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

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Abstract

This paper focuses on the switching behaviour of enrolees in the Swiss basic 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 is limited evidence of premium convergence within cantons. This indicates that competition has not been effective so far, 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 supplementary insurance. We use survey data on health plan choice (a sample of 1,943 individuals whose switching behaviours were observed between 1997 and 2000) as well as administrative data relative to all insurance companies which operated in the 26 Swiss cantons between 1996 and 2005. The decision to switch and the decision to subscribe to a supplementary contract are jointly estimated.

Our findings show that holding a supplementary insurance contract substantially decreases the propensity to switch. However there is no negative impact of supplementary insurance on switching when the individual assesses his/her health as "very good". Our results give empirical support to one possible mechanism through which supplementary insurance might influence switching decisions: given that subscribing to basic and supplementary contracts with two different insurers may induce some administrative costs for the subscriber, holding supplementary insurance acts as a barrier to switch if customers who consider themselves "bad risks" also believe that insurers reject applications for supplementary insurance on these grounds. In comparison with previous research, our main contribution is to offer a possible explanation for consumer inertia. Our analysis illustrates how consumer choice for one's basic health plan interacts with the decision to subscribe to supplementary insurance.

Keywords: competition in health insurance, switching behaviour, premium convergence, 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 enrolee and risk-adjustment schemes have been introduced to reduce 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 can be undertaken. Characterising consumer behaviour in health insurance choice is a crucial issue when determining whether competition is effective or not. This paper focuses on the switching behaviour of sickness fund enrolees in the Swiss health insurance system.

Switzerland is an interesting 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 for basic health insurance. The main regulatory features of basic health insurance are as follows: 1) Basic health insurance is mandatory[1]; 2) A standardized basic benefit package and the level of cost sharing (deductible, coinsurance of 10% up to an annual ceiling) are defined by the law and are invariant across insurers; 3) Premiums are community-rated. That is, premiums can differ between health plans but an insurer must offer uniform premiums for people in the same age groups (0-18, 19-25, and >25), in the same geographic area (78 regions, i.e. 3 per Canton), with the same type of coverage (i.e. contracts with low/high deductible levels, contracts with a limited choice of providers); 4) Health insurers must accept every applicant. There is an open enrolment opportunity every six months (June and December) in which individuals can switch insurance providers; 5) A risk adjustment mechanism is in place.
In short, there is no competition in contracts, and private firms only compete in premiums. There is a little room for some innovation in contracts, but this is left to the supplementary insurance market, which is separated by law from that of basic insurance.

Given these features, premiums for the basic package should have converged. However, results from Swiss data do not support this: twelve years after the reform, premium variability is still quite large and has decreased only slightly. This disappointing result has given rise to several interpretations in the empirical literature (Beck et al., 2003; Colombo, 2001). It may reveal: (i) differences in service quality, (ii) inertia of consumers resulting from switching costs or (iii) risk selection practices by the insurers. Our purpose is to focus on possible interactions between basic and supplementary insurance markets. Despite the fact that it is forbidden to sell basic and supplementary insurance as a joint contract, some features of the market for supplementary insurance may induce external effects on the basic insurance market. A survey carried out by the Federal Office of Social

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[1] Note that each family member must hold an insurance contract on an individual basis. Furthermore, in Switzerland, as opposed to all other countries, health insurance cannot be provided by the employer as a fringe benefit and so the premium is fully paid by the enrollee, something which should make him/her more reactive to differences in premiums.

Insurance (OFAS, 2001) showed that 75 % of insurees had subscribed to at least one supplementary insurance contract. For 93% of these, their contracts were with the same insurer as for their basic insurance contract, suggesting that the two markets are actually not that separated. In this paper, we attempt to evaluate the influence of supplementary insurance on the choice of the basic insurance plan in Switzerland. Having supplementary insurance may raise switching costs and be used as a tool for risk selection in basic insurance. Our argument is thus connected to explanations (ii) and (iii) above.

This paper studies the decisions involved in both switching and subscribing 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 market performance and on consumer choices are provided in section 5. The econometric specification is presented in section 6 and the results in section 7. Concluding remarks and a discussion of implications are included in the final section of the paper.

2.   Health insurance choice: present state of knowledge

In Europe, many countries have recently moved away from the traditional model of social health insurance provided by a single public fund. Market-oriented reforms of social insurance systems have introduced the possibility for individuals or firms to choose between several public or private insurers. Competition is assumed to put insurance providers under consumer pressure, and to generate incentives to increase quality and/or decrease premiums. However, as for any market, competition works only if the threat of consumers to "vote with their feet" is credible, i.e. if enough consumers switch to more efficient insurers.

Hence, many empirical papers have studied consumer switching behaviour, and attempted to identify the barriers to such behaviour. Two main questions are asked in this literature, depending on the country under scrutiny and on the available data. In some countries, insurance firms offer various plans with different characteristics. This is in particular the case with Managed Care in the US, where insurance funds may offer access to different health care providers, and the contractual relationship between insurance firms and providers may vary from one fund to another. In such contexts, from the consumer point of view, contracts are different, and the empirical issue is to understand the impact of different contract characteristics on the choice of plan. In other countries, competition is restricted to identical contracts. For perfectly substitutable goods, cross price elasticity should be infinite, but the fact that some consumers still choose to buy or renew more expensive contracts reveals imperfect information about the distribution of prices or a status quo bias. In such contexts, the empirical issue is to estimate the price elasticity: lower price elasticity indicates that switching costs are larger. However, the distinction between these two polar cases is not always perfectly clear: in many countries, the health insurance system is made of two layers - social insurance which covers "basic" health care, and supplementary insurance which covers additional goods and services (see, e.g., OECD, 2004). The supplementary insurance market may indeed affect individual decisions about social insurance cover, especially switching decisions and health plan choice.

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Several papers have attempted to compare consumer behaviour in different countries where health plan choice is possible. For example, Laske-Alderhof et al. (2004) indicate that switching rates are higher 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 and Switzerland than in the three other countries. Third, the insurance market seems more competitive in Germany and Switzerland. This is due to the fact that the level of market concentration is relatively low, and there are no barriers to entry. Schut et al. (2003) also show that the propensity to switch was much larger in Germany than in the Netherlands (before the 2006 Dutch reform). This may be explained by the more active role of German employers, who contribute significantly to employees' premiums and act as collective buyers of health insurance. In contrast, in the Netherlands before 2006, the choice of fund entirely depended on the individual, but 90% of the premium was paid by a central fund. The small monetary gain for someone switching to a less expensive fund was not sufficient to compensate for the transaction costs. Interestingly, the 2006 reform raised the share of premium directly paid by individuals to 50%, and seems to have led to a substantial increase in the rate of consumers switching (Douven et al., 2007).

The analysis of switching behaviour has also provided interesting results as to the characteristics of consumers who are more likely to switch. This behaviour may be affected by elements of the demand side as well as reactions on the supply side in terms of direct or indirect risk selection by insurance funds. A result common to many papers is the higher propensity of young, healthy and highly educated individuals to switch companies. As noted by Strombom et al. (2002), this finding means that companies with higher prices than their competitors will not only lose market share, but will experience an increase in costs due to adverse retention. Analysing data from the German Socio-Economic Panel, Nuscheler and Knaus (2005) find no evidence of selection by funds, and stress the importance of switching costs, which are larger for individuals with poor health.

Characteristics of insurance plans have also been shown to affect health plan choice and switching behaviour. Differences in premium matter for health plan choice and switching, but the literature has failed to reach a consensus as to the magnitude of premium elasticity. Empirical estimates range from –8.4 to –0.1 (Schut et al., 2003; Laske-Aldershof and Schut, 2003; Buchmueller, 2000 ; Buchmueller and Feldstein, 1997 ; Royalty and Solomon, 1999). More recently, Tamm *et al.* (2007) showed that short-run price elasticities in Germany are smaller than those previously found in other studies. In the long run, however, their estimates provide evidence of substantial price effects.

One important issue offered to insurance companies in managed competition settings is the possibility to selectively contract with health care providers. Choosing a health plan gives the consumer access to a specific provider network, with a given quality of care. Beyond the role of price elasticities, many papers have tried recently to evaluate the impact of quality of care on switching behaviour. 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. This may provide an explanation as to why switching costs may be larger for patients with poorer health.

Another key issue is the potential interaction between basic and supplementary insurance choice. This issue seems to be of particular relevance in the Dutch system. Schut et al. (2003) and Laske-Aldershof and Schut (2003) explain the inertia of Dutch consumers by the magnitude of switching costs in comparison to the relatively small expected gains. However, this result can be interpreted quite differently and has to be examined more thoroughly. As stated by Laske-Aldershof and Schut (2003), 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: in fact compulsory and supplementary insurance are tied together 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.

In Switzerland, basic insurance contracts are standardised, and therefore are perfectly substitutable. Managed care is very limited: less than 10% of enrolees have chosen an HMO style option. The others have unlimited access to all care providers. Therefore, quality of care or loyalty towards a preferred family doctor cannot induce barriers to switching. However, health insurance firms may also offer supplementary insurance contracts, and the market for such contracts is substantially less regulated: in particular, contracts may cover various sets of goods and services, premiums may depend on health status, firms can select risks, and individuals may choose not to subscribe to any supplementary insurance contract. Examples of supplementary insurance contracts include: the coverage of the extra costs of a single-bed room in case of hospitalisation; the reimbursement of alternative medicine; dental care insurance; the possibility to be hospitalised anywhere in Switzerland; etc. Overall, of total health expenditures, basic health insurance accounts for 34%, out-of-pocket payments account for 31% and supplementary health insurance for the significant share of 9% (OFS, 2007).

One report carried out by OFAS in 2001 stresses that only a minority of households had switched from their basic health sickness fund after the introduction of LAMal. However, there is a switch potential because 50% of households complained 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.

Using market share aggregate data, Beck et al. (2003) estimate a premium elasticity in the range between −2.1 and −1.0, which is smaller than the German estimates, but larger than estimates from the Netherlands. Beck et al. (2003) consider that switching costs are negligible. However, Beck et al (2003) argue that most switching occurs within insurance funds belonging to the same group. They point out the poor performance of existing risk adjustment mechanisms in reducing risk selection incentives.

Colombo (2001) analyses data from the 2000 OFAS survey, and puts the stress on consumer inertia: annual switching percentages are very low and seemed to decrease steadily from 5.4% in 1998 to 2.1% in 2000.

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The OFAS survey also indicates that many customers were even unaware that they could purchase basic and supplementary insurance contracts from two different funds. The bottom line is that only 7% of Swiss residents who subscribed to a supplementary insurance contract did so with an insurer different from their basic insurance one. 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 with the same fund. Moreover, many people complain that reimbursement delays deteriorated after they separated basic and supplementary health insurance into two different sickness funds. According to Colombo (2001), "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 are successful in linking basic and supplementary health insurance.

This intuition is confirmed by Paolucci et al. (2007), who examine the role of supplementary health insurance as a potential tool for risk-selection in five countries. Based on the institutional comparison of regulatory settings concerning health insurance markets, they conclude that supplementary health insurance may be a selection tool in Switzerland.

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 was to evaluate the influence of supplementary health insurance on switching behaviour in Switzerland.

3.   How supplementary insurance may affect the decision to switch

As stated above contracts for basic insurance are standardized in Switzerland. Moreover, 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 in gathering information about price differences. To analyse the interaction between basic and supplementary insurance, we have to consider two characteristics of the Swiss health insurance market. Firstly, subscribing basic and supplementary contracts with two different insurers may induce some administrative costs for the subscriber, such as sending separate bills, etc (Colombo, 2001). Secondly, 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 as for example the new insurer may offer a different contract or require some medical examination before accepting a new customer. These characteristics can be summarized as follows:

- (i) Additional cost when basic and supplementary contracts are subscribed to different companies.
- (ii) Risk selection authorized for supplementary insurance

Given this framework, supplementary insurance may affect the decision to switch in four 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.[2]

(b) The second mechanism refers to selection practice on the supplementary insurance market, and to consumer beliefs about the existence of such a policy. Take for example a customer who thinks that he/she is a "bad risk" and believes that insurers reject applications for supplementary insurance contracts from individuals considered as such. Having a supplementary insurance contract would then act as a barrier for him/her to switch basic insurance. Indeed, after the switch for basic insurance more costs might be incurred, if the new insurer rejected the application for the supplementary contract or proposed an unacceptable offer (very high premiums for example). These beliefs may lead to an equilibrium in which individuals with poor health do not even try to switch, and so insurers do not even have to select risks: this mechanism is based on consumer beliefs about selection practice. To validate such an interpretation, we have to check whether the influence of supplementary insurance on switching propensity depends on the level of self-assessed health. Finding that the effect of holding a supplementary insurance contract on the probability of switching depends on the level of self-assessed health (i.e. no effect when health is perceived as good, negative effect when it is perceived as poor) would provide empirical support to this interpretation.

The third and fourth mechanisms refer to the use of supplementary insurance as a tool to select risks in basic health insurance markets. Insurers would retain enrolees who hold supplementary contracts and drop the others.[3] Two possibilities might explain such selection behaviour based on supplementary insurance.

(c) The first is simply based on the fact that regulation for supplementary insurance is less constraining. Lack of contract standardisation may lead to less severe pressure from competition, and positive profits could be made from selling supplementary insurance contracts. In this context, profit-maximising insurers would have an incentive to retain supplementary contract purchasers. The empirically testable consequence of this hypothesis is simple: if supplementary contracts are profitable for all levels of health, the effect of supplementary contracts on switching rates should be independent of the individual's self-assessed health.

(d) A second explanation relies on the assumption that holding a supplementary insurance contract might be correlated with being a good risk vis-à-vis basic insurance, i.e. having a lower basic health care consumption for a given illness. This conjecture might be relevant for supplementary insurance covering alternative medicine: individuals who subscribe to such contracts may be more reluctant to consume "standard" health care, especially drugs, covered by the basic insurance. It might also be true for other kinds of supplementary contracts, which

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[2] Notice that the paperwork associated with subscription to a supplementary insurance contract is the same whatever the health condition (same quantity of papers to fill in, same clinical examinations to undergo).
[3] In Switzerland, the risk adjustment scheme is based on age and gender only. There remain strong incentives to risk selection.

could indicate a greater attention to health and prevention. An insurance company can observe the use of health services of its enrolees, but the econometrician cannot: we only observe self-assessed health. If we suppose that supplementary insurance indicates that the individual is a good risk, then finding that individuals with supplementary insurance and/or good health are less likely to switch, would in turn reveal that sickness funds try and succeed in retaining good risks.

Given the prohibition of risk selection in the Swiss market for basic insurance, interpretations (c) and (d) raise the question of the indirect tools available to the insurers to retain some of their enrolees. A recent individual example illustrates how it works. An insurance company which operates both on the basic and supplementary markets sent the following letter to an enrolee holding a basic contract: *"In order to thank you for being insured with us, we are pleased to offer three special discount offers. 1. Sun glasses for CHF 5 (instead of CHF 49.90). 2. A certified ski helmet for CHF 20 (instead of CHF 89.90). 3. Free hospitalization (two-bed room) coverage if you insure with our supplementary insurance for a minimal period of 3 years* (translation of a mail received from insurance company X, Switzerland, 12 September 2007). The enrolee who received this mail had no health care consumption during the preceding year, and anecdotal evidence regularly reported in newspapers suggests that this is not an isolated phenomenon. Such commercial practices are a good example of some strategies that insurance companies can develop to retain good risks.

4. Data

We use two sources of data, the OFAS survey (2001) and information recorded at the cantonal level.

The OFAS survey

The *OFAS* survey 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 of 2000. As premiums were set differently for people aged 18-26, we selected individuals older than 26, leading to a sample of 1, 943 individuals. Extensive information was 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 basic and supplementary health insurance packages 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 during the previous four years (1997- 2000) and whether they had changed any of their health insurance contracts. Information about one's intention to switch in the future as well as general satisfaction towards insurance coverage was also collected. Knowledge, beliefs and attitudes towards LAMal were investigated.

The survey records the household's income as a categorical variable with 11 categories. We aggregated this information into three categories defined on the basis of the observed income distribution (see Table 1 below): income lower than 5,000 CHF (i.e. 3,300 €), income between 5,000 and 8,000 CHF and income higher than 8,000 CHF (i.e. 5,280 €). The threshold for the lowest category might appear to be rather high but it is representative of Swiss income distribution. Information about household income was missing for 367 individuals. We checked that the recording of income was not significantly connected with the probability of switching (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.

Unfortunately, the OFAS survey does not provide individual information about health expenditures, nor about the premiums paid for supplementary health insurance contracts. Moreover, it is a cross-section.

The cantonal database

We constructed a second database based on the insurance companies which operated in the 26 Swiss cantons from 1996 to 2005. For each company within each canton, yearly information was recorded about the number of enrolees and the level of premium requested for each deductible level. Our source of information was the Federal Office for Public Health (OFSP), who provided the number of enrolees directly to us. Yearly premiums are available on the OFSP website.

This second database, hereafter called the "cantonal database", is made of 12,423 observations. Each observation relates to one insurance company observed in a given year in a given canton.

5.   Descriptive analysis

5.1. Did competition induce a decrease in premium variability?

Price competition for homogenous contracts should induce a reduction in premium differences. However, the empirical results obtained from the cantonal database did not support this prediction.

In the cantonal database, information relative to premiums was recorded at three levels: sickness fund, canton and year. For any given year, the double dimension of the data allows us to decompose changes in the premium variability, into changes in the between-canton variability and changes in the within-canton variability.

With $p_{j,c,t}$ denoting the premium paid for the basic insurance supplied by a 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. The between-canton premium variance, denoted by $V(p_{.,c,t})$ for each year is equal to the variance of the average premiums per canton. It captures only differences between cantons. $V(p_{j,c,t} - p_{.,c,t})$ is the within-canton premium variance. 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 $Log(p_{j,c,t})$. We used the log transformation in order that changes in premium variability would not be affected by premium increase over time. Weighted indicators were computed to take the number of enrolees per sickness funds into account. The value of the overall standard deviation decreases 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, competition takes place within the framework of each canton: within-canton standard deviation only can be affected by competition pressure. Graph 1 shows a very slight decrease in the within-canton standard deviation. Premium convergence within cantons appears to be very limited.

The proportion of overall variability due to average differences in premiums between cantons is sizeable with more than 80% due to average differences between cantons[4]. 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 2 displays the annual values of the ratio of the ninth decile to the median of the premium distribution. The ratio is computed for each canton, and an average is then calculated, weighting cantonal ratios by the number of enrolees in each canton. The same computation is implemented for the ratio of the median to first decile of the premium. Graph 2 makes it possible to examine more closely the very small reduction that we observed on the within-canton variability. It reveals that the dispersion is equal at the top and at the bottom of the distribution at the beginning of the period, and then falls at the top of the distribution (D9/D5), suggesting that for the highest premiums there is some competition pressure. However, the observed changes are very small. On the whole, there is no sizeable decrease in premium variability which suggests that competition does not seem to be effective.

5.2 The individual level: basic features of the data

Basic features of the information provided by the OFAS survey are given in Table 1. During the period 1997-2000, 14.3% of individuals older than 26 switched from one sickness fund to another. In 2000, 9.5% were considering switching. A supplementary insurance contract of any kind was subscribed to by 74.8% of enrolees. In Switzerland, an individual may subscribe to several contracts for supplementary insurance covering for example dental care, first and second class treatments in hospitals, cross-border care, alternative medicine, sick-leave payments, etc. There is also a very simple supplementary contract entitled the "Division commune Suisse entière", which extends 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 this kind of supplementary contract, the proportion of enrolees covered by a supplementary insurance falls to 64.6%.

More than one third of individuals belong to the lowest income category, while the highest category covers less than a quarter of individuals. Premiums are community rated within each insurance company in a given canton. However, a state subsidy fixed at the canton level assists people on low incomes to pay their premium. The generosity of this subsidy and the eligibility criteria vary between cantons: on the whole, 23 % of the respondents benefitted from such a subsidy. At the time of the survey, subsidies were provided by the canton authority independently of the fund chosen. Hence, switching was not more costly for those who benefitted from subsidies.

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[4] We computed the ratio of between-canton to overall variance of the log of premiums.

Table 2 shows that while subscription to supplementary insurance is not significantly linked to gender it is to age: people aged 35-65 are more likely to subscribe to a supplementary insurance contract (excluding "Division commune Suisse entière" contracts).

Table 3 shows that subscribing to supplementary insurance is negatively associated with the propensity to switch: the probability of switching is one third lower (odds ratio significant and equal to 72 %) when the individual has 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 depends on age group and supplementary insurance status. Younger people exhibit a high switching propensity, whatever their supplementary insurance status. This is not the case for older people as their switching propensity decreases with age and is reduced if they have supplementary coverage.

Health status was measured by the individual's self assessed health, which was recorded on a five point scale collapsed into three categories: Poor, Good and Very good health. Table 1 shows that about 17 % of individuals graded their health as Poor and 35 % as Very good. Income level was strongly related to self-assessed health, with those better off having better health (Table 3bis). The magnitude of this influence is startling: the probability of having poor health decreases by two-thirds for people earning an income in the intermediate category. For those belonging to the high income category, the probability of having poor health is divided by a factor of five, in comparison with those on low-incomes. There is an apparent connection between subscription to supplementary insurance and having good health (Table 3bis). But this impact is no longer robust after multivariate analysis. This indicates that it is entirely due to the influence of income on supplementary insurance: when incorporating both supplementary insurance and income in the logistic model, we found that the correlation between supplementary insurance and health status is no longer significant.

6.   Econometric specification and estimation

Specifications

To investigate the decision to switch health plans we consider a binary variable y_i defined by $y_i = 1$ if the individual switched and $y_i = 0$ when he/she did not switch. The benefit of switching can be modelized as a latent variable y_i^* defined by $y_i^* = x_i'\beta + g_i\eta + s_i\gamma + \varepsilon_i$, where x_i' is a vector of individual characteristics, g_i is the monetary gain of switching and s_i is a dummy variable indicating whether the individual had subscribed to supplementary insurance. A difficulty arises from the fact that we cannot build a relevant measure for the monetary gain to switch g_i. Given that we do not observe the insurance company which the switcher comes from, we can only construct a proxy that evaluates the expected gain of switching for switchers and non-switchers. As explained below, this proxy is likely to induce simultaneity biases and it is preferable to simply omit this variable in the estimated specification. Hence, we consider:

$$y_i^* = x_i'\beta + s_i\gamma + u_i \,, \qquad (1)$$

where u_i is a disturbance supposed to follow a normal distribution. The decision to switch is given by:

$$y_i = 1 \ if \ y_i^* \geq 0. \qquad (2)$$

We also specify a model explaining the decision to subscribe to at least one supplementary insurance contract[5]. The benefit of subscribing is specified as a latent variable s_i^* defined by:

$$s_i^* = z_i'\alpha + v_i \,, \qquad (3)$$

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

$$s_i = 1 \ if \ s_i^* \geq 0. \qquad (4)$$

Is subscription to supplementary insurance exogenous to the decision to switch?

A separate estimation of equations (1) and (3) would lead to biased estimates if their disturbances are correlated. The disturbances u_i and v_i would be correlated if both were influenced by unobserved variables such as the individual's risk aversion or health status. However, regulation in the basic insurance market, especially contract standardisation, is likely to eliminate any influence of risk aversion or health status on the decision to switch. This equation has nothing to do with demand for insurance, given that basic insurance is mandatory. These components of the individual unobserved heterogeneity might therefore affect only v_i.

Equations (1) and (3) define a two equation model known as a bivariate recursive model (Maddala, 1983). If u_i and v_i are not independent, one has to use a maximum likelihood estimator, where the likelihood derives from the joint distribution of (s_i, y_i). Conversely, if u_i and v_i are not correlated, both equations can be estimated separately.

The conditions for identification of this model were met. Several instruments explaining the decision to subscribe to supplementary insurance were excluded from the decision to switch: gender, income in three categories and education in five categories were not significant in the switching equation. Moreover, a Sargan test performed on the corresponding linear probability model led to a non rejection of the null hypothesis that these instruments are valid, i.e. uncorrelated with u_i ($p = 0.910$)[6].

In what follows, we present the results of the estimation of the bivariate probit model and of separate estimations of models (1) and (3). The joint estimation of the bivariate model led to a non significant correlation coefficient ρ between u_i and v_i, justifying a separate estimation. This conclusion is supported by a Hausman test run on the corresponding linear probability model to examine whether s_i is an exogenous variable in the model explaining

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[5] Excluding "Division commune Suisse entière" contracts
[6] The Sargan test was performed on the linear probability model corresponding to specification entitled (III) (see Tables 4 and 5)

the decision to switch. This test led to the conclusion that the exogeneity of s_i cannot be rejected (significance level $p = 0.509$)[7].

The difficulty in measuring the monetary gain of switching

As stated above, we constructed a proxy to capture the monetary gain of switching to a lower premium for basic insurance. An important difficulty arises from the fact that we did not observe the insurance company which the switcher came from. The premium that he or she paid before the decision to switch would have been the appropriate explanatory variable for the switching decision. However, this information was not available. We therefore constructed a proxy based on the value of the premium paid to the enrolee's insurance company at the time of the study. To do this, we considered the premiums p observed for each deductible level in the cantonal database, adjusted for inflation in the basic health insurance sector. The monetary gain of switching for an individual i who comes from sickness fund k and switches to fund j is equal to $p_{ik} - p_{ij}$ and is based on the premiums related to the year of the switch. Given that we did not observe k, we constructed a variable for those who switched which evaluated the expected switching gain. This is defined as follows:

$$(dp)_i = E\left[p_{ik} - p_{ij}\middle|k \neq j\right] = \sum_{k \neq j}\left[(p_{ik} - p_{ij})(\frac{n_k}{\sum_{k \neq j} n_k})\right] \qquad (5)$$

where n_k is the number of enrolees of sickness fund k during the year preceding the switch. This definition relies on the assumption that the probability of i coming 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 not chosen randomly. For non switchers dp_i is computed as the mean value of the monetary gains of switching over the four previous years.

For switchers, dp_i is a measure of the ex post gain, which is not the appropriate variable to explain the decision to switch. If it were introduced in the equation explaining the decision to switch, dp_i would be non exogenous. Straightforward algebra shows that the corresponding simultaneity bias would be positive: the elasticity of the switching decision with respect to the monetary gain of switching would therefore be overestimated. Unfortunately, no relevant instrument is available to solve this simultaneity problem. Hence, it seemed preferable to us to simply omit this proxy from equation (1). Nevertheless, to control for the robustness of our main result concerning the influence of supplementary insurance on the switching propensity, we included dp_i in one version of the estimated models (specification *IV* in Tables 4 and 5): the resulting estimates were not affected.

7.   Results

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[7] The test was run on specification (III) in Table 5

The bivariate model and equations (1) and (3) were estimated with and without canton fixed effects to deal with the unobserved heterogeneity between cantons. The results were qualitatively the same (detailed results are available upon request). Therefore we only reported those results based on the canton fixed-effects models.

The estimations of the single and bivariate probit models are displayed in Tables 4 and 5. As stated above, the estimations of the bivariate model show that the correlation of the disturbances between both equations is not significant. Hence, we concentrated on the single equation results.[8]

Four specifications were considered for an individual's decision to switch: with supplementary insurance included as a plain covariate (I), with the addition of the subjective health status (II), with supplementary insurance interacting with subjective health status (III) and finally with the proxy *dp* (IV).

We found that the probability of switching continuously decreases with age. This result is consistent with the empirical literature on switching behaviour reviewed in section 2. Younger people (27-35) have a higher probability of switching than the reference age group (35-50) whereas older people (>65) have a lower probability. Choosing a deductible level higher than the basic one is also associated with a significantly higher propensity to switch. To investigate whether the impact of supplementary insurance could vary with age, we estimated the same model with cross effects of age group with the supplementary insurance dummy. This specification led to a loss in precision yielding many non significant coefficients.

Our results show that having subscribed to supplementary insurance has a significant negative impact on switching (Table 4, specifications I and II). Specification III allows the impact of supplementary insurance to vary in relation to the subscriber's self-assessed health. The estimates show that supplementary insurance has no significant effect on switching when the enrolee's self-assessed health is "very good". Instead, for those having supplementary insurance with only "poor" or "good" self-assessed health, the likelihood of switching decreases when subjective health status deteriorates.

These results support mechanism (*b*). They are consistent with expectations from enrolees that switching may be more difficult for supplementary contracts due to risk selection on the supplementary insurance markets. Notice that this significant cross-effect does not pick up a direct effect of self-assessed health on the propensity to switch. The results of model (II) (Table 4) show that self-assessed health, when introduced separately, does not have a significant effect on switching as suggested both by the individual p-values and the Wald test evaluating whether the coefficients of "Good" and "Very Good" health are jointly equal to zero.

These results rule out the other potential mechanisms that were proposed in section 3 to describe how supplementary insurance might affect the decision to switch. Indeed, under assumptions *a* and *c*, the effect of supplementary contracts on switching rates should be independent of an individual's self-assessed health. We

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[8] The bivariate probit results exhibit one difference from those of the single equation: 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 are of the same magnitude as those of the single equation estimates. This is true for the supplementary insurance variable and the interaction terms between supplementary coverage and health status. Only the precision of the estimates deteriorates greatly in the bivariate estimations: the instruments that we use to explain the subscription to a supplementary contract lead to a loss of information.

find that the three cross effects are significantly different (see the Wald tests implemented on specification III). Under assumption *d*, a very good health status should reduce the propensity to switch or increase, in absolute value, the negative effect of holding supplementary insurance. Our findings reject such predictions: self-assessed health is not significant when introduced alone, and the negative effect of holding supplementary insurance is lower when self-assessed health improves. For, poor, good and very good self-assessed health, the estimated cross effect of supplementary insurance is equal to -0.35, -0.21 and -0.15 respectively (this latter coefficient being non significant).

Finally, our results do not support the assumption that supplementary insurance is a tool for selection on the basic insurance market. Instead they suggest that barriers to switching are mainly linked to selection in the supplementary insurance market.

The bottoms of Tables 4 and 5 display the results relative to the decision to subscribe to a supplementary insurance contract. They show that this decision is not a monotonic function of age, as the probability of subscribing increases with age until the category 51-65. It then decreases for people older than 65. Descriptive statistics have shown that poor health has a negative influence on the subscription to a supplementary insurance contract. Low income is however strongly correlated with poor health status (Table 3bis). In fact all the information about health is captured by income: the influence of self-assessed health on supplementary insurance is no longer significant when income and education are introduced as covariates. Therefore the results exhibited in Tables 4 and 5 do not include health status as a covariate.

We found a significant and positive influence of the income level on the propensity to take out supplementary insurance. This result seems to be at odds with a standard assumption in insurance theory that absolute risk aversion decreases with income, which would make insurance contracts an inferior good (Eeckoudt, Gollier and Schlesinger, 2005). However, health insurance covers the costs associated with ex post consumption of some health care goods (this holds for basic insurance as well as for supplementary insurance). Therefore, if some such goods (e.g. a private room at the hospital) are (ex post) superior goods, the willingness to pay for an insurance contract which would cover the cost of these goods could well (ex ante) increase with income. Quite interestingly, we find that for basic insurance contracts the level of deductibles chosen increases with income. This empirical finding is in line with the decreasing absolute risk aversion assumption[9]: richer individuals are more willing to self-insure a substantial share of this risk. In the end, income has opposite effects on the demand for basic and supplementary insurance. Rather than a risk aversion effect, this result suggests that the ex post demand for goods covered by these two types of insurance are strikingly different in terms of income effects.

8.   Conclusion

A better understanding of the effectiveness of competition in the 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

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[9] Results available upon request and are not published here. Studying the demand for basic insurance is outside the scope of this study.

from the less efficient to more efficient funds. Potential barriers to switching may explain the persistence of inefficiencies.

In Switzerland, the introduction of a managed competition scheme for basic health insurance has failed to reduce the premium variability: within cantons, the premium variability appears to have been stable between 1996 and 2005. This finding raises the question of the effectiveness of competition in Switzerland for the basic health insurance market.

In this paper we investigated one of the potential barriers to switching, namely supplementary insurance. Two key features characterize the Swiss markets for basic and supplementary health insurance: first, the customer incurs additional costs when he/she holds basic and supplementary insurance contracts with different companies; second, risk pricing and risk selection are authorized for supplementary insurance. Given this framework, holding supplementary insurance might limit the decision to switch through various possible mechanisms: switching costs, risk selection practices in supplementary markets and risk selections practices in basic health insurance markets. Our empirical findings suggest that the main mechanisms at work rely on customer beliefs regarding selection practices in supplementary markets: if the customer thinks he/she is a bad risk and believes that insurers reject applications for supplementary contracts from individuals considered as such, he/she might refrain from switching, even for basic insurance.

Hence, in comparison with previous research, one main contribution of our research is to offer some possible mechanisms for consumer inertia. Our analysis illustrates that consumer choices for basic and supplementary health plans are not independent. Even though basic insurance and supplementary insurance are regulated by two different laws and supervised by two different institutions, both markets turn out to be closely tied in Switzerland, as insurance companies are allowed to operate in both markets. Managed competition in the basic insurance market may suffer from the lack of adequate regulation in the market for supplementary insurance. The two main policy options are either to separate these two markets more effectively, or to regulate the supplementary insurance market differently, in particular preventing risk selection.

Our analysis deserves further investigation. Additional research is required to compute monetary gains of switching. The variable we used to calculate the benefit from switching may introduce endogeneity biases, and our analysis may overestimate the impact of premiums in the switching decision. It would be interesting to provide an assessment of the respective influences on the probability of switching, of supplementary insurance and expected gains of switching. This might help us understand whether the barriers to switching induced by supplementary insurance are large enough to explain the lack of premium convergence. Ongoing research based on new data providing more information on switcher trajectories will make it possible for us to improve our understanding of competition in the Swiss basic and supplementary health insurance markets.

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Table 1: Descriptive statistics

	% (n=1840)
Age: [27,35]	18.13
Age: [35,50]	36.87
Age: [51,65]	26.37
Age: >65	18.64
Househod 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 insurance 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
Poor subjective health	16.92
Good subjective health	48.05
Very good subjective health status	35.03
Having lowest (ordinary) deductible	56.48
Having any supplementary health insurance	74.81
Having supplementary health insurance (excluding "division commune Suisse entière" contracts)	64.57
Switched contracts between 1996 and 2000	14.34
Intent to switch in 2001	9.58

Source: OFAS survey data

Table 2: Association between age, gender and supplementary insurance

	No supplementary insurance	Supplementary insurance (excluding "division commune Suisse entière" contracts)	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 switching behaviour or intention (logistic regression)

	Switched*		Intention to switch	
	Odds ratio	p**	Odds ratio	p**
Has supplementary health insurance (excluding'division commune Suisse entière contracts)	0.72	< 0.01	0.93	0.66

*during the previous 4 years
p** = significance level

Table 3bis: Association between poor self assessed health and several variables (logistic regression)

	Poor Health	
	Odds ratio	p**
Income alone		
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
Supp alone		
Has supplementary health insurance (excluding "division commune Suisse entière" contracts)	0.72	0.008
Income and supp		
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 (excluding "division commune Suisse entière")	0.94	0.641

p** = significance level

Table 4: Simple probit models explaining the probability of switching and the probability of subscribing to a supplementary insurance contract

	(I)		(II)		(III)		(IV)	
Explained variable: switch during the previous 4 years	Coef	p	Coef	p	Coef	p	Coef	p
Age: [27,35]	0.35	<0.01	0.33	<0.01	0.33	<0.01	0.32	<0.01
Age: [36,50]	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*	*ref*
Age: [51,65]	-0.20	0.04	-0.19	0.05	-0.19	0.05	-0.29	0.01
Age: >65	-0.44	<0.01	-0.42	<0.01	-0.42	<0.01	-0.55	<0.01
Urban setting	-0.20	0.04	-0.20	0.04	-0.20	0.04	-0.20	0.04
Option deductible (no ordinary deductible)	0.27	<0.01	0.27	<0.01	0.27	<0.01	0.24	<0.01
Supplementary health insurance*	-0.19	0.01	-0.21	0.01	-	-	-	-
Poor subjective health	-	-	*ref*	*ref*			-	-
Good subjective health	-	-	0.08[1]	0.50			-	-
Very good subjective health	-	-	0.10[2]	0.40			-	-
(Supplementary health insurance*) and (Poor subjective health)	-	-	-	-	-0.35[3]	0.02	-0.31	0.05
(Supplementary health insurance*) and Good subjective health)	-	-	-	-	-0.21[4]	0.02	-0.19	0.04
(Supplementary health insurance*) and (Very good subjective health)	-	-	-	-	-0.15[5]	0.12	-0.13	0.21
Expected gain of switching dp	-	-	-	-	-	-	0.02	<0.01
Constant	-1.40	<0.01	-1.46	<0.01	-1.39	<0.01	-1.37	<0.01
n	1840		1840		1840		1840	
Loglikelihood	-734.23		-731.00		-730.58		-681.65	

	(i)'	
Explained variable: Individual is covered by supplementary insurance *	Coef	p
Age: [27,35]	-0.24	0.01
Age: [36,50]	*ref*	*ref*
Age: [51,65]	0.17	0.03
Age: >65	-0.04	0.64
Household Income: < 5000 Swiss Francs per year	*ref*	*ref*
Household Income: 5000 - 8000 Swiss Francs per year	0.39	<0.01
Household Income: > 8000 Swiss Francs per year	0.53	<0.01
Gender: male	-0.22	<0.01
First cycle regular track (compulsory school)	*ref*	*ref*
Second cycle regular track	0.44	<0.01
Short professional track	0.73	<0.01
Long professional track	0.57	<0.01
University completed	0.51	<0.01
Option deductible (no ordinary deductible)	0.15	0.02
Constant	-0.32	0.05
n	1840	
Loglikelihood	-1168.79	

*Individual has a supplementary contract   (excluding "division commune Suisse entière ")

All regressions include canton dummies

[12] Wald test of H_0: the coefficients of "Good" and "Very good" subjective health are jointly equal to 0: **p=0.76**

[345] Wald test of H'_0: the coefficients of the three cross-effects are equal; **p=0.04**

[34] Wald test of H''_0: the coefficients of the two first cross-effects are equal; **p=0.01**

Table 5: Bivariate probit models explaining the probability of switching and the probability of subscribing to a supplementary insurance contract

| | Bivariate probit models | | | | | | | |
| | (i) | | (ii) | | (iii) | | (iv) | |
Explained variable: switch during the previous 4 years	Coef	p	Coef	p	Coef	p	Coef	p
Age: [27,35]	0.34	<0.01	0.31	<0.01	0.31	<0.01	0.33	<0.01
Age: [36,50]	ref	ref	ref	ref	ref	ref	ref	ref
Age: [51,65]	-0.19	0.05	-0.18	0.08	-0.18	0.08	-0.28	<0.01
Age: >65	-0.45	<0.01	-0.43	<0.01	-0.44	<0.01	-0.54	<0.01
Urban setting	-0.21	0.03	-0.20	0.04	-0.20	0.04	-0.20	0.04
Option deductible (no ordinary deductible)	0.28	<0.01	0.29	<0.01	0.29	<0.01	0.24	<0.01
Supplementary health insurance*	-0.35	0.27	-0.44	0.18	-	-	0.02	<0.01
Poor subjective health	-	-	ref	ref	-	-	-	-
Good subjective health	-	-	0.08	0.47	-	-	-	-
Very good subjective health	-	-	0.12	0.34	-	-	-	-
(Supplementary health insurance*) and (Bad subjective health)	-	-	-	-	-0.56	0.11	-0.33	0.36
(Supplementary health insurance*) and (Good subjective health)	-	-	-	-	-0.43	0.19	-0.23	0.50
(Supplementary health insurance*) and Very good subjective health)	-	-	-	-	-0.36	0.27	-0.15	0.66
Expected gain of switching dp	-	-	-	-			0.02	<0.01
Constant	-1.29	<0.01	-1.31	<0.01	-1.24	<0.01	-1.35	<0.01

| | (i) | | (ii) | | (iii) | | (iv) | |
*Explained variable: Individual is covered by supplementary insurance**	Coef	p	Coef	p	Coef	p	Coef	p
Age: [27,35]	-0.24	0.01	-0.24	0.01	-0.24	0.01	-0.24	<0.01
Age: [36,50]	ref	ref	ref	ref	ref	ref	ref	ref
Age: [51,65]	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03
Age: >65	-0.04	0.64	-0.04	0.63	-0.04	0.63	-0.04	0.62
Household Income: < 5000 Swiss Francs per year	ref	ref	ref	ref	ref	ref	ref	ref
Household Income: 5000 - 8000 Swiss Francs per year	0.39	<0.01	0.39	<0.01	0.39	<0.01	0.39	<0.01
Household Income: > 8000 Swiss Francs per year	0.54	<0.01	0.53	<0.01	0.53	<0.01	0.53	<0.01
Gender: male	-0.22	<0.01	-0.21	<0.01	-0.21	<0.01	-0.21	<0.01
First cycle regular track (compulsory school)	ref	ref	ref	ref	ref	ref	ref	ref
Second cycle regular track	0.44	<0.01	0.42	<0.01	0.42	<0.01	0.42	<0.01
Short professional track	0.73	<0.01	0.71	<0.01	0.71	<0.01	0.71	<0.01
Long professional track	0.56	<0.01	0.54	<0.01	0.54	<0.01	0.54	<0.01
University completed	0.50	<0.01	0.49	<0.01	0.49	<0.01	0.49	<0.01
Option deductible (no ordinary deductible)	0.15	0.02	0.16	0.01	0.16	0.01	0.16	0.01
Constant	-0.31	0.05	-0.30	0.06	-0.30	0.06	-0.30	0.06
Rho	0.10		0.14		0.13			
Likelihood-ratio test of rho=0 (Prob > chi2)	0.62		0.48		0.51			
n	1840		1840		1840		1840	
Loglikelihood	-1900.32		-1891.20		-1890.80		-1842.1	

* Individual has a supplementary contract   (excluding "division commune Suisse entière ")

All regressions include canton dummies

Graph 1: Evolution of the log premium variability
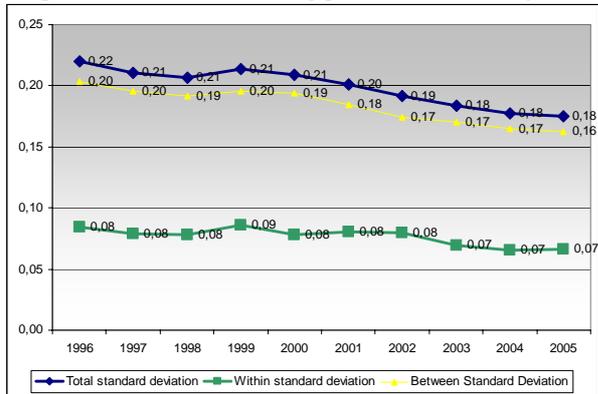
Graph 2: Ratio of D9/D5 and D5/D1 for premium
(computed within cantons with a weighted average between cantons)