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Working Paper

Thinking of Incentivizing Care? The Effect of Demand Subsidies on Informal Caregiving and Intergenerational Transfers

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Thinking of Incentivizing Care? The Effect of Demand Subsidies on Informal Caregiving and Intergenerational Transfers

Abstract

We still know little about what motivates the informal care arrangements provided in old age**.** The introduction of demand-side subsidies such as unconditional caregiving allowances (cash benefits designed either to incentivize the provision of informal care, or compensate for the loss of employment of informal caregivers) provide us with an opportunity to gain a further understanding of the matter. In this paper we exploit a quasi-natural experiment to identify the effects of the inception in 2007 (and its reduction in 2012) of a universal caregiving allowance on both the supply of informal care, and subsequent intergenerational transfer flows. We find evidence of a 30% rise in informal caregiving after the subsidy, and an increase (reduction) in downstream (upstream) intergenerational transfers of 29% (and 15%). Estimates were heterogeneous by income and wealth quantiles. Consistently, the effects were attenuated by a subsequent policy intervention; the reduction of the subsidy amidst austerity cuts in 2012.

JEL-Codes: I180, D140, G220.

Keywords: caregiving, intergenerational transfers, difference-in-differences, long-term care, family transfers, exchange motivation, caregiving allowances, demand-side subsidies.

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1. Introduction

The public subsidization of long-term care (LTC) is limited in many western countries, and it is not uncommon in many countries to means-test it (Costa-Font *et al.*, 2015). Hence, it is not surprising that informal caregiving (the default in the absence of public support) remains today as the main source of long-term care (LTC) support (Rodrigues *et al.*, 2013)[1]. Some argue that emotional and informational advantages add to reasons for the predominance of informal care (Arno, 1999). However, we still know little about how the supply of informal care reacts to monetary incentives. Previous research has documented that informal caregiving is not independent of either the accessibility or the affordability of different alternative forms of care, which can substitute, or complement, the delivery of informal care (van Houtven and Norton, 2004, 2008, Bolin, 2008a, 2008b, Bonsang, 2009). However, does such a substitution effect apply after cash subsidies such as caregiving allowances? This is important because cash subsidies can serve other purposes in addition to relieving some of the financial burden of care[2], often replacing paid for unpaid care. Although caregiving allowances can be less costly than the equivalent extension of community care at the individual level, they often encompass a sacrifice in terms of forgoing employment of the caregiver (Carmichael *et al*, 2010)[3].

To date we have limited evidence from policy interventions that exogenously change the magnitude of caregiving subsidies. An exception is Kim and Lim (2015), who study the effect of

[1] Informal caregiving refers to unpaid care provided by children and members of the community to individuals in need of help with everyday tasks (e.g., bathing, toileting, etc).

[2] Some studies refer to a specific type of moral hazard, often referred as 'woodwork effect' (Pauly, 2004). The importance of the woodwork effects has been reported in the United States in the context of the expansion of Medicaid (a state cofounded program) following the implementation of the ACA (Affordable Care Act). Indeed, some state governors have expressed their concern that people who could have previously qualified under regular Medicaid rules, but never registered, would now claim their entitlement and leave state funding in a difficult position. The latter can partially account for the doubling of the costs from 19% in 1995 to 37% in 2005, which is arguably a threat to the financial stability of long-term care insurance schemes.

[3] Furthermore, they are designed to compensate caregivers for the loss of employment and income, and they can either be means tested (e.g., attendance allowance in England) or universal. Similarly, they can either take the form of conditional (e.g., vouchers) allowances, or alternatively, offer unconditional cash payment to households with dependent elders facing a significant caregiving burden.

formal home and institutional care subsidies on informal care use in South Korea[4]. This paper instead focuses on a cash incentive to informal caregiving competing with other forms of caregiving.

One, and possibly the most important mechanism for subsidies to act as an incentive lies in the in the effect allowances have in modifying pre-existing intergenerational transfer arrangements[5]. Indeed, in addition to the effects on the supply of care, they can in turn shift existing intergenerational financial arrangements to compensate family members for supplying informal care. This is important because, in the absence of a caregiving subsidy, intergenerational (also referred as 'intervivos') transfers can serve the purpose of subsidizing the provision of informal care (indicative of some 'exchange motivation'). That is, informal care can be hypothesized to rest on an implicit 'care for money' exchange arrangement (Laferrere and Wolff, 2006). In such as case, intergenerational transfers can either flow from children to parents (inflows or upstream transfers) or from parents to children (outflows, or downstream transfers), depending on each party's relative income (Sloan *et al.*, 2002). However, there is still limited consensus on how sensitive informal caregiving is to changes in the relative income of household members such as those resulting form the inception of a subsidy. In Europe, there have been a number of reforms that increase demand-side subsidies which are natural experiments suitable for testing the latter. Specifically, the Spanish 2007 reform leading to the universalisation of a caregiving allowance in 2007 is probably one of the most important ones of the last decade.

This paper studies the effect that the universalisation of an unconditional caregiving subsidy (which modifies the relative financial position of the recipient of care) has on the supply of informal care to elderly dependents. However, unlike previous studies, in addition to the supply of care, we examine the effect on both upward and outward intergenerational transfer flows. We draw

[4] Using a regression discontinuity design, Kim and Lim (2015) find that homecare is a substitute for informal care at the intensive margin, but do not find such evidence at the extensive margin. However, their work only measures the short-term effects of long-term care subsidisation, and hence further evidence that examines a longer time span might be informative.

[5] A question emerges as to whether they crowd out pre-existing altruistic motivations, but it is beyond the scope of this paper.

uponevidence from a natural experiment, specifically, the universalization of the caregiving subsidy in Spain after the 2007 reform (which we refer to using the Spanish initials of the bill that implemented it: SAAD[6]), and the subsequent contraction of the subsidy in 2012 as a result of austerity reforms. The Spanish 2007 reform was a unique expansion of public funding that is only comparable in magnitude to a handful of reforms in Europe (e.g., the introduction of Germany's social insurance in 1994, or Scotland's free personal care in 2002). However, unlike other reforms, it was largely unanticipated, as it was the legislative initiative of an unexpected socialist government elected after the Madrid bombings in 2004, the decisions of which depended on a hung-parliament. SAAD introduced a fully tax-funded subsidy with universal access, conditional only upon needs (rather than means) tests, namely, an independent assessment of needs[7]. Appendix B in turn evidences that the reform's implementation was politically motivated, and we will exploit this data in a subsequent instrumental variable strategy[8].

We use a difference-in-differences (DiD) strategy to examine the effect of SAAD on the probability of informal care supply and intergenerational transfers (both upward and downward). We exploit the four usable SHARE waves from 2004-2013, covering the period of both natural experiments. We examine a subsample of cohabitants, and heterogeneous effect by income and wealth. We use an instrumental variable strategy to capture the heterogeneity of the reform implementation which could result in attenuation bias. In addition, we consider the fact that SAAD offered the choice of home help care, and we follow the literature to account for such a choice by instrumenting it by the presence and number of daughters in the household. We run a number of robustness and placebo tests to assess the accuracy of our results.

[6] Sistema de Autonomía y Atención a la Dependencia.

[7] Informal care is especially relevant in the Spanish context, and Oliva *et al*. (2015) estimate that the cost of the total number of hours of informal care provided in Spain in a given year range between 1.7-4.9% of GDP.

[8] Regional governments run by the socialists, such as Andalusia and Catalonia were at the time among the front-runners at implementing the reform, whilst regions run by the conservatives were among the slowest (see Costa-Font, 2010)

Our baseline results aim to identify the average treatment effect of the reform on the supply of informal care and the resulting transfer decisions following the subsidy's expansion[9]. The identification of such effect is important to understand the economic consequences of informal care subsidization. Caregiving allowances can alter the balance of care and financial arrangements that individuals would otherwise have chosen. The welfare effects of an expansion of a demand subsidy depend on understanding such effects. More generally, informed policies need to take account of both the intended and the unintended effects of subsidizing various types of care[10].

We contribute to the literature in several ways. First, we estimate the presence of a change in the external margin of both caregiving (including co-residence) arrangements and intergenerational transfers resulting from an expansion (and universalization) of an unconditional caregiving allowance. Second, the paper contributes to the wider literature on the underlying motivations of money and care transfers (Laferrère and Wolff, 2006), which as we show are sensitive to the income expansion after the reception of a caregiving allowance, as caregiving allowances in the pre-reform period were significantly less generous, and means-tested. The second part of the paper studies a second natural experiment, namely, the reduction in the amount of the allowance in 2012, which we expect to produce the opposite effect to that of the reform's expansion. In turn, we provide parallel placebo tests, as well as test a number of potential identification threads. Finally, given the nature of the intervention, we control for the potential endogeneity in its regional implementation, the different regional rates of this implementation, and other potential mechanisms in place.

Our preferred specification suggests that the introduction of SAAD increased the probability of informal caregiving by 31%, the probability of downstream (outflows) intergenerational transfers by 29%, together with a 10% reduction in the probability of upstream (inflow) transfer. The effects are heterogenenous among income quintiles, health status and region of implementation, but robust

[9] That is, we test whether family transfers (acting as informal credit mechanisms that take place within households when caregiving produces an exchange mechanism) were affected by the expansion in public subsidization.

[10] Del Pozo and Escribano (2012) contend that economic benefits for informal caregivers are responsible for a reduction in public long-term care costs.

to the inclusion of specific regional time trends, as well as to a battery of checks and placebo tests. A simulation exercise suggests significant costs associated with universalization distortions.

The next section contains the paper's background, followed by the data and identification strategy. Section four contains the results, and a final section concludes.

2. Background

This paper attempts to contribute to the literature on the design of public long-term care systems as described below, and it seeks to illustrate how sensitive caregiving decisions are to changes in economic incentives.

2.1 Informal caregiving motivation

The motivation of informal caregiving has been a subject of extensive theoretical analysis under the label of 'time transfers', but empirical evidence is scare, and only a handful of studies takes advantage of policy interventions that modify the supply of formal care. Carcagno and Kemper (1988) using US National LTC Demonstration, which extended the affordability of home care services, find evidence of a reduction in informal care provision. Similarly, Pezzin and Schone (1999), use the Hebrew Rehabilitation Centre for the Aged Survey to find that the provision of formal care reduced the likelihood of co-residence, and thus the provision of informal care. Pezzin et al (1996) using the longitudinal data for a seven-year study in Massachusetts show evidence of substitution effects on informal caregiving resulting from changes in living arrangements. Finally, Li (2005) analyzes the Michigan's Home and Community Based Waiver Program (three-year period), consistently document an initial decline in informal care just after the provision of publicly paid home care, which soon ended.

Nonetheless, these studies do not focus on changes in cash subsidies. The exception is Skira (2015) who considers a range of policy experiments, and concludes that caregiver's allowance has an even larger effect on informal care provision. Similarly, using the exogenous variation of the 1997 Balanced Budget Act, which reduced Medicare reimbursement for home care services, Golberstein

et al. (2009) find an expansion in the probability of the use of informal caregiving. In Europe, Arntz and Thomsen (2011) use German data to show that cash incentives to switch to personal budgets increase the amount of time allocated to care for former recipients of care, without an impact on outcomes. In contrast, Eiken *et al.* (2013) finds evidence of either moderate or no effects[11].Hence, the matter does not seem to be settled. Furthemore, we know little about the underlying mechanisms that motivate a change in the provision of informal care. Evidence form a policy intervention that radically changed the incentives to the provision of informal care is scarce.

In addition to the Spanish reform examined here, some evidence has been retrieved from the introduction of the Scottish Parliament passed the Community Care and Health Act in 2002 which abolished all personal care and increased weekly average hours of care from 5.6 in 2000 to 8.2 in 2005. Although Bowes and Bell (2007) do not identify any effects on informal caregiving, more recent estimates by Karlsberg-Schaffer (2015) identify an expansion of the probability of women supplying informal care by around six percentage points. Hence, the evidence on the effect of subsidies seems to be mixed. Furthermore, it remains unclear whether the effect size is of a magnitude that invites concern.

2.2 Family Transfers

The effects of subsidies on intergenerational transfers have received limited empririical attention, especially, from stydies attempting to produce a causal estimate after an exogenous variation in the incomes the receipient of care. Intergenerational transfers can be studied as implicit contracts, which can adopt two extreme perspectives, namely, those of exchange and altruism (Becker, 1981). These invectives line up alongside other more sophisticated ones, such as those that stress the roles of insurance and reciprocity. In the latter case, the family is reported to act as a substitute for the credit market as means of inter-temporal distribution of resources (Laferrère and

[11] Other studies find that policies designed to incentivize community living are found to have little effect on nursing home entry, although they increase the probability of living independently (Hoerger *et al.*, 1996).

Wolf, 2006), transfers flow from the financially stronger member of the family to the weakest[12]. Exchange motivations ('time for money') are suggestive of a change in monetary transfers after a change in informal caregiving subsidies. Altruistic motivations, in contrast, generally do not give rise to any form of compensation if they are two-sided (Stark and Falk, 1998). Hence, by changing the relative financial position of household members, the subsidization of caregiving should be reflected in caregiving decisions.

The empirical evidence so far suggests the presence of some form of exchange, or reciprocity in people's transfers of care and money. Altonji *et al.* (1997) predicts that a one-dollar increase in a recipient's income reduces the transfers between household members by exactly the same amount. Norton *et al.* (2013) find that a child who provides informal care is more likely to receive intergenerational transfers than a sibling who does not, albeit conditional upon providing care. If more than one child provides care, they find no statistically significant effect on the amount of the transfer. In contrast, Jiménez-Martín and Vilaplana (2015) find that the contemporaneous provision of informal care decreases the probability of receiving a transfer and its amount. So it appears that whether intergenerational transfers are not independent of changes of incentives to caregiving is not a settled matter.

One way of discriminating between different motivations is by examining an exogenous change in income support for caregiving, which we hypothesize, should not change the motivations of an otherwise altruistic caregiver, assuming that household members do not alter their altruistic motivations (McGarry, 2000). It is important then to test whether it only affects transfers consistently with an insurance model (where transfers take the form of an 'informal insurance' payment), or if it only affects care but not the transfers provided (consistent with a one-sided altruistic model), or both suggestive of some exchange motive. The reception of an unconditional allowance would provide

[12] Sloan *et al.* (2002) argue that insurance motivations give rise to an insurance motive. Indeed, family caregiving could be interpreted as a substitute for other types of insurance (e.g., long-term care insurance).

some variation in such income, which allows testing the impact on the probability and the intensity of caregiving and monetary transfers. Rather than focusing on the internal margin change of such an effect, we are interested instead in the existence of a shift in the uptake of informal caregiving and monetary transfers after a reform.

3. Reform and identification strategy

3.1 The reform and post-reform

Act 39/2006, of December 14th, on the Promotion of Personal Autonomy and Care for Dependent Persons[13] (SAAD) involved a major expansion in the funding of public support for the long-term care of elderly Spaniards. The reform encompassed the introduction of a universal and unconditional caregiving subsidy. In addition, it contemplated an expansion of community care services to provide home help (see Figure 1 for a calendar of events). The reform was the outcome of both an unexpected election, only three days before congressional elections, of a new socialist government following the 2004 Madrid bombings (Garcia Montalvo, 2011), and a parliament that required a multiparty agreement to reach a new reform deal. A new minority socialist government began to expand the public subsidization of LTC in a different way from the failed attempts of the previous governments. Indeed, the implementation was left to the Spanish regions (autonomous communities), and, as we show, it tended to be faster in some regions (run by the party running the central government) than in others, as reflected in Tables A1 and A2[14] in the Appendix[15].

[Insert Figure 1 and Figure 2 about here]

[13] http://sid.usal.es/leyes/discapacidad/13776/3-1-2/act-39/2006-of-14th-december-on-the-promotion-of-personal-autonomy-and-care-for-dependent-persons.aspx

[14] Consequently, there was a wide variation in the percentage of beneficiaries (e.g., 3.19% Andalusia versus 1.17% in the Canaries, using data for 2010). We have used this threshold in view of the differences in the ranking scale between the population under and over the age of 18. Similarly, the reliance on cash or in-kind benefits differs across regions, representing a high dispersion rate in the cost per dependent (e.g. €5,093 in the Murcia region versus €12,715 in the Madrid region, while the percentage of informal caregivers' benefits with respect to total benefits awarded are 68.7 and 18.6%, respectively; Barriga et al., 2015).

[15] Although the principles of the new regulation applied nationwide, its implementation was largely the decision of the autonomous communities themselves (Costa-Font, 2010).

Unlike the pre-reform period, where care was means tested, SAAD incepted a universal entitlement to care involving either cash on in-kind support upon meeting the established needs tests. First, an individual care assessment is carried out to determine the services and/or benefits that best match the applicant's needs, including formal and informal care. This program is established with the beneficiary after the family has been consulted, and the subsidy is determined depending on the intensity of needs, which are classified as 'moderate dependency', 'severe dependency' or 'major dependency'[16]. Figure 2 reports on the implementation of the reform and the proportion benefiting from the caregiving allowance upon qualifying in a needs test. The population that relies on cash benefits increased steadily to 50% of the reform beneficiaries in 2012, and it then declines after that date amid the austerity reforms. We are therefore exploiting the effect of the uptake of such a subsidy.

One of the potential threats to the identification lies in controlling for the effect of the economic downturn which hit Spain very significantly. Spain was one of the countries with the highest unemployment rate, which arguably makes caregiving allowances more attractive. Hence, controlling for regional macroeconomic conditions is especially important. In addition, the country undertook a number of fiscal policy interventions including financial consolidation to reduce the large public deficit (8.9% at the beginning of 2012) led to the implementation of a reduction in the subsidy. As part of the budget cuts, the long-term care subsidy was slashed in July 2012 (Royal Decree 20/2012, July 13th 2012), and the implementation of the subsidy for 'moderate dependent' people was delayed until 2015[17]. The subsidy decline for those receiving an equivalent cash allowance to pay for informal caregivers was reduced by between 15 and 25%, conditional upon the degree of dependency. This explains the flattening line in Figure 2.

[16] Additionally, funding is subject to a co-payment determined according to income and capital, but it was never enforced in practice.

[17] So only people with severe and major dependency were supported, home care support fell from 70–90 hours/month to 56–70 hours/month for individuals with 'major dependency', and from 40–55 hours/month to 31–45 hours/month for those with 'severe dependency' (see Table A3).

3.2 The identification strategy

We seek to examine whether the incentives to the supply of informal care managed to shift caregiver and intergenerational financial arrangements. The uniqueness of the Spanish reform lies in that the exposure to the reform is clearly identified on the basis of the following observables: a) the severity of a person's disability and the needs assessment, b) the region of residence, as it was implemented with some delay, driven primarily by political expediency (Costa-Font, 2010), and c) the timing of the need for long-term care at individual level, that is, whether before or after the reform was in place. These specific features allow for ample variability arising from the reform's exposure, which would be expected to provide an additional subsidy for those individuals who provide informal care for their family dependents, alongside further coverage of community and institutional care. Indeed, the subsidy for informal caregivers in 2007 ranged between 506.96 €/month to 405.99 €/month, depending on severity, which correspond, respectively, to 89% and 71% of the minimum salary. In addition, there was monthly social security contribution of €153.93 for each caregiver. This support adds to the pension to which each elderly person income is entitled, or a statutory non-contributory allowance of €312.43 (see Table A3 for further details).

Our empirical strategy draws upon exploiting the rich covariates and the number of waves before and after the reform that are present in the SHARE dataset. That is, we use data from four different waves of the SHARE for Spain, 2004, 2006-07, 2010 and 2013, which capture the time of the reform in 2007. Specifically, for the 2006-07 wave, we can identify certain individuals interviewed before and after the reform, depending on the interview date.

We estimate a DiD fixed effects model for the probability of receiving informal care and the probabilities of receiving (giving) economic support from (to) informal caregivers, with the following specification:

$$Y_{ict} = X_{ict}\beta_0 + \beta_1 E_{ct} + \beta_2 SAAD_{ict} + \beta_3 POST_t + \beta_4 POST_t * SAAD_{ict} +$$

$$+C_c+T_t+\varepsilon_{ict} \qquad (1)$$

$$Y_{ict} = \{ IC_{ict}, TR^R_{ict}, TR^G_{ict} \}$$

The outcomes of interest are given by three binary variables: IC_{ict} takes the value 1 if the respondent *i* living in autonomous community *c* in year *t* receives informal care (0 otherwise), TR^R_{ict} takes the value 1 if the respondent has received a monetary transfer from his/her informal caregiver during the last year (0 otherwise), and TR^G_{ict} is a binary variable that takes the value 1 if the respondent has given a financial gift to his/her informal caregiver during the last year (0 otherwise). X_{ict} is a vector of control variables for respondent's socio-demographic characteristics (age, gender, marital status, level of education, dependency degree, income, and wealth in real terms), E_{ct} is a vector of economic characteristics of the autonomous community where the respondent lives (per capita GDP, unemployment rate), $SAAD_{ict}$ is a binary variable that takes the value 1 if the individual is a recipient of LTC insurance cash benefits) and $POST_t$ takes the value 1 if the observation relates to the post-reform period (0 otherwise). Finally, C_c and T_t denote autonomous community fixed effects and year fixed effects, respectively, and ε_{ict} is an individual-specific error term. The main coefficient of interest in this specification is β_4, which measures effect of public long-term care over the three outcomes of interest.

A core assumption of the DiD model is that both the national and regional specific time trends are common to both groups; that is, that treatment and control individuals would behave in a parallel manner without the long-term care reform, after controlling for observables. However, there are a number of identification threads that need to be accounted for, as we describe in the following section.

3.3 Additional specification issues

Endogeneity of reform implementation

One of the potential threats to the specification strategy results from the heterogeneous effects of the reform's implementation which could bias the estimates downwards. Specifically,

given that the reform was the 'star social program' of a newly elected socialist government, and that the regions were both co-financing and implementing the reform, we use regional political information to instrument for the reform implementation. If, for example, regions with a socialist government have both lower percentages of informal care and lower percentage of LTC awardees, the omission of the variable "region with socialist government" will mean that the covariance between the error term and long-term care benefit will be negative, and the estimated coefficient will underestimate the true causal impact of receiving a long-term care benefit. Consequently, the percentage of support for the socialist government in a region seems a good instrument candidate, provided that individuals with a higher preference for long-term care benefits, but living in a region where the socialist party has more support, are not tempted to move to another region with lower support for the socialist party (and more generous rules regarding the granting of a caregiving allowance),[18] which is likely to happen given the very high mobility cost and low level of mobility observed in the Spanish economy, at least in the short run[19].

Thus, we use a complementary empirical strategy that entails drawing upon an instrumental variable (2SLS) estimator, with the main instrument being whether the region is run by the socialist party in the region, whose electoral mandate included the development and implementation of a new long-term care Act[20]. The instrument is both theoretically relevant and empirically significant, and there is no reason to believe it impacts on the dependent variable in any other way. Given that we have two potential endogenous variables ($SAAD_{ict}$ and $POST * SAAD_{ict}$), we instrument them using the following equations:

$$SAAD_{ict} = \gamma_0 + \gamma_1 Soc_{ict} + \gamma_2 POST_t * Soc_{ict} + \gamma_3 Z_{ct} + E_{ct} + C_c + T_t + \vartheta_{ict} \qquad (2)$$

[18] According to article 28 of the Law on Dependency, each region is responsible for awarding long-term care benefits. Therefore, in the event of moving from one region to another, the program designed for the beneficiary in the region of origin will not be valid in the incoming region.

[19] As an example, in 2012 only 200 beneficiaries out of 764,969 moved from one region to another (Spain's Audit Office - Tribunal de Cuentas, 2014).

[20] Regions governed by the socialist party would therefore be expected to speed up the reform's implementation, as some previous research has documented (Costa-Font, 2010).

$$POSTSAAD_{ict} = \delta_0 + \delta_1 Soc_{ict} + \delta_2 POST_t * Soc_{ict} + \delta_3 Z_{ct} + E_{ct} + C_c + T_t + \vartheta_{ict} \quad (3)$$

Where Soc_{ict} is a dummy variable equal to 1 if the socialist party won the last regional elections, and zero otherwise (or the percentage of vote for the socialist party[21]), and Z includes other instruments (coverage index for public home care in 2000 and 2002[22]).

This identification strategy exploits two sources of variation: a time series variation alongside, an exogenous cross-sectional variation, especially in the instrumental variable strategy chosen. To avoid any concern regarding the estimation by 2SLS, Angrist and Krueger (2001) show that using 2SLS provides a causal interpretation that is not affected by the nonlinearity of the binary variables. By contrast, using probit to generate first-stage predictions may lead to inconsistent estimations.

Subsidy reduction

A second concern for the empirical strategy lies in that the post-reform period coincided with a period of an economic downturn. As we show below, SAAD gave rise to extra claims to benefit from the universal nature of the caregiving allowance. The Spanish government reacted to such spike in the SAAD uptake (displayed in Figure 2) by cutting down on the program's outlay by an average of 25%. In order to analyze the effect of the deficit-cutting policies introduced in 2012 and 2013, we extend the analysis to include the 2013 wave data, and account for the possibility that the effect of the policy was different by the time of the 2013 interview.

4. Data and Descriptive Evidence

We use data from SHARE (Survey of Health, Ageing and Retirement in Europe) for Wave 1 (2004), Wave 2 (2007), Wave 4 (2011) and Wave 5 (2013)[23]. SHARE is the most comprehensive

[21] See Table A4 in the Appendix for the percentage of votes to the socialist party. The results reported correspond to the estimation using as instrumental variable a dummy variable equal to 1 if the socialist party won the last regional elections (0 otherwise). We have also run the same regressions using as main instrument the percentage of support for the socialist party in the last regional elections. The magnitude and significance of the coefficients for $SAAD_{ict}$ and $POSTSAAD_{ict}$ have not changed.

[22] See Table A5 in the Appendix for the home care coverage index.

[23] Unfortunately, wave 3 could not be included, as it was not comparable with other waves. SHARE is the European equivalent of the Health and Retirement Survey, a panel dataset of interviewees born in 1960 or earlier and their partners,

dataset available across Europe to examine the effects of changes in long-term care subsidies among elderly individuals. While sample sizes vary between countries, the pooled dataset exceeds 100,000 individuals, from which only 20% have some form of dependency, defined as some activity of daily living (ADL) or instrumental activity of daily living (IADL) they cannot perform. We take advantage of the fact that some interviews in the 2006 wave were carried out in 2007, and hence they allow us to further identify the initial effects of the exposure to the expansion in public insurance. The data contain information on the reception of informal care, on the extensive margin (probability of informal care, and upward and downward transfers), and the relevant dependent variables of interest to us here. Finally, we examine whether the individual receives a cash transfer to pay for long-term care.

Our dataset also contains a long list of covariates, including parental characteristics, demographics (including age, gender, marital status, number of children), controls for health and dependency (Katz index), personal monthly income, wealth, time of the interviews, and sample weights (see Tables A6-A8 in the Appendix). Other data from aggregate sources were considered, including macroeconomic controls (regional unemployment, regional GDP, and regional deficits) that account for the effects of the economic downturn, which are largely regional specific.

4. 1. Descriptive Evidence

Before moving to the results, Figure 3 and Table 1 provide a description of the key dependent variables examined in the study. Figure 3 shows the density function of the two dependent variables, namely, the reception of informal caregiving alongside the inflows and outflows of inter-vivos transfers. Overall, and consistent with the universal nature of SAAD, we find a shift over time in the probability of receiving informal care towards individuals in a higher income quintile. In contrast, the effect of SAAD on transfers is less obvious according to Figure 3. There is a reduction in the

covering Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Israel, the Czech Republic, Poland, and Ireland.

inflows of intergenerational transfers among lower income individuals and an opposite effect among individuals closer to the median of income distribution.

[Insert here Figure 3 and Table 1]

Table 1 reports the proportion of SHARE survey respondents that state they receive informal care (breaking down such care from different caregivers, which include a co-residential caregiver, a non co-residential caregiver, and then specifies whether it refers to the spouse or partner along with an adult child), and monetary transfers (both outflows and inflows). The evidence suggests a limited effect of the exposure to the reform unless we distinguish by type of care. We find that those not affected by the reform record stable patterns over time, with the exception of a change in the provision of informal care by nonresidential caregivers, we can be reasonably explained by compositional effects (relatively higher income individuals). In contrast, we find the opposite effect when we study the effect among those affected by the reform, namely, an expansion of informal care provided by a co-resident caregiver and the family (partner or child).

5. Results

5.1 Baseline results

Table 2 reports alternative econometric estimates of the effect of the SAAD reform on the uptake of informal care. The various specifications differ in the inclusion of alternative specific controls and, specifically macroeconomic covariates, given that Spain was exposed at the time to an economic downturn. Columns 1-5 have been estimated using a linear probability model, and finally, Column 6 reports the marginal effects of a probit specification for comparative purposes. Overall, the results provide robust evidence for an increase in the probability of informal care after SAAD, and effects sizes specifically point towards a 17-18% increase in the probability of informal care, which appears robust to different specifications. Importantly, we find significant and negative income and wealth effects consistent with our expectations.

[Insert Table 2 and 3 about here]

Similarly, Table 3 reports the estimates of the SAAD effect on both inflow and outflow intergenerational transfers. Overall, the picture that emerges suggests a 14% increase in outflow transfers by those individuals that benefit from SAAD. Consistently, we observe a 7% decline in inflow transfers. The latter results indicate that, as expected, SAAD led to a lesser reliance on transfers from other family members, which was common practice before SAAD was implemented. As expected, outflow transfers increase with income and wealth, whilst inflow transfers decline with income and wealth. The latter indicates that transfers are typically motivated by financial need.

5.2 Implementation Effects: Instrumental variable (IV) estimates

As mentioned, one of the potential concerns is that the implementation of the reform was not homogenous but random. Hence, our previous results are likely to suffer from attenuation bias. Table 4 presents the OLS and IV estimates,[24] for the three outcomes of interest, using regional support for the party running the central government (socialist party) as a main instrument. The Hausman test rejects the null of exogeneity in all cases. However, the validity of these tests crucially relies on the validity of the instrument set.

Table B1 in the Appendix reports diagnostic tests for the validity of the instruments. Support for the socialist party is positive and significant in the first-stage equation for the uptake of a caregiving allowance, and its interaction with the post-reform period is negative and significant in both first-stage equations. Furthermore, The Kleibergen-Paap statistic rejects the under-identification hypothesis at 5% confidence level. To determine whether the IV estimates are weakly identified, we have performed the Stock and Yogo F-test. Given that there are two potential endogenous variables, we compare the Kleibergen-Paap *rk* statistic (7.93) with the Stock and Yogo critical values (Stock and Yogo, 2005; Kleibergen and Paap, 2006). Given that the Kleibergen-Paap *rk* statistic is higher than the Stock-Yogo critical value at 10% (7.03), we conclude that the null hypothesis of weak identification can be rejected.

[24] We have bootstrapped all the standard errors of the IV estimates.

The instrumental variable estimates of the model's key coefficients suggest, consistently with the presence of attenuation bias, a larger increase in informal care and outflow transfers, indicating an effect size of 32% on informal care, which is almost double that of the OLS estimate. Similarly, the effect of a 29% increase in outflow transfers more than doubles the OLS estimates. In contrast, the effect on the reduction of inflow transfers is more modest, and only increases from 7% to 10% when an IV strategy is used. The comparison of standard errors for all the regressions reveals that IV estimation does not significantly decrease estimation precision. Finally, it should be noted that the estimation of IV model with regional specific time trends for each region leads to similar results[25].

[Insert Table 4 about here]

5.3 Heterogeneous effects on caregiver arrangements

Table 5 presents both the OLS and IV estimates of the effect of SAAD by type of informal care arrangement. The results indicate that the SAAD effect was larger among both non-resident caregivers and co-resident children (40%). The specific effect of the reform on the supply of informal care increased less if the caregiver was the partner (24%). When we examine the effect of the care supplied by co-resident and non-resident children, we find that the estimates replicate those shown in the first four columns referring to (non) co-resident caregivers. These results are consistent with a potential income substitution effect of SAAD alongside its intended effect, which was the reduction in the caregiving burden for family caregivers. The latter can explain the difference in the effect between co-resident and non-co-resident caregivers.

[Insert Table 5 about here]

Table 6 takes a step further, and distinguishes the effect of SAAD according to the caregiver's income quintile, again reporting OLS and IV estimates. Importantly, with respect to the omitted category (5th quintile) we find significant and positive effects on the probability of caregiving only

[25]The estimated coefficient for the interaction of the LTC variable with the post-reform period is 0.321 (s.e.=0.03) in the model for informal care, -0.108 (s.e.=0.01) in the model for inflow transfers, and 0.298 (s.e.=0.03) in the model for outflow transfers.

for the two lowest income quintiles (+20% for the 1st and +13% for the 2nd quintile). This effect is consistent with a reduction in inflows among individuals both in the middle and higher income quintiles, and an increase among the lower income ones of a comparable magnitude (11% among the lowest income quintile). This result applies even though SAAD is not means-tested. Interestingly, we identify the reverse effect on intergenerational transfer outflows, where the largest increase in outflows is among the higher income quintile (where we find a 17% increase compared to no change among the lowest income quintile).

[Insert Table 6 about here]

5.4. The effect of budget cuts on behaviour

Subsidy reductions provide a subsequent quasi-experiment where we can test whether there is a reversion of the effects of SAAD. Table 7 present the results of the preferred specification for the key outcomes but adding an interaction of the LTC variable with the 2013 dummy picking up the effect of the subsidy reduction. We find that the effect and sign of the reform coefficient reverts in year 2013, with a 9.8% reduction in the probability of receiving informal care, a 4.6% increase in the probability of receiving inflow transfers, and a reduction in observing outflow transfers by the same magnitude. In fact, the effect on caregiving is consistently driven by a reduction in the probability of all sources of informal caregiving, either co-resident (7.7%) or not co-resident (15.8%). Note, however, a slower reduction in the probability of caregiving among partners (2.3%). [Detailed results are not shown, but are available upon request.]

[Insert Table 7 about here]

5.5 Robustness Checks

Family Characteristics: Daughters

Given that beneficiaries of the SAAD (and their families) are not a random sample, we test whether family characteristics have exerted a significant influence on the expansion of LTC-benefits consistently with other studies (Norton and van Houtven, 2004). More specifically, we test whether

the presence of daughters, who have traditionally been informal caregivers, is driving the result. We use an IV strategy in which the proportion of co-resident daughters with respect to total household members is an additional instrumental variable (see Table B2). It is therefore necessary to test whether this new variable is correlated with the reception of long-term care benefits, but uncorrelated with the structural equation's error term. Comparing the pre-reform and post-reform periods, it becomes clear that the distribution of daughters has remained stable for non-beneficiaries (see Table B3 in the Appendix)[26]. Hence, pour results are robust to the presence of daughters.

Individuals receiving care at baseline

Next, we have examined whether the effect of the reform remains when we examine individuals that received care at baseline after the reform. Table C1 in the Appendix shows that, as expected, individuals who received informal care in 2004 are likely to receive it from 2007 onwards, but the interaction with the treatment variable is not significant[27]. Hence, we rule out that the effect is due to changes of those who were receiving care at baseline.

6. Budgetary Estimates

This section seeks to draw on previous estimates to assess the budgetary cost of the universalization caregiving subsidy. More specifically, we draw on the following three features: (i) the impact of SAAD on the probability of receiving informal care, (ii) the number of people who benefit from the universalisation of the caregiving allowance after the reform, and (iii) the average allowance received by them. To estimate (i), we take our preferred estimates from Table 7. To estimate (ii), we use data on the uptake of the caregiving allowance per year (2007, 2011 and 2013),

[26]Table B1 in the Appendix presents a battery of endogeneity diagnostics. Firstly, the Hausman tests do no reject endogeneity. Secondly, the instrument set is significant in all the models. Instruments pass both the Hansen J test of over-identifying conditions and the under-identification test because the Kleibergen-Paap LM statistic is significant at 1% level. To determine whether the IV estimates are weakly identified, we have performed the Stock and Yogo F-test. Given that there are two potential endogenous variables, we compare the Kleibergen-Paap *rk* statistic with the Stock and Yogo critical values (Stock and Yogo, 2005; Kleibergen and Paap, 2006) and reject the null hypothesis of weak identification.

[27] Table C2 in the Appendix shows that the instrument for our IV specification did not influence the supply of informal care and intergenerational transfers before the reform.

and estimate a calibrated weighted average[28]. Finally, to estimate (iii), we use the magnitude of the unitary costs of each allowance for each level of needs (dependency degree) in 2007, 2011 and 2013. The average caregiving allowance has been computed as the product of the allowance corresponding to each dependency degree, times the percentage of beneficiaries for each degree (see Table A9 for the distribution of LTC beneficiaries by dependency degree).

Taking all these considerations into account, Table 8 shows the three elements described before, alongside the product of the three of them in column (4). This amount indicates the average expenditure per month devoted to subsidize a caregiving allowance. For a better understanding, we have expressed the caregiving allowance expenditure as a percentage of total expenditure of the SAAD (column (5)). We estimate that expenditure on the universal caregiving allowance amounted to about one fifth of total expenditure in 2011, but declined by 7.41% in 2012 due to the budgetary cuts introduced in 2012/2013.

In per capita terms, the increase in the expenditure to cover informal care due to the implementation of the SAAD involved an extra per capita expenditure of 0.09 €/year in 2007 and 8.09 €/year at the highest generosity level, in 2011. Finally, the budgetary cuts implemented in 2012 reduced per capita expenditure by 1.92 €/year.

[Insert Table 8 about here]

5. Conclusions

This paper has empirically studied the effect of the introduction of caregiving subsidies on both the supply of informal care, and on intergenerational (or inter-vivos) transfers within the household. We have drawn upon a natural experiment, namely the introduction of the Promotion of Personal Autonomy and Care for Dependent Persons Bill (referred as SAAD) in Spain after 2007,

[28]SHARE provides two types of weights. Sampling design weights are defined as the inverse of the probability of any specific wave of being included in the sample. Although these weights compensate for the unequal selection probabilities of the sample units, obtaining unbiased estimators of the population parameters is only possible under the ideal situation of complete response. Unfortunately, given that the SHARE data are affected by problems of unit non-response and sample attrition, estimators constructed using sample design weights alone may be biased (Lessler and Kalsbeek 1992). The strategy used by SHARE to cope with these problems relies on the ex-post calibration procedure of Deville and Särndal (1992).The present simulation uses these calibrated weights.

which universalized the previous means-tested caregiving allowance upon meeting the required needs. Our results suggest a significant expansion of informal caregiving as well as a shift in intergenerational financial transfers reducing (increasing) upstream (downstream) transfers, consistently with the idea of the possibility of 'incentivising caregivers'. Second, the uniqueness of the subsequent reforms reducing the subsidy have allowed for further testing the robustness of our estimates. Third, the paper's evidence is consistent with the presence of an exchange motivation driving the supply of informal care, namely an income incentive modifying both intergenerational caregiving and income transfers.

Overall, our result suggests that the introduction of SAAD had both non-neutral effects on informal care and on intergenerational transfers. We find a 32% increase in the probability of informal caregiving, a subsequent 29% increase in the probability of downstream inter-vivos transfer, together with a 10% reduction in the probability of an upstream transfer. The effect is found to be heterogeneous among income quantiles. Overall, we estimate that the (unexpected) expansion of informal caregiving that resulted from the implementation of SAAD accrued to about 20% of total LTC expenditure, but that such expenditure expansion was attenuated by 7% reduction attributable to the spending cuts associated with 2012 austerity reforms.

This paper contains a number of policy suggestions on the nature of family relationships in Southern Europe. Specifically, based on the results above, there seems to be scope for incentivizing informal care. Caregiving subsidies can significantly alter the decision to provide care and financially support household members. The universal nature of caregiving allowances might have entailed an incentive for previous non-caregivers to provide care, whether they were motivated by a 'unsatisfied demand for being cared informally', provided that the family delivers a higher quality (information and emotional advantage) of care, or by the search for the extra income provided by the paid nature of informal care, which we could have labelled as 'caregiving moral hazard'. Disentangling the effect of the two appears as an important question for further research.

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Tables and Figures

Figure 1. Disability and caregiver allowance entitlements by Spain per SHARE wave

ACT 39/2006, of December 14th, on the Promotion of Personal Autonomy and Care for Dependent Persons (SAAD)

2004 & 2006 Wave 1 &2

Disability Allowance (degree of disability higher than 65%)
- Before 1990: €286 (including caregiver and transport allowance).
- Means-tested (very strict income threshold)
- After 1990: €322
  Age: 18-65 years
  Additional €161 for caregiver allowance in case of major disability

2007 Wave 2

Caregiver allowance (art. 18 SAAD Act):
- Major dependency. Level 2: €**487**
- Major dependency. Level 1: €**390**
- No means-tested, but with copayments (computed according to awardees' income and assets)

2011 Wave 4

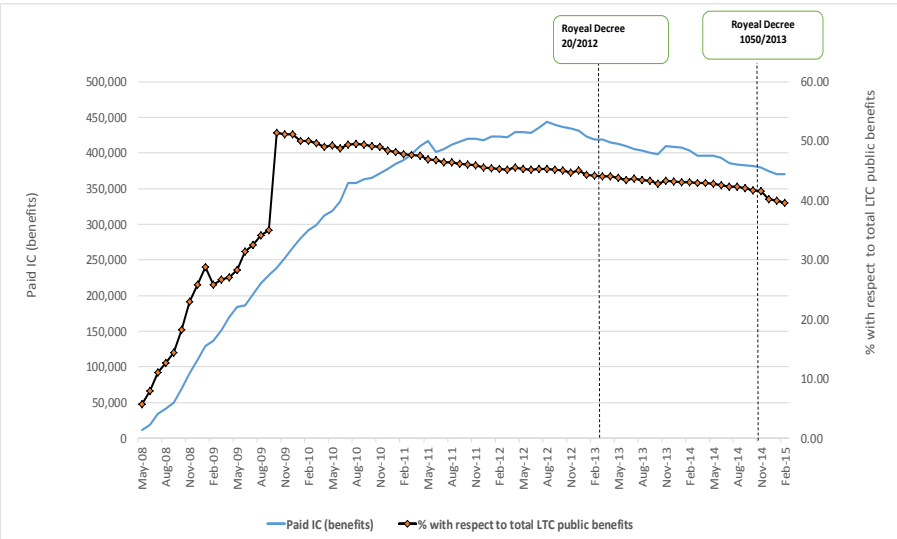
Coverage expansion to severe dependent and moderate dependent (level 2)
- Major Dep. Level 2: €**530**
- Major Dep. Level 1**: €417**
- Severe Dep. Level 2: €**337**
- Severe Dep. Level 1**: €300**
- Moderate Dep. Level 2: €**180**
- Co-payment was suspended during 2011 by High-Court

2013 Wave 5

Budgetary cuts introduced by Royal Decree 20/2012, July 13th
- Previous beneficiaries:
- Major Dep. Level 2: €**442**
- Major Dep. Level 1: €**354**
- Severe Dep. Level 2: €**236**
- Severe Dep. Level 1**: €255**
- Mod. Dep. Level 2: €**153**
- New beneficiaries: (removal of distinction between levels)
- Major Dep.: €**387**
- Severe Dep: €**268**
- Mod. Dep.: €**153**

For a better understanding of the amount of caregiver allowance and disability allowance, they can be compared with Spain's minimum wage: 460.50 €/month (2004), 540.90 €/month (2006), 570.60 €/month (2007), 641.40 €/month (2011), 645.30 €/month (2013).

Figure 2. Implementation of the Long-Term Care Reform (2008-2013)



Source: Own work using data from the Ministry of Health, Social Affairs and Equality.

http://www.dependencia.imserso.es/dependencia_01/index.htm

Figure 3. Density function of receiving informal care, outflow and inflow inter-vivos donations according to LTC benefits and real income (2007-2013)

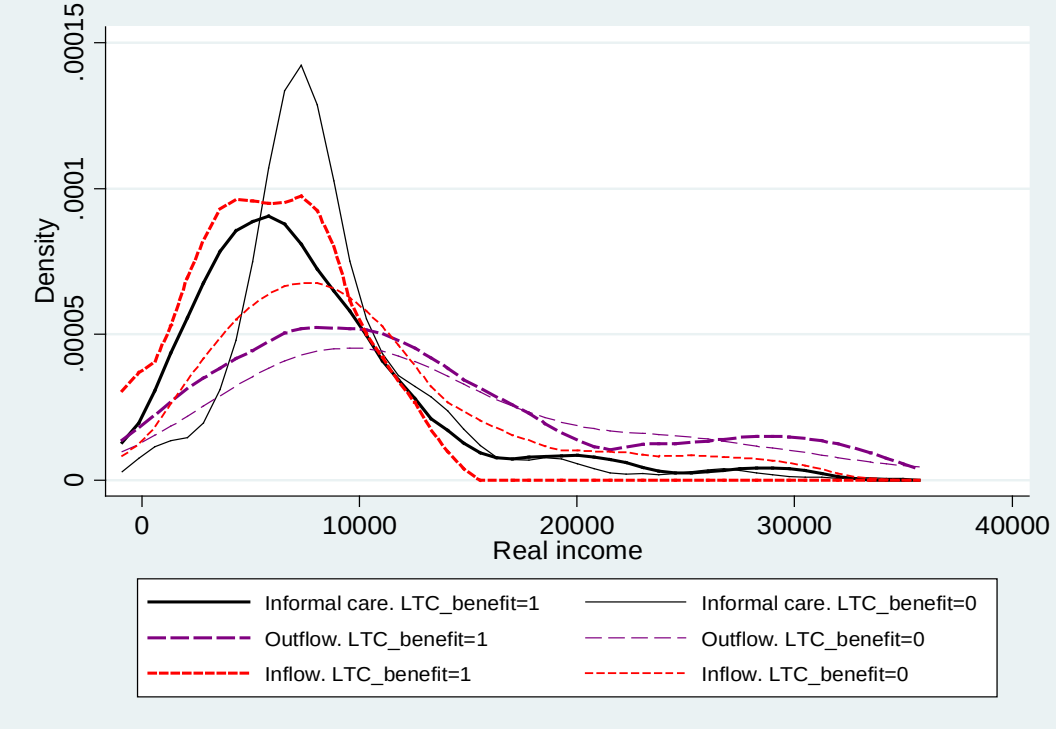


Table 1. Percentage of individuals receiving informal care, inflow inter-vivos donations and outflow inter-vivos donations distinguishing between those that benefit from SAAD

	Not receiving public caregiving allowance (SAAD)			Receiving public caregiving allowance (SAAD)		
	2004-2006	2011	2013	2004-2006	2011	2013
Receiving informal care	18.63	18.32	13.49	37.16	37.86	34.01
Informal care from:						
Co-resident caregiver	58.04	48.80	48.71	34.71	65.22	69.64
Not co-resident caregiver	53.42	62.00	62.36	71.17	54.89	48.86
Partner/spouse	32.63	29.60	29.90	6.14	49.28	42.83
Adult child	35.36	33.60	48.86	55.05	21.21	39.12
Inflow inter-vivos donation	1.13	2.09	1.99	2.34	2.55	2.86
Outflow inter-vivos donation	5.68	7.48	7.81	7.23	9.18	7.14
N	1,879	2,729	7,933	299	196	350

Note: These estimates have been computed from SHARE data (waves 1, 2, 4 and 5). Standard errors between parentheses. We exclude 2007 given the small number of observations (96). The number by groups depends on whether they benefit from SAAD.

Table 2. Regressions for the probability of receiving informal care (2004-2011)

	C1-OLS	C2-OLS	C3-OLS	C4-OLS	C5-OLS	C6-Probit
Receiving public caregiving allowance	-0.029*	-0.029*	-0.029*	-0.034*	-0.036**	-0.032*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Interaction Year = 2007 or 2011	0.175***	0.174***	0.174***	0.174***	0.173***	0.176***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)
Year = 2006	0.045**	0.045**	0.040**	0.004**	0.043**	0.044***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year = 2007	0.004	0.004	-0.011	0.025**	0.008	0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year = 2011	-0.078***	-0.078***	-0.074***	-0.073***	-0.070***	-0.071***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Real income (million € 2011)	-	-0.020***	-0.021***	-0.022***	-0.021***	-0.020***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Real wealth (million € 2011)	-	-0.009***	-0.009***	-0.009***	-0.009***	-0.010***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Disabilities allow.	Yes	Yes	Yes	Yes	Yes	Yes
Dependency	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment	No	No	Yes	No	Yes	Yes
Regional GDP	No	No	No	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.099***	-0.094**	-0.107**	0.100***	-0.051**	-0.070***
	(0.03)	(0.05)	(0.04)	(0.08)	(0.03)	(0.03)
N	6,672	6,672	6,672	6,672	6,672	6,672
R^2	0.248	0.259	0.270	0.282	0.288	0.265
F-statistic	612.24	568.93	334.17	296.52	284.57	-
p-value	0.000	0.000	0.000	0.000	0.000	

Notes: The omitted time variable is the year dummy for 2004, and the other omitted variable includes whether the respondent is a woman, whether there no elementary education, widow, Katz index equal to zero. Standard errors between parentheses.

Table 3. OLS Regressions for the probability of outflow inter-vivos (O) transfers and inflow inter-vivos transfers (I) (2004-2011)

	Outflows						Inflows					
	O1-OLS	O2-OLS	O3-OLS	O4-OLS	O5-OLS	O6-Probit	I1-OLS	I2-OLS	I3-OLS	I4-OLS	I5-OLS	I6-Probit
Receiving public caregiving allowance	0.024**	0.026**	0.026**	0.026*	0.027*	0.027**	0.044***	0.046***	0.045***	0.045***	0.044***	0.043***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Interaction with Year = 2007 or 2011	0.140***	0.143***	0.145***	0.145***	0.145***	0.146***	-0.072***	-0.071***	-0.075***	-0.073***	-0.073***	-0.077***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year = 2006	0.009	0.011	-0.008	-0.008	-0.009	0.000	-0.004	-0.014*	-0.013*	-0.013*	-0.016**	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year = 2007	0.050***	0.052***	0.052***	0.051***	0.050***	0.054***	-0.016***	-0.016***	-0.017***	-0.020***	-0.021***	-0.022***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Year = 2011	-0.122***	-0.124***	-0.124***	-0.123***	-0.123***	-0.125***	0.014**	0.014**	0.017**	0.015**	0.016**	0.014**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Real income (million € 2011)	-	0.101***	0.101***	0.102***	0.102***	0.101***	-	-0.042**	-0.044*	-0.047**	-0.045**	-0.044**
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Real wealth (million € 2011)	-	0.023***	0.022***	0.022**	0.021**	0.021**	-	-0.011**	-0.012**	-0.011**	-0.012**	-0.012**
		(0.00)	(0.00)	(0.01)	(0.01)	(0.01)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Disability allow.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Katz Index	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No
Regional GDP	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.201***	0.202***	0.198***	0.204***	0.195***	0.199***	0.077***	0.075***	0.075***	0.068***	0.071***	0.076***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
N	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672
R^2	0.108	0.109	0.110	0.107	0.111	0.098	0.127	0.132	0.135	0.130	0.125	0.120
F-statistic	70.45	71.59	75.35	74.87	71.58		57.86	61.63	62.36	62.78	60.74	
p-value	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	

Omitted variables: Year = 2004, women, no elementary education, widow, Katz index equal to zero. Standard errors between parentheses.

Table 4. Comparison OLS and IV estimates. (2004-2011)

	Informal care		Outflow transfers		Inflow transfers	
	OLS	IV	OLS	IV	OLS	IV
Receiving public caregiving allowance	-0.036**	-0.024***	0.027*	0.043**	0.044***	0.032***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Interaction with Year = 2007 or 2011	0.173***	0.317***	0.145***	0.293***	-0.073***	-0.103***
	(0.03)	(0.04)	(0.03)	(0.05)	(0.01)	(0.02)
Year = 2006	0.043**	0.044***	-0.009	-0.0011	-0.016**	-0.018**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Year = 2007	0.008	0.008	0.050***	0.053***	-0.021***	-0.023**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)
Year = 2011	-0.070***	-0.073***	-0.123***	-0.127***	0.016**	0.015**
	(0.01)	(0.01)	(0.03)	(0.04)	(0.00)	(0.00)
Real income (million € 2011)	-0.021***	-0.022**	0.102***	0.100***	-0.045**	-0.043*
	(0.00)	(0.01)	(0.03)	(0.03)	(0.01)	(0.02)
Real wealth (million € 2011)	-0.009***	-0.001***	0.021*	0.023**	-0.012**	-0.011**
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Disability allowance	Yes	Yes	Yes	Yes	Yes	Yes
Katz Index	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment rate	Yes	Yes	Yes	Yes	Yes	Yes
Regional GDP	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.051**	-0.079**	0.195***	0.151**	0.071***	0.041**
	(0.03)	(0.03)	(0.04)	(0.05)	(0.02)	(0.02)
N	6,672	6,672	6,672	6,672	6,672	6,672
R^2	0.288	0.297	0.111	0.120	0.125	0.131
F-statistic	284.57	122.80	71.58	55.23	60.74	44.65
p-value	0.000	0.000	0.000	0.000	0.000	0.000

.Note: Omitted variables: Year = 2004, women, no elementary education, widow, Katz index equal to zero. Standard errors between parentheses. IV regressions use 'support for PSOE' (Spanish socialist party) as an instrument. Diagnostic tests are reported in Table D4 in the appendix. Standard errors of IV estimations have been obtained using bootstrap with 100 repetitions.

Table 5. OLS and IV regressions for the probability of receiving informal care according to different profiles of caregivers. (2004-2011)

	Co-resident		Not co-resident		Partner		Co-resident child		Not co-resident child	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Receiving public caregiving allowance	-0.037***	-0.025**	-0.031***	-0.021**	-0.028**	-0.017*	-0.030***	-0.020**	-0.021**	-0.015*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Interaction with Year = 2007 or 2011	0.165***	0.302***	0.218***	0.403***	0.142***	0.240***	0.197***	0.304***	0.220***	0.405***
	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)	(0.04)	(0.00)	(0.02)	(0.00)	(0.02)
Year = 2006	0.040***	0.041**	0.041***	0.041***	0.043***	0.045***	0.038**	0.039**	0.039***	0.040***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year = 2007	0.008	0.009	0.009	0.008	0.008	0.008	0.009	0.009	0.010	0.011
	(0.00)	(0.00)	(0.01)	(0.03)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.02)
Year = 2011	-0.058**	-0.059**	-0.068**	-0.068**	-0.071**	-0.073**	-0.068**	-0.069**	-0.063**	-0.065**
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.02)
Real income (million € 2011)	-0.022***	-0.020***	-0.033***	-0.035***	-0.015***	-0.017***	-0.028***	-0.027***	-0.035***	-0.034***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Real wealth (million € 2011)	-0.010**	-0.011	-0.014**	-0.014**	-0.005**	-0.006	-0.013**	-0.014**	-0.017**	-0.018**
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.022)	(0.00)	(0.00)	(0.00)	(0.00)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Disability allowance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Katz index	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment rate	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.112***	-0.173***	0.052***	0.081***	-0.051***	-0.080***	-0.011	-0.017*	0.027***	0.042***
	(0.01)	(0.03)	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
N	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672	6,672
R^2	0.312	0.330	0.322	0.328	0.370	0.375	0.350	0.359	0.352	0.361
F-statistic	520.12	418.23	785.23	689.23	312.56	289.26	358.89	345.70	201.58	185.71
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Omitted variables: Year = 2004, women, no elementary education, widow, Katz index equal to zero. Standard errors between parentheses. IV regressions employ 'support for PSOE' (Spanish socialist party) as an instrument. Standard errors of IV estimations have been obtained using bootstrap with 100 repetitions.

Table 6. OLS and IV regressions for the probability of receiving informal care and inter-vivos transfers by income quintile and wealth quintile (2004-2011)

INCOME QUINTILES	Informal care		Outflow transfers		Inflow transfers	
	OLS	IV	OLS	IV	OLS	IV
Interaction public caregiving allowance & YEAR = 2007 or YEAR = 2011	0.175**	0.320***	0.140***	0.282***	-0.070**	-0.098***
	(0.03)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)
Interactions with public caregiving allowance & YEAR = 2007 or 2011						
1st quintile income	0.112***	0.201***	-0.002*	-0.005**	0.087**	0.118**
	(0.04)	(0.05)	(0.00)	(0.01)	(0.03)	(0.04)
2nd quintile income	0.078***	0.132***	0.015***	0.032***	0.046***	0.065***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
3rd quintile income	-0.035**	-0.054**	0.075***	0.154***	-0.097**	-0.130***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)	(0.04)
4th quintile income	-0.085***	-0.151***	0.086***	0.170***	-0.112***	-0.158***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
WEALTH QUINTILES	Informal care		Outflow transfers		Inflow transfers	
	OLS	IV	OLS	IV	OLS	IV
Interaction public caregiving allowance & YEAR = 2007 or YEAR = 2011	0.174***	0.301***	0.141***	0.272***	-0.071**	-0.093**
	(0.04)	(0.05)	(0.02)	(0.04)	(0.02)	(0.03)
Interactions with public caregiving allowance & YEAR = 2007 or 2011						
1st quintile wealth	0.084***	0.147***	-0.023*	-0.039**	0.018***	0.030***
	(0.02)	(0.03)	(0.01)	(0.01)	(0.00)	(0.01)
2nd quintile wealth	0.023***	0.044***	-0.015**	-0.031***	0.011**	0.015**
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
3rd quintile wealth	-0.014***	-0.027*	0.023**	0.041***	-0.023***	-0.032***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
4th quintile wealth	-0.078***	-0.150***	0.044**	0.091***	-0.030***	-0.047**
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)

Note: Fifth quintile of income or wealth rate is the omitted category. Other explanatory variables included in the regressions are age, gender, Katz index, disability allowance, marital status, level of education, year and regional dummies, real income (in the regression for wealth quintiles) and real wealth (in the regression for income quintiles). Note: Omitted variables: Year=2004, women, no elementary education, widow, Katz index equal to zero. Standard errors between parentheses. IV regressions employ 'support for PSOE' (Spanish socialist party) as an instrument. Standard errors of IV estimations have been obtained using bootstrap with 100 repetitions.

Table 7. Effect of austerity reforms. (2004-2013).

	Informal care	Outflow inter-vivos donations	Inflow inter-vivos donations	IC Co-resident	IC Not co-resident	IC Partner	IC Co-resident child	IC Not co-resident child
OLS Estimates								
Receiving public caregiving allowance	-0.040**	0.029*	0.046***	-0.039***	-0.032***	-0.027**	-0.029***	-0.024**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Interaction 2007	0.132***	0.088**	-0.072*	0.098***	0.113***	0.072***	0.123**	0.140**
	(0.04)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)
Interaction 2011	0.201***	0.190***	-0.122*	0.215***	0.275***	0.163***	0.247**	0.298**
	(0.03)	(0.02)	(0.01)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Interaction 2013	**-0.098*** **	**-0.046*** **	**0.043*** **	**-0.077*** **	**-0.158*** **	**-0.023*** **	**-0.125** **	**-0.179** **
	(0.02)	**(0.03)**	**(0.01)**	**(0.02)**	**(0.01)**	**(0.01)**	**(0.00)**	**(0.00)**
IV Estimates								
Receiving public caregiving allowance	-0.025***	0.043***	0.033***	-0.027**	-0.022**	-0.017*	-0.021**	-0.014*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Interaction 2007	0.100**	0.082**	-0.067*	0.061***	0.088***	0.071***	0.077***	0.090***
	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Interaction 2011	0.220***	0.213***	-0.170*	0.255***	0.320***	0.195***	0.291***	0.342***
	(0.04)	(0.03)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.03)
Interaction 2013	-0.057***	-0.093***	0.061***	-0.044**	-0.091***	-0.012	-0.074***	-0.107***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Income and wealth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Disabilities allow.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependency	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8. Simulation effects of SAAD: Monthly estimate of the economic impact of SAAD

	(1)	(2)	(3)	(4) Product (1)*(2)*(3) (€/month)	(5) % with respect to total expenditure of SAAD	(6) Per capita expenditure increase (€/year)
2007	0.100	6,612	476,31	327,538	1.3%	0.086
2011	0.220	400,086	357,34	31,881,548	21.2%	8.09
2013	-0.057	408,296	299,78	7,466,456	7.42%	1.92

(1) Coefficient of the interaction LTC-benefit and year dummy (Table 7)
(2) Population beneficiaries using calibrated weights
(3) Average LTC-benefit (multiplying average monthly benefit for each dependency degree by distribution of beneficiaries by dependency degree: Table B4)
(4) To obtain the percentage over total expenditure of SAAD, we have multiplied the monthly estimation by 12 and divided by the annual expenditure corresponding to that year.
(5) Total expenditure in the SAAD: €302,563,029 (2007); €1,802,975,359 (2011); €1,206,789,133 (2013)
(6) Per capita expenditure is obtained multiplying monthly estimation (4) by 12 and dividing by total population. Total population: 45,668,938 (2007), 47,265,312 (2011), 46,771,341 (2013). Source: National Institute of Statistics. http://www.ine.es/

Note: The figures for registered beneficiaries in the SAAD were as follows: 11,385 (May 2008), 401,176 (June 2011), 409,435 (June 2013).
Source: http://www.dependencia.imserso.gob.es/dependencia_01/index.htm

Appendix A

Table A1 Working of SAAD according to the main political affiliation of the regional government (%)

	$\frac{Assessments}{Applications}$	$\frac{Awardees}{Assessments}$	$\frac{Awardees}{Applications}$	$\frac{Receiving}{Awardees}$	$\frac{Econ.\,benefit}{Receiving}$	$\frac{Econ.\,benefit}{Applications}$
2007						
Socialist	91.35	72.99	66.67	57.58	35.14	13.49
Non- socialist	68.95	81.24	56.01	53.43	63.06	18.87
Total	81.05	76.21	61.77	55.85	46.27	15.96
2011						
Socialist	91.05	71.65	65.24	70.16	59.29	27.14
Non- socialist	95.18	72.89	69.38	69.02	55.38	26.52
Total	93.50	72.40	67.70	69.46	56.92	26.77

Note: Socialist regional government: 2007 (Andalusia, Aragón, Asturias, Castilla La Mancha, Catalonia, Extremadura); 2011 (Andalusia, Aragón, Asturias, Castilla La Mancha, Extremadura).
Applications over the total: total number of applications received. Assessments: official valuation of applicant's long-term care needs using the Ranking Scale of the SAAD (it includes positive and negative valuations). Awardees: favourable evaluations that recognize the entitlement to publicly funded long-term care (but does not imply the reception of any benefit). Receiving: awardees that in addition are receiving some type of long-term care public benefit (economic or in-kind).
Source: own work using data from http://www.dependencia.imserso.gob.es/dependencia_01/index.htm

Table A2 Working of SAAD according to the speed of implementation of the regional government (%)

	$\frac{Assessments}{Applications}$	$\frac{Awardees}{Assessments}$	$\frac{Awardees}{Applications}$	$\frac{Receiving}{Awardees}$	$\frac{Econ.\,benefit}{Receiving}$	$\frac{Econ.\,benefit}{Applications}$
2007						
Slow regions	25.27	87.59	22.13	57.58	60.59	7.72
Front running regions	75.39	82.99	62.56	57.45	44.49	15.99
Total	64.35	83.38	53.66	55.85	46.27	13.87
2011						
Slow regions	91.27	75.66	69.05	54.61	57.22	21.58
Front running regions	93.95	71.77	67.43	72.49	56.88	27.80
Total	93.50	72.40	67.70	69.46	56.92	26.77

Note: Slow regions 2007: Asturias (22.04%), Balearic Isles (7.09%), Canary Islands (30.15%), Galicia (31.47%), average for Spain (64.35%). Slow regions 2011: Canary Islands (61.28%), Balearic Isles (42.09%), Community of Valencia (57. 85%), Galicia (54.63%), average for Spain (70.37%).
Applications: total number of applications received. Assessments: official valuation of applicant's long-term care needs using the Ranking Scale of the SAAD (it includes positive and negative valuations). Awardees: favourable valuations that recognize the existence of long-term care needs (but does not imply the reception of any benefit). Receiving: awardees that are receiving some type of long-term care public benefit (economic or in-kind).
Source: own work using data from http://www.dependencia.imserso.gob.es/dependencia_01/index.htm

Table A3 Home care hours before and after Royal Decree 20/2012

	Before Royal Decree 20/2012	After Royal Decree 20/2012	
		Old beneficiaries	New beneficiaries
Major dependency. Level 2	70-90	56-70	
Major dependency. Level 1	55-70	46-55	46-70
Severe dependency. Level 2	40-50	31-45	
Severe dependency. Level 1	30-40	21-30	21-45
Moderate dependency. Level 2	21-30	Max. 20	Max. 20

After Royal Decree 20/2012, the distinction between dependency levels inside the same dependency degree was removed.
Source: Spain's Royal Decree-Law 20/2012, July 13th.

Table A4. Voting percentages for the socialist party in regional elections.

	Wave 1	Wave 2		Wave 4	Wave 5
	2004	2006	2007	2011	2013
Andalusia	51.07	51.07	51.07	48.41	39.52
Aragón	37.91	37.91	41.03	41.03	21.41
Asturias	40.30	40.30	42.04	42.04	26.45
Balearic Isles	24.60	24.60	31.75	31.75	18.94
Canary Islands	25.50	25.50	34.72	34.72	19.96
Cantabria	29.91	29.91	24.33	24.33	14.01
Community of León	36.74	36.74	37.49	37.49	37.77
Community of La Mancha	57.81	57.81	51.92	51.92	36.11
Catalonia	31.16	31.16	27.38	18.32	14.43
Community of Valencia	46.92	46.92	34.49	34.49	20.30
Extremadura	51.62	51.62	52.90	52.90	41.50
Galicia	22.20	33.64	33.64	31.02	20.61
Madrid	33.46	33.46	33.47	33.47	25.44
Murcia	34.03	34.03	31.81	31.81	23.96
Navarre	21.14	21.14	22.40	22.40	13.43
Basque Country	17.90	22.68	22.68	30.70	19.14
La Rioja	38.29	38.29	40.47	40.47	26.70
Ceuta	8.76	8.76	8.71	8.71	11.70
Melilla	11.92	11.92	18.49	18.49	8.44

Source: own work using http://www.congreso.es/consti/elecciones/autonomicas/

Aragón, Asturias, Balearic Isles, Canary Islands, Cantabria, Castilla León, Castilla La Mancha, Community of Valencia, Extremadura, Madrid, Murcia, Navarre, La Rioja, Ceuta and Melilla:

- Results from regional elections May 25th 2003 have been applied to waves 1 and 2.
- Results from regional elections May 27th 2007 have been applied to wave 4.
- Results from regional elections May 22nd 2011 have been applied to wave 5.

Andalusia:

- Results from regional elections March 14th 2004 have been applied to waves 1 and 2.
- Results from regional elections March 9th 2008 have been applied to wave 4.
- Results from regional election March 25th 2012 have been applied to wave 5.

Catalonia

- Results from regional elections November 16th 2003 have been applied to wave 1 and wave 2 (only 2006).
- Results from regional elections November 1st 2006 have been applied to wave 2 (only 2007).
- Results from regional elections November 28th 2010 have been applied to wave 1
- Results from regional elections November 25th 2012 have been applied to wave 5.

Basque Country

- Results from May 13th 2001 have been applied to wave 1.
- Results from regional elections April 17th 2005 have been applied to wave 2.
- Results from regional elections March 1st 2009 have been applied to wave 4.
- Results from regional elections October 21st 2012 have been applied to wave 5.

Galicia

- Results from October 21st 2001 have been applied to wave 1.
- Results from regional elections June 19th 2005 have been applied to wave 2.
- Results from regional elections March 1st 2009 have been applied to wave 4.
- Results from regional elections October 21st 2012 have been applied to wave 5.

Table A5. Coverage index public home care

	2000	2002
Andalusia	1.79	2.04
Aragón	2.52	2.44
Asturias	1.51	1.79
Balearic Isles	2.28	2.78
Canary Islands	1.9	1.88
Cantabria	1.51	1.55
Community of León	2.54	2.48
Community of La Mancha	2.13	2.55
Catalonia	1.23	1.3
Community of Valencia	0.78	2.16
Extremadura	4.69	4.86
Galicia	1.16	1.35
Madrid	1.98	1.89
Murcia	1.44	1.60
Navarre	3.33	3.02
Basque Country	2.3	2.85
La Rioja	2.76	2.84
Ceuta	2.79	1.76
Melilla	1.82	2.07

Coverage index: ratio of number of homecare beneficiaries divided by the population aged 65 and older and multiplied by 100.
Source: "Las personas mayores en España" (IMSERSO, 2000, 2002)

Table A6. Descriptive statistics according to the variable "Informal care"

	Informal care = 0				
	2004	2006	2007	2011	2013
Public caregiving allowance	5.90	2.63	3.24	2.50	1.89
Disability allowance	6.25	1.12	2.27	2.89	2.01
Men	41.24	41.88	45.32	45.80	43.26
Age	65.98	67.03	64.01	62.86	66.96
	(10.10)	(9.67)	(10.10)	(10.14)	10.59
Dependency degree					
Katz_1	11.06	18.75	10.15	9.34	3.82
Katz_2	1.92	0.63	1.10	1.78	0.93
Katz_3	0.70	1.88	1.02	1.91	1.16
Marital status					
Married/cohab.	77.43	76.53	77.58	76.87	77.85
Separated/div.	2.43	2.96	2.45	2.32	2.12
Single	5.82	5.64	4.76	4.96	4.07
Widow	14.32	13.12	13.14	12.87	13.23
Missing	0.00	1.75	2.07	3.98	2.73
Level of education					
College	6.07	1.25	3.62	4.50	5.73
Secondary	12.28	3.13	6.06	8.62	34.36
Elementary	67.33	13.75	25.57	34.55	34.12
Not elementary	14.32	81.88	64.75	52.33	53.27
Income	44,507	47,258	46,238	43,568	41,257
(real € 2011)	(86,278)	(85,458)	(77,268)	(68,267)	(65,275)
Missing income (% of sample)	11.26	11.87	10.57	11.41	10.12
Wealth	495,234	497,258	488,235	462,237	458,268
(real € 2011)	(329,726)	(343,287)	(321,822)	(314,287)	(327,879)
Missing wealth (% of sample)	6.25	5.36	5.54	5.08	5.01
N	1,564	160	1,271	2,356	7,302

	Informal care = 1				
	2004	2006	2007	2011	2013
Public caregiving allowance	16.64	6.24	7.55	11.06	11.15
Disability allowance	8.23	2.23	1.15	1.07	1.06
Men	33.50	28.81	35.12	34.62	37.37
Age	73.82	70.46	71.60	71.02	76.05
	(11.99)	(9.81)	(11.38)	(10.92)	(11.37)
Dependency degree					
Katz_1	33.76	32.20	27.09	26.19	20.12
Katz_2	11.17	20.34	10.37	16.17	11.68
Katz_3	9.90	11.86	14.72	18.10	15.69
Marital status					
Married/cohab.	52.54	53.68	53.41	54.14	52.87
Separated/div.	2.79	2.78	2.96	2.45	2.73
Single	8.12	8.75	8.86	8.68	8.63
Widow	36.54	33.56	34.58	33.87	34.54
Missing	0.01	1.23	0.19	0.86	1.23
Level of education					
College	2.79	0.00	2.68	2.64	3.39
Secondary	4.82	1.69	2.01	2.81	19.84
Elementary	57.61	10.17	18.39	30.93	41.66
Not elementary	34.77	88.14	76.92	63.62	60.41
Income	23,727	21,715	20,838	18,005	17,430
(real € 2011)	(100,412)	(96,856)	(85,785)	(72,386)	(70,458)
Missing income (% of sample)	10.03	8.81	10.23	12.65	11.47
Wealth	471,719	468,256	464,896	437,238	433,248
(real € 2011)	(229,426)	(223,256)	(212,128)	(202,156)	(198,425)
Missing wealth (% of sample)	5.23	5.28	5.87	5.12	6.05
N	394	59	299	569	981

Note: This table displays the descriptive statistics (mean and standard deviation) of the Spanish population in the sample that received and did not receive informal care support during the years of the data 2004-2013.
Source: Own work using SHARE (waves 1, 2, 4 and 5). Standard errors between parentheses.

Table A7. Descriptive statistics for outflow intergenerational transfers

	Outflow intergenerational transfers=0				
	2004	2006	2007	2011	2013
Public caregiving allowance	12.26	4.69	5.19	5.57	4.62
Disability allowance	2.07	0.89	0.78	1.02	0.53
Men	39.10	37.06	42.94	43.69	41.94
Age	67.89	68.37	65.77	64.80	68.58
	(10.96)	(9.95)	(10.70)	(10.82)	11.30
Dependency degree					
Katz_1	15.50	22.84	13.23	12.69	5.92
Katz_2	3.85	6.09	2.92	4.70	2.58
Katz_3	2.68	5.08	3.73	5.36	3.49
Marital status					
Married/cohab.	72.78	73.31	73.62	74.70	73.97
Separated/div.	2.23	1.80	1.37	1.96	2.17
Single	6.30	6.12	5.83	6.02	6.58
Widow	18.69	17.65	16.87	16.58	16.15
Missing	0.00	1.06	2.31	0.74	1.13
Level of education					
College	4.63	1.02	3.19	3.55	4.77
Secondary	9.43	3.05	5.16	6.66	31.74
Elementary	65.92	13.20	24.49	34.11	36.06
Not elementary	20,02	82,74	67,16	55,68	54.39
Income	46,732	49,621	48,550	45,746	43,320
(real € 2011)	(90,592)	(89,731)	(81,131)	(71,680)	68,539)
Missing income (% of sample)	11.49	12.11	10.78	11.64	10.32
Wealth	505,139	507,203	498,000	471,482	467,433
(real € 2011)	(336,321)	(350,153)	(328,258)	(320,573)	(334,437)
Missing wealth (% of sample)	6.38	5.47	5.65	5.18	5.11
N	1,793	197	1,474	2,703	7,763
	Outflow intergenerational transfers=1				
	2004	2006	2007	2011	2013
Public Caregiving allowance	16.66	0.00	7.18	7.07	4.44
Disability allowance	2.13	0.00	1.15	1.04	0.23
Men	46.06	50.00	50.00	42.79	48.01
Age	63.94	64.23	60.57	60.19	66.05
	(10.42)	(7.67)	(10.66)	(9.50)	(9.80)
Dependency degree					
Katz_1	16.97	18.18	15.63	11.71	9.48
Katz_2	3.03	4.55	2.08	3.15	1.52
Katz_3	1.21	0.00	2.08	1.35	0.72
Marital status					
Married/cohab.	68.48	71.23	73.62	72.94	74.20
Separated/div.	5.45	4.55	4.17	5.21	5.97
Single	6.06	5.64	5.02	4.95	1.86
Widow	20.00	17.56	13.74	13.12	14.47
Missing	0.00	1.07	3.45	3.78	3.49
Level of education					
College	13.94	0.00	7.29	11.26	12.92
Secondary	25.45	0.00	7.29	17.57	38.46
Elementary	59.39	9.09	19.79	30.63	24.86
Not elementary	1,21	90,91	65,62	40,54	53.33
Income	42,282	44,895	43,926	41,390	39,194
(real € 2011)	(81,964)	(81,185)	(73,405)	(64,854)	(62,011)
Missing income (% of sample)	11.82	12.46	11.10	11.98	10.63
Wealth	445,711	447,532	439,412	416,013	412,441
(real € 2011)	(296,753)	(308,958)	(289,640)	(282,858)	(295,091)
Missing wealth (% of sample)	6.56	5.63	5.82	5.33	5.26
N	165	22	96	222	520

Source: Own work using SHARE (waves 1, 2, 4 and 5). Standard errors between parentheses.

Table A8. Descriptive statistics for inflow intergenerational transfers

	Inflow intergenerational transfers=0				
	2004	2006	2007	2011	2013
Public caregiving allowance	12.57	3.80	5.24	5.92	4.46
Disability allowance	1.32	0.89	0.78	0.75	0.61
Men	40.39	37.56	43.85	43.97	42.37
Age	67.49	67.91	65.42	64.52	68.42
	(10.92)	(9.88)	(10.75)	(10.74)	(11.18)
Dependency degree					
Katz_1	15.31	21.60	13.21	12.36	6.09
Katz_2	3.75	6.10	2.72	4.58	2.49
Katz_3	2.27	4.69	3.56	5.10	3.27
Marital status					
Married/cohab.	73.28	74.15	74.85	74.60	74.32
Separated/div.	2.43	2.31	2.11	2.20	2.31
Single	6.28	5.87	5.50	5.41	5.33
Widow	18.00	17.35	16.08	15.43	15.66
Missing	0.00	0.32	1.46	2.36	2.41
Level of education					
College	5.28	0.94	3.43	4.02	5.38
Secondary	10.77	2.82	5.38	7.23	32.23
Elementary	65.42	13.15	24.35	33.85	35.02
Not elementary	18,53	83,10	66,84	54,91	54.52
Income	46,732	49,621	48,550	45,746	43,320
(real € 2011)	(90,592)	(89,731)	(81,131)	(71,680)	(68,539)
Missing income (% of sample)	11.03	11.63	10.36	11.18	9.92
Wealth	519,996	522,121	512,647	485,349	481,181
(real € 2011)	(346,212)	(360,451)	(337,913)	(330,001)	(344,273)
Missing wealth (% of sample)	6.13	5.25	5.43	4.98	4.91
N	1,894	213	1,544	2,863	8,147
	Inflow intergenerational transfers=1				
	2004	2006	2007	2011	2013
Public caregiving allowance	36.82	14.52	10.00	6.94	6.18
Disability allowance	2.24	2.15	1.54	1.12	0.96
Men	18.75	66.67	15.38	27.42	44.00
Age	69.70	69.50	67.31	60.95	66.44
	(12.18)	(7.21)	(11.55)	(12.30)	12.33
Dependency degree					
Katz_1	25.00	50.00	23.08	24.19	11.29
Katz_2	4.69	0.00	11.54	4.84	2.86
Katz_3	10.94	0.00	7.69	3.23	3.57
Marital status					
Married/cohab.	46.88	58.68	63.25	67.23	68.14
Separated/div.	4.69	5.09	4.82	4.12	3.48
Single	6.25	6.17	6.47	6.58	6.89
Widow	42.18	27.58	23.07	18.12	16.86
Missing	0.00	2.48	2.39	3.95	4.60
Level of education					
College	9.38	0.00	3.85	9.68	5.71
Secondary	10.94	0.00	0.00	19.35	32.86
Elementary	64.06	0.00	15.38	33.87	45.29
Not elementary	15,63	100,00	80,77	37,10	43.57
Income	35,606	37,806	36,990	34,854	33,006
(real € 2011)	(69,022)	(68,366)	(61,814)	(54,614)	(52,220)
Missing income (% of sample)	10.92	11.51	10.25	11.07	9.82
Wealth	371,426	372,944	366,176	346,678	343,701
(real € 2011)	(247,295)	(257,465)	(41,367)	(235,715)	(245,909)
Missing wealth (% of sample)	6.06	5.20	5.37	4.93	4.86
N	64	6	26	62	136

Source: Own work using SHARE (waves 1, 2, 4 and 5). Standard errors between parentheses.

Table A9. Average Long-Term Care Benefits and Beneficiaries

	2007		2011		2013	
	LTC-benefit (€/month)	Beneficiaries (%)	LTC-benefit (€/month)	Beneficiaries (%)	LTC-benefit (€/month)	Beneficiaries (%)
Major dependency. Level 2	487	88.98	520.69	17.54	442.59	13.95
Major dependency. Level 2	390	11.02	416.98	25.40	354.43	22.63
Severe dependency. Level 2			337.25	17.66	286.66	17.14
Severe dependency. Level 2			300.90	24.50	255.77	26.05
Moderate dependency. Level 2			180.00	14.90	153.00	13.61
Major dependency(*)					387.64	2.91
Severe dependency(*)					268.79	3.71
Average LTC-benefit	476.31		357.34		299.78	

Source: Spain's Royal Decree 727/2007, June 8th; Royal Decree 570/2011, April 20th; and, Royal Decree-Law 20/2012, July 13th.

(*) The reform implemented in 2012 unified levels inside the same degree of dependency. Therefore, new beneficiaries were only qualified as major dependents, severe dependents or moderate dependents.

The distribution of beneficiaries by dependency degree corresponds to May 2008 (the most recent data available at the System of Information of the SAAD), June 2011 and June 2013 (to gain an average perspective of the mid-year distribution).

http://www.dependencia.imserso.gob.es/dependencia_01/index.htm

Appendix B. Alternative instrumentation strategy

Table B1. First Stage Estimates

	Using 2 instruments		Using 3 instruments	
	LTC-benefit	LTC-benefit interacted with year = 2007, 2011	LTC-benefit	LTC-benefit interacted with year = 2007, 2011
Support socialist party	0.021*	0.015	0.026*	0.002
	(0.01)	(0.01)	(0.01)	(0.06)
Interaction year = 2007, 2011	-0.089***	-0.044**	0.092***	0.046
	(0.02)	(0.02)	(0.02)	(0.03)
Proportion of daughters	-	-	0.015**	0.019***
(% household members)			(0.008)	(0.008)
N	6,672	6,672	6,641	6,641
F (p-value)	18.02	55.43	27.13	81.24
	(p = 0.0000)	(p = 0.0000)	(p = 0.0000)	(p = 0.0000)
F-test of excluded instruments	7.79 (p = 0.0004)		6.57(p = 0.0002)	
Endogeneity				
Durbin (score) $chi^2(2)$	31.5691 (p = 0.0000)		62.453 (p = 0.0000)	
Wu-Hausman	15.8073 (p = 0.0000)		35.8025 (p = 0.0000)	
Under-identification				
Kleibergen-Paap rk LM statistic	6.09 (p = 0.0136)		15.210 (p=0.0000)	
Weak identification				
Kleibergen-Paap rk Wald F statistic	7.930		8.912	
Cragg-Donald	10.662		13.005	
Stock and Yogo test critical values(*)	10% maximal IV size: 7.03		10% maximal IV size: 8.43	
	15% maximal IV size: 4.58		15% maximal IV size: 6.18	
	20% maximal IV size: 3.95		20% maximal IV size: 5.40	
	25% maximal IV size: 3.63		15% maximal IV size: 4.45	
Overidentification				
Hansen's J-statistic	-		0.874 (p=0.3298)	
Sargan statistic	-		1.86013 (p = 0.1726)	

(*): As there are two or three endogenous variables, the Stock-Yogo critical values are compared to the Kleibergen-Paap rk statistic.

Table B2. Addition of an instrument: proportion of daughters to household members

		Pre-reform (2004-2006)	Post-reform (2007-2011)
LTC-benefit=0	Has daughters	51.37	48.76
	Number of daughters	1.65	1.66
		(0.88)	(0.89)
	Proportion of daughters (% of household members)	35.60	31.75
		(49.54)	(52.27)
LTC-benefit=1	Has daughters	62.66	41.24
	Number of daughters	1.74	1.63
		(0.86)	(0.78)
	Proportion of daughters (% of household members)	35.04	25.38
		(45.84)	(40.44)

Standard error between parentheses.

Table B3. Estimates of the effects using an additional instrument

	Informal care		Outflow transfers		Inflow transfers	
	IV-2 instruments	IV-3 instruments	IV-2 instruments	IV-3 instruments	IV-2 instruments	IV-3 instruments
Receiving public Caregiving allowance	-0.024***	-0.046**	0.043***	0.057***	0.032***	0.024**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Interaction Year = 2007 or 2011	0.317***	0.325***	0.293**	0.308***	-0.103***	-0.117**
	(0.05)	(0.06)	(0.06)	(0.07)	(0.03)	(0.04)
Year = 2006	0.044**	0.071**	-0.0011	-0.002**	-0.018**	-0.013**
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)
Year = 2007	0.008	0.011**	0.053**	0.076***	-0.023***	-0.023
	(0.01)	(0.00)	(0.02)	(0.02)	(0.00)	(0.04)
Year = 2011	-0.073***	-0.097**	-0.127***	-0.134**	0.015**	0.027**
	(0.02)	(0.04)	(0.04)	(0.05)	(0.00)	(0.01)
Real income (million € 2011)	-0.022***	-0.025***	0.100**	0.090**	-0.043**	-0.049**
	(0.00)	(0.00)	(0.04)	(0.04)	(0.01)	(0.02)
Real wealth (million € 2011)	-0.0010***	-0.0013***	0.023**	0.018**	-0.011**	0.013**
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Disability allowance	Yes	Yes	Yes	Yes	Yes	Yes
Katz Index	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment rate	Yes	Yes	Yes	Yes	Yes	Yes
Regional GDP	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.079***	-0.067***	0.151***	0.114*	0.041***	0.031**
	(0.02)	(0.02)	(0.03)	(0.06)	(0.01)	(0.01)
N	6,672	6,641	6,672	6,641	6,672	6,641
R^2	0.297	0.225	0.120	0.117	0.131	0.126
F-statistic	122.80	139.67	55.23	62.24	44.65	46.85
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Sample size is different for the IV estimation with three instruments because there were missing values or a refusal to give the number of children. Standard errors of IV estimations have been obtained using bootstrap with 100 repetitions.

Appendix C. Other Placebos Tests

Table C1. Effect of informal care at Baseline

	Without wave 5			With wave 5		
	Informal care	Outflow inter-vivos donations	Inflow inter-vivos donations	Informal care	Outflow inter-vivos donations	Inflow inter-vivos donations
Receiving public caregiving allowance	-0.030	-0.003	0.001	-0.015	-0.013	0.000
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)
Informal care (2004/06)	0.790***	-0.002	0.108***	0.769***	0.000	0.106***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)
LTC public * IC(2004/06)	-0.013	-0.013	-0.019	0.041	-0.025	-0.007
	(0.05)	(0.04)	(0.02)	(0.04)	(0.03)	(0.02)
IC(2004/06) * Post-reform	-0.674***	-0.002	-0.111***	-0.660***	-0.004	-0.109***
	(0.03)	(0.02)	(0.01)	(0.03)	(0.02)	(0.01)
LTC public * IC(2004/06)*Post-reform	0.061*	-0.037	0.034	0.059	0.008	0.012
	(0.07)	(0.06)	(0.03)	(0.04)	(0.03)	(0.02)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Disabilities allowance	Yes	Yes	Yes	Yes	Yes	Yes
Dependency	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment	Yes	Yes	Yes	Yes	Yes	Yes
Regional GDP	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.211***	0.153***	0.045***	-0.219***	0.187***	0.051**
	(0.02)	(0.02)	(0.01)	(0.04)	(0.03)	(0.01)
N	3,396	3,396	3,396	5,094	5,094	5,094
R2	0.387	0.097	0.086	0.366	0.110	0.105
F-statistic	200.447	9.404	10.821	203.362	9.945	10.415
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Omitted variables: women, no elementary education, widow, Katz index equal to zero and time dummies.
The first three regressions have been performed over the subsample of individuals who have answered waves 1, 2 and 4, whereas the last three regressions have been performed over the subsample of individuals who have answered waves 1, 2, 4 and 5.

Table C2. Instrument validity

	Only 2004			2004-2006		
	Informal care	Outflow inter-vivos donations	Inflow inter-vivos donations	Informal care	Outflow inter-vivos donations	Inflow inter-vivos donations
Receiving public caregiving allowance	0.031	0.030	0.029**	0.040	0.032*	0.025*
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)
Socialist regional government	0.015	0.017	-0.008	-0.006	0.012	-0.006
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Disabilities allowance	Yes	Yes	Yes	Yes	Yes	Yes
Dependency	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes
Unemployment	Yes	Yes	Yes	Yes	Yes	Yes
Regional GDP	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.167***	0.256***	0.112***	-0.215***	0.125**	0.110***
	(0.05)	(0.04)	(0.02)	(0.05)	(0.04)	(0.03)
N	1,958	1,958	1,958	2,177	2,177	2,177
R2	0.193	0.130	0.116	0.183	0.128	0.118
F-statistic	58.761	7.554	3.871	53.537	6.946	4.298
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Omitted variables: women, no elementary education, widow, Katz index equal to zero. Regressions for the period 2004-2006 include the time dummy for 2006. Standard errors between parentheses.