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* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.
Determinants of consumer financial risk-taking: Evidence from deductible choice

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Abstract

We analyze a clear-cut example of choice under uncertainty, namely deductible choice in the Dutch health insurance market. The unique institutional features of this market enable us to examine demand-side choices that only vary in their financial parameters. Using a rich dataset, we investigate the theoretical determinants of deductible choice. In line with expected-utility theory, we find that healthier, wealthier and more risk-tolerant consumers choose higher levels of deductibility. Consumer choice for financial risk is thus driven by various considerations, not only by risk type. Heterogeneity in risk preferences seems at least as important in explaining financial risk-taking. These results are not only relevant to insurance markets but to all markets where consumers decide on financial risk.

\textbf{JEL classification:} D12, D81, G22

\textbf{Key words:} Financial Risk, Risk Tolerance, Adverse Selection, Deductible, Insurance

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1. INTRODUCTION

The theory of choice under uncertainty has been at the core of economic research ever since the seminal work of von Neumann and Morgenstern (1948) and Friedman and Savage (1948). Empirical evidence on actual choices is, however, surprisingly scarce. Of course, there have been numerous analyses of laboratory experiments, game shows and hypothetical gambles, which have greatly enhanced our understanding of individual choice behaviour. Yet the same features that make such studies valuable actually limit their real-life applicability (Loewenstein, 1999). For real-life applicability, real-life choice behaviour should be analyzed.

In textbooks, the theory of choice under uncertainty is typically illustrated with an insurance example. This is of course no coincidence. Through insurance, individuals can reduce their uncertainty, at the cost of an insurance premium. Hence, insurance decisions provide researchers with valuable information on choice behaviour (Machina, 2000). Consequently, there is a sizeable and growing strand of empirical research on insurance markets, including, e.g., Cutler, Finkelstein and McGarry (2008) and Fang, Keane and Silverman (2008). A complicating factor in such empirical research is that insurance decisions in practice typically involve more than just a transfer of financial risk. Indeed, the choice among different insurance schemes or, more fundamentally, whether to insure or not, may involve non-financial considerations, such as quality and service aspects of insurance plans. Accordingly, non-financial preferences can complicate analyses of insurance demand (Cohen and Einav, 2007).
Another empirical challenge concerns the modelling of insurance demand (Chiappori and Salanié, 2008). One needs a detailed understanding of the insured risk and the exact features of the contracts traded. Knowledge on the distribution of information between buyers and sellers is also required. Indeed, when insurers have information on policyholders that can be used in pricing, the estimation methodology should correct for that (Chiappori and Salanié, 2000). Furthermore, the empirical strategy should typically also cope with potential sampling problems, at least if one aspires to draw general conclusions with validity outside the analyzed market. As this is notoriously difficult, researchers typically point out that care should be taken with interpreting the results outside the scope of their papers (e.g., Cohen and Einav, 2007; Cutler et al., 2008).

We contribute to the literature by examining a clear-cut example of choice under uncertainty, namely deductible choice in universal health insurance in the Netherlands. In this nationwide market, consumers only choose the degree of financial risk they will be subject to. Individuals that opt for a higher deductible have the same health plan like everybody else, yet they voluntarily expose themselves to more financial risk, in return for a premium rebate. A key advantage of analyzing deductible choice in the Dutch context is that the institutional features are such that modelling insurance demand is a task of manageable proportions. The majority of health costs are covered by the so-called Basic Health Insurance Policy, which is mandatory for all residents. As a result, there is no sample selection bias. Moreover, as these policies are highly standardized and community-rated, i.e. premiums are independent of health status and risk, practically no room exists for risk selection by the insurer. A
tailor-made Risk Equalisation Fund (REF) is designed to share risks among insurers. Therefore, there is also little reason for selecting risks as this scheme curtails potential gains from risk selection by the insurer. Consequently, the focus of our empirical approach can be entirely on the demand-side, i.e. consumer deductible choice.

Deductible choice is a particular case of insurance demand that has been extensively analyzed in the theoretical literature (for a recent overview see, e.g., Gollier, 2000; and Schlesinger, 2000). Under expected-utility theory, three key drivers are distinguished: risk type, risk preferences and wealth. First, given that deductible rebates are community-rated, risky individuals are expected to choose a lower deductible and therewith more insurance coverage. Second, an increase in risk aversion reduces the optimal deductible, i.e. the deductible that maximizes utility. Third, assuming decreasing absolute risk aversion (DARA), wealthier individuals have a higher optimal level of deductibility.

To investigate the drivers of deductible choice, we use survey data from CentERpanel. These data are representative for the adult population in the Netherlands and have been used by, among others, van Rooij, Kool and Prast (2007). For each consumer in the sample, we observe the voluntary deductible choice from an array of six alternatives. These alternatives range from €0-€500, in steps of €100. An important strength of our dataset is that it also includes good proxies of consumers’ risk type, risk preferences and wealth – proxies that have been widely used in the literature. This enhances the comparability of our research with other empirical studies of insurance demand, including the
increasingly important literature on adverse/advantageous selection (examples for the US health insurance market include Hurd and McGarry, 1997; Cardon and Hendel, 2001; Fang et al., 2008).

Using tobit regression analyses, we find that the theoretical determinants of deductible choice are also significant drivers in practice. Healthier, wealthier and more risk-tolerant consumers choose higher levels of deductibility, and thus less health insurance coverage. Accordingly, heterogeneity in risk preferences is found to be at least as important as heterogeneity in risk type in explaining consumer financial risk-taking.

The rest of the paper is organized as follows. A brief overview of the institutional aspects of universal basic health in the Netherlands is provided in the next section. This is followed by an outline of our estimation approach. The fourth section discusses the data and the fifth section presents the empirical results. Section six concludes.

2. INSTITUTIONAL BACKGROUND
The implementation of the Health Insurance Act in 2006 significantly changed the Dutch market for health insurance. After decades of price and capacity control by government, the Dutch health care system shifted from supply-side regulation to managed competition (van de Ven and Schut, 2008). The aim of this shift was to make health care more cost efficient and improve the quality. However, to guarantee that every Dutch citizen has equal access to essential care with good quality, the government introduced specific limitations to market
functioning. As a result, the Dutch health care system has both public and private aspects (Okma, 2009).

As of 2006, residents in the Netherlands are obliged to purchase a specific health insurance plan, the so-called basic health insurance policy, from a private insurance company. Each year, the exact composition of this basic package is determined by the government. Generally, it includes hospital care, care provided by general practitioners and specialists, the prescription of drugs, maternity care, obstetrics, technical aids and dental care for children (van Kleef, Beck, van de Ven and van Vliet, 2008). Though insurers are free to offer preferred-provider policies, the large majority of insurers cover all health care suppliers. Therefore, the basic health insurance plan is quite close to being a homogeneous product in the theoretical sense.

To curtail unnecessary health care consumption arising from moral hazard, Dutch government initially arranged for both a no-claim refund and a voluntary deductible. The no-claim refund was applicable to adult residents in 2007. If total personal claims were between €0 and €255, the individual would get the no-claim refund minus the actual claims.\(^1\) On top of this, residents could choose a deductible from six alternatives, ranging from €0 till €500 in stages of €100. Choosing higher levels of deductibility leads to more financial risk, for which consumers are compensated via premium rebates. In 2008, the no-claim refund was replaced by a mandatory deductible of €150. The six voluntary deductible

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\(^1\) This applies to all medical benefits in the basic package except for care provided by the general practitioner, obstetrics and maternity care (van Kleef et al., 2008).
alternatives remained the same. This allows us to use voluntary deductible choice in both 2007 and 2008.

While insurers can set their premiums and premium-rebates freely, differentiation by health condition and risk type is prohibited. In addition, insurers are obliged to accept every eligible applicant. To compensate health insurers for unhealthy and therefore costly pools of policy-holders, a Risk Equalisation Fund (REF) has been set up. This fund finances, on average, 50\% of total health care expenditures through income-related contributions. Using information on residents’ age, gender, region, source of income, pharmacy-based cost groups and diagnostic-based cost groups, an insurer receives equalisation payments from this fund (van Kleef et al., 2008). For instance, an insurer with an above average fraction of elderly people in its portfolio is compensated accordingly. About 45\% of total health care costs are financed through insurance premiums. Note that children up to the age of 18 are exempted from paying premiums; their medical care is financed by government and constitutes about 5\% of total health care costs.

3. EMPIRICAL APPROACH

Modelling deductible choice in an empirical setting can be quite challenging. It requires a detailed understanding of the risks that are insured, the features of the contracts traded and the exact distribution of information between buyers and sellers (Chiappori and Salanié, 2008). When insurers have information on their (would-be) policyholders and they are allowed to use this information in their pricing, the estimation methodology should correct for that.
Thanks to the unique institutional features of basic health insurance in the Netherlands, modelling deductible choice context is relatively straightforward. As health insurers are obliged to accept every eligible applicant at community-rated premiums, asymmetric information is effectively guaranteed. Therefore, we ignore the supply-side in our empirical approach and focus our attention on the factors that determine consumers’ deductible choice. Note that we assume that rebate difference between insurers do not affect our results. The rationale behind this assumption is two-fold. First, in practice consumers first choose their insurer and then their preferred deductible with that insurer. Indeed, most consumers (60%) contract their insurer via their employer, or another organization that negotiates certain collective benefits (ranging from sport clubs to internet groups). Second, insurers do not actively publicize their premium rebates. As a result, comparing rebates is accompanied with extra search costs. In a robustness exercise, we verify that relaxing this assumption does not change our results.

Standard insurance theory suggests three demand-side characteristics that affect optimal deductible choice: risk type, risk preferences and wealth (see e.g. Gollier, 2000; and Schlesinger, 2000). Regarding risk type, Schlesinger (1981) shows that a risk-averse policy-holder with a higher loss probability chooses a lower deductible. A necessary condition for this intuitive result is that the insured’s risk-type is unknown to the insurer. Whereas this condition is clearly met in Dutch basic health insurance with community-rated premiums, in many

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2 We thank the Dutch Healthcare Authority for kindly providing us the right data.
circumstances it is not. When insurers can at least partially price and select risk as part of their underwriting activities, then the effect of a higher loss probability on insurance demand is ambiguous (Jang and Haddar, 1995).

The effect of risk preferences on deductible choice is theoretically straightforward. Both for the expected-utility framework (Mossin, 1968) and the more general non-expected utility framework (Machina, 1995) it has been shown that an increase in risk aversion reduces the optimal deductible, i.e. the deductible that maximizes utility. This is an intuitive result, since an increase in risk-aversion increases the marginal benefit of insurance coverage, while the marginal costs (i.e. premiums) stay the same. Mossin (1968) combines this with the assumption of decreasing absolute risk aversion in wealth (DARA) to conclude that, everything else equal, wealthier individuals are expected to purchase less insurance coverage.

We proxy risk type by using a subjective measure, that is self-assessed health status (SASH). SASH is generally regarded to be a good predictor of future health conditions (e.g. Gerdtham et al., 1997; Wagstaff and van Doorslaer, 1994). Moreover, like all subjective measures SASH has the advantage of strictly reflecting information known to the consumer. Thereby unknown aspects of one’s health condition – which by definition cannot play a role in the demand for health insurance – are rightly ignored. The question providing information on SASH is formulated as follows: ‘How is your health in general’, with five response categories ranging from ‘excellent’ to ‘poor’. A potential drawback of SAHS is that survey respondents may implicitly assess their health
relative to their age category (Buchmueller et al., 2009; Doiron et al., 2008). To address this concern, we also interact SASH with age.

Risk preferences are measured by stated and actual behaviour. Regarding the former, we use a proxy of stated financial risk tolerance. Specifically, we use answers to the following question: ‘I am willing to run the risk of losing money if there is also a chance that I will make money’. Respondents can answer this question on a seven point scale, where one means ‘completely disagree’ and seven means ‘completely agree’. This measure of financial risk tolerance is quite fitting, as higher levels of deductibility only involve higher levels of financial risk. Our measures of actual behaviour concern the smoking and drinking behaviour of respondents. Smoking and drinking have been frequently used as indicators of risky behaviour (see for example Barsky et al., 1997; Cutler et al., 2008; Doiron et al., 2008). Dummy variable smoking is one for daily smokers; dummy variable drinking is one for individuals with daily alcoholic consumptions in excess of four.

Our third deductible choice determinant is wealth, which we proxy by gross annual income and total financial assets (checking and savings accounts, stocks and bonds). Both variables are measured in euros. Under DARA, wealth is negatively correlated with absolute risk aversion. To account for this in our estimation approach, we include interaction terms between our two wealth proxies and financial risk tolerance.
Recapitulating, we model deductible choice as

\begin{equation}
\begin{align*}
D_{it}^\circ &= \alpha + \beta_1^{\prime} Rtype_{it-1} + \beta_2^{\prime} Rpref_{it-1} + \beta_3^{\prime} Wealth_{it-1} + \beta_4^{\prime} (Rtype_{it-1} \times Age_{it-1}) \\
&\quad + \beta_5^{\prime} (Rpref_{it-1} \times Wealth_{it-1}) + \gamma X_{it-1} + \epsilon_{it},
\end{align*}
\end{equation}

where disturbance term \( \epsilon_{it} \) follows a normal distribution. The dependent variable \( D_{it}^\circ \) is a latent variable measuring consumer \( i \)'s desired level of deductibility in period \( t \). Since \( D_{it}^\circ \) is unobserved, we use actual deductible choice, \( D_{it} \), instead. This indicator variable takes monetary values €0, €100, €200, €300, €400 and €500. Equation (1) is estimated as a Tobit equation - rather than as an ordered probit equation - to make full use of the information provided by voluntary deductible choice.\(^3\) Our Tobit specification has two censoring limits:

\begin{equation}
D_{it} = \begin{cases} 
0 & \text{if } D_{it}^\circ \leq 0 \\
D_{it}^\circ & \text{if } 0 < D_{it}^\circ < 500 \\
500 & \text{if } D_{it}^\circ \geq 500
\end{cases}
\end{equation}

where €0 and €500 are the lower and upper censoring limits, respectively.

In Equation (1), \( Rtype_{it-1} \), \( Rpref_{it-1} \) and \( Wealth_{it-1} \) are our measures of risk type, risk preference and wealth, respectively. Furthermore, \( X_{it-1} \) is a vector of demographic characteristics described in the data section. Note that all

\(^3\) We also estimated Equation 1 as an ordered probit model. The results are qualitatively similar and available upon request.
explanatory variables are lagged because consumers select their deductible one year ahead.

4. DATA

We use individual-level data on CentERpanel members that have been collected through internet surveys of CentERdata. The CentERpanel was established in 1991 and consists of over 2,000 households. The panel is an appropriate representation of the Dutch-speaking population in the Netherlands and has been used before by van Rooij et al. (2008). The questionnaires are answered at home, so participants do not feel rushed to give an answer and are fully anonymous when answering the questions. Chiang and Krosnick (2003) argue that when compared to telephone interviewing, internet surveys exhibit higher validity and less social desirability response bias. Participants are not paid for their participation.

Our sample consists of those panel members that have indicated to be the principal financial decision maker of their respective household. We have asked them to specify their basic health insurer (from a list of 30 insurers) in 2007 and 2008, as well as their voluntary deductible in these years. Out of the 1828 survey participants 1238 responded (68%). We merged the data with DNB Household Survey (DHS) data, covering these same individuals. The DHS includes several proxies for the theoretical drivers of deductible choice, mentioned above, as well as several demographic characteristics. These characteristics include age (measured in years), gender (male=1), partner

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4 CentERdata forms part of the CentER Group at Tilburg University. See also http://www.uvt.nl/centerdata/en.
5 The RAND American Life Panel is modelled after the CentERpanel in the Netherlands.
(yes=1), number of children, living area (major urban=1) and highest education
(1-7 scale, 7=university). Year-end 2006 and 2007 data were used, since
deductibles are chosen ex-ante. The final dataset contains 1433 consumer-year
observations.6

Sample averages are given in Table 1 by voluntary deductible choice. We
observe significant differences between those who choose a voluntary
deductible and those that do not. Consumers with a voluntarily deductible
generally consider themselves healthier. They also are significantly more risk
tolerant: not only towards financial risk but also towards health risk. Among
those with a voluntary deductible, the proportion of daily smokers is
significantly higher. However, the proportion of daily drinkers does not vary by
deductible choice. With respect to our wealth proxies, we observe that
consumers with a voluntary deductible generally have higher incomes and more
financial assets. Of the demographic variables, gender and education seem
particularly relevant. While the overall proportion of males in our sample is
high (73%), it is even higher for the sub-sample with a voluntary deductible
(81%). Interestingly, average education level of individuals with a voluntary
deductible is also significantly higher. Education is likely to be positively
correlated to our wealth proxies in our empirical analysis.

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6 We dropped observations for which the dependent variable (deductible choice) or one of the
explanatory variables was missing. Total non-response is reasonably randomly distributed on
the proxies for the theoretical determinants of deductible choice, i.e. self-assessed health status,
financial risk tolerance, smoking, income and financial wealth. Consequently, selection bias
does not seem to be an important problem.
Table 1. Sample averages by voluntary deductible choice

<table>
<thead>
<tr>
<th>Variables</th>
<th>Voluntary deductible?</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Self-assessed health status (1-5 scale, 5 is poor)</td>
<td>2.07</td>
<td>2.17</td>
</tr>
<tr>
<td>Financial risk tolerance (1-7 scale, 7 is very tolerant)</td>
<td>3.12</td>
<td>2.45</td>
</tr>
<tr>
<td>Smoking (1=smoker)</td>
<td>0.22</td>
<td>0.16</td>
</tr>
<tr>
<td>Drinking (1=drinker)</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Financial assets (€100,000)</td>
<td>0.55</td>
<td>0.39</td>
</tr>
<tr>
<td>Income (€10,000)</td>
<td>4.08</td>
<td>3.48</td>
</tr>
<tr>
<td>Gender (1=male)</td>
<td>0.81</td>
<td>0.70</td>
</tr>
<tr>
<td>Partner (1=yes)</td>
<td>0.72</td>
<td>0.73</td>
</tr>
<tr>
<td>Region (1=major urban)</td>
<td>0.21</td>
<td>0.16</td>
</tr>
<tr>
<td>Age (years)</td>
<td>53</td>
<td>54</td>
</tr>
<tr>
<td>Children (number)</td>
<td>0.56</td>
<td>0.60</td>
</tr>
<tr>
<td>Education (1-7, university is 7)</td>
<td>5.40</td>
<td>5.04</td>
</tr>
</tbody>
</table>

Sample proportions: 0.27 0.73
Number of observations: 386 1047

Notes: ** and * indicate that the sample averages are significantly different at the 99% and 95% confidence level, respectively.

5 RESULTS

We estimate three alternative specifications of Equation (1): model (A) includes only SASH as an explanatory variable; model (B) includes SAHS as well as our proxies of risk tolerance and wealth; and in model (C) interaction terms and various demographic variables are additionally added. Table 2 shows the results.
### Table 2. Deductible choice tobit regressions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model (A)</th>
<th>Model (B)</th>
<th>Model (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-assessed health status (SAHS)</td>
<td>-64.11***</td>
<td>-46.71**</td>
<td>-45.14***</td>
</tr>
<tr>
<td></td>
<td>(18.61)</td>
<td>(18.25)</td>
<td>(18.81)</td>
</tr>
<tr>
<td>Financial risk tolerance (FRT)</td>
<td>44.19***</td>
<td>37.20***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.42)</td>
<td>(7.66)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>100.90***</td>
<td>92.22***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(29.48)</td>
<td>(30.00)</td>
<td></td>
</tr>
<tr>
<td>Drinking</td>
<td>-8.91</td>
<td>-36.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(42.01)</td>
<td>(42.40)</td>
<td></td>
</tr>
<tr>
<td>Financial assets (FA)</td>
<td>29.58**</td>
<td>44.37***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(11.70)</td>
<td>(13.19)</td>
<td></td>
</tr>
<tr>
<td>Income (INC)</td>
<td>16.60***</td>
<td>6.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAHS*Age^a</td>
<td>3.54***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRT* FA^a</td>
<td>-23.98****</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.49)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRT* INC^a</td>
<td>7.47**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>92.80***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(31.16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner</td>
<td>-47.58*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(28.16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major urban</td>
<td>23.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(29.95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-1.79*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of children</td>
<td>-24.20*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(13.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>20.54**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-78.47*</td>
<td>-320.62***</td>
<td>-308.28***</td>
</tr>
<tr>
<td></td>
<td>(41.67)</td>
<td>(54.55)</td>
<td>(89.98)</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-2999.41</td>
<td>-2559.68</td>
<td>-2890.81</td>
</tr>
<tr>
<td>No. Obs</td>
<td>1433</td>
<td>1433</td>
<td>1421</td>
</tr>
<tr>
<td>Pseudo-R^2</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
</tbody>
</table>

^a For ease of interpretation, these variables are in deviation from their sample means.

Notes: The dependent is deductible choice, which ranges from to €0 to €500. Standard errors are in parentheses. ***, ** and * indicate significantly different from zero at the 99%, 95% and 90% confidence level, respectively.

Using model (A) we find a significant negative correlation between subjective health risk and deductible choice. Accordingly, individuals with better health status are more likely to opt for a voluntary deductible, and thus less insurance coverage. This positive correlation between perceived risk type and insurance coverage suggest that adverse selection is important in Dutch basic health
insurance. This result is robust to adding our indicators for risk preferences and wealth (=model B). Indeed, the correlation between risk type and level of deductibility conditional on wealth and risk preferences is also negative and significantly different from zero. This robustness is in line with deductible choice theory, which predicts that risk type significantly affects deductible choice, given the other two factors. Risk preferences and wealth have their expected signs as well. Regarding the former, both financial risk tolerance and health risk tolerance (as measured by smoking behaviour) are found to be strong and significant determinants of deductible choice. In spite of the increasing public awareness of the negative health effects of smoking, heavy smokers are found to have a higher propensity to go for a voluntary deductible. Thus it appears that for the average daily smoker, higher health risk tolerance dominates higher health risk in choosing financial risk.

Model (C) presents our most general tobit estimation, where we additionally include three interaction terms and various demographic variables. For presentational purposes, variables are interacted in deviation to their sample means. Again, all estimated coefficients maintain their expected signs and significance. The standard-errors increase though, due to correlation among the explanatory variables. As one would expect, there is for example substantial correlation between education level and our wealth proxies. The coefficient on the interaction term SAHS*Age is positive and highly significant, which implies that the marginal effect of SAHS on deductible choice decreases with age. This suggests scale of reference bias in SASH (Groot, 2000), namely that survey participants assess their health condition in comparison to other people their
age. As a result, SAHS overestimates health risk for young consumers, and vice versa. For the average consumer the coefficient on SAHS remains statistically the same, however. Hence the reporting bias in SAHS does not change our result that healthier consumers generally choose higher levels of deductibility.

The interactions between financial risk tolerance and wealth (\text{FRT}*\text{FA} and \text{FRT}*\text{INC}) in model (C) are also highly significant. Although the coefficients have opposite signs, their sum is such that a proportional increase in both wealth proxies lowers the marginal effect of financial risk tolerance on deductible choice. We conclude from this that our financial risk tolerance measure does not solely measure absolute risk tolerance but also incorporates an effect of wealth. Indeed, in our data wealthier consumers are more financial risk tolerant, in line with DARA. When we correct for this measurement bias, the marginal effect of financial risk tolerance on deductible choice decreases yet remains positive and significant.

To sum up, we find that consumer deductible choice is fully in line with expected utility maximizing behaviour: healthier, wealthier and more risk-tolerant consumers choose higher deductible, and thus buy less insurance coverage. To test the robustness of these findings to premium-rebate differences among health insurers, we have performed corresponding tobit regression with net deductible choice (deductible minus rebate) as dependent variable. Comparing these findings with our earlier results, we find only marginal differences. All demand factors, interaction effects and control variables keep
their sign and level of significance. Consequently, taking rebates into account does not change our results.

6. CONCLUSION

We find robust empirical support for the theoretical determinants of deductible choice. Risk type, risk preferences and wealth significantly affect deductible choice in the expected direction. Hence, consumer financial risk-taking is influenced by various considerations, not only by risk type. Risk preferences are at least as important in explaining consumer choice for financial risk. Since both academics and policy makers have traditionally focused on the role of risk type in financial decision making - and still have a tendency to do so – incorporating risk-preference heterogeneity in welfare analyses is a fruitful terrain of research. Indeed, risk preferences are not only relevant to insurance markets but to all markets where consumers face financial risk.

LITERATURE


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