L. Crivelli, G. Domenighetti, M. Filippini

Federalism versus social citizenship : investigatine the preference for equity in health care

Quaderno N. 03-08

Decanato della Facoltà di Scienze economiche
Via G. Buffi, 13 CH-6900 Lugano

Università della Svizzera italiana
Facoltà di scienze economiche
Istituto di microeconomia ed economia pubblica MecoP

FEDERALISM VERSUS SOCIAL CITIZENSHIP: INVESTIGATING THE PREFERENCE FOR EQUITY IN HEALTH CARE[1]

LUCA CRIVELLI (Luca.Crivelli@lu.unisi.ch)
Department of Economics – University of Lugano
University of Applied Sciences of Southern Switzerland

GIANFRANCO DOMENIGHETTI (Gianfranco.Domenighetti@ti.ch)
Department of Health and Social Affairs, Canton Ticino
Health Economics and Management Institute, University of Lausanne

MASSIMO FILIPPINI (Massimo.Filippini@lu.unisi.ch)
Department of Economics – University of Lugano
Swiss Federal Institute of Technology – Zurich

JEL classification: *I18, D63, D78, H73, H77*

[1] We would like to thank the Department of Health and Social Affairs of Ticino for providing us with the data set used in this study and Karen Ries for proofreading the final version of the text. The views expressed in this paper are strictly personal. Responsibility for any remaining errors lies solely with the authors.

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 like 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 the 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 ballot, which will take place in May 2003, invites the Swiss population to support the introduction of income and wealth dependent health insurance premiums. The goals of this study 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 show the consequences of federalism and wide-ranging cantonal autonomy in a particular health insurance context such as the Swiss one, in terms of interregional inequalities in per capita health care expenditure and in production capacity; (3) to investigate the willingness of the Swiss citizens to foster more equity in the finance of health care and (4) 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 interest – such as 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 and show the consequences of federalism on the organization of the

health care sector in Switzerland; section 4 is devoted to a short presentation of the reform proposals presently under discussion in Switzerland, which aim at achieving more equity in the financing of health care; 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 puzzle: 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 microscopic [see e.g. Andreoni and Scholz (1998), Andreoni (1995)].

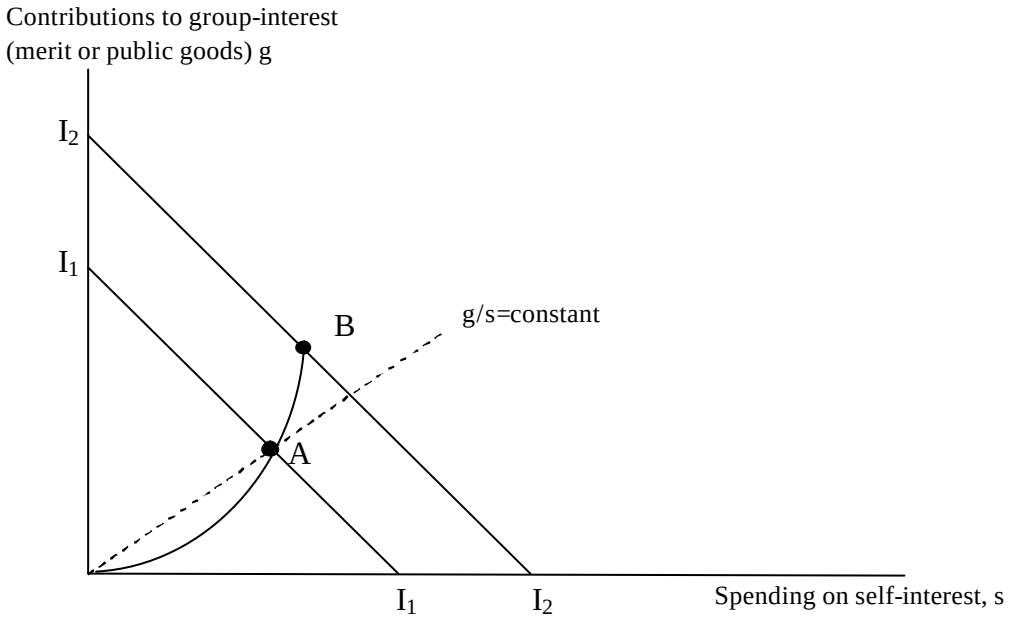
According to Margolis (1982) in these situations it is important to distinguish between two classes of goods: private goods on the one hand, and public or merit goods[2] on the other hand. Margolis supposes that the utility function of individuals includes two components that comply with two different 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, so 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] 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.

[2] Margolis calls this second class of goods "group-interest".

[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).

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



Margolis' model can be useful for the analysis of health care services, which are generally considered merit goods.[4] The demand for health care broadly reflects the utility that individuals draw from their health, whereas 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 whole 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

[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).

and significant room for manoeuvre at the regional level in the health care sector. Using the case study approach, the authors have proved 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 the five federations 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 strongly delegated to regional authorities 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 to 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:

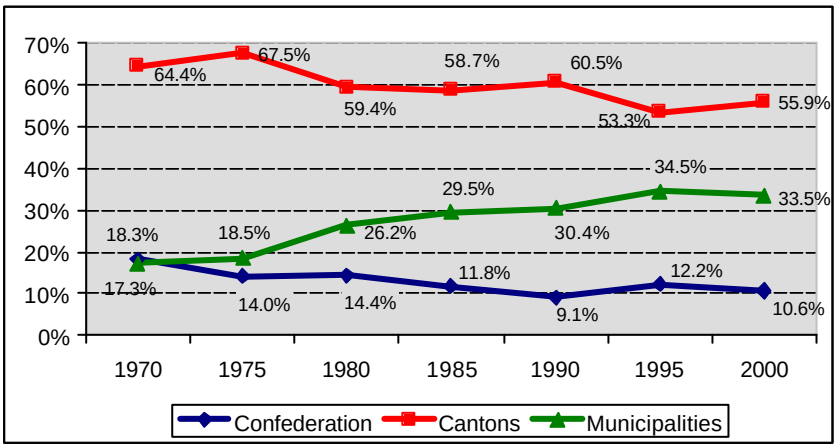
- the system is based on a private insurance model, with about 100 competing insurance companies on the one hand and some social characteristics on the other hand;
- since 1996 the health insurance has been mandatory for all residents;
- the rights of the insured are laid down in the individual insurance contracts; since 1996 the basic contract has been the same for all residents by law;
- both public and private hospitals and 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 1999 a meager 25% of the total health care expenditure was covered by general taxation.[5] Moreover, the public contribution was predominantly provided by cantons and municipalities, whereas the Confederation contributed with 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



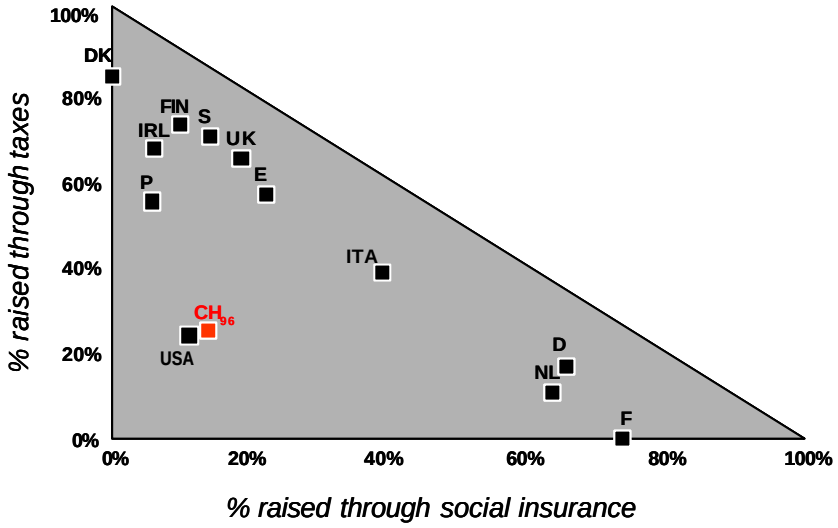
Source: UFS, Finances publiques en Suisse, Neuchâtel, over many years.

Switzerland's peculiarity is highlighted in the triangle of the health care financing reproduced in figure 3. The closer a country is to the triangle's hypotenuse, the higher the

[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 State 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.

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 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.[6] In fact, the more part of health care costs is progressively financed or at least proportionally to income, the more equal the health care system financing is. 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.[7] This has negative repercussions especially on the middle class, which does not benefit from subsidies for the payment of the insurance premiums;

- 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

[6] Because of its marked iniquity of financing, in 2000 the Swiss system ranked twentieth in an international comparison on the performance of health care systems, commissioned by the World Health Organisation.
[7] Wagstaff et al. (1999) have published a comparative study on the equity of financing in OECD countries, where Switzerland ranked last.

financial share than to engage in a more rational use of total health care spending. This encourages a shifting of the costs at the expense of another payer, rather than the search for solutions that 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 activity regulation. 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 power of the central body was not sustained 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 the public health care expenditure towards a greater engagement of the Confederation (see Crivelli and Filippini, 2003).

The organizational autonomy granted to the cantons for 90 years has created a very heterogeneous picture both in the provision of health care services and in the level of financing, giving rise to a relevant issue 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 and 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.

Consequences of federalism on the organisation of the health care system in Switzerland

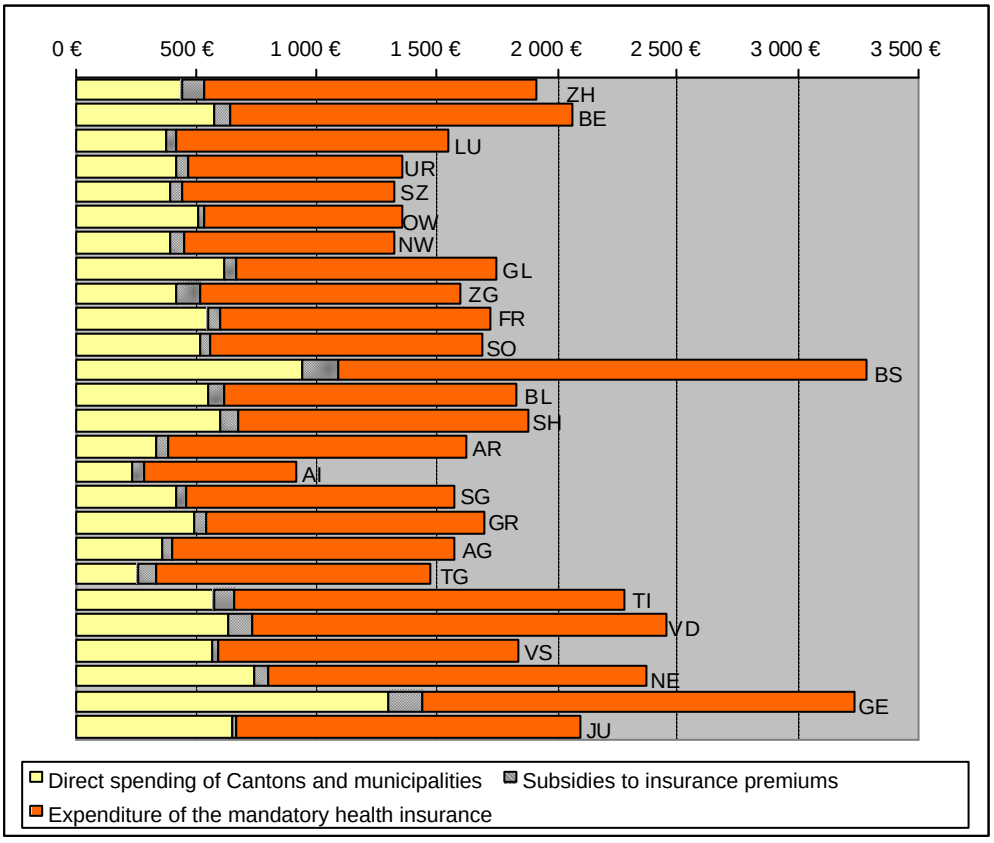
Decentralisation of competences and of expenditure and the strong autonomy of the 26 cantonal health care sub-systems has led to a series of significant inter-cantonal differences with regard to public financing and the regulatory settings as well as to production capacity.

The first sign of wide-ranging disparities among the Cantons can be found in the per capita public health expenditure (figure 4), which can be calculated by adding two fundamental elements: (a) the cantonal and local direct financing for the provision of health care services to the population (in particular the subsidies to public and private, public-interest hospitals, the participation in hospitalizations outside the home Canton, the

subsidies to nursing homes and to home care services) and (b) the contributions to the less wealthy in the form of subsidies for the payment of the health insurance premiums (it is important to stress that each canton is entitled to develop its own model for the granting of subsidies and, within a framework set by the Confederation, they can also decide how many public funds should flow in this direction).

In 2000 per capita public health expenditure ranged from 278 Euro per capita in Appenzell Inner-Rhodes (AI)[8] to 1440 Euro in Geneva (GE). It is important to remember that this indicator (financial contributions from the cantons and the local authorities) only represents one part of the total expenditure for basic health care services. The expenses covered by the mandatory insurance, which is financed by means of income-independent insurance premiums, have to be added.

Figure 4 Per capita public health expenditure (direct payments + subsidies to the mandatory insurance) and expenses covered by the mandatory insurance in the various cantons (2000)



Source: UFS (2002), Coûts du système de santé, Neuchâtel. UFAS (2002), Statistiques de l'assurance-maladie 2000, Berne.

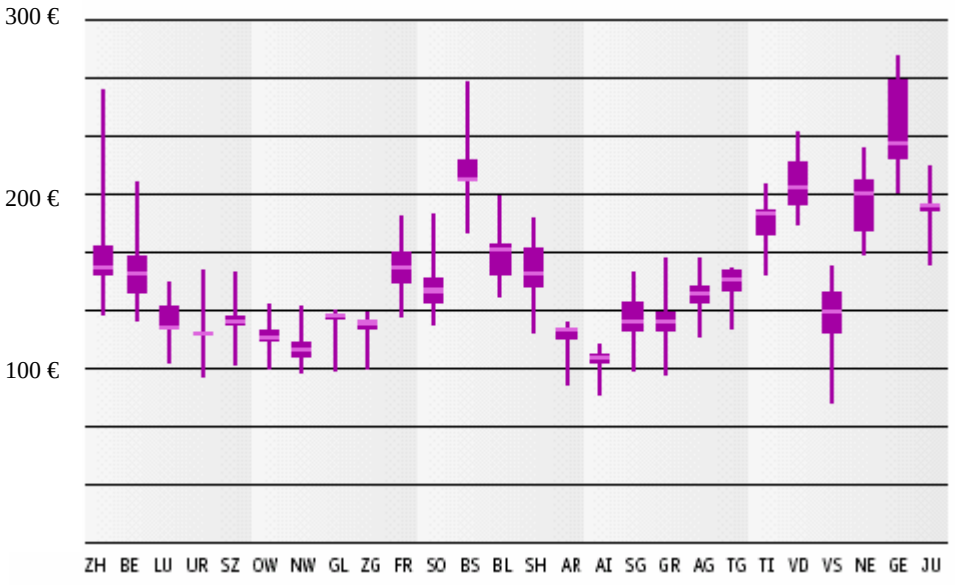
The notable differences registered in the public health expenditure are to be found once again in the expenses covered by the mandatory health insurance, as shown in figure 4. By adding the two expenditure items the *socialized health expenditure* is obtained, which

[8] All the cantons' acronyms and names can be found in table 1.

ranged from a peak of 3290 Euro per capita in Basle-Town to a low of 910 Euro in Appenzell Inner-Rhodes in the year 2000.

If we consider the financing of the health insurance (the level of the premiums) instead of considering the expenses it covers, we can see significant differences between the various Cantons (figure 5) and at the same time disparities within the single Cantons (the basic health insurance is offered by several insurance companies, which calculate their premiums on a Cantonal basis). The box-plot shows the median, maximum and minimum premium values for each canton and the concentration of the distribution of the premiums paid by 50% of the cantonal population (the box-plot rectangle shows the dispersion between the first and the third quartile). The highest premium of all (more than 270 Euro per month) was paid in Canton Geneva, the lowest (less than 90 Euro) was paid in Valais (VS). The highest median value (about 225 Euro) is to be found in Geneva, whereas the lowest median value (about 108 Euro) can be found in Appenzell Inner-Rhodes.

Figure 5 Inter-cantonal and infra-cantonal differences in adult premiums (2002)



Source: UFAS (2002), Statistiques de l'assurance-maladie 2000, Berne.

By combining these first two indicators we obtain interesting data concerning the socialized health expenditure financed by general taxation rather than by income-independent premiums. The highest percentage can be measured in Geneva (with 46%), the lowest in Thurgovia (TG), where only 26% of the socialized health expenses were financed by tax revenues. If we consider the threshold of those entitled to subsidies for the mandatory health insurance premiums in relation to the average cantonal premium, we obtain an even more accurate indicator of the degree of financing equity and of the economic burden that the health insurance premiums represent for the middle class. If we

take a married couple without children, this threshold ranged from 23,000 Euro of taxable income in Canton Ticino (TI) to 54,240 Euro in Basle-Country (BL).

There are also very marked differences between cantons with regard to production capacity in the health care sector. The first aspect we would like to consider is the density of acute beds (table 1). The national average is 4.5 acute beds per 1,000 inhabitants, but there are 3 Cantons that exceed this average by over 35% [Ticino: 6.4 beds; Appenzell Inner-Rhodes: 7.3 beds and Basle-Town (BS): 8.1 beds], and 4 Cantons that have a density lower than the national average by over 35% [Zug (ZG), Schwyz (SZ) and Thurgovia (TG): 2.9 beds; Nidwalden (NW): 2.5 beds].

Table 1 Density of acute beds per 1,000 inhabitants and density of medical practices per 10,000 inhabitants (year 2000)

Canton	Density of acute beds per 1,000 inhabitants	Density of medical practices per 10,000 inhabitants	**Canton**	Density of acute beds per 1,000 inhabitants	Density of medical practices per 10,000 inhabitants
Argovia (AG)	4.2	13.9	Nidwalden (NW)	2.5	10.6
Appenzell Inner-Rhodes (AI)	7.3	11.0	Obwalden (OW)	3.5	9.9
Appenzell Outer-Rhodes (AR)	3.2	15.2	St Gall (SG)	3.8	15.3
Berne (BE)	4.7	19.8	Schaffhausen (SH)	3.6	18.7
Basle-Country (BL)	3.6	18.6	Solothurn (SO)	4.1	15.3
Basle-Town (BS)	8.1	35.7	Schwyz (SZ)	2.9	11.5
Fribourg (FR)	4.0	14.2	Thurgovia (TG)	2.9	12.6
Geneva (GE)	4.5	32.2	Ticino (TI)	6.4	18.8
Glarus (GL)	3.6	12.5	Uri (UR)	4.9	13.0
Grisons (GR)	4.6	16.6	Vaud (VD)	5.3	23.8
Jura (JU)	4.7	14.9	Valais (VS)	4.1	16.8
Lucerne (LU)	3.8	14.1	Zug (VS)	2.9	16.5
Neuchâtel (NE)	4.3	20.1	Zurich (ZH)	4.6	21.9
Swiss average	**4.5**	**19.3**			

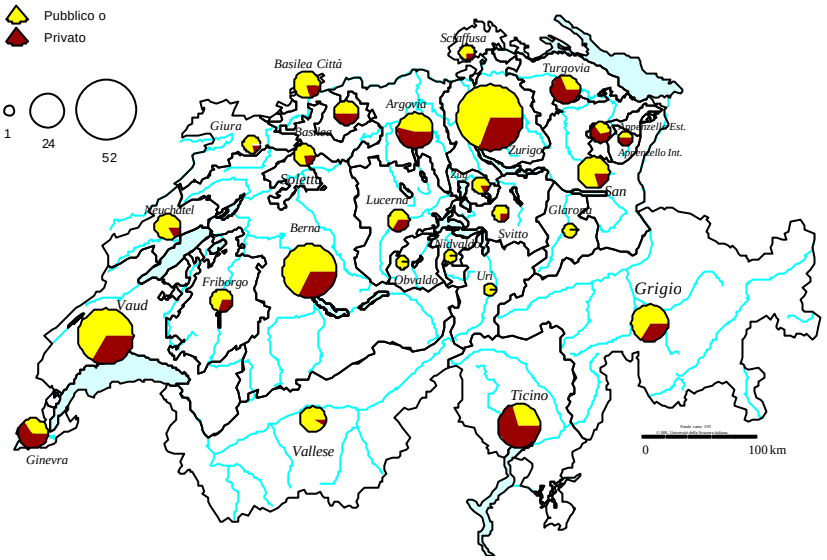
Source: UFS, Informations sur le projet "Statistiques des établissements de santé (soins intra-muros), StatSanté 1/2002, 29 and Bollettino dei medici svizzeri, 2001; 82: Nr 21

There is a real gap with respect to the density of medical practices. The data range from more than 30 medical practices per 10,000 inhabitants in Basle-Town and Geneva to 10-11 practices per 10,000 inhabitants in Obwalden (OW), Nidwalden, Appenzell Inner-Rhodes and Schwyz, whereas the national average is 19.3. In Switzerland all doctors who have obtained a Swiss university degree in medicine and have at least two years' hospital experience are automatically entitled to practice independently and to invoice their services at the expense of the mandatory health insurance according to a fee-for-service scheme

(the fees are fixed on a cantonal basis in a specific price list for medical services). [9] This easily leads to a phenomenon of supply-induced demand.

Another difference that emerges among the Swiss cantons is the frequency of the institutional forms in the hospital sector. In figure 6 a pie-chart has been drawn within each canton. The pie surface corresponds to the total number of hospitals operating in a specific canton, whereas the 2 pie slices represent the relative weight of public and private subsidized hospitals in comparison with non-subsidized private institutions. The public-private mix has a strong impact on the financing model of mandatory health care. The higher the percentage of private beds in a canton, the higher the share covered by means of the health insurance premiums (do not forget that they are income-independent).

Figure 6: Comparison between public or subsidized, private acute hospitals and private clinics in the different Swiss Cantons (year 2000)



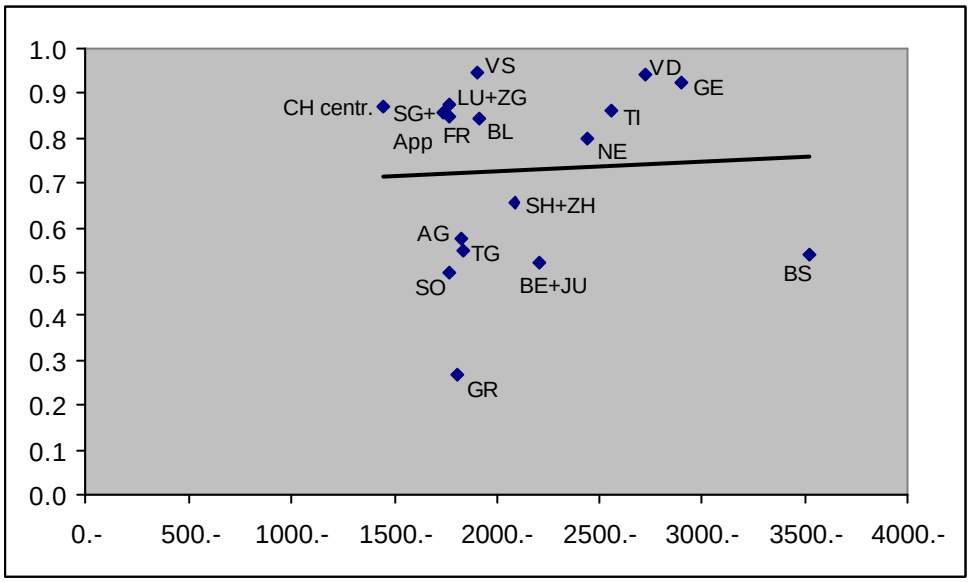
Source: UFS, Informations sur le projet "Statistiques des établissements de santé (soins intra-muros), StatSanté 1/2002, 17.

Consequently the cantons contribute less to the total expenditure, as they only have to subsidize beds in public and public-interest hospitals. Therefore the cantons can reduce the revenues of general taxation (and taxes are collected progressively according to the tax-payers' income). More private beds thus imply, ceteris paribus, a greater iniquity of financing. In this sense the hospital situation in Ticino, Thurgovia, Geneva and Appenzell Outer-Rhodes appears to be rather peculiar, as it is characterized by a clear prevalence of private non-subsidised hospitals.

[9] The health insurance companies are obliged to cooperate with all the medical practitioners entitled to practice independently within the framework of the coverage provided for by the Federal law on health insurance. Service-providers can be excluded from the reimbursement of the mandatory health insurance only in the case of citizens who have voluntarily joined a managed care insurance scheme.

All the indicators presented in this paper concern expenditure, the organizational levels and schemes of the health care sector in the various cantons. This analysis clearly fails to consider the effectiveness factor (outcome indicators), which would make it possible to determine whether such different expenditure and activity levels lead to a proportional difference with regard to the population's health conditions and degree of satisfaction. In the light of the difficult task of measuring the effectiveness of a health care system, on the basis of few simple indicators such as mortality amenable to medical intervention, the population's degree of satisfaction concerning the cantonal health care system (see figure 7) and the subjective rationing perception (like the indicator of waiting lists, virtually non-existent in all cantons)[10], it is possible to conclude that there are no significant effectiveness gaps in Switzerland at present.

Figure 7 Correlation between average satisfaction and per capita expenditure of the mandatory health insurance in Swiss cantons (2002)[11]



This conclusion emphasizes the wide-ranging differences with respect to the single cantons' performances in terms of the cost-effectiveness ratio. In fact, the per capita health care expenses are much higher in some cantons than in others, even though the effectiveness level is very much the same. The differences in the per capita health care expenses could be partially caused by an excessive production capacity (high density of

[10] For a more complete illustration of some of these indicators for 6 groups of cantons see Domenighetti and Crivelli (2001).

[11] The figure highlights the results of a survey carried out in September 2002 on 1128 households based in Switzerland. Among others the following question was asked: "In general, would you say that you are very satisfied, fairly satisfied, neither satisfied nor dissatisfied, fairly dissatisfied or very dissatisfied with the way health care is run in your canton"?. The satisfaction index was constructed by weighting the five possible answers with 2, 1, 0, -1 and -2 points, respectively. Some small cantons had to be aggregated in order to achieve a sufficient number of observations.

medical practices and hospital beds) and therefore they could be the consequence of a situation of supply induced demand.

In conclusion, the Swiss health care system seems to guarantee a satisfying level of equity of access to the health care services, while lacking equity both at the individual and the territorial level with regard to the system's financing. In table 2 a summary of the differences between the Swiss cantons is presented and an attempt is made to explain the reasons.

Table 2 Summary of the disparities existing at the cantonal level

	Situation	**Possible reasons**
Horizontal equity	No significant differences (the *outcome is* fairly homogeneous)	The central government defines the package of health care services that ought to be granted to the whole population
Mandatory health insurance premiums	Differences among cantons and, within the same cantons, between the insurance companies	federalism, lack of competition in the health insurance system limited planning on the supply side, inappropriate incentives
Public subsidies for the payment of health insurance premiums	Marked differences among cantons	federalism
Per capita "socialized" health care expenditure	Marked differences among cantons	federalism, limited planning on the supply side, inappropriate incentives
Production capacity and regulatory settings	Marked differences among cantons	federalism, limited planning on the supply side, inappropriate incentives

4. Proposals for a reform

People in Switzerland are, in general, fairly satisfied with the way the health system in their country is run.[12] In a survey carried out in September 2002 among a sample of 1128 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 3 – can be compared with the results yielded 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

[12] 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.

second to the seventh place in a hypothetical European ranking; it would be overshadowed 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, whereas expectations are endogenous, i.e. they tend to increase as the perceived quality of the health system itself improves.

Table 3 Satisfaction concerning the health care system in Switzerland, 2002

	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 Federal law – and 2002, premiums rose by 62% on average in Switzerland. 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 4 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 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.

Table 4 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 €

In the case of the couple without children, the health insurance premiums total 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 introducing greater control and planning on the supply side (thus directly influencing the cost pattern), and providing for a more equitable financing mechanism on the other hand.

None of these proposals has been endorsed by the Federal Parliament yet. One of the proposed changes is especially important, for if it were to be accepted, it would lead Switzerland, too, to adopt a form of income- and wealth-related financing of health insurance, thus maintaining the already existing equal access to health care and at the same time guaranteeing a fair financing method. This system would also be more in line with the models adopted by the other European countries. The proposal (a citizens' initiative launched by the left wing and supported by labour unions and consumer organizations) would ensure – according to the proponents – the following financing rule for the compulsory health insurance expenditure: 60% based on personal income, 15% based on the personal wealth stock and 25% by means of a general VAT increase.

Swiss citizens are to vote on this proposition on 18 May 2003.

Two surveys run during the second half of 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%) are 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. Table 5 illustrates the percentages of people in favor of income-dependent insurance premiums according to 6 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 5 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 dependent on income and wealth and to shifting a part of the burden to indirect taxation, and they are calling on the population to turn down the proposition.[13]

The analysis we have presented here is based on data gathered in September 2002 and thus takes into account the early willingness of the citizens to accept income-related premiums, i.e. their stance prior to the actual start of the political and media campaign leading up to the balloting on this issue. This is highly interesting because the analysis in the wake of the people's verdict of 18 May 2003 will make it possibile to measure how much the public debate on the contents of this popular ballot will have affected the results achieved in the earlier surveys, which are the subject of this analysis.

5. Model specification

The Binomial Logit model was used in this study.[14] 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 a yes 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.

In this analysis, we have also considered the following socio-economic factors that could influence an individual's behaviour: age, gender, household size, employment, level of education.

[13] Both the Parliament's public health committee and the federal government in their respective reform proposals advocate maintaining the current premium system – not related to criteria such as risk and citizens' financial capability. They suggest instead that the social issue should be solved by resorting more frequently to the subsidies the Confederation and the cantons are already paying to the less fortunate in order to help them finance their health insurance premiums. Both proposals substantially contemplate a threshold, (defined as a percentage ratio between the family's health insurance costs and its taxable income) above which a family would automatically be eligible to receive these subsidies.

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

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[15]:

$$L_i = b_0 + b_1 DY_1 + b_2 DY_2 + b_3 DY_3 + b_4 DY_4 + b_5 DY_5 + b_6 DY_6 + b_7 DHS_1 + b_8 DHS_2 + b_9 DHS_3 + b_{10} DGENDER + b_{11} DACA + b_{12} DPRE + b_{13} AGE + u_i \quad (1)$$

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

6. Data and estimation results

The household micro data used in this study have been provided by a special survey carried out in Switzerland in 2002 by a private social 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 were collected by phone interviews using a pre-coded questionnaire. The total sample

[15] 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).

consists of 1128 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 tastes and 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 6 and 7 give some statistical details on the variables employed in the estimation of the model (1).

Table 6 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 7 Descriptive statistics on AGE

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

In table 8 we report the estimation results for the logit model specification (1). The statistical results are in line with most of the important coefficients significant.[16] Moreover, the value of the Count R^2, a fit measure for the estimated model, is fine. Therefore, our model performs quite well in predicting the individual's choice.

[16] For the econometric estimation we used LIMDEP, version 8.

Table 8 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.[17] 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 income is associated with a lower probability of a yes 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.[18]

[17] 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.

[18] 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.

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 premium 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 particularly 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 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 base 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 more affected 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

Andreoni, J. and J.-K. Scholz, An Econometric Analysis of Charitable Giving with Interdependent Preferences, Economic Inquiry, 36(3): 410-28.

Andreoni, J. (1995), Cooperation in Public-Goods Experiments: Kindness or Confusion?, American Economic Review, 85(4): 891-904.

Arrow, K. (1963), Uncertainty and the Welfare Economics of Medical Care, *The American Economic Review*, 53 (5), 941-973.

Banting, G. e S. Corbett (2002), Health Policy and Federalism. A Comparative Perspective on Multi-Level Governance, Montreal & Kingston: McGill-Queen's University Press.

Crivelli, L. e M. Filippini (2003), Il federalismo nel settore sanitario, in: A. Ghiringhelli (a cura di), Locarno, Dadò.

Domenighetti, G. e L. Crivelli (2001), Sécurité de l'approvisionnement en médecine de ville dans le cadre de la suppression de l'obligation de contracter, Santésuisse.

Greene, W. (2000), Econometric Analysis, Prentice Hall.

Margolis, H. (1982), *Selfishness, altruism and rationality*, Cambridge: Cambridge University Press.

Mossialos, E. (1997), Citizens' view on health care systems in the 15 Member States of the European Union, *Health Economics*, 6, 109-116.

Wagstaff A. et al., (1999), Equity in the finance of health care: some further international comparisons, *Journal of Health Economics*, 18, 263-290.

Zweifel, P. and F. Breyer. (1997), Health Economics, New York: Oxford University Press.

QUADERNI DELLA FACOLTÀ

I quaderni sono richiedibili (nell'edizione a stampa) alla Biblioteca universitaria di Lugano
via G. Buffi 13 CH 6900 Lugano
e-mail: biblioteca@lu.unisi.ch

The working papers (printed version) may be obtained by contacting the Biblioteca universitaria di Lugano
via G. Buffi 13 CH 6900 Lugano
e-mail: biblioteca@lu.unisi.ch

Quaderno n. 98-01

P. Balestra, *Efficient (and parsimonious) estimation of structural dynamic error component models*

Quaderno n. 99-01

M. Filippini, *Cost and scale efficiency in the nursing home sector : evidence from Switzerland*

Quaderno n. 99-02

L. Bernardi, *I sistemi tributari di oggi : da dove vengono e dove vanno*

Quaderno n. 99-03

L.L. Pasinetti, *Economic theory and technical progress*

Quaderno n. 99-04

G. Barone-Adesi, K. Giannopoulos, L. Vosper, *VaR without correlations for portfolios of derivative securities*

Quaderno n. 99-05

G. Barone-Adesi, Y. Kim, *Incomplete information and the closed-end fund discount*

Quaderno n. 99-06

G. Barone-Adesi, W. Allegretto, E. Dinenis, G. Sorwar, *Valuation of derivatives based on CKLS interest rate models*

Quaderno n. 99-07

M. Filippini, R. Maggi, J. Mägerle , *Skalenerträge und optimale Betriebsgrösse bei den schweizerische Privatbahnen*

Quaderno n. 99-08

E. Ronchetti, F. Trojani, *Robust inference with GMM estimators*

Quaderno n. 99-09

G.P. Torricelli, *I cambiamenti strutturali dello sviluppo urbano e regionale in Svizzera e nel Ticino sulla base dei dati dei censimenti federali delle aziende 1985, 1991 e 1995*

Quaderno n. 00-01

E. Barone, G. Barone-Adesi, R. Masera, *Requisiti patrimoniali, adeguatezza del capitale e gestione del rischio*

Quaderno n. 00-02

G. Barone-Adesi, *Does volatility pay?*

Quaderno n. 00-03

G. Barone-Adesi, Y. Kim, *Incomplete information and the closed-end fund discount*

Quaderno n. 00-04

R. Ineichen, *Dadi, astragali e gli inizi del calcolo delle probabilità*

Quaderno n. 00-05

W. Allegretto, G. Barone-Adesi, E. Dinenis, Y. Lin, G. Sorwar, *A new approach to check the free boundary of single factor interest rate put option*

Quaderno n. 00-06

G.D.Marangoni, *The Leontief Model and Economic Theory*

Quaderno n. 00-07

B. Antonioli, R, Fazioli, M. Filippini, *Il servizio di igiene urbana italiano tra concorrenza e monopolio*

Quaderno n. 00-08

L. Crivelli, M. Filippini, D. Lunati. *Dimensione ottima degli ospedali in uno Stato federale*

Quaderno n. 00-09

L. Buchli, M. Filippini, *Estimating the benefits of low flow alleviation in rivers: the case of the Ticino River*

Quaderno n. 00-10

L. Bernardi, *Fiscalità pubblica centralizzata e federale: aspetti generali e il caso italiano attuale*

Quaderno n. 00-11

M. Alderighi, R. Maggi, *Adoption and use of new information technology*

Quaderno n. 00-12

F. Rossera, *The use of log-linear models in transport economics: the problem of commuters' choice of mode*

Quaderno n. 01-01

M. Filippini, P. Prioni, *The influence of ownership on the cost of bus service provision in Switzerland. An empirical illustration*

Quaderno n. 01-02

B. Antonioli, M. Filippini, *Optimal size in the waste collection sector*

Quaderno n. 01-03

B. Schmitt, *La double charge du service de la dette extérieure*

Quaderno n. 01-04

L. Crivelli, M. Filippini, D. Lunati, *Regulation, ownership and efficiency in the Swiss nursing home industry*

Quaderno n. 01-05

S. Banfi, L. Buchli, M. Filippini, *Il valore ricreativo del fiume Ticino per i pescatori*

Quaderno n. 01-06

L. Crivelli, M. Filippini, D. Lunati, *Effizienz der Pflegeheime in der Schweiz*

Quaderno n. 02-01

B. Antonioli, M. Filippini, *The use of a variable cost function in the regulation of the Italian water industry*

Quaderno n. 02-02

B. Antonioli, S. Banfi, M. Filippini, *La deregolamentazione del mercato elettrico svizzero e implicazioni a breve termine per l'industria idroelettrica*

Quaderno n. 02-03

M. Filippini, J. Wild, M. Kuenzle, *Using stochastic frontier analysis for the access price regulation of electricity networks*

Quaderno n. 02-04

G. Cassese, *On the structure of finitely additive martingales*

Quaderno n. 03-01

M. Filippini, M. Kuenzle, *Analisi dell'efficienza di costo delle compagnie di bus italiane e svizzere*

Quaderno n. 03-02

C. Cambini, M. Filippini, *Competitive tendering and optimal size in the regional bus transportation industry*

Quaderno n. 03-03

L. Crivelli, M. Filippini, *Federalismo e sistema sanitario svizzero*

Quaderno n. 03-04

L. Crivelli, M. Filippini, I. Mosca, *Federalismo e spesa sanitaria regionale : analisi empirica per i Cantoni svizzeri*

Quaderno n. 03-05

M. Farsi, M. Filippini, *Regulation and measuring cost efficiency with panel data models : application to electricity distribution utilities*

Quaderno n. 03-06

M. Farsi, M. Filippini, *An empirical analysis of cost efficiency in non-profit and public nursing homes*

Quaderno n. 03-07

F. Rossera, *La distribuzione dei redditi e la loro imposizione fiscale : analisi dei dati fiscali svizzeri*

Quaderno n. 03-08

L. Crivelli, G. Domenighetti, M. Filippini, *Federalism versus social citizenship : investigating the preference for equity in health care*