	0.050	0.303	0.057
Age 4	0.243	0.037	0.137	0.041	0.365	0.061
Total	0.208	0.020	0.150	0.025	0.265	0.031

Table 5. Maximum Likelihood Estimates (t-values in the parenthesis)

Variable	WTP (1)	WTP(2)	PROTEST	RISK
Disabled		-0.402		
		(-0.45)		
Health status	-0.765		0.34	-0.617
	(-2.04)		(0.71)	(-2.57)
Income	0.22	0.86		
	(2.14)	(2.56)		
High education	-1.23		0.418	-0.295
	(-0.11)		(1.12)	(-0.581)
Capital	-0.13	0.13		
	(0.30)	(0.96)		
Bid	$-3.33x10^{-4}$	$-3.42x10^{-4}$		
	(-6.34)	(-6.23)		
Gender	0.498	0.348	-0.851	-0.459
	(1.47)	(1.35)	(2.91)	(-2.88)
Age			-0.021	0.010
			(2.10)	(1.71)
Age less than 20	1.56	1.56		
	(1.67)	(2.53)		
Age 30–40	1.30	1.23		
	(2.76)	(2.58)		
Age 40–50	1.67	1.35		
	(3.12)	(2.82)		
Age 50–60	0.56	0.152		
	(0.79)	(0.34)		
Survival perceptions at 80	-0.321	-0.43		
	(-0.86)	(-1.01)		
Risk averse	0.49		-0.906	0.452
	(0.61)		(0.94)	(1.78)
Perceived	1.32		-0.62	
own disability	(0.35)		(1.66)	
Visit to doctor		0.62		
		(1.99)		
Household size	-0.194	-0.18		
	(1.04)	(1.18)		
Housing tenure	-0.85	-0.57		
	(-2.44)	(-1.95)		
		1.56		
Intercept	1.12	(2.12)	0.042	-0.871
	(1.97)		(0.04)	(-1.92)
Sample size	383	383	383	383
Pseudo R square	0.26	0.30		
Log-likelihood	-124.99	-117.98	-161.46	-156.18

ρ	-0.77	-0.211
	(-1.26)	(-0.67)

Figure 1. Estimated Aggregate Demand Function of the Willingness to Pay (using a non parametric approach)



Note: The table is based on the original sample which used the former Spanish currency (PTAS) . The exchange rate from 1999 is 166.69 PTAS 1€.