

Decentralization and the Partial Health Care 'Opting Out'

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Acknowledgements: we acknowledge the comments of the participants of the European Public Choice Society Conference, Cambridge University, 2014, and the Italian Health Economics Association Conference plenary 2014. We are grateful to Pau Olivella, Stephen Jenkins, Lucinda Platt, Berkay Ozcan, Matteo Galizzi, Chiara Orsini, and the other participants at the LSE Reading group as well as Alberto Batinti, Gilberto Turati, Gebhard Kirchgässner, and Roger Congleton who commented on previous version of the paper. We are especially grateful to Alejandra Hernandez for research assistance. All errors remain our own.

Abstract

When health care is delivered by a mainstream public insurer such as the National Health Service (NHS), uniform health services pose as challenge to satisfy heterogeneous demands for care, and some share of the population chooses to partially 'opts out' by using, and supporting, private health care. We investigate the effect of the political decentralization of the NHS, which lead to the re-allocation of political health care authority to regions, on both individual preferences for, and satisfaction with, public health care, alongside the actual uptake of private health insurance (PHI). We find robust evidence of shift in perceptions and preferences making more likely that individuals would use public health care and, a consistent reduction in the uptake of PHI for some subsamples, after decentralization. These results are heterogeneous by income and education groups and robust to placebo and other checks.

Keywords: National Health Service (NHS), political decentralization, use of private health care, private health insurance, health system satisfaction, demand for private health care.

JEL: H7, I18.

1. Introduction

The feasibility of tax funded national health services (NHS) is compromised when citizens question the quality of uniform, or less heterogeneous health care access (compared to the more heterogeneous access and quality offered by private market substitutes) and limited responsiveness to individual specific needs. In such health systems, individuals can supplement publicly funded health care, and either pay for it out of pocket (OOP), or ex-ante, by purchasing private health insurance (PHI). Hence, if the care delivered by the NHS falls short of quality expectations (e.g., due to waiting list and times, amenities, etc.), then individuals can resort, at least partially, to using market substitutes for a subgroup of services (Propper, 1996). Alternatively, they can ex-ante, purchase PHI (Besley *et al*, 1999).

An important question for public policy design is how, and whether to keep individuals using the NHS, especially those who otherwise might consider partially opting out to using private health care. This is important question as private health care lessens the demand pressure to the NHS and hence can improve the quality of those who stay. However, the expansion of private health care can compromise the political support of the NHS by those who opt out¹. Hence, whether one or the other prevails is an empirical question.

An institutional response to satisfying heterogeneous demands for health care without opting out to the private sector is that of regional decentralisation. Specifically, if preferences are heterogeneous across the territory, political decentralisation fragments the median voter at the regional level, so that the political incumbent in each region has political incentives (re-election aspirations) to deliver the package of health care services to that satisfies the median voter. In other words, regional decentralization can strengthen the political agency (Besley, 2006), namely the responsiveness of political representatives to citizens needs, and hence alter the quality and access to publicly funded health care.

Consistently, previous studies have established that the political agency, in some form, is associated with health outcomes (Besley and Kudamatsu, 2006, Navia and Zweifel, 2000; Alvarez Dadet and Franco-Giraldo, 2006 and Wigley and Akkoyunlu-Wigley, 2011)². However, limited research has focused on the specific mechanisms that underpin such an association. Reforms shifting authority in health care decision making to regions can help disentangle some of such mechanisms. Hence, if

¹ Some studies have examined the effect of attitudes to the NHS after individuals take up private health insurance, and they show evidence consistent of an attitude change after conditioning for a number of key covariates (Costa-Font and Jofre-Bonet, 2008)

² In contrast, in systems where there is no responsiveness to the health care quality (e.g., autocracies) there is less interest in providing quality social services, as there is no need of being regarded for them. Sen (1999) notes that there is not famine happening in countries where there are regular elections and free press. Epidemiological research into the social determinants of health suggests that being subordinate to authority can have detrimental effects of mental and physical health (Marmot, 2004) which can be explained by a reduction in the exposure to chronic stress.

there is a quality improvement resulting from strengthening regional political then one should observe a reduction in both the use of private health care and the uptake of PHI. This paper examines whether the above claims can be empirically substantiated.

One of the limitations of measuring the effects of an institutional reform is that health care quality is not fully observable to individuals to make a completed informed choice. In such a setting, individuals rely instead on a subset of observable measures of quality (either by themselves or by individuals in their social group). Those observable quality dimensions tend to include process dimensions³ (e.g., waiting times or waiting lists for specific services) which in turn influence the choice of NHS versus private health care⁴. Therefore, one would expect decentralization to change the perception of the process dimensions of the health care quality (e.g., health system satisfaction) and a preference for public health care and insurance. So far, the literature reveals that health care users are more likely to be satisfied with the quality of care they receive when provision is better than what they have been used to in the past (Leonard, 2008)⁵. Hence, a policy reform strengthening the political incentives to adjust health care services to regional specific preferences, should exert some effect on process dimension of quality and hence, show in the use of public health care.

This paper examines the effect of political health care decentralization on measures of use of publicly funded (NHS) health care. We define as partial opting out the situation where individuals use, plan to use (or insure the access to) private health care. Hence, we examine whether political decentralisation exerted an effect on both their 'partial option out' preferences, and on their satisfaction towards the NHS. We draw upon probably one of the main experiences of countrywide health care decentralization in Europe which took place in Spain since 1981 and then in 2002⁶ (other experiences include United Kingdom's devolution of health care to Scotland, Wales and Northern Ireland after 2000, and decentralization in Italy after 1978 and 1997).

Evidence from Spain is specifically important because decentralisation took place in two different waves, hence, the effects of decentralization can be distinguished from other effects such as the country democratisation alongside macroeconomic conditions. Hence be more precisely identified and qualifies as a 'natural experiment'. Specifically, we take examine the regional transfer of health care responsibilities to the ten regions (out of the seventeen region states or autonomous communities) which health service was still centrally run until 2002. The health care authority of the remaining seven regions had already been decentralized by 2002, and hence are our treatment group. All

³ This is so much is that the imperfect agency between health providers and patients is replicated by an imperfect agency between citizens and incumbents.

⁴ Hence, it is not unsurprising that previous work on the impact of measures of governance on health finds only indirect effects (Klomp and deHaan, 2008, 2009).

⁵ Descriptive analysis identifies a positive association between health system dissatisfaction and the decision to purchase PHI in the UK (Calnan *et al*, 1993).

⁶ Hence funding is uniform and grounded on general taxation, but where health care delivery is allowed to differ across the country.

regions, with the exception of two, were subject to the same financial constraints (Lopez-Casasnovas *et al*, 2005) . Hence, the differences in access to public health care between region states is not driven by differences in resources (except for two regions), but by the differences in policy across regions.

We use a difference in difference methodology where we compare the seven regions that had already decentralized before 2002 (control group) to the ones that were decentralized in 2002 (treatment group). However, we exploit different sources of heterogeneity that results from the specific institutional structure of Spanish decentralization, and specifically the different effects by socio-economic status, given that financial affordability of public health care is heterogeneous among individuals⁷. There will be an income threshold upon which individuals can afford to opt out and thus decide to use private health care. We find indeed that decentralization reduced PHI uptake for higher income individuals in Spain. Besley and Coate (1991) argue that if higher income individuals opt out from using publicly provided private goods but continue to subsidizing them through income taxes, the net effect produces redistributive outcomes. However, quality of care is typically left out of such analysis; hence if, as we argue, opting out reduces support for public health care and deteriorates the financing and the quality of NHS care, which might incentive the uptake of private health care. Hence, our paper contributes to identify the causal effect of a change in the quality of care resulting from decentralization reforms⁸, on the probability of partial opting out.

Our results survive a long list of robustness checks and falsification tests to rule out alternative explanations for the positive return of decentralization and identify the driver of the effect. Our preferred explanation is that the strengthening of the territorial political agency resulting from the second wave of political decentralization provided the electoral incentives to improve salient dimensions of quality of care, and have increases the expectation of use and support for the NHS and, simultaneously, reduced the development of private alternatives to mainstream public providers such as national health services (NHS). Given that health care decentralization gives rise to regional political cycles, regional specific quality improvements are found to increase support for NHS care and reduced the demand for private health care by reducing the uptake of PHI for high income individuals.

We first focus on test the hypothesis that political decentralization exerts an effect on some process dimensions of health care quality (such as the perception of the system and NHS atisfaction), to then show that it does indeed shift the demand for public (NHS) health care (preference for public health

⁷ Given that health care is a normal good (Costa-Font *et al*, 2011), *ceteris paribus*, one would expect that only more affluent populations groups can afford the significant costs of private health care or PHI

⁸ The effect can be heterogeneous by education and income group consistent with the ‘middle class’ hypothesis, whereby the middle class exerts a pivotal effect influencing preferences towards public health care (LeGrand, 1984).

care), and finally the uptake of PHI. We next provide the conceptual framework, followed by a description of the institutional setting. In section four we describe the data and the empirical strategy. Section five contains the results and section six concludes.

2. Conceptual framework

Health care is a credence good (Arrow, 1963), which individuals evaluate on the basis of experience when sick and form others' experience when healthy by updating the information on observable dimensions of its provision which we refer to as (observable) quality of care. Individuals derive utility from a health care quality (Q_i) and income (Y_i). The latter is obtained income from their labor market participation, and a share is devoted to pay taxes to the government (T_i). The government is run by agents interested in re-election and is knowledgeable of the observable nature of health care quality.

2.1 Public health care and decentralization

Quality of care in a region j can be delivered either by a centralized (c) or a decentralized (d) government structure $j \in (d, c)$. Under political centralization, the central government delivers a certain health care quality as perceived by an individual i (Q_i^c), and similarly, under political decentralization, the regional government provide certain quality of care (Q_i^d) of such observable dimensions. As a publicly funded health system, it is funded by the abovementioned taxes, so that individuals can estimate their income after taxes $Y_i^n (= Y_i - T_i)$. We allow for state depending preferences on health stats, so utility can be represented by $U(\cdot)$ when sick, and $u(\cdot)$ when healthy (as its common practice see Besley *et al* 1999), and the probability of *ill health is represented by p* . Hence, individuals can evaluate the health system both when sick and healthy. Based on the latter, individuals can compare the expected utility of decentralized and centralized health system governance, and health system decentralization will improve welfare if the combined welfare gain of decentralization under the states of sickness and health exceed that of centralization as below:

$$pU(Q_i^d, Y_i^n) + (1 - p)u(Q_i^d, Y_i^n) \geq pU(Q_i^c, Y_i^n) + (1 - p)u(Q_i^c, Y_i^n) \quad (1)$$

2.2 Private Health Care and decentralization

However, we can introduce a private alternative to the public health care in the analysis, so that we can distinguish public health care ($Q_i^{c,d}$) from private health care quality (q_i), which we assume remains the same irrespectively of desentralisation. Using private health care entails an out of pocket costs (L). Benefits of private health care, can encompass prompter access to specialist's physicians, avoiding waiting time and waiting lists, personalized health care, choice of GP, being entitled to a second opinion and, in certain circumstances, additional coverage (Ireland, 1990). Individuals will choose go keep using the public health care if their expected utility gain from the quality of care is higher than going private. Hence, if as in (1), health care *decentralization increases*

quality of care, we expect it to reduce the expected utility gain from using private health care. Since private care implies an income sacrifice L , this should be less after decentralization:

$$(1 - p)u(Q_i^d, Y_i^n) + p[U(Q_i^d, Y_i^n) - U(q_i, Y_i^n - L)] \leq p(1 - p)u(Q_i^c, Y_i^n) + p[U(Q_i^c, Y_i^n) - U(q_i, Y_i^n - L)] \quad (2)$$

2.3 Private Health insurance

Before, we assumed private health insurance (PHI) as an ex-ante device which allows individuals to access private healthcare, and hence attain private health care quality (q_i), paying a premium (k). Theoretical models on the demand for PHI assert that individuals will purchase PHI whenever the net expected utility gain resulting from insuring privately is positive (Besley et al., 1999). That is, whenever the benefits — namely quality, choice, and coverage improvements — outweigh the income loss from paying an insurance premium. Hence, in the presence of PHI, if (1) and (2) holds, then *the utility gain from purchasing private health insurance under decentralization should have declined as follows*:

$$(1 - p)[u(Q_i^d, Y_i^n) - u(Q_i^d, Y_i^n - k)] + p[U(Q_i^d, Y_i^n) - U(q_i, Y_i^n - k)] \leq (1 - p)[u(Q_i^c, Y_i^n) - u(Q_i^c, Y_i^n - k)] + p[U(Q_i^c, Y_i^n) - U(q_i, Y_i^n - k)] \quad (3)$$

2.4 Concluding remarks

Based on the above simple conceptual framework, one would expect an increase in salient quality of care after decentralization as in (1), a reduction in the probability of using private health care (2) and the increase in the uptake of private health insurance after decentralization as in (3). The following section offers the institutional background and the empirical analysis to test these hypotheses.

3. Institutional Setting

3.1 Health Care Decentralization in Spain.

Health care decentralization in Spain only compares to the Italian and encompassed the transfer of the political power to regulate and organize the health care system. A number of region-states (so-called autonomous communities, henceforth ACs) progressively took over health care responsibilities (see Appendix). Health care is funded by general taxation and access is universal, but decentralization modified the nature of the political agency in health care. Regional parliaments with decentralized health care responsibilities enjoyed large legislative capacity (only limited by framework legislation). Coordination draws on the input of the Inter-Territorial Council of the health system — an advisory committee comprising representatives from the central and regional governments — but with limited activity. Health care together with education is the main regional responsibility accounting for about 40 per cent of regional public expenditure.

It is therefore not surprising that after decentralization regional parliaments have exerted a significant legislative activity in health care, especially affecting the organization of the delivery of health care. In contrast, the main power to raise most taxes (with the exception of minor taxes, and surcharges on specific taxes e.g. petrol tax surcharges) is in the hands of the central state with the exception of two ACs (Basque Country and Navarre), who collect all general taxes and allocates back such resources through block grant in accordance with an unadjusted capitation formula.

Nonetheless, the dynamics of the transfer of the political agency was unique in Spain insofar as it took place in two steps, or so called “decentralization waves”. A first wave (1981-2001) formally began the early 1980s with the transfer of health care responsibilities to Catalonia (completed in 1981), followed by Andalusia (1984), the Basque country and Valencia (1988), Galicia and Navarra (1991), and ended with the transfer of health care responsibilities to the Canary Islands (1994). Health care in the remaining ten ACs remained centrally managed by the National Institute of Health (*Instituto Nacional de la Salud*, INSALUD) and regional governments in those regions only had some restricted powers in the fields of primary and community care.

The second wave of decentralisation took place in 2002 when all health care responsibilities were decentralized to those remaining ten region states (ACs). This was largely unexpected and resulting from the first absolute majority of the conservative government in 2000. This paper employs this exogenous variation produced from this specific transfer of political health care responsibilities to all remaining ten region states after the election of a new central government in 2001.

3.2 Private health care in Spain

Individuals in Spain are entitled to publicly funded health care, which in some region states does employ a network of private health care providers. However, individuals can use private providers if they perceive that the public health care network falls short of certain dimensions of health care quality, and providers such as doctors, are allowed to work both in the public and the private sector. Although the National Health System (NHS) finances the vast majority of healthcare in Spain, a significant and growing number of people subscribe to duplicate Private Health Insurance (PHI).

PHI is one of the most traditional mechanisms available to the middle class to be able to ensure access to private health care. Indeed, it is a financial arrangement that gives *ex-ante* access to those benefits at a ‘reasonable price’⁹. Private healthcare accounts for 2.5% of Spain's GDP (26.2% of healthcare spending), mostly from out-of-pocket expenditure, but PHI premiums account for approximately 21% of private health expenditure in 2010 and provide coverage to 13% of the population having a PHI cover (IDIS Foundation, 2013). PHI can be subscribed either by voluntary

⁹ Because insurance premiums are *ex-ante* prices based on a pool of PHI subscribers and the probability of receiving is smaller than one they are cheaper alternatives as compared to health care purchased out-of-pocket.

employer group plans, whether it is the public administration (22% of PHI policyholders in 2012) or private companies (35% in 2012), as well as individually (43% of subscribers) (IDIS Foundation, 2013). In the last two cases (78% of privately insured individuals) it gives rise to 'double coverage'. This is, these individuals that choose to go private do not totally opt out of the NHS, and often use both private and NHS care depending on their own preferences on specific health services. This pattern is not unique to Spain but is consistent with what is found in other countries organized under national health (NHS) systems where healthcare is uniform and there is little flexibility to adjust coverage to different preferences as regards quality of care.

3.3 The co-existence of public and private health care

The coexistence of private health insurance with the NHS is not without significant interactions. It is frequently advocated as an option by relatively better-off that might prefer to pay individually in order to improve the quality of care. Quality has been argued to be one variable explaining the interaction between the public and private health sectors (Besley *et al.*, 1999). Waiting lists are interpreted as a proxy variable for the quality of the NHS. Some studies show that demand for PHI is not independent of attitudes towards the public sector, which appear to have a significant influence on the demand for and utilization of health care (Gouveia, 1997; Besley *et al.*, 1996; Hall and Preston, 1999, Propper 2000; Costa-Font and Jofre-Bonet, 2008). In the Spanish setting, there is evidence from previous studies that the probability of PHI uptake is associated with a perception of lower health care quality.

4. Data and Identification Strategy

4.1 Data

Our data has been collected from all the waves of an annual survey of the health sector that contains standardized question on perception and attitudes towards the NHS, access to private health care and private health insurance, and a set of individual characteristics, namely the Health Care Barometer. The survey is regionally representative of Spain and was first commissioned in 1993 by the Ministry of Health, Social Services and Equality in collaboration with the Center for Sociological Research (Barometro Sanitario, 2010). However, given the nature of the data, we draw upon data running from 1998 to 2010, as previous years do not include the information needed to perform the analysis, and later years use different definition of the study variables. We study the effects until 2010 for two reasons. First, after 2010 Spain was significantly hit by an economic downturn which could have modified health care preferences. Second, given that the reform we are interested took place in 2002, our time span is large enough for our purposes. In addition, we could not include 2007 and 2008 because the relevant questions were not asked. Furthermore, given that the period we are interested in examining refers to an institutional changed occurring in 2002, the data appears to be adequate for our purposes. We control for non-response by identifying missing information dummies. Specifically, 27% of respondents do not report their income and 5% do not report education attainment. The rest of the variables have very few missing observations.

The survey comprises individual data on attitudes to public health care and includes (except for 2005, 2006, and 2010) uptake of private health insurance. In addition, there are measures of income, education, occupation, socio-demographics (age, gender, and marital status), and regional identifiers among other variables such as attitudes towards education and other publicly provided services which we exploit in our falsification tests. We use the following four dependent variables, defined in the survey as follows:

(a) *NHS perception (support)* refers to a general question about whether the NHS works fairly well. Answers can take values (1) the NHS works well, although some changes are needed, (2) the NHS needs fundamental changes, although some things do work well, and (3) our NHS works so very poorly that we would need to rebuild it completely. We recoded the variable such that 3 means that the respondent is satisfied with the way in which the health system works and 0 means that the respondents thinks that they health system works very poorly. We call this variable *Perception of the Health System*.

Next, (b) respondents are asked about their hypothetical choice between public and private health system for themselves or a family member in case they needed it. We call this variable *Preference for using public health care*. Respondents are asked about four categories of health use (primary care, specialist, hospital admission, and emergency room) and they can cast their answer into 3 categories: public, private or both. The answers are coded 0 if the respondent would choose for private or both and 1 if for public. In this way, we have a measure that takes value 1 if the respondent has a strong preference for the public system. Once the four categories are added together, we end up with an ordered variable that ranges from 0 to 4, where 4 corresponds to having a preference for public health in all four categories.

(c) *NHS satisfaction* refers to a question in which respondents are asked to evaluate from 1 to 10, ten different aspects of the public health system. We cardinalized the answers and took the mean as a satisfaction index about the public health system. Although the questionnaire includes satisfaction with 15 different aspects, due to many missing, we finally use only 8 satisfaction questions. The measure used in the paper is an average of the 8 satisfaction answers and it therefore also ranges from 1 to 10. The results are also robust to using principal component analysis (PCA) to generate the satisfaction measure. In fact, PCA analysis shows that the first eigenvalue takes up 58% of the variance and each of the eight satisfactions have a very similar weight (0.28, 0.34, 0.38, 0.36, 0.33, 0.38, 0.32, and 0.38).

(d) Refers to a dummy variable indicating when the individual has private health insurance (PHI). *PHI uptake* is asked in waves 1997 to 2004 and in 2009 and it takes value 1 if individuals have taken up a PHI.

Table 1 summarizes the main variables under study. We disentangle the descriptive estimates between individuals exposed to health care decentralization before the reform (controls) and those regions that obtained health care responsibilities after the reform in 2002 (treatment). Specifically, the first part of the table reports the number of observations, mean, and standard deviation of the four dependent variables and a number of covariates. Overall, treatment and controls groups show similar descriptive statistics on all variables except for the satisfaction with the public health and years of exposure to treatment. Nevertheless, we include them in our empirical specification.

Table 1. Descriptive Statistics

	Total			Treatment		Control	
	<i># Obs.</i>	<i>Average</i>	<i>(SD)</i>	<i>Average</i>	<i>SD</i>	<i>Average</i>	<i>SD</i>
<i>Dependent variables</i>							
Perception Health System	67828	1.87	0.82	1.92	0.82	1.83	0.81
Preference for Public Health	67778	2.56	1.70	2.59	1.69	2.53	1.71
Satisfaction with Public Health	55402	0.01	0.73	0.09	0.71	-0.06	0.73
Private Health Insurance	47824	0.11	0.32	0.13	0.33	0.10	0.30
<i>Treatment and Controls</i>							
Years of exposure	68591	10.50	8.39	3.00	3.06	17.27	5.38
Female	68589	0.51	0.50	0.51	0.50	0.51	0.50
Age	68568	46.25	18.28	46.76	18.44	45.78	18.13
Income, if income not missing	49766	3.40	1.27	3.41	1.28	3.38	1.27
Missing income	68591	0.27	0.45	0.26	0.44	0.28	0.45
Education Level, if not missing	65189	2.46	1.24	2.47	1.25	2.46	1.23
Missing education level	68591	0.05	0.22	0.04	0.20	0.06	0.23
Retired	68475	0.21	0.40	0.21	0.41	0.20	0.40
Unemployed	68475	0.08	0.27	0.07	0.26	0.08	0.28
Student	68475	0.06	0.24	0.05	0.23	0.07	0.25
At home	68475	0.09	0.29	0.10	0.30	0.09	0.28
Other	68475	0.03	0.18	0.04	0.18	0.03	0.18

4.2 Empirical Strategy

This paper attempts to empirically model following equations (1), (2) and (3), (i) perception of the public (NHS) care, (ii) the preference for public health care, (iii) satisfaction with the public health care system, and finally (iv) the uptake of PHI. The latest one result results from comparing the expected utility from two states of nature, one where individuals have access to private health care through PHI, and a competing state of nature where individuals use only NHS coverage. Traditionally, models of health care assume that quality is perceived and that health care provided by the NHS is uniform (Besley *et al*, 1999). However, this paper allows for some heterogeneity in the provision of health care, by allowing quality of care to be decentralized. Similarly, given that preferences for health care use vary across the individual's socio-economic distribution, we allow for income and education related heterogeneity.

4.2.1 Difference-in-difference effects

The identification of the decentralization effect is estimated by means of a treatment variable taking the value of 1 after a region state is transferred health care responsibilities. The control group is regions that already enjoyed health care responsibilities before 2002, and the treated group refers to region state that have health care responsibilities transferred after that. We include vectors of region states (ACs) and years dummy variables, so that either region specific and temporal shocks are controlled for. Our dependent variable is a measure of public health care support and use of an individual i in region g (perception and preference for NHS care, health system satisfaction, and PHI uptake), and we attempt to control for a number of other confounders. The variable POST refers to the period after the decentralization of health care services (2002-2010). Time effects are important insofar as decentralization is not necessarily a function of years of exposure, especially for those people who have experienced less contact with the health system. Health care quality can be appreciated by users and non-users, though in a rather different way. Hence, the fact that someone has had some contact with the health system provides an additional source of variation to take account of. The specification is as follows:

$$Y_{itg} = \gamma_1 D_{itg} + \gamma_2 \mu_t + \gamma_3 X_{itg} + \gamma_4 Z_{gt} + \gamma_5 (POST_t \cdot D_{itg}) + \gamma_6 \vartheta_g + \varepsilon_{itg} \quad (4)$$

Where D_{itg} is the dummy variable indicating treatment, X_{itg} refers to time variant covariates of each individual, whilst Z refers to pre-reform controls that can potentially affect health system satisfaction such as differences in the age composition and education attainment of the sample. We also include regional fixed effects (ϑ_g), time fixed effects ($\gamma_2 \mu_t$), and the usual error term (ε_{itg}). For the experiment to be credible it is important to show that treatment and controls variables should have similar characteristics and any difference should be conditioned for. Hence, we compare the changes in the treated with the changes of the control. The estimation methods correspond to a treatment effects model (differences in differences), which controls for unobservable characteristics that could

influence estimates and the decision to decentralize, influencing $E(\mu_{igt}|D_{itg})$ i and hence γ would be biased.

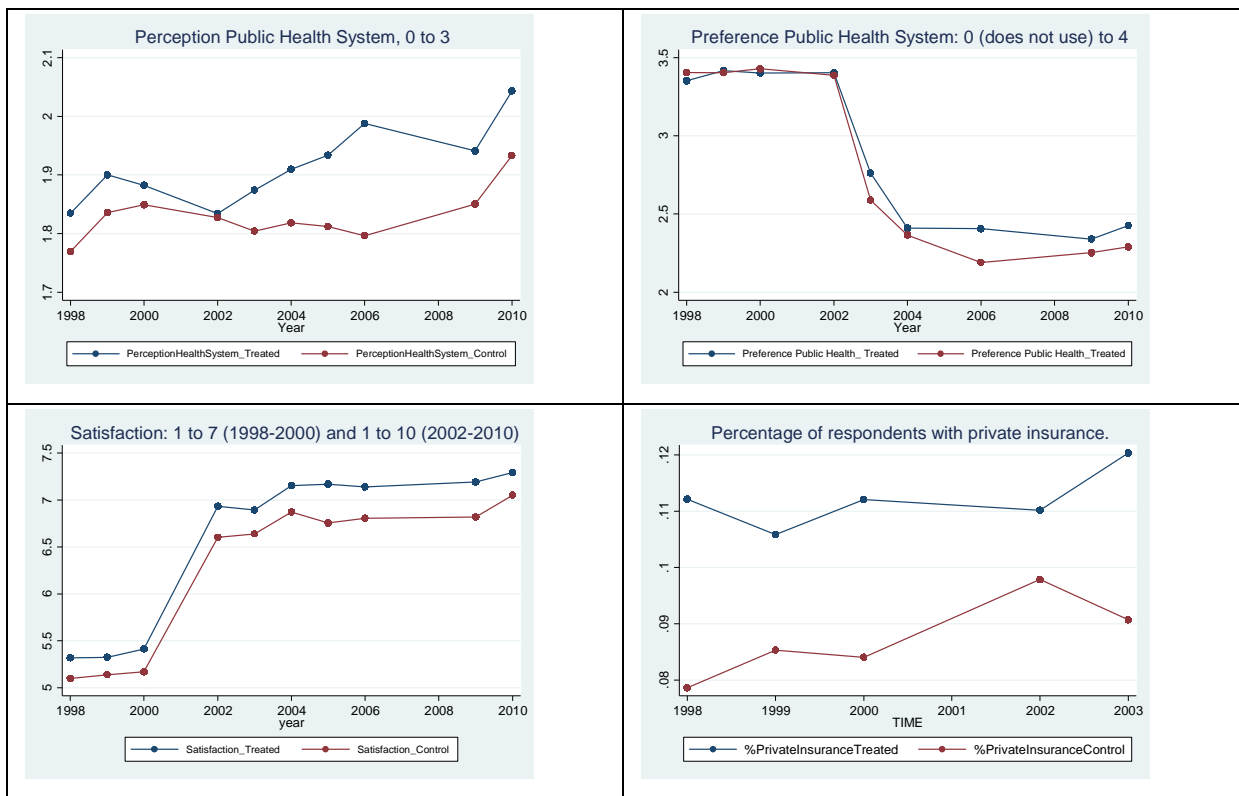
4.2.2 Heterogenous effects, robustness and falsification

As abovementioned, we examine heterogeneous effects across both education and income groups to test for the existence of some socioeconomic effects which are consistent with the hypothesis of middle or higher income class influencing preferences for the NHS. As a falsification test we have examined the effect of decentralization treatment on other public services that are not decentralized to test whether we find or not a preference towards the public nature of those services. In addition, we use an alternative instrumental variable strategy where decentralization determines satisfaction with and perception of public health services which then it is employed to estimate preference for public health care. We also add a trend and trend square so as to relax the assumption of common temporal effects, we include a variable indicating whether there were elections on that year, and we check our results to the exclusion of two small autonomy regions with a particular tax system. Finally, we examine the effect of decentralization depending on individuals' preference for the public system.

4.3. Parallel Trends

As a preliminary analysis, we graphically examine the existence of parallel trends prior to the treatment. Figure 1 display such trends for the four dependent variables in the study in which respondents are asked for their perception of a public health system (NHS), their preferences (demand) for public health care, their NHS Satisfaction, and uptake of PHI. The blue line represents those regions that were centralized prior to 2002 (treatment), while the red line represent those regions that were decentralized prior to 1999 and therefore were not treated in 2002 (control). The figure indicates that after 2002 (treatment year) those regions that were decentralized (blue line) increased the number of respondents who thought that the health system works properly. The others variables do not show a clear differentiated trend after 2002. Figure 1 shows evidence suggestive of the presence of parallel trends before 2002 for all three variables used in the analysis as explained above, except for PHI where departure points are difference and we observe some variation around the period 2000-2001, yet the overall increasing trend is comparable. The control group has systematically lower uptake of PHI.

Figure 1. Parallel trends in the dependent variables



Note: This Figure display the parallel trends 1998-2010 for the four dependent variables of our study : (a) support for Public Health System (NHS support), (b) preference for Public Health Care, (c) NHS Satisfaction and (d) uptake of PHI. The figure shows the evolution of this variable for those regions that were decentralized prior to 1999 (blue line) and for those that were decentralized in 2002 (red line).

5. Results

5.1 Baseline results

Table 2 reports DiD results of the impact of decentralization on different dimension measures of the preference of public health care. We find evidence of positive and significant effect for all domains on public health care preferences, although not statistically significant for one of the four dependent variables, namely PHI uptake and is only significant at 10% for satisfaction with the NHS. In a latter section, we will examine whether these two non-significant coefficients arise from heterogeneous effects. These results control for all the set of variables mentioned above, i.e. time and region fixed effects, income, education level, age, gender, occupation, and a dummy variable for missing income and education level.

Specifically, when we study the effect of health care descentralisation on four dependent variables under analysis we find a 7 pp point increase in the positive perception of the health system, an increase in the a preference for public health care 13 pp (both significant at 1%), and an increase in NHS satisfaction by 0.02 (significant at 10%) alongside a 0.045pp (not statistically significant) effect

on the uptake of PHI. Hence, overall these results are consistent that decentralisation does indeed shift preferences for NHS use.

Table 2. Effect of Political Decentralization on Opting Out

	Perception health system [0 bad - 3 excellent]		Preference for public health [0 never use-4 use it always]		Satisfaction with public health [0 unsatisfied - 10 very satisfied]		PHI [1 yes – 0 no] Probit	
	No controls	Controls	No controls	Controls	No controls	Controls	No controls	Controls
Treated	0.285 ^{***} (0.021)	0.282 ^{***} (0.021)	-0.099 ^{***} (0.036)	-0.064 ^{**} (0.036)	0.200 ^{***} (0.021)	0.185 ^{***} (0.020)	0.155 ^{***} (0.054)	0.059 (0.057)
Post 2002	0.141 ^{***} (0.015)	0.129 ^{***} (0.015)	-1.088 ^{***} (0.026)	- 1.103 ^{***} (0.026)	-0.017 (0.015)	-0.031 ^{**} (0.014)	0.509 ^{***} (0.032)	0.580 ^{**} (0.035)
Treated*Post	0.070 ^{***} (0.012)	0.076 ^{***} (0.012)	0.129 ^{***} (0.022)	0.127 ^{***} (0.021)	0.015 (0.012)	0.021 [*] (0.012)	-0.039 (0.032)	-0.045 (0.033)
Year FE	Included	Included	Included	Included	Included	Included	Included	Included
Country FE	Included	Included	Included	Included	Included	Included	Included	Included
Controls	Not incl.	Included	Not incl.	Included	Not incl.	Included	Not incl.	Included
<i>N</i>	67828	67692	67778	67641	55402	55297	47824	47723

Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Controls: female, age, income, education level, occupation, and a dummy for missing income and education level.

In interpreting the estimates, a question that emerges is whether the effect is driven by the effect of political decentralization or the fact that two out of the seventeen regions are fully fiscally accountable as they collect their taxes. The latter would tend to indicate that fiscal, as opposed to political accountability is driving the results. To address this concern, in Table 3 we examine the effect after removing the observation referring to the two regions that are fully fiscally accountable (hence, can collect their own taxes) and make less than 5% of the total Spanish population. Again, results hold and remain virtually unchanged for the four main variables, except that satisfaction with NHS is now statistically significant at 5% for, but the coefficient remains insignificant for PHI up take. These results indicate that political, rather than fiscal decentralisation appear to be driving the results.

Table 3. Eliminating the effect of Navarra and Basque Country

	Perception health system [0 bad - 3 excellent]	Preference for public health [0 never use-4 use it always]	Satisfaction with public health [0 unsatisfied - 10 very satisfied]	PHI [1 yes – 0 no] Probit
Treated	0.286*** (0.021)	-0.073** (0.036)	0.183*** (0.020)	0.057 (0.057)
Post 2002	0.140*** (0.016)	-1.107*** (0.028)	-0.048*** (0.016)	0.564*** (0.037)
Treated*Post	0.067*** (0.013)	0.141*** (0.023)	0.028** (0.013)	-0.038 (0.034)
<i>N</i>	61693	61617	50208	43504

Notes: Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Controls: year and region fixed effects, female, age, income, education level, occupation, and a dummy for missing income and education level. Regressions exclude the Bask Country and Navarra

5.2 Robustness Checks

Next we address some threats to our identification. Indeed, so far, our previous estimates rely on time effects, however one could argue that the effects are deemed to be sensitive to linear and quadratic trends. Another argument can be made that users of the health services might be different from non-users, and one would expect that experience with health care services influences the formation of health care preferences. In Table 4, we present our first two robustness checks. First, we control for both a linear trend and quadratic trend (trend squared). When we turn out to examine an alternative strategy in Table 4 we find consistent results (Panel 1).

Second, we test whether the effect is driven by the users of public health care by introducing a triple interaction between post*treatment and individuals' preference (hypothetical demand) for the public health.

Table 4 Robustness Tests (I, II): trend and trend square; and triple interaction effect

	PANEL 1:				PANEL 2:		
	Robustness: includes trend and trend square				Robustness: control for preference		
	Perception health system	Preference for public health	Satisfaction with public health	PHI	Perception health system	Satisfaction with public health	PHI
Treated	0.243*** (0.019)	-0.148*** (0.038)	0.195*** (0.019)	0.059 (0.057)	0.293*** (0.021)	0.193*** (0.020)	0.018 (0.058)
Post 2002	-0.012 (0.018)	-0.665*** (0.035)	-0.003 (0.017)	0.106 (0.117)	0.114*** (0.015)	-0.046*** (0.014)	0.584*** (0.035)
Treated*Post	0.074*** (0.012)	0.142*** (0.023)	0.022* (0.011)	-0.045 (0.033)	-0.103*** (0.014)	-0.121*** (0.014)	0.427*** (0.039)
Treated*Post* Preference for public system (0 to 4)					0.086*** (0.003)	0.068*** (0.003)	-0.228*** (0.011)
Trend	-0.013 (0.008)	-0.573*** (0.016)	-0.004 (0.008)	-0.017 (0.071)			
Trend Square	0.002*** (0.001)	0.048*** (0.001)	0.000 (0.001)	0.008 (0.006)			
Year FE					Included	Included	Included
Country FE	Included	Included	Included	Included	Included	Included	Included
<i>N</i>	67692	67641	55297	47723	66914	54776	47112

Note: Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
 Controls: female, age, income, education level, occupation, and a dummy for missing income and education level.

The first two columns of Panel 2 show the results for a positive perception of and satisfaction with the public health system. As expected, when we interact whether individuals use public health care with the treatment we find a comparable and expected positive effect, whilst the effect for the interaction between treatment and post are negative¹⁰. Combining the information of the two coefficients we see that for individuals using the public health system at least for two of the four care options (primary care, specialist, hospital, and emergency room), decentralization brings about more satisfaction and

¹⁰ In order to interpret the coefficients and also to understand the evolution of public use, we provide the descriptive statistics of this variable.

Year	0 =Never (%)	1 (%)	2 (%)	3(%)	4= always (%)
2002	7.31	2.99	4.4	13.51	71.79
2006	27.68	8.73	11.33	11.31	40.95
2010	24.64	10.15	11.26	12.61	41.35

good perception of the health system, and importantly, and unlike previous estimates, it reduces the take up of PHI. All effects are now statistically significant at 1%, including the take up of PHI.

Another potential concern to the identification is whether the political cycle is driving our results. Table 5 introduces election year as an additional control (robustness test III). Election year as expected exhibits a statistically significant effect in almost all regression estimates, but it does not change the coefficients of the treatment effects (the interaction between treated and post). These estimates result from adding an additional variable that takes value 1 on the year that there were general elections: 2000, 2004, and 2008.

Table 5: Robustness Tests (III) - Effects Controlling for election year

	Perception health system [0 bad- 3excellent]	Preference for public health [0never use-4 use it always]	Satisfaction with public health [0 unsatisfied - 10 very satisfied]	PHI [1 yes – 0 no] Probit
Treated	0.282*** (0.021)	-0.064* (0.036)	0.185*** (0.020)	0.059 (0.057)
Post 2002	0.129*** (0.015)	-1.103*** (0.026)	-0.031** (0.014)	0.580*** (0.035)
Treated*Post	0.076*** (0.012)	0.127*** (0.021)	0.021* (0.012)	-0.045 (0.033)
Election year	-0.096*** (0.013)	0.036 (0.023)	0.028** (0.013)	-0.411*** (0.029)
<i>N</i>	67692	67641	55297	47723

Note; Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Regressions include same controls as Table 1, and election year

5.3 Heterogeneous Effects

As a potential driver of the results we first test whether income and education heterogeneity could explain our baseline results. We proceed by dividing the sample into the following four income groups: (i) those who do not report their monthly income, (ii) low income respondents when individuals reporting an income below 900€ per month, (iii) middle income when their income ranges from 901 to 1800€, and (iv) upper income when individual reports a monthly income above 1801€ for the period. Table 6 reports the results of income specific effects in four panels for each of the question of health care preferences and PHI take up. Table A2 in the Appendix show the statistical significance of the difference between the interaction of treatment and post across income groups.

Table 6. Heterogeneous effects across income groups

Income in		Perception health system [0 bad - 3 excellent]			
euros/month	missing income	Income<900	900<inc.<1800	Income>1800	
Treated	0.404*** (0.038)	0.243*** (0.049)	0.228*** (0.034)	0.219*** (0.052)	
Post 2002	0.177*** (0.029)	0.082** (0.034)	0.135*** (0.026)	0.111*** (0.034)	
Treated*Post	-0.008 (0.024)	0.130*** (0.029)	0.084*** (0.021)	0.123*** (0.027)	
<i>N</i>	18435	13305	23103	12849	
		Preference for public health [0 never use -4 use it always]			
	missing income	Income<900	900<inc.<1800	Income>1800	
Treated	0.142** (0.068)	-0.084 (0.072)	-0.203*** (0.059)	-0.067 (0.105)	
Post 2002	-1.156*** (0.052)	-1.140*** (0.050)	-1.117*** (0.044)	-0.866*** (0.069)	
Treated*Post	0.063 (0.043)	0.142*** (0.043)	0.067* (0.036)	0.290*** (0.053)	
<i>N</i>	18467	13316	23059	12799	
		Satisfaction with public health [0 unsatisfied - 10 very satisfied]			
	missing income	Income<900	900<inc.<1800	Income>1800	
Treated	0.260*** (0.038)	0.147*** (0.046)	0.149*** (0.032)	0.169*** (0.054)	
Post 2002	-0.046 (0.029)	-0.103*** (0.033)	-0.026 (0.024)	0.040 (0.034)	
Treated*Post	-0.047* (0.024)	0.121*** (0.028)	0.018 (0.020)	0.020 (0.027)	
<i>N</i>	14331	10813	19555	10598	
		PHI (Probit)			
	missing income	Income<900	900<inc.<1800	Income>1800	
Treated	0.004 (0.095)	-0.234 (0.229)	0.032 (0.103)	0.257** (0.116)	
Post 2002	0.724*** (0.065)	0.592*** (0.111)	0.468*** (0.062)	0.537*** (0.068)	
Treated*Post	0.012 (0.061)	-0.038 (0.115)	-0.028 (0.061)	-0.131** (0.060)	
<i>N</i>	13093	8375	16112	10143	

Note: Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Controls: Year & region fixed effects, female, age, education level, occupation, & dummy missing education level.

The differences in individuals' perception of the health system do not show a statistically significant heterogeneity across income groups. Nevertheless, individuals with an income larger than 1800 euros a month exhibit a statistically significant higher change on their preference for public health care. In contrast, satisfaction primarily increased among individuals classified as lower income (<900 euros a month), who were the income group more bound to have been using public health before. Remarkably, decentralization brought a reduction of the PHI take up statistically significant (5%) for high income individuals on a significant magnitude (0.13 pp). Nevertheless, the difference across income groups does not show any statistical significance. Hence, overall, lower income individuals used public health more than the rest and therefore they benefit from the quality improvements that decentralization might have brought (panels three of Table 6). Yet, richer individuals increase their preference for public health (Panel 2) and consequently they reduce their PHI up take (last panel of Table 6, although the difference is not statistically significant). Individuals in between (between 900 and 1800 euros a month) are the ones benefiting the least. We also find that those individuals not reporting their income, as expected, do not exhibit some unobserved characteristics that correlate with their preferences for decentralization.

Similarly, in Table 7 we then test the existence of heterogeneity by education attainment. The results are very similar, although the statistical significance differs. Specifically, we distinguish four groups, namely level 0 when there is missing information, level 1 for primary education or less, level 2: high school or finished professional education and level 3 for those with university degree or higher. We find robust evidence of an effect for individuals among the middle and high abovementioned education attainment increasing preferences for public health care services after decentralization and reducing their PHI take up. These differences are statistically significant for high education versus the rest in preferences for public health and between middle and high education versus lower education in PHI take up. The satisfaction with public health and perception of health (both related to perceived quality of public health) do not show statistical significant differences across samples.

Table 7. Heterogeneity across education groups

Perception health system [0 bad - 3 excellent]				
	missing education	Low education	Middle education	High education
Treated	0.097 (0.130)	0.313*** (0.028)	0.282*** (0.037)	0.195*** (0.058)
Post 2002	0.129 (0.224)	0.116*** (0.021)	0.152*** (0.026)	0.213*** (0.044)
Treated*Post	0.199** (0.079)	0.060*** (0.017)	0.099*** (0.022)	0.047 (0.035)
<i>N</i>	3305	42051	18500	3836
Preference for public health [0 never use -4 use it always]				
	missing education	Low education	Middle education	High education
Treated	-0.196 (0.209)	-0.068 (0.046)	-0.040 (0.069)	-0.174 (0.121)
Post 2002	-0.967*** (0.366)	-1.174*** (0.033)	-1.093*** (0.049)	-0.457*** (0.090)
Treated*Post	0.140 (0.128)	0.085*** (0.027)	0.140*** (0.041)	0.213*** (0.073)
<i>N</i>	3340	42059	18445	3797
Satisfaction with public health [0 unsatisfied - 10 very satisfied]				
	missing education	Low education	Middle education	High education
Treated	-0.146 (0.134)	0.219*** (0.027)	0.166*** (0.036)	0.161*** (0.062)
Post 2002	-0.409* (0.214)	-0.030 (0.019)	-0.051** (0.026)	0.068 (0.046)
Treated*Post	0.024 (0.080)	0.014 (0.016)	0.043** (0.021)	-0.017 (0.037)
<i>N</i>	2468	34733	15060	3036
PHI (Probit)				
	missing education	Low education	Middle education	High education
Treated	0.195 (0.426)	0.069 (0.086)	0.057 (0.095)	-0.004 (0.139)
Post 2002	0.326 (0.584)	0.578*** (0.054)	0.609*** (0.057)	0.557*** (0.087)
Treated*Post	0.210 (0.304)	0.038 (0.050)	-0.095* (0.054)	-0.140* (0.084)
<i>N</i>	1868	31052	12414	2226

Note: Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Controls: year and region fixed effects, female, age, income, occupation, and a dummy for missing income level.

5.4 Falsification Tests

Table 8 reports the results of a DiD but now examining the effect of our treatment on other priorities as a falsification (placebo) test. As expected we find no significant effect for any of the variables (education, housing, and pensions), except for interest in health. Hence, this leads us to conclude that the effect of decentralization is genuine.

Table 8. Falsification Tests: Effect on other government priorities

	Interested in Education	Interested in Health	Interested in Housing	Interested in Pensions
Treated	-0.052*** (0.011)	0.001 (0.012)	-0.005 (0.009)	0.028*** (0.008)
Post 2002	0.027*** (0.008)	-0.017* (0.009)	0.031*** (0.007)	-0.020*** (0.006)
Treated*Post	-0.003 (0.006)	0.023*** (0.007)	-0.007 (0.006)	0.003 (0.005)
<i>N</i>	66633	66633	66633	66633

Notes: Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Controls: Year and region fixed effects, female, age, income, education level, occupation, and a dummy for missing income and education level.

5.5 An alternative specification: effect of decentralization on use

Table 9 we report the estimates of an instrumental variable model where preference (stated demand) for public health care depend on the perceptions of health systems and satisfaction with public health both instrumented by the decentralization treatment. The results suggest a similar picture that is consistent with all the result above. Perception of the quality of the health system and satisfaction with the health system (both instrumentalized with centralization) have a positive and statistically significant (at 1 and 10%, respectively) coefficient on stated demand (preference) for public health.

Table 9 Preference for public health instrumented (IV)

	Preference for public health [0never use–4 use it always]	Preference for public health [0never use–4 use it always]
Perception health system (instrumented with centralized)	1.665*** (0.359)	
Satisfaction with public health (instrumented with centralized)		5.406* (2.769)
<i>N</i>	66914	54776
	First Stage (Perception health system)	First Stage (Satisfaction with NHS)
Centralized	-0.076*** (0.012)	-0.021* (0.012)
<i>N</i>	67692	55297

Standard errors in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Controls are the same as Table 9 with a dummy indicating whether the region is centralized.

5.5 Interaction with regional incumbent : 'double agency'

One of the consequences of processes of regional decentralisation lies in that the regional incumbent might not be an agenco solely of its own constituents, but might become an agent of the political party. Hence, the effect might well be heterogeneous depending on whether the regional incumbent coincides with the incumbent at the national level. When they do not belong to the same party, there is an incentive for them to engage in vertical competition (Breton , 1996). Table 10 reports evidence suggesting that regional incumbent.

Table 10. Interaction with a regional incumbent

	Perception health system	Preference for public health	Satisfaction with public health	PHI
treated	0.278*** (0.021)	-0.059 (0.036)	0.177*** (0.020)	0.037 (0.058)
post	0.128*** (0.015)	-1.101*** (0.026)	-0.036** (0.014)	0.576*** (0.035)
interactionpost	0.082*** (0.013)	0.118*** (0.022)	0.037*** (0.012)	-0.024 (0.035)
incumbent	0.015** (0.007)	-0.024** (0.011)	0.041*** (0.006)	0.040** (0.020)
<i>N</i>	67692	67641	55297	47723

Note: Standard errors in parentheses

Regressions include same controls as in baseline, and additionally `incumbent`

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusion

Processes of regional decentralization of uniformly run publicly provided services can potentially satisfy regionally heterogeneous demands, and reduce the decision to opt out by turning to the private sector. However, whether this is the case is an empirical question. This paper exploits the political health care decentralization in Spain, where progressive health system decentralization took place in the period of study where progressive health system decentralization took place in the period of study, on individual's preferences for either public versus private health care use, NHS satisfaction and, the purchase of PHI. We find evidence that political decentralization increase preferences for use of public health care (stated demand), perception for the health system, and PHI take up and satisfaction for some groups. The results are as expected heterogeneous across income and education groups. Results are robust to falsification tests and controls for electoral years and time trends; and depend on individuals' use of the NHS. The evidence support that decentralization shifts the demand for private health care insurance only for higher income and educated individuals.

Overall, our evidence is consistent with the thesis that 'decentralization' provides an alternative to the 'build in accountability mechanism' of the market (Tanzi, 2001). That is, regional decentralization reforms such as those taking place in several European countries (Manchester health authority in England) can potentially change certain dimensions of health care quality and expand further the use and support for the NHS reducing the uptake of PHI. That is, political decentralization can reduce health system opting out

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Appendix

Table A1. Time of Decentralization Transfers by region state

Andalusia Royal Decree (RD) 400/1984, 22nd February
 Aragon RD 1475/2001, 27th December
 Asturias RD 1471/2001, 27th December
 Balearic Islands RD 1478/2001, 27th December
 Basque Country RD 1536/1987, 6th November
 Canary Islands RD 446/1994, 11th March
 Cantabria RD 1472/2001, 27th December
 Castile-La Mancha RD 1476/2001, 27th December
 Castile and Leon RD 1480/2001, 27th December
 Catalonia RD 1517/1981, 6th July
 Extremadura RD 1471/2001, 27th December
 Galicia RD 1679/1990, 28th December
 La Rioja RD 1473/2001, 27th December
 Madrid RD 1479/2001, 27th December
 Murcia RD 1474/2001, 27th December
 Navarre RD 1680/1990, 28th December
 Valencian Community RD 1612/1987, 27th November

Table A2. t-test differences coefficients across subsamples

	Perception Health System	Preference for Public Health	Satisfaction with public health	PHI uptake
Prob > chi2				
High income to Low income	0.8555	0.0233	0.0087	0.4731
Low income to Median income	0.2024	0.1395	0.0023	0.937
High income to mid income	0.2538	0.0004	0.9531	0.225
High education to Low education	0.7515	0.0994	0.4498	0.0687
Low education to Median education	0.1567	0.2431	0.2814	0.069
High education to mid education	0.2116	0.3817	0.1673	0.6565