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## Buying Control? 'Locus of Control' and the Uptake of Supplementary Health Insurance

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# Buying Control? 'Locus of Control' and the Uptake of Supplementary Health Insurance

## Abstract

This paper analyses the relationship between locus of control (LOC) and the demand for supplementary health insurance. Drawing on longitudinal data from Germany, we find robust evidence that individuals having an internal LOC are more likely to take up supplementary private health insurance (SUPP). The increase in the probability to have a SUPP due to one standard deviation increase in the measure of internal LOC is equivalent to an increase in household income by 14 percent. Second, we find that the positive association between self-reported health and SUPP becomes small and insignificant when we control for LOC, suggesting that LOC might be an unobserved individual trait that can explain advantageous selection into SUPP. Third, we find comparable results using data from Australia, which enhances the external validity of our results.

JEL-Codes: I120, I130, I180, D150.

Keywords: private health insurance, health care use, risk aversion, locus of control, positive selection, supplementary insurance, Germany, Australia.

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This article uses data from the German Socio-Economic Panel Study (GSOEP). The data were made available to us by the German Socio-Economic Panel Study (SOEP) at the German Institute for Economic Research (DIW), Berlin. This paper also uses unit record data from the Household, Income and Labour Dynamics in Australia Survey (HILDA) conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the authors and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners.

## 1. Introduction

Even in well-established health systems, individuals spend both income and search effort on securing better access to quality health care. However, not all individuals are naturally sensitive to the future cost and quality of care in the event of need. Among individual psychological traits, locus of control (LOC) refers to the extent to which one believes they are in control of their own life (Rotter, 1954)<sup>1</sup>. Individuals can be classified on a scale ranging between *external LOC* – those who believe that external factors drive their life (e.g., fate and luck) – and *internal LOC* – those who believe that they are in control over their own life, and that the main outcomes of their lives are determined by their own actions. Individuals with an internal LOC, might be more likely to anticipate their future needs (including the use of private health care, and their desired quality of care), and to invest more effort in securing better access to health care. In settings where there is a mainstream public health insurer, LOC could therefore explain the purchase of supplementary private health insurance (SUPP).

This paper studies whether LOC predicts the uptake of SUPP (and other related forms of insurance). More specifically, given that SUPP reduces the financial uncertainty in the event of needing private health care and allows access to higher health care quality, individuals with an internal LOC might exhibit a higher ex-ante valuation of additional health care quality, and reduced financial uncertainty (and hence a larger control over disposable income) resulting from insurance purchase. Accordingly, SUPP “*buys control*” over the future use of private health care, which might be more appreciated by individuals with an internal LOC<sup>2</sup>. We expect individuals with an internal LOC to place more value on SUPP; this hypothesis would be consistent with previous research which shows that individuals with an internal LOC are more

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<sup>1</sup> Personality traits have been identified as important drivers of health care choices (Flynn et al, 2007).

<sup>2</sup> Consistent with this, previous studies have already documented that an internal LOC is associated with precautionary measures with regards to natural disasters (Antwi-Boasiako, 2017) and increased resilience against personal shocks (Buddelmeyer and Powdthavee, 2016).

likely to engage in preventative health behaviours (Cobb-Clark et al, 2014)<sup>3</sup>. Yet not even individuals with an internal LOC can fully prevent having to use health care as the available health information is largely incomplete (Murray et al, 2003), which might prompt individuals to purchase SUPP.

Our second claim is that LOC provides an explanation for previous evidence suggesting advantageous selection into supplementary insurance<sup>4</sup>. Indeed, individuals with an internal LOC exhibit a lower-than-average number of private health insurance claims and are more likely to value SUPP (Buchmueller et al, 2013 and Schmitz, 2011). Hence, LOC appears to be a behavioral parameter in the way individuals make ex-ante judgements that can help explain “advantageous selection” into health insurance (despite standard theoretical models predicting adverse selection). We return to this point in more detail in Section 5.

The empirical analysis is mainly based on survey data from Germany. In this country, statutory public health insurance (SHI) is available for individuals participating in the labor market as well as their dependents.<sup>5</sup> Individuals benefiting from the SHI can also purchase additional supplementary insurance. The latter extends health care coverage beyond that of SHI, and its premium is mainly adjusted based on age and, when observable, chronic

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<sup>3</sup> Cobb-Clark et al (2014) for example show that an internal LOC is associated with preventive health measures such as eating healthy and exercising. This is consistent with findings in the psychology literature showing that self-regulation increases the likelihood of healthy behaviors (Saffer, 2014), and that future orientation and self-efficacy negatively reduce drinking and increase exercising (Chiteji, 2010).

<sup>4</sup> Against the backdrop of the hypothesis of individuals self-selecting into insurance based on their objective risk (Rothschild and Stiglitz, 1976), several studies document puzzling evidence of either “no evidence of selection” (Chiappori and Salanié, 2000), or in some cases, the presence of “advantageous selection” into insurance (de Meza and Webb, 2001, Einav and Finkelstein, 2011), meaning that people buying insurance have actually lower risks of facing the insured loss. Throughout the paper, we use the terms *positive health selection*, *positive selection* or *advantageous selection* interchangeably to refer to a situation where healthier people (people with poor health) are more (less) likely to take up an insurance policy, in contrast to adverse selection where healthy people (people with poor health) are less likely to take up insurance.

<sup>5</sup> Individuals can also opt out of the statutory public health insurance scheme and take up substitutive health insurance if they qualify for it based on an income threshold of €6,000 in 2017. More specifically, employees and pensioners earning less than €7,600, and their non-earning dependents have mandatory SHI (and individuals with a gross income above the threshold or self-employed can purchase substitutive private health insurance). A significant share of the population purchases SUPP to ensure access to private health care in the event of need.

conditions. To enhance the external validity of our results, we also replicate our analysis with Australian data, where a universal health insurance scheme, *Medicare*, provides health care to the entire population, but where individuals can have access to SUPP in exchange of a community premium<sup>6</sup>. One could argue that the reason LOC influences SUPP in Germany is because of insurance underwriting. That is, preexisting health conditions (to an extent more preventable for higher internal LOC individuals) can influence the premium and condition of access to insurance. To address this point, we examine evidence from Australia where premiums are community rated, hence no underwriting is possible. If we observe results similar to those observed in Germany, it strengthens the hypothesis that LOC is the main driver of insurance choices, rather than insurance underwriting.

We extend the literature in three ways. First, we contribute to the analysis of the demand of SUPP by focusing on LOC, an important behavioral trait unobserved by the insurer<sup>7</sup>. Second, we add to the existing literature on the influence of LOC on important life outcomes such as: education (Coleman and Deleire, 2003); earnings (Cebi, 2007); preventive health behaviors (Cobb-Clark et al, 2014); and savings (Cobb-Clark et al, 2016). Third, we examine whether LOC can play a role as a potential unobservable, explaining previous evidence of positive health selection into SUPP. Finally, to enhance our external validity, we report evidence from two large countries with substantial SUPP markets which complement the coverage of a mainstream insurer: Germany and Australia.

We show evidence that *an internal LOC predicts the uptake of SUPP*<sup>8</sup>. This finding is robust to controls for risk attitudes, wealth, and income, personality traits, as well as other

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<sup>6</sup> Community rating means that a given health insurance policy must be offered to all consumers at the same price thereby prohibiting insurers from charging premiums on observable risks.

<sup>7</sup> Furthermore, in the context of Handel and Kolstad (2015), it is a welfare relevant preference factor, that is a parameter of the utility function that affects how individuals make evaluations.

<sup>8</sup> An advantage of examining data from Australia is that insurance pricing is community rated, and hence differences in risks are unlikely to result in difference in insurance premiums.

potential observed confounders and time invaring unobserved heterogeneity. Finally, we show that *the positive health selection* into SUPP is explained by LOC both in Germany (Lange et al, 2017) and Australia (Buchmueller et al, 2013)<sup>9</sup>.

Section 2 describes the institutional settings in Germany including a conceptual background on SUPP decisions and the role of LOC. Section 3 describes the data and our empirical strategy. Section 4 displays the main results, Section 5 analyses the role of LOC in the positive health selection into purchasing SUPP, and Section 6 discusses the effect of LOC on private substitutive health insurance (SUBST). Section 7 shows a comparable analysis using Australian data to strengthen the validity of our finding. Section 8 contains our concluding remarks.

## **2. The German supplementary health insurance (SUPP)**

The German market for SUPP offers additional insurance to those covered by social or statutory health insurance (SHI), which provides coverage for 90% of the German population and is funded from employment-based payroll contributions. Individuals in the statutory system have the option of SUPP, which is in addition to the coverage provided by the SHI. SUPP provides access to additional health care services excluded from the SHI and can also increase certain quality aspects of healthcare delivered by SHI. However, it entails paying an insurance premium. SUPP is subject to risk-based premiums, which, in practice, are mainly based on age and the disability status of the individual.

The main reason for individuals to purchase SUPP lies in attaining better health care quality service than delivered by the social health insurance (Lungen et al, 2008) and better access to rationed care, which individuals expect to consume out-of-pocket otherwise (Gruber and Kiesel, 2010, Hulleger and Klein, 2010; Grunow and Nusheler, 2013). Hence, the purchase

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<sup>9</sup> Note that results are not based on an exogenous source of variation, so we interpret the estimates as associations.



of SUPP provides individuals with better quality and reduces out-of-pocket expenses. Lange et al (2017) estimate that whilst 8.24% of individuals received SUPP in 1999, its uptake increased to 22.68% in 2008. For individuals younger than 66 years, they find evidence that healthier individuals are more likely to choose private insurance (so called, “positive selection” into insurance). However, so far, a behavioral explanation for a “selective” choice of private health insurance is lacking, and we propose in the following pages that LOC provides a potential explanation for this phenomenon.

Finally, a unique feature of the German system is that those whose income exceeds a given threshold<sup>10</sup> (in addition to civil servants and self-employed people) have the choice of either remaining in the statutory system<sup>11</sup>, and additionally purchasing SUPP or, opting out completely and purchasing SUBST. However, the majority remain in the system, and SUBST funds less than 10% of the population<sup>12</sup>.

### 3. Empirical Strategy and Data

*Empirical Strategy.* The aim of the empirical analysis is to investigate whether (or not) individuals with an internal LOC are more likely to have SUPP. We estimate the following equation:

$$SUPP_{it} = \beta_1 + \beta_2 LOC_i + \beta_3 H_{it} + \beta_4 X_{it} + \epsilon_{it} \quad (1)$$

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<sup>10</sup> The threshold varies from year to year and was €7,600 per year in 2017.

<sup>11</sup> Furthermore, premiums are front-loaded so that older individuals have a shorter time-horizon to build up old-age provisions. However, the premium is considerably lower than the public premium. This is particularly relevant for civil servants.

<sup>12</sup> Upon choosing SUBST, switching back to the SHI is restricted to cases where an individual’s income falls below the threshold. Individuals aged 55 years and older however are generally not allowed to switch back to the statutory health insurance. Unemployed spouses and dependents under 25 years are co-insured at no additional cost. Civil servants have a strong financial incentive to purchase SUBST as they are entitled by law to a 50% subsidy (“*Beihilfe*”), whilst self-employed people bear the full cost of insurance coverage.

where ownership of SUPP ( $SUPP_{it}$ ) of individual  $i$  at time  $t$  is a function of LOC ( $LOC_i$ ), an individual's health status, which reflects the probability of sickness ( $H$ ), as well as a number of relevant confounders ( $X_{it}$ ) (including income, risk attitudes, Big Five personality traits, gender, age, education, marital status, current health conditions, and self-reported health measures). Our goal is to estimate  $\beta_2$ , which depends on adequately controlling for any unobserved heterogeneity in the error structure. We assess the potential for omitted variables bias in our estimates by estimating several different model specifications (including fixed effects models) and controlling for a wide range of potential confounders, following the literature in the field of LOC and health (Cobb-Clark et al 2014). Similarly, we examine the effect of  $\beta_3$  to identify the potential presence of selection on health, which is consistent with theoretical considerations, and the evidence of “positive selection” into insurance.

*Data.* In the main part of the analysis, we use data from the German Socio-Economic Panel (SOEP, 2019). The SOEP is a longitudinal household survey that started in West Germany in 1984 and in East Germany in 1990. It collects information on a wide range of factors including LOC as well as related concepts such as willingness to take risks and other personality traits. Furthermore, we use all waves from 1999 to 2016 from the SOEP where LOC was measured and questions about SUPP were asked, with the exception of data from 2009 and 2015 as the SUPP questions were not asked in these years. Our sample is restricted to individuals who are between 25 and 90 years old. After dropping observations with missing values for the variables used in the analyses, our final sample includes 24,274 individuals; constituting an unbalanced panel including 231,784 observations. On average, individuals were observed 9.5 times.

*Private Health Insurance Uptake.* Insurance records in the SOEP include SUBST and SUPP information since 1996. Specifically, the SUBST question is as follows: “*How are you insured for sickness: Do you have state health insurance or are you almost exclusively privately*

*insured?*” From this, we generate a binary variable indicating whether individuals have SUBST (extensive margin).

Individuals who report to have a SHI are asked whether they additionally have private health insurance, which we define as *supplementary health insurance*. If the answer is positive, they are asked how much they pay for this insurance per month and what it covers (hospital stays, dentures, corrective devices, coverage abroad, or other), which we also use in the analysis. It is important to note that SUBST and SUPP have very different purposes. While SUBST is purchased at lower premiums and allows the choice of plans as well as flexibility with cost-sharing (and lower waiting times but possibly higher out-of-pocket spending), SUPP is an add-on for services that the generous SHI in Germany does not cover, such as dentals, glasses, alternative medicine, travel insurance, or getting a single room when hospitalized.

*LOC and other non-cognitive skills.* Our main explanatory variable of interest is LOC, which was measured in 1999, 2005, 2010 and 2015 in the SOEP. Respondents had to state on a seven-point scale the extent to which they agreed or disagreed with several statements referring to perceptions about fate and control.<sup>13</sup> The items are based on the Psychological Coping Resources Component of the Mastery Module developed by Pearlin and Schooler (1978). We follow the recent economic literature and predict the first factor from a factor analysis, which produces a continuous measure increasing in internal LOC tendencies (see Piatek and Pinger, 2016; Cobb-Clark et al., 2014; Cobb-Clark et al., 2016 Cobb-Clark and Schurer, 2013). We also follow Cobb-Clark et al. (2014) and calculate individual-specific averages of LOC over time to minimize measurement error and attach those values to each wave. We then standardize LOC to mean zero and standard deviation one.

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<sup>13</sup> The questions aimed at measuring LOC were measured on a four-point scale in 1999 in SOEP. We rescaled those variables from 1999 accordingly. As a robustness check, we discarded the 1999 measure to calculate the individual specific average, but we found very similar results.

We also control for individuals' other non-cognitive skills which are measured by the Big Five personality traits inventory based on Saucier (1994) in wave 2005, 2009 and 2013 in the SOEP. The Big Five personality traits are extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. To construct a summary measure for each trait, we use the 15 items in the SOEP in a factor analysis (see Cobb-Clark and Schurer, 2012). In line with our procedure for LOC, we calculate individual-specific averages and standardize each measure to mean zero and standard deviation one.

We additionally control for individuals' willingness to take risks. In the SOEP, risk attitude has been asked every year since 2004, except in 2005 and in 2007, using the following question: *“How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where the value 0 means: ‘risk averse’ and the value 10 means: ‘fully prepared to take risks’. You can use the values in between to make your estimate.”* We calculate an individual-specific average and attach this value for each year.<sup>14</sup>

We also include two proxies for time preference that are available in 2008 and 2013. The first measure is based on the following question: *“Would you describe yourself as an impatient or a patient person in general? Please answer on a scale from 0 to 10, where 0 means very impatient and 10 means very patient.”* The second question is: *“Do you generally think things over for a long time before acting – in other words, are you not impulsive at all? Or do you generally act without thinking things over for long, in other words, are you very impulsive? Please answer on a scale from 0 to 10, where 0 means ‘not at all impulsive’ and 10 means ‘very impulsive’.”* It turned out that neither of these two measures were significantly associated with the ownership of SUBST or SUPP once all the other control variables were included. We

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<sup>14</sup> As a robustness check, we also re-estimated the models using the actual measure of risk attitudes and thus restricted the sample to the waves of SOEP for which this measure is available, and we found very similar results.

therefore do not include these variables in our main model, however estimation results based on models that include these variables are available upon request.

*Other confounders.* We also control for several potential confounders that may be correlated with LOC and the uptake of health insurance. We control for wealth which was measured in 2002, 2007 and 2012 in the SOEP. We calculated individual-specific average wealth over the three waves and created a categorical variable for the quintiles of wealth.<sup>15</sup>

We furthermore control for gender, age (using third order polynomials in order to take into account potential nonlinearities in the relationship between age and insurance ownership), years of education, labor force status (working, unemployed or other), after-tax net household income, partnership status (a dummy equal to one if the individual is married or partnered), the number of children and adults in the household, and a dummy variable equal to one if the individual reports being in poor or bad health.

*Descriptive statistics.* Table 1 and A1 in the Appendix provide descriptive statistics by above/below median LOC (Table 1) and by insurance uptake (Table A1), respectively. Individuals with a LOC above the median are more likely to have a SUPP (conditional on having no SUBST). Likewise, they are more likely to have higher levels of education, employment, health, wealth, and income. Table A1 shows a higher level of internal LOC for individuals who take up SUPP (and similarly for SUBST).

Consistent with the hypothesis of positive insurance selection, the willingness to take risks is found to be higher among those individuals with both SUPP and SUBST<sup>16</sup>. We also find that average income is significantly larger among those who take up private health

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<sup>15</sup> As a robustness check, we also used the actual measure of wealth and thus restricted the sample to the waves of SOEP for which this measure is available, and we found very similar results.

<sup>16</sup> A simple comparison between those with and without insurance provides suggestive evidence of advantageous risk selection as the proportion of individuals reporting being in poor/bad health is lower among those with insurance.

insurance. Men are found to be more likely to have substitutive insurance, whilst women are more likely to have supplementary insurance. However, we do not find a significant difference in average age between those with and without SUPP.

**[Insert Table 1 about here]**

*Correlates of LOC.* One of the questions that emerges is what correlates with LOC. We explore this in Table A2 in the Appendix. For this analysis, we only focus on observations for which LOC was measured at the time of the interview. We estimate the equation by Ordinary Least Squares (OLS) and use clustered (at the individual level) robust standard errors to allow for the possibility that the error term is correlated among observations for the same individual. Years of education, income and wealth are positively associated with an internal LOC. Unemployed individuals have a lower internal LOC than employed individuals, and individuals living in larger households are also less internal. Importantly, individuals reporting poor/bad health have a lower internal LOC in Germany. There is a positive association between LOC and the willingness to take risks. Finally, extraversion, conscientiousness, agreeableness, and emotional stability are positively correlated with LOC while openness is negatively associated with it.

#### **4. Results**

*Uptake of Supplementary Insurance (SUPP).* The top panel of Table 2 displays the estimates of a linear probability model for uptake of SUPP<sup>17</sup>. As expected, the coefficient estimate of LOC is positive and statistically significant in all estimates (estimates with the full set of controls are included in Appendix B), although the effects size declines with the inclusion

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<sup>17</sup> We also estimated the extensive margin equation using a probit model and we found very similar results.

of income and wealth, and to a lesser extent when we control for several other controls, including employment status, household characteristics, risk attitude, health, and individual personality traits (the so called ‘Big Five’). If we compare the coefficient estimate of LOC with the coefficient estimate of the logarithm of household income (estimate: 0.131; standard error: 0.005), the effect of an increase in LOC by one standard deviation is equal to an estimated increase in household income by 13% for the ownership of SUPP.<sup>18</sup>

**[Insert Table 2 about here]**

*Heterogeneity.* Given that the full sample could hide important heterogeneous effects underpinning the estimated average effects, we also investigate whether predictions of LOC differ by age groups, gender and types of health insurance coverage. In Table 3, we examine whether the observed relationship differs according to age by estimating the equations using a set of different age-based subsamples. Generally, we find that the association is higher for the youngest age group (25–39-year-old) but the positive association remains highly significant for all of them. Next, Table 4 examines the existence of gender-specific heterogeneity. Again, the coefficients are very similar across genders with respect to SUPP (estimates with a full set of controls are included in Appendix B).

**[Insert Table 3 and 4 about here]**

Next, given that insurance can differ by the extent of coverage provided, Table 5 reports the association between LOC and different types of health insurance coverage. More specifically, we find that the coefficient for LOC is significantly different from zero

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<sup>18</sup> Wealth is positively associated with the ownership of SUPP while household size reduces the probability of having insurance, and some of the coefficients for the personality traits (emotional stability, conscientiousness, and openness) are significantly different from zero.

irrespective of the type of coverage, although the coefficient is larger when insurance contracts cover hospital and dental care compared to glasses, for example. This finding suggests that LOC exerts a particularly strong influence on the uptake of insurance against more costly risks.

**[Insert Table 5 about here]**

*Robustness Checks.* We then account for the panel dimension of the data, which allows us to control for fixed unobserved heterogeneity<sup>19</sup>, though it reduces the sample to the years for which a current measure of SUPP and a current measure of LOC is available.<sup>20</sup> We also control for all time-varying covariates from the main model including: regional fixed effects, year fixed effects, a third order polynomial in age, the logarithm of net monthly household income, employment status (working, unemployed or other), partnership status, the number of adults and children in the household, and health status.

Although Cobb-Clark and Schurer (2013) have shown that LOC is relatively stable (but not time-invariant) over a four-year period, there may be meaningful variations in the measure of LOC over a longer time span, as we have in our data, as we observe individuals for 16 years. It should also be stressed that the estimates from a fixed effects regression are likely downward biased as the presence of measurement error in the measure of LOC might result in an attenuation bias which tends to be exacerbated in fixed effects estimators.

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<sup>19</sup> We use a linear fixed effects estimator for the extensive margin equations. Our results are robust to alternative estimation methods such as the fixed effects logit model or the correlated random effects probit based on the Mundlak correction approach (Mundlak 1978).

<sup>20</sup> Note, however, that the information about supplementary insurance is not available in 2015. We thus impute the supplementary insurance information from 2016 to 2015. We also did a robustness check by discarding the observations from 2015 and the results are robust to this exclusion.



[Insert Table 6 about here]

Table 6 compares the OLS results and the fixed effects estimations for the takeup of SUPP. We find that the association between the uptake of SUPP and LOC drops by about 60% *but remains positive and highly significant* in the fixed effects estimation. The effect of an increase in one standard deviation in LOC is equivalent to an increase in household income by 17.9% (the coefficient estimate of the logarithm of household income is equal to 0.039, standard error: 0.008), which is slightly larger to what we found in the previous analysis where the effect was compared to an increase in household income by 13%. Importantly, the fact that LOC remains significant in the fixed effects specifications reduces the possibility that the observed association between LOC and SUPP uptake is still due to other unobservables.

We also investigate whether there are non-linearities in the association between LOC and the uptake of private health insurance. Table A3 shows the role of LOC on SUPP when we include dummy variables corresponding to the different deciles of LOC instead of the continuous measure of LOC. In general, the coefficients are stronger for the higher deciles of LOC.

*Effects of LOC on health care use.* Next, Table 7 examines whether health care is used more heavily among individuals with an internal LOC as an explanation for the uptake of insurance by high internal LOC individuals. Health care utilization could either reflect the fact that one is sicker, or that one simply visits a health care provider more often as a preventive measure. However, none of the effects turn out to be significant. Table 7 shows that LOC is not significantly associated with the number of doctor visits or the probability of having been hospitalized in the last twelve months. This suggests that *more frequent use of health care*

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*utilization by individuals with a higher internal locus is unlikely to be a significant driver in their uptake of SUPP.*

**[Insert Table 7 about here]**

## **5. LOC and health selection into SUPP**

An important question is whether LOC can explain the existence of positive selection into SUPP, which has been shown in previous studies (Lange et al, 2017, Buchmueller et al, 2013). Previous studies discuss the effect of risk selection (Schmitz, 2011). To control for the effect of risk selection, all of our specifications include self-reported health and risk preferences. Table A2 in the appendix suggests that LOC is negatively associated with poor health and positively associated with the willingness to take risks.

Table 8 reports to which extent LOC can mediate the association between self-reported health and SUPP uptake. We report the effect of poor health (defined by categories of the Likert scale) on the uptake of insurance including and excluding LOC. Our estimates show that when we exclude LOC from the specification, poor self-reported health is negatively associated with SUPP uptake. This is consistent with the presence of positive selection into insurance. In contrast, the effect of self-reported health becomes insignificant once LOC is controlled for (Columns 4 and 6). This result is consistent with the presence of omitted variable bias when ignoring LOC. Another interesting finding is that when LOC is controlled for, the effect of risk aversion no longer predicts the uptake of SUPP (see Table B20 in the appendix). This result is in line with previous studies for Germany (Lange et al, 2017).

**[Insert Table 8 about here]**

## 6. An extension: LOC and private substitutive health insurance (SUBST)

Additionally, given the specific German setting, where a small share of individuals can choose between statutory insurance and SUBST, we apply the same logic as before, except that the choice is between purchasing SUBST or staying with the statutory insurance and either paying out-of-pocket costs or purchasing SUPP. Table B0 in the appendix reports the estimates for the LOC coefficient using OLS (Panel B) and fixed effects estimation. Panel A shows that the effect of an increase in one standard deviation in LOC is equivalent to an increase in household income by 8.5%.<sup>21</sup> We also find that the signs and significance levels of the demographic characteristics are consistent with the descriptive statistics. Willingness to take risks is not significantly associated with the ownership of a private substitutive insurance. Furthermore, being married and the number of adults and children in the household are associated with a lower uptake of insurance. We find a non-monotonous effect on wealth and a significant effect of employment.

Panel B shows a significant positive coefficient for LOC on the probability of owning a SUBST in Germany even once individual fixed effects are controlled for. If we compare this coefficient estimate with the coefficient estimate for the logarithm of household income, it implies that the effect of an increase in one standard deviation in LOC on the probability to own a private substitutive insurance is equivalent to an increase in household income by 6.9%. Quite interestingly, this comparison is close to the result from Panel A showing that this increase was equivalent to an 8.5% increase in household income.

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<sup>21</sup> Based on the estimates from the third column. The coefficient estimate of the logarithm of the household income is equal to 0.177 (standard error of 0.005).

## 7. LOC and SUPP in Australia

To assess the external validity of our results, and our overall claim, we have performed a similar set of analysis with Australian data. Below we: briefly describe the setting for the Australian SUPP; provide a description of the Australian dataset; and report the main results of estimating equation (1) with Australian data.

*Australian private health insurance.* In Australia, private health insurance plays a complementary role to a universal public insurer (*Medicare*) in granting access to extra services that are not included in its public catalogue. Hence, it compares to what we have labelled as ‘supplementary insurance’ in the German system as it provides speedier access to private health care for elective procedures that mostly take place in hospitals (Buchmueller et al, 2013). The uptake of a private hospital health insurance plan is incentivized by income and age specific rebates ranging between 0%–36%. Furthermore, individuals who have an income above \$90,000 (\$180,000 for families) and no private hospital insurance are liable to pay the *Medicare Levy Surcharge*. A unique feature of the Australian system is that it relies on a regulated gatekeeper model, whereby private health insurance cannot cover outpatient services which are already financed by both Medicare and out-of-pocket payments. Like other complementary insurance schemes in Europe, Medicare-listed prescription drugs are not covered by private insurance plans. More generally, having private health care improves quality of care as it provides access to a wider choice of providers and additional health care amenities, which is similar to Germany. Again, those quality dimensions are more likely to be anticipated, and hence valued, among those individuals that have a higher internal LOC.

*Data.* We employ data from the Household, Income and Labour Dynamics in Australia (HILDA) survey. The HILDA survey collects longitudinal information from a large nationally representative sample of Australian households since 2001 and contains information on LOC, willingness to take risks and other personality traits. We employ all

waves from 2005 to 2014 from the HILDA survey when information on annual household expenditures on private health insurance coverage is available.

For Australia, out of the 120,185 observations (19,597 individuals) in 2005 to 2014 aged between 25 and 90 years old, we lose six percent due to missing information on LOC and another eight percent due to missing information in any of the other control variables. This leaves us with a final sample of 103,448 observations (10,406 individuals).

In the HILDA survey, individuals report on their annual household expenditures on SUPP. More specifically, we generate a binary variable indicating whether households have SUPP if they report any expenditure for private health insurance (extensive margin). Therefore SUPP is measured at the household level rather than the individual level. Our measure for LOC is measured at the individual level and based on seven questions in the HILDA survey as described in Cobb-Clark et al. (2014). We follow Cobb-Clark et al. (2014) and calculate individual-specific averages of LOC over time to minimize measurement error and attach those values to each wave. The HILDA survey allows us to control for the same variables as in SOEP, such as the Big Five personality traits as well as risk attitudes. All relevant questions in the HILDA survey are directly comparable to the SOEP except for the risk measure. Instead of self-assessed general willingness to take risks in the SOEP, the HILDA survey asks about financial risk taking. We generate a binary variable indicating whether someone is an above-average financial risk taker based on a question designed to gather information on the extent to which individuals are willing to take financial risks (substantial, above-average, average, no risk). Furthermore, given that the variable was not asked in 2005, 2007 and 2009, we impute information for these years from previous waves.

*Results.* Table C1 provides the descriptive statistics for the Australian sample to match those for the German sample. Further, Table C2 displays the correlates of LOC in the HILDA

survey.<sup>22</sup> Consistent with the evidence from Germany, we find that men exhibit a higher internal LOC, and that years of education, income and wealth are also positively associated with an internal LOC. The association between income, wealth and internal LOC in Australia is slightly weaker. As for the German sample, a more internal LOC is associated with better health. Consistent with the German sample, we identify small associations with risk attitudes and personality traits.

We examine the association of LOC with the decision to have a SUPP in Australia. Results are presented in Table 9<sup>23</sup> and reveal that LOC exhibits significantly positive coefficient across all models: a more internal LOC is associated with SUPP uptake. Other controls exhibit the expected signs<sup>24</sup>. Risk attitude exhibits a significant coefficient consistent with the results for Germany.

**[Insert Table 9 about here]**

In Tables C3 and C4 in the appendix we examine the extent to which the results hold when we examine a set of different subsamples by age group and gender. The results by age groups for Australia are comparable to the ones for Germany, however the relationship between LOC and SUPP is stronger for males than females in Australia.

We next examine in Table C5 whether the association between LOC and insurance uptake varies by type of insurance coverage. Since information on coverage is only available in 2004, 2009 and 2013 in the HILDA survey, we re-estimate in column (1) the association

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<sup>22</sup> In all regression models using the HILDA survey data, standard errors are clustered at the individual and household-year level using the STATA *ado cgmreg.ado* by A. Colin Cameron, Jonah B. Gelbach and Douglas L. Miller (Cameron, 2021).

<sup>23</sup> The extensive margin equation is estimated using a linear probability model. The results from a probit model are very similar.

<sup>24</sup> Wealth is positively associated with the probability of having SUPP and household size is negatively associated with the probability of SUPP. Some personality traits (agreeableness and conscientiousness) exhibit positively significant coefficients.

between LOC and insurance uptake overall for this smaller sample. In line with Table 9, the association is positive and significant. Splitting the sample by coverage type for Australia reveals that LOC is only significantly positively associated with the uptake of insurance coverage for hospitals and extra services; whilst it is not significant for partial hospital or extra services alone.<sup>25</sup> This is somewhat in line with the German results which suggested that internals are more likely than externals to insure comprehensively. Table C7 in the appendix shows that in Australia LOC is associated with a reduced number of doctor visits. This suggests that the association between internal LOC and SUPP uptake is not driven by higher utilizations of health care by LOC, but rather it seems likely that LOC directly influences the utility value of SUPP. Finally, Table C8 shows evidence of positive selection (poor health is associated with reduced insurance uptake and spending) but controlling for LOC reduces and eventually renders the effect of poor health insignificant.

## 8. Conclusion

Individuals' uptake of SUPP varies with their internal LOC, which reflects the extent to which individuals believe they can control their future (health care use). We document robust evidence that *individuals' LOC predicts the purchase of SUPP* in the context of Germany, where statutory social insurance is available to the entire population, and in Australia subject to a similar institutional setting, but where SUPP is community rated.

We find that the inclusion of LOC in our specification for SUPP choice renders previous evidence of positive (health) selection into insurance as insignificant. That is, the inclusion of LOC renders the negative association between poor self-reported health and SUPP uptake insignificant. In examining the mechanisms that explain the role of LOC, we find that

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<sup>25</sup> Because wealth is not measured in the years that coverage type is available for Australia (2009 and 2013), we attach individual specific average wealth from the years 2002, 2006 and 2010 to this smaller sample. Table C6 in the appendix shows that our results for Australia are robust to attaching wealth from the previously available year to the data (year 2006 wealth to the year 2009 data and wealth from the year 2010 to the year 2013 data).

the effect of LOC is qualitatively different to risk aversion and time preferences<sup>26</sup>. Finally, we document consistent evidence for Australia, a country which presents a similar institutional setting and where longitudinal data for both LOC and SUPP is available.

Our results show that the positive association between LOC and SUPP is not driven by individuals with an internal LOC having increased health care use. Instead, our results suggest that individuals with a more internal LOC are more likely to undertake preventive measures (as shown in Cobb-Clark et al, 2014), and therefore they are more likely to be healthy and less likely to face health shocks. Thus, we find that individuals' LOC provides an explanation for advantageous selection into SUPP (Cutler et al, 2008).

Our main results have important implications for policy. More specifically, individuals with a strong internal LOC are more likely to purchase SUPP, whilst those with an external LOC might need extra incentives to reach similar insurance uptake. While we cannot claim causality from our estimates, a causal interpretation of our findings would suggest that LOC exerts an independent effect on SUPP, which means that individuals will react to insurance incentives depending on their LOC. Hence, all else equal, tax exemptions, rebates, and other financial incentives to purchase SUPP might exhibit different effects based on an individual's LOC.

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<sup>26</sup> Consistent with previous studies, we find that risk aversion increases an individual's preference for staying with the mainstream insurer rather than purchasing SUPP (Costa-Font and Garcia, 2009), while at the same time it is consistent with the finding that risk averse individuals are more likely to engage in preventive activities (Hemmingway, 1990).



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## Tables

**Table 1. Descriptive statistics according to the measure of locus of control, Germany**

	Locus of control below the median	Locus of control above the median
Private substitutive health insurance	9.1%	19.5%
Supplementary private health insurance (conditional on having no private substitutive health insurance)	13.7%	21.4%
Sex (woman=1)	55.5%	49.9%
Age	52.4	50.6
Years of education	11.4	12.7
<u>Labour force status:</u>		
Working	54.1%	66.4%
Unemployed	6.5%	2.8%
Other	39.3%	30.8%
Married/ partnership	75.9%	78.1%
Monthly net household income	2743	3533
#adult in the household	2.1	2.1
#children in the household	0.5	0.5
Bad/poor health	24.2%	12.6%
General risk attitudes	4.0	4.6
<u>The Big Five:</u>		
Extraversion	-0.169	0.169
Agreeableness	-0.100	0.100
Emotional stability	-0.323	0.323
Conscientiousness	-0.154	0.154
Openness	-0.122	0.122
<u>Wealth:</u>		
1 <sup>st</sup> quintile	25.6%	14.4%
2 <sup>nd</sup> quintile	21.4%	18.6%
3 <sup>rd</sup> quintile	20.2%	19.8%
4 <sup>th</sup> quintile	18.2%	21.9%
5 <sup>th</sup> quintile	14.6%	25.3%
Number of observations	115,889	115,895

Note: GSOEP 1999–2016 (except 2009 and 2015). This table reports the characteristics of individuals according to their degree of internal locus of control.

**Table 2. Supplementary health insurance, Germany**

	Supplementary private health insurance		
	(1)	(2)	(3)
Locus of control	0.041*** (0.002)	0.018*** (0.002)	0.017*** (0.002)
Age and sex	Yes	Yes	Yes
Education, income and Wealth	No	Yes	Yes
Labour force status	No	No	Yes
Household characteristics	No	No	Yes
Health satisfaction	No	No	Yes
Big 5	No	No	Yes
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.060	0.105	0.116
N	198,712	198,712	198,712

*Note.* GSOEP 1999-2016 (except 2009 and 2015). Clustered at the individual-level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. See Table B4 and B5 for substitutive insurance and B6 and B7 for supplementary insurance in the Appendix for full set of controls.

**Table 3. Age Heterogeneity of Supplementary Private Health Insurance, Germany**

Age group:	Supplementary private health insurance		
	25-40	41-64	65+
	(4)	(5)	(6)
Locus of control	0.021*** (0.004)	0.014*** (0.003)	0.016*** (0.004)
Age and sex	Yes	Yes	Yes
Education, income and Wealth	Yes	Yes	Yes
Labour force status	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes
Health satisfaction	Yes	Yes	Yes
Risk attitude	Yes	Yes	Yes
Big 5	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.083	0.116	0.179
N	52,803	99,607	46,302

*Note.* GSOEP 1999-2016 (except 2009 and 2015). Clustered at the individual level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. See Table B10 and B11 in the Appendix for a full set of controls.

**Table 4. Heterogeneity by Gender, Germany**

	Supplementary private health insurance	
	Male	Female
	(3)	(4)
Locus of control	0.016*** (0.003)	0.017*** (0.003)
Full controls	Yes	Yes
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R <sup>2</sup>	0.107	0.126
N	89,707	109,005

*Note.* GSOEP 1999-2016(except 2009 and 2015). Clustered at the individual-level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Table B12 and B13 in the Appendix for full set of controls.

**Table 5. Coverage Type of the supplementary health insurance, Germany**

	Coverage of the supplementary private health insurance (1=covered; 0=not covered or no supplementary private insurance)				
	Hospital	Denture	Glasses	Abroad	Other
Locus of control	0.012*** (0.002)	0.009*** (0.002)	0.006*** (0.001)	0.004*** (0.001)	0.002*** (0.001)
Full controls	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.090	0.085	0.036	0.040	0.010
N	198,712	198,712	198,712	198,712	198,712

*Note.* GSOEP 1999–2016 (except 2009 and 2015). Clustered at the individual-level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 See Table B14 in the Appendix for full set of controls.



**Table 6. Private supplementary health insurance. OLS and individual fixed effects (FE) models, Germany**

	OLS		Fixed effects	
	(1)	(2)	(3)	(4)
Locus of control	0.036*** (0.002)	0.008*** (0.003)	0.007*** (0.003)	0.007*** (0.003)
Age	Yes	Yes	Yes	Yes
Income	No	No	Yes	Yes
Labour force status	No	No	No	Yes
Household characteristics	No	No	No	Yes
Health satisfaction	No	No	No	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.056	0.047	0.048	0.049
Number of observations	39,794	39,794	39,794	39,794
Number of individuals	19,413	19,413	19,413	19,413

*Note.* GSOEP 1999, 2005, 2010, 2015. Clustered at the individual-level. LOC time-varying. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

See Table B16–B19 in the Appendix for full set of controls

**Table 7. Health care utilization, Germany**

	Number of doctor visits per year	Hospital stays
	(1)	(2)
Locus of control	-0.048 (0.067)	0.0001 (0.001)
Full controls	Yes	Yes
Region FE	Yes	Yes
Year FE	Yes	Yes
R <sup>2</sup>	0.147	0.055
N	231,232	231,514

*Note.* GSOEP 1999-2016 (except 2009 and 2015). Clustered at the individual level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. See Table B15 in the Appendix for full set of controls

**Table 8. Locus of Control and Positive Selection GSOEP 1999-2016. Linear models: extensive margin – Germany: Private supplementary health insurance**

	Supplementary private health insurance					
	(1)	(2)	(3)	(4)	(5)	(6)
Locus of control		0.040*** (0.002)		0.018*** (0.002)		0.017*** (0.002)
Poor/bad health	-0.042*** (0.004)	-0.024*** (0.004)	-0.010*** (0.004)	-0.003 (0.004)	-0.008** (0.004)	-0.005 (0.004)
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Income, wealth and education	No	No	Yes	Yes	Yes	Yes
Employment	No	No	Yes	Yes	Yes	Yes
Household characteristics	No	No	No	No	Yes	Yes
Personality	No	No	No	No	Yes	Yes
Risk Attitudes	No	No	No	No	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.050	0.061	0.103	0.105	0.115	0.116
N	198,712	198,712	198,712	198,712	198,712	198,712

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. See Table B20 in the Appendix for full set of controls

**Table 9. Supplementary private health insurance, Australia**

	Extensive margin		
	(1)	(2)	(3)
Locus of control	0.0707*** (0.0040)	0.0159*** (0.0036)	0.0095** (0.0039)
Age and sex	Yes	Yes	Yes
Education, income and Wealth	No	Yes	Yes
Labour force status	No	No	Yes
Household characteristics	No	No	Yes
Health satisfaction	No	No	Yes
Risk attitudes (above average financial risk taking)	No	No	Yes
Big 5	No	No	Yes
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.043	0.265	0.273
N	103,448	103,448	103,448

*Note.* HILDA 2005–2014. Standard errors are clustered at the individual- and household-year-level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

# Online Appendix A

**Table A1. Descriptive statistics by ownership of private substitutive insurance and supplementary private health insurance ownership, Germany**

	Private substitutive health insurance		Supplementary private health insurance	
	No	Yes	No	Yes
Locus of control	-0.071	0.427	-0.125	0.187
Sex (woman=1)	54.9%	39.6%	54.2%	58.0%
Age	51.4	52.0	51.5	50.8
Years of education	11.6	14.5	11.4	12.6
<u>Labour force status:</u>				
Working	58.5%	71.1%	56.4%	68.5%
Unemployed	5.4%	0.4%	6.1%	2.0%
Other	36.2%	28.4%	37.6%	29.5%
Married/ partnership	76.2%	81.7%	75.5%	79.5%
Monthly net household income	2848	4879	2695	3580
#adult in the household	2.1	2.1	2.1	2.1
#children in the household	0.5	0.5	0.5	0.5
Bad/poor health	19.4%	12.1%	20.3%	15.6%
General risk attitudes	4.26	4.79	4.20	4.54
<u>The Big Five:</u>				
Extraversion	-0.014	0.085	-0.036	0.090
Agreeableness	0.016	-0.097	0.026	-0.032
Emotional stability	-0.040	0.242	-0.055	0.028
Conscientiousness	0.008	-0.048	0.004	0.025
Openness	-0.037	0.224	-0.080	0.166
<u>Wealth:</u>				
1 <sup>st</sup> quintile	22.4%	5.8%	24.6%	11.7%
2 <sup>nd</sup> quintile	21.7%	9.6%	22.4%	18.3%
3 <sup>rd</sup> quintile	20.7%	15.9%	20.7%	20.9%
4 <sup>th</sup> quintile	19.2%	25.3%	18.7%	21.5%
5 <sup>th</sup> quintile	16.0%	43.4%	13.6%	27.6%
Number of observations	198,712	33,072	164,322	34,390

*Note:* GSOEP 1999-2016 (except 2009 and 2015). This table reports the characteristics of individuals having and not having private health insurance (both substitutive and supplementary) in Germany.

**Table A2. Correlates of locus of control, Germany**

	Locus of control (standardized)				
	All years	1999	2005	2010	2015
	(1)	(2)	(3)	(4)	(5)
Sex (woman=1)	-0.022*	-0.042**	-0.046***	0.012	-0.006
	(0.011)	(0.020)	(0.016)	(0.018)	(0.019)
Age	-0.035***	0.022	-0.040**	-0.062***	-0.061***
	(0.011)	(0.024)	(0.017)	(0.019)	(0.021)
Age <sup>2</sup> /100	0.041**	-0.065	0.048	0.086**	0.083**
	(0.021)	(0.048)	(0.033)	(0.037)	(0.040)
Age <sup>3</sup> /1000	-0.001	0.005*	-0.001	-0.003	-0.004
	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Years of education	0.023***	0.023***	0.025***	0.018***	0.025***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Log(household income)	0.252***	0.144***	0.236***	0.298***	0.250***
	(0.013)	(0.028)	(0.019)	(0.021)	(0.023)
<u>Wealth:</u>					
1 <sup>st</sup> quintile	Ref.	Ref.	Ref.	Ref.	Ref.
2 <sup>nd</sup> quintile	0.089***	0.084***	0.113***	0.068**	0.068**
	(0.015)	(0.029)	(0.023)	(0.027)	(0.030)
3 <sup>rd</sup> quintile	0.146***	0.133***	0.175***	0.140***	0.129***
	(0.015)	(0.030)	(0.024)	(0.026)	(0.029)
4 <sup>th</sup> quintile	0.171***	0.144***	0.223***	0.179***	0.114***
	(0.016)	(0.030)	(0.025)	(0.028)	(0.030)
5 <sup>th</sup> quintile	0.260***	0.302***	0.320***	0.227***	0.187***
	(0.018)	(0.034)	(0.027)	(0.030)	(0.032)
<u>Labour force status:</u>					
Working	Ref.	Ref.	Ref.	Ref.	Ref.
Unemployed	-0.236***	-0.214***	-0.279***	-0.239***	-0.190***
	(0.024)	(0.045)	(0.038)	(0.044)	(0.058)
Other	-0.019	-0.031	-0.037	-0.029	0.020
	(0.015)	(0.029)	(0.023)	(0.027)	(0.029)
Married/ partnership	0.034**	0.130***	0.036	0.026	-0.009
	(0.015)	(0.029)	(0.022)	(0.025)	(0.026)
#adult in the household	-0.120***	-0.122***	-0.091***	-0.159***	-0.096***
	(0.008)	(0.015)	(0.011)	(0.013)	(0.015)
#children in the household	-0.012*	-0.016	0.001	-0.024**	-0.004
	(0.006)	(0.011)	(0.009)	(0.012)	(0.013)
Bad/poor health	-0.240***	-0.236***	-0.190***	-0.272***	-0.265***
	(0.013)	(0.028)	(0.020)	(0.022)	(0.024)
General risk attitudes	0.019***	0.025***	0.022***	0.011***	0.022***
	(0.002)	(0.005)	(0.004)	(0.004)	(0.004)
Extraversion	0.102***	0.060***	0.126***	0.097***	0.098***
	(0.005)	(0.010)	(0.008)	(0.009)	(0.010)

Agreeableness	0.061*** (0.006)	0.035*** (0.011)	0.090*** (0.008)	0.044*** (0.009)	0.049*** (0.010)
Emotional stability	0.223*** (0.005)	0.124*** (0.010)	0.265*** (0.008)	0.219*** (0.009)	0.238*** (0.010)
Conscientiousness	0.100*** (0.006)	0.098*** (0.011)	0.135*** (0.009)	0.087*** (0.009)	0.072*** (0.010)
Openness	-0.028*** (0.006)	-0.020* (0.011)	-0.060*** (0.009)	-0.011 (0.009)	-0.015 (0.010)
Constant	-1.606*** (0.186)	-2.026*** (0.400)	-1.303*** (0.304)	-0.888*** (0.338)	-0.756** (0.378)
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	No	No	No	No
R <sup>2</sup>	0.219	0.165	0.254	0.199	0.202
N	46,407	7,656	15,365	12,845	10,541

*Note.* GSOEP 1999, 2005, 2010, 2015. Clustered at the individual-level (for column (1)). \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A3. Nonlinear Locus of Control Effects. Extensive margin, Germany**

	Private substitutive insurance			Private supplementary insurance		
	(1)	(2)	(3)	(4)	(5)	(6)
<u>Deciles of Locus of Control:</u>						
1 <sup>st</sup> decile	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2 <sup>nd</sup> decile	0.020*** (0.008)	0.003 (0.007)	0.003 (0.007)	0.031*** (0.008)	0.017** (0.007)	0.015** (0.007)
3 <sup>rd</sup> decile	0.016** (0.007)	-0.010 (0.007)	-0.010 (0.007)	0.034*** (0.008)	0.014* (0.008)	0.012 (0.008)
4 <sup>th</sup> decile	0.038*** (0.008)	-0.004 (0.008)	-0.005 (0.008)	0.075*** (0.008)	0.045*** (0.008)	0.042*** (0.008)
5 <sup>th</sup> decile	0.063*** (0.009)	0.009 (0.008)	0.005 (0.008)	0.070*** (0.008)	0.034*** (0.008)	0.029*** (0.008)
6 <sup>th</sup> decile	0.087*** (0.009)	0.017** (0.008)	0.013 (0.008)	0.089*** (0.009)	0.045*** (0.009)	0.041*** (0.009)
7 <sup>th</sup> decile	0.084*** (0.009)	0.003 (0.008)	-0.004 (0.009)	0.095*** (0.009)	0.042*** (0.009)	0.035*** (0.009)
8 <sup>th</sup> decile	0.113*** (0.009)	0.016* (0.009)	0.010 (0.009)	0.116*** (0.009)	0.056*** (0.009)	0.051*** (0.009)
9 <sup>th</sup> decile	0.148*** (0.010)	0.041*** (0.009)	0.033*** (0.009)	0.127*** (0.010)	0.061*** (0.009)	0.055*** (0.010)
10 <sup>th</sup> decile	0.192*** (0.010)	0.068*** (0.010)	0.059*** (0.010)	0.129*** (0.010)	0.057*** (0.010)	0.050*** (0.010)
Age and sex	Yes	Yes	Yes	Yes	Yes	Yes
Education, income and wealth	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.064	0.192	0.207	0.060	0.105	0.117
N	231,784	231,784	231,784	198,712	198,712	198,712

*Note.* GSOEP 1999–2016 (except 2009 and 2015). Clustered at the individual-level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## Online Appendix B. Regressions with all covariates for Germany

**Table B0. Private substitutive health insurance. Germany**

Panel A	Substitutive health insurance – no individual fixed effects		
	Extensive margin		
	(1)	(2)	(3)
Locus of control	0.057*** (0.002)	0.018*** (0.002)	0.015*** (0.002)
Age and sex	Yes	Yes	Yes
Education, income and Wealth	No	Yes	Yes
Labour force status	No	No	Yes
Household characteristics	No	No	Yes
Health satisfaction	No	No	Yes
Big 5	No	No	Yes
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.062	0.190	0.206
N	231,784	231,784	231,784

  

Panel B	Substitutive health insurance – individual fixed effects		
	Extensive margin		
	(1)	(2)	(3)
Locus of control	0.003** (0.001)	0.003** (0.001)	0.002* (0.001)
Age	Yes	Yes	Yes
Income	No	Yes	Yes
Labour force status	No	No	Yes
Household characteristics	No	No	Yes
Health satisfaction	No	No	Yes
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Within-R <sup>2</sup>	0.012	0.014	0.015
Number of observations	46,407	46,407	46,407
Number of individuals	22,245	22,245	22,245

*Note.* GSOEP 1999, 2005, 2010, 2015. Clustered at the individual-level.

LOC time-varying. Standard errors in parentheses. \*

\*\* p<0.01, \*\* p<0.05, \* p<0.1.

See Table B16 and 17 in the Appendix for full set of controls



**Table B1. Descriptive statistics according to the measure of locus of control. Pooled sample GSOEP 1999-2016 – Germany**

	Locus of control below the median	Locus of control above the median
Private substitutive health insurance	9.1%	19.5%
Supplementary private health insurance	13.7%	21.4%
Sex (woman=1)	55.5%	49.9%
Age	52.4	50.6
Years of education	11.4	12.7
<u>Labour force status:</u>		
Working	54.1%	66.4%
Unemployed	6.5%	2.8%
Other	39.3%	30.8%
Married/ partnership	75.9%	78.1%
Monthly net household income	2743	3533
#adult in the household	2.1	2.1
#children in the household	0.5	0.5
Bad/poor health	24.2%	12.6%
General risk attitudes	4.0	4.6
<u>The Big Five:</u>		
Extraversion	-0.169	0.169
Agreeableness	-0.100	0.100
Emotional stability	-0.323	0.323
Conscientiousness	-0.154	0.154
Openness	-0.122	0.122
<u>Wealth:</u>		
1st quintile	25.6%	14.4%
2nd quintile	21.4%	18.6%
3rd quintile	20.2%	19.8%
4th quintile	18.2%	21.9%
5th quintile	14.6%	25.3%
Number of observations	115,889	115,895

*Note:* GSOEP 1999-2016 (except 2009 and 2015). This table reports the characteristics of individuals according to their degree of internal locus of control.

**Table B2. Descriptive statistics according to the ownership of private substitutive insurance and supplementary private health insurance. Pooled sample GSOEP 1999–2016 – Germany**

	Private substitutive health insurance		Supplementary private health insurance	
	No	Yes	No	Yes
Locus of control	-0.071	0.427	-0.125	0.187
Sex (woman=1)	54.9%	39.6%	54.2%	58.0%
Age	51.4	52.0	51.5	50.8
Years of education	11.6	14.5	11.4	12.6
<u>Labour force status:</u>				
Working	58.5%	71.1%	56.4%	68.5%
Unemployed	5.4%	0.4%	6.1%	2.0%
Other	36.2%	28.4%	37.6%	29.5%
Married/ partnership	76.2%	81.7%	75.5%	79.5%
Monthly net household income	2848	4879	2695	3580
#adult in the household	2.1	2.1	2.1	2.1
#children in the household	0.5	0.5	0.5	0.5
Bad/poor health	19.4%	12.1%	20.3%	15.6%
General risk attitudes	4.26	4.79	4.20	4.54
<u>The Big Five:</u>				
Extraversion	-0.014	0.085	-0.036	0.090
Agreeableness	0.016	-0.097	0.026	-0.032
Emotional stability	-0.040	0.242	-0.055	0.028
Conscientiousness	0.008	-0.048	0.004	0.025
Openness	-0.037	0.224	-0.080	0.166
<u>Wealth:</u>				
1st quintile	22.4%	5.8%	24.6%	11.7%
2nd quintile	21.7%	9.6%	22.4%	18.3%
3rd quintile	20.7%	15.9%	20.7%	20.9%
4th quintile	19.2%	25.3%	18.7%	21.5%
5th quintile	16.0%	43.4%	13.6%	27.6%
Number of observations	198,712	33,072	164,322	34,390

*Note:* GSOEP 1999–2016 (except 2009 and 2015). This table reports the characteristics of individuals having and not having private health insurance (both substitutive and supplementary) in Germany.

**Table B3. Pooled sample GSOEP 1999, 2005, 2010, 2015. Correlates of locus of control**

	Locus of control (standardized)				
	All years	1999	2005	2010	2015
	(1)	(2)	(3)	(4)	(5)
Sex (woman=1)	-0.022*	-0.042**	-0.046***	0.012	-0.006
	(0.011)	(0.020)	(0.016)	(0.018)	(0.019)
Age	-0.035***	0.022	-0.040**	-0.062***	-0.061***
	(0.011)	(0.024)	(0.017)	(0.019)	(0.021)
Age <sup>2</sup> /100	0.041**	-0.065	0.048	0.086**	0.083**
	(0.021)	(0.048)	(0.033)	(0.037)	(0.040)
Age <sup>3</sup> /1000	-0.001	0.005*	-0.001	-0.003	-0.004
	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Years of education	0.023***	0.023***	0.025***	0.018***	0.025***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Log(household income)	0.252***	0.144***	0.236***	0.298***	0.250***
	(0.013)	(0.028)	(0.019)	(0.021)	(0.023)
<u>Wealth:</u>					
1st quintile	Ref.	Ref.	Ref.	Ref.	Ref.
2nd quintile	0.089***	0.084***	0.113***	0.068**	0.068**
	(0.015)	(0.029)	(0.023)	(0.027)	(0.030)
3rd quintile	0.146***	0.133***	0.175***	0.140***	0.129***
	(0.015)	(0.030)	(0.024)	(0.026)	(0.029)
4th quintile	0.171***	0.144***	0.223***	0.179***	0.114***
	(0.016)	(0.030)	(0.025)	(0.028)	(0.030)
5th quintile	0.260***	0.302***	0.320***	0.227***	0.187***
	(0.018)	(0.034)	(0.027)	(0.030)	(0.032)
<u>Labour force status:</u>					
Working	Ref.	Ref.	Ref.	Ref.	Ref.
Unemployed	-0.236***	-0.214***	-0.279***	-0.239***	-0.190***
	(0.024)	(0.045)	(0.038)	(0.044)	(0.058)
Other	-0.019	-0.031	-0.037	-0.029	0.020
	(0.015)	(0.029)	(0.023)	(0.027)	(0.029)
Married/ partnership	0.034**	0.130***	0.036	0.026	-0.009
	(0.015)	(0.029)	(0.022)	(0.025)	(0.026)
#adult in the household	-0.120***	-0.122***	-0.091***	-0.159***	-0.096***
	(0.008)	(0.015)	(0.011)	(0.013)	(0.015)
#children in the household	-0.012*	-0.016	0.001	-0.024**	-0.004
	(0.006)	(0.011)	(0.009)	(0.012)	(0.013)
Bad/poor health	-0.240***	-0.236***	-0.190***	-0.272***	-0.265***
	(0.013)	(0.028)	(0.020)	(0.022)	(0.024)
General risk attitudes	0.019***	0.025***	0.022***	0.011***	0.022***
	(0.002)	(0.005)	(0.004)	(0.004)	(0.004)
Extraversion	0.102***	0.060***	0.126***	0.097***	0.098***
	(0.005)	(0.010)	(0.008)	(0.009)	(0.010)

Agreeableness	0.061*** (0.006)	0.035*** (0.011)	0.090*** (0.008)	0.044*** (0.009)	0.049*** (0.010)
Emotional stability	0.223*** (0.005)	0.124*** (0.010)	0.265*** (0.008)	0.219*** (0.009)	0.238*** (0.010)
Conscientiousness	0.100*** (0.006)	0.098*** (0.011)	0.135*** (0.009)	0.087*** (0.009)	0.072*** (0.010)
Openness	-0.028*** (0.006)	-0.020* (0.011)	-0.060*** (0.009)	-0.011 (0.009)	-0.015 (0.010)
Constant	-1.606*** (0.186)	-2.026*** (0.400)	-1.303*** (0.304)	-0.888*** (0.338)	-0.756** (0.378)
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	No	No	No	No
R <sup>2</sup>	0.219	0.165	0.254	0.199	0.202
N	46,407	7,656	15,365	12,845	10,541

*Note.* GSOEP 1999, 2005, 2010, 2015. Clustered at the individual-level (for column (1)). \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B4. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private substitutive health insurance**

	Private substitutive health insurance		
	(1)	(2)	(3)
Locus of control	0.057*** (0.002)	0.018*** (0.002)	0.015*** (0.002)
Sex (woman=1)	-0.065*** (0.005)	-0.044*** (0.004)	-0.051*** (0.004)
Age	0.015*** (0.003)	-0.012*** (0.003)	0.001 (0.003)
Age <sup>2</sup>	-0.016** (0.006)	0.026*** (0.006)	0.003 (0.007)
Age <sup>3</sup>	0.000 (0.000)	-0.002*** (0.000)	-0.001 (0.000)
Years of education		0.024*** (0.001)	0.021*** (0.001)
Log(household income)		0.124*** (0.004)	0.177*** (0.005)
<u>Wealth:</u>			
1st quintile		Ref.	Ref.
2nd quintile		-0.021*** (0.004)	-0.027*** (0.004)
3rd quintile		-0.011** (0.005)	-0.014*** (0.005)
4th quintile		0.027*** (0.006)	0.026*** (0.006)
5th quintile		0.092*** (0.008)	0.080*** (0.008)
<u>Labour force status :</u>			
Working			Ref.
Unemployed			0.013*** (0.004)
Other			0.021*** (0.005)
Married/ partnership			-0.044*** (0.005)
#adult in the household			-0.046*** (0.003)
#children in the household			-0.016*** (0.002)
Bad/poor health			-0.005 (0.003)
General risk attitudes			0.002 (0.001)

Extraversion			0.005** (0.002)
Agreeableness			0.003 (0.002)
Emotional stability			-0.002 (0.002)
Conscientiousness			-0.012*** (0.002)
Openness			0.006** (0.002)
Constant	-0.214*** (0.052)	-0.993*** (0.054)	-1.459*** (0.061)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.062	0.190	0.206
N	231,784	231,784	231,784

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B6. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Supplementary private health insurance**

	Supplementary private health insurance		
	(1)	(2)	(3)
Locus of control	0.041*** (0.002)	0.018*** (0.002)	0.017*** (0.002)
Sex (woman=1)	0.026*** (0.004)	0.036*** (0.004)	0.032*** (0.004)
Age	0.001 (0.003)	-0.018*** (0.003)	-0.010*** (0.004)
Age <sup>2</sup>	0.006 (0.007)	0.038*** (0.007)	0.023*** (0.007)
Age <sup>3</sup>	-0.001** (0.000)	-0.003*** (0.000)	-0.002*** (0.000)
Years of education		0.012*** (0.001)	0.009*** (0.001)
Log(household income)		0.090*** (0.004)	0.131*** (0.005)
<u>Wealth:</u>			
1st quintile		Ref.	Ref.
2nd quintile		0.032*** (0.005)	0.023*** (0.005)
3rd quintile		0.043*** (0.006)	0.036*** (0.006)
4th quintile		0.051*** (0.006)	0.045*** (0.006)
5th quintile		0.120*** (0.008)	0.106*** (0.008)
<u>Labour force status :</u>			
Working			Ref.
Unemployed			-0.004 (0.004)
Other			-0.015*** (0.005)
Married/ partnership			-0.001 (0.005)
#adult in the household			-0.050*** (0.003)
#children in the household			-0.020*** (0.002)
Bad/poor health			-0.005 (0.004)
General risk attitudes			0.004*** (0.001)

Extraversion			0.003 (0.002)
Agreeableness			-0.003 (0.002)
Emotional stability			-0.009*** (0.002)
Conscientiousness			-0.007*** (0.002)
Openness			0.012*** (0.002)
Constant	0.045 (0.055)	-0.498*** (0.059)	-0.812*** (0.065)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.060	0.105	0.116
N	198,712	198,712	198,712

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



**Table B8. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private substitutive health insurance**

	Private substitutive health insurance		
	(1)	(2)	(3)
Log(household income)		0.123*** (0.004)	0.176*** (0.005)
<u>Deciles of Locus of Control:</u>			
1 <sup>st</sup> decile	Ref.	Ref.	Ref.
2 <sup>nd</sup> decile	0.020*** (0.008)	0.003 (0.007)	0.003 (0.007)
3 <sup>rd</sup> decile	0.016** (0.007)	-0.010 (0.007)	-0.010 (0.007)
4 <sup>th</sup> decile	0.038*** (0.008)	-0.004 (0.008)	-0.005 (0.008)
5 <sup>th</sup> decile	0.063*** (0.009)	0.009 (0.008)	0.005 (0.008)
6 <sup>th</sup> decile	0.087*** (0.009)	0.017** (0.008)	0.013 (0.008)
7 <sup>th</sup> decile	0.084*** (0.009)	0.003 (0.008)	-0.004 (0.009)
8 <sup>th</sup> decile	0.113*** (0.009)	0.016* (0.009)	0.010 (0.009)
9 <sup>th</sup> decile	0.148*** (0.010)	0.041*** (0.009)	0.033*** (0.009)
10 <sup>th</sup> decile	0.192*** (0.010)	0.068*** (0.010)	0.059*** (0.010)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
R <sup>2</sup>	0.064	0.192	0.207
N	231,784	231,784	231,784

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The control variables included in columns (1), (2), and (3) are the same as in columns (1), (2), and (3) in Table A4.

**Table B9. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private supplementary health insurance**

	Private supplementary health insurance		
	(1)	(2)	(3)
Log(household income)		0.090*** (0.004)	0.131*** (0.005)
<u>Deciles of Locus of Control:</u>			
1 <sup>st</sup> decile	Ref.	Ref.	Ref.
2 <sup>nd</sup> decile	0.031*** (0.008)	0.017** (0.007)	0.015** (0.007)
3 <sup>rd</sup> decile	0.034*** (0.008)	0.014* (0.008)	0.012 (0.008)
4 <sup>th</sup> decile	0.075*** (0.008)	0.045*** (0.008)	0.042*** (0.008)
5 <sup>th</sup> decile	0.070*** (0.008)	0.034*** (0.008)	0.029*** (0.008)
6 <sup>th</sup> decile	0.089*** (0.009)	0.045*** (0.009)	0.041*** (0.009)
7 <sup>th</sup> decile	0.095*** (0.009)	0.042*** (0.009)	0.035*** (0.009)
8 <sup>th</sup> decile	0.116*** (0.009)	0.056*** (0.009)	0.051*** (0.009)
9 <sup>th</sup> decile	0.127*** (0.010)	0.061*** (0.009)	0.055*** (0.010)
10 <sup>th</sup> decile	0.129*** (0.010)	0.057*** (0.010)	0.050*** (0.010)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
R <sup>2</sup>	0.060	0.105	0.117
N	198,712	198,712	198,712

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The control variables included in columns (1), (2), and (3) are the same as in columns (1), (2), and (3) in Table A6.

**Table B10. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private substitutive health insurance. Results by age group**

Age group:	Private substitutive health insurance		
	25–39	40–64	65+
	(2)	(3)	(4)
Locus of control	0.017*** (0.003)	0.016*** (0.003)	0.009** (0.004)
Sex (woman=1)	-0.045*** (0.007)	-0.066*** (0.006)	-0.016** (0.008)
Age	-0.289*** (0.059)	-0.075** (0.032)	0.027 (0.100)
Age <sup>2</sup>	0.891*** (0.185)	0.152** (0.062)	-0.044 (0.134)
Age <sup>3</sup>	-0.090*** (0.019)	-0.010** (0.004)	0.002 (0.006)
Years of education	0.011*** (0.001)	0.026*** (0.001)	0.027*** (0.002)
Log(household income)	0.144*** (0.007)	0.188*** (0.007)	0.179*** (0.010)
<u>Wealth:</u>			
1st quintile	Ref	Ref	Ref
2nd quintile	0.001 (0.007)	-0.040*** (0.006)	-0.031*** (0.007)
3rd quintile	0.015* (0.008)	-0.024*** (0.007)	-0.024*** (0.009)
4th quintile	0.046*** (0.012)	0.017** (0.008)	0.001 (0.009)
5th quintile	0.107*** (0.016)	0.069*** (0.010)	0.021* (0.012)
<u>Labour force status :</u>			
Working	Ref	Ref	Ref
Unemployed	-0.001 (0.005)	0.018*** (0.005)	-0.049** (0.022)
Other	0.025*** (0.006)	0.040*** (0.007)	-0.018 (0.016)
Married/ partnership	-0.031*** (0.006)	-0.054*** (0.007)	-0.033*** (0.010)
#adult in the household	-0.054*** (0.004)	-0.041*** (0.003)	-0.050*** (0.008)
#children in the household	-0.020*** (0.003)	-0.019*** (0.003)	-0.012 (0.016)
Bad/poor health	-0.002 (0.006)	-0.005 (0.004)	-0.007 (0.005)
General risk attitudes	0.003	0.003*	-0.006**

	(0.002)	(0.002)	(0.002)
Extraversion	0.009***	0.008**	-0.005
	(0.003)	(0.003)	(0.004)
Agreeableness	0.005	0.001	0.006
	(0.003)	(0.003)	(0.004)
Emotional stability	-0.001	-0.003	0.000
	(0.003)	(0.003)	(0.004)
Conscientiousness	-0.014***	-0.010***	-0.011***
	(0.003)	(0.003)	(0.004)
Openness	0.001	0.004	0.010***
	(0.004)	(0.003)	(0.004)
Constant	2.023***	-0.310	-1.908
	(0.627)	(0.542)	(2.473)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.114	0.230	0.260
N	59,461	119,571	52,752

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B11. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private supplementary health insurance. Results by age group**

Age group:	Private supplementary health insurance		
	25-39	40-64	65+
	(2)	(3)	(4)
Locus of control	0.021*** (0.004)	0.014*** (0.003)	0.016*** (0.004)
Sex (woman=1)	0.020*** (0.008)	0.038*** (0.006)	0.042*** (0.008)
Age	-0.110 (0.077)	0.005 (0.041)	0.294** (0.123)
Age <sup>2</sup>	0.366 (0.243)	-0.015 (0.079)	-0.394** (0.164)
Age <sup>3</sup>	-0.039 (0.025)	0.001 (0.005)	0.017** (0.007)
Years of education	0.005*** (0.001)	0.011*** (0.001)	0.013*** (0.002)
Log(household income)	0.102*** (0.008)	0.127*** (0.007)	0.172*** (0.011)
<u>Wealth:</u>			
1st quintile	Ref	Ref	Ref
2nd quintile	0.049*** (0.009)	0.021*** (0.007)	-0.014* (0.008)
3rd quintile	0.044*** (0.010)	0.042*** (0.008)	0.008 (0.010)
4th quintile	0.043*** (0.012)	0.051*** (0.008)	0.020* (0.010)
5th quintile	0.109*** (0.017)	0.091*** (0.010)	0.097*** (0.013)
<u>Labour force status :</u>			
Working	Ref	Ref	Ref
Unemployed	-0.018*** (0.007)	-0.005 (0.006)	-0.061 (0.044)
Other	-0.013* (0.007)	-0.021*** (0.006)	-0.037*** (0.017)
Married/ partnership	0.011 (0.007)	-0.013* (0.008)	0.015 (0.010)
#adult in the household	-0.048*** (0.004)	-0.040*** (0.003)	-0.081*** (0.008)
#children in the household	-0.026*** (0.003)	-0.016*** (0.003)	-0.008 (0.013)
Bad/poor health	-0.001 (0.007)	0.001 (0.005)	-0.008 (0.006)
General risk attitudes	-0.001	0.002	0.009***

	(0.002)	(0.002)	(0.002)
Extraversion	0.009**	0.006*	-0.007
	(0.004)	(0.003)	(0.004)
Agreeableness	-0.007*	-0.004	0.003
	(0.004)	(0.003)	(0.004)
Emotional stability	-0.010***	-0.010***	-0.005
	(0.004)	(0.003)	(0.004)
Conscientiousness	-0.006*	-0.005	-0.012***
	(0.004)	(0.003)	(0.004)
Openness	0.004	0.009***	0.022***
	(0.004)	(0.003)	(0.004)
Constant	0.386	-0.976	-8.404***
	(0.816)	(0.689)	(3.069)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.083	0.116	0.179
N	52,803	99,607	46,302

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B12. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private substitutive health insurance. Results by sex**

	Private substitutive health insurance	
	Men	Women
	(1)	(2)
Locus of control	0.018*** (0.004)	0.012*** (0.003)
Age	0.015*** (0.006)	-0.013*** (0.004)
Age <sup>2</sup>	-0.021* (0.011)	0.029*** (0.008)
Age <sup>3</sup>	0.001 (0.001)	-0.002*** (0.000)
Years of education	0.019*** (0.001)	0.022*** (0.001)
Log(household income)	0.205*** (0.007)	0.151*** (0.006)
<u>Wealth:</u>		
1st quintile	Ref	Ref
2nd quintile	-0.030*** (0.007)	-0.022*** (0.005)
3rd quintile	-0.012 (0.008)	-0.012** (0.006)
4th quintile	0.035*** (0.010)	0.021*** (0.007)
5th quintile	0.093*** (0.012)	0.065*** (0.010)
<u>Labour force status :</u>		
Working	Ref	Ref
Unemployed	0.014** (0.006)	0.023*** (0.005)
Other	0.010 (0.008)	0.033*** (0.006)
Married/ partnership	-0.032*** (0.008)	-0.047*** (0.006)
#adult in the household	-0.061*** (0.004)	-0.030*** (0.003)
#children in the household	-0.022*** (0.004)	-0.013*** (0.003)
Bad/poor health	-0.007 (0.005)	-0.003 (0.004)
General risk attitudes	0.003 (0.002)	0.000 (0.002)
Extraversion	0.005	0.005*

	(0.004)	(0.003)
Agreeableness	0.004	0.001
	(0.003)	(0.003)
Emotional stability	0.000	-0.002
	(0.004)	(0.003)
Conscientiousness	-0.014***	-0.011***
	(0.003)	(0.003)
Openness	0.015***	-0.001
	(0.004)	(0.003)
Constant	-1.894***	-1.099***
	(0.101)	(0.074)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R <sup>2</sup>	0.214	0.186
N	109,687	122,097

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



**Table B13. Pooled sample GSOEP 1999-2016. Linear probability models: extensive margin – Germany: Private supplementary health insurance. Results by sex**

	Private supplementary health insurance	
	Men	Women
	(1)	(2)
Locus of control	0.016*** (0.003)	0.017*** (0.003)
Age	-0.005 (0.005)	-0.012** (0.005)
Age <sup>2</sup>	0.012 (0.010)	0.028*** (0.009)
Age <sup>3</sup>	-0.001 (0.001)	-0.002*** (0.001)
Years of education	0.011*** (0.001)	0.008*** (0.001)
Log(household income)	0.120*** (0.007)	0.141*** (0.007)
<u>Wealth:</u>		
1st quintile	Ref	Ref
2nd quintile	0.027*** (0.007)	0.019*** (0.007)
3rd quintile	0.025*** (0.008)	0.043*** (0.008)
4th quintile	0.034*** (0.009)	0.054*** (0.009)
5th quintile	0.091*** (0.011)	0.121*** (0.012)
<u>Labour force status :</u>		
Working	Ref	Ref
Unemployed	0.012* (0.006)	-0.020*** (0.006)
Other	-0.002 (0.007)	-0.022*** (0.006)
Married/ partnership	0.018** (0.007)	-0.016** (0.007)
#adult in the household	-0.043*** (0.004)	-0.055*** (0.004)
#children in the household	-0.020*** (0.003)	-0.021*** (0.003)
Bad/poor health	-0.009* (0.005)	-0.003 (0.005)
General risk attitudes	0.003 (0.002)	0.004** (0.002)
Extraversion	0.003	0.003

	(0.003)	(0.003)
Agreeableness	-0.001	-0.005
	(0.003)	(0.003)
Emotional stability	-0.005	-0.013***
	(0.003)	(0.003)
Conscientiousness	-0.008**	-0.006*
	(0.003)	(0.003)
Openness	0.009***	0.014***
	(0.003)	(0.003)
Constant	-0.810***	-0.819***
	(0.097)	(0.088)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R <sup>2</sup>	0.107	0.126
N	89,707	109,005

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B14. Robustness Checks. Pooled sample GSOEP 1999-2016. Linear probability models – Germany**

	Coverage of the supplementary private health insurance (1=covered; 0=not covered or no supplementary private insurance)				
	Hospital	Denture	Glasses	Abroad	Other
Locus of control	0.012*** (0.002)	0.009*** (0.002)	0.006*** (0.001)	0.004*** (0.001)	0.002*** (0.001)
Sex (woman=1)	0.019*** (0.004)	0.027*** (0.004)	0.014*** (0.003)	0.007*** (0.003)	0.002 (0.001)
Age	-0.004 (0.003)	-0.008*** (0.003)	-0.001 (0.002)	-0.003 (0.002)	0.004*** (0.001)
Age <sup>2</sup>	0.008 (0.006)	0.020*** (0.006)	0.003 (0.004)	0.005 (0.004)	-0.007*** (0.002)
Age <sup>3</sup>	-0.000 (0.000)	-0.002*** (0.000)	-0.000 (0.000)	-0.000* (0.000)	0.000*** (0.000)
Years of education	0.006*** (0.001)	0.004*** (0.001)	0.002*** (0.000)	0.004*** (0.000)	0.000* (0.000)
Log(household income)	0.097*** (0.004)	0.071*** (0.004)	0.035*** (0.003)	0.049*** (0.003)	0.012*** (0.001)
<u>Wealth:</u>					
1st quintile	Ref.	Ref.	Ref.	Ref.	Ref.
2nd quintile	-0.004 (0.004)	0.027*** (0.004)	0.017*** (0.004)	0.012*** (0.003)	0.005*** (0.001)
3rd quintile	0.009** (0.004)	0.030*** (0.005)	0.019*** (0.004)	0.019*** (0.003)	0.007*** (0.002)
4th quintile	0.027*** (0.005)	0.028*** (0.005)	0.022*** (0.004)	0.023*** (0.003)	0.005*** (0.002)
5th quintile	0.094*** (0.007)	0.039*** (0.006)	0.019*** (0.005)	0.034*** (0.004)	0.014*** (0.002)
<u>Labour force status :</u>					
Working	Ref.	Ref.	Ref.	Ref.	Ref.
Unemployed	0.019*** (0.004)	-0.017*** (0.004)	-0.011*** (0.003)	-0.003 (0.002)	-0.003** (0.001)
Other	0.002 (0.004)	-0.024*** (0.004)	-0.015*** (0.003)	-0.003 (0.003)	-0.004*** (0.001)
Married/ partnership	-0.009** (0.004)	0.005 (0.004)	0.002 (0.003)	0.002 (0.003)	0.002 (0.001)
#adult in the household	-0.032*** (0.002)	-0.030*** (0.002)	-0.014*** (0.002)	-0.017*** (0.002)	-0.006*** (0.001)
#children in the household	-0.011*** (0.002)	-0.014*** (0.002)	-0.006*** (0.002)	-0.011*** (0.001)	-0.004*** (0.001)
Bad/poor health	-0.006** (0.003)	-0.003 (0.003)	-0.002 (0.002)	-0.003 (0.002)	0.004*** (0.001)
General risk attitudes	0.002** (0.001)	0.002** (0.001)	0.001 (0.001)	0.001 (0.001)	0.001*** (0.000)

Extraversion	0.004** (0.002)	0.003 (0.002)	0.002 (0.001)	0.002* (0.001)	0.001* (0.001)
Agreeableness	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.001)	-0.002* (0.001)	-0.000 (0.001)
Emotional stability	-0.006*** (0.002)	-0.003 (0.002)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Conscientiousness	-0.003 (0.002)	-0.003 (0.002)	-0.001 (0.001)	-0.002* (0.001)	-0.001 (0.001)
Openness	0.006*** (0.002)	0.006*** (0.002)	0.003** (0.002)	0.002* (0.001)	0.002*** (0.001)
Constant	-0.627*** (0.053)	-0.408*** (0.053)	-0.232*** (0.042)	-0.310*** (0.037)	-0.135*** (0.020)
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.090	0.085	0.036	0.040	0.010
N	198,712	198,712	198,712	198,712	198,712

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B15. GSOEP 1999-2016. Health care use. OLS estimations – Germany**

	Number of doctor visits per year	Hospital stay
Locus of control	-0.048 (0.067)	0.000 (0.001)
Sex (woman=1)	0.999*** (0.128)	0.009*** (0.002)
Age	-0.239** (0.117)	-0.017*** (0.002)
Age <sup>2</sup>	0.568** (0.231)	0.028*** (0.004)
Age <sup>3</sup>	-0.036** (0.014)	-0.001*** (0.000)
Years of education	0.093*** (0.021)	0.001*** (0.000)
Log(household income)	0.568*** (0.133)	-0.005** (0.002)
<u>Wealth:</u>		
1st quintile	Ref.	Ref.
2nd quintile	0.105 (0.184)	-0.006** (0.003)
3rd quintile	-0.071 (0.178)	-0.004 (0.003)
4th quintile	-0.060 (0.205)	-0.001 (0.003)
5th quintile	-0.623*** (0.210)	-0.007** (0.003)
<u>Labour force status :</u>		
Working	Ref.	Ref.
Unemployed	1.817*** (0.276)	0.013*** (0.004)
Other	2.126*** (0.195)	0.022*** (0.003)
Married/ partnership	0.823*** (0.148)	0.012*** (0.002)
#adult in the household	-0.694*** (0.069)	-0.006*** (0.001)
#children in the household	-0.475*** (0.060)	0.009*** (0.001)
Bad/poor health	13.221*** (0.218)	0.160*** (0.003)
General risk attitudes	-0.021 (0.037)	0.003*** (0.001)
Extraversion	0.383*** (0.065)	0.004*** (0.001)

Agreeableness	-0.104 (0.067)	0.001 (0.001)
Emotional stability	-1.076*** (0.070)	-0.007*** (0.001)
Conscientiousness	-0.111 (0.071)	-0.002 (0.001)
Openness	0.257*** (0.073)	0.001 (0.001)
Constant	5.212** (2.083)	0.381*** (0.035)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R <sup>2</sup>	0.147	0.055
N	231,232	231,514

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table B16. Pooled sample GSOEP 1999, 2005, 2010, 2015. Linear probability models – Individual fixed effects models: extensive margin – Germany: Private substitutive health insurance**

	Private substitutive health insurance		
	(1)	(2)	(3)
Locus of control	0.003** (0.001)	0.003** (0.001)	0.002* (0.001)
Age	0.020*** (0.005)	0.017*** (0.005)	0.019*** (0.005)
Age <sup>2</sup>	-0.036*** (0.006)	-0.030*** (0.006)	-0.036*** (0.006)
Age <sup>3</sup>	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Log(household income)		0.022*** (0.004)	0.029*** (0.005)
<u>Labour force status :</u>			
Working			Ref.
Unemployed			-0.005 (0.004)
Other			0.009** (0.004)
Married/ partnership			-0.002 (0.006)
#adult in the household			-0.008*** (0.002)
#children in the household			-0.003 (0.002)
Bad/poor health			-0.003 (0.002)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Within-R <sup>2</sup>	0.012	0.014	0.015
N	46,407	46,407	46,407

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table B17. Pooled sample GSOEP 1999, 2005, 2010, 2015. Linear probability models – Individual fixed effects models: extensive margin – Germany: Private substitutive health insurance**

	Log(Premium private substitutive health insurance)		
	(1)	(2)	(3)
Locus of control	0.011 (0.010)	0.011 (0.010)	0.012 (0.009)
Age	0.123*** (0.041)	0.113*** (0.040)	0.090** (0.040)
Age <sup>2</sup>	-0.194*** (0.046)	-0.176*** (0.045)	-0.133*** (0.046)
Age <sup>3</sup>	0.009*** (0.003)	0.008*** (0.003)	0.006** (0.003)
Log(household income)		0.072*** (0.022)	0.041* (0.024)
<u>Labour force status :</u>			
Working			Ref.
Unemployed			-0.165*** (0.056)
Other			-0.189*** (0.026)
Married/ partnership			0.046 (0.032)
#adult in the household			-0.019 (0.014)
#children in the household			0.001 (0.014)
Bad/poor health			-0.004 (0.020)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Within-R <sup>2</sup>	0.128	0.132	0.157
N	5,458	5,458	5,458

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



**Table B18. Pooled sample GSOEP 1999, 2005, 2010, 2015. Linear probability models – Individual fixed effects models: extensive margin – Germany: Supplementary private health insurance**

	Supplementary private health insurance		
	(1)	(2)	(3)
Locus of control	0.008*** (0.003)	0.007*** (0.003)	0.007*** (0.003)
Age	-0.009 (0.009)	-0.013 (0.009)	-0.010 (0.009)
Age <sup>2</sup>	0.020** (0.010)	0.027*** (0.010)	0.020* (0.010)
Age <sup>3</sup>	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Log(household income)		0.030*** (0.007)	0.039*** (0.008)
<u>Labour force status :</u>			
Working			Ref.
Unemployed			0.000 (0.008)
Other			0.008 (0.007)
Married/ partnership			0.006 (0.009)
#adult in the household			-0.013*** (0.004)
#children in the household			-0.005 (0.004)
Bad/poor health			-0.008 (0.006)
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Within-R <sup>2</sup>	0.047	0.048	0.049
N	39,794	39,794	39,794

*Note.* Clustered (at the individual-level) standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The question about supplementary health insurance was not asked in 2015. We impute the response from 2016.

# Online Appendix C

**Table C1. Descriptive statistics by locus of control, Australia**

	Australia – HILDA 2005-2014	
	Locus of control below the median	Locus of control above the median
Supplementary private health insurance	55.2%	66.8%
Sex (woman=1)	55.1%	51.8%
Age	52.12	48.61
Years of education	11.89	12.60
<u>Labour force status:</u>		
Working	57.4%	71.4%
Unemployed	2.6%	1.5%
Other	40.0%	27.1%
Married/ partnership	68.0%	77.3%
Monthly net household income	6442\$	8114\$
#adult in the household	2.141	2.150
#children in the household	0.721	0.852
Satisfaction with health	6.579	7.691
Risk attitudes (Australia: above average financial risk taking)	7.3%	10.4%
<u>The Big Five:</u>		
Extraversion	-0.191	0.191
Agreeableness	-0.129	0.129
Emotional stability	-0.293	0.293
Conscientiousness	-0.227	0.227
Openness	-0.053	0.053
<u>Wealth:</u>		
1st quintile	19.9%	12.2%
2nd quintile	19.7%	18.4%
3rd quintile	21.4%	20.4%
4th quintile	20.8%	23.0%
5th quintile	18.2%	26.0%
Number of observations	51,724	51,724

*Note.* HILDA 2005-2014. This table reports the characteristics of individuals according to their degree of internal locus of control in Australia.

**Table C2 Correlates of locus of control, Australia**

	All years	2005	2007	2011	2014
	(1)	(2)	(3)	(4)	(5)
Sex (woman=1)	-0.1193*** (0.0150)	-0.1286*** (0.0174)	-0.1133*** (0.0167)	-0.1148*** (0.0159)	-0.1283*** (0.0162)
Age	-0.0576*** (0.0129)	-0.0678*** (0.0213)	-0.0532*** (0.0187)	-0.0699*** (0.0167)	-0.0308* (0.0170)
Age <sup>2</sup>	0.0009*** (0.0003)	0.0011*** (0.0004)	0.0008** (0.0004)	0.0011*** (0.0003)	0.0004 (0.0003)
Age <sup>3</sup>	-0.0000*** (0.0000)	-0.0000*** (0.0000)	-0.0000** (0.0000)	-0.0000*** (0.0000)	-0.0000 (0.0000)
Years of education	0.0105*** (0.0035)	0.0068 (0.0044)	0.0093** (0.0042)	0.0093** (0.0039)	0.0110*** (0.0040)
Log(household income)	0.1036*** (0.0100)	0.1459*** (0.0191)	0.1428*** (0.0182)	0.1030*** (0.0165)	0.0766*** (0.0170)
<u>Wealth:</u>					
1st quintile	Ref.	Ref.	Ref.	Ref.	Ref.
2nd quintile	0.0784*** (0.0256)	0.0536 (0.0370)	0.0636* (0.0324)	0.0892*** (0.0292)	0.0810*** (0.0290)
3rd quintile	0.1040*** (0.0258)	0.0906** (0.0358)	0.0660** (0.0326)	0.1224*** (0.0298)	0.1220*** (0.0299)
4th quintile	0.1375*** (0.0263)	0.1128*** (0.0374)	0.1061*** (0.0338)	0.1501*** (0.0307)	0.1534*** (0.0304)
5th quintile	0.1834*** (0.0279)	0.1448*** (0.0408)	0.1376*** (0.0369)	0.1954*** (0.0332)	0.2208*** (0.0333)
<u>Labour force status:</u>					
Working	Ref.	Ref.	Ref.	Ref.	Ref.
Unemployed	-0.1418*** (0.0258)	-0.1726** (0.0749)	-0.1605** (0.0681)	-0.1700*** (0.0558)	-0.1068** (0.0517)
Other	-0.0644*** (0.0169)	-0.0343 (0.0272)	-0.0662*** (0.0256)	-0.0764*** (0.0239)	-0.0657*** (0.0236)
Married/ partnership	0.1314*** (0.0171)	0.0621** (0.0259)	0.1078*** (0.0249)	0.1389*** (0.0225)	0.1722*** (0.0223)
#adult in the household	-0.0812*** (0.0078)	-0.0965*** (0.0141)	-0.1022*** (0.0127)	-0.0808*** (0.0114)	-0.0723*** (0.0110)
#children in the household	0.0073 (0.0050)	-0.0068 (0.0072)	-0.0004 (0.0068)	0.0104 (0.0070)	0.0169** (0.0071)
Satisfaction with health	0.1191*** (0.0036)	0.1288*** (0.0056)	0.1352*** (0.0051)	0.1204*** (0.0049)	0.1063*** (0.0050)
Risk attitudes (Australia: above average financial risk taking)	0.0425** (0.0170)	0.0902*** (0.0289)	0.0409 (0.0272)	0.0181 (0.0277)	0.0153 (0.0274)
Extraversion	0.1054***	0.0943***	0.0990***	0.1117***	0.1096***

	(0.0076)	(0.0095)	(0.0091)	(0.0082)	(0.0083)
Agreeableness	0.0214**	0.0033	0.0082	0.0285***	0.0363***
	(0.0088)	(0.0113)	(0.0107)	(0.0098)	(0.0102)
Emotional stability	0.2879***	0.3089***	0.3056***	0.2728***	0.2665***
	(0.0085)	(0.0110)	(0.0102)	(0.0095)	(0.0098)
Conscientiousness	0.1044***	0.0986***	0.0973***	0.1002***	0.1133***
	(0.0080)	(0.0101)	(0.0096)	(0.0088)	(0.0090)
Openness	0.0401***	0.0437***	0.0443***	0.0434***	0.0309***
	(0.0088)	(0.0112)	(0.0106)	(0.0096)	(0.0097)
Constant	-0.3981*	-0.3645	-0.8215**	-0.1602	-0.7186**
	(0.2232)	(0.3849)	(0.3502)	(0.3022)	(0.3015)
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	No	No	No	No
R <sup>2</sup>	0.314	0.340	0.350	0.302	0.284
N	103,448	8,352	9,128	12,023	11,981

*Note.* HILDA 2005–2014. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table C3. Heterogeneity by Age Groups, Australia**

Age group:	Supplementary private health insurance		
	25–40	41–64	65+
	(1)	(2)	(3)
Locus of control	0.0096 (0.0063)	0.0083 (0.0054)	0.0089 (0.0083)
Risk attitudes (Australia: above average financial risk taking)	0.0271** (0.0114)	0.0293*** (0.0098)	-0.0015 (0.0222)
Age and sex	Yes	Yes	Yes
Education, income and Wealth	Yes	Yes	Yes
Labour force status	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes
Health satisfaction	Yes	Yes	Yes
Big 5	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R <sup>2</sup>	0.276	0.293	0.273
N	32,003	50,040	21,405

*Note.* HILDA 2005–2014. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table C4. Heterogeneity by Gender, Australia**

Gender:	Supplementary private health insurance	
	Male	Female
	(1)	(2)
Locus of control	0.0132** (0.0059)	0.0068 (0.0051)
Risk attitudes (Australia: above average financial risk taking)	0.0198** (0.0096)	0.0270** (0.0112)
Full controls	Yes	Yes
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R <sup>2</sup>	0.272	0.277
N	48,147	55,301

*Note.* HILDA 2005–2014. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table C5. Coverage Type, Australia**

	Supplementary private health insurance	Coverage of the supplementary private health insurance (1=covered; 0=not covered or no supplementary private insurance)		
		Hospital	Extras	Hospital + Extras
Locus of control	0.0113*** (0.0040)	-0.0014 (0.0023)	-0.0007 (0.0016)	0.0136*** (0.0040)
Risk attitudes (Australia: above average financial risk taking)	0.0218** (0.0093)	0.0075 (0.0066)	-0.0084** (0.0037)	0.0238** (0.0102)
Full controls	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.265	0.046	0.018	0.232
N	34,401	34,305	34,305	34,305

*Note.* HILDA Years 2004, 2009 and 2013. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table C6. Alternative Specification with wealth attached from previous years, Australia**

	Supplementary private health insurance	Coverage of the supplementary private health insurance (1=covered; 0=not covered or no supplementary private insurance)		
		Hospital	Extras	Hospital + Extras
Locus of control	0.0157*** (0.0045)	0.0001 (0.0026)	-0.0001 (0.0018)	0.0162*** (0.0044)
Risk attitudes (Australia: above average financial risk taking)	0.0785*** (0.0174)	0.0126 (0.0131)	-0.0123* (0.0072)	0.0789*** (0.0197)
Full controls	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.258	0.046	0.017	0.228
N	30,922	30,838	30,838	30,838

*Note.* HILDA Years 2004, 2009 and 2013. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Table C7. Health Care Utilisation, Australia**

	Number of doctor visits per year	Hospital stay
	(1)	(2)
Locus of control	-0.3540*** (0.0588)	0.0041 (0.0076)
Full controls	Yes	Yes
Region FE	Yes	Yes
Year FE	Yes	No
R <sup>2</sup>	0.207	0.061
N	26,002	26,055

Note. HILDA 2009, 2013. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level. Standard errors in parenthesis. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table C8. Locus of Control and Positive Health Selection, Australia**

	Supplementary private health insurance					
	(1)	(2)	(3)	(4)	(5)	(6)
Loc (mean, std)		0.0616*** (0.0041)		0.0146*** (0.0036)		0.0089** (0.0039)
Poor/bad health	-0.1748*** (0.0082)	-0.1222*** (0.0081)	-0.0315*** (0.0081)	-0.0207** (0.0081)	-0.0176** (0.0082)	-0.0127 (0.0081)
Age and gender	Yes	Yes	Yes	Yes	Yes	Yes
Income, wealth and education	No	No	Yes	Yes	Yes	Yes
Employment	No	No	Yes	Yes	Yes	Yes
Household characteristics	No	No	No	No	Yes	Yes
Personality	No	No	No	No	Yes	Yes
Risk Attitudes	No	No	No	No	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.034	0.048	0.264	0.265	0.273	0.273
N	103,448	103,448	103,448	103,448	103,448	103,448

Note. Years 2005–2014. Standard errors in parentheses. Standard errors are clustered at the individual- and household-year-level.