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Public and Private Health Insurance in Germany: The Ignored Risk Selection Problem

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Public and Private Health Insurance in Germany: The Ignored Risk Selection Problem*

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Abstract

While risk selection within the German public health insurance system has received considerable attention, risk selection between public and private health insurers has largely been ignored. This is surprising since – given the institutional structure – risk selection between systems is likely to be more pronounced. We find clear evidence for risk selection in favor of private insurers. While private insurers are unable to select the healthy upon enrollment they manage to dump high risk individuals who then end up in the public system. This gives private insurers an unjustified competitive advantage vis-à-vis public insurers. A risk adjusted compensation would mitigate this advantage.

Keywords: Risk Selection, Public and Private Health Insurance, Risk Adjustment.

JEL classification numbers: C13, C23, I10, I18.

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1 Introduction

In contrast to national health service systems, countries that rely on public and/or private health insurers have to deal with the nature of competition found within and between the two branches of health care financing. While competition among insurers is said to increase the quality and improve the efficiency of care as well as foster insurer responsiveness to consumer preferences (Van de Ven and Van Vliet 1992, p. 24), these benefits may not materialize if insurance markets are plagued with risk selection. An insurer that offers high quality care, for example, may mainly attract bad risks and may therefore refrain from providing high quality in the first place. To the contrary, there may even be an incentive to reduce quality in order to deter bad risks from joining the plan. As competition may then be harmful, one needs to regulate competition or reduce the incentives for risk selection.

Problems of this kind have been investigated for a great many developed countries, including Germany (for overviews see, e.g., Van de Ven and Ellis 2000, Van de Ven et al. 2003, and for the German case Buchner and Wasem 2003). All these studies, however, concentrate on competition, selection issues, and regulatory measures *within* the public system. So far, no study has addressed the same set of questions for a market that is characterized by the presence of public and private insurers, that is, risk selection *between* public and private systems has largely been ignored. This is surprising as parallel systems of finance with sizeable public and private sectors exist in several countries, the United States, Germany and the Netherlands being the prime examples. Debate on public-private health care financing, however, extends to a great many of other countries including Australia, Austria, Canada, Greece, Ireland, Italy, Portugal, Spain, and the United Kingdom (Healy et al. 2006, Mossialos and Thomson 2004). Nevertheless, the impact of health care financing on access and health outcomes is not well understood (see Tuohy et al. 2004 for an international survey). We contribute to the understanding of the effects of parallel health care financing by focussing on risk selection between public and private health insurers.

In Germany about 90 percent of the population are publicly insured, most of them compulsorily. The remaining 10 percent hold a private insurance policy. Note that an

individual who purchases private health insurance opts out the public system, that is, the individual is not eligible for any services offered in the public system but also does not directly contribute to the financing of the system.[1] There are two fundamental differences between public and private health insurance in Germany. First, premiums in the public system are proportional to income (up to some income threshold) while premiums in the private health insurance market are unrelated to income. Second, there is community rating in the public system but risk rated premiums in the private system. As a consequence, two selection problems may arise within the public system and between public and private insurers. Obviously, with community rated premiums bad risks are unattractive for public health insurers. Although the incentives for risk selection are clear evidence for active selection is lacking (Nuscheler and Knaus 2005). This is due to the regulatory measures that were introduced to prevent risk selection, e.g., open enrollment, regulation of benefit packages and risk adjustment. Nevertheless, politicians and several reports felt that risk adjustment needs to be improved (see, e.g. Jacobs et al. 2002 and Lauterbach and Wille 2001) what, according to Nuscheler and Knaus (2005), should be viewed as a response to passive risk selection. This resulted in the implementation of a new risk adjustment mechanism that, in addition to some socio-economic characteristics, uses as many as 106 hierarchic morbidity indicators to calculate the transfers amongst funds aimed at mitigating differences in risk pools.[2]

The second selection problem is clearly more troublesome. Especially high income individuals may find the private system more attractive because proportional premiums in the public system likely exceed actuarial fair premiums in the private system. Once they switch they opt out the public system and, therefore, draw considerable resources away from the public system. Healthy individuals have a higher incentive to switch because, all else equal, their premium savings when going private exceed the savings of sick individuals who face a higher actuarial fair premium in the private system. The institu-

[1]There are indirect payments through general taxation (4.7 per cent of public health care spending in the first half of 2009, see BMG 2009) and cross-subsidization via higher reimbursement rates in the private system.

[2]Kifmann and Lorenz (2010) recently demonstrated that cost reimbursement in addition to risk adjustment helps to reduce selection incentives.

tional environment in Germany clearly promotes risk selection in favor of private health insurers.[3] For at least three reasons this is highly problematic. First, private patients escape income redistribution so that health care financing does not follow the ability-to-pay principle. Second, the better risk pool in the private system allows private insurers to offer better and more comprehensive services than those included in the public plan. Moreover, this enables private insurers to offer higher reimbursement rates to providers than public insurers without undermining their competitive advantage vis-à-vis the public plan. Private patients thus have better access to better care, resulting in an inequity in health.[4] Third, distorted competition between systems weakens the private insurers' incentives for efficiency. As competition among private insurers is heavily restricted (see Section 2 for details), incentives for cost containment will generally be low.

It is surprising that health care policy is more concerned about the (at most moderate) risk selection problem in the public system than about the clear incentives for risk selection between public and private insurers. No less surprising is the fact that – apart from the descriptive analysis of Albrecht et al. (2007) – no study has yet analyzed risk selection between systems. To some extent Greß (2007) is an exemption. For the German case he notes adverse selection against the public plan, but does not analyze how selection actually works or what can be done about it. The current study fills this gap. We have two central research questions. First, is there any econometric evidence for risk selection in favor of private insurers? This certainly is the starting point. Without such evidence there would be no reason other than distributional concerns to intervene in health care financing. Second, provided risk selection is present, how does risk selection actually work? Is it that private health insurers are able to select the healthy or is it that they can dump bad risks? The channel of risk selection is important for the design of appropriate policies that aim at mitigating distortions originating in risk selection.

Using 2000 to 2007 data from the German Socio-Economic Panel (GSOEP) we find evidence for risk selection in favor of private insurers. While private insurers are unable

[3]The positive correlation between income and health amplifies selection even further.

[4]Recent evidence from an economic laboratory experiment shows that the rich select themselves into parallel private health insurance because of better access to needed care (Buckley et al 2009).

to select the more healthy upon enrollment they successfully dump high risk individuals. More precisely, individual health status does not contribute to explaining the decision to switch from the public to the private system, while lower health status significantly increases the probability of a switch from private to public. The costs of the high risks are thus 'socialized', while the benefits of low risks are kept by private insurers. This is clearly inefficient as it gives private insurers an unjustified competitive advantage. Private health insurers should compensate public insurers for these bad risks. This implies that compensations must be risk adjusted. Note that private insurers (should) have the means to pay these transfers as they are legally obliged to build up a capital stock for every single insured individual. Currently this capital stock is lost, i.e. remains in the private system, when a privately insured individual switches from the private to the public system. This needs to be changed.

Our paper contributes to the literature on risk selection. Cutler and Reber (1998) and Nicholson et al. (2003) found evidence for selection in favor of Health Maintenance Organizations (HMO). Both studies analyze actual cost data and show that those who switch to a less generous plan, that is, to an HMO, have lower health care expenses than those who remain in the pool. More recent studies on Germany investigate the effectiveness of competition among public health insurers focussing on the price elasticity of switching (e.g. Schut et al. 2003 and Tamm et al. 2007) or on the means of competition (Becker and Übelmesser 2007). But none of these studies addresses the selection problem between public and private insurers in Germany.

The paper is organized as follows. Section 2 provides more institutional details about the German health care system. Focus is on regulatory rules that govern the incentives and possibilities to switch between systems. We briefly introduce the dataset is Section 3, followed by a discussion of econometric methods in Section 4. Section 5 presents our results and Section 6 offers concluding remarks.

2 Institutional background

As already mentioned in the introduction, about 90 per cent of the German resident population is insured in the public health care system. In most cases public insurance is compulsory but based on certain characteristics individuals may opt out the public system. Prior to 2009 individuals that opted out the public system could decide between buying a private insurance policy or going without insurance. Since 2009, however, individuals must hold health insurance so that access to health care is guaranteed for the entire population (we will provide little more detail below).

Exemptions from compulsory public insurance are based on income and profession. If annual gross income exceeds some threshold (49,950 euros for 2010), then an individual is allowed to leave the public system. Should the individual decide to stay in the public system he or she is voluntarily insured therein. Further, self-employed and civil servants are not compulsorily insured in the public system. For the latter, there is a third source of health care financing: the entirely tax-financed plan for civil servants (Beihilfe). This scheme covers, depending on marital status and the number of children, 50 to 70 per cent of health care expenses (the benefits are comparable to those offered in the public system), with the remainder being covered by purchased private health insurance. As they lose their Beihilfe entitlements while staying in the public system, there is a strong incentive for civil servants to (partially) join the private health care system.

Switching possibilities from private to public are also restricted. First, individuals aged 55 or older are not allowed to switch into the public system in any case. In this way the legislator wants to avoid people enjoying low private premiums when young, but escaping increased private premiums when old. Beyond that two cases of switching into the public system can be distinguished: the obligatory switch and the voluntary switch. If the insured individual's salary falls short of the compulsory public insurance income threshold signing up for the public system is obligatory. The same applies to privately insured individuals who become unemployed. For voluntary public insurance eligibility it is necessary to have been insured in the public system for the previous 12 month or at least 24 month during the last five years without interruption. These requirements created a problem for those who dropped out the private system but did not meet these

criteria. These are, for instance, self-employed individuals that lost their business and could not afford their private premiums anymore. As a result, some individuals were left without health insurance (about 0.4 per cent in 2008). Since the health care reform in 2009 these individuals have access to basic private health insurance. Benefits of the basic private plan are comparable to those in the public system. There is also open enrollment and community rating. Moreover, the premium must not exceed the maximum premium in the public system. This regulation implies two things: first, everybody has access to affordable health insurance (which is good) and, second, private insurers face a massive adverse selection problem for the basic plan (which is bad). The second problem calls for an inclusion of the basic private plan into the public risk adjustment mechanism. As will become clear below, our results imply that essentially the entire private system should be included.

Finally, note that competition within the private system is heavily restricted. Once an individual joins a private plan and builds up old age provisions he or she is to some extent locked in. The reason is the insufficient portability of old age provisions. Since 2009 individuals have been entitled to transfer their capital stock to a new private insurer, but only up to a ceiling defined by the basic plan. Since virtually all privately insured individuals have subscribed to a more generous plan portability is incomplete. Moreover, the transferrable amount is not risk adjusted so that especially bad risks will face difficulties to find an affordable alternative private insurance contract other than the basic plan. Competition among private insurers is thus only effective for new customers.

3 Data, Sampling, and Descriptive Statistics

The data used to analyze risk selection between public and private health insurance in Germany is taken from the German Socio-Economic Panel (GSOEP). The GSOEP is an annual representative survey that collects extensive information of the same private households and individuals. Since its inception in 1984 the GSOEP has seen several extensions and refreshment samples.[5] The data set contains extensive information on

[5]For more information on the data set see Wagner et al. (1993) and Wagner et al. (2007).

health and it provides further information on individual characteristics that are needed to analyze risk selection between systems.

Our analysis is based on the period between 2000 to 2007 inclusively. We define two indicator variables that assume a value of one if a switch occurred and zero otherwise. More precisely, the variable $PUB2PRIV_{it}$ is one if individual i was publicly insured in period t but privately insured in period $t+1$ and zero otherwise. Similarly, the variable $PRIV2PUB_{it}$ is one if individual i was privately insured in period t but publicly insured in period $t+1$. In order to analyze switching decisions between systems we split the sample based on insurance status and obtain a 'public sample' (individuals insured in the public system) and a 'private sample' (individuals insured in the private system).

The full data set contains 65,901 observations with 55,626 observations that belong to the public and 10,275 that belong to the private sample. There are 705 switches from the public to the private system and 539 vice versa (see Table 1 below). Sample selection is largely governed by institutions. In order to have a proper decision problem publicly insured individuals must have a choice between systems. This implies that we have to exclude all individuals that are compulsorily insured in the public system. We thus concentrate on those who are publicly insured on a voluntary basis. The sample size drops accordingly (see Table 1). However, this also implies that we have to exclude individuals who are covered via 'family insurance' (up to an age of 25 years dependents of an insured are covered by the public plan at no cost provided that they do not earn their own income. This also applies to married partners, without age restrictions). Exclusion of individuals below the age of 26 years thus minimizes the risk of measuring effects that are rooted in expiring family insurance. The upper age limit we have considered is 53 years. This guarantees that all switchers from public to private actually make the same decision. As it is impossible to switch from private to public once an individual is 55 years or older a switch of an at least 54 years old individual would be irreversible. We have further restricted the sample to observations with a maximum of one change between systems as there are strong indications of measurement error when more than one switch occurred. This is unproblematic for our analysis as only persistent changes are relevant for risk selection. The result is an analysis sample that comprises of 12,386 (426 switches) and

6,771 (369 switches) observations for the public system and private system, respectively.

[Table 1 about here]

We use the GSOEP variable "self-assessed health" as a proxy for an individual's risk status. As usual, this variable has five outcomes ranging from very good health to bad health. For the purposes of this paper (see Section 4 for details) we collapse this variable into the binary variable SAH that assumes the value 1 when self-assessed health is at least good and zero otherwise. Thus, the mean of SAH reflects the share of people with good or very good health.

Table 2 provides an explanation of variables and Table 3 summary statistics split by sample and switcher status (see Appendix). Table 4 below shows mean self assessed health by year. Switchers from public to private appear to be healthier than public non-switchers, while there is no clear pattern in the private sample. This suggests that private insurers are able to attract the healthy publicly insured but fail to dump the sick privately insured. The econometric analysis, however, shows that health has no significant effect on switching for publicly insured but a significant negative effect for privately insured. Descriptive studies may therefore be flawed due to the inherent omitted variable bias when simply comparing raw averages.

[Table 4 about here]

4 Methods

We want to identify risk selection between public and private health insurance using the switcher approach. The key is to analyze the impact of individual health on the probability of switching from one system to the other. As argued above, we split the sample into publicly insured and privately insured and construct two indicator variables, $PUB2PRIV$ and $PRIV2PUB$ for a switch between systems. Controlling for observed and unobserved heterogeneity, it would theoretically be sufficient to regress these variables on individual health. Given the institutional details of the German system, we would predict risk selection in favor of private insurers. Thus, we expect to see healthy individuals switch

from public to private. Additionally, private insurers may be able to dump bad risks so that the less healthy are expected to switch from private to public with a higher probability. There are, however, a number of issues that need to be dealt with and we address these in turn.

First, health status in such a regression may well be endogenous. As was shown in many other studies that used the switcher approach the healthy are more likely to switch (see, e.g., Lauterbach and Wille 2001, Nicholson 2003, and Nuscheler and Knaus 2005). Although this may in part be due to risk selection it is also evident that the sick have better things to do than switching their insurer (e.g. restore health). Moreover, as was highlighted in Nuscheler and Knaus (2005), the sick have higher switching costs and therefore are less likely to switch their insurer than the healthy. In short, the decision to switch and health status realize simultaneously, and thus, potentially introducing simultaneity bias.

Second, self-assessed health is often considered an appropriate approximation of actual health. However, Crossley and Kennedy (2002) have shown that there is considerable measurement error in self-assessed health which would give rise to attenuation bias when using self-assessed health as a regressor in a switcher analysis.

Third, health status is not a uni-dimensional variable. As already mentioned above, self-assessed health has five categories ranging from very good health to bad health. As health is clearly measured on an ordinal scale it would be misleading to treat self-assessed health as a continuous cardinal variable. However, there are also more objective measures of health that further increase the dimensionality of the problem. Examples are the number of visits to a doctor and hospital stays. The problem then is that identification of risk selection would require that all health measures have the same sign. Otherwise, the incomplete ordering of the n-dimensional space would yield inconclusive results. Ideally we would summarize all relevant health information in a single one-dimensional health index.[6]

All mentioned problems can be addressed using an instrumental variables approach.

[6]This approach is standard in the literature investigating inequalities in health (see, e.g., van Doorslaer and Jones 2003).

Consider a system of two equations with the switching decision at the second stage. The first stage is a regression of self-assessed health on a set of exogenous and potentially health related variables. The predicted value of the first stage, the health index, is used as a regressor at the second stage, the switching decision. Given validity of instruments we solve a potential endogeneity problem. Provided that objective health measures have a smaller measurement error – which we believe is the case – measurement error is mitigated. Finally, the first stage regression summarizes all relevant health information in a single index and thereby solves the dimensionality problem. We arrive at the following recursive system

$$SAH_{it} = Z'_{it}\alpha + X'_{it}\beta + \lambda_{1t} + v_{1it}, \tag{1}$$

$$SWITCH_{it} = \gamma\widehat{SAH}_{it} + X'_{it}\delta + \lambda_{2t} + v_{2it}, \tag{2}$$

where $SWITCH_{it}$ is either $PUB2PRIV_{it}$ for the public sample or $PRIV2PUB_{it}$ for the private sample. The matrix Z contains exogenous objective measures of health as well as variables that explain individual health but not the decision to switch between systems. We consider the following health measures: disability status, the number of visits to a doctor, whether the individual had a hospital stay, and a sickness absence from work of 6 weeks or more. As all variables refer to a time period prior to the interview but self-assessed health describes health at present these four variables a clearly exogenous.

The question is how to deal with the panel structure of the data. The way equations (1) and (2) are written up shows that we generally control for time fixed effects, λ_{kt}, $k = 1, 2$. This captures the potentially important effects of numerous smaller and larger institutional changes originating in the permanent reform efforts of the government. Without further assumptions about the error terms, v_{kit}, equations (1) and (2) simply describe a pooled regression where observations on one and the same individual in different years are considered independent. This approach clearly understates standard errors so that internal validity would be compromised (significance levels are not met).

Panel data allow us to control for unobserved heterogeneity, provided that this heterogeneity is constant over time so that the risk of omitted variable bias is reduced. This requires assumptions about the error terms in equations (1) and (2). Let $v_{kit} = \mu_{ki} + u_{kit}$. If the individual specific effect μ_{ki} is uncorrelated with the explanatory variables, then we

would end up with the random effects model. In case of a correlation we obtain the fixed effects model. A potential advantage of a pooled regression is that it allows to observe effects for variables that are constant over time. As this approach may suffer from omitted variable bias results should be interpreted with caution. To select between models we contrast the results of the pooled regression with the outcomes of (potentially) more appropriate fixed effects estimator (see Section 5.1 below).

As our dependent variables are both binary, discrete choice models like probit our logit would be in order. Since no instrumental variable procedure for the resulting highly non-linear recursive system is available we consider a linear probability model for both stages. This allows us to use a standard panel data IV estimator.

5 Results

As mentioned in the previous section, we first have to check whether model efficiency calls for a random effects specification or whether endogeneity renders the random effects estimator biased. We conducted a Hausman test that clearly points to the latter so that we concentrate on the fixed effects regression results. Table 5 (see below) shows the results of the second stage fixed effects estimation for both the public and the private sample. Health status has no significant effect on the probability to switch from the public to the private system. This is somewhat surprising. An individual comparison of costs and benefits between systems is largely governed by health status. Preexisting condition clauses and risk rated premiums strongly suggest that the healthy would, ceteris paribus, benefit more from such a switch than the less healthy. In fact, the coefficient obeys the 'correct' sign but there are too few observations to find significance for the relatively small coefficient. However, it may also be that the health questionnaire used by private insurers is not well suited to assess individual health. Applicants may even cheat and overstate their health. This would prevent insurers from selecting the healthy upon enrollment. Another reason may be that even for bad risks the public private premium differential may be large enough given the presumably better access to health care in the private system to make such a switch beneficial.

[Table 5 about here]

Health status significantly affects the probability of switching from the private to the public system. A one unit increase in the health index *decreases* the probability of switching by 6 percentage points. That is, the healthy are more likely to stay or, equivalently, the sick are more likely to switch. This result is also surprising as the sick typically have higher switching costs, so that a lower propensity to switch would have been in order. This is likely to be the case here as well, but selection incentives are apparently so strong that the transaction costs effect is dominated casting a damning light on private insurers: they manage to dump bad risks into the public system. Incentives are clear. Once a health shock occurres, private insurers incur losses with this particular patient and, therefore, seek ways to keep costs under control. There is evidence, for instance, that private insurers delay or even deny reimbursement of services that are covered by the insurance policy. The insured individual then has to sue the insurer. This not only involves monetary costs (lawyers, opportunity costs of time, risk) but also non-monetary costs (stress) so that many patients eschew to go to court (see, e.g., Focus Online 2009). It may also be that some individuals (at least partially) lose insurance cover when they got caught cheating on the health questionnaire. Effective patient co-payments may therefore be considerable so that a switch to the public system can be an attractive option. As it is impossible for public insurers to deny coverage (provided that the insured is legally allowed to switch) the costs of the health shock that should be borne by the private insurer is 'socialized.' Note that the receiving public insurer is compensated by other public insurers via the risk adjustment mechanism. Hoewever, it should be the private insurer that compensates the public insurance system for dumping the bad risk. Such a compensation must be risk adjusted in order to guarantee fair competition between insurance systems. Ideally a risk adjusted transfer would eliminate dumping incentives so that even bad risks would enjoy good service in private system. This ultimately implies that the risk adjustment mechanism should be extended from public insurers to both public *and* private insurers.

For completeness we also briefly comment on some coefficients of control variables.[7] Let us consider switches from public to private first. Age has an effect over and above health status. The likelihood of switching to a private insurer increases with age up to the third age bracket and then falls. All else equal, switching behavior of the oldest insured individuals in our sample (fifth age bracket) is no different than switching behavior of the youngest (reference category).[8] This pattern can be explained by old age provision payments. Private insurers are legally obliged to build up reserves in order to guarantee that premiums do not increase with age.[9] The older an individual upon enrollment the higher the old age provision payments. Beyond 40 years a switch to the private system quickly becomes unattractive as the available time span to build up old age provisions shrinks. The negative effect of gross income may be surprising at a first glance. But note that contributions to the public system are proportional to income only up to an income ceiling (3750 Euros a month in 2010). Many individuals who are voluntarily insured in the public system have gross income beyond that threshold so that their premium is, in fact, flat. The premium differential between systems is constant with respect to income and it appears reasonable that more affluent individuals are less tempted to leave the public system. Finally, there is a clear time pattern – private insurance became increasingly attractive over time. As switchers are primarily high income earners (within the group of all individuals in the public system), the loss of financial resources accelerates financial pressure in the public system. There is no such time pattern in switches from private to public. The only effect that we can clearly interpret is unemployment (UNEMP) – which dramatically increases the probability of a switch. This is rooted in institutions: privately insured individuals who are laid off are obliged to join the public system.[10] Finally, we find that switching from private to public health insurance becomes less likely

[7]Remember that we are using a fixed effects approach. This implies that we are unable to identify effects of variables that are constant over time (like gender, for instance) or lack sufficient variation to guarantee significance (e.g., time in education system, nationality, and marital status).

[8]The Wald-Test strongly suggests that the age dummies are jointly significant (p-value: 0.001).

[9]Premiums nevertheless increase over time for essentially two reasons: technological progress and supplier induced demand.

[10]According to the Social Code Book V there are only very few exemptions.

when individuals age. This is consistent with the assertion that switching costs rise with age. Note, however, that significance is not overwhelming. In fact, the Wald-Test finds no joined significance of the age dummies (p-value: 0.265).

As mentioned in Section 4 above, a potential benefit of running a pooled regression is that it might enable us to come up with effects of time-invariant regressors on individual switching decisions. For at least two reasons caution is in order. First, standard errors may be understated and, second, parameter estimates may suffer from omitted variable bias. In Table 6 in the Appendix we offer the results of the pooled regression (and, for completeness, also for the random effects model). With respect to health the results differ sharply from those obtained in the fixed effects regression. Health now has a positive and significant effect on the probability to switch from public to private and the health effect in the opposite direction is insignificant. This suggests that a pooled regression inappropriately deals with unobserved heterogeneity so that biased estimates result. Comparison of the estimated coefficients of all other variables with those of the fixed effects regression reveals that the omitted variable bias, by an large, affects all coefficients. Studies based on cross section data should therefore be interpreted with great caution and, as our analysis has shown, results may be misleading when it comes to risk selection.

Finally, Table 7 in the Appendix shows first stage fixed effects regression results. The indicator variable self-assessed health (SAH) is regressed on measures of health care utilization (the number of visits to a doctor, VISITSDOC, and whether an individual had a hospital stay, HOSPITALSTAY) and other objective measures of individual health (disability status, DISAB, and sickness absenteeism from work, SICKSIX). All variables have the expected negative sign, four of which are significant in the public sample and two in the private sample. For both samples we find a negative time trend, individuals rate their health lower and lower. Most importantly, note that the F-statistics are above 60 (public sample) and above 30 (private sample). This implies that we have valid instruments, that is, our instrumental variables approach does not suffer from weak instruments.

6 Conclusion

Risk selection and regulatory measures to prevent risk selection or to mitigate its consequences have received considerable attention in a great many of developed countries. Germany is no exception. Interestingly, efforts were directed towards risk selection within public health care systems. Selection issues between public and private branches of health care financing have largely been ignored. At least for the German case this is surprising since about 10 percent of the population are insured in the parallel private health insurance market – a non-negligible market share.

Given the institutional structure, risk rated premiums in the private system and community rated premiums in the public system – risk selection in favor of private insurers is to be expected. Using 2000-2007 data from the German Socio-Economic Panel we found clear evidence for such selection. Interestingly, private insurers are unable to select the healthy upon enrollment, but somehow manage to dump high risk individuals. The costs of the high risks are thus 'socialized', while the private insurers keep the benefits of insuring a healthy risk pool. This gives private insurers an unjustified competitive advantage and implies efficiency losses originating in distorted competition between systems.

This problem can easily be solved by instituting risk adjusted transfers from private to public insurers as a compensation. Practically this implies that private health insurers should be included in the risk adjustment mechanism that currently only covers public insurers. Fair competition can be guaranteed as well as good access to health care for privately insured individuals that were subject to a negative health shock. Private insurers should easily be able to pay this compensation using the old age provisions of the insured.

Finally, note that our main policy message, that is, inclusion of the private system in the public risk adjustment mechanism, receives additional support from the fact that healthy individuals leave the public system for the private system. This holds true although we were unable to find a positive and significant health effect for the public sample. The reason is sample selection. In order to have a proper decision problem for publicly insured individuals, we concentrated on those who are voluntarily enrolled in the public plan. However, these individuals are healthier than the public system average.

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Appendix

Table 1: Data Selection Process

	TOTAL		PUBLIC		PRIVATE	
Data Selection Process	All	Switches	All	Switches	All	Switches
Full Sample	65901	1244	55626	705	10275	539
Insurance Holder and Voluntary Insured	26753	1149	16863	664	9890	485
Age 26-53	20056	903	12853	534	7203	369
Max. 1 Change	19157	679	12386	426	6771	253

Table 2: Explanation of Variables

Variable	Explanation
Dependent variables	
SAH	Self-assessed health status,1 = good or very good, 0 = bad, not so good or satisfactory
PUB2PRIV	1 = switch from public into private system, 0 = no switch
PRIV2PUB	1 = switch from private into public system, 0 = no switch
Explanatory variables	
VISITSDOC	Number of visits to doctors during the last three month
LNINCOME	Natural logarithm of net income
INCOMEGR	Natural logarithm of gross income
CHILDNUM	Number of children
EDU	Number of years completed in the education system
Dummy variables	
DISAB	1 = disability or incapacity to work
HOSPITAL	1 = hospital stay during the last year
SICKSIX	1 = work disability for longer than 6 weeks during the last year
TRAINING	1 = if receiving educational training
PUBLEMP	1 = if public employee
CIVILSERV	1 = if civilservant
GERMAN	1 = German nationality
FULLTIME	1 = full time employed
UNEMP	1 = unemployed
SELFEMP	1 = selfemployed
JOBWEST	1 = job in western part of Germany
FEMALE	1 = female
MARRIED	1 = married
AGE26_30*	1 = age between 26 and 30
AGE31_35	1 = age between 31 and 35
AGE36_41	1 = age between 36 and 41
AGE42_47	1 = age between 42 and 47
AGE48_53	1 = age between 48 and 53
YEARXXXX	1 = year XXXX, XXXX=2000*, . . ., 2006

Note: * indicates that the variable is a reference category in our estimation.

Table 3: Mean and Standard Deviation for all Variables

	PUBLIC				PRIVATE			
	non-Switcher		Switcher		non-Switcher		Switcher	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD
SAH5*	3.6214	0.8175	3.8333	0.7743	3.7110	0.7958	3.7826	0.8382
DISAB	0.0400	0.1959	0.0117	0.1075	0.0353	0.1845	0.0237	0.1525
VISITSDOC	1.8007	2.9395	1.5587	2.7815	1.9296	3.2880	1.5692	2.5589
HOSPITAL	0.0736	0.2611	0.0540	0.2301	0.0700	0.2551	0.0514	0.2212
SICKSIX	0.0322	0.1765	0.0211	0.1435	0.0298	0.1699	0.0435	0.2043
LNINCOME	7.5664	0.7138	7.6821	0.6258	7.9149	0.6279	7.6445	0.7291
CHILDNUM	0.9056	1.0244	0.6667	0.9289	0.8159	0.9726	0.8340	1.0893
TRAINING	0.0466	0.2107	0.0704	0.2553	0.0399	0.1957	0.0672	0.2509
EDU	13.3480	2.8328	14.2829	2.9061	14.8794	2.9240	13.4387	2.8248
PUBLEMP	0.1033	0.3044	0.1549	0.3612	0.2400	0.4271	0.1779	0.3832
CIVILSERV	0.0142	0.1184	0.1526	0.3612	0.4165	0.4930	0.2846	0.4521
GERMAN	0.9430	0.2319	0.9413	0.2345	0.9701	0.1704	0.9407	0.2366
FULLTIME	0.8375	0.3689	0.8803	0.3240	0.8800	0.3250	0.8617	0.3459
UNEMP	0.0060	0.0774	0.0023	0.0483	0.0003	0.0175	0.0040	0.0629
SELFEMP	0.0289	0.1676	0.0493	0.2208	0.0385	0.1924	0.0949	0.2936
JOBWEST	0.6750	0.4684	0.6573	0.4767	0.7241	0.4470	0.6482	0.4785
FEMALE	0.3780	0.4849	0.3310	0.4720	0.3245	0.4682	0.3399	0.4746
MARRIED	0.6760	0.4680	0.5681	0.4958	0.6824	0.4656	0.6285	0.4842
INCOMEGR	39.0909	27.5323	41.3789	24.2491	49.4750	41.3686	39.2497	27.7336
AGE26_30	0.1253	0.3311	0.1878	0.3910	0.0611	0.2395	0.1304	0.3374
AGE31_35	0.1763	0.3811	0.2324	0.4229	0.1430	0.3501	0.1462	0.3541
AGE36_41	0.2641	0.4409	0.2700	0.4445	0.2369	0.4252	0.2292	0.4212
AGE42_47	0.2429	0.4288	0.1667	0.3731	0.2760	0.4471	0.2490	0.4333
AGE48_53	0.1913	0.3933	0.1412	0.3507	0.2831	0.4505	0.2451	0.4310
YEAR2000	0.1538	0.3607	0.1268	0.3347	0.1198	0.3248	0.1779	0.3832
YEAR2001	0.1452	0.3523	0.1808	0.3861	0.1146	0.3186	0.1225	0.3285
YEAR2002	0.1544	0.3614	0.1831	0.3861	0.1671	0.3731	0.1976	0.3990
YEAR2003	0.1457	0.3528	0.1502	0.3567	0.1609	0.3675	0.1225	0.3285
YEAR2004	0.1421	0.3491	0.1056	0.3068	0.1517	0.3588	0.1225	0.3285
YEAR2005	0.1313	0.3377	0.1174	0.3213	0.1425	0.3496	0.1107	0.3143
YEAR2006	0.1277	0.3337	0.1362	0.3448	0.1433	0.3504	0.1462	0.3541
AGE	39.9835	7.3778	38.0093	7.4492	42.2026	7.0429	40.8339	7.6529
N	11960		426		6518		253	

* SAH5: self assessed health status with 5 response categories as in raw data

Table 4: Mean Self Assessed Health

	PUBLIC		PRIVATE	
Year	non-Switcher	Switcher	non-Switcher	Switcher
2000	0.6346	0.7593	0.6825	0.6957
2001	0.6325	0.6753	0.6734	0.7576
2002	0.6165	0.7308	0.6639	0.6600
2003	0.6171	0.7969	0.6749	0.6875
2004	0.5915	0.7778	0.6491	0.7097
2005	0.5841	0.7000	0.6301	0.6071
2006	0.5881	0.7241	0.6381	0.5000
Mean	0.6101	0.7319	0.6582	0.6589

Table 5: Fixed Effects Model for Switching Behaviour

	PUBLIC		PRIVATE	
	Coefficient	SE	Coefficient	SE
SAH	0.0259	0.0229	-0.0616**	0.0308
CHILDNUM	0.0035	0.0040	0.0004	0.0057
TRAINING	-0.0204**	0.0089	0.0129	0.0124
EDU	0.0068	0.0055	0.0010	0.0081
PUBLEMP	0.0096	0.0060	0.0062	0.0066
CIVILSERV	0.0148	0.0345	-0.0237	0.0235
GERMAN	-0.0888**	0.0348	-0.0285	0.0840
FULLTIME	0.0163*	0.0084	-0.0110	0.0137
UNEMP	0.0108	0.0239	0.2278**	0.0906
SELFEMP	0.0058	0.0099	-0.0075	0.0123
JOBWEST	-0.0009	0.0053	-0.0058	0.0078
MARRIED	-0.0053	0.0080	0.0016	0.0108
INCOMEGR	-0.0003**	0.0001	-0.0001	0.0001
AGE31_35	0.0204**	0.0085	-0.0297**	0.0141
AGE36_41	0.0366***	0.0123	-0.0324*	0.0191
AGE42_47	0.0292*	0.0157	-0.0433*	0.0234
AGE48_53	0.0150	0.0193	-0.0443	0.0274
YEAR2001	0.0303***	0.0049	0.0133*	0.0080
YEAR2002	0.0271***	0.0063	0.0031	0.0086
YEAR2003	0.0372***	0.0066	0.0078	0.0094
YEAR2004	0.0348***	0.0071	0.0095	0.0098
YEAR2005	0.0408***	0.0077	0.0137	0.0112
YEAR2006	0.0523***	0.0083	0.0287**	0.0120
N	12386		6771	
χ^2_4Age Dummies	17.86		5.22	
Prob $> \chi^2$	0.0013		0.2654	

Note: *p<0.1, **p<0.05, ***p<0.01

Table 6: Results for Alternative Models of Switching Behaviour

	PUBLIC POOLED		PUBLIC RE		PRIVATE POOLED		PRIVATE RE	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
SAH	0.0433***	0.0109	0.0568***	0.017	0.0208	0.0140	-0.0059	0.0235
CHILDNUM	-0.0071***	0.0017	-0.0088***	0.0027	0.0050	0.0032	0.0049	0.0039
TRAINING	0.0038	0.0098	-0.0097	0.0082	0.0146	0.0140	0.0133	0.0118
EDU	0.0024***	0.0007	0.0055***	0.0011	-0.0053***	0.0009	-0.0100***	0.0015
PUBLEMP	0.0013	0.0061	0.0051	0.0058	-0.0117	0.0073	-0.0035	0.0067
CIVILSERV	0.2452***	0.0296	0.3015***	0.0164	-0.0169***	0.0059	-0.0337***	0.0089
GERMAN	-0.0055	0.0072	-0.0135	0.0114	-0.0213	0.0180	-0.0297	0.0219
FULLTIME	-0.0011	0.0051	0.0092	0.0067	-0.0028	0.0090	-0.0052	0.0105
UNEMP	-0.0133	0.0144	-0.0083	0.0219	0.2679	0.2648	0.2308**	0.0952
SELFEMP	0.0275**	0.0121	0.0149	0.0094	0.0340**	0.0171	0.0107	0.0114
JOBWEST	-0.0062	0.0039	-0.0035	0.0045	-0.0059	0.0059	-0.0099	0.0066
FEMALE	-0.0063	0.0042	-0.0103	0.0064	0.0096	0.0062	0.0178*	0.0094
MARRIED	-0.0066*	0.0040	-0.0080	0.0056	-0.0025	0.0058	-0.0072	0.0077
INCOMEGR	0.0001	0.0001	-0.0001	0.0001	-0.0002***	0.0001	-0.0002***	0.0001
AGE31_35	0.0028	0.0072	0.0121*	0.0068	-0.0358**	0.0140	-0.0321***	0.0118
AGE36_41	-0.0012	0.0068	0.0142*	0.0078	-0.0367***	0.0139	-0.0352***	0.0133
AGE42_47	-0.0155**	0.0065	-0.0004	0.0084	-0.0327**	0.0139	-0.0364***	0.0140
AGE48_53	-0.0130*	0.0072	-0.0078	0.0097	-0.0251*	0.0139	-0.0283*	0.0148
YEAR2001	0.0141**	0.0061	0.0223***	0.0051	-0.0177	0.0113	-0.0005	0.0083
YEAR2002	0.0154**	0.0065	0.0232***	0.0059	-0.0103	0.0104	-0.0029	0.0081
YEAR2003	0.0109*	0.0063	0.0265***	0.0060	-0.0292***	0.0108	-0.0102	0.0087
YEAR2004	0.0010	0.0060	0.0215***	0.0061	-0.0248**	0.0101	-0.0065	0.0085
YEAR2005	0.0071	0.0063	0.0287***	0.0063	-0.0289***	0.0108	-0.0062	0.0092
YEAR2006	0.0138**	0.0067	0.0377***	0.0064	-0.0205*	0.0112	0.0046	0.0093
N	12386		12386		6771		6771	

Note: *p<0.1, **p<0.05, ***p<0.01

Table 7: Fixed Effects Model for Health Status

	PUBLIC		PRIVATE	
	Coefficient	SE	Coefficient	SE
DISAB	-0.0824**	0.0379	-0.0413	0.0554
VISITSDOC	-0.0222***	0.0015	-0.0211***	0.0019
HOSPITAL	-0.0455***	0.0160	-0.0536**	0.0231
SICKSIX	-0.0649***	0.0238	-0.0476	0.0340
LNINCOME	-0.0222	0.0188	0.0299	0.0243
CHILDNUM	-0.0111	0.0102	0.0297**	0.0145
TRAINING	-0.0326	0.0231	-0.0533*	0.0319
EDU	0.0127	0.0142	-0.0250	0.0209
PUBLEMP	0.0041	0.0156	0.0064	0.0171
CIVILSERV	0.0586	0.0894	0.0096	0.0607
GERMAN	-0.0407	0.0901	-0.2529	0.2159
FULLTIME	-0.0377*	0.0226	0.0368	0.0360
UNEMP	-0.0102	0.0628	-0.0363	0.2348
SELFEMP	-0.0059	0.0257	0.0712**	0.0312
JOBWEST	-0.0025	0.0137	0.0173	0.0201
MARRIED	-0.0148	0.0207	-0.0151	0.0278
INCOMEGR	0.0002	0.0004	-0.0001	0.0003
AGE31_35	-0.0123	0.0221	-0.0258	0.0365
AGE36_41	0.0150	0.0319	-0.0466	0.0493
AGE42_47	0.0329	0.0406	-0.0348	0.0603
AGE48_53	-0.0017	0.0501	-0.0232	0.0708
YEAR2001	-0.0060	0.0128	-0.0067	0.0207
YEAR2002	-0.0536***	0.0174	-0.0463*	0.0238
YEAR2003	-0.0455**	0.0179	-0.0312	0.0258
YEAR2004	-0.0792***	0.0187	-0.0837***	0.0258
YEAR2005	-0.0925***	0.0200	-0.1123***	0.0283
YEAR2006	-0.1114***	0.0213	-0.1217***	0.0299
N	12386		6771	
F (m,n)	14.18 (27,9019)		9.56 (27,4713)	
Prob > F	0.000		0.000	
Instruments				
F (m,n)	60.01 (5,9650)		32.88 (5,5105)	
Prob > F	0.0000		0.000	
Age Dummies				
F (m,n)	2.11 (4,9019)		0.43 (4,4713)	
Prob > F	0.0770		0.7838	

Note: *p<0.1, **p<0.05, ***p<0.01