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To switch or not to switch.
A study on the factors influencing the decision to switch health insurance.

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Abstract

Sustainability challenges cause the Dutch healthcare system to change. Switching rates have been low and steady for a while, but this can signify a perfectly or poorly competitive market. Instead of controlling the switching rates, it is better to understand the determinants for consumers to switch health insurance. Therefore, this research aims to investigate these determinants and whether they differ among age, certainty, and education levels. Since many factors are unknown to a consumer when switching health insurance, this decision is considered decision-making under uncertainty. Consumers tend to factor in their feelings and account for loss aversion and their past regret and disappointment when it comes to decision-making under uncertainty. A survey was conducted and completed by 190 respondents. A mixed logit and logistic regression model were used to test the hypotheses. This research found that the higher the price difference in health insurance, the more likely someone is to switch health insurance. Furthermore, it was found that poor quality of customer service makes a consumer more likely to switch. Also, having limited options in contracted providers makes consumers more likely to switch. The last direct effect found was that the more time a person invests searching for information, the more likely this person is to switch. There was no significant effect found that these factors differ among age. Being very certain about the insurance needs positively affects the relationship between the price difference of basic health insurance and switching and negatively influences the relationship between more choice in contracted providers and switching. Lastly, it was found that higher educated people are more likely to be positively influenced in their decision to switch. These results were discussed, and recommendations for future research were made.

Keywords: health insurance, switching behavior, decision-making, conjoint analysis, product characteristics, consumer characteristics

Table of Contents

1. Introduction	5
1.1. Problem statement	5
1.2. Structure	6
2. Literature Review	8
2.1. Consumer decision-making in health insurance	8
2.1.1. Consumer choice theory	8
2.1.2. Decision-making under uncertainty	8
2.2. Switching health insurance	9
2.2.1. The Dutch health insurance market	9
2.2.2. Health insurance characteristics	10
2.2.3. Consumer characteristics	12
2.3. Conceptual model	14
3. Research Methodology	16
3.1. Data collection	16
3.1.1. Data measures	16
3.1.2. Choice-based Conjoint Analysis	17
3.2. Methods	18
3.2.1. Logistic Regression	18
3.2.2. Mixed Logit model	19
3.2.3. Latent class mixed logit model	20
3.3. Overview	20
4. Results	22
4.1. Statistics	22
4.2. Hypotheses	26
4.2.1. Product characteristics	26
4.2.2. Consumer characteristics	28
4.2.3. Interaction effects consumer characteristics	29
4.2.4. Overview of all hypotheses	32
4.3. Other findings	33
4.3.1. Latent class logit model	33
4.3.2. Risk taking behavior	35
4.3.3. Reasons and barriers to switch	36
5. Conclusion and Discussion	39

5.1.	Findings.....	39
5.1.1.	Main findings	39
5.1.2.	Other findings.....	42
5.2.	Limitations and future research.....	44
5.2.1.	Limitations	44
5.2.2.	Future research	44
References	46
Appendix	49
Appendix A	Survey.....	49
Appendix B	Design of experiments	58
Appendix C	Variable description.....	59

1. Introduction

1.1. Problem statement

The Dutch healthcare system is changing due to sustainability challenges. Healthcare costs are rising partly because of an aging population and the need for highly specialized care (Johansen et al., 2018). Because of these rising costs, there might be a capacity shortage, and combined with the decreasing amount of personnel; the healthcare supply also has challenges. Therefore, a transition is needed to restore the balance between the higher demand for healthcare and the lowering capacity to supply this care (Janssen & Moors, 2013). With these rising costs, health insurance get more expensive. The prices of basic health insurance in the Netherlands are expected to rise to €240 a month in 2040 (Financieel Dagblad, 2021). However, there is still a large difference between the most expensive basic health insurance and the least expensive one of €535,80 a year (Kuijper, 2021).

In 2006 the Netherlands changed its health care system to a demand-orientated system. It is obligated for every citizen of the Netherlands to have basic health insurance (Rooijen et al., 2011). However, if a consumer wants to, it is possible to get complementary health insurance. This covers, for example, dental care and physical therapy. The choice of whether to only have basic insurance or also get complementary health insurance is up to the consumer. Observing the consumers' preferences is essential to distinguish risk-taking from a well-considered decision. The choice of health insurance is based on the consumer choice theory, where a choice is based on maximizing the consumer's utility, given prices, income, and health status (Manning & Marquis, 1996). However, multiple disciplines investigated decision-making and created theoretical models showing systematic errors made because of simplifying heuristics and biases (Gilovich et al., 2002). Therefore, it is important to investigate decision-making in the context of health insurance choices where complex decisions are made under uncertainty.

The most important decision-making in the Dutch health care system is at the end of the year when all the consumers get the opportunity to switch health insurance companies, which is regulated by law. Because people are allowed to switch only once a year, it stimulates insurance providers to provide good deals and services. Suppose consumers have full access to information to choose between health insurers and will not face any search or switching costs. In that case, the market competition between health insurance companies will be effective (Boonen et al., 2015). Furthermore, consumers need to be responsive to quality and price to incentivize the health insurance companies to manage their costs properly. However, full access to information is necessary to control that the insurers will not sacrifice the quality of care over the price (van den Berg et al., 2008). Good choice in health insurance is obligatory for the performance of demand-orientated health care systems (Boonen et al., 2015). Furthermore, there is low institutional trust in health insurance among the consumers, which may

cause inefficiency in the market. Lack of information is one of the reasons there is low trust. Therefore, insurers need to know a lot about their clients to build a trust-based relationship (Maarse & Jeurissen, 2019). Although switching rates of health insurance have been steady and low for the last couple of years, low switching rates exist in perfectly and poorly competitive markets (Duijmelinck et al., 2015; Vektis, 2022). For these reasons, understanding the drivers for consumers to switch health insurance companies instead of just controlling the switching rates is essential information. Previous research has already identified some of the possible drivers in the choice of switching health insurance. It shows that health insurance characteristics influence the probability of switching health insurance, such as price and quality (Boonen et al., 2015; Duijmelinck et al., 2015; van den Berg et al., 2008). Furthermore, consumer characteristics are important in this decision-making. These characteristics are age, health status, certainty, and education (Boonen et al., 2015; Duijmelinck et al., 2015; Hesselink et al., 2009; van den Berg et al., 2008). Therefore, this research will answer the following research question:

"What factors influence the decision to switch health insurance (or not), and to what extent do they differ among age, certainty and education levels in the Netherlands?"

Previous research has discovered some interesting insights about the decision to switch in health insurance. For instance, younger people are more sensitive to price, while older people are more sensitive to quality (Boonen et al., 2015). However, research about the decision to switch mainly focuses on the influence of the 2006 Health Insurance Act. Therefore, this research will consider the factors found in past research but will also look at the definition of certain factors like price, and certainty. The current price mainly defines this factor; however, as mentioned before, health insurance is price-elastic. Therefore, this research will look at the year-to-year price difference as an incentive to switch health insurance rather than the current price. Certainty will be looked at as the certainty of the consumer about their insurance needs instead of just uncertainty costs. Furthermore, past research often focuses on aspects of the insurance itself, but it does not look very deeply into consumer characteristics. This research thus extends the current literature by redefining the definitions of specific drivers and investigating interaction effects between age, certainty, and education and some of the other drivers.

1.2. Structure

This research is organized as follows. Section 2 provides an overview of the literature on the main topics of this research. Then, hypotheses will be developed based on this previous research to answer the research question. After which, a conceptual model will be presented. Section 3 explains the data collection and the methods used to test the hypotheses. Section 4 covers descriptive statistics, after

which the main results regarding the hypotheses testing will be presented, followed by other findings worth mentioning. Finally, section 5 concludes and discusses possible limitations, followed by recommendations for further research.

2. Literature Review

In this section, previous literature is examined to form hypotheses. First, the economic theory on decision-making in relation to health insurance will be discussed. After that, the Dutch health insurance market will be explained, followed by a discussion about health insurance characteristics and consumer characteristics. Finally, this section will finish with a conceptual model of this research.

2.1. Consumer decision-making in health insurance

2.1.1. Consumer choice theory

Consumer choice theory assumes that consumers maximize their utility through the optimal combinations of goods, given price, income, and preferences. Health insurance is considered a normal good and price elastic with a price elasticity of demand (Schneider, 2004). However, choosing health insurance comes with much uncertainty. A consumer must decide on various possible types of health insurance without knowing what kind of care the consumer needs. Therefore, health insurance choice is not only based on utility but also factors like health status.

Furthermore, choosing health insurance contains a trade-off between minimizing financial risks and unnecessary purchase of additional health insurance products (Manning & Marquis, 1996). With accounting for minimal financial risks, price is a huge factor to consider in deciding on health insurance. However, the uncertainty makes it challenging to prevent unnecessary products like more choices in contracted providers or good customer service.

Furthermore, certain factors about the consumer, like health status or age, contribute to their certainty level and influences how easy this trade-off is. Thus, this research defines health insurance as a choice based on maximizing the utility of the consumer, given prices, income, and health status (Manning & Marquis, 1996). Since the consumer does not know all the information, like his health status for the coming period, decision-making under uncertainty theories is used in decision-making in health insurance.

2.1.2. Decision-making under uncertainty

This research will focus on several theories that analyze decision-making under uncertainty. These theories are expected utility, endowment effect, and regret and disappointment.

Expected utility theory assumes that the consumer is risk-averse and is a choice between a probable uncertain loss and a specific loss (Manning and Marquis 1996). If applied to switching health insurance, consumers must choose between the risks and the implications on wealth and health (Schneider, 2004). When a consumer faces the choice of switching health insurance, they are uncertain whether their health status changes over the coming year, what the quality is of the insurer, and if the

insurer covers the same as what they are used to with their current insurer. The Dutch switching rates reflect consumers' risk aversion and need for certainty (Schneider, 2004; Vektis, 2022). The more risk-averse a consumer is, the less likely this consumer will switch. Also, the more likely this consumer is to get complementary insurance.

Within decision-making under uncertainty, the endowment effect states that a consumer's decision-making process is affected by the risk aversion of this consumer in deciding something new. Consumers tend to keep the current situation because of the uncertainty of the benefits of the unknown exceeding the costs they lose when quitting the old situation (Schneider, 2004). For example, when switching health insurance, it is sure what a consumer will pay and the price difference if they stay at their current insurer. However, it is not sure what the quality of the new health insurance services will be. Furthermore, they do not know if their health status changes and whether this affects the costs they make not staying with their current insurer. Therefore, having a small price difference might not weigh up to the uncertainty of the other aspects of the new health insurance.

Regret and disappointment theories assume that people are loss averse and have conservative preferences. The consumer does not just consider all the options and chooses the option with the maximum utility and lowest risks; they want to avoid regret and disappointment. Consumers factor in their regret when the decision was wrong or their disappointment when the choice does not provide the expected outcome (Bell, 1982, 1985). Consumers will therefore factor in their past experiences with switching health insurance or their expected feelings in deciding whether to change their health insurance. This might also indicate that the current health insurance must worsen due to minimal choice in contracted providers and lousy customer service will the consumer be up to switching.

All these theories describe a consumer's decision to switch health insurance. It is a difficult choice because of the uncertainty and because consumers try to consider their feelings in the decision. In addition, the choice is often affected by loss aversion and the possible regret and disappointment resulting from the switching decision. These factors will affect the decision to switch health insurance through a specific set of drivers influencing health insurance switching, which will be discussed further in Sections 2.2.2 and 2.2.3.

2.2. Switching health insurance

2.2.1. The Dutch health insurance market

Before 2006 most of the citizens of the Netherlands were publicly insured, and others privately. In 2006 the healthcare system changed to a demand-orientated system with overseed competition. This change was brought about by the 2006 Health Insurance Act (Rooijen et al., 2011). Because of this

law, everyone who lives in the Netherlands or pays taxes is obligated to have basic health insurance. This insurance is free for children under 18 when they are put in the insurance plan of one of the parents.

Within this new system, there is basic and complementary insurance. Basic health insurance covers general care for general practitioners, emergency care, specialists, and medicines. Complementary insurance mainly covers physical therapists, dental care, and glasses (Rooijen et al., 2011). According to this law, people can switch insurance companies and plan once a year at the end of the year because people are allowed to switch only once a year since it stimulates insurance to provide a good deal and good services. Furthermore, the health insurance companies are allowed to select contracted health care providers and restrict the consumer, based on the health plan, to choose only from that pool of contracted providers. This is regulated in the act to strengthen the market power of the insurance companies. The insurers are also encouraged to be very thoughtful about their care purchasing because a deficit needs to be covered either by using financial reserves or raising their premium. However, raising the premium will result in people switching and thus going to another health insurance company (Maarse & Jeurissen, 2019).

2.2.2. Health insurance characteristics

Empirical studies have shown several characteristics of the health insurance plans that influence whether a consumer switches health insurance. One of these characteristics is the price. The price or premium of health insurance can change yearly in the Netherlands. Each year a consumer receives a message from the insurer with the prices for the next year given the current health plan. Van den Berg et al. (2008) found that consumers who considered switching provide finances as one of the most important reasons behind it. Boonen et al. (2015) have found that the price of the premium influences whether someone switches.

Furthermore, how sensitive a consumer is to the price difference is different across different age groups. All consumers get to know the premium for next year around the same time and have a limited time to decide whether to switch. Most likely, consumers thus compare this premium with the one from last year. Therefore, the price difference is considered a driver for consumers to switch their health insurance and is defined as the year-to-year price difference. As aforementioned, it is obligated to have basic health insurance. Regarding complementary insurance, having complementary health insurance decreases the chances of switching (Boonen et al., 2015). However, the influence of the price has not been investigated yet, since most research combines the price of both the basic and the complementary insurances. Therefore, the same assumption is made for the basic health insurance premium. This leads to the following hypotheses:

H1: There is a positive relationship between the price difference of basic health insurance and switching health insurance.

H2: There is a positive relationship between the price difference of complementary health insurance and switching health insurance.

Another health insurance plan characteristic is quality. Health insurance can become quite complex, especially when someone is in poor health and needs special care. Therefore, knowing which treatment is covered or not is crucial information. Research has shown that consumers tend to choose better-performing health providers and value providers that provide quality information (Kolstad & Chernew, 2009). Also, the quality of customer service is essential in considering switching and deciding on new health insurance (van den Berg et al., 2008). Boonen et al. (2015) found that the quality rating of the insurer negatively influences the chance of a customer switching. Customer service quality can exist from the speed of claims payments, decisions about coverage, and help from the service desk (Duijmelinck et al., 2015). Customers in poor health may be quite sensitive to the quality given the regular contact this customer has because of the high demand for healthcare. The quality of customer service will be defined as experienced by the consumers instead of a rating, because this research focuses on the quality of the customer service of the current health insurance. This leads to the following hypothesis:

H3: A poor quality of customer service makes a consumer more likely to switch health insurance.

The last characteristic considered in this research is contracted care. Duijmelinck et al. (2015) look at the decision to switch (or not) from the perspective of benefits versus costs. In case the switching benefits of the consumer are more significant than the switching costs, the consumer will switch health insurance. One of the identified switching benefits is the insurers' contracted provider network. Quality of consumer information is seen as a part of this switching benefit. The other part of this switching benefit is the insurers' freedom to contract healthcare providers selectively. Having limited options, especially in the COVID-19 situation where one is not guaranteed a spot in a specific hospital, can be very stressful. Therefore, the insurers' freedom to choose providers is considered a driver to switch (Duijmelinck et al., 2015). In the context of this research, having less options regards the change in contracted providers for the coming year which will be looked at as a 20% change. This leads to the following hypothesis:

H4: Having less options in contracted providers makes a consumer more likely to switch health insurance.

2.2.3. Consumer characteristics

Besides health insurance characteristics, consumer characteristics are crucial in switching health insurance. Consumer characteristics being investigated in this research are health status, education, age, satisfaction, certainty, and the amount of time the consumer spends searching for information.

First, health status is looked at as a consumer characteristic. Lako et al. (2010) have found that the health status of an individual matter in the process of switching. For example, people with an excellent health status have a 2.3% higher chance of switching compared to good health status. Furthermore, compared to people with poor health, people in good health are 1% more likely to switch (Boonen et al., 2015). It can therefore be concluded that health care status influences the probability of switching. Also, people with poor health status are more attracted to pay more to receive better quality of care (van den Berg et al., 2008). This leads to the following hypothesis:

H5: Poor health status makes a consumer less likely to switch health insurance compared to consumers with excellent health.

Second, this research investigates information search as a driver of switching health insurance. When examining previous research, it stands out that the definition of information is different among these various papers. One way information is researched whether the customer has searched for information (Boonen et al., 2015). Another way is what information is searched for and what information sources have been used (Hesselink et al., 2009). Searching for information is one of the most comprehensive drivers of switching health insurance. To capture all the possible effects of the different definitions, information search is defined in this research as how much time consumers spend searching for information.

In conclusion, the time spent researching health insurance is considered a driver of switching. Therefore, it is expected that the more time a person spends on research, the more likely they are to switch health insurance (Hesselink et al., 2009). This leads to the following hypothesis:

H6: The more time a person invests in researching health insurance, the more likely this person is to switch health insurance.

Research by Burnham et al. (2003) identifies three main streams of switching costs and factors that prevent a consumer from switching health insurance. One of these types is the relational switching cost which entails the psychological or emotional discomfort of breaking with the company. Satisfaction with the insurance company is a great part of the relationship between a consumer and the company and might therefore influence the likeliness to switch. Therefore, being very satisfied is

expected to reduce the likeliness of switching health insurance, as the relational switching costs are too high. This leads to the following hypothesis:

H7: A satisfied consumer is less likely to switch health insurance compared to an unsatisfied consumer.

Another consumer characteristic investigated in this research is age. When considering switching between health insurance, it is expected that age influences the importance of one or multiple previously stated drivers. Being in another stage of life comes with different types of risks in health status. Previous research has discovered that younger people, in general, are more likely to switch health insurance but are less likely to switch when they have an excellent health status. Furthermore, younger people value a lower price more, which suggests younger people are more price sensitive. On the other hand, older people value health care quality (Boonen et al., 2015). This leads to the following hypotheses:

H8: Age negatively influences switching health insurance in case of a positive price difference.

H9: Age positively influences switching health insurance in case of a lower quality of the health insurance.

Deciding to switch insurance companies comes with uncertainty costs. The uncertainty of not knowing what the performance is of the other insurer or if there are additional costs or waiting times (Duijmelinck et al., 2015). But most importantly, the uncertainty about the insurance needs. This uncertainty prevents people from switching health insurance, as not knowing their needs makes it very hard to decide something different. As aforementioned, a higher price makes people tend to switch easier. However, being uncertain about insurance needs diminishes the effect of a higher price. The same goes for the choice of contracted providers. Having many options makes someone less likely to switch health insurance compared to having less choice. However, if someone is very certain about their needs, having many options might be unnecessary. Therefore, being certain about insurance needs diminish the effect of having much choice in contracted providers. Uncertainty costs are higher for people with high risks and thus poor health status than those with low risks and thus excellent health status (Duijmelinck et al., 2015). This leads to the following hypotheses:

H10: Consumers with greater certainty about their insurance are more likely switching health insurance in case of a higher price difference.

H11: Consumers with greater certainty about their insurance are less likely switching health insurance in case the consumer has more choice in contracted providers compared to less choice.

H12: Consumers with greater certainty about their insurance are more likely switching health insurance in the case of consumers with excellent health compared to poor health.

The last consumer characteristic considered in this research is education level. Duijmelinck et al. (2015) have found that low-educated consumers state sunk costs as the most important reason for not switching. Sunk costs are the non-recoverable investments in creating and maintaining a relationship with the insurer. High-educated consumers consider costs of ‘benefit loss’ and learning as the most important reason for not switching health insurance. ‘Benefit loss’ costs are defined as the benefit lost when the relationship with the current insurance company is terminated (Duijmelinck et al., 2015). Education and is thus considered to indirectly influence the probability of switching health insurance. Boonen et al. (2015) found that compared to lower educated people, higher educated people are more likely to switch when searching for information. This leads to the following hypothesis:

H13: Higher educated people are more likely to be positively influenced in their choice to switch health insurance by information search than lower educated people.

2.3. Conceptual model

Figure 1 shows the conceptual model of this research. This conceptual model shows an overview of the expected relations between the variables deduced from the hypotheses. Each arrow indicates the direction of the relation, accompanied by the corresponding hypothesis and the expected sign of the relation. Switching health insurance is measured in two ways, which will be elaborated on more in the following sections. Product characteristics are measured as the decision to switch, and the consumer characteristics are the switching behavior over the last three years.

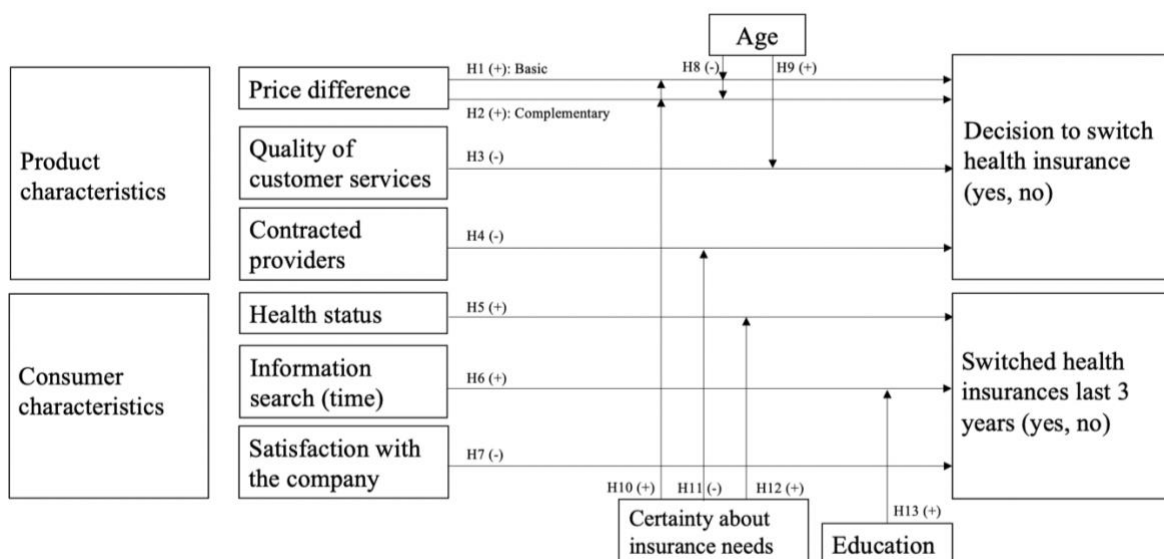


Figure 1. Conceptual model

As can be taken from the conceptual model, switching health insurance is directly influenced by price differences in either basic (H1) or complementary insurances (H2). Quality of customer service (H3) and contracted providers (H4) negatively influence switching health insurance. The health status of a consumer (H5) and information search (H6) positively influences the decision to switch (or not). The relation between satisfaction with the insurance company and switching health insurance is negative (H7). Lastly, some indirect relations with switching health insurance are observed. Age negatively influences the decision to switch (or not), given the positive relationship between price difference and switching (H8). Age positively influences the decision to switch (or not) given the negative influence of low-quality customer service, resulting in a less satisfied consumer on switching (H9). Certainty about insurance needs positively influences switching health insurance through price (H10) and health status (H12) and negatively through contracted providers (H11). Finally, education positively influences switching health insurance through information search (H13). In Table 1, the conceptual model is converted into an overview of each hypothesis with the corresponding formula to each of the hypotheses. It becomes clear what the relationship is between the variables.

Table 1. Hypotheses with corresponding formula

Hypothesis	Formula
H1	Decision to switch = $\beta_0 + \beta_1 \times \text{Price difference in basic health insurance} + \varepsilon$
H2	Decision to switch = $\beta_0 + \beta_1 \times \text{Price difference in complementary health insurance} + \varepsilon$
H3	Decision to switch = $\beta_0 + \beta_1 \times \text{Quality of customer service} + \varepsilon$
H4	Decision to switch = $\beta_0 + \beta_1 \times \text{Contracted providers} + \varepsilon$
H5	Switched = $\beta_0 + \beta_1 \times \text{Health status} + \varepsilon$
H6	Switched = $\beta_0 + \beta_1 \times \text{Information search} + \varepsilon$
H7	Switched = $\beta_0 + \beta_1 \times \text{Satisfaction with the insurance company} + \varepsilon$
H8	Decision to switch = $\beta_0 + \beta_1 \times \text{Price difference basic} + \beta_2 \times \text{Price difference complementary} + \beta_3 \times \text{Age} + \beta_4 \times (\text{Price difference basic} \times \text{Age}) + \beta_5 \times (\text{Price difference complementary} \times \text{Age}) + \varepsilon$
H9	Decision to switch = $\beta_0 + \beta_1 \times \text{Quality of customer service} + \beta_2 \times \text{Age} + \beta_3 \times (\text{Quality of customer service} \times \text{Age}) + \varepsilon$
H10	Decision to switch = $\beta_0 + \beta_1 \times \text{Price difference basic} + \beta_2 \times \text{Price difference complementary} + \beta_3 \times \text{Certainty} + \beta_4 \times (\text{Price difference basic} \times \text{Certainty}) + \beta_5 \times (\text{Price difference complementary} \times \text{Certainty}) + \varepsilon$
H11	Decision to switch = $\beta_0 + \beta_1 \times \text{Contracted providers} + \beta_2 \times \text{Certainty} + \beta_3 \times (\text{Contracted providers} \times \text{Certainty}) + \varepsilon$
H12	Switched = $\beta_0 + \beta_1 \times \text{Health status} + \beta_2 \times \text{Certainty} + \beta_3 \times (\text{Health status} \times \text{Certainty}) + \varepsilon$
H13	Switched = $\beta_0 + \beta_1 \times \text{Information search} + \beta_2 \times \text{Education} + \beta_3 \times (\text{Information search} \times \text{Education}) + \varepsilon$

These formulas are an indication of the relationship between the dependent and independent variables that is tested in the corresponding hypotheses. The formulas do not represent the actual formulas that result from the performed models in this research.

3. Research Methodology

This research section elaborates on the methodology used to examine the previously stated hypothesis. The first section covers the data collection. Then, they were followed by the methods used to analyze the hypothesis. Lastly, an overview of the dependent and independent variables, the data measures, and the type of analysis used is given.

3.1. Data collection

A survey was created to collect data for this research. This survey firstly measures the respondent's consumer characteristics and risk-taking behavior. Next, the respondent was faced with a choice-based conjoint analysis to measure the product characteristics, followed by questions to elaborate on their choices and their average research time and switching behavior over the last couple of years. The survey is in Dutch because the subject merely applies to Dutch adults who are obliged to have health insurance. Since a part of the target population might not understand an English survey about this subject very well, providing the survey in Dutch will increase the response rate.

3.1.1. Data measures

The first questions of the survey are demographic and will gain information about the gender, age, and highest education level. These are used to check the sample's representativeness and to measure the consumer characteristics of age and education. As can be taken from the conceptual model, there are two main subjects of interest, the consumer, and the product characteristics. The health status of a person falls within the consumer characteristics, but there is not one straightforward way to measure this. In this research, this is measured by asking the respondent about their current health status on a scale of excellent to very bad. Since this is a private question, the respondent is given an extra option not to answer. A statement captures the certainty about the insurance needs of the respondent: "I am very certain about my insurance needs for the next year." It is measured using a 5-point Likert scale from strongly agree to strongly disagree. As the last question of the first part of the survey, the satisfaction with the health insurance company is measured on a scale from very satisfied to very unsatisfied.

The next part of the survey is designed to measure the risk-taking behavior of the respondents as a control variable. Blais and Weber (2006) designed the Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. The DOSPERT scale evaluated risk-taking behavior from five domains using a 7-point scale from Extremely Unlikely (1) to Extremely Likely (7). The five domains are ethical, financial, health/safety, social, and recreational. In this research, one question is developed for each of the five domains. The next part consists of a choice-based conjoint analysis where the product characteristics are measured and will be further explained in Section 3.1.2. The theoretical framework

determines a set of product characteristics based on previous research. A multiple-choice question is added in the final part of the survey to investigate whether there are any other reasons respondents gave for their decision to switch health insurance. The question "What are normally factors you consider in your decision to switch health insurance?" gives the product-related factors described in the conceptual model and the last option where they can answer with any other reasons. However, as described in Duijmelinck et al. (2015), the decision of someone to switch health insurance might also be driven by barriers. To consider this, the question "What are normal factors that withhold you in your decision to switch health insurance?" is added. There are again five answers, four of which are related to the switching costs of Duijmelinck et al. (2015), and again the last option where the respondent can provide any other answer. Both questions are multiple-choice, but the respondent can select multiple options, so they are not limited to just one factor as this difficult choice might be a combination of factors.

There are two questions left in this last part of the survey. First, as mentioned in the conceptual model, switching behavior is the dependent variable for H5 to H7, H12, and H13. Therefore, the respondent is asked whether he or she has switched health insurance companies in the last three years. Finally, to measure the consumer's information search, the respondent is asked how much time he or she spends on average searching for information at the end of the year when faced with the decision to switch health insurance. The survey is done in Qualtrics; the complete version can be found in Appendix A.

3.1.2. Choice-based Conjoint Analysis

As described in Section 2.1, decision-making is a very complex subject, especially when there are many factors to account for. Conjoint analysis is a method that determines a consumer's preference based on different combinations of attributes (Green & Srinivasan, 1990). This method makes it possible to determine what attributes are important in a consumer's decision-making process and investigate what combination of these attributes is most important. Conjoint analysis is extensively used in research to investigate consumer preferences and is survey-based (Cattin & Wittink, 1982). Three main types of conjoint analysis can be used: rating-based conjoint analysis, rank-based conjoint analysis, and choice-based conjoint analysis. The respondent is asked to respectively rate the choices, rank the choices, or choose one of the choices. Since a consumer is usually faced with multiple options and makes trade-offs, the choice-based conjoint analysis (CBC) is most representative in this research and therefore used (Elrod et al., 1992).

The CBC analysis performed in this research investigates the product characteristics of hypotheses H1 to H4, and the interaction effects of H8 to H11. To perform the CBC analysis, the attributes, the levels of those attributes, the number of profiles per choice set, and the number of choice sets must be determined. This survey has four attributes, and a total of ten choice sets based on the corresponding

drivers determined in Section 2.2.2. This number of attributes and choice sets is also in line with what is typical for health research (Marshall et al., 2010). The ten choice sets were created using JMP Software. Besides the decisions mentioned above in choice design, using the prior mean function in this software is helpful. It makes sure that the choices become more informative due to assigning utilities to the levels; this makes certain levels more attractive or less attractive. Since higher prices, worse quality, and less contracted providers are always less fortunate; these levels are assigned a low prior mean value of -0.5. The complete design of experiments can be found in Appendix B. Because each respondent can interpret attributes differently, an explanation of the attributes is given in the survey before the choices are shown. The question asked by each choice is: "Under what circumstances are you most likely to switch health insurance? This question is a little different from the standard question for a CBC analysis since the goal is not to select the most desirable scenario but to discover the aspects of the decision to switch health insurance. Table 2 shows the attributes and the corresponding levels used in the survey.

Table 2. Attributes of conjoint analysis with corresponding levels

Attributes	Levels
Price difference basic health insurance	+10 +20 +30
Price difference complementary insurance	+5 +10 +15
Quality of customer service	Bad; Average; Excellent.
Contracted providers	Less choice; No change; More choice.

The price difference in basic health insurance shows the year-to-year price difference the basic health insurance. The price difference of complementary insurance shows the year-to-year price difference of complementary health insurance. Customer service quality shows how someone's experience was with their health insurance company in the past year. So, the level of bad corresponds to the scenario of having a bad experience in the past year. Finally, contracted providers show if there are any changes in the freedom of choice in contracted providers someone has for the coming year. So, the level of less choice corresponds to having 20% less choice in contracted providers for the coming year.

3.2. Methods

3.2.1. Logistic Regression

Logistic regression is used to investigate the relationship between choice and consumer characteristics. This logistic regression tests H5 to H7, H12, and H13, and *switch_3y* (switched in the past three years) was the dependent variable. The dependent variable must be binary in logistic regressions, so 0 or 1. *Switch_3y* had an outcome of 1 when the respondent switched health insurance in the past three years and 0 if the respondent did not switch in the past three years. As output, the logistic regression provides the probability of the independent variables on the dependent variable (Wright, 1995). The following formulas represent logistic regression including interaction effects:

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 * x_2 \quad (1)$$

$$p = e^{-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 * x_2)} \quad (2)$$

where p stands for the probability of the outcome being a choice. β_0 in Equation 1 is the intercept term, and β_1, \dots, β_n are the coefficients belonging to the corresponding predictor variables x_1, \dots, x_n . $\ln\left(\frac{p}{1-p}\right)$ is the log odds ratio, where $\frac{p}{1-p}$ represents the probability of the outcome being a choice divided by the probability of the outcome not being a choice. The estimated coefficients are not a direct representation of the effect of a change in the predictor variable, but the coefficients indicate the effect of the predictor variable on the log odds. To interpret the result, a transformation is required. In case predictor x_n increases by Δ units, the odds of the variable of interest change by $e^{\beta_n \Delta} - 1 * 100\%$. If this change is positive, the predictor variable has a positive effect on choice, and vice versa. The logistic regression model requires five assumptions: a binary dependent variable, linearity of independent variables and log odds, little or no multicollinearity among explanatory variables, the response variable follows a binomial distribution, and the sample size is sufficiently large. The McFadden R^2 assesses the goodness of fit of the logistic regression. The McFadden R^2 has a value between 0 and 1, where a higher value indicates that the variance of the model is better explained (Louviere et al., 2000).

3.2.2. Mixed Logit model

To examine by which variables the choice of a consumer is influenced, a mixed logistic regression is used (Hensher & Green, 2003). This model is used to investigate H1 to H4 and H8 to H11. The dependent variable was choice (decision to switch health insurance) in all the models. In the case of choosing, the outcome is 1 when it is the choice of the respondent and 0 if it is not the choice of the respondent. A mixed logit model is a logit model for which the parameters are assumed to vary among individuals, so it accounts for unobserved heterogeneity (Train, 2009). The unconditional choice probability of the mixed logit model of person n chooses alternative i among all alternatives j equals:

$$P_{ni} = \int L_{ni}(\beta_n) f(\beta_n | \theta) d\beta_n \quad (4)$$

where $f(\beta_n | \theta)$ is the density function and θ represent the parameters. $L_{ni}(\beta_n)$ is the logit probability evaluated at parameters β_n :

$$L_{ni}(\beta_n) = \frac{e^{\beta_n' x_{ni}}}{\sum_j e^{\beta_n' x_{nj}}} \quad (5)$$

Then the mixed logit probability can be written as:

$$P_{ni} = \int \frac{e^{\beta_n' x_{ni}}}{\sum_j e^{\beta_n' x_{nj}}} f(\beta_n | \theta) d\beta_n \quad (6)$$

The mixing distribution $f(\beta_n | \theta)$ is continuous in case of a normal distribution. Then, the mixed logit probability can be written as:

$$P_{ni} = \int \frac{e^{\beta_n' x_{ni}}}{\sum_j e^{\beta_n' x_{nj}}} \phi(\beta_n | b, W) \quad (7)$$

where $\phi(\beta | b, W)$ is the normal density, and b and W are the mean and covariance respectively.

3.2.3. Latent class mixed logit model

Latent class models are an alternative to the mixed logit models as they have a discrete distribution instead of a continuous distribution (Greene & Hensher, 2013). The latent class model assumes Q groups of individuals (Green & Hensher, 2003). In the latent class model, the groups differ from each other, not the individuals within a group. The latent class mixed logit model extends the latent class model and accounts for possible heterogeneity between a group. It is not known which individual is put in which class, but the probability is as follows:

$$P(\text{class} = q) = \pi_q(\theta), \quad q = 1, \dots, Q \quad (8)$$

The probability that individual n chooses alternative i is now written as:

$$P_{ni} = \sum_{q=1}^Q \pi_q(\theta) \int \frac{e^{\beta_{nq}' x_{ni}}}{\sum_j e^{\beta_{nq}' x_{nj}}} f(\beta_{nq} | \theta) d\beta_{nq} \quad (9)$$

where $f(\beta_{nq} | \theta)$ is the density function, and θ represents the parameters as explained in Equation 4.

This model is used to investigate whether H1 to H4 differ among classes. As consumers' needs and preference are heterogeneous, it is to be expected that there are certain classes identifiable in this dataset (Duijmelinck et al., 2015). The Akaike Information Criterion (AIC) is used to assess the optimal number of latent classes. The number of classes that minimizes the AIC is the optimal number of classes (McFadden, 1973).

3.3. Overview

An overview of the dependent and independent variables accompanied by the previously stated data measures and the type of analysis is given in Table 3. The dependent variable decision to switch corresponds to the "choice" variable of the CBC analysis, and the dependent variable switched corresponds to the variable switched in the last three years. In Table 3 all hypotheses are individually

stated with the corresponding model. However, one model is performed for several hypotheses rather than one model for each hypothesis. H1 to H4 are tested in one model, H5 to H7, H8 & H9, H10 & H11, and lastly H12 & H13.

Table 3. Hypotheses with corresponding dependent variable and independent variable(s), data measure and type of analysis

Hypothesis	Dependent Variable	Independent Variable(s)	Data measure	Type of analysis
H1	Decision to switch	Price difference of basic insurance	Survey question	Mixed logit regression
H2	Decision to switch	Price difference of complementary insurance	Survey question	Mixed logit regression
H3	Decision to switch	Quality of customer service	Survey question	Mixed logit regression
H4	Decision to switch	Contracted providers	Survey question	Mixed logit regression
H5	Switched	Health status	Survey question	Logistic regression
H6	Switched	Information search	Survey question	Logistic regression
H7	Switched	Satisfaction with insurance company	Survey question	Logistic regression
H8	Decision to switch	Age, price difference of basic insurance and price difference of complementary insurance	Survey question	Mixed logit regression
H9	Decision to switch	Age and quality of customer service	Survey question	Mixed logit regression
H10	Decision to switch	Certainty, price difference of basic insurance and price difference of complementary insurance	Survey question	Mixed Logit regression
H11	Decision to switch	Certainty and contracted providers	Survey question	Mixed logit regression
H12	Switched	Certainty and health status	Survey question	Logit regression
H13	Switched	Education and Information search	Survey question	Logit regression

4. Results

In this section, descriptive statistics of the data were discussed. Next, the results regarding the previously stated hypotheses were analyzed, followed by other noteworthy findings of this research.

4.1. Statistics

As aforementioned, the data used in this research was collected using a survey. This survey was spread through various social media channels, and this resulted in a total of 250 responses. Of these 250 responses, 58 were not complete, so these responses are omitted from the dataset. Furthermore, since health insurance are only mandatory in the Netherlands from 18, the responses of people under 18 years old were removed. Therefore, in this research, the total amount of responses was 190. Every respondent answered ten choice sets consisting of two choices per choice set. Therefore, the dataset contained 3800 observations of choices. The total number of variables in the final dataset is 19, of which one is an ID; six are the stated consumer characteristics and gender; one is satisfaction; one is a risk score based on the five risk-taking questions in the survey; six are about the choice experiment which includes the choice set number, choice number, and the attributes; one variable which is the dependent variable named “choice” which is the choice selected by the respondent for all the choice set; and lastly three variables about the reasons and barriers for switching a health insurance, and also dependent variable whether the respondent has switched health insurance in the last three years. A full explanation of all the variables can be found in Appendix C.

Within the dataset, both numeric and categorical variables occur. Table 5 shows the descriptive statistics of the categorical variables. As can be taken from Table 4, 48.4% of the respondents were male, and 51.6% were female. Furthermore, most of the respondents stated higher professional education (HBO) as the highest level, and none stated elementary school as the highest level of education. Noteworthy that only 34 respondents classified themselves as having a (very) poor health status. Most respondents are certain about their insurance needs and are satisfied with the insurance company. Lastly, 30.5% of the respondents switched health insurance in the past three years.

Regarding the numeric variables, the age ranges from 18 to 84 years old, with an average of 37 years old. The average time people spend searching for information is 40 minutes, ranging from 0 to 360 minutes. The risk-taking behavior has a minimum score of 5, the lowest possible score, and the maximum score observed is 29, while the maximum score can be 35. Furthermore, the average risk-taking score is 12, while the average on this risk-taking scale is around 17.

Table 4. Descriptive statistics of categorical variables

Variable name	Category	n	Percentage (%)
Gender	Male	92	48.4
	Female	98	51.6
Education	Elementary school	0	0
	High school	9	4.8
	Community college (MBO)	15	7.9
	Higher professional education (HBO)	68	35.7
	University bachelor	24	12.6
	University master	67	35.3
	Post-Master/PhD/doctorate	7	3.7
Health	0 (Good)	156	82.1
	1 (Poor)	34	17.9
Certainty	0 (Uncertain)	69	36.3
	1 (Certain)	121	63.7
Satisfaction	0 (Unsatisfied)	34	17.9
	1 (Satisfied)	156	82.1
Switch_3y	0 (No)	132	69.5
	1 (Yes)	58	30.5

A count analysis was conducted to explore the choice experiment's data. This analysis counted how often an attribute level was chosen by the respondent, as seen in Figures 2 to 5 below.

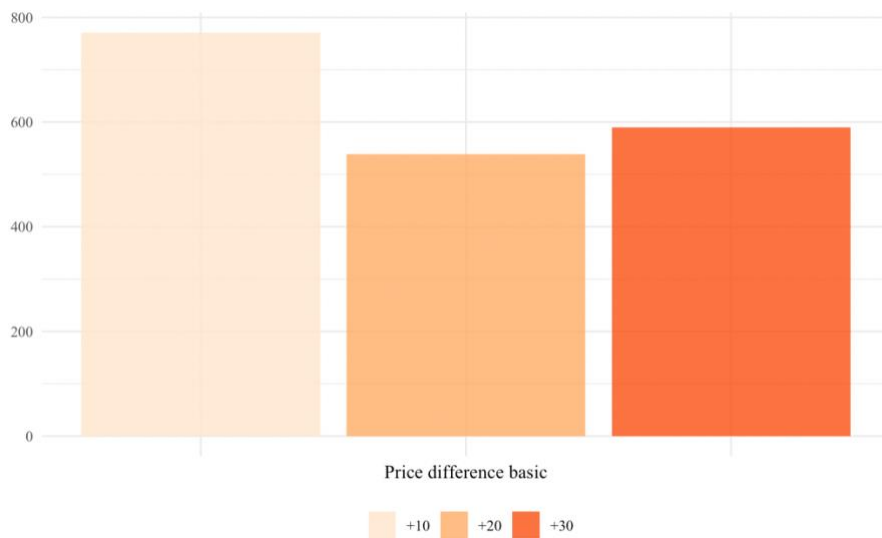


Figure 2. Count analysis of attribute price difference basic health insurance

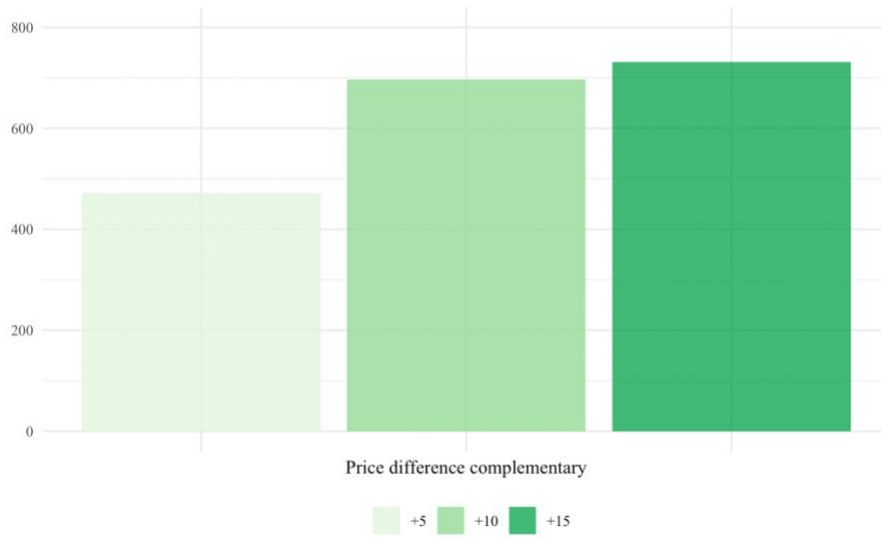


Figure 3. Count analysis of attribute price difference complementary health insurance

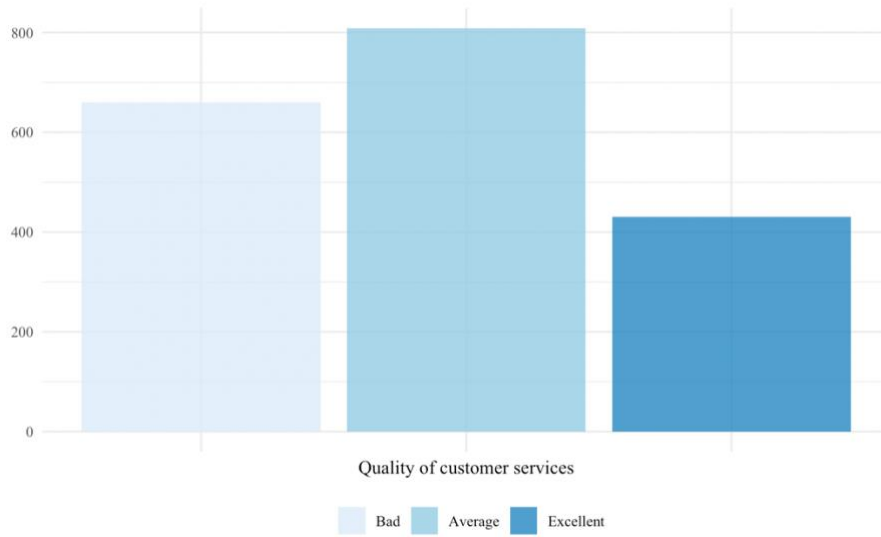


Figure 4. Count analysis of attribute quality of customer service

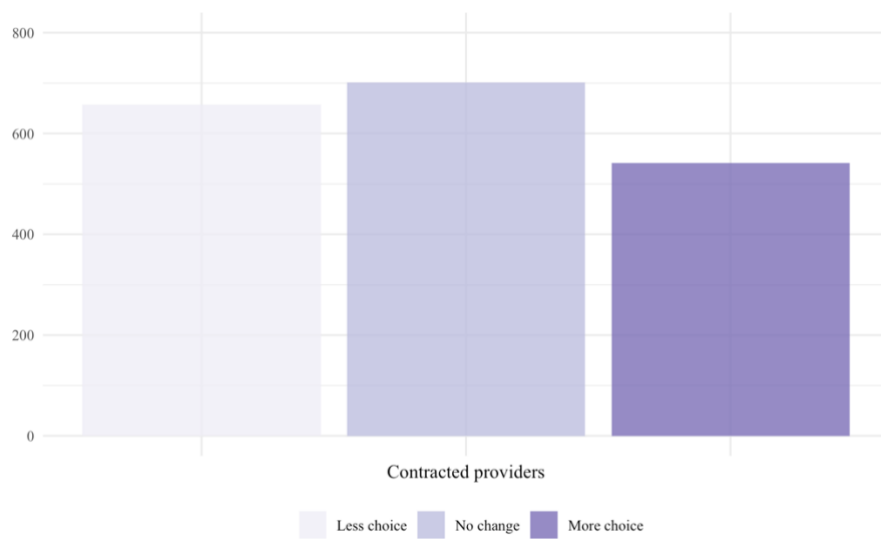


Figure 5. Count analysis of attribute contracted providers

This analysis shows some interesting aspects. As aforementioned, the question regarding the choice experiment was, "Under what circumstances are you most likely to switch health insurance?". First, for the price difference of the primary health insurance, people mainly chose the price difference of 10 euros. This indicates that people already want to switch if the price difference is 10 euros. This is interesting because it is a relatively small difference compared to the basic premium price per month (around 100 euros).

Furthermore, most people would go for at least a price difference of 15 euros for the complementary health insurance, but the amount is almost the same as for the 10-euro price difference. On the other hand, this difference is quite large relative to the costs of a complementary premium, although this amount differs greatly among the providers. Furthermore, it is interesting that for the attribute quality, most people chose an average quality and not bad quality. This indicates that the quality of customer service needs to be above average to keep someone from switching. Lastly, more choice regarding contracted providers is the least chosen, but it is still relatively high compared to the other two levels. This might indicate that this factor is not so important as other attributes.

Since these attributes are chosen based on literature, additional questions were added to discover other potential reasons and barriers when switching health insurance. For these two questions, a quick frequency analysis is done to examine these, but further analysis will be explained in Section 4.3. The result of this analysis is shown in Figures 6 and 7.

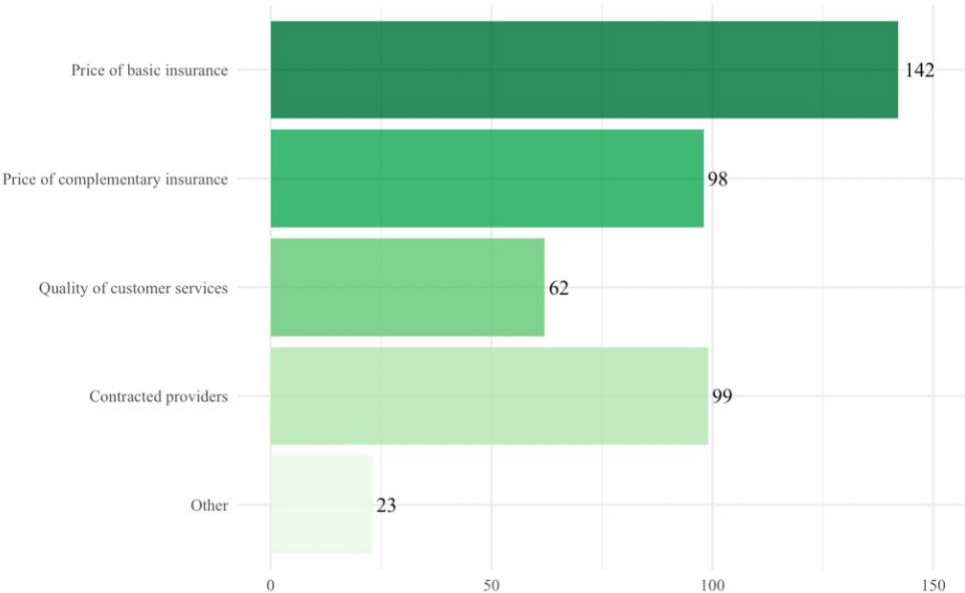


Figure 6. Frequency of chosen reasons to switch health insurance

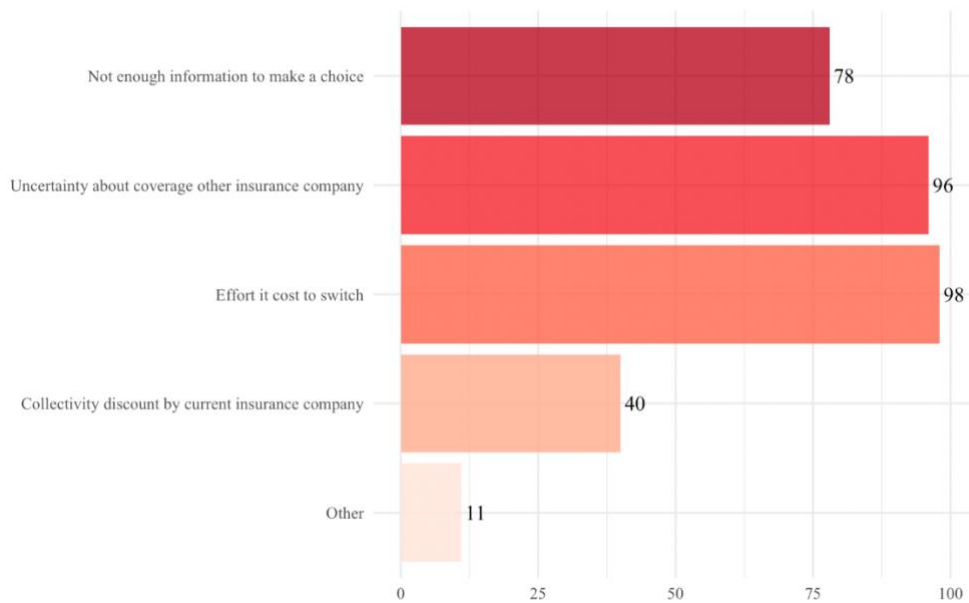


Figure 7. Frequency of chosen barriers to switch health insurance

From Figure 6, it follows that people chose the price difference of the basic insurance the most. Remarkably, the price difference of the complementary insurance is chosen almost as much as the contracted providers. This contradicts the earlier finding that the attribute contracted providers are not that important in deciding to switch health insurance. The quality of customer service is chosen the least. Figure 7 shows that uncertainty about the coverage of another insurance company and the effort it costs to switch are the two mostly chosen reasons not to switch health insurance. It is also interesting that despite the digital world with many sites helping us gather information, people still feel like they have not got enough information to make a choice.

4.2. Hypotheses

In this section, all the hypotheses are tested. This is done in three parts. The first part covers the hypotheses regarding the product characteristics, the second covers the hypotheses regarding the consumer characteristics, and the last part covers the interaction effects of age and education within the consumer characteristics. A significance level of 10% was chosen in the evaluation of the results.

4.2.1. Product characteristics

There are four hypotheses related to the product characteristics. The first hypothesis stated that a positive relationship exists between the price difference of basic health insurance and switching health insurance. The second hypothesis stated that a positive relationship exists between the price difference of complementary health insurance and switching health insurance. The third hypothesis stated that poor quality of customer service makes a consumer more likely to switch health insurance. Finally, the fourth hypothesis stated that having less options in contracted providers makes a consumer more likely

to switch health insurance. These hypotheses were tested using a mixed logit regression, presented in Table 5 below. The variables are related to the choice experiment.

Table 5. Mixed logit model of the product characteristics on the decision to switch

Variable	Estimate	P-value
Intercept	-0.152 (0.070)	0.029 *
Price difference basic insurance	0.056 (0.007)	2.620*10 ⁻¹⁴ ***
Price difference complementary insurance	0.018 (0.011)	0.107
Quality average	0.191 (0.096)	0.048 *
Quality bad	0.257 (0.113)	0.023 *
Contract providers no change	-0.443 (0.095)	3.281*10 ⁻⁶ ***
Contract providers more choice	-0.487 (0.117)	3.415*10 ⁻⁵ ***
Log-Likelihood	-1191.1	
McFadden R ²	0.095	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

As can be taken from Table 5, all variables are significant on a 10% significance level except for the *Price difference complementary insurance*. This variable will not be interpreted because this indicates a lack of explanatory effect on the variable of interest, choice. The variable *Price difference basic insurance* is significant, which indicates that the price difference of the basic health insurance has an explanatory effect on choice. Since the coefficient is positive, it means that *Price difference basic insurance* has a positive effect on choice, meaning that a higher price difference in the basic health insurance increases choice. Both variables *Quality bad* and *Quality average*, are significant, which indicates that compared to *Quality excellent*, these variables have an explanatory effect on choice. The quality of customer service being bad or average increases choice compared to excellent quality, ceteris paribus. Both variables *Contract providers no change* and *Contract providers more choice* are significant, which indicates that compared to *Contract providers less choice* these variables have an explanatory effect on choice. Both the coefficients are negative, meaning that compared to having less choice in contracted providers, having no change or more choice in contracted providers decreases choice, ceteris paribus.

These findings show the effect of price difference in basic health insurance, quality of customer service, and contracted providers on the decision to switch health insurance. The effects of the first two significant affects positively impact the decision to switch health insurance, and the last one negatively influences the decision to switch health insurance. This implies a positive relationship between the price difference in basic health insurance and the decision to switch health insurance, and thus confirms the first hypothesis. Furthermore, it implies that a consumer is more likely to switch health insurance when there is a poor quality of customer service compared to an excellent quality of

customer service, which confirms the third hypothesis. Lastly, it implies that having more choice in contracted options makes a customer less likely to switch health insurance than having less choice in contracted providers, and thus confirms the fourth hypothesis. Since the effect of price difference in complementary insurance is not significant, the second hypothesis is rejected.

Furthermore, a willingness-to-pay (WTP) analysis is run based on the mixed logit model. As price the variable price difference in basic health insurance is used. For a more logical interpretation the mixed logit model is run with quality bad as reference instead of quality excellent. In Table 6, the results of the WTP analysis are shown.

Table 6. WTP analysis

Variable	Monetary value (in €)
Quality Excellent	7.10
Quality Average	2.97
Contract providers more choice	10.07
Contract providers no change	7.62

These result show that an excellent quality of customer service compared to a bad quality is worth a price difference in basic health insurance of €7.10, and an average quality compared to bad quality is worth €2.97. Thus, people are prepared to pay a higher price difference for an excellent quality than an average quality compared to a bad quality when deciding to switch health insurance. Furthermore, more choice in contracted providers is worth €10.07 compared to less choice, and no change compared to less choice is worth €7.66. Thus, people are prepared to pay a higher price difference in basic health insurance for more choice than no change compared to less choice when deciding to switch health insurance.

4.2.2. Consumer characteristics

There are four hypotheses related to consumer characteristics with direct effects on switching. First, hypothesis five states that poor health status makes a consumer less likely to switch health insurance than consumers with excellent health. Hypothesis six states that the more time a person invests in researching health insurance, the more likely this person is to switch health insurance. Lastly, hypothesis seven states that a satisfied consumer is less likely to switch health insurance than an unsatisfied consumer. These hypotheses were tested using logistic regression, presented in Table 7 below. The variables are related to the consumer.

Table 7. Logistic regression model of the consumer characteristics on switched

Variable	Estimate	P-value
Intercept	-1.825 (0.479)	0.000 ***
Health status	0.370 (0.420)	0.378
Time	0.015 (0.004)	8.940*10 ⁻⁵ *
Satisfaction	0.371 (0.456)	0.417
Log-Likelihood	-107.295	
McFadden R ²	0.082	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

As can be taken from Table 7, only the variable *Time* is significant on a 10% significance level. Therefore, only this variable will be interpreted. There is a positive relation between *Time* and switching. Searching 10 minutes leads to a change of switching with $e^{0.015*10} = 1,162$, ceteris paribus. This indicates that searching for 10 minutes instead of 0 minutes increases the change of switching by 116%. This indicates that the more time someone spends searching for information, the more likely this person is to switch health insurance. This confirms hypothesis six. Hypotheses five and seven are rejected because the variables health status and satisfaction are not significant.

4.2.3. Interaction effects consumer characteristics

The first interaction effect investigated in this research is the interaction effect of age with price and quality. Hypothesis eight states that age negatively influences switching health insurance in case of a positive price difference. Hypothesis nine states that age positively influences switching health insurance in case of lower quality. These hypotheses were tested using a mixed logit regression, presented in Table 8 below. The variables are related to the choice experiment and the consumer characteristic age.

Table 8. Mixed logit model of interaction effects of age with price and quality on the decision to switch

Variable	Estimate	P-value
Intercept	-0.031 (0.058)	0.589
Price difference basic insurance	0.025 (0.014)	0.077 .
Price difference complementary insurance	0.000 (0.024)	0.984
Quality average	0.398 (0.212)	0.061 .
Quality bad	0.515 (0.255)	0.043 *
Price difference basic insurance *Age	-0.001 (0.000)	0.147
Price difference complementary insurance *Age	0.000 (0.001)	0.735
Quality average *Age	-0.004 (0.005)	0.376
Quality bad *Age	-0.007 (0.006)	0.265
Log-Likelihood	-1218.8	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

From Table 8, it follows that none of the interaction effects are significant on a 10% significance level. Because this indicates a lack of explanatory effect on choice, these interaction effects will not be interpreted. This means there is no evidence that the moderator age affects the relationship between the price difference or quality and choice, and thus rejects hypotheses eight and nine.

There are two hypotheses related to the interaction effects of certainty with the price difference and contracted providers. Hypothesis ten states that consumers with greater certainty about their insurance needs are more likely switching health insurance in case of a higher price difference. Hypothesis eleven states that consumers with greater certainty about their insurance needs are less likely switching health insurance if the consumer has more choice in contracted providers compared to less choice. These hypotheses are investigated using a mixed logit regression, presented in Table 9 below. The variables are related to the choice experiment and the consumer characteristic certainty.

Table 9. Mixed logit model of interaction effects of certainty with price and contracted providers on the decision to switch

Variable	Estimate	P-value
Intercept	-0.139 (0.061)	0.022 *
Price difference basic insurance	0.035 (0.007)	1.423*10 ⁻⁷ ***
Price difference complementary insurance	0.001 (0.012)	0.959
Contract providers no change	-0.240 (0.099)	0.015 *
Contract providers more choice	-0.384 (0.136)	0.005 **
Price difference basic insurance * Certainty	0.020 (0.011)	0.074 .
Price difference complementary insurance * Certainty	0.019 (0.020)	0.512
Contract providers no change * Certainty	-0.426 (0.164)	0.009 **
Contract providers more Choice * Certainty	-0.141 (0.216)	0.512
Log-Likelihood	-1223.9	
McFadden R ²	0.070	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

Not all the variables in this model are significant on a 10% significance level, as shown in Table 8. The variables *Price difference basic insurance*, *Contract providers no change*, and *Contract providers more choice* are significant and have the same relation with choice as concluded before in Section 4.2.1. The interaction effects with *Certainty* are not all significant. The interaction effect of *Price difference basic insurance* with *Certainty* is positive and significant on a 10% significance level. This indicates that having a greater certainty about the insurance needs positively affects the relationship

between the price difference of basic health insurance and the decision to switch health insurance. This confirms hypothesis ten for the price difference in basic health insurance.

Furthermore, the interaction effect of *Contract providers no change* and *Certainty* is negative and significant. This indicates that being very certain about the insurance needs has a negative effect on the relationship between having no change in contracted providers compared to less choice in contracted providers and the decision to switch health insurance. In other words, consumers with a greater certainty about their insurance needs and having no change in contracted providers makes a consumer want to switch less compared to having less choice in contracted providers. This confirms hypothesis eleven for no change in contracted providers compared to less choice.

The last two hypotheses investigated in this research are about the interaction effect of health status and certainty and time and education. Hypothesis twelve states that consumers with greater certainty about their insurance are more likely switching health insurance in the case of consumers with excellent health compared to poor health. Hypothesis thirteen states that higher educated people are more likely to be positively influenced in their choice to switch health insurance by information search than lower educated people. These hypotheses are investigated using a logit regression, presented in Table 10 below. The variables are related to the consumer characteristics health status, time, certainty, and education.

Table 10. Logistic regression model of the interaction effects of certainty and education with health status and time respectively on switched

Variable	Estimate	P-value
Intercept	-1.229 (0.281)	1.250*10 ⁻⁵ ***
Health status	0.331 (0.576)	0.566
Time	0.012 (0.003)	0.001 **
Certainty	-0.430 (0.409)	0.294
Education level	-2.238 (1.290)	0.083 .
Health status * Certainty	0.207 (0.898)	0.818
Time * Education level	0.048 (0.024)	0.048 *
Log-Likelihood	-103.877	
McFadden R ²	0.111	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

As can be taken from Table 10, the variable health status and the interaction effect of health status and certainty are not significant and will therefore not be interpreted. This indicates no evidence of moderator certainty influencing the relation between health status and switching, and thus rejects hypothesis twelve. However, the variable *Time* is significant and has a positive effect on switching,

which is the same relation as in Section 4.2.2. The interaction effect of *Time* and *Education level* is positive and significant. This indicates that higher education positively affects the relationship between searching for information and switching health insurance. In other words, spending more time searching for information increases that change of switching health insurance, and having a high education compared to a low education increases this change of switching even further, and thus confirms hypothesis thirteen.

4.2.4. Overview of all hypotheses

An overview of all the tested hypotheses and the corresponding outcome is given in Table 11 below.

Table 11. Hypotheses overview with outcome

Hypothesis	Outcome
H1: There is a positive relationship between the price difference of basic health insurance and switching health insurance.	Confirmed
H2: There is a positive relationship between the price difference of complementary health insurance and switching health insurance.	Rejected
H3: A poor quality of customer service makes a consumer more likely to switch health insurance.	Confirmed
H4: Having less options in contracted providers makes a consumer more likely to switch health insurance.	Confirmed
H5: Poor health status makes a consumer less likely to switch health insurance compared to consumers with excellent health.	Rejected
H6: The more time a person invests in researching health insurance, the more likely this person is to switch health insurance.	Confirmed
H7: A satisfied consumer is less likely to switch health insurance compared to an unsatisfied consumer.	Rejected
H8: Age negatively influences switching health insurance in case of a positive price difference.	Rejected
H9: Age positively influences switching health insurance in case of a lower quality of the health insurance.	Rejected
H10: Consumers with a greater certainty about their insurance needs are more likely switching health insurance in case of a higher price difference.	Confirmed, for basic health insurance.
H11: Consumers with a greater certainty about their insurance needs are less likely switching health insurance in case the consumer has more choice in contracted providers compared to less choice.	Confirmed, for no change compared to less choice.
H12: Consumers with a greater certainty about their insurance needs are more likely switching health insurance in the case of consumers with excellent health compared to poor health.	Rejected
H13: Higher educated people are more likely to be positively influenced in their choice to switch health insurance by information search than lower educated people.	Confirmed

4.3. Other findings

This research section focuses on findings worth mentioning other than the hypotheses testing. As described in Section 3.2.3, a latent class logit model is performed on the dataset. This model accounts for heterogeneity within the groups. Therefore, it is investigated whether the effects of the product characteristics on choice differ among groups in Section 4.3.1. Furthermore, some questions were asked in the survey to investigate the risk-taking behavior of the respondent. Therefore, it is worth investigating to what extent the risk-taking behavior of the respondent influences their choice behavior which is done in Section 4.3.2. Lastly, two questions about switching health insurance were asked at the end of the survey. The first question was “What are normally factors you consider in your decision to switch health insurance?” and the second question was “What are normal factors that withhold you in your decision to switch health insurance?”. Preliminary results show that the price of health insurance is mainly chosen as a factor to consider in the decision to switch health insurance, and the effort is the cost to switch is mainly chosen as a factor that withholds someone in their decision to switch health insurance. In Section 4.3.3, these results are further investigated.

4.3.1. Latent class logit model

The number of latent classes needs to be determined to perform the latent class logit model. This is done using the AIC. The number of classes providing the lowest AIC is chosen, and as shown in Table 12, three classes result in the lowest AIC. Therefore, the latent class logit model is performed using three classes in this research.

Table 12. Different number of classes with corresponding AIC

Number of classes	2	3	4
AIC	2219.497	2137.256	2152.23

The latent class logit model was performed using three classes, resulting in the following class distribution. The share of individuals in the first class is 39.7%, for the second class, this is 19.1%, and for the third class, this is 41.2%. The results of the latent class logit model are presented in Table 13 below. Again, the independent variables are related to the choice experiment, and the dependent variable was choice.

Table 13. Latent class logit model of product characteristics on the decision to switch

Variable	Estimate	P-value
(Class)2	-0.735 (0.071)	< 2.2*10 ⁻¹⁶ ***
(Class)3	0.036 (0.053)	0.497
Class 1 Price difference basic insurance	-0.041 (0.008)	7.518*10 ⁻⁷ ***
Class 1 Price difference complementary insurance	-0.005 (0.016)	0.725

Class 1 Quality average	-0.196 (0.135)	0.146
Class 1 Quality bad	-1.167 (0.164)	1.207*10 ⁻¹² ***
Class 1 Contract providers no change	0.740 (0.121)	1.105*10 ⁻⁹ ***
Class 1 Contract more choice	0.996 (0.152)	6.362*10 ⁻¹¹ ***
Class 2 Price difference basic insurance	0.058 (0.019)	0.002 **
Class 2 Price difference complementary insurance	0.042 (0.031)	0.182
Class 2 Quality average	0.882 (0.228)	0.002 ***
Class 2 Quality bad	2.824 (0.380)	1.068*10 ⁻¹³ ***
Class 2 Contract providers no change	-0.708 (0.249)	0.004 **
Class 2 Contract providers more Choice	-0.728 (0.264)	0.006 **
Class 3 Price difference basic insurance	0.186 (0.019)	< 2.2*10 ⁻¹⁶ ***
Class 3 Price difference complementary insurance	0.113 (0.031)	0.000 ***
Class 3 Quality average	0.436 (0.255)	0.088 .
Class 3 Quality bad	1.302 (0.373)	0.000 ***
Class 3 Contract providers no change	-1.752 (0.192)	< 2.2*10 ⁻¹⁶ ***
Class 3 Contract providers more Choice	-2.565 (0.290)	< 2.2*10 ⁻¹⁶ ***
Log-Likelihood	-1048.6	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

The variable *Price difference basic insurance* is significant on a 10% significance level for all three classes. For classes two and three, the relation between *Price difference basic insurance* and choice is positive, corresponding to the previous results in Section 4.2.1. The coefficient of *Price difference basic insurance* for class three is greater, indicating that for class two *Price difference basic insurance* has a greater influence on choice for class three than it does for class two. On the other hand, the relationship between *Price difference basic insurance* and choice is negative for class one. This indicates that a higher price difference of basic health insurance decreases choice. Class one is therefore not as sensitive to price as classes two and three.

Furthermore, *Price difference complementary insurance* was not significant in the model of Section 4.2.1 but is significant for class three. A positive relationship between the price difference of complementary health insurance and choice is observed. This is in line with the expected relation between *Price difference complementary insurance*, and choice. The variable *Quality bad* is significant for all three classes. For classes two and three, the relation between *Quality bad* and choice is positive, indicating that the quality of customer service increases choice compared to excellent quality. The coefficient of class two is greater for this variable than class three, meaning that quality has a greater influence on choice for class two. For class one, it is the opposite; the relation between *Quality bad* choice is negative, indicating that the quality of customer service decreases choice compared to excellent quality. Lastly, the variable *Contracted providers more choice* is also

significant for all three classes. The relationship between *Contracted providers more choice* and choice is positive for class one and negative for classes two and three. This indicates that having more choice in contracted providers increases choice for class one. For classes two and three, having more choice in contracted providers decreases choice. The coefficient of the class tree is greater for this variable compared to class two, meaning that choice in contracted providers has a greater influence on choice for class three.

Class one is not sensitive to price and quality as it decreases the decision to switch health insurance. However, class one is sensitive to contracted providers, increasing the decision to switch health insurance. Class two is mostly very sensitive to the quality of customer service but also sensitive to the price difference of basic health insurance and contracted providers. Class three is the only class sensitive to the price of the complementary health insurance and all other product characteristics where contracted providers has the greatest coefficient indicating that class three is very sensitive to a difference in providers.

4.3.2. Risk taking behavior

To investigate to what extent the risk-taking behavior of the respondent influences the choice behavior a mixed logit model is used. The variable *Risk* is used as a moderator to capture the effect. The results of the mixed logit model are presented in Table 14 below. Besides the variable risk the independent variables are related to the choice experiment, and the dependent variable was choice.

Table 14. Mixed logit model of interaction effect of risk with product characteristics on the decision to switch

Variable	Estimate	P-value
Intercept	-0.153 (0.070)	0.028 *
Price difference basic insurance	0.073 (0.017)	1.769*10 ⁻⁵ ***
Price difference complementary insurance	0.035 (0.028)	0.216
Quality average	0.253 (0.251)	0.313
Quality bad	0.338 (0.287)	0.238
Contract providers no change	-0.410 (0.242)	0.091 .
Contract more choice	-0.925 (0.290)	0.001 **
Price difference basic insurance * Risk	-0.014 (0.012)	0.023 **
Price difference complementary insurance * Risk	-0.001 (0.002)	0.509
Quality average * Risk	-0.005 (0.018)	0.788
Quality bad * Risk	-0.007 (0.021)	0.738
Contract providers no change * Risk	-0.003 (0.018)	0.871
Contract providers more choice * Risk	0.035 (0.021)	0.010 *
Log-Likelihood	-1189.4	
McFadden R ²	0.097	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

Table 14 shows that not all the variables in this model are significant on a 10% significance level. The variables *Price difference basic insurance*, *Contract providers more choice* are significant and have the same relation with choice as concluded before in Section 4.2.1. The interaction effects with *Risk* of *Price difference basic insurance* and *Contract providers more choice* are significant. The interaction effect of *Price difference basic insurance* with *Risk* is negative, which indicates that risk-taking behavior negatively affects the relationship between the price difference of basic health insurance and the decision to switch health insurance. In other words, risk-taking behavior diminishes the sensitivity to the price difference in basic health insurance. Furthermore, the interaction effect of *Contract providers more choice* and *Risk* is positive, which indicates that risk-taking behavior positively influences the relationship between having more choice in contracted providers compared to less choice and the decision to switch health insurance. Risk-taking behavior diminishes the negative effects of having more choice in contracted providers compared to less choice on the decision to switch health insurance.

4.3.3. Reasons and barriers to switch

As aforementioned, two questions about switching health insurance were asked at the end of the survey. One question relates to the reasons why someone switches health insurance, and one relates to the barriers one withholds from switching. Preliminary results in Section 4.1 show that the price of health insurance is mainly chosen as a factor to consider in deciding to switch health insurance. The second most chosen reason is the contracted providers, the third the price of the complementary insurance, and the last quality of customer services. Section 4.2.1 show that except for the price of complementary insurance, all these drivers statistically influence the decision to switch health insurance. The survey question also allowed the respondent to fill in any other answer. Examining this open answer shows that coverage is an essential factor in why someone would switch health insurance. Furthermore, loyalty to and experience with the current health insurance is important in the decision to switch health insurance. Lastly, not the price of the complementary insurance but the content is an essential factor in the decision to switch health insurance.

Preliminary results in Section 4.1 show that the effort is the cost to switch is mainly chosen as a factor that withholds someone in their decision to switch health insurance. The second most chosen reason is the uncertainty about the coverage of another insurance company, the third is not having enough information to make a choice, and lastly, the collectivity discount by the current insurance company. Examining the open answers to this question shows that the lack of a big difference between the health insurance companies available is a barrier to switching. Furthermore, lack of a cheaper alternative, loyalty to the insurance company, and no clear information were mentioned as factors that withhold someone from switching health insurance. Since the effort and uncertainty about coverage are the two main barriers, they were investigated as a moderator in a mixed logit model with the product

characteristics as independent variables used to investigate this. However, this showed that no interaction effects with the barrier effort were significant. Therefore, the mixed logit model of interaction effects with only the barrier uncertainty about coverage is presented in Table 15 below. Besides the variable barrier coverage, which represents the dummy value for the barrier uncertainty about the coverage of another insurance company, the independent variables are related to the choice experiment, and the dependent variable was choice.

Table 15. Mixed logit model of interaction effects of barrier coverage with product characteristics on the decision to switch

Variable	Estimate	P-value
Intercept	-0.154 (0.072)	0.032 *
Price difference basic insurance	0.040 (0.009)	2.063*10 ⁻⁵ ***
Price difference complementary insurance	0.021 (0.016)	0.185
Quality average	0.224 (0.142)	0.114
Quality bad	0.556 (0.165)	0.001 ***
Contract providers no change	-0.514 (0.132)	0.000 ***
Contract providers more choice	-0.621 (0.168)	0.000 ***
Price difference basic insurance * Barrier coverage	0.029 (0.013)	0.030 *
Price difference complementary insurance * Barrier coverage	-0.006 (0.022)	0.802
Quality average * Barrier coverage	-0.060 (0.198)	0.762
Quality bad * Barrier coverage	-0.381 (0.231)	0.099 .
Contract providers no change * Barrier coverage	0.026 (0.186)	0.887
Contract providers more Choice * Barrier coverage	0.142 (0.227)	0.531
Log-Likelihood	-1176.8	
McFadden R ²	0.106	

Note: . p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001. Standard deviations are given within parentheses.

Table 15 shows that not all the variables in this model are significant on a 10% significance level. The variables *Price difference basic insurance*, *Quality bad*, *Contract providers no change*, and *Contract providers more choice* are significant and have the same relation with choice as concluded before in Section 4.2.1. The interaction effects of *Price difference basic insurance* and *Quality bad* with *Barrier coverage* are significant. The interaction effect of *Price difference basic insurance* with *Barrier coverage* is positive, which indicates that being uncertain about the coverage of other health insurance companies affects the relationship between the price difference in basic health insurance and the decision to switch health insurance. This uncertainty about the coverage enlarges the sensitivity to the price difference in basic health insurance. Furthermore, the interaction effect of *Quality bad* and *Barrier coverage* is negative, which indicates that being uncertain about the coverage of other health insurance companies negatively influences the relationship between bad quality in customer service compared to excellent quality and the decision to switch health insurance. Uncertainty about coverage

diminishes the positive influence of a bad quality in customer service compared to excellent quality on deciding to switch health insurance.

5. Conclusion and Discussion

The Dutch healthcare system is changing due to sustainability challenges. This comes with rising costs, which causes health insurance to get more expensive. Understanding the drivers for consumers to switch health insurance companies instead of just controlling the switching rates is therefore essential information. This yielded into the following research question: *"What factors influence the decision to switch health insurance (or not), and to what extent do they differ among age, certainty and education levels in the Netherlands?"*. To answer this research question first a literature review was provided on the main topics of this research. Hypotheses were developed based on the previous research, and a conceptual model was presented. After that, the data collection, and methods to analyze the hypotheses were explained and the results were given. This concluding section first summarizes the main findings of this research and discusses the (di)similarities with the findings in previous research followed by the summary of the other findings. Lastly, the limitations of this research will be discussed followed by recommendations for future research.

5.1. Findings

5.1.1. Main findings

Past research has found that price is an important factor in the reason why people switch health insurance (Van den Berg et al., 2008). Boonen et al., (2015) found that the price influences whether someone switches, and that having a complementary insurance decreases the chance of switching. Therefore, hypothesis one states that there is a positive relationship between the price difference of basic health insurance and switching health insurance. Hypothesis two states that there is a positive relationship between the price difference of complementary health insurance and switching health insurance. In the context of this this research there is indeed a positive relationship between the price difference of basic health insurance and switching health insurance, and thus confirms hypothesis one which is in line with previous findings. There was however no significant relationship found between the price difference of complementary health insurance and switching health insurance. Thus, the results are inconclusive and hypothesis two was rejected. As discussed in Section 4.3.3, respondents stated that the content of the complementary insurance is quite crucial to them. Whether the insurance covers dental care and glasses, for example, it might be that the respondents value the content of the complementary insurance more than the price since the content is related to their needs, which might explain why the results regarding the price difference in complementary insurance were inconclusive. This is also in line with expected utility theory, that people who are risk-averse, possibly due to their need for more certainty in complementary insurance, are more likely to have a complementary insurance.

Furthermore, previous research has found that quality of customer service is important in considering switching and found that there is a negative relationship between the quality rating of the insurer and the chance of a customer switching (van den Berg et al., 2008; Boonen et al., 2015). This resulted in hypothesis three stating that a poor quality of customer service makes a consumer more likely to switch health insurance. The results show that the quality of the health insurance being bad, or average increases the decision to switch health insurance compared to excellent quality. This confirms hypothesis three and is thus in line with previous research.

Contracted providers were also found to be a driver of switching health insurance. Duijmelinck et al. (2015) identified the insurers' contracted provider network as one of the switching benefits, which prevents people from switching. Another switching benefit is the insurers' freedom to choose providers. Therefore, hypothesis four stated that having less options in contracted providers makes a consumer more likely to switch health insurance. This research found that having more choice in contracted options makes a customer less likely to switch health insurance than having less choice in contracted providers, and thus confirms the fourth hypothesis which is in line with previous research.

Lako et al. (2010) have found that the health status of an individual matter in the process of switching. Boonen et al. (2015) found that people with an excellent health status have a 2.3% higher chance of switching compared to good health status. Therefore, hypothesis five stated that poor health status makes a consumer less likely to switch health insurance compared to consumers with excellent health. In the context of this research the results were inconclusive and therefore hypothesis five was rejected. A possible explanation for this is the distribution of the variable health status. There were just a few people in the dataset with a poor health status.

Previous research used different definitions of information as a driver of switching health insurance (Boonen et al., 2015; Hesselink et al., 2009). In the context of this research information search is defined as how much time consumers spend searching for information. Hesselink et al. (2009) found that the more time a person spends on research, the more likely they are to switch health insurance. Thus, hypothesis six stated that the more time a person invests in researching health insurance, the more likely this person is to switch health insurance. This research found a positive relation between the time searching for information and the decision to switch health insurance. Searching for 10 minutes instead of 0 minutes increases the change of switching by 116%. This confirms hypothesis six which is in line with previous research.

Burnham et al. (2003) identified relational switching cost which entails the psychological or emotional discomfort of breaking with the company as a factor to prevent someone from switching health insurance. Satisfaction with the insurance company is a great part of the relationship between a

consumer and the company and might therefore influence the likeliness to switch. Therefore, hypothesis seven stated that a satisfied consumer is less likely to switch health insurance compared to an unsatisfied consumer. The variable satisfaction was not significant indicating that the results are inconclusive and therefore hypothesis seven was rejected. A reasonable explanation for this is the fact that in the used dataset 82% of the respondents were satisfied with the insurance company.

Boonen et al. (2015) found that younger people, in general, are more likely to switch health insurance but are less likely to switch when they have an excellent health status. Furthermore, younger people value a lower price more, which suggests younger people are more price sensitive. On the other hand, older people value health care quality. Therefore, hypothesis eight stated that age negatively influences switching health insurance in case of a positive price difference, and hypothesis nine stated that age positively influences switching health insurance in case of a lower quality of the health insurance. The results show that the interaction effects between price difference in basic health insurance as well as complementary insurance and age was not significant. The results were thus inconclusive and hypothesis eight was rejected. Furthermore, the interaction effect between the quality of customer service and age was also not significant. The results were thus also inconclusive and hypothesis nine was rejected. A possible explanation could be that not all age groups were represented well. Also, van den Berg et al. (2008) found that age mattered in the consideration of switching but not in the actual decision to switch.

Previous research identified that uncertainty costs prevent someone from switching health insurance (Duijmelinck et al., 2015). In the context of this research certainty is defined as the certainty about insurance needs. Being uncertain about insurance needs diminishes the effect of a higher price. Being certain about insurance needs diminish the effect of having much choice in contracted providers. Uncertainty costs are higher for people with high risks and thus poor health status than those with low risks and thus excellent health status (Duijmelinck et al., 2015). Therefore, hypothesis ten stated that consumers with a greater certainty about their insurance needs are more likely switching health insurance in case of a higher price difference. Hypothesis eleven stated that consumers with a greater certainty about their insurance needs are less likely switching health insurance in case the consumer has more choice in contracted providers compared to less choice. Lastly, hypothesis twelve stated that consumers with a greater certainty about their insurance needs are more likely switching health insurance in the case of consumers with excellent health compared to poor health. In the context of this research having a greater certainty about the insurance needs is found to positively affect the relationship between the price difference of basic health insurance and the decision to switch health insurance. The interaction effect of price difference of complementary insurance was not significant. This confirms hypothesis ten for the price difference in basic health insurance and is thus in line with previous research. Furthermore, having a greater certainty and having no change in contracted

providers makes a consumer want to switch less compared to having less choice in contracted providers. This confirms hypothesis eleven for no change in contracted providers compared to less choice and is thus in line with previous research. The interaction effect between health status and certainty was not significant. Therefore, the results were inconclusive and hypothesis twelve was rejected. However, it does make sense that most survey respondents that are certain about their insurance needs are healthy consumers. Since unhealthy people were underrepresented, this could explain the inconclusive results.

Lastly, previous research has found that education indirectly influence the probability of switching health insurance. Boonen et al. (2015) found that compared to lower educated people, higher educated people are more likely to switch when searching for information. Therefore, hypothesis thirteen stated that higher educated people are more likely to be positively influenced in their choice to switch health insurance by information search than lower educated people. Results show that spending more time searching for information increases that change of switching health insurance, and having a high education compared to a low education increases this change of switching even further, and thus confirms hypothesis thirteen which is in line with previous research.

To summarize, this research has found that several factors influence the decision to switch health insurance. The factors that directly influence the decision to switch are the price difference in basic health insurance, the quality of customer service, the choice in contracted providers, and lastly the time someone spends searching for information. Furthermore, this research has found that certainty about insurance needs indirectly influences the decision to switch health insurances through the price difference in basic health insurance differs and having no change in contracted providers compared to less choice. Also, this research has found that education level indirectly influences the decision to switch health insurance through the time someone spends looking for information. Lastly, this research has found that the results regarding the indirect of age are inconclusive. In general, this research has found evidence of the expected utility theory, and the endowment effect. The expected utility theory is visible in the insignificant effect of the price difference in complementary insurance, and the endowment effect in the significant indirect effect of certainty.

5.1.2. Other findings

Besides the hypothesis testing, this research also found some other findings worth mentioning. A latent class logit model was performed to look for heterogeneity in the product characteristics. This model shows that the effects of the product characteristics on the decision to switch health insurance are not the same for the three latent classes. The first class show no sensitivity to price and quality as these factors decrease the decision to switch health insurance. Class one is however sensitive to contracted providers, as having more choice increases the decision to switch health insurances. This is

quite contradictory to earlier findings, however a plausible explanation for this, is that class one consists of people who are very loyal to the insurance company, and do not like change or do not want to take the effort to change. Also, this class might be very risk-averse and therefore not likely to switch health insurance, which is in line with the expected utility theory. Class two is mostly sensitive to the quality of customer service but also sensitive to the price difference of basic health insurance. This shows that class two probably consists of people who value the quality very much, but not at the cost of the other factors. This might be due to the regret and disappointment theory that consumers factor in their past experiences or their expected feelings in deciding whether to change their health insurance. They currently value the quality of customer service and prevents them from switching although other factors might usually make them switch. Class three is the only class sensitive to the price of the complementary health insurance and all other product characteristics. However, of the other product characteristics, shows class two mostly sensitivity to the contracted providers. This shows that class three consist of people who value the freedom in choice they have for contracted providers very much, but within reasonable limits of the other factors. This might be due to the endowment effect, that they want to keep their current situation since their current freedom is valued and are uncertain what this will be at another health insurance, but within reasonable limits. So, when the costs of the certainty exceed the benefits of the uncertainty, they will switch.

Furthermore, the survey exists of a series of question to examine the risk-taking behavior of the respondent. This risk-taking behavior is used as a moderator in a mixed logit model is used to investigate this. Results show that risk-taking behavior diminishes the sensitivity to the price difference in basic health insurance. Also, risk-taking behavior is found to diminish the negative effects of having more choice in contracted providers compared to less choice on the decision to switch health insurance. This is of course explained by the fact that deciding to switch health insurance is a decision under uncertainty. Consumers weigh in their risk-averse behavior when they factor in rational aspects like price difference and choice in contracted providers.

Lastly, two questions were asked in the survey to investigate what factors people usually consider or what withholds them in their decision to switch health insurance. Frequency analysis showed that the price of health insurance is mainly chosen to consider when deciding to switch health insurance. The effort is the cost to switch is mainly chosen as a factor that withholds someone in their decision to switch health insurance. The open answer to the question regarding reasons to switch shows that coverage of the insurance, loyalty to and experience with the current health insurance, and the content of the complementary insurance are important in the decision to switch health insurance. The open answer to the question regarding the barriers to switching shows that the lack of a big difference between the health insurance companies, lack of a cheaper alternative, loyalty to the insurance company, and no clear information are barriers to switching.

Furthermore, the two most chosen barriers were used as moderators in a mixed logit model with the product characteristics. These two barriers were the effort it costs to switch, and the uncertainty about the coverage of another insurance company. The results regarding the interaction effect with effort were all inconclusive. The interaction effect with uncertainty about coverage shows that this uncertainty about the coverage enlarges the sensitivity to the price difference in basic health insurance. Furthermore, uncertainty about coverage diminishes the positive influence of bad quality in customer service compared to excellent quality on deciding to switch health insurance.

5.2. Limitations and future research

5.2.1. Limitations

A limitation of this research is the data used. The data was collected through a survey posted on social media and forums. The responses came thus from family and friends, but also many other students through these forums. This sample is not a complete representation of the Dutch consumers since it was mostly people in their twenties or fifties have filled in the survey underrepresenting the age categories that are a bit underrepresented. The reason this survey was spread through these channels was a time issue. There was limited time to collect responses. More time or investing money into the data collection could have led to a better representation of the Dutch consumer population.

Another limitation is that in this research, the focus was on the determinants of switching health insurance, but some factors were not measured dynamically in the choice experiment. For instance, satisfaction with health insurance, uncertainty about insurance needs, and health status was asked before the choice experiment. However, it might have been interesting to investigate the respondent's reaction if these factors were not a current situation but a what-if situation. In this way, healthy people, for instance, also think about this decision if they are not healthy because these factors can suddenly change.

5.2.2. Future research

The first suggestion for future research is regarding the barriers people experience when deciding to switch health insurance. Since there is an effect of uncertainty about coverage on deciding to switch, it is recommended to investigate more barriers and their trade-off with the reasons or even incentives people experience in their decision-making process. Furthermore, in this research, four main product characteristics were investigated as determinants of switching health insurance. However, from the open question at the end of the survey, other reasons emerge as possible determinants. For example, loyalty and the content of the (complementary) insurance were two reasons. Combining these reasons

with the previously mentioned barriers might be very interesting, especially for insurance companies, as loyalty, for instance, is something these companies can act on.

Another suggestion coming from a limitation to this research is thus measuring specific consumer characteristics dynamically within the choice experiment. Furthermore, in the context of this research, it is found that time spent searching for information encourages people to switch, especially in the case of higher educated people. Therefore, it is recommended to investigate if these people make a more informed choice resulting in a good proportion between price and quality. Also, researching how lower educated people, who search less for information, can be helped to make a well-informed decision. Lastly, it is recommended to look at the connection between the probability of switching in the real Dutch market and the effects of the determinants of switching health insurance. Then, something can be said about the actual impact of these determinants on the probability in the real market.

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Appendix

Appendix A Survey

Beste Respondent,

Mijn naam is Frederieke Huegen en deze survey is voor mijn master scriptie in Economie en Bedrijfseconomie met een specialisatie in Data Science & Marketing Analytics aan de Erasmus Universiteit Rotterdam.

Deze survey bestaat uit een aantal demografische vragen, vervolgd door vragen over risico nemen, vervolgd door een keuze experiment waar u gevraagd wordt een scenario te kiezen, en tot slot een paar afsluitende vragen over zorgverzekeringen. Het kost ongeveer 5-10 minuten van uw tijd. Uw antwoorden worden alleen gebruikt voor onderzoeksdoeleinden en zullen vertrouwelijk worden behandeld.

Als u vragen heeft over deze survey aarzel dan niet om contact met mij op te nemen: 471024fh@student.eur.nl. Bij voorbaat hartelijk dank voor uw deelname en tijd.

Met vriendelijke groet,
Frederieke Huegen

Het eerste deel van deze survey bestaat uit demografische vragen. Uw antwoorden worden alleen voor onderzoeksdoeleinden gebruikt en zullen vertrouwelijk worden behandeld. Gelieve naar waarheid te antwoorden.

Wat is uw geslacht?

- Man
- Vrouw
- Anders
- Zeg ik liever niet

Wat is uw leeftijd?

Wat is uw hoogste opleidingsniveau? Ben je student, geef dan aan welke opleiding je op dit moment volgt.

- Basisschool

- Middelbare school
- MBO
- HBO
- WO Bachelor
- WO Master
- Post-Master/PhD/doctoraat

Hoe zou u uw gezondheid op dit moment kwalificeren?

- Uitstekend
- Goed
- Gemiddeld
- Slecht
- Zeer slecht
- Zeg ik liever niet

Geef aan in hoeverre u het eens bent met de onderstaande stelling:

Ik ben heel zeker over mijn verzekeringsbehoeften voor volgend jaar.

- Sterk mee eens
- Eens
- Neutraal
- Oneens
- Sterk mee oneens

Hoe tevreden bent u met uw huidige zorgverzekeraar?

- Erg tevreden
- Tevreden
- Neutraal
- Ontevreden
- Erg ontevreden

Geef voor elk van de volgende vijf uitspraken aan hoe waarschijnlijk het is dat u de beschreven activiteit of het beschreven gedrag zou uitvoeren als u zich in die situatie zou bevinden.

Een gevonden portemonnee met € 200,- niet retourneren.

- Uiterst onwaarschijnlijk
- Redelijk onwaarschijnlijk
- Enigszins onwaarschijnlijk

- Even waarschijnlijk als onwaarschijnlijk
- Enigszins waarschijnlijk
- Redelijk waarschijnlijk
- Uiterst waarschijnlijk

Een daginkomen inzetten bij een pokerspel met hoge inzetten.

- Uiterst onwaarschijnlijk
- Redelijk onwaarschijnlijk
- Enigszins onwaarschijnlijk
- Even waarschijnlijk als onwaarschijnlijk
- Enigszins waarschijnlijk
- Redelijk waarschijnlijk
- Uiterst waarschijnlijk

Motorrijden zonder helm.

- Uiterst onwaarschijnlijk
- Redelijk onwaarschijnlijk
- Enigszins onwaarschijnlijk
- Even waarschijnlijk als onwaarschijnlijk
- Enigszins waarschijnlijk
- Redelijk waarschijnlijk
- Uiterst waarschijnlijk

Bungee jumpen van een hoge brug.

- Uiterst onwaarschijnlijk
- Redelijk onwaarschijnlijk
- Enigszins onwaarschijnlijk
- Even waarschijnlijk als onwaarschijnlijk
- Enigszins waarschijnlijk
- Redelijk waarschijnlijk
- Uiterst waarschijnlijk

Verhuizen naar een stad ver weg van uw familie.

- Uiterst onwaarschijnlijk
- Redelijk onwaarschijnlijk
- Enigszins onwaarschijnlijk
- Even waarschijnlijk als onwaarschijnlijk

- Enigszins waarschijnlijk
- Redelijk waarschijnlijk
- Uiterst waarschijnlijk

Het volgende deel van deze survey bestaat uit een 10 keuze vragen waar twee toekomstige scenario's van zorgverzekeringen met bijbehorende kenmerken worden getoond.

Lees de onderstaande kenmerken aandachtig door.

De kenmerken zijn:

- Prijsverandering basis, dit geeft het jaar-op-jaar prijsverschil van de basisverzekering aan (bijv. als er staat +10 betekent dit dat de prijs voor de basispremie van volgend jaar €10 hoger is dan dit jaar);
- Prijsverandering aanvullend, dit geeft het jaar-op-jaar prijsverschil van de aanvullende verzekering aan (bijv. als er staat +10 betekent dit dat de prijs voor de aanvullende premie van volgend jaar €10 hoger is dan dit jaar);
- Kwaliteit van de klantenservice, dit geeft een scenario aan hoe uw ervaring was met uw zorgverzekeraar in het afgelopen jaar (bijv. als er staat slecht betekent dit dat u in het afgelopen jaar een slechte ervaring met uw zorgverzekeraar heeft gehad);
- Gecontracteerde aanbieders, dit geeft aan of voor het volgende jaar verandering is in de keuze uit gecontracteerde aanbieders bij uw huidige zorgverzekeraar (bijv. als er staat minder keuze betekent dit dat u voor het volgende jaar bij uw zorgverzekering kan kiezen uit 20% minder gecontracteerde aanbieders en bij meer keuze vice versa).

De vraag die u steeds moet beantwoorden bij deze keuze is:

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+10	+20
Prijsverandering aanvullend	+5	+10
Kwaliteit klantenservice	Excellent	Slecht
Gecontracteerde aanbieders	Geen verandering	Geen verandering

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+30	+20
Prijsverandering aanvullend	+15	+15
Kwaliteit klantenservice	Gemiddeld	Slecht
Gecontracteerde aanbieders	Geen verandering	Minder keuze

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+10	+10
Prijsverandering aanvullend	+10	+15
Kwaliteit klantenservice	Slecht	Gemiddeld
Gecontracteerde aanbieders	Geen verandering	Minder keuze

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+10	+20
Prijsverandering aanvullend	+10	+5
Kwaliteit klantenservice	Gemiddeld	Excellent
Gecontracteerde aanbieders	Meer keuze	Geen verandering

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+10	+20
Prijsverandering aanvullend	+10	+15
Kwaliteit klantenservice	Slecht	Gemiddeld
Gecontracteerde aanbieders	Minder keuze	Geen verandering

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+10	+10
Prijsverandering aanvullend	+15	+5
Kwaliteit klantenservice	Excellent	Gemiddeld
Gecontracteerde aanbieders	Meer keuze	Minder keuze

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+30	+20
Prijsverandering aanvullend	+10	+5
Kwaliteit klantenservice	Gemiddeld	Slecht
Gecontracteerde aanbieders	Minder keuze	Meer keuze

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+30	+20
Prijsverandering aanvullend	+15	+10
Kwaliteit klantenservice	Slecht	Gemiddeld
Gecontracteerde aanbieders	Meer keuze	Meer keuze

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+10	+30
Prijsverandering aanvullend	+15	+10
Kwaliteit klantenservice	Slecht	Excellent
Gecontracteerde aanbieders	Geen verandering	Minder keuze

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

	Toekomst scenario 1	Toekomst scenario 2
Prijsverandering basis	+30	+10
Prijsverandering aanvullend	+5	+15
Kwaliteit klantenservice	Gemiddeld	Excellent
Gecontracteerde aanbieders	Meer keuze	Geen verandering

Onder welke omstandigheden bent u het meest geneigd om te veranderen van zorgverzekeraar?

- Toekomst scenario 1
- Toekomst scenario 2

Wat zijn normaal gesproken factoren die u meeneemt in uw besluit om te veranderen van zorgverzekeraar? (Meerdere antwoorden mogelijk)

- De prijs van de basisverzekering
- De prijs van de aanvullende verzekering
- De kwaliteit van de klantenservice
- De gecontracteerde aanbieders
- Anders, namelijk...

Wat zijn normaal gesproken factoren die u weerhouden in uw besluit om te veranderen van zorgverzekeraar? (Meerdere antwoorden mogelijk)

- Niet genoeg informatie om een keuze te maken
- Onzekerheid over de dekking van andere zorgverzekeraars
- De moeite die het kost om van zorgverzekeraar te veranderen
- Collectiviteitskorting bij de huidige zorgverzekeraar
- Anders, namelijk...

Bent u in de afgelopen 3 jaar veranderd van zorgverzekeraar?

- Ja
- Nee

Hoeveel tijd besteedt u aan het eind van het jaar gemiddeld aan het zoeken naar andere zorgverzekeringen (in min)?

Appendix B Design of experiments

Table 16. Attributes

Name	Role	Attribute level		
Price difference basic health insurance	Categorical	+30	+20	+10
Price difference complementary insurance	Categorical	+15	+10	+5
Quality of customer service	Categorical	Bad	Average	Excellent
Contracted providers	Categorical	Less choice	No change	More choice

Table 17. Prior mean specification

Effect	Prior mean
Price difference basic health insurance 1	-0.5
Price difference basic health insurance 2	0
Price difference complementary insurance 1	-0.5
Price difference complementary insurance 2	0
Quality of customer service 1	-0.5
Quality of customer service 2	0
Contracted providers 1	-0.5
Contracted providers 2	0

Table 19. Choice design

Choice Set	Choice ID	Price difference basic health insurance	Price difference complementary insurance	Quality of customer service	Contracted providers
1	1	+10	+5	Excellent	No change
1	2	+20	+10	Bad	No change
2	1	+30	+15	Average	No change
2	2	+20	+15	Bad	Less choice
3	1	+10	+10	Bad	No change
3	2	+10	+15	Average	Less choice
4	1	+10	+10	Average	More choice
4	2	+20	+5	Excellent	No change
5	1	+10	+10	Bad	Less choice
5	2	+20	+15	Average	No change
6	1	+10	+15	Excellent	More choice
6	2	+10	+5	Average	Less choice
7	1	+30	+10	Average	Less choice
7	2	+20	+5	Bad	More choice
8	1	+30	+15	Bad	More choice
8	2	+20	+10	Average	More choice
9	1	+10	+15	Bad	No change
9	2	+30	+10	Excellent	Less choice
10	1	+30	+5	Average	More choice
10	2	+10	+15	Excellent	No change

Appendix C Variable description

Table 16. Variable description

Variable	Description
ID	ID of the respondent.
QES	Choice set number.
ALT	Choice number, either 1 or 2.
Choice	Whether the respondent choose this option. Also, it's the dependent variable, 1 is the respondent chose this option, 0 is the respondent didn't choose this option.
Pricebasic	Numeric variable for the attribute price difference basic insurance.
Pricecomp	Numeric variable for the attribute price difference complementary insurance
Quality	Categorical variable for the attribute quality of customer service with corresponding levels "Bad", "Average", and "Excellent".
Contract	Categorical variable for the attribute contracted providers with corresponding levels "Less choice", "No change", and "More choice".
Age	Age of the respondent.
Gender	Gender of the respondent.
Education	Dummy variable corresponding to the highest level of education, or currently followed level of education in case of students. The levels go from elementary school to Post-Master/PhD/doctorate. If the education level is Higher professional education or higher, the dummy variable is 1 and otherwise 0.
Health	This dummy variable corresponds to the health status of the respondent. The variable where value 1 corresponds to a poor health and thus a health score of 3 and higher and the value 0 corresponds to a good health with a health score of 1 or 2.
Certainty	This is a dummy variable corresponding to the certainty of the respondent. If the score is 3 or higher, where 1 being very certain and 5 being very uncertain, the dummy value is 0 corresponding to an uncertain respondent. Otherwise, the dummy value is 1 corresponding to a certain respondent.
Satisfaction	This is a dummy variable corresponding to the satisfaction of the respondent with their current health insurance. If the score is 3 or higher, where 1 being very satisfied and 5 being very unsatisfied, the dummy value is 0 corresponding to an unsatisfied respondent. Otherwise, the dummy value is 1 corresponding to a satisfied respondent.
Time	This is the time in minutes the respondent spends (on average) searching for information regarding other health insurance.
Switch_3y	This is a dummy variable about the switching behavior of the respondent in the previous three years. It is 0 if the respondent didn't switch health insurance in the last three years, and 1 is the respondent did switch.

Risk	This variable is the combined value of the five risk taking questions in the survey. The answered questions are each scored on a scale from 1-7 where 1 is extremely unlikely and 7 is extremely likely. Hence, the higher the value, the more risk-taking the respondent is.
Reasons	This variable contains the selected reasons to switch health insurance asked in question 20. When the option other is selected, it also states the respondents' filled-in reason.
Barriers	This variable contains the selected barriers to switch health insurance asked in question 21. When the option other is selected, it also states the respondents' filled-in barriers.
