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► **To cite this version:**

Brigitte Dormont, Pierre-Yves Geoffard, Karine Lamiraud. The influence of supplementary health insurance on switching behaviour: evidence on Swiss data. 2007. halshs-00587785

**HAL Id: halshs-00587785**

**<https://shs.hal.science/halshs-00587785>**

Preprint submitted on 21 Apr 2011

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**PARIS SCHOOL OF ECONOMICS**  
ÉCOLE D'ÉCONOMIE DE PARIS

**WORKING PAPER N° 2007 - 34**

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**JEL Codes: D12, I18, G22**

**Keywords: competition in health insurance, switching  
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**The influence of supplementary health insurance on switching behaviour:  
evidence on Swiss data**

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October 2007

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We gratefully acknowledge the financial support of the Swiss National Foundation for Scientific Research (FNRS).

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## **The influence of supplementary health insurance on switching behaviour: evidence on Swiss data**

### **Abstract**

This paper focuses on the switching behaviour of sickness fund enrollees in the Swiss health insurance system. Even though the new Federal Law on Social Health Insurance (LAMal) was implemented in 1996 to promote competition among health insurers in basic insurance, there still remains large premium variations within cantons. This indicates that competition has not been able so far to lead to a single price, and reveals some inertia among consumers who seem reluctant to switch to less expensive funds. We investigate one possible barrier to switching behaviour, namely the influence of the supplementary insurance. Our aim is to analyse two decisions (switching decision in basic insurance, subscription to supplementary insurance contracts). We use survey data on health plan choice and import some market data related to the sickness funds (number of enrollees, premiums). The decision to switch and the decision to subscribe to a supplementary contract are estimated both separately and jointly. The results suggest that holding a supplementary insurance contract substantially decreases the propensity to switch. However the impact of supplementary insurance is not significant when the individual assesses his/her health as "very good"; to the contrary, holding a supplementary contract significantly reduces the propensity to switch when the individual's subjective health status deteriorates. Furthermore, the switching decision is positively influenced by the expected gain of switching. In comparison with the range of the premium difference, the limitations to switch due to the supplementary insurance is moderate, though non negligible. As for the decision to subscribe a supplementary contract, the results show that the income level has a direct positive influence on the propensity to buy a supplementary insurance. Our results suggest that a major mechanism is going on in relation to supplementary insurance: holding a supplementary contract might stop individuals from switching when the individual thinks that she/he could be regarded as a bad risk due to the selection practices that are allowed in supplementary insurance markets. This result bears major policy implications concerning the regulation of basic and supplementary insurance markets.

**Keywords:** competition in health insurance, switching behaviour, premium convergence, influence of supplementary insurance

## 1. Introduction

According to its advocates, competition in health insurance markets should promote efficiency in insurance and care delivery. However, it may have some potential drawbacks, linked to the incentives it provides for risk selection. Managed competition settings have been implemented to deal with these difficulties: homogenous contracts are defined to avoid competition on coverage, health funds are not allowed to turn down an enrollee and a risk-adjustment scheme is introduced to eliminate incentives for risk selection.

Nevertheless, the effectiveness of competition between sickness funds is a prerequisite before any assessment about its positive or potential harmful effects. Characterising consumer behaviour in health insurance choice is a crucial issue to examine whether competition is effective. This paper focuses on the switching behaviour of sickness funds enrollees in the Swiss health insurance system.

Actually, Switzerland is a wonderful case for studying competition in health insurance markets: in 1996, the Federal Law on Social Health Insurance (LAMal) was adopted, which aimed at introducing a perfect managed competition scheme. In Switzerland as opposed to all other countries, health insurance cannot be provided by the employer as a fringe benefit: the premium is fully paid by the enrollee, which should make her more reactive to differences in premiums.

The reform introduced by the LAMal was designed in line with the managed competition scheme. The basic health insurance was defined as a homogenous product, i.e. full coverage in basic health insurance, with competition in price only. In theory, premium differences for the basic package should then disappear. However, empirical results on Swiss data do not support this prediction (Beck et al., 2003 ; Colombo, 2001): since 1996, the premium variability has been quite large and has decreased only slightly. This disappointing result suggests several interpretations. It may reveal: (i) differences in service quality, (ii) inertia of consumers resulting from switching costs, (iii) risk selection practices by the insurers, (iv) the influence of supplementary insurance.

We focus on the fourth interpretation (iv). Despite the fact that it is forbidden to sell basic and supplementary insurance as a joint contract, insurers' behaviour relative to the supply of supplementary insurance contracts may induce some perverse effects on the basic insurance market. Our purpose is to evaluate the influence of the supplementary insurance on the choice for basic insurance plan in Switzerland. A survey carried out by the Federal Office of Social Insurance (OFAS, 2001) show that 75 % of insurees have subscribed to at least one supplementary insurance contract. These contracts are usually subscribed with the same insurer as for the basic contract.

This paper studies the decisions to switch and to subscribe to a supplementary insurance contract. It is structured as follows. Section 2 provides a literature review on health plan choice. Section 3 offers some explanation concerning how supplementary insurance might affect the decision to switch. Data are described in Section 4. The related descriptive statistics on the performance of the market and on consumer choices are provided in

section 5. The econometric specification and the results are presented in section 6. Concluding remarks and a discussion of implications are included in the final section of the paper.

## **2. Health insurance choice: present state of knowledge**

Outside the US, many industrialised countries have a social health insurance where citizens cannot choose between different payers for the basic coverage. Only recently health plan choice has been introduced in the social health insurance systems of Germany and the Netherlands, whereas this has been a traditional feature of the Swiss health insurance system. Israel and Belgium also have a social health insurance system with health plan choice.

The empirical literature relative to the switching behaviour of consumers leads to very different results, depending on national regulatory systems and institutional context. Premium elasticities of plan choice range from  $-8.4$  to  $-0.1$  (Schut et al., 2003; Laske-Aldershof and Schut, 2002; Buchmueller, 2000 ; Buchmueller and Feldstein, 1997 ; Royalty and Solomon, 1999).

A result common to many papers is the higher propensity to switch of young, healthy and highly educated individuals. As noted by Strombom et al. (2002), this finding means that plans that increase their price relative to competitors will not only lose market share, but will experience an increase in costs due to adverse retention.

As concerns differences in switching elasticities between countries, Schut et al. (2003) show that the propensity to switch is much larger in Germany than in the Netherlands. There are several possible explanations for this observed difference in consumer switching behaviour<sup>1</sup>. First, differences in premium paid by consumers are much larger in Germany than in the Netherlands. The relative small price difference among Dutch sickness funds may not be sufficient to compensate the transaction costs involved in switching from one sickness fund to another. Second, incentives for employers are different in Germany and in the Netherlands: in the Netherlands, employers contribute a uniform percentage of employees' income, independent of their choice of sickness fund. By contrast, in Germany, the level of employer contributions strongly depends on their employees' choice of sickness fund. Hence, employers seem to play an important role in facilitating consumer choice and motivating their employees to switch to a cheaper (company-based) sickness fund. More recently, Tamm *et al.* (2007) showed that short-run price elasticities in Germany are smaller than previously found by other studies. In the long run, however, their estimates give evidence of substantial price effects. Nuscheler and Knaus (2005) analyze the determinants of switching behavior in Germany from 1995 to 2000. They find evidence that transitions are a result of switching costs. Selection by funds seems to be a negligible problem.

Schut et al. (2003) and Laske-Aldershof and Schut (2002) explain the inertia of Dutch consumers by the magnitude of switching cost in comparison to the relatively small differences between premiums, i.e. expected

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<sup>1</sup> Note that this analysis is based on the Dutch system before the new universal health system was implemented in January 2006.

gain of switching. However, this result can be interpreted quite differently and has to be examined more thoroughly. As stated by Laske-Aldershof and Schut (2002), despite the fact that it is forbidden to sell basic and supplementary insurance as a conjunct product, there is a discrepancy between the rules and the practice: actually, compulsory and supplementary insurance are tied in the Dutch system. Therefore, one has to take the issue of supplementary insurance combined with compulsory insurance into account: this creates heterogeneity between insurance plans in terms of premiums and coverage. A stable equilibrium can be reached, with no need for switching, whether or not there are switching costs.

International comparisons of five countries in which health plan choice is possible (Laske-Aldershof et al., 2004) indicate that switching rates are larger in Germany and Switzerland than in Belgium, the Netherlands, or Israel. The authors attribute these higher switching rates to three main features. First, basic insurance contracts have options (in Switzerland, the deductible level may be chosen). Second, the potential benefits (monetary gains) from switching are larger in Germany or Switzerland than in the three other countries. Third, the insurance market seems more competitive in Germany and Switzerland: the level of market concentration is relatively low, and there are no barriers to entry.

One important issue in managed competition setting is the possibility, offered to insurance companies to selectively contract with health care providers. Then, choosing one health plan gives the consumer an access to a specific provider network, with a given quality of care. Beyond the role of price elasticities, many papers tried recently to evaluate the impact of quality of care on switching behavior. Using US data, Beaulieu (2002) finds that quality information has a small, but significant effect on consumer plan choices. This result is not supported by Abraham et al (2006), who show that information about higher quality alternatives is not connected with the switching probability. Conversely, patients place a high value on their relationship with their personal physician which makes switching more costly.

In Switzerland, switching behavior is likely to be weakly influenced by the quality of care. Indeed, less than 10% of enrolees have chosen an HMO option. The others have unlimited access to all care providers.

One report done by OFAS in 2001 and two studies are available on health insurance choice in Switzerland (Colombo, 2001 ; Beck et al., 2003). The OFAS report stresses that only a minority of households have switched from their basic health sickness fund since the introduction of LAMal. However the results show that there is a switch potential because 50% of households complain about the financial burden of basic insurance. Both Colombo (2001) and Beck et al. (2003) underscore the lack of convergence of premiums across sickness funds. However, they deliver rather different assessments of the functioning of the Swiss health insurance system.

On the one hand, Colombo (2001) puts the stress on consumer inertia: annual switching percentages are very low and seem to decrease steadily from 5.4% in 1998 to 2.1% in 2000. According to her, this inertia is attributable to switching costs linked to the costs of collecting information about relative performance of sickness funds: "Switching is in fact a time consuming exercise that involves transaction costs on the side of individuals. Information on sickness funds performance is currently inadequate and not easily comparable." (Colombo, 2001). Analysing the responses to the OFAS survey, she shows that individuals are not always well informed.

Some consumers may think that sickness funds can risk adjust and cream skim, because they do not know that the health insurance reform introduced a clear-cut regulatory separation between basic compulsory insurance (regulated by the LAMal) and the supplementary voluntary health insurance (regulated by the Insurance Contract Law (LCA)). In addition, some consumers think that they cannot split supplementary from basic insurance and purchase them from two different funds. Colombo (2001) concludes that the goals of the LAMal are not fulfilled: the lack of sensitivity of switching behaviour to sickness fund performance leads to an unhealthy competition. It does not create cost-containment incentives but incentives to risk selection. She suggests to improve the individual choice mechanism by providing a better access to information and introducing a clear separation of LAMal coverage from supplementary insurance.

On the other hand, Beck et al. (2003) adopt an econometric approach which leads them to an opposite assessment of the Swiss health insurance market. On the basis of models close to the specifications used by Schut et al. (2003) (with additional fixed effects for taking heterogeneity between cantons into account), they estimate premium elasticities which range between  $-2.1$  and  $-1.0$ . These results are obtained on cantonal data which were provided by OFAS or on micro data from a sickness fund. The magnitude of their estimates is far from negligible: they range between the elasticities reported for the Netherlands by Schut et al. (2003) and the elasticities reported for Germany. The problem of Beck et al. (2003) is then to explain high and permanent premium differentials, together with a non negligible mobility of consumers between sickness funds, characterised by high elasticities. They use an interpretation in terms of “conglomerate” (cartel): a subgroup of some sickness funds may work together and move their members from one insurer to the other within the conglomerate, in order to create a homogenous risk profile within each fund. In this case, the flat rate premium of each fund of the conglomerate can evolve toward a risk-rated premium. Beck et al. (2003) give an empirical support to this interpretation: whereas the overall premium elasticity estimated on data relative to all cantons and funds is quite large, the premium elasticity estimated on the sub-sample of insurers suspected to apply this strategy of conglomerate is small and not significant.

As opposed to Colombo, Beck et al. (2003) consider that switching costs are negligible: “the basic insurance coverage is identical from one health insurer to the other, and both basic and supplementary premium information is freely and easily available on the web or from the federal office, which keeps the cost and amount of effort needed to retrieve the relevant information low. In addition, the actual switching procedure is quite simple: it is entirely sufficient to write a letter to one’s health insurer.”(Beck et al., 2003).

Finally, Beck et al. (2003) maintain that the present Swiss health insurance system gives insurers a strong incentive for risk-based selection. This is due to the rule of flat rates for premiums, together with an inefficient risk compensation mechanism. The latter being based on a too simple formula, leads in fact to an unfair compensation for all high-risk profiles. According to Beck et al. (2003), the legislator should authorise risk rated premiums or improve the risk adjustment formula.

The representations of the Swiss health insurance system given by Colombo (2001) and Beck et al. (2003) are very contrasted. Both notice the lack of premium convergence and healthy competition mechanisms. But Colombo underlines the consumer inertia due to switching costs, whereas Beck et al. (2003) give evidence of



consumer mobility and put the stress on risk selection practices. Both suggest that supplementary insurance may have some influence on switching behaviour but do not make a thorough analysis of this issue.

The common view is that in Switzerland supplementary insurance contracts only cover some rare events. However, the proportion of health expenditures financed by supplementary insurance is not negligible. The supplementary insurance accounts for 30.9 % of health insurance financing (mandatory basic insurance covers 66.7 %). This financing is mainly operated by sickness funds (23 %) followed by private insurers (7.9 %). The OFAS survey shows that only 7% of Swiss residents who have subscribed to a supplementary insurance contract did so with an insurer different from the sickness fund providing their basic coverage. As regards supply behaviour, sickness funds can risk adjust indirectly if they tie the conditions of a supplementary health insurance contract to the possession of a basic health insurance contract at the same fund. Colombo (2001) reports that many people complained that reimbursement delays deteriorated after they separated basic and supplementary health insurance in two different sickness funds. “Such separation is in addition very impractical because doctors and hospitals do not separate bills for services included under the two different covers. Finally, premiums for supplementary health insurance may be more expensive if people are not insured by the same fund for basic health insurance”. These practices suggest sickness funds try to tie basic and supplementary health insurance.

Paolucci et al. (2007) examine the role of supplementary health insurance as a potential tool for risk-selection in five countries. Their approach is mainly institutional. Comparing the regulatory settings concerning health insurance markets, they conclude that supplementary health insurance may be a selection tool in Switzerland. In addition, incentives to use it for risk selection are increasing in Netherlands.

This point is analysed from a normative perspective by Kifmann (2006), who studies the relative social costs and benefits of allowing the same insurance funds to be active on both markets (for basic and supplementary insurance). Under the assumption that subscription to a supplementary insurance contract is exogenous and random, Kifmann (2006) shows that insurers cream-skim on the basic insurance market by selling supplementary insurance contracts below marginal cost. However, it is more efficient to separate the two markets if integrating both activities leads to large savings (administrative costs).

These features are likely to exert a great influence on the choice of sickness fund for basic insurance, switching behaviour and more generally the health insurance market. Our purpose is to evaluate the influence of supplementary health insurance on switching behaviour in Switzerland. In particular, we examine the relative importance of two main elements in the switching decision: premiums for basic insurance contracts, and supplementary insurance.

### **3. How supplementary insurance may affect the decision to switch**

Certain features of the Swiss health insurance market should be kept in mind when analysing the interaction between basic and supplementary insurance. First, information about differences in premiums for basic insurance

is perfect, with publications in all newspapers, and websites comparing premiums: this rules out any explanation in terms of switching costs due to difficulties to gather information about price differences (remind that contracts for basic insurance are standardised). Second, subscribing basic and supplementary contracts with two different insurers may induce some administrative costs for the subscriber, such as sending separate bills, etc. Third, supplementary insurance is regulated by the Insurance Contract Law, which allows selection and does not impose any constraint on the supplied coverage. Therefore, switching can be difficult for supplementary contracts: the new insurer may offer a different contract or require some medical examination before accepting a new customer.

Given this framework, supplementary insurance may affect the decision to switch in three ways.

(a) The first mechanism is very simple and could be interpreted as a “pure switching cost effect”. Given that subscribing basic and supplementary contracts with two different insurers induces administrative costs, subscribers planning to switch to a new fund may have to consider moving both the basic and supplementary contracts: this is more burdensome than a single switch.

(b) The second mechanism relies on selection practices that are allowed in supplementary insurance markets. If enrollees believe that insurers reject applications from individuals considered as bad risks, holding a supplementary insurance would act as a brake upon switching only when the subscriber thinks he or she could be considered as a bad risk. In this case, finding that supplementary insurance has no effect on switching when the subscriber self-assesses his or her health at the highest level (very good health) would provide an empirical support to such an interpretation, assuming that poor self-assessed health is associated with higher expected expenditures covered by supplementary insurance contracts.

(c) The third mechanism refers to potential selection practices by insurers in basic health insurance markets. They would retain those who hold supplementary contracts and push away the others. Two assumptions might underlie a selection behaviour based on supplementary insurance.

Suppose that holding a supplementary insurance contract reveals that the insured is a good risk for the basic insurance, i.e. that she/he has a lower basic health care consumption for a given illness. This assumption is certainly relevant as concerns supplementary insurance covering alternative medicine. It may be true for other kind of supplementary contracts, revealing a greater attention to health and prevention. If this assumption is true, then finding that individuals with supplementary insurance are less likely to switch would reveal that sickness funds try to, and succeed in retaining good risks<sup>2</sup>.

Another very simple explanation is based on the fact that the regulation for supplementary insurance is less constraining, and competition on this market may be less aggressive. If selling supplementary insurance contracts is overall profitable, then profit-maximising insurers would have an incentive to retain supplementary contracts purchasers. As said above, different arguments indicate that the profit per contract could be larger or smaller than average for individuals in self-assessed good health. However, if supplementary contracts are

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<sup>2</sup> In Switzerland, the current risk adjustment scheme is based on age and gender only. There remain strong incentives to risk selection.

profitable for any level of health, then the effect of supplementary contracts on switching rates should be independent of the individual self-assessed health.

#### **4. Data**

We use two sources of data, the OFAS survey (2001) and information extracted from the cantonal data base that we have constructed.

##### *The OFAS survey*

To study the switching behaviour of the Swiss health enrolees, we used the data collected by OFAS (2001) as part of a general assessment of the Law on Sickness Insurance (Art. 32 OAMal). As previously mentioned a detailed descriptive analysis of this dataset is available in the OFAS report (2001) and is also provided by Colombo (2002). However, as far as we know, no further analysis was performed.

This database was obtained from the Swiss Information and Data Archive Service (SIDOS). It displays information on 2,152 individuals who were surveyed by telephone during the early summer 2000. Selecting individuals older than 26, and allowing for missing information relative to income leads to a sample of 1,943 individuals<sup>3</sup>. Extensive information is collected at the micro level (individual or household, depending on the question) concerning health plan choice. People were requested to name their insurance funds for the basic and supplementary health insurance package separately and to define their criteria for the choice of insurers. The options they had opted for (deductibles, HMO) and the composition of the supplementary benefit package were also reported. Respondents were asked whether they had moved from one sickness fund to another one during the four previous years (1997- 2000) and whether they had changed any of their health insurance contracts. Intention to switch in the future as well as general satisfaction towards insurance coverage was collected. Knowledge, beliefs and attitudes towards LAMal were investigated.

The information provided by the OFAS survey is somewhat limited. It does not provide individual information about health expenditures, nor about the premiums paid for supplementary health insurance contracts. Moreover, it is a cross-section: it will not be possible for us to perform an accurate treatment of the unobserved heterogeneity.

##### *The cantonal database*

We have constructed a second dataset including information relative to each insurer company for the 26 Swiss cantons over the years 1996 to 2005. Insurer-related information includes the number of insured people per sickness fund within each canton, and the premiums (per person and month) for each fund (for each premium region) during the years 1996 to 2005.

The number of insured people in each plan was directly provided by the Federal Office for Public Health (OFSP) upon request; yearly premiums are available on the OFSP website in the yearly reports entitled “Statistics in

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<sup>3</sup> According to the LAMal, premiums are set differently for people aged 18-26.

Health Insurance”. Finally, the database is made of 12,423 observations (one line per insurance company, per canton and per year). This second dataset will be referred to as “cantonal database”.

This dataset will be used to define the gains associated with switching by making the connection between the information about the sickness fund chosen in the OFAS survey and the premiums of all competitors available in the cantonal database. Notice that premiums cannot be regarded as exogenous at this macroeconomic level. It is more appropriate to use individual data to study the demand for insurance and switching behaviour.

## 5. Descriptive analysis

### 5.1. Did competition induce some decrease in premium variability?

In principle, competition in price with homogenous contracts should induce a reduction in premium differences. The empirical results obtained from the cantonal database do not support this prediction.

In the cantonal database, information relative to premiums is recorded at three levels: sickness fund, cantons and year. Each year, the double dimension of the data allows us to identify, in the changes over time of the premium variability, what is due to changes in the between-canton variability and what can be attributed to changes in the within-canton variability.

Denoting by  $p_{j,c,t}$  the premium paid for the basic insurance in sickness fund  $j$  in canton  $c$  in year  $t$ , one has:

$$V(p_{j,c,t}) = V(p_{.,c,t}) + V(p_{j,c,t} - p_{.,c,t}),$$

where  $V(p_{j,c,t})$  is the overall variance of premiums in year  $t$  and  $V(p_{.,c,t})$  is the between-canton variance of premiums (it is equal for each year to the variance of the average premium per canton).  $V(p_{j,c,t} - p_{.,c,t})$  is the within-canton variance of premiums. Given that competition takes place within each canton, any assessment on competition effectiveness should be based on this second term only.

Graph 1 displays the annual values of the total, between-canton and within-canton standard deviations, computed for  $\text{Log}(p_{j,c,t})$ . We used the log transformation for changes in premium variability not to be affected by premium increase over time. We computed weighted indicators to take into account the number of enrolees per sickness funds. The value of the overall standard deviation is decreasing very slightly over time, from 22 % in 1996 to 18 % in 2005. This small decrease is mainly due to a decrease in the between-canton standard deviation. As stated above, the competition takes place within the framework of each canton: the within-canton standard deviation only can be affected by competition pressure. Graph 1 shows how stable it is over time, suggesting there is no premium convergence within cantons.

Graph 2 shows that the proportion of overall variability due to average differences in premiums between cantons is sizeable: more than 80% is due to average differences between cantons. Adjusting premiums for differences in the gender and age composition of the enrolees does not change substantially this result. The high proportion of between cantons variability may derive from pricing strategy on the supply side. It questions the relevance of limiting competition to the canton level.

Graph 3 displays the annual values of the ratio of the ninth to first decile of the premium distribution. The ratio is computed for each canton, then an average is calculated, weighting the cantonal ratios by the number of enrolees in each canton. The same computation is implemented for the ratio of the third to first quartile of the premium. The figures of Graph 3 are more easy to interpret than the standard deviations computed above: there is a difference of about 20% between the ninth and the first decile of the premium, and a difference of around 10% between the third and the first quartile. The decrease over time of Q3/Q1 is very tiny. It is slightly more marked for D9/D1. Graph 4 makes it possible to examine more closely this small reduction. Following the same procedure as above, we computed the annual values of D9/D5 and D5/D1, where D5 stands for the median. Graph 4 shows that, at the beginning of the period, the dispersion is at the same level at the top and at the bottom of the distribution, and then falls at the top of the distribution (D9/D5), suggesting there is some competition pressure on the highest premiums. However, the observed changes are very small. On the whole, there is no sizeable decrease in premium variability; the competition does not seem to be effective.

### *5.2 The individual level: basic features of the data*

The OFAS survey displays information at the micro level. Basic features of this information are provided in Table 1. During period 1997-2000, 14.3% of individuals switched from one sickness fund to another. In the year 2000, 9.5 % were considering to switch.

A supplementary insurance contract of any kind was subscribed to by 74.8% of enrolees. In Switzerland, an individual may subscribe to several potential contracts for supplementary coverage: dental care, first and second class treatments in hospitals, cross-border care, alternative medicine, sick-leave payments, etc. There is also a very simple contract, the “Division commune Suisse entière”, which extends the basic coverage to any Swiss hospital, not only those in the home Canton. This contract is offered by most insurers at low cost and without any medical examination. When excluding the supplementary insurance relative to “Division commune Suisse entière”, the proportion of enrolees covered by a supplementary insurance falls to 64.6%. Table 2 shows that the subscription to a supplementary insurance is not significantly linked to gender. Conversely, age is significantly connected to supplementary coverage: people aged 35-65 are more likely to subscribe to a supplementary insurance contract (except for “Division commune Suisse entière”).

The survey records the household’s income as a categorical variable with 11 categories. We aggregated this information into three categories: income lower than 5,000 CHF (i.e. 3,300 €), income between 5,000 and 8,000 CHF, income higher than 8,000 CHF (i.e. 5,280 €). The threshold for the lowest category might appear to be rather high to the basic European citizen. Actually, it is representative of the Swiss income distribution. Information about household’s income was missing for 367 individuals. We checked that the recording of income is not significantly connected with the probability to switch (significance level  $p = 151$ ). To avoid losing too many observations, we implemented an ordered probit estimation to predict the missing values of income. This was possible for 264 observations, using the following explanatory variables: age, gender, employment status, education level, family size, location, health status and cantonal fixed effects.

Figures in Table 1 show that more than one third of individuals belong to the lowest income category, the highest category covering less than one fourth of individuals. Within one insurance compagny, in a given canton, premiums are community rated. However, a state subsidy set at the canton level help people with a low level of

resources to pay their premium. The generosity of the coverage, and the eligibility criteria depend on the canton: on the whole, 23 % of the respondents benefit from such a subsidy.

Table 3 shows that having subscribed to a supplementary insurance is negatively connected with the propensity to switch: the probability of switching is one third lower (odds ratio significant and equal to 72 %) when the individual has a supplementary insurance. Conversely, the *intention* to switch seems to be independent of supplementary insurance (odds ratio equal to 93 %, with a significance level  $p=0.66$ ). Other statistics (not reported here, available on request) show that switching propensity depends on age group and supplementary insurance status. Young people exhibit a high switching propensity, whatever their supplementary insurance status. This is not the case for older people: their switching propensity decreases with age and is reduced by a supplementary coverage.

Health status is measured by the individual's self assessed health, which is recorded on a five point scale that we collapsed into three categories: Bad, Good and Very good. Table 1 shows that about 17 % of individuals grade their health as Bad and 35 % as Very good. The level of income is strongly related to self-assessed health, the richer being in better health (Table 3bis). The magnitude of the influence is amazing: the probability to be in bad health decreases by two-third for people earning an income in the intermediate category. For people belonging to the high income category, the probability to be in bad health is divided by five, in comparison with low-income individuals. People having subscribed to a supplementary insurance are in a rather good health (odds ratio equals to 0.72, see Table 3bis). But this impact is entirely due to the influence of income on the supplementary insurance: when incorporating both supplementary insurance and income in the logistic model, one finds that the impact of supplementary insurance on the probability to be in bad health is no longer significant.

## 6. Estimation and results

### 6.1. Econometric specification

#### *Switching behaviour*

We estimate a model explaining the switching decision in the past. Consider the binary variable  $y_i$  defined by  $y_i = 1$  if the individual switched and  $y_i = 0$  when he/she did not switch. We model the benefit of switching as a latent (unobserved) variable  $y_i^*$  defined by:

$$y_i^* = x_i' \beta + (dp)_i \eta + s_i \gamma + u_i, \quad (1),$$

where  $x_i'$  is a vector of individual characteristics and  $s_i$  is a dummy variable indicating whether the individual had subscribed to supplementary insurance.  $u_i$  is a disturbance supposed to follow a normal or a logistic distribution.

The decision to switch is given by:

$$y_i = 1 \text{ if } y_i^* \geq 0. \quad (2)$$

The variable  $dp_i$  is defined to capture the monetary gain of switching in terms of cost to be insured for the basic insurance. To construct this variable, we consider the premiums observed for each deductible level in the cantonal database and adjust these premiums for inflation in the basic health insurance sector. We observe the level of the premium of the sickness fund chosen. In a given year, if individual  $i$  comes from sickness fund  $k$  and switches to fund  $j$ , the monetary gain of switching is equal to  $p_{ik} - p_{ij}$ . We constructed a variable that evaluates potential switching gains for switchers and non-switchers. One difficulty is that we do not observe the fund the switchers come from. We thus decided to compute the expected gain of switching. This is defined as follows:

$$(dp)_i = E[p_{ik} - p_{ij} | k \neq j] = \sum_{k \neq j} \left[ (p_{ik} - p_{ij}) \left( \frac{n_k}{\sum_{k \neq j} n_k} \right) \right] \quad (3)$$

where  $n_k$  is the number of enrolees of sickness fund  $k$ . This definition of the expected gain of switching is based on the assumption that the probability of  $i$  to come from sickness fund  $k$  is equal to the proportion observed for all individuals of the sample in the year preceding the switch.

For non-switchers, the variable  $dp_i$  represents the potential switching gains, if the fund is chosen at random. It undervalues potential switching gains for non-switchers, given that a fund is actually not chosen randomly, but because it is the least expensive one.

#### *Decision to subscribe to a supplementary insurance contract*

We also estimate a model explaining the decision to subscribe to at least one supplementary insurance contract (except "Division commune Suisse entière"). The benefit of subscribing is specified as a latent variable  $s_i^*$  defined by:

$$s_i^* = z_i' \alpha + v_i, \quad (4)$$

where  $z_i'$  is a vector of individual characteristics. The decision to subscribe is given by:

$$s_i = 1 \text{ if } s_i^* \geq 0. \quad (5)$$

The premium differential  $(dp)_i$  for basic insurance is in principle not linked to the decision to subscribe. We included it into specification (4) to check that it is uncorrelated with the choice to subscribe a supplementary insurance. Actually, we found that  $(dp)_i$  was not significant. Therefore,  $(dp)_i$  and  $s_i$  act as orthogonal determinant of the switching decision in equation (1).

#### *A bivariate model of decisions to switch and to subscribe to a supplementary insurance*

The bivariate model consists in estimating a simultaneous equation model of joint decision to switch and to subscribe to a supplementary insurance contract. A separate estimation of equations (1) and (4) would lead to asymptotically biased estimates if their disturbances ( $u_i$  and  $v_i$ ) are correlated.

The disturbances  $u_i$  and  $v_i$  may be correlated for several reasons. Both are influenced by unobserved heterogeneity relative to individual  $i$ , in other words, by unobserved variables which influence the decisions we

try to explain. It may be for instance risk aversion or health status. Another source of bias is the fact that the premium of the supplementary insurance is unobserved. This variable could be an explanatory variable of the decision to subscribe to supplementary insurance and of the decision to switch. In this case, it would be a common component of disturbances  $u_i$  and  $v_i$ . However, the regulation in the basic insurance market, especially the contract standardisation, is likely to eliminate any role of risk aversion or health status in the switching decision: this equation has nothing to do with demand for insurance, given that basic insurance is mandatory. It is possible that these components of the individual unobserved heterogeneity affect only  $v_i$ .

Such a two equation model is defined by Maddala (1983) as a bivariate recursive model. If  $u_i$  and  $v_i$  are not independent, a two-stage method is not appropriate to estimate the decision to switch equation. One has to use a maximum likelihood estimator, where the likelihood is built on the basis of the joint distribution of  $(s_i, y_i)$ . Conversely, if  $u_i$  and  $v_i$  are not correlated, both equations can be estimated separately.

In what follows, we present the results of separate estimations and of the estimation of the bivariate probit model. The joint estimation of the bivariate model led to a non significant correlation coefficient  $\rho$  between  $u_i$  and  $v_i$ , justifying a separate estimation. Actually, the conditions for an identification of the model are met: several instruments explaining the decision to subscribe a supplementary insurance are excluded from the decision to switch (income (3 digits), gender, and education (5 digits)). These variables are not significant in the switching equation.

## 6.2. Results

Equations (1) and (4) were estimated with or without canton fixed effects to deal with the unobserved heterogeneity between cantons. The results of both specifications were qualitatively the same. Therefore we only reported the results based on the fixed-canton effect models (Table 4 and Table 6).

The decision to switch was estimated by a logit estimator. The results are displayed in Table 4. They show that the expected gain of switching ( $dp$ ) influences positively the switching decision. Having subscribed to supplementary insurance has a significant negative impact on switching. The impact of the supplementary insurance is sizeable: *ceteris paribus*, it reduces the probability to switch by about 30 %. Columns three and four report estimates from a model that allows the impact of supplementary insurance to vary when the subscriber is in very good, good or bad health. Three interaction terms are incorporated. One obtains the very interesting result that supplementary insurance has no effect on switching when the enrolee self-assesses his/her health status as "very good". However, holding a supplementary insurance is associated with a monotonically declining likelihood of switching when the subjective health status gets worse. These results are consistent with rational expectations from enrolees that switching may be more difficult for supplementary contracts due to the selection practices that are allowed in supplementary insurance markets. These results thus rule out the two other potential



mechanisms that were highlighted in section 3 to describe how supplementary insurance might affect the decision to switch.

Otherwise, we find that the probability to switch is continuously decreasing with age. This result is consistent with the empirical literature on switching behaviour we have reviewed above. The youngest (27-35) have a probability to switch which is more than 80 % higher than the reference age group (35-50) whereas the oldest (>65) have a much lower probability to switch (- 66 % to -67 %). Having chosen a deductible level higher than the basic deductible is linked with a significantly higher propensity to switch (+53 to +55 %).

The descriptive analysis has suggested that the impact of the supplementary insurance should vary with age. To allow for this possibility, we have estimated the same model with cross effects of age group with the supplementary insurance dummy. This specification led to a loss in precision with many non significant coefficients.

Table 5 gives the average expected gain of switching (variable  $dp$ ), for switchers and non-switchers, with or without a supplementary insurance contract. Not surprisingly, we find that the average switching gain is larger for those who have indeed switched (CHF 15.75) than for non-switchers (CHF 2.21). The annual switching gain is therefore CHF 189 for switchers, i.e 124.7 €. Graph 5 displays the corresponding distributions of the annual switching gains for switchers and non-switchers.

The effect of supplementary contracts is more surprising. Since holding a supplementary insurance contract decreases the likelihood to switch, it may be interpreted as a switching cost, and we may expect that individuals with a supplementary contract would switch for larger switching gains than those without supplementary insurance. This is not the case: the average switching gain is CHF 13.06 for those with supplementary contracts, and CHF 19.44 for those without. This result suggests the existence of heterogeneity within switchers and deserves further investigation. Actually, people who are not holding supplementary insurance differ from the others as regards *the level* of their premium for the basic health insurance: their premiums appear to be higher, especially at the top of the distribution. More precisely, the average level of their monthly premium is CHF 6.2 higher, the first quartile of their monthly premium is CHF 6.5 higher and the third quartile of their monthly premium CHF 16.3 higher. The interpretation of our results could be the following. Individuals who are not holding supplementary insurance differ strongly from the others by their unobservable characteristics. Since they are characterized by a low level of education (as shown by the results commented on above), their switching costs may be larger than for more educated people (information may be more difficult to collect and interpret). This effect could be large enough to more than compensate for the negative effect of holding supplementary insurance. The fact that people without a supplementary insurance pay higher premiums (for a given level of deductible), gives support to this interpretation.

Table 6 displays the results relative to the decision to subscribe to a supplementary insurance contract. They show that the decision to subscribe to a supplementary insurance contract is not a monotonic function of age: the probability of subscribing increases with age until the class 51-65. Then, it decreases for people older than 65. The income level has a significant positive influence on the propensity to buy a supplementary insurance. The

magnitudes of the effects are amazing: the probability to subscribe is almost twice as high for an intermediate income individual in comparison with a low income individual, and more than doubles (OR= 2.40) for the highest level of income. This result is opposed to the basic insurance theory, which predicts a lower absolute risk aversion for rich people. Therefore, they should be less likely to buy insurance. Our estimates suggest that the purchase of supplementary insurance is influenced, not only by risk aversion, but also by the willingness to pay for goods covered by the supplementary insurance.

Descriptive statistics have shown that bad health has a negative influence on the subscription to a supplementary contract. But this influence is no longer significant when income and education are introduced as covariates. All the information about health seems to be captured by the income level: as stated above, a low income is strongly correlated with bad health status (Table 3bis). Therefore the results exhibited in Table 6 do not include health status as a covariate.

The estimations of the bivariate probit model are displayed in the appendix (together with the results of the single probit equations). In both the single and bivariate equation models, two specifications are tested depending on whether the supplementary variable is included as a plain covariate or as an interaction variable with health status. The results are similar to those of the separate equation models. Furthermore the correlation of the disturbances between both equations is not significant. This allows us to report the single equation results. The bivariate probit results exhibit only one difference with the single equation results: the effect of the supplementary insurance is no longer significant in the switching equation. However it is important to notice that the coefficients of the bivariate probit models have the same magnitude as the coefficients of the single equations. In particular this is true for the supplementary insurance variable and the interaction terms between supplementary coverage and health status. However the precision of the estimates deteriorates greatly in the bivariate estimations. This suggests that the instruments that we use to explain the subscription to a supplementary contract lead to an important loss of information.

Are the limitations to switch induced by the supplementary insurance large enough to explain the lack of premium convergence? We can use the estimates of equation (1) to have a first insight into this question.

Consider the distribution function of the logistic. Equations (1) and (2) give the expression of the probability to switch for individual  $i$  :

$$\text{Pr ob}(y_i = 1) = F(x_i' \beta + s_i \gamma + (dp)_i \eta)$$

This probability can be estimated by :

$$\widehat{\text{Pr ob}}(y_i = 1) = F(x_i' \hat{\beta} + s_i \hat{\gamma} + (dp)_i \hat{\eta}) \quad (6)$$

where  $\hat{\beta}$ ,  $\hat{\gamma}$  and  $\hat{\eta}$  stand for the estimators of  $\beta$ ,  $\gamma$  and  $\eta$ .

This predicted probability varies with the observation considered. We want to focus on the respective impacts of the premium differential and of the supplementary insurance. To summarize these individual probabilities, we evaluate them for the average individual, except for the variable  $dp$ , which is allowed to vary over its range. This

computation leads to a function  $g(dp_i)$  describing the switching probability according to the premium difference  $dp$ , when the individual has not subscribed to a supplementary insurance :

$$\widehat{Pr ob}(y_i = 1 / x_i' = \bar{x}' ; s_i = 0) = F(\bar{x}' \hat{\beta} + (dp_i) \hat{\eta}) = g(dp_i)$$

The same computation is used to build the function  $h(dp_i)$  describing the switching probability according to the premium difference  $dp$ , when the individual has subscribed to a supplementary insurance :

$$\widehat{Pr ob}(y_i = 1 / x_i' = \bar{x}' ; s_i = 1) = F(\bar{x}' \hat{\beta} + \hat{\gamma} + (dp_i) \hat{\eta}) = h(dp_i)$$

Graph 6 displays the curves for the functions  $g(dp_i)$  and  $h(dp_i)$ . Vertical lines are drawn to represent the values of the first and ninth deciles of the expected premium difference  $dp$  (equal to the expected gain to switch). In comparison with the range of  $dp$ , the limitations to switch due to the supplementary insurance is not very large, but non negligible.

## 7. Conclusion

In this paper we highlighted that the introduction of a managed competition scheme for basic health insurance in Switzerland failed in reducing the premium variability: within canton, the premium variability appears to be stable between 1996 and 2005. This finding raises the question of the effectiveness of competition in Switzerland for the basic health insurance market.

Our results show that the switching decision is positively influenced by the expected gain of switching and that holding a supplementary insurance contract substantially decreases the propensity to switch.

However, holding a supplementary insurance has no effect on the propensity to switch when the individual self-assesses his/her health as "very good"; holding a supplementary contract monotonically reduces the probability to switch when the individual's subjective health status gets worse.

As far as the decision to subscribe to a supplementary contract is concerned, our results suggest that the income plays a major role. It has a direct positive influence on the propensity to buy a supplementary insurance. This finding suggests that the purchase of supplementary insurance is influenced, not only by risk aversion, but also by the willingness to pay for the goods covered by the supplementary insurance, which would be higher for rich people.

Our estimates allow us to compute the switching probability as a function of the premium difference, which corresponds to gains of switching. This function is drawn for people with and without a supplementary insurance contract. In comparison with the range of the premium difference, the limitations to switch due to the supplementary insurance is moderate, though non negligible.

A better understanding of the effectiveness of competition on the basic health insurance market is of major interest for policy makers. Needless to say, competition puts providers under pressure only if consumers are able to switch from the least efficient to the most efficient funds, and potential barriers to switching may explain the persistence of inefficiencies. In this paper we investigated one specific barrier to switching, namely the influence of supplementary insurance. As explained, the supplementary insurance might affect negatively the decision to switch in three possible ways: (a) holding a supplementary contract might act as a pure switching cost when the enrolees subscribe basic and supplementary contracts with the same fund (b) holding a supplementary contract might stop individuals from switching when the individual thinks that he/she could be regarded as a bad risk; (c) The negative impact of supplementary insurance on the switching propensity might reveal risk selection practices by insurers to the extent that high profit margins are associated with supplementary insurance provision and that holding supplementary insurance may be synonymous to being a good risk. Our results suggest that mechanism *b* is a major explanatory factor of consumers' inertia in relation to supplementary coverage. Note that mechanism *b* entails anticipation of selection practices from the consumer.

Our analysis illustrates how the consumer choice for health plan interacts with the decision to subscribe to a supplementary insurance contract. If these private decisions are not independent, then the regulation of the supplementary health insurance market should integrate the effects it may have on the basic insurance market. Even if basic insurance and supplementary insurance are regulated by two different laws (respectively, LAMal and LCA) and supervised by two different institutions (respectively, OFSP and OFAP), both markets turn out to be closely tied as insurance companies are allowed to operate both on basic and supplementary insurance markets. We may wonder whether it is relevant to implement managed competition in basic insurance markets and allow pure competition (no regulation) in supplementary insurance markets. As regards the policy agenda, our results suggest two alternative changes: either more effective separation between basic and supplementary insurance markets or more severe regulation in the supplementary insurance sector.

Our analysis would deserve further investigation. Data including the premia of supplementary contracts as well as a longer period of observation of consumer choices and insurance markets would be much helpful. So far our results provide recommendations for better regulation in Swiss insurance markets.

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Table 1: Descriptive statistics

	% (n=1943)
Age: [27,35]	18.13
Age: [35,50]	36.87
Age: [51,65]	26.37
Age: >65	18.64
Household Income: < 5000 Swiss Francs per month	36.82
Household Income: 5000 - 8000 Swiss Francs per month	39.32
Household Income: > 8000 Swiss Francs per month	23.86
State Subsidy for the Premium (yes=1)	23.45
Gender: male	46.75
Education level: first cycle regular track (compulsory school)	11.16
Education level: second cycle regular track	11.11
Education level: short professional track	51.77
Education level: long professional track	14.18
Education level: university completed	11.73
Urban setting	78.75
Bad subjective health	16.92
Good subjective health	48.05
Very good subjective health status	35.03
Has the lowest (ordinary) deductible	56.48
Has any supplementary health insurance	74.81
Has a supplementary health insurance (except for "division commune Suisse entière")	64.57
Has switched between 1996 and 2000	14.34
Intents to switch in 2001	9.58

Table 2: Association between age, gender and supplementary insurance

	<b>No supplementary insurance</b>	<b>Supplementary insurance (except for "division commune Suisse entière")</b>	p
Age: [27,35]	42.37%	57.63%	
Age: [35,50]	31.94%	68.06%	
Age: [51,65]	29.32%	70.68%	
Age: >65	44.23%	55.77%	<0.001
Male	36.04%	63.96%	
Female	34.90%	65.10%	0.602



Table 3: Association between supplementary insurance and switch behaviour or intention (logistic regression)

	Has switched*		Intents to switch	
	Odds ratio	p**	Odds ratio	p**
Has a supplementary health insurance (except for "division commune Suisse entière") over the past 4 years	0.72	< 0.01	0.93	0.66

p\*\* = significance level

Table 3bis: Association between bad subjective health and several variables (logistic regression)

	Bad Health	
	Odds ratio	p**
<i>Income alone</i>		
Household Income: < 5000 Swiss Francs per month	ref	ref
Household Income: 5000 - 8000 Swiss Francs per month	0.33	< 0.001
Household Income: > 8000 Swiss Francs per month	0.21	< 0.001
<i>Supp alone</i>		
Has a supplementary health insurance (except for "division commune Suisse entière")	0.72	0.008
<i>Income and supp</i>		
Household Income: < 5000 Swiss Francs per month	ref	ref
Household Income: 5000 - 8000 Swiss Francs per month	0.33	< 0.001
Household Income: > 8000 Swiss Francs per month	0.21	< 0.001
Has a supplementary health insurance (except for "division commune Suisse entière")	0.94	0.641

p\*\* = significance level

Table 4: Decision to switch

*Explained variable: switch over the past 4 years*

	<b>Fixed effects model</b>			
	OR	p	OR	p
Age: [27,35]	1,87	<0.01	1,80	<0.01
Age: [36,50]	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Age: [51,65]	0,58	<0.01	0,60	<0.01
Age: >65	0,33	<0.01	0,34	<0.01
Urban setting	0,68	0,03	0,68	0,03
Option deductible (no ordinary deductible)	1,55	<0.01	1,53	<0.01
Difference in premium (dp)*	1,03	<0.01	1,04	<0.01
Has a supplementary health insurance**	0,72	0,02	-	-
Has a supplementary health insurance**and bad subjective health	-	-	0,54	0,04
Has a supplementary health insurance**and good subjective health	-	-	0,68	0,03
Has a supplementary health insurance**and very good subjective health	-	-	0,81	0,25

\* *dp* is the expected gained of switching defined by equation (3)

\*\* any supplementary contract (except for "division commune Suisse entière")

All explanatory variables are qualitative variables, except for *dp*

All regressions include canton dummies

Table 5: Average premium difference

	<b>Average premium difference</b>		
	All individuals	Has no supplementary insurance	Has a supplementary insurance
Has switched	15.75	19.44	13.06
Has not switched	2.21	2.37	2.13

Table 6: Decision to subscribe to a supplementary

<i>Explained variable: is covered by supplementary insurance*</i>	<b>Fixed effects model</b>	
	OR	p
Age: [27,35]	0,68	<0.01
Age: [36,50]	<i>ref</i>	<i>ref</i>
Age: [51,65]	1,33	0,03
Age: >65	0,93	0,60
Household Income: < 5000 Swiss Francs per year	<i>ref</i>	<i>ref</i>
Household Income: 5000 - 8000 Swiss Francs per year	1,89	<0.01
Household Income: > 8000 Swiss Francs per year	2,40	<0.01
Gender: male	0,70	<0.01
First cycle regular track (compulsory school)	0,44	<0.01
Second cycle regular track	1,45	0,10
Short professional track	0,89	0,54
Long professional track	1,12	0,58
University completed	<i>ref</i>	<i>ref</i>
Option deductible (no ordinary deductible)	1,30	0,01

\* any supplementary contract (except for "division commune Suisse entière")

The regression includes canton dummies

Appendix: Simple probit models and bivariate probit models explaining the probability to switch and the probability to subscribe a supplementary insurance contract.

<i>Explained variable: switch over the past 4 years</i>	Simple probit models				Bivariate probit models			
	Coef	p	Coef	p	Coef	p	Coef	p
Age: [27,35]	0,35	<0.01	0,32	<0.01	0,35	<0.01	0,33	<0.01
Age: [36,50]	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Age: [51,65]	-0,30	<0.01	-0,29	<0.01	-0,29	<0.01	-0,28	<0.01
Age: >65	-0,56	<0.01	-0,55	<0.01	-0,55	<0.01	-0,54	<0.01
Urban setting	-0,20	0,04	-0,20	0,04	-0,21	0,03	-0,20	0,04
Option deductible (no ordinary deductible)	0,23	<0.01	0,24	<0.01	0,24	<0.01	0,24	<0.01
Difference in premium (dp)*	0,02	<0.01	0,02	<0.01	0,02	<0.01	0,02	<0.01
Has a supplementary health insurance**	-0,17	0,03	-	-	-0,15	0,63	-	-
Has a supplementary health insurance**and bad subjective health	-	-	-0,31	0,05	-	-	-0,33	0,36
Has a supplementary health insurance**and good subjective health	-	-	-0,19	0,04	-	-	-0,23	0,50
Has a supplementary health insurance**and very good subjective health	-	-	-0,13	0,21	-	-	-0,15	0,66
Constant	-1,38	<0.01	-1,37	<0.01	-1,40	<0.01	-1,35	<0.01

<i>Explained variable: is covered by supplementary insurance*</i>	Coef	p	Coef	p	Coef	p
Age: [27,35]	-0,24	<0.01	-0,23	<0.01	-0,24	<0.01
Age: [36,50]	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Age: [51,65]	0,17	0,03	0,17	0,03	0,17	0,03
Age: >65	-0,04	0,64	-0,04	0,63	-0,04	0,62
Household Income: < 5000 Swiss Francs per year	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Household Income: 5000 - 8000 Swiss Francs per year	0,39	<0.01	0,39	<0.01	0,39	<0.01
Household Income: > 8000 Swiss Francs per year	0,53	<0.01	0,53	<0.01	0,53	<0.01
Gender: male	-0,22	<0.01	-0,22	<0.01	-0,21	<0.01
First cycle regular track (compulsory school)	-0,51	<0.01	-0,51	<0.01	-0,49	<0.01
Second cycle regular track	0,22	0,10	0,22	0,11	0,21	0,11
Short professional track	-0,07	0,52	-0,07	0,51	-0,07	0,50
Long professional track	0,06	0,62	0,06	0,62	0,05	0,68
University completed	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Option deductible (no ordinary deductible)	0,15	0,02	0,15	0,02	0,15	0,01
Constant	0,19	0,27	0,20	0,27	0,20	0,26

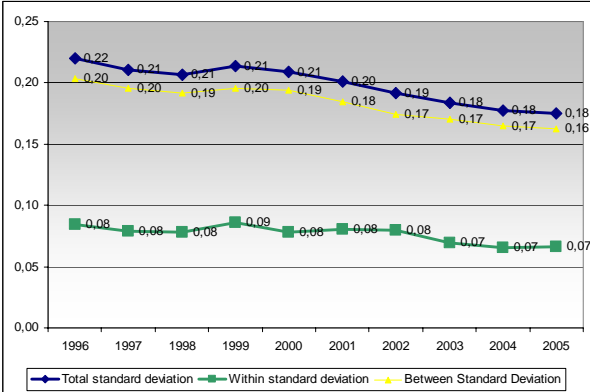
  

Rho	-0,02	0,01
Likelihood-ratio test of rho=0 (Prob > chi2)	0,94	0,94

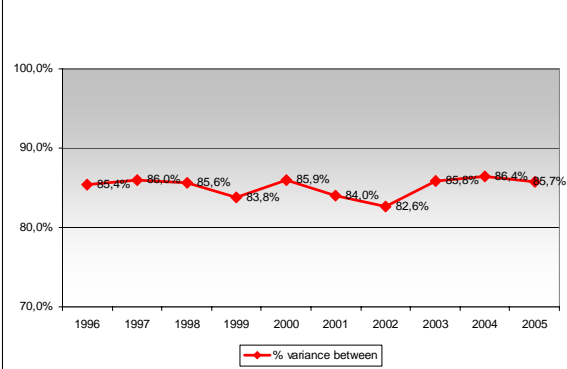
\* any supplementary contract (except for "division commune Suisse entière")

All regressions include canton dummies

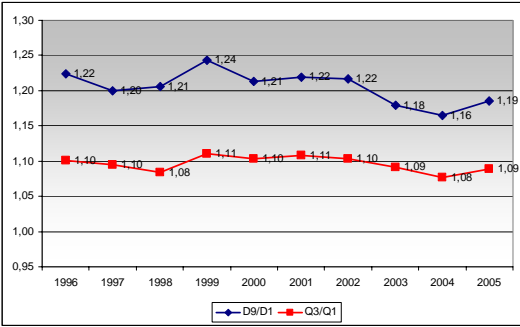
Graph 1: Evolution of the log premium variability



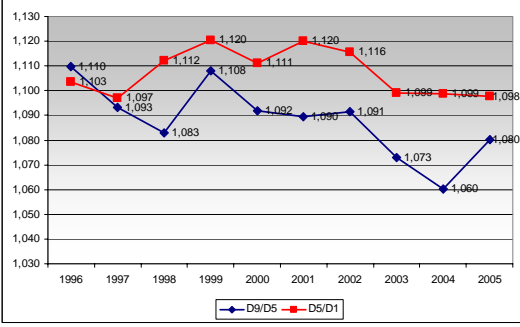
Graph 2: Share of the between cantons log premium variability



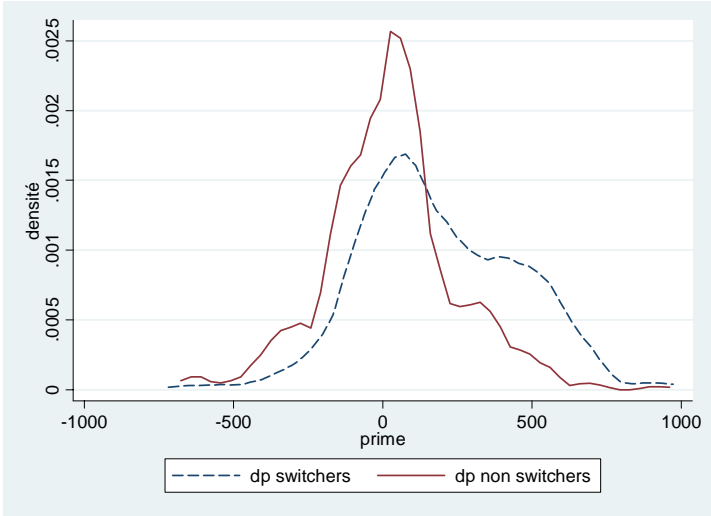
Graph 3: Ratio of D9/D1 and Q3/Q1 for premium  
(computed within cantons with a weighted average between cantons)



Graph 4: Ratio of D9/D5 and D5/D1 for premium  
(computed within cantons with a weighted average between cantons)

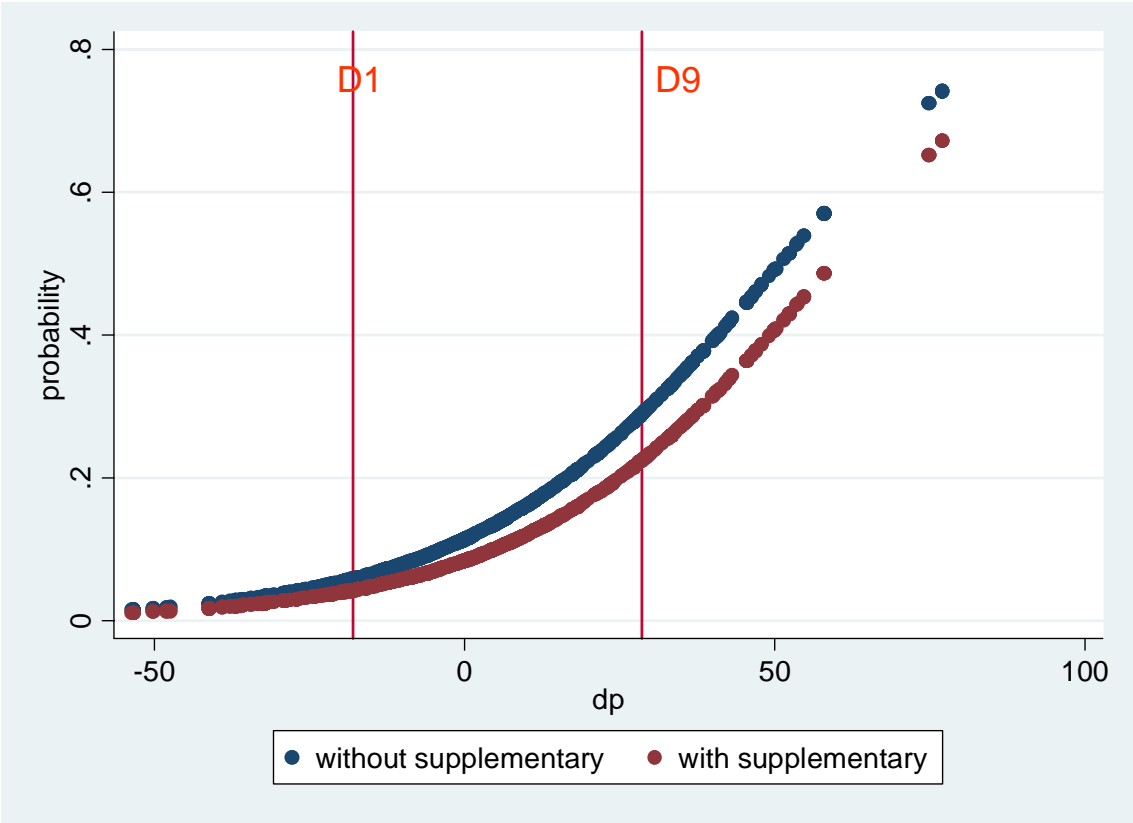


Graph 5: distribution of  $dp$  (premium difference) for switchers and non-switchers





Graph 6: Association between Probability of switching and difference in premium



D1 and D9 refer to first and ninth deciles of premium differences  $dp$ . The graph represents the switching probability functions when the individual has or has not subscribed to a supplementary insurance.