

## CHANGES IN THE DEMAND FOR PRIVATE MEDICAL INSURANCE FOLLOWING A SHIFT IN TAX INCENTIVES

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### SUMMARY

The 1998 Spanish reform of the Personal Income Tax eliminated the 15% deduction for private medical expenditures including payments on private health insurance (PHI) policies. To avoid an undesired increase in the demand for publicly funded health care, tax incentives to buy PHI were not completely removed but basically shifted from individual to group employer-paid policies. In a unique fiscal experiment, at the same time that the tax relief for individually purchased policies was abolished, the government provided for tax allowances on policies taken out through employment. Using a bivariate probit model on data from National Health Surveys, we estimate the impact of said reform on the demand for PHI and the changes occurred within it. Our findings indicate that the total probability of buying PHI was not significantly affected by the reform. Indeed, the fall in the demand for individual policies (by 10% between 1997 and 2001) was offset by an increase in the demand for group employer-paid ones. We also briefly discuss the welfare effects on the state budget, the industry and society at large. Copyright © 2007 John Wiley & Sons, Ltd.

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### INTRODUCTION

Until 1998 the Spanish Personal Income Tax (PIT) regulations permitted taxpayer units (individuals or families) to deduct 15% of their annual private medical expenses from their gross income tax liability, as long as the deduction was no higher than their net tax liability. In the 1990s both the number of taxpayer units claiming this deduction and the total amount deducted increased rapidly and steadily. According to the annual tax reports,<sup>1</sup> in 1990 a mere 2.4 million taxpayers (22% of the total) applied for tax relief for medical expenditure while in 1998 this number had gone up to 7.1 million (46% of all taxpayers) (Ministerio de Economía y Hacienda, 1991, 1999). In terms of monetary volume the tax expenditure rose from 28 866 million pesetas (173.5 million euros) in 1990 to 109 254 million pesetas (656.6 million euros) in 1998; that is a 278.5% rise, compared to a 52.2% growth in PIT deductions in general over the same period (IEF, 2003). In other words, the 656.6 million euros of revenue forgone in 1998 represented 1.57% of total PIT gross liabilities, or enough to cover that year's public health care for one million people.

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<sup>1</sup> Figures do not include the Basque Country and Navarre, which collect their own taxes.

Naturally, the size and evolution of this fiscal benefit started to be a matter of concern to the government. Signs that it was the higher-income groups that were availing more of the relief (Martínez García *et al.*, 1999) added still further doubts with respect to its appropriateness. Finally, such deductions were eliminated by the 1998 PIT reform (Act 40/1998, dated 9th of December, effective as of 1st of January 1999), along with certain other specific deductions and allowances. The main argument used to justify the measure was that medical and other personal expenses were encompassed in the new general allowance – a minimum amount of family and personal income exempt from taxation – introduced in the same Act.

The 15% deduction had been applicable both to direct out of pocket medical expenses such as payments for visits, hospitalisation, medical appliances, medicines, etc. and to indirect medical expenditure, that is, payment of private health insurance (PHI) premiums. While the government clearly wanted to eliminate the tax relief on private medical expenditures in general, it is apparent from the complementary measures that were taken that it did not want to remove the incentives to taking out PHI altogether. The reasons the government had for not wanting to put a brake on the demand for PHI were, most likely, a wish to avoid a sudden increase in the flow of patients to the public sector and the desire not to harm the sizeable Spanish PHI market. Due to a substitution effect, eliminating the deduction on direct out of pocket medical expenditure was expected to result in a certain increase in the demand for publicly funded services. Adding to this the complete removal of incentives to buy PHI was feared it would lead to a further reduction in the demand for private medical services, thus, putting additional pressure on public health spending.

Two accompanying policy measures were adopted: firstly, a proviso was made (Act 40/1998, additional provision 13th) exempting health insurance premiums from the new 6% tax on insurance transactions enacted in 1997 (Act 13/1996, art. 12). Secondly, the tax consideration of employer-paid group premiums was modified. Previously, such premiums had been considered as salary in kind, and thus subject to PIT. The reform changed this explicitly stating (Act 40/1998, art. 43.2.f) that, up to a certain limit, any premiums paid by firms on PHI policies for their employees were not to be considered salary in kind. Shortly afterwards the measure was extended to include any premiums paid to cover the employee's spouse and dependent children (Royal Decree 214/1999, dated 9th of February). The annual limit established by the Decree was 360 euros if the insurance covered the employee alone and 1200 euros when other family members were also included.

In order to study the impact of the reform, it is very important to understand the incentives introduced by these policy changes properly. First of all, contrary to what is sometimes thought, the tax allowance on employer-paid insurance is mainly a subsidy to employees for insurance purchased through the firm and not a subsidy to employers. From the point of view of the firm, to pay the employee in the form of health insurance or cash wage is almost<sup>2</sup> the same: both are booked as outgoings and thus both reduce profits and corporate tax liabilities. There is an important difference, however, from the point of view of the employee: wages are taxed while the premium paid by (or through) the employer is now fully, or nearly fully,<sup>3</sup> subsidised by the government at the individual's average tax rate. In other words, the reform reallocated tax incentives while still keeping them within the PIT: it eliminated the previous subsidy on policies taken out directly by individuals and replaced it with a tax credit on insurance bought through an employer. Since, at all events, both types of insurance policies received a rebate through the tax exemption on insurance premiums, it meant that employer-paid policies obtained a double subsidy, while individually bought insurance received only one.

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<sup>2</sup>'Almost' and not 'exactly' the same since social insurance contributions are levied on money wages but not on any form of payment in kind.

<sup>3</sup>This depends on whether the premium is lower or higher than the legal limit. In 2001, the average annual premium for employer-paid group policies of the 'services in kind' type (the vast majority of policies in Spain) was 289.89 euros (ICEA, 2002), and thus lower than the annual legal limit of 360 euros.

In investigating the effects of the reform, in this paper we are interested in two questions, whether or not a sudden fall in the demand for PHI was actually avoided and what changes occurred within it, namely, how individual and group policies responded to the incentives just described. Other things being equal, the price of individually purchased PHI went up, while the price of insurance taken out through an employer went down. One would thus expect to see a fall in the demand for individual insurance policies and a rise in the demand for employer-paid group schemes, making the net effect on the total demand for PHI uncertain. Additionally, we explore whether the probable change to the quantity and composition of the privately insured population translated into changes to the patterns of use of public and private health-care services which would, in the end, affect public health spending.

The remainder of the paper is organised as follows. First, we provide a background explanation of the Spanish health-care system and the PHI market. This is accompanied by a brief discussion of the main arguments involved in the decision on whether or not to tax subsidise PHI and by a review of the Spanish literature on this issue. In the third section we describe the econometric model, the data set and the explanatory variables we use to estimate the effect of the reform on the demand for PHI in general, and on individual and group policies in particular. This is followed by a section presenting the results. In the fifth section we discuss the results and give a brief account of their impact on the state budget, the industry and society as a whole.

## BACKGROUND AND LITERATURE REVIEW

### **The Spanish health-care system and the private insurance market**

Today Spain's National Health System is financed exclusively through general taxation (although affiliation is still done through the Social Security System). Coverage is virtually universal (98.7% according to the 2001 National Health Survey), the set of benefits is quite comprehensive (dental care being the main exception) and the services are mostly provided by publicly financed hospitals and doctors directly employed by the public sector. There is a low degree of choice (although some regions have started to offer more options with regard to being able to choose both family doctors and specialists) and waiting lists feature largely. Altogether though, the system performs reasonably well, or even very well, by some international standards.<sup>4</sup>

Alongside the public system, there is a sizeable private sector. Private health services amounted to 27.8% of total health expenditure in 1998 (OECD Health Data, 2004.) The most important items within private expenditure were medicines (30%), dental care (19%), insurance premiums (18.5%<sup>5</sup>), eyeglasses and other prosthesis (15%), and outpatient visits (13%) (INE, 1999). Approximately 81% of all PHI policies in Spain are of the 'benefits in kind' type<sup>6</sup>; the rest provide sickness compensations or reimbursement of medical expenses – the latter requiring a co-payment (ICEA, 2002). Most PHI is supplementary to the public sector, that is, it essentially provides coverage for the same goods and services offered by the public sector, but it is presumably purchased because it provides faster access, greater consumer choice and better amenities.<sup>7</sup> Employer-paid group policies were the

<sup>4</sup>Spain ranked 7th in the league of 191 countries analysed in the World Health Report 2000, which took into account the level and distribution of health, the responsiveness of the system, fairness in financial contribution and health expenditures per capita (WHO, 2000).

<sup>5</sup>Thus, insurance premiums accounted for 5% of all health expenditures in Spain.

<sup>6</sup>Subscribers can obtain medical care from a very wide network of providers who have agreements with the insurance companies, which pay the providers directly. As opposed to the public system, access to specialists does not require a referral from a general practitioner. Co-payments are in-existent or involve very small amounts. Some exclusions or waiting periods apply with respect to certain services (for example, the delivery of babies).

<sup>7</sup>Most people with PHI thus have double coverage, public and private.

minority in 2001, representing around 23.4% of all voluntary health insurance (ICEA, 2002). At this point, perhaps it is appropriate to remark that public servants, who belong to one of the three public mutualities (Muface, Mugeju and Isfas), are not included in our definition of PHI<sup>8</sup> and are left out of the study altogether.

### Arguments and findings from the literature

Our paper draws from the literature on the optimal mix of public and private provision of private goods and their tax/subsidisation and from the literature on the demand for supplementary PHI. Epplé and Romano (1996) and Gouveia (1996) model how the levels of public and private provision are decided under the political process using the median voter paradigm. A classical conclusion of these models is that mixed systems of public and private provision are usually preferred to pure public or pure private systems. Specifically in the health field, Hansen and Keiding (2002) demonstrate that under certain assumptions a compulsory scheme supplemented by voluntary competitive health insurance has welfare advantages over other insurance alternatives, including a purely compulsory system. The main condition is that supplementary health insurance is taken out by the higher risk groups that presumably find the compulsory scheme sub-optimal and are willing to pay more. Nevertheless, Danzon (2002) warns against ignoring the additional administrative costs and moral hazard that result when individuals hold multiple overlapping insurance policies. And López-Casasnovas (2003) discusses the implications of such supplementation for the finance, organisation and management of public health services.

Permitting supplementation is usually not an issue in most countries that have national health insurance systems. Only Canada prohibits supplementary private coverage.<sup>9</sup> The actual policy debate in these countries is whether private medical insurance should be encouraged through tax subsidies at all. In line with Besley and Coate (1991), one of the best known arguments in favour of subsidising supplementary insurance runs as follows: if the level of quality chosen for the public sector is not very high, some people will decide not to use its services and instead buy PHI. By doing so, they unclog the public services that will offer better service to the people who stay. Since the people who waive the public sector cannot opt-out and still have to contribute to it, it is fair to subsidise their PHI to partially compensate them for paying twice for their health care – or for saving the public sector money. Hoel and Saether (2003) argue similarly for the case of limit capacity and waiting time in the public sector.

Two crucial empirical issues arise. First, how effective is the subsidy in stimulating the demand for PHI. If the subsidy is small or the elasticity of demand low, it will not encourage enough people to buy private insurance and will only act as a government ‘gift’ to those who would have, anyway, purchased the insurance. By the same token, removing the subsidy would not deter demand by much and the government would save money. There are few studies that have examined this issue. One of them is a British study by Emmerson *et al.* (2001), who after the elimination of the income tax relief on private medical insurance for people over 60 in 1998 calculated the

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<sup>8</sup> There is a mandatory social insurance scheme and they are, therefore, counted among the publicly insured. It is true, though, that these groups are privileged in being able to choose *their health-care provider* from either the public system or any of the private insurance companies that want to enter the scheme in exchange for a premium that is paid by the mutuality. Members of these mutualities who opt to receive services through a private insurance company are not able to use the public sector and cannot be counted as being doubly insured. On the other hand, these groups constitute a large proportion of the business for the insurance companies: almost one-third of all holders of a ‘benefits in kind’ type of policy are members of one of these public mutualities (ICEA, 2004).

<sup>9</sup> However, complementary insurance, that is, insurance for goods and services not covered or not covered in full by the public sector – such as dental care or chiropractors – is allowed.

elasticity to be just  $-0.024$ . A recent New Zealand report estimates the price elasticity of demand for PHI to be  $-0.54$  (NZIER, 2001). In Australia, a 30% tax rebate on PHI take-up, introduced at the beginning of 1999, increased demand by 11%, thus implying an elasticity of  $-0.37$  (Frech *et al.*, 2002).<sup>10</sup>

The second issue involved in the subsidising of PHI is to what extent private care will actually substitute public care. That is, whether 1 euro of subsidy reduces public health expenditure by 1 euro or less. A common finding in countries like Jamaica, UK and Spain is that most people who hold PHI on top of their public coverage still use the public sector for much of their health care (Gertler and Sturm, 1997; Propper, 2000; Rodríguez and Stoyanova, 2004). This could be viewed as 'negative': the pressure on the public sector is not eased as much as expected (each additional euro spent on the subsidy saves less than 1 euro in public health-care spending), or as 'positive': such individuals will, overall, still strongly support increases to public health-care financing (Propper, 2000). Since supplementary PHI in Europe is predominantly bought by the higher social classes (Mossialos *et al.*, 2004), one of the arguments against subsidisation is, precisely, that it is regressive and it can lead to a separation of health-care systems: private, 'high-quality' care for the rich and public, 'poor-quality' services for the poor. In fact, in most European countries there are no tax incentives on taking out supplementary PHI or such incentives have been reduced or abolished in recent years (Mossialos *et al.*, 2004).

In Spain, the reform drew some attention just after its implementation. Freire (1999) argued against the fiscal subsidy granted to employer-paid group insurance policies on equity grounds and because, in his opinion, the reform would only serve to bolster the PHI industry. Ibern (1999) also remarked that the reform could prove beneficial to the industry since group policies reduce adverse selection and the costs of commercialisation. Through a simulation based on the 1994 Catalan Health Survey, López-Nicolás and Vera-Hernández (2003) analysed whether or not tax subsidies on private medical insurance were self-financing in Spain. They estimated that there would be public savings due to the elimination of the tax deduction, therefore, not supporting the self-financing hypothesis.<sup>11</sup>

The issue of the progressiveness of tax relief on private medical expenditure (including private insurance policies) was studied by Martínez García (1993). Using the Suits index, she concluded that in 1990 the deduction was nearly proportional, with a certain degree of regressiveness in the lower-income brackets. In terms of the type of expenditure, insurance premiums (at the time, mostly individually bought) appeared to be also nearly proportional. Given the extraordinary growth of this deduction before it was eliminated, it would be risky to extrapolate these results to the situation in 1998. On the other hand, the case for group policies could be different to that of individual ones.

Regarding the main determinants of the demand for supplementary health insurance in countries with universal public health-care systems Propper (1989, 1993), Propper *et al.* (2001) and Besley *et al.* (1999) for the UK; Harmon and Nolan (2001) for Ireland; Christiansen *et al.* (2002) for Denmark and Johannesson *et al.* (1998) for Sweden, all report a positive effect of income and education on the

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<sup>10</sup>The evidence from the US is of limited help here given the tremendous difference in health-care systems. But Gruber and Lettau (2004) find the elasticity of the corporate demand for health insurance to be  $-0.25$ . (Since public insurance is only for people over 65 or the really poor, most health insurance is employer provided in the US.) Gruber and Poterba (1994) also find high negative elasticity in the demand for health insurance by the self-employed.

<sup>11</sup>Nevertheless, two points should be made: firstly, in their simulation they took into account only the elimination of the tax credit on individually bought policies and ignored the new tax incentives on employer-paid policies and secondly, as far as PHI is concerned, Catalonia can hardly be considered representative of the whole Spanish population. It is well known in Spain that the private insurance market is much larger and has a much longer standing in Catalonia than in most of the other Spanish regions.

demand for PHI. Women are also found to be more likely to take out a private insurance policy than men. Age variables exhibit a significant concave and quadratic relationship. The effect of other personal characteristics such as socio-economic status, self-employment and house-ownership is not conclusive. The effect of waiting lists as a measure of public health sector quality is found to be significant in those studies where this variable is present.

In Spain, the first studies analysing the decision to purchase supplementary PHI (González, 1995; Vera-Hernández, 1999) found that age, income, educational level, occupation (being professional or self-employed) and living in certain regions (Balearic Islands, Catalonia and Madrid) are the main determinants of such a decision. Later, other authors included waiting lists for surgery (Jofre-Bonet, 2000) and a gap in perceived quality between the public and the private sector (Costa and García, 2003) in their studies and found them also to be important factors affecting the demand for PHI.

## EMPIRICAL FRAMEWORK

### Econometric specification

Changes in the probability of buying PHI could be estimated using a basic discrete choice (logit or probit) model. However, the analysis of the demand for specific types of policies – individual or collective – is not so straightforward since we would be incurring into a problem of sample selection. One way to address both issues at the same time and avoid the sample selection problem is to use a bivariate probit model (Van de Ven and Van Praag, 1981<sup>12</sup>). The econometric specification consists, then, of two simultaneous equations. The first models the binary decision to buy PHI or not,  $y_{1i}$ ; the second discriminates between holding individually purchased or employer-paid insurance, conditional on being privately insured,  $y_{2i}$ . These equations are initially defined as

$$\begin{aligned} y_{1i}^* &= X_{1i}\beta_1 + \varepsilon_{1i} \\ y_{2i}^* &= X_{2i}\beta_2 + \varepsilon_{2i} \end{aligned} \quad (1)$$

for individual  $i$ ,  $i = 1, \dots, N$ . The  $y_{1i}^*$  and  $y_{2i}^*$  are unobserved latent variables indicating an individual's propensity to purchase PHI and an individual's propensity to have individually bought PHI, respectively. The  $X_{ji}$ ,  $j = 1, 2$ , denote the vectors of explanatory variables.

The remaining terms in Equation (1) are the two vectors of parameters to be estimated,  $\beta_1$  and  $\beta_2$ , the random error terms,  $\varepsilon_{1i}$  and  $\varepsilon_{2i}$ , where  $(\varepsilon_{1i}, \varepsilon_{2i}) \sim \text{BVN}(0, 0, 1, 1, \rho)$ , and the correlation coefficient,  $\rho = \text{corr}(\varepsilon_{1i}, \varepsilon_{2i})$ .

The unobserved propensities ( $y_{1i}^*, y_{2i}^*$ ) defined in the system of equations (1) can be measured by means of two binary variables  $y_{1i}$  and  $y_{2i}$ . For  $y_{1i}$ , the indicator takes a value of 1 if the individual purchases PHI and 0 otherwise, and for  $y_{2i}$  the indicator takes a value of 1 in the case of individually purchased PHI and 0 in the case of group employer-paid PHI

$$y_{1i} = \begin{cases} 1 & \text{if } y_{1i}^* > 0, \\ 0 & \text{if } y_{1i}^* = 0, \end{cases} \quad y_{2i} = \begin{cases} 1 & \text{if } y_{2i}^* > 0 \\ 0 & \text{if } y_{2i}^* = 0 \end{cases}$$

This gives rise to three types of observations: insured with an individually contracted policy; insured holding an employer-paid group policy; and not privately insured. The unconditional probabilities

<sup>12</sup>Technical details and discussion of the bivariate probit model are also presented in Green (2000).

corresponding to these three types of observations are given by

$$\begin{aligned} y_{1i} = 1, y_{2i} = 1 &: \Pr(y_{1i} = 1, y_{2i} = 1) = \Phi_2[\beta_{1i}X_{1i}, \beta_{2i}X_{2i}, \rho] \\ y_{1i} = 1, y_{2i} = 0 &: \Pr(y_{1i} = 1, y_{2i} = 0) = \Phi_2[\beta_{1i}X_{1i}, -\beta_{2i}X_{2i}, -\rho] \\ y_{1i} = 0, y_{2i} = 0 &: \Pr(y_{1i} = 0) = 1 - \Phi(\beta_{1i}X_{1i}) \end{aligned} \quad (2)$$

where  $\Phi$  and  $\Phi_2$  are the univariate and bivariate standard normal cumulative distribution functions, respectively.

The probabilities defined in (2) yield the following log-likelihood function:

$$\text{Log } L = \sum_{\substack{y_{1i}=1 \\ y_{2i}=1}} \log \Phi_2(X_{1i}\beta_1, X_{2i}\beta_2, \rho) + \sum_{\substack{y_{1i}=1 \\ y_{2i}=0}} \log \Phi_2(X_{1i}\beta_1, -X_{2i}\beta_2, -\rho) + \sum_{y_{1i}=0} \log(1 - \Phi(X_{1i}\beta_1)) \quad (3)$$

The above equation is maximised with respect to the two vectors of coefficients and the correlation coefficient,  $\rho$ .

The estimation strategy relies upon finding variables that affect the decision to buy PHI but do not influence the choice of policy. Individual health status is a likely candidate, since health is one of the most important determinants of PHI purchase, but it should not affect the kind of policy held.<sup>13</sup> Another variable with possible identifying power could be one reflecting the extent and quality of public health care. This again should influence total insurance take up, but not for any particular policy. The indicator incorporated is the amount (lagged 1 year) of public health expenditure per capita in the region of residence.<sup>14</sup> To check the robustness of the exclusion restrictions we estimated a bivariate probit model including the said variables as covariates in the second equation. The two variables turned out not to be statistically significant, which indicates that they do not determine the type of insurance policy held. We also performed a log-likelihood ratio test. The value of the LR-statistic (2.62) permits to accept the null hypothesis about the validity of the excluded variables.

### Data and explanatory variables

The empirical analysis is based on data from the National Health Surveys conducted in 1997 (Centro de Investigaciones Sociológicas, 1997) and 2001 (Ministerio de Sanidad y Consumo, 2001a). After deleting observations from people not responding to one of the relevant questions and from people insured with a public mutuality, the final samples contain 5743 individuals in 1997 and 18 995 in 2001 of 16 years of age and over who belong to different households that have been randomly selected by means of a stratified random sampling across autonomous communities (regions). For these individuals we have information on their health insurance take-up and several indicators of their health status and socio-economic characteristics; the latter referring both to the individual and to the head of the household. Of special interest to our analysis is the fact that the data provide a distinction between people with individually purchased PHI and those with PHI bought through the firm. No other national data set – e.g. the Continuous Family Expenditure Survey or the Spanish section of the European Community Household Panel (ECHP) – allows for such a distinction to be made. Finally, we employ the same data sets to revise the patterns of consumption of medical care by type of insurance, in order to ascertain whether these patterns have changed significantly over the period.

<sup>13</sup>If insurance companies practised a risk selection strategy this assumption would probably not hold and individuals in poor health would have a lower probability of being accepted for individual coverage compared to the chance of being accepted under a group policy where, by definition health risks are evened out. Spanish health insurance companies adamantly claim they do not practice risk selection except for some who say they do so in the case of older new members. However, this effect should already be captured by 'age'.

<sup>14</sup>Some examples where macro-variables have been used as identifying restrictions are Beenstock and Rahav (2002) and Goldman and Bao (2004). Goldman and Bao (2004) use only macro-variables as exclusion restrictions, while the variables excluded in Beenstock and Rahav (2002) consist of macro-variables and individual characteristics.

The choice of years obeys two reasons. First, the availability of the same type of data set before and after the tax reform. Although there are some differences in the sampling method<sup>15</sup> the questions and wording are practically the same in both surveys. Second, and most importantly, we reckon that it was probably not until 2001 that the effects of the reform started to take hold. There are various arguments to support this: (i) consumers often take time to acknowledge legislative measures and change their behaviour accordingly; (ii) employees – already holding an individually bought policy or not – and their employers would need some time to negotiate beneficial modifications to their contracts, possibly exchanging part of the monetary wage (or expected rise in wage) for an employer-paid PHI policy<sup>16</sup>; (iii) insurance companies also needed time to shift their marketing strategy from individuals to enterprises.

The variables appearing in the econometric model are the following. Age and age square, given previous findings of significant concave and quadratic relationship with PHI demand. Sex has also been found to influence the decision to buy PHI. Females of prime fertility age are most particularly known by insurance companies to have a greater likelihood of taking out a private policy.<sup>17</sup> Therefore, we include ‘female’ and ‘female-fertility’ (females aged 25–45) as explanatory variables in our equations. As an indicator of health we incorporate a variable that combines perceived health status and the presence of chronic conditions. ‘Good health’ is equal to 1 if the individual reports good or very good health *and* no chronic conditions; the indicator is equal to 0 if the individual reports fair, bad or very bad health *and/or* at least one chronic condition. As mentioned in the previous section, this variable is only included in the first equation, but not in the second one, where it does not contribute to explain the dependent variable.

In almost every study of the demand for supplementary health insurance education appears as a main determinant in that decision. It also probably influences the type of occupation and the likelihood of being offered insurance by the firm. Therefore, we have included the individual’s level of education (four categories) in the two equations. Similarly, occupation (six categories) is believed to influence both, the decision to purchase PHI and the chance of being offered group insurance. Earnings are also a favourite in the explanation of the demand for PHI – and probably also in accounting for the demand for individually bought policies – thus we control for household disposable income in both equations.<sup>18</sup> Last among the personal characteristics, we have included the size of the town of residence since it probably reflects fairly well the availability of health-care supply, both public and private. Presumably, the less available private medical care is, the lower the demand for PHI. Private medical care facilities are usually concentrated in the bigger cities.

We have also included three macroeconomic variables, collected from official sources. Given the interrelationship between private and public insurance, the demand for PHI should be negatively correlated to the extension and quality of services in the public sector, and positively correlated to the presence and quality of private supply. To capture these effects, and changes in both sectors during the period, among the covariates in the first equation we have incorporated a variable measuring lagged

<sup>15</sup>The main difference is in the distribution of the sample by autonomous communities. In the 1997 data set the number of observations by autonomous communities follows closely their share in the total Spanish population, while in the 2001 data set smaller regions are given an ‘extra’ weight and more populated ones have relatively less observations.

<sup>16</sup>The decision to offer private health insurance is taken at the firm level through collective bargaining or individual arrangements whose nature is idiosyncratic to each firm and it is not publicly known. On the other hand, employers certainly use their negotiating power to obtain discounts on policies. In the case of the ‘benefits in kind’ type of insurance, in 2001 the average annual premium of employer-paid group policies was 30% lower than that of individually bought policies: 289.89 versus 415.5 euros (ICEA, 2002).

<sup>17</sup>What they seek is usually private hospital amenities – i.e. private room – when giving birth.

<sup>18</sup>Since household disposable income comes as a six-interval categorical variable in the survey, and the rate of ‘no answer’ is around 20%, we imputed the household’s monthly income using the interval regression procedure given in STATA (2001). In the regression we controlled for possible differences due to age, sex and level of education of the head of household, labour, social and marital status of the respondent, as well as the autonomous community and size of the town of residence.

public health expenditures per capita (Public health expenditures in Table II) in the region of residence and a variable representing the proportion of beds in private hospitals with high technology equipment<sup>19</sup> relative to the total number of beds (public and private) in the region in each of the previous years (Private high technology beds).<sup>20</sup> In the second equation we exclude public health expenditures since it does not help discriminate between the two types of policies. Instead, we include a proxy for the likelihood of being offered employer-paid group insurance. Since bigger companies are usually more prone to offer this kind of perk, we introduce a variable measuring the proportion of firms of over 50 employees with respect to the total number of enterprises in the region (medium/large firms) (Instituto Nacional de Estadística, 2000). This is a factor which we expect to positively affect the demand for employer-paid health insurance.

Finally, we introduce a dummy variable to capture the effect of the 1998 changes to the tax treatment of PHI ('Fiscal Reform'). The values it takes are 1 for observations in 2001 and 0 for observations in 1997. This is somewhat problematic as the coefficient of this dummy may capture other shocks besides the tax reform. A comparison with a 'control' group not affected by the reform would have been more desirable. However, this was not possible because of the lack of any population group similar enough (very low-income earners and pensioners, in principle not affected by the reform because the former are exempt from income tax and the latter are not employed, are not, obviously, random samples of the population. Besides, the pensioners *per se* are not excluded from the reform since they may hold group insurance as spouses of employed people). Therefore, the best we could do was to control for the main relevant changes that may have occurred during the period; essentially, changes to the quantity and quality of the public and private health-care sectors (represented here by 'Public health expenditures' and 'Private high technology beds') and to disposable income.<sup>21</sup>

The dummy variable appears in the two equations since we want to estimate both, the impact of the reform on the demand for PHI in general and the differential response by each type of insurance to the incentives introduced in the 40/1998 Act. As stated in the Introduction, the various tax measures adopted amount to a net increase in the price of individually purchased PHI and a reduction in the price of corporate policies. We think both types of policies are normal goods, so we expect a negative effect on the demand for individually bought policies versus group ones in the second equation. Following the international evidence mentioned in the second section, we expect a low elasticity of demand for individual policies, but we cannot really speculate with regard to group policies. Therefore, depending on how substantial the level of substitution of individual for group policies is, one could expect to see no effect, a negative effect, or a positive effect on the total demand for PHI in the first equation.

Table I describes the main characteristics of the individuals in the 1997 and 2001 surveys, according to the three insurance statuses defined in the econometric model. Firstly, we observe a slight decline in the proportion of people holding PHI over the period: 11.37% in 1997 versus 9.71% in

<sup>19</sup> A hospital with high technology equipment is defined as a hospital equipped with at least one of the following: Computerised Axial Tomography, Magnetic Resonance, Gamma Camera, Hemodynamics Room, Digital Subtraction Angiography, Extracorporeal Shock Wave Litotripsy, Cobalt Bomb, Particles Accelerator. The information has been extracted from the Catálogo Nacional de Hospitales, 1997 (Ministerio de Sanidad y Consumo, 1998) and 2001 (Ministerio de Sanidad y Consumo, 2001b), which contains data for 1996 and 2000, respectively.

<sup>20</sup> The rationale behind the HTbeds variable is twofold: on the one hand, you are less likely to buy a private insurance policy if the supply of beds in private high technology hospitals is relatively small in your region and if hospitalised you are going to end up in a public hospital at all events. (There are no private beds in public hospitals in Spain.) On the other hand, the availability of those beds allows the privately insured to avoid the queues in the public sector. We have not used waiting lists directly as a measure of difference in quality between the public and the private sector because, according to our information, waiting lists were, in the years of interest, poorly and heterogeneously recorded in the Spanish regions.

<sup>21</sup> Controlling for current household disposable income should pick up any differences in the effect of the reform of the personal income tax in which the shift in the tax treatment of PHI was embedded and, more important, it should also capture the macroeconomic trend of growth of the Spanish economy during those years. In fact, national accounts show a 32% increase in GDP at current prices during the 4 year period between 1997 and 2001; this figure is quite close to the 30% increase in disposable income in our sample of individuals.

Table I. Characteristics of individuals in the 1997 and 2001 samples, by health insurance status

Variables	PHI								
	No PHI			Individually purchased			Group employer-paid		
	1997	2001	$\chi^2/t$	1997	2001	$\chi^2/t$	1997	2001	$\chi^2/t$
<i>N</i>	5090	17 150		535	1374		118	471	
% (of total <i>N</i> )	88.63	90.29	13.02*	9.32	7.23	29.47*	2.05	2.48	29.47*
% (of total PHI)				81.93	74.47	14.89*	18.07	25.53	14.89*
Age (mean)	44.27	45.73	4.82*	41.41	44.17	3.20*	38.94	38.65	0.21
Sex (%)									
Female	51.45	52.06	0.57	51.21	52.98	0.48	33.90	33.76	0.01
Male	48.55	47.94		48.79	47.02		66.10	66.24	
Female fertility (%)									
Female aged 25–45	18.19	19.31	3.15**	24.11	24.09	0.01	13.56	16.99	0.81
Health <sup>a</sup> (%)									
Good health	54.28	52.44	5.33**	60.37	54.08	6.19**	65.25	60.08	1.06
Not good health	45.72	48.56		39.63	45.92		34.75	39.92	
Education (%)									
Without studies	16.56	14.00	21.32*	3.74	3.42	5.46	4.24	2.12	6.22
Primary	50.61	51.62		29.91	33.55		48.31	39.70	
Secondary	23.03	23.97		38.88	33.48		28.81	39.49	
University	9.80	10.41		27.48	29.55		18.64	18.68	
Occupation (%)									
Without occupation	32.77	20.43	470.2*	32.15	16.45	88.68*	22.88	6.58	36.24*
Farmer	4.01	4.68		2.24	1.02		0.00	1.49	
Employer/self-employed	7.47	14.69		11.96	18.78		4.24	7.01	
Professionals	5.44	6.55		12.15	14.77		6.78	14.44	
Qualified worker	31.69	30.16		36.07	34.57		50.85	46.50	
Unqualified worker	18.62	23.48		5.42	14.41		15.25	23.99	
Household income (mean)	777€	1025€	45.15*	1067€	1269€	8.61*	989€	1311€	9.01*
Size of town of residence									
Under 2000	7.80	9.92	99.13*	4.11	5.02	73.23*	11.86	5.31	35.72*
2001–10 000	18.74	19.60		8.22	13.46		6.78	12.74	
10 001–50 000	25.15	24.46		15.70	18.92		19.49	27.39	
50 001–100 000	8.41	10.23		6.73	8.73		7.63	11.25	
100 001–400 000	24.11	24.24		19.63	25.04		17.80	23.99	
400 001–1 000 000	6.66	5.50		3.93	6.33		1.69	4.46	
Over 1 000 000	9.14	6.04		42.68	22.49		34.75	14.86	

Source: National Health Survey 1997 and 2001.

Note: \*Statistically significant at a 95% confidence level.

\*\*Statistically significant at a 90% confidence level.

<sup>a</sup> Good health: individuals that report good or very good health and no chronic condition; No good health: individuals that report fair, bad or very bad health and/or at least one chronic condition.

2001. The distribution of the privately insured shows a more drastic change. The percentage of individuals holding group insurance increased by 41% with respect to 1997, jumping from 18% to over 25% of the total.

In terms of age there are clear differences between the two groups of privately insured. Subscribers of group policies are noticeably younger than their individually insured counterparts. Sex is another

interesting variable. Although there are no significant differences in the number of men and women that contract PHI, females constitute only one-third of the people in the employer-paid insurance category. Privately insured individuals report, in general, better health than those who do not have PHI. Nonetheless, the increase in the proportion of people with not good health is more pronounced among those who take out an individual policy directly. Regarding education, compared to the population who do not purchase PHI, those who do so have, on average, a higher level of education. In 2001, a quarter of the individuals with PHI were university graduates (30% among subscribers of individual policies and around 19% among those with a group policy), while in the non-PHI category only 10.4% held a university degree.

Average disposable household monthly income is also higher in the two groups of people with PHI for both years. Regarding the last occupation of the interviewed, the most interesting feature is the increase in privately insured individuals (holding either type of policy) among the unqualified workers. In the case of group policies the change could be accounted for by the increasing number of immigrant workers in sectors such as agriculture and construction, as well as the navy, for whom employers might take out a group policy. Finally, while in 1997 privately insured individuals were mainly concentrated in the bigger cities, the figures for 2001 show that the geographical distribution was then more even. This may indicate the success of the marketing of their products all around the territory by the insurance companies, and/or the movement of the better off amongst the population, principal buyers of PHI, away from the larger cities towards the smaller neighbouring communities.

### ECONOMETRIC RESULTS

Table II reports our estimated results. In Equation (1), the decision to purchase PHI appears to be significantly determined by several of the potentially explanatory variables, none of which is the fiscal reform, which does not seem to have affected total demand for PHI. We tested the robustness of this result in two ways. Firstly, we estimated a model that excluded public health expenditures and private high technology beds (the variables meant to capture differences and changes over the period in the quantity and quality of the public and private health sectors) from the explanatory variables. In this case the Fiscal Reform dummy comes out to be significant, which may be interpreted as indicating that this variable now captures the changes represented by the two excluded ones. Secondly, we estimated the demand for private insurance using the 1995–2001 waves of the ECHP,<sup>22</sup> and found no significant differences.<sup>23</sup>

Good health has a significant negative impact on the demand for private insurance, a result consistent with common wisdom in health economics. Also as expected, the higher the level of education the greater the probability of buying PHI. Likewise, income comes forth as having a highly significant positive effect on this probability. Among the occupational categories, employers and the self-employed show a positive significant sign, in line with previous findings in Spain. However, professionals show a significant negative sign, contrary to what we had expected. We have no adequate explanation to account for this result. As for town size, only the residents of Madrid and Barcelona (the two cities of over 1 000 000 inhabitants) show a significantly higher probability of buying PHI. Finally, the level of public health expenditures per capita in the region shows a significantly negative effect on the demand

<sup>22</sup> We ignore the 1994 wave because the question on insurance coverage did not distinguish between private and public insurance. The estimation is made using the balanced panel of individuals present in all seven waves. The set of explanatory variables was defined as similarly as possible to that used in the bivariate probit estimation.

<sup>23</sup> Working with the panel structure of the survey we examined whether or not it was the same individuals who had private insurance before and after the reform. The percentage of people saying that they had private insurance is around 10.2% every year; approximately half have private insurance in all periods while the other half move in and out of private insurance with no clear pattern emerging, except that 2% entered anew in 2001 – possibly into group insurance, but we cannot be sure since this data set does not distinguish between the two types of policy.

Table II. Bivariate probit estimation results (standard errors shown in brackets)

	Equation (1) $y_{1i} = 1$ for those who have PHI		Equation (2) $y_{2i} = 1$ for those who have individually bought PHI	
	Coef. (Std. Err.)	Avg. partial effects	Coef. (Std. Err.)	Avg. partial effects
Constant	-8.4023* (0.3448)		-5.3727* (0.6879)	
Fiscal reform	0.0399 (0.0490)	0.0055	-0.2999* (0.0585)	-0.0785
Good health	-0.0591* (0.0243)	-0.0081		
Age	0.0211* (0.0041)	0.0029	-0.0112 (0.0089)	-0.0029
Age squared	-0.0001* (0.0000)	0.0000	0.0003* (0.0001)	0.0001
Female	0.0276 (0.0307)	0.0038	0.1899* (0.0628)	0.0497
Female fertility	-0.0535 (0.0379)	-0.0073	0.1995* (0.0781)	0.0522
Primary education	0.3608* (0.0734)	0.0494	0.2649* (0.1320)	0.0693
Secondary education	0.6697* (0.0624)	0.0917	0.6249* (0.1382)	0.1635
University education	0.8060* (0.0681)	0.1104	0.9751* (0.1463)	0.2551
Farmer	0.0302 (0.0880)	0.0041	-0.0745 (0.1997)	-0.0195
Employer/self-employed	0.1085* (0.0460)	0.0149	0.2013* (0.1000)	0.0527
Professional	-0.1212* (0.0533)	-0.0166	-0.5085* (0.1019)	-0.1330
Qualified worker	0.0566 (0.0377)	0.0077	-0.3477* (0.0771)	-0.0910
Unqualified worker	-0.0095 (0.0418)	-0.0013	-0.4690* (0.0846)	-0.1227
Log household income	0.9976* (0.0527)	0.1366	0.5639* (0.1004)	0.1475
2001-10 000 inhabitants	-0.0767 (0.0554)	-0.0105	0.0874 (0.1147)	0.0229
10 001-50 000 inhabitants	-0.0895* (0.0531)	-0.0123	-0.0262 (0.1072)	-0.0068
50 001-100 000 inhabitants	-0.0644 (0.0624)	-0.0088	-0.0268 (0.1225)	-0.0070
100 001-400 000 inhabitants	-0.0876 (0.0535)	-0.0120	0.0793 (0.1075)	0.0208
400 000-1 000 000 inhabitants	-0.0205 (0.0688)	-0.0028	0.2734* (0.1371)	0.0715
Over 1 000 000 inhabitants	0.4829* (0.0574)	0.0661	0.5694* (0.1180)	0.1490
Public health expenditures	-0.0018* (0.0002)	-0.0003		
Private high technology beds	1.9779* (0.1477)	0.2709	2.8112* (0.2606)	0.7355
Medium/large firms			-0.1899* (0.0427)	-0.0497
Correlation of error terms ( $\rho$ )	-0.7758* (0.1302)			
N	24 488			
Log-likelihood	-7995.60			
Wald $\chi^2$ (22)	1961.46*			

Note: \*Statistically significant at a confidence level of 95%.

\*\*Statistically significant at a confidence level of 90%.

for PHI, while the supply of beds in private high technology hospitals exerts a significantly positive effect, thus confirming our expectations and the ability of these variables to capture the intertwining of the two sectors.

The most important result from the second equation is the negative and significant sign of the coefficient of the fiscal reform variable. As expected, the reform lowered the demand for individually purchased PHI. According to the last column of Table II, which contains the marginal effects thereof, for the average person the probability of buying an individual policy declined by 0.08 points. On the other hand, being female has a significantly positive effect on the demand for this kind of policy compared to employer-paid group policies; the average partial effect implies an increase in the probability of around 0.05 points. Perhaps, women work in (lower) job positions where they are less likely to be offered company group insurance. Being a female of prime fertile age has an additional distinctly positive effect on the probability of holding an individually bought insurance policy. Such women have a 6.4% higher probability of holding an individual policy than women in general.

Income also makes a significant difference in favour of the probability of purchasing PHI coverage directly. Given its partial effect, a 10% increase in the logarithm of monthly income increases the

probability of buying an individual policy by 15%. Regarding occupation, the results are quite reasonable: employers and the self-employed have a greater likelihood of buying an individual policy, while professionals and qualified and non-qualified workers show a negative probability. Residents in the larger cities (over 400 000 inhabitants) also have, as expected, a significantly higher probability of purchasing insurance individually. Living in a region with a larger supply of beds in private hospitals with high technology equipment exhibits the greatest partial effect: the probability of having individually bought insurance increases by 0.73 percentage points. As for the variable capturing the effect of medium/large-sized enterprises on the type of insurance held, our results confirm its explanatory power. The negative significant sign indicates that the greater the proportion of companies of over 50 employees in the region of residence, the lower the probability that the insurance held is individually purchased. The probability falls by around 0.05 points.

## DISCUSSION

### Impact on the demand for private health insurance

The Spanish reform of the tax treatment of PHI contrasts with other cases studied in the literature in which tax credits were eliminated but no incentives created. In our case, the reform clearly encouraged the substitution of individual policies for group employer-paid schemes, which turns it especially interesting.

Given that the shift in incentives increased the price of individually bought policies while at the same time reducing the price of employer-paid ones, we expected a negative effect on the demand for individually bought policies versus group schemes in the second equation. Our results fit with expected behaviour. After controlling for other variables, the marginal effect of the reform was to cause a decline of 0.08 percentage points in the probability of purchasing individual PHI (see last column of Table II), a fall of about 10% with respect to the probability prevailing in 1997. Two price effects are at work here: first, the own-price elasticity due to the elimination of the deduction and, second, the cross-price elasticity effect due to the fall in the price of its substitute, group employer policies.<sup>24</sup> Both price effects act in the same direction: they reduce the demand for individual policies although, unfortunately, it is impossible to disentangle their share in that decline. Therefore, we cannot calculate the own-price elasticity, even though it seems to be low, in line with other results found in the literature.

We also said that, depending on how substantial the substitution of individual for group policies was, we might expect no effect, a negative effect, or a positive effect on the total demand for PHI in the first equation. The results of the econometric estimation support the hypothesis that the 1998 changes in the tax treatment of PHI did not significantly alter overall demand. The negative impact on the demand for individual policies would have been offset by an increase in the demand for group employer-paid schemes due to the same, but reversed, price effects as those affecting individual policies.<sup>25</sup> This does not necessarily mean that actual insurance take up had to remain unchanged since, obviously, there are other variables that affect the demand for PHI. In fact, descriptive statistics in Table I and in the previous footnote show that, according to this data set, there was a slight decline in the total percentage of people holding PHI between 1997 and 2001. A decline that other surveys, like the ECHP, do not reflect (see footnote 23). Attempts to verify these figures with information from the industry are

<sup>24</sup> Other things being equal, the price of individual policies went up by 9% (a 15% increase due to the elimination of the deduction minus 6% subsidy from the exemption on the tax on insurance premiums) while the price of employer-paid policies went down, on average, by 22.04% (16.04% average tax rate in 2001 plus 6% exemption on the tax on insurance premiums).

<sup>25</sup> Descriptive statistics from the series of National Health Surveys in the 1990s show a marked jump in 2001 in the percentage of group insurance policies; the figures for 1993, 1995, 1997 and 2001 are 19.2, 16.3, 17.9 and 25.4%, respectively. The total percentage of people holding private health insurance in the same years was 8.2, 11.4, 11.3 and 9.7%, respectively.

somewhat frustrating. It is well known among health economists in Spain that it is very difficult to obtain reliable and homogeneously defined data from the insurance companies.<sup>26</sup> But internal reports often talk of 'stability' in terms of the number of insured persons during the period (Guerrero Gilabert, 2001). Also, the number of subscribers under the 'services in kind' category for 1997 reported by Murillo (2000) – citing data from UNESPA, the insurance industry association – is very similar to the number in 2001 given by ICEA (2002).

Although the results are not shown here,<sup>27</sup> we also estimated the model for different groups of the population. Specifically, we tested the results for males and females and for people earning over and lower than average income, separately. First of all, the impact of the reform is negative for individually purchased policies for all subgroups, and insignificant for the overall demand for PHI in all cases except for that of women; in their case the sign of the reform variable is positive and significant. Other interesting findings are the following: health status is not a significant determinant of the demand for PHI (first equation) either for men or for people of over average income. It is, however, significant for women and for people earning lower than average income. That is, being in good health makes women and people below average income buy less PHI but not in the case of males and people over average income. Being a female exerts a positive effect on the total demand for PHI in the case of upper income, but it makes no difference for people of lower income. In Equation (2), in which we distinguish between the two kinds of policies, we note that among people earning over the average income, being female increases the probability of taking out an individual policy, but among people below that average it is being a female in prime fertility age that counts. The coefficient of the income variable is greater for men and for persons earning over the average income than for women and those below that average. Regarding occupation, the professionals who show a significantly negative sign with respect to the choice of an individual policy are women and people below average income. The rest of the coefficients and signs are quite similar to those of the general sample.

### Impact on state budget

In 1998, before the deduction was eliminated from the PIT, the total amount deducted for medical expenditure was 656.6 million euros. Since 18.5% of all private medical expenditure was on insurance premiums (INE, 1999), the estimated revenue forgone by the government on this item alone was approximately 121.5 million euros. Or, in other words, this is the amount the government saved with the removal of the deduction on individually purchased policies.

To calculate the fiscal expenditure incurred by subsidizing group employer-paid policies, we take into account the fact that the average premium for group policies was 289.89 euros in 2001 (ICEA, 2002). Since this is not considered taxable income, the government forgoes the average tax rate times 289.89 euros for each policy held. The average tax rate in 2001 equalled 16.04%.<sup>28</sup> The average cost of the subsidy was then 46.5 euros per policy. Given the total number of group policies in 2001 (1 243 485 according to ICEA, 2002) we calculate the fiscal expenditure on this specific incentive to be around 55 million euros. To this we have to add 158.8 million euros, the official amount of tax money foregone with the exemption from the tax on health insurance premiums granted to both types of policies (Ministerio de Economía y Hacienda, 2001). Thus, the total revenue lost by the government with the introduction of the two new subsidies is 213.8 million euros, which outweighs the savings made by the elimination of the previous tax credit on individual policies (121.5 million euros). This is the effect on

<sup>26</sup> There are problems with how the different categories of policy ('services in kind', 'reimbursement of medical expenditures' and 'sickness compensations') are aggregated and with members of the public mutualities not being rigorously counted apart – at least, not until 2001.

<sup>27</sup> Available on request.

<sup>28</sup> Since individuals with group PHI have higher average income than those without, their average tax rate is probably higher and our calculation may thus underestimate total fiscal expenditure.

Table III. Pattern of utilisation of public and private health-care services by type of insurance in 1997 and 2001 (percentages)

Description of variables	PHI											
	No PHI			PHI			Individually purchased			Group employer-paid		
	1997	2001	$\chi^2$	1997	2001	$\chi^2$	1997	2001	$\chi^2$	1997	2001	$\chi^2$
At least one visit to the doctor in the last 15 days	25.31	23.37	8.57*	24.05	25.83	0.84	25.04	25.42	0.03	20.49	27.01	2.17
Visited a GP	72.71	71.86	0.36	55.90	51.22	1.06	57.25	49.17	2.61	52.00	56.92	0.21
Public	98.62	98.87	0.38	64.63	70.95	1.15	63.89	71.26	1.30	75.00	70.15	0.12
Private	1.38	1.13		35.37	29.05		36.11	28.74		25.00	29.85	
Visited a Specialist	27.29	28.14	0.36	44.10	48.78	1.06	42.75	50.93	2.61	48.00	43.08	0.21
Public	85.92	88.52	1.72	20.29	26.89	1.23	13.56	20.77	1.50	60.00	47.27	0.55
Private	14.08	11.48		79.71	73.11		86.44	79.23		40.00	52.73	
Hospitalised in the last year	8.43	8.34	0.04	8.50	11.11	3.64**	7.82	11.88	6.95*	12.30	8.85	1.34
Hospital expenditures covered by the public sector	99.48	98.93	0.99	26.53	39.44	2.77**	21.05	31.79	1.68	50.00	79.31	3.52**
Hospital expenditures covered by a private insurance company	0.52	1.07		73.47	60.56		78.95	68.21		50.00	20.69	

Source: National Health Survey 1997 and 2001.

Note: \*Statistically significant at a 95% confidence level.

\*\*Statistically significant at a 90% confidence level.

the revenue side if we focus on PHI alone. If we look, however, at the full effect of the reform, including the elimination of the deduction on all private medical expenditures, the result is quite different: the government saved approximately 362 million euros in fiscal benefits.

Now, looking at the impact on the expenditure side of the budget, the effect could potentially come from either a rise in the consumption of public medical care derived from an increase in the number of people without PHI, or from changes to the pattern of use of public and private services by the privately insured. We know that the proportion of people with and without PHI changed very little, so the predicted flow of new users to the public sector did not occur. Regarding possible changes to the patterns of utilisation of health-care services, Table III describes such patterns and suggests that the proportion and distribution of medical visits and hospitalisations by insurance categories remained unchanged between 1997 and 2001.<sup>29</sup> Although one may observe a certain increase in the use of public services by people with and without PHI, none of these differences are significant at the 95% level.<sup>30</sup> In short, the aim of avoiding increased pressure on public health-care expenditure seems to have been accomplished, and thus the balance of the reform would seem clearly positive for the government.

### Impact on society and the industry

An important actor at stake potentially affected by this policy change is the PHI industry. Although a detailed analysis is beyond the scope of this study, we would like to briefly sketch out some of the issues of possible concern. From the point of view of the industry, it is positive that the reform does not appear to have had any effect on the overall size of the market. However, the change in the distribution of

<sup>29</sup> Let us note in passing that this also suggests that people who used to pay directly for private medical services was hardly affected by the elimination of the 15% deduction on all private medical expenditures.

<sup>30</sup> This is not surprising since absolute figures for some of these cells are really low: e.g. only 15 people with a group policy were hospitalised in 1997; that 50% used a public hospital means seven did. Larger samples would be needed in order to be able to make a more definite statement.

individually bought and group employer-paid policies could affect industry profits in two ways. Firstly, through the ‘squeeze’ in premiums due to the growth of group policies.<sup>31</sup> Secondly, through a change in risk rate due to a modification of the average age–sex–health of subscribers. In principle, group insurance lowers the chance of adverse selection, but the descriptive statistics provided in Table I indicate a possible increase in risk, above all among those with individually purchased insurance.

From the point of view of society, and in line with the literature reviewed, maintaining the mix of public and private supply can also be interpreted as a positive outcome. On the one hand, because the mix provides a basis for the healthy benchmarking of the two sectors; on the other, because the existence of PHI allows for channelling of the heterogeneity of willingness to pay for certain services (Vera Hernández, 2003).

Nevertheless, the reform was not neutral as far as people likely affected. There are certain groups in society who inherently have less opportunity of buying group insurance, or of moving into group insurance, than others. Such is the case of pensioners (since they are too old or too ill to work), the unemployed, people who do not form part of the work force and, lastly, the self-employed.<sup>32</sup> Since women make up a disproportionately large part of some of the above-mentioned categories, it is not surprising that they are clearly underrepresented in the number of subscribers to group policies shown in Table I. For them, the reform had a negative welfare effect since they have less choice. A final issue is whether the shift in fiscal incentives has improved or worsened the progressiveness of the tax relief. This is, again, a topic we will have to leave for future research.

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<sup>31</sup>This ‘squeeze’ could very well threaten the survival of some companies in the medium/long run if the trend of replacing individual with group policies were to continue at the same rate.

<sup>32</sup>The discrimination against the self-employed was corrected by Act 46/2002, art. 14, which came into effect in 2003. It provides for the premiums paid on private health insurance by the self-employed and their families to be considered allowable expenditure when calculating net income. The same act increased the limit exempt from taxable income to 500 euros per person.

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