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FEDERALISM VERSUS SOCIAL CITIZENSHIP:
INVESTIGATING THE PREFERENCE FOR EQUITY
IN HEALTH CARE

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Abstract[1]

La maggior parte degli Stati federali è contraddistinta da un elevato grado di decentramento regionale per quanto attiene la gestione e l'erogazione dei servizi pubblici. La maggior vicinanza dei governi regionali ai propri cittadini, come evidenziato dalla teoria economica del decentramento fiscale, consente allo Stato di meglio interpretare le preferenze della popolazione locale e offre l'opportunità di adottare scelte pubbliche differenziate all'interno della stessa nazione, con un aumento del benessere complessivo rispetto ad una soluzione uniforme su scala nazionale. Non sorprende pertanto che all'interno di molti Stati federali vi siano forti differenze interregionali per quanto concerne le varie voci di spesa pubblica.

Un caso particolare è tuttavia rappresentato dalla sanità. Sebbene la costituzione di alcuni stati federali preveda la delega ai governi sub-centrali di molte competenze in campo sanitario, le differenze nelle politiche sanitarie regionali sono alquanto sfumate e la spesa sanitaria pro-capite delle singole regioni appare molto più livellata di quanto non accada in altri settori quali l'educazione o l'assistenza sociale (cfr. *Banting e Corbett*, 2002).

L'autonomia regionale prevista dal federalismo viene in altre parole superata dalla tutela di un diritto di "cittadinanza sociale", che richiede un accesso universale alle prestazioni sanitarie di base e un finanziamento dei servizi il più equo possibile. Vi è, in altre parole, il riconoscimento che la salute è un bene meritorio e che di conseguenza l'accesso alle prestazioni sanitarie deve essere uguale per tutti i cittadini (equità orizzontale), il finanziamento assicurato in modo almeno parzialmente socializzato (equità verticale), mentre entrambi gli obiettivi dovrebbero essere perseguiti in modo analogo in tutte le regioni (equità geografica).

Una modellizzazione di questi aspetti è stata offerta da Margolis (1982), la cui teoria suggerisce di separare la funzione di utilità in due componenti, una subordinata alla logica del self-interest e relativa al consumo di beni privati, l'altra afferente ad una razionalità collettiva per i beni meritori e pubblici. I cittadini trarrebbero, secondo Margolis, utilità dal fatto stesso di sentirsi partecipi di una data comunità. Vi sarebbe, in altre parole, una gratificazione dal fatto che la società metta a disposizione di tutti i suoi membri una serie di servizi fondamentali e dal fatto di contribuire personalmente ("by doing their fair share") ad offrire queste pari opportunità. Di conseguenza il contributo

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al finanziamento dei beni meritori si configura, secondo Margolis, come un bene superiore, per cui aumenta al crescere del reddito in modo più che proporzionale.

Il presente contributo analizza il tema dell'equità verticale nel finanziamento della sanità elvetica. A differenza di quanto registrato in altri stati federali, l'autonomia decisionale dei cantoni, rafforzata dal federalismo fiscale, si è tradotta in una forte eterogeneità per quanto concerne la partecipazione dello Stato al finanziamento dei servizi sanitari ed il livello complessivo della spesa sanitaria cantonale. In Svizzera la sanità è finanziata in modo piuttosto iniquo (solo il 25% della spesa è raccolto tramite la fiscalità generale – il 5% è assicurato dallo Stato Centrale, il rimanente 20% dai poteri locali), mentre il 26% è assicurato mediante premi indipendenti dal reddito, ed il 42.5% tramite contributi privati (out-of-pocket, assicurazioni integrative private). Attraverso un'indagine condotta su un campione rappresentativo di 1000 cittadini svizzeri si è cercato di analizzare la disponibilità della popolazione a sostenere l'introduzione di premi dell'assicurazione malattia proporzionali al reddito. Questa analisi, condotta in riferimento al reddito e ad altre caratteristiche degli intervistati, consente di verificare la disponibilità dei cittadini a contribuire per un miglioramento dell'equità verticale e costituisce, almeno in modo indiretto, un test del modello teorico di Margolis.

1. Introduction

Switzerland does not have a National Health Service like Italy and Great Britain, nor is its system based on a public insurance scheme such as in France and Germany. The Swiss health care system is based upon a mixed insurance model. On the one hand, competing private non-profit companies are responsible for health insurance, and on the other hand, the system incorporates some elements that are normally adopted within the context of a social insurance, such as mandatory insurance for all residents, regulated and risk-independent premiums, public subsidies to the less wealthy for the payment of the insurance premiums. In an unusual health care context such as the Swiss one, the decision-making autonomy of the single cantons, reinforced by fiscal federalism, has led to a highly heterogeneous system. This heterogeneity applies both to the production capacity and to the specific weight which each canton attributes to the various forms of health care provision (for example to public versus private hospitals or nursing homes). Instead of being a single health care system, Switzerland can be therefore considered an ensemble of 26 sub-systems, connected to each other by the Federal Law on Health Insurance (FLHI).

In contrast with the majority of European countries, where the financial contribution of the State to health care expenditure is significant, the Swiss system provides for a

rather limited public participation. Moreover, the mandatory health insurance premiums are independent of income and citizens finance 42% of total health expenditure directly or by means of private insurances. This situation leads to a highly regressive financing of health care expenses.

In recent years many proposals have been formulated in the Swiss political arena, all aimed at reforming the financing of the mandatory health insurance. Among others, a popular vote, which was rejected by more than 70% of voters in May 2003, invited the Swiss population to support the introduction of income and wealth derived health insurance premiums.

The goals of the study presented here are: (1) to briefly describe the Swiss health care system, paying particular attention to the issue of equity in the financing of health care; (2) to investigate the willingness of the Swiss citizens to foster more equity in the financing of health care and (3) to empirically test the theory of Margolis (1982), whose fair-share model suggests that spending in group interest should behave as a superior good (i.e. willingness to pay for collective interests – as in the case of a mandatory health insurance system – should rise as the income of individuals increases).

This paper is structured as follows: in section 2 we introduce some considerations on the nature of the patient's utility functions and we briefly describe the fair-share model developed by Margolis in 1982; in section 3 we present the main features of the Swiss health care system; section 4 is devoted to a short presentation of the reform proposals, which aim at achieving more equity in the financing of health care, presently under discussion in Switzerland; in section 5 the specification of the model is discussed, while the data set and the empirical estimation results are presented in section 6; conclusions are drawn in section 7.

2. Some considerations on the utility of spending for merit goods like health care

Some experimental and empirical evidence has been collected on the following paradox: in many situations people spontaneously contribute to the financing of public or merit goods, although free-riding is a viable option, the return appears inconsequential and the effect of one's personal contribution to the society's well-being is minimal [see e.g. Andreoni and Scholz (1998), Andreoni (1995)].

According to Margolis (1982), in these situations it is important to distinguish between two classes of goods: private goods on the one hand, and public or merit goods[2] on the other hand. Margolis assumes that the utility function of individuals
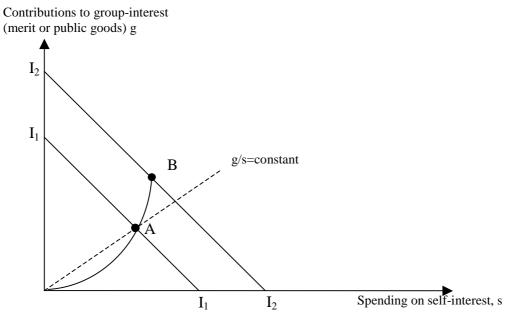
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[2] Margolis calls this second class of goods "group-interest".

includes two components that comply with two different logics. Individuals value the consumption of private goods and services in a selfish way, but at the same time they value collective spending on merit and public goods from a group's point of view. As members of a given community, they derive well-being from the amount of resources which are devoted to group-interest issues, but subject to the condition that they are personally "doing their fair share" and contributing in such a manner that everyone enjoys equal access to group-interest services. Therefore, Margolis assumes the utility function $U=U(S,G)$, with S representing the utility of the individual from the point of view of pure self-interest and G the utility from the point of view of pure group-interest.

The logic of the utility maximization model is the following: each member of the community has an initial endowment of financial resources that should be divided into two spending alternatives: the maximization of S-utility (s), and the maximization of G-utility (g). The allocation decision depends on two factors: the ratio between the marginal utility of spending in group-interest and the marginal utility of spending in self-interest (G'/S') and a weighting function W, which varies positively with the participation ratio g/s of the individual (in other terms the likelihood of spending an additional Euro for self-interest rather than for group-interest increases as g/s grows).[3]

Figure 1 The equilibrium income-spending path in the Margolis "fair-share" model

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[3] "*The larger the share of my resources I have spent unselfishly, the more weight I give to my selfish interests in allocating marginal resources. On the other hand, the larger benefit I can confer on group compared with the benefit from spending marginal resources on myself, the more I will tend to act unselfishly*" (Margolis, 1982, p. 36).

The fair-share model developed by Margolis has a simple theoretical implication: g, i.e. spending in group-interest, is a superior good. As the endowment of a given individual increases (e.g. from I_1 to I_2 in figure 1), spending for group-interest increases more than proportionally, leading to the upward-bending income-spending path illustrated in figure 1.

Margolis' model can be useful for the analysis of health care services, which are generally considered to be merit goods.[4] The demand for health care broadly reflects the utility that individuals draw from their health, whereby health represents a prerequisite for most human activities. For this reason many societies consider health care services as merit goods. Generally, the State promotes two dimensions of equity through the health care system: **horizontal equity** (citizens with the same medical needs should receive the same treatment, even if they belong to different age and sex classes or ethnical groups) and **vertical equity** (the demand for basic health care should not depend on the patients' ability to pay). In most OECD countries the emphasis given to equity has two major consequences: a significant public participation in the financing of health care and the development of a package of medical services which should be granted to the entire population. In order to guarantee that social citizenship is offered to everybody, citizens participate (through taxes or through social health insurance contributions) to the financing of health care services. In the case of federal states like Switzerland, the two dimensions of equity should be attained in the same way in all the country's regions.

Banting and Corbett (2002) illustrated that federal states offer a particularly intriguing context. In federal states, the central government faces a trade-off between two social values: (1) a commitment to social citizenship, to be achieved through a common set of public health care services for citizens across the entire country, and (2) respect for regional communities and cultures, to be achieved through decentralized decision-making and significant room for manoeuvre at the regional level in the health care sector. Using the case study approach, the authors have proven that the regional variations in health care supply (e.g. the number of hospital beds or doctors per 1,000 inhabitants) and in per capita health care spending are not very large in the five federative countries analyzed (Belgium, Germany, Australia, United States and Canada). The result is fairly surprising because it holds even in federal states where the decision-making power in the health care sector has been delegated to regional

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[4] It is important to recognize the particular nature of the commodity "health care" (see Arrow, 1963). Health care per se has little utility. If any satisfaction is associated with medical services, this occurs with higher likelihood in the case of ill people, the productivity of health care being state-dependent (see Zweifel and Breyer, 1997).

authorities to a great extent or where the resort to interregional redistribution by means of financial transfers is very low. It seems that policy-makers in the five countries are committed to granting comparable access to health services and to limiting interregional inequalities in health care spending despite the importance of diversity embedded in the logic of federalism. However, as we will illustrate in the next section, in Switzerland there is a marked heterogeneity between cantons in terms of vertical equity. Moreover, two features of the Swiss health care system distinguish it from those of other European countries: (1) highly regressive health care financing (due to the very limited public financial participation and income-independent insurance premiums) and (2) the existence of significant differences among cantons in per capita health care spending and in production capacity.

One of the objectives of this paper is to assess whether Swiss citizens would favor a more equitable financing system and in particular if they are willing to introduce income-dependent health insurance premiums. According to Margolis' fair-share model we should expect growing willingness-to-pay for socialized health care expenditure, since health care services are usually considered merit goods as income increases. In our case we were not able to test directly the relationship between income and the desire to contribute to social health care spending. However, the willingness of the superior income classes to adopt income-dependent insurance premiums can be interpreted as a proxy for their higher willingness to contribute to the financing of health care services.

3. The Swiss health care system

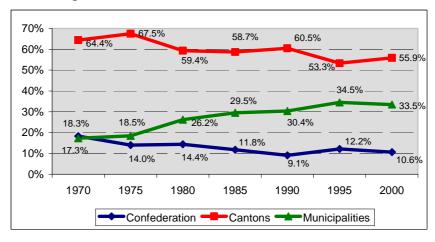The main features of the Swiss health care system are the following:

- the system is based on a private insurance model, with about 100 competing insurance companies on the one hand and some social characteristics on the other hand;

- since 1996 health insurance has been mandatory for all residents;

- the rights of the insured are laid down in the individual insurance contracts; since 1996 the basic contract has been the same for all residents by law;

- both public and private hospitals as well as nursing homes offer inpatient health care, which (in most cases) is still reimbursed on a per diem base;

- ambulatory health care services provided by freelance general practitioners and specialists are reimbursed according to a fee-for-service scheme;

- the insured can freely choose the service-provider (general practitioner, specialist);

- the service fees are regulated and defined according to agreements concluded between the service providers association, the health insurance companies and the State;

- the financial contribution of the State (Swiss Confederation, cantons and local authorities) to the health care system is very limited (subsidies to public-interest hospital structures, subsidies to the low income classes for the payment of the mandatory health insurance premiums).

The financing model and the allocation of competences between the Confederation and Cantons

In 2000 a meager 25% of the total health care expenditure was covered by general taxation.[5] Moreover, public contribution was predominantly provided by cantons and municipalities, whereas the Confederation contributed only 10% to the public health care budget (see figure 2). The rest was financed by the mandatory (income and risk-independent) health insurance premiums (26%), by contributions to other forms of social insurance (6.5%) such as income-proportional deductions from salary for accidents. Citizens finance 42% of the health care costs directly (cost-participation and deductible amount from the invoices covered by the mandatory insurance, additional private insurance premiums and insurance-exempted services).

Figure 2 Distribution of public health care spending between Confederation, Cantons and Municipalities, 1970-2000

Source: UFS, Finances publiques en Suisse, Neuchâtel, over many years.

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[5] This quota is divided into shares of 15.4% for public financing of hospitals and nursing homes, 8.7% for subsidies to the less wealthy citizens in form of a public contribution to the payment of the mandatory health insurance premiums and of the nursing homes' daily rates, and 1.5% for public subsidies to other social insurances that participate in the health care expenditure.

Switzerland's peculiarity is highlighted in the triangle of health care financing depicted in figure 3. The closer a country is to the triangle's hypotenuse, the higher the health care expenditure share financed according to the citizens' paying ability (progressive general taxation or proportional payroll taxes). The closer it is to the right angle, the greater the use of private financing schemes.
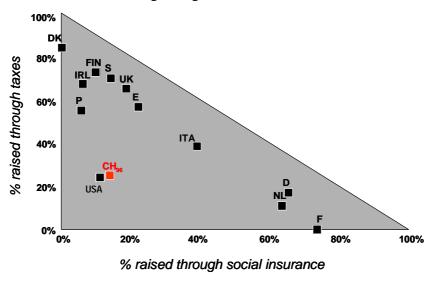
Figure 3   Health care financing triangle

Source: Wagstaff et al (1999).

Switzerland's position is in clear contrast with all the other European countries (which are all within a range of public financing between 65% to 80% of health care expenditure) and shows some similarities with the situation in the United States. This particular structure of the health care financing scheme has two main consequences:

- the Swiss health care system does not give much importance to the principle of equity of financing. In fact, the larger the share of progressive or at least income-proportional financing of health care costs is, the greater the equity of health care system financing. The fact that the mandatory health insurance premiums are independent of income and that citizens have to finance directly (or through private insurances) 42% of total expenditure, leads to a highly regressive financing model.[6] This has negative repercussions especially on the medium income class, which does not benefit from subsidies for the payment of the insurance premiums;

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[6] Wagstaff et al. (1999) have published a comparative study on the equity of financing in OECD countries, where Switzerland ranked last.

- the presence of a large number of third-party payers makes it extremely complex to follow the financial flows, which in turn makes it more difficult to manage the health care expenditure in general, and leads to a "*cost shifting*" problem in particular. Since nobody is responsible for the global health care budget, it is sometimes easier for a single financing body to obtain a reduction in its own financial share than to engage in a more rational use of total health care spending. This encourages shifting costs at the expense of another payer, rather than searching for solutions which would allow an effective rationalisation of expenditure.

Although the State's presence in the Swiss health care system cannot be considered to be very strong in financial terms, it is definitely stronger in terms of regulatory activity. As far as allocation of competences is concerned, the cantons are legally entitled to legislate on all health care matters except for a few issues that explicitly fall within the competence of the Confederation. Almost all cantons have drawn up cantonal health care laws and some provisions that regulate the application of the Federal health care legislation. According to the Constitution, each canton enjoys decision-making autonomy in the planning of health care institutions (in particular hospitals and nursing homes), in deciding which competences are to be delegated to the local authorities and with regard to vocational training. Since 1996, when the Federal Law on Health Insurance (FLHI) was introduced, the Confederation has played a more active role in the health care sector. However, the additional decision-making powers of the central body were not supported by a formal devolution of competences from the cantons to the Confederation (which would have required a change in the Constitution) nor by a redistribution of public health care expenditure towards a greater engagement of the Confederation (see Crivelli and Filippini, 2003).

The organizational autonomy granted to the cantons in the last 90 years has created a very heterogeneous picture both in the provision of health care services and in the level of public health financing (direct contributions to public hospitals and health insurance premiums subsidies), giving rise to relevant issues of social and territorial inequity.

Such a marked decentralisation of financing and of the provision of health care does not have any term of comparison in other countries with a federal setting such as Canada or Germany. In these countries the central governments play a more active role in the financing of the health care sector. Moreover, since the regional entities in these countries are much larger than the Swiss cantons, the regional differences are not as

marked and the problems connected to the presence of mini-systems are not as significant.

4. Proposals for a reform

People in Switzerland are, in general, fairly satisfied with the way the health system in their country is run.[7] In a survey carried out in September 2002 among a sample of 1'128 respondents, 21% said they were "very satisfied" and 45.1% "fairly satisfied" with the way health care is run in this country. On a European scale these percentages – see table 1 – can be compared with the figures gathered in 1996 by the Eurobarometer survey of citizens' views on health care systems (see Mossialos, 1997). Only in Denmark was the rate of "very satisfied" respondents higher than in Switzerland. By adding the percentages of the "very satisfied" and "fairly satisfied", Switzerland (with 66.93%) would drop from the second to the seventh place in a hypothetical European ranking; it would be passed not only by Denmark (90.0%) but also by Finland (86.4%), Holland (72.8%), Luxemburg (71.1%), Belgium (71.1%) and Sweden (67.3%). The main limitation of these comparisons lies in the fact that people voice their opinions on the basis of their personal experiences (which are in general limited to the own health care system) and of the expectations they place in the system, whereby expectations are endogenous, i.e. they tend to increase as the perceived quality of the health system itself improves.

Table 1   Satisfaction regarding the health care system in Switzerland, 2002

	Answer Percentage	Cumulative percentage
Very satisfied	21.81%	21.81%
Fairly satisfied	45.12%	66.93%
Neither satisfied nor dissatisfied	15.43%	82.36%
Fairly dissatisfied	10.90%	93.26%
Very dissatisfied	3.99%	97.25%
Do not know	2.75%	100.00%

This satisfaction on the health care delivery front is offset by the Swiss population's growing concern regarding the constant increase of health expenditure and in particular the share of costs financed by the premiums of the mandatory health insurance. Indeed, between 1996 - the year in which universal health insurance became compulsory under

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[7] Switzerland can be regarded as the world's greatest "health shopping center" because there are almost no barriers to the access to medical and/or health services.

Federal law – and 2002, premiums rose in Switzerland on average by 62%. The population's growing concern with respect to these massive increases is reflected in the difficulty that many families experience nowadays when it comes to paying health insurance premiums. As an example, table 2 displays the situation of two representative households (a couple without children and a couple with two children), both earning the Swiss median income of about 5000 Euro and living in the canton Ticino. For the year 2002 we have calculated the amount that each household would pay in income taxes (including federal, cantonal and local taxes) and the amount it would pay in terms of the mandatory health insurance premiums for all family members.

In the case of the couple without children, the health insurance premiums sum up to 78% of the amount spent on taxes, whereas in the case of the couple with two children premiums equal 1.8 times the amount spent on income taxes. This situation could undermine the social fabric and has ultimately prompted the political forces to work out proposals to amend current laws, with a view to introduce greater control and planning on the supply side (thus directly influencing the cost pattern), to enforce more competition among insurance plans and to provide for a more equitable financing mechanism.

Table 2   Proportion between spending on income taxes and health insurance premiums in the case of a representative household, 2002

	Couple without children	Couple with two children
Family's gross income	65000 €	65000 €
Family's taxable income	45333 €	34667 €
Federal income taxes	681 €	308 €
Cantonal income taxes	2743 €	1538 €
Local income taxes	2331 €	1307 €
Total taxes	5755 €	3154 €
Yearly health insurance premiums	4480 €	5680 €

Swiss citizens voted on 18 May 2003 on a citizens' initiative launched by the left wing and supported by labor unions and consumer organizations, whose most important aim was at challenging the way health insurance premiums are presently financed in Switzerland. Instead of income-independent flat premiums, the following financing rule for the compulsory health insurance expenditure was suggested: 60% of total health insurance cost based on personal income, 15% based on the personal wealth stock and 25% by means of a general VAT increase. Such a system would be, according to the

proponents, more in line with the models adopted by the other European countries and would contribute to maintain the already existing equal access to health care guaranteeing at the same time a fair financing method. The proposal was rejected by a strong majority of the Swiss population (72.9%), in all 26 cantons (the participation at the ballot remained, however, below 50%).

Two surveys conducted during the second half of the year 2002, among them the one that provided the data for the analysis presented in sections 5 and 6, have shown that a substantial majority of the Swiss (63%) declares to be willing to pay health insurance premiums that depend proportionally on their income, though they are rather skeptical when it comes to supporting a VAT increase to finance the health sector. It should be pointed out that the proposal of income-dependent premiums illustrated in the questionnaire of the surveys, was quite different from the proposal of the initiative rejected in May 2003. For instance, the initiative proposed to calculate the premiums on the basis of a person's personal wealth stock. Moreover, the initiative proposed a general VAT increase to finance the health sector. These differences have to be kept in mind when interpreting the following empirical analysis.

Table 3 illustrates the percentages of people in favor of income-dependent insurance premiums according to six income classes. However, we have to point out that these results could also be influenced by other factors than income, e.g. family size or age. In the regression analysis, which we will present in sections 5 and 6, these factors will be taken into account.

Table 3 Percentages of people favoring income-dependent health insurance premiums by income classes, 2002

Income per month	in favor	contrary	do not know
Less than 2000 €	79.3%	13.8%	6.9%
2000 €- 3000 €	72.9%	19.9%	7.2%
3000 €- 4000	67.5%	20.7%	11.8%
4000 €- 6000 €	57.6%	33.2%	9.2%
6000 €- 9000 €	42.5%	54.5%	3.0%
More than 9000 €	23.1%	69.2%	7.7%

The government and a majority of parliament are opposed to making health insurance premiums directly dependent on income and wealth and to shifting a part of the burden to indirect taxation. Both the parliament and the federal government advocate maintaining the current health insurance system where premiums are not

related to criteria such as the risk of the insured and the individual's financial resources. They suggest to solve the social issue by simply resorting more frequently to the subsidies the Confederation and the cantons are already paying to the less wealthy in order to help them finance their health insurance premiums. Current legislation, which grants Cantons large autonomy in the organization of subsidies distribution, should be amended in favor of a more homogeneous regulation. The new law will require that health insurance premiums paid by very poor families (by very poor single persons) do not exceed a maximum threshold of 2% (4%) of their income. If income becomes sufficiently high, premiums can account for a greater percentage of income (4%, 6%, 8%), but at the most reach 10% of the income in the case of families and 12% in the case of singles. Accordingly, if premiums paid by a family (a single) exceed the limit defined by the law, the family becomes automatically eligible for subsidies, while cantonal governments are obliged to provide the corresponding financial means. The only freedom left to cantons concerns the definition of the five income classes associated with the maximum ratios.

The analysis we have presented here is based on data gathered in September 2002 and thus takes into account the inital willingness of the citizens to accept income-related premiums, i.e. their stance prior to the start of the political and media campaign leading up to the voting on this issue.

5. Model specification

The Binomial Logit model was used in this study.[8] The resort to this model is especially appropriate when working with dependent binary qualitative variables, built up from qualitative data obtained through surveys containing a wide range of questions concerning individual attitude, characteristics and behavior. In our case we are interested in identifying the most important factors that can explain the choice to support (dependent variable = 1) or not to support (dependent variable =0) the introduction of income dependent health insurance premiums in Switzerland.

Several factors could potentially influence a person's decision with respect to this proposal. Household income is an obvious candidate. We hypothesize, following Margolis' thesis, that in the case of people with a higher income, the probability of an affirmative answer to the proposal of income dependent health insurance premiums will increase or remain the same. This means that the high income classes are more likely to support the proposal than the low income classes.

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[8] For a general presentation of the logit model see Greene (2000).

In this analysis, we have also considered the following socio-economic factors that could influence an individual's behaviour: age, gender, household size, employment and level of education. The probability that an individual falls within the group of people in favor of the proposal concerning the introduction of income dependent health insurance premiums is defined by the following model[9]:

$$L_i = \beta_0 + \beta_1 \, DY_1 + \beta_2 \, DY_2 + \beta_3 \, DY_3 + \beta_4 \, DY_4 + \beta_5 \, DY_5 + \beta_6 \, DY_6 + \beta_7 \, DHS_1$$
$$+ \beta_8 \, DHS_2 + \beta_9 \, DHS_3 + \beta_{10} \, DGENDER + \beta_{11} \, DACA + \beta_{12} \, DPRE + \beta_{13} \, AGE + u_i \qquad (1)$$

where

L_i = unobserved dependent variable which takes on the value one if the household chooses to support the income dependent health insurance premium and zero if it does not

DY_a = dummy variable indicating whether the person belongs to the income class a, with $a = 1,..,6$; therefore, in our analysis, the income level of a person is measured using a series of dummy variables for different income classes;

DHS1 = dummy variable indicating whether the person is living in a one-person household;

DHS2 = dummy variable indicating whether the person is living in a two-person household;

DHS3 = dummy variable indicating whether the person is living in a three-person or more household;

DGENDER = dummy variable indicating the gender;

DACA = dummy variable indicating whether the person has an academic degree;

DPRE = dummy variable indicating whether the person is living in a canton where the level of the health insurance premiums is higher than the Swiss average;

AGE = Age of the person

u_i = stochastic error term

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[9] To recall that the sign of an estimated coefficients of the model (1) gives the direction of the effect of a change in the explanatory variable on the probability of a success (an observation at one).

6. Data and estimation results

The household micro data used in this study has been compiled through a special survey carried out in Switzerland in 2002 by a private market research company. The questionnaire used for this survey was developed by the Department of Health and Social Affairs of the Canton Ticino in cooperation with the Istituto Mecop of the University of Lugano. The data was collected by phone interviews using a pre-coded questionnaire. The total sample consists of 1'128 households living in Switzerland. After correcting for missing values, the sample was reduced to 819 individuals for the total sample. This data set contains socio-economic information on the individuals, as well as preferences from a list of proposals for a reform of the Swiss health system. The questionnaire included a specific question on the proposal concerning the introduction of income dependent health insurance premiums.

Tables 4 and 5 give some statistical details on the variables employed in the estimation of the model (1).

Table 4   Descriptions of the dummy variables

Variable	Condition for which the variable value is equal to one	Frequency (%)
DY1	Individual in income class 1 < 3000 CHF)	9.2
DY2	Individual in income class 2 (3000-4500 CHF)	18
DY3	Individual in income class 3 (4500-6000 CHF)	28.3
DY4	Individual in income class 4 (6000-9000 CHF)	28.1
DY5	Individual in income class 5 (9000-15000 CHF)	15.1
DY6	Individual in income class 6 (> 15000 CHF)	1.3
DHS1	One-person household	23.6
DHS2	Two-person household	35.5
DHS3	Three- and more person hosehold	40.9
DGENDER	Male	44.9
DACA	Individual with an academic degree	20.3
DPRE	Individual living in a canton with high premiums	52

Table 5 Descriptive statistics on AGE

Variable	*Min*	*Median*	*Mean*	*Max*
AGE	18	44	46	74

In table 6 we report the estimation results for the logit model specification (1). The statistical results are significant regarding most of the important coefficients.[10] Moreover, the value of the Count R^2, a fit measure for the estimated model, is within the acceptable range. Therefore, our model performs quite well in predicting the individual's choice.

Table 6 Estimated coefficients for the logit model

Variable	*Coefficients*	*t-ratio*
Constant	1.438 ***	2.860
DY2	-0.599	-1.471
DY3	-0.774 **	-1.991
DY4	-1.521 ***	-3.908
DY5	-2.316 ***	-5.576
DY6	-2.983 ***	-3.796
DHS2	0.785 ***	3.401
DHS3	0.464 **	2.080
AGE	0.002	0.335
GENDER	-0.359 **	-2.161
DACA	-0.279	-1.391
DPRE	0.429**	2.627

    a.   t-test of whether the coefficient is zero $*p<0.10, **p<0.05, ***p<0.01$

    b.   Count $R^2 = 0.704$

The main aim of this empirical study is to identify the effect of income and income classes on the choice to support or not to support the proposal of income dependent health insurance premiums.[11] Most coefficients of the dummy variables for the different income classes (DY2, DY3, DY4, DY5, DY6) are significantly different from zero and have a negative sign. These coefficients have to be interpreted with respect to the first income class (DY1), taken as a reference, which does not appear in the table. The absolute value of the coefficients of these variables increases with an increase of the income class. These negative coefficients suggest that, *ceteris paribus,* an increase in

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[10] For the econometric estimation we used LIMDEP, version 8.
[11] The variables DY1 and DHS1 do not appear in the table because they are taken as reference level, in order to avoid the dummy variable trap.

income is associated with a lower probability of an affirmative answer to the proposal of income dependent health insurance premiums. Therefore, these results show that the willingness to have a higher degree of equity in financing the health care system decreases as income increases. This result is confirmed by the analysis of the marginal effects for the income class dummy variables, which give the change in the probability of a yes (dependent variable=1) that results from changing a single dummy variable from zero to one, holding all other variables at some fixed values, e.g. at their mean values.[12]

In order to estimate the magnitude of the effect of the income class on the decision to support or not to support the proposal of income dependent premiums, we have set the explanatory variables to values that should represent a "typical individual" of the sample, e.g., a 50-year-old man with family, without an academic degree and living in a canton with high health insurance premiums. If an individual with these characteristics belongs to the third income class (DY3), there is a probability of supporting the proposal of 0.87. If this individual belongs to the fourth income class (DY4), the probability decreases to 0.75.

The coefficients of the two-person and three-person household dummy variables are positive and significant. This result implies that, *ceteris paribus*, small households are less likely to accept health insurance premiums dependent on income than three or more person households. Moreover, men appear, *ceteris paribus,* to be significantly less interested in increasing the degree of equity in financing the health services. Finally, people living in cantons characterized by high health insurance premiums are more likely to accept the proposal of income dependent premiums.

7. Conclusions

The main goal of this paper was to verify empirically the underlying hypothesis of Margolis (1982), namely that spending in group-interest is a superior good. We tested the fair-share model in the context of health care services, which in the most OECD countries are considered merit goods. After presenting the main features of the Swiss health care system, we emphasized the strongly regressive financing of health care in Switzerland, which is due to the limited public participation in health care spending and to income-independent premiums for the mandatory health insurance. The willingness of the Swiss population to favor more vertical equity has been assessed with regard to the principle of introducing income dependent premiums in the mandatory health

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[12] The values of the marginal effects are: -0.132 for DY2; -0.169 for DY3; -0.34 for DY4; -0.521 for DY5; -0.602 for DY6.

insurance. We applied the Binomial Logit model using micro data collected through a special survey carried out in 2002. It should be noted that people participating in the survey gave their opinion not on the basis of a precise proposal (i.e. being aware of marginal benefits and costs) but only on the general principle of promoting vertical equity through income dependent health insurance premiums. For this reason, the results could vary by submitting a more precise proposal of income-dependent premiums. In this case the results of the econometric analysis reject the Margolis hypothesis of group-interest spending behaving as a superior good. Indeed, as household income increases, the likelihood of accepting a more equitable financing of health insurance decreases. However, it is intriguing to note that many individuals who earn more than the median income (i.e. people who will suffer a financial loss through a reform of the system) favor the more fair financing system. Finally, the econometric analysis shows that women are significantly more interested than men in increasing the degree of vertical equity, while small households (which are affected more by taxation and less by individual premiums) and people living in cantons characterized by low health insurance premiums are less likely to accept income-dependent health insurance financing.

8. References

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