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Bachelor's Thesis:

Dealing with Adverse Selection In Health Care

Insurance

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Abstract

This paper examines the problem of adverse selection in the health care insurance market. Unlike most of the recent papers, this paper considers behavioral economic factors that influence the problem of adverse selection in both a negative and positive way. I research the many testing of the existence of adverse selection in the health care insurance market and examine the negative consequences which adverse selection might have in this market. We distinguish between two types of individuals; low-risk and high-risk individuals. Low-risk individuals are those who are relatively healthy and/or have a low probability of incurring any health problems in the future and high-risk individuals are those who are relatively unhealthy and/or have a high probability of incurring any health problems in the future. The paper finds enough evidence to prove the existence of adverse selection in health care insurance markets. Before proposing several solutions for the problem, I first look at how countries are currently dealing with the problem and if their system is effective. Then I determine different deviations that individuals have from the rational expectations, primarily advantageous selection and determine whether these deviations reduce the problem of adverse selection. We conclude that both adverse selection and advantageous selection is present in the health care market. There are many tools to avoid the problem of adverse selection, such as insuring all individuals and making a risk-equalization fund. Adverse selection poses as a problem in a situation where countries do not take actions to avoid it, such as the above mentioned tools. If countries do not take these actions, high-risk individuals will make health care insurance companies less profitable and might even make them encounter losses.

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Introduction

Adverse selection is a highly discussed issue in the market of health care insurance. It poses as a threat for health care insurance providers to create an optimal health care system for a country. In order to create an optimal system, policy makers have to know the cognitive process of different types of individuals. In this paper I distinguish between low-risk and high-risk individuals. In the last decade behavioral insights are suggesting that individuals do not follow the appropriate steps to reach a decision according to the rational expectations theory. Taking this into account, systems should be adapted to these behavioral decision-making techniques in order to reach a social-optimal outcome.

Rather than the rational expectations that researchers assume individuals undertake, this paper gives added value to the behavioral economic aspect of decision making. This paper considers both rational expectations and behavioral insights to come up with a general conclusion and find solutions to the problem of adverse selection. In this paper the existence of adverse selection will be researched with its possible consequences, solutions and also deviations from the theory of adverse selection which is advantageous selection.

In the first chapter, I explain the general concept of adverse selection and possible implications that it might have for different types of markets. In the second chapter I focus more on health care insurance market and show that adverse selection does exist in this sector based on several researches that have been already conducted on this topic. High-risk individuals are those who are more likely to take up health care insurance and take up more generous coverage. The low-risk individuals do not take up health care insurance, because according to their cost-benefits calculations, the premium that they have to pay does not compensate for the benefits.

In the third chapter, I explain the health care insurance system in the Netherlands and in the United States. These countries have different systems and different ways to address the problem of adverse selection. Chapter 4 proposes some solutions for adverse selection that researches have come up with in the past few years and also solutions that are based on behavioral economic factors.

Some researchers have stated that adverse selection does not exist in health care insurance and that the opposite is true, that only individuals with low-risk insure themselves. This is also known as advantageous selection. It is coupled with the concept of risk-averse individuals who lead a healthy lifestyle and also insure themselves in order to be fully protected against health problems and health expenses. In chapter 5, I deviate from the rationale expectations and introduce a new concept which is advantageous selection. This concept is seen as the opposite of adverse selection and it is correlated with the notion of risk-aversion. There is also a broad paragraph showing the development of empirical evidence that have been done on advantageous selection since its beginning and until recently.

In chapter 6, I will give some recommendation on what kind of experiments best suites adverse selection in health care, and what researchers should take into account when testing for the existence of adverse selection and advantageous selection.

Chapter 7 will elaborate on the testing of information asymmetry in health care and give its implication. I will also show that the focus should shift from the actual problem to how to deal with adverse selection if it really is present in the health care market.

Chapter 8, which is the general conclusion, includes the most important findings on the existence of adverse selection and how it is dealt with according to rational expectation and behavioral insights. In addition, I illustrate the effects of advantageous selection on the market of health care insurance, which can either be positive and negative at the same time.

Chapter 1: Adverse Selection

§1.1 What is adverse selection

Adverse selection is one of the several economic factors that are said to influence the economy in a way that it cannot reach a social optimal equilibrium. Adverse selection can be defined as a situation in competitive markets in which the characteristics of the commodities exchanged are not fully known to at least one of the parties involved in the transaction.¹ Most economic theories study markets in which homogenous commodities are traded.² Adverse selection can also be defined as an event in which one party in a transaction has relevant information about the situation that the other party lacks, and that asymmetry information leads to a series of bad decisions or choices, such as doing more and more business with less profitable or riskier segments.

Adverse selection poses as a problem for both sides of the market, the demand and the supply side of the market. Buyers are willing to pay a price for a product with a specific value, but buyers cannot know beforehand what the value of the product is. On the other hand, sellers in for example the insurance markets want to offer premiums that are calculated considering the risk that is associated with a certain type of individual, but insurers do not know previous to the transaction if the individual poses high-risk or low-risk. Not all individuals are alike and therefore they do not have the same preferences and risk. Adverse selection arises because at times it is in the best interest of the individual to conceal information to maximize their wealth. Individuals have more to gain when they conceal specific information instead of disclosing it.

It is said that in a case with adverse selection traders are better of selecting someone who is randomly picked from the population than someone who volunteered to trade. Because it is assumed that these volunteer traders conceal relevant information.

¹Rotschild, M., J. Stiglitz. 1976. Equilibrium in competitive insurance markets: an essay on the economics of imperfect information. The quarterly journal of economics, volume 90, No.4, pp 629-649.

²Guasch, J., A. Weiss. 1981. Self-selection in the labor market. The American economic review, Vol. 71, No. 3, pp 275-284.

§1.2 Problems associated with adverse selection

According to the EMH, Efficient Market Hypothesis, a market should comply with three criteria. These being a large amount of buyers and sellers on the market, rational individuals who want to maximize their wealth/utility and a transparent market where all information is publicly available and traded freely on the market. Throughout the years many economic theories have been created assuming the notion of the Efficient Market Hypothesis. This paper will focus on the last mentioned criteria, which is “transparent market where all information is publicly available and traded freely”. The Efficient Market Hypothesis is the basis to reach the market equilibrium where supply is equal to demand. When the market does not comply with one of these criteria it will not reach a socially optimal equilibrium.

When not all information is fully public to at least one of the parties included in a transaction there is said to be information asymmetry. Information asymmetry consists of two components one of them being moral hazard and the other one being adverse selection. Adverse selection is active in markets such as health care insurance, car insurance market, stock market, labor market etc. As long as there is a situation in which individuals can make gains by concealing relevant information, adverse selection will be present in these situations and in these markets.

The problem of adverse selection in insurance market can be illustrated in figure 1.³ The average cost curve in this case is downward sloping, meaning the lower the price; the more low-risk individuals will decide to take on the contract. What distinguishes the insurance market from the other markets is that the demand curve and the average cost curve are dependent of each other. This in most markets is not the case. Individuals who think that they will have a lot of health costs in the future are willing to pay more for health care insurance. The equilibrium is reached when the AC curve intersects the demand curve. The problem with this is that social optimal equilibrium is reached when demand is equal to marginal cost. But in this case, demand never reaches the marginal cost because the MC is downward sloping and not a horizontal line like in most cases. This is a problem that adverse selection brings in insurance markets. The marked box CDEF is the inefficiency of adverse selection that prohibits the health care insurance company from providing insurance to all individuals.

³ Einav,L., A. Finkelstein. 2011. Selection in Insurance Markets: Theory and Empirics in Pictures. ." Journal of Economic Perspectives, 25(1): 115–38.

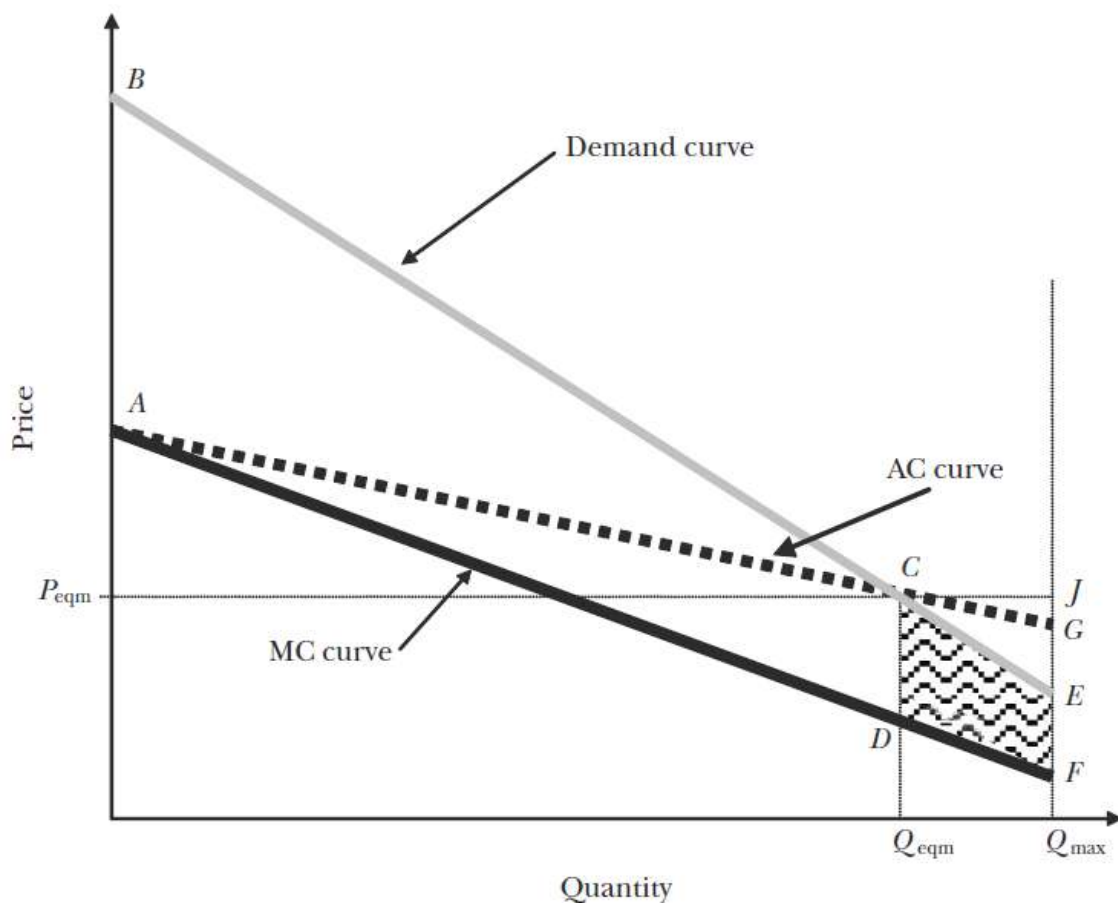


Figure 1

§1.3 Examples of adverse selection in different markets

Adverse selection arises in many competitive markets. In insurance markets such as car-insurance and health-care insurance, adverse selection arises because individuals try to attain insurance at the lowest price possible. In this paper I will focus on the health care insurance market. Health care insurance policies are optimal when the health care insurance company assigns the correct premium based on the risk of the individual to the insurance buyers and the health care insurance buyers pay an appropriate amount for the coverage that they are receiving given their risk. It is in the best interest of the individuals to conceal any health problems that can be harmful for the level of premium that they pay for health care insurance.

By concealing their actual health risks, the premium that will be assigned to them will be lower. Health care insurance companies are aware of this and try to calculate premiums associated with the actual risk involved to protect themselves from all the high-risk

individuals that conceal critical information. Trying to calculate this risk is difficult, since an individual's health is very uncertain, even for the individual himself. Adverse selection in health care insurance can be seen as a vicious circle; because not all information is available to both parties, insurance issuers try to protect themselves from high-risk individuals by increasing the price of the premiums. By doing so, individuals with low-risk who consider the cost and benefits of the insurance will realize that the costs exceed the benefits and will not purchase the insurance. This has as a consequence that only high-risk individuals will still be active in the market for health care insurance and this is exactly what health care insurance companies do not want. As long as the costs of health care exceed the benefits, individuals will be better off without any health insurance.

Adverse selection induces three types of losses in the health insurance market: efficiency losses from individuals being allocated to the wrong plans; risk-sharing losses, because premium variability is increased; and losses from insurers distorting their policies to improve their mix of insureds.⁴ In the next chapter I will elaborate in more detail on these three losses.

In the labor market, when companies are searching for new employees they are faced with two types of workers; high-skilled workers and low-skilled workers. It is in the best interest of the company to acquire the high-skilled workers. It is also in the best interest of the workers to portray themselves as motivated workers with great potential. Low-skilled workers try to present themselves in such a way that companies will qualify them as high-skilled workers and hire them for the job. Companies try to avoid this problem using several tools such as job interviews, past experiences and assessments.

The self-selection mechanism has also been introduced as a tool to make individuals reveal their true skills. Self selection device is a pricing scheme that causes the applicant to reveal truthful information about himself by his market behavior. Because of all the screening that is accompanied with the problem of adverse selection, one negative consequence is the costs that the company has to face by implementing the screening procedure and self-selection. Adverse selection is also present in auctions, since buyers know their own valuation of the item, but not that of the seller. According to (Rapoport et al 1998) buyers bid a smaller fraction of their valuations when their valuations are high and sellers mark up their costs

⁴ Culter, M., R. Zeckhauser. 1998. Adverse selection in health insurance. *Frontiers in health policy research* Vol.1

considerably. This is another example in which adverse selection effects how supply and demand interact with each other.

Adverse selection is highly present in the market for second hand cars. Buyers usually do not have all the information of a used car except that they know that it is not brand new. Buyers are also aware that sellers conceal some information in order to sell the car at the highest possible price. In the second hand car market two types of cars are identified. There are 'good used cars' and 'lemons'. The second hand car market is also referred to as the lemons market. I will explain this illustrating a simple example. Buyers have their own valuation of a "good used care" and a "lemon" and they also know the fraction of good used cars and lemons. In order to make their decision based on a rational choice they calculate the expected value of each car.

Let's say buyers value lemons for \$400 and good used cars for \$1200. The sellers of the cars value the good used cars for \$700 and the lemons for \$200. If the buyers know that the fraction of good used cars and lemons are 1:3 then their expected value would be $(0.25 \times 1200) + (0.75 \times 400) = \600 . This means that if the price of the car is below \$600, the buyers are willing to buy the car. This value is also known as the buyer's willingness to pay. The only problem is that the good used cars are valued by their owners for \$700. This means that these owners will not sell their cars, and the market will only consist of lemons. But the buyer's value of lemons is \$400, which is below the \$600 that they are willing to pay. This is where adverse selection acts as a vicious circle and ultimately no car will be traded under these circumstances.

This principle can also be applied for the health care insurance markets. Companies calculate their premiums based on the average, and individuals calculate their premiums based on their own health risks. Individuals with low-risk will calculate a premium beneath the premium that is offered by the health care insurance company and thereby will not take up this coverage. Companies will be aware of this and will calculate their premium based on a new average that excludes these low-risk individuals and will come up with a new premium average. This average will also be too high for certain individuals and this process will continue until it is not worth it for any individual to take up health care insurance.

Adverse selection ultimately impacts economic equilibrium in a negative way, where the supply and demand do not intersect with each other in the equilibrium. Buyers are aware that

sellers conceal information to sell their commodities at a higher price than what the commodity is actually worth. The same applies to buyers who try to conceal relevant information to attain a commodity at a lower price. Adverse selection makes companies adjust their prices with the associated risk involved. This will make individuals with low-risk worse off than they would be in the absence of high-risk individuals. However, the high-risk individuals are no better off than they would be in the absence of low-risk individuals.⁵

⁵ Rothschild, M., J. Stiglitz. 1976. Equilibrium in competitive insurance markets: an essay on the economics of imperfect information. *The quarterly journal of economics*, volume 90, No.4, pp 629-649.

Chapter 2: Adverse Selection In Health

Care Insurance

§2.1 The basics of health care insurance

Before I address the issue of adverse selection in health care, I will first explain the basics of health care insurance. Health care insurance is a broad term covering all types of medical costs, such as visits to the doctor, dentist's appointments, managed care, medication, operations etc. The health care insurance market works as follows; buyers pay insurance premium to providers of health care insurance, which in turn covers an amount of that the insured will have to pay if he or she is faced with health costs. Insurance premium can be defined as the money paid to an insurance company in exchange for compensation if a specified adverse event occurs.⁶ The higher the amount of the premium that the insured has to pay, the more compensation he or she gets in case of an illness. In some countries health care insurance is obligatory to take up and in other countries this is not the case.

Health care insurance can be divided into two categories being; public insurance and private insurance. Private insurance is conducted by private parties, as opposed to public insurance which is supplied by the government. Because health care insurance is such a critical topic, the government wants to make it eligible for the whole society. Recent debate for improving health care policies have shifted from eligibility expansion to increasing enrollment or take-up rate among those who are already eligible but are not enrolled.⁷ Health care insurance is always a major topic in the government agenda, because in many big countries such as the USA a lot of individuals are not insured for health care.

The health care system differs from country to country. The system usually depends on several factors such as the economy, political system, country's development, religion,

⁶ Harvey S., T.Gayer.2010. Public Finance. New York; McGraw-Hill/Irwin.

⁷ Baicker, K., W. Congdon,S. Mullainathan. 2012. Health insurance coverage and take up: lessons from behavioral economics.The Milbank Quarterly, Vol. 90, No. 1, 2012 (pp. 107–134).

culture, GDP. Health care can be divided in 3 components; primary health care, secondary health care and tertiary health care. Primary health care is the first contact point of a patient with a doctor. Secondary is when a patient is directed to the specialist and tertiary health care is when a patient is admitted to the hospital.

§2.2 Costs associated with health care insurance

One may argue that the primary reason why people do not take up health care insurance is because they think they are relatively healthy and that the benefits of health care do not exceed the costs that they are required to make. According to Aizer (2003) there are several costs associated with enrolling in a health care plan; the information costs, this is the difficulty or complexity of the task needed to become enrolled. These can be enrollment requirements such as birth certificates or salary slips. Another cost is the process cost, these are the out of pocket costs or the time required to become enrolled. In additions, some individuals see it as a stigma to be enrolled in a government program and therefore decide not to take part in it. This is also the case with food stamps and unemployment insurance.

In the standard approach it is assumed that individuals make decisions based on rational choices. But findings from behavioral economics and psychology indicate that individuals may have difficulty implementing the optimal choices that would be in their best private interest.⁸ These beliefs make some researcher argue that behavioral economic aspects also play an important role in the decision making of health care take up. Because these factors seem crucial in the decision making of individuals, in order for the market to reach a social optimal equilibrium, the government should take behavioral economic factors into account when implementing a policy.

When calculating a premium, companies take different factors into account such as age group, income and previous illnesses. Many countries introduced a fixed base premium in order to avoid the problem of adverse selection. Introducing a fixed base premium with obligatory enrolment from the society and obligatory acceptance from the companies makes a country share the risks and reduce the problem of adverse selection. Companies attain individuals with

⁸ Baicker, K., W. Congdon, S. Mullainathan. 2012. Health insurance coverage and take up: lessons from behavioral economics. *The Milbank Quarterly*, Vol. 90, No. 1, 2012 (pp. 107–134).

low-risk and high-risk enabling them to provide a premium that is based on the country's average health risk.

§2.3 Does adverse selection exist in health care insurance?

As already discussed in the previous chapter, adverse selection can play an important role in health care and it can distort health care insurance from reaching its social optimal equilibrium. It is still an ongoing debate whether adverse selection is present in the health care insurance market or not. It might as well be one of the reasons and this is why many health care insurance policies are designed taking adverse selection and its possible consequences into account.

According to the Efficient Market Hypothesis, if individuals have more information than insurance companies, they will be eager to maximize their utility and thereby giving the insurance companies a disadvantage in the trade. This problem poses as adverse selection. If an insurance company is unable to distinguish a high-risk individual from a low-risk individual and each individual knows his/her probability of a loss, then an insurance policy giving full coverage to a low-risk individual at an actuarially fair premium will not be profitable because high-risk individuals will also purchase it.⁹

Testing for adverse selection in health care insurance has been proven in past years to be very difficult. The main reason for this is that an individual's health is highly uncertain even for the individual. Health is dependent on many factors and it also deals with uncontrollable factors, such as accidents, genes, natural disasters. Therefore it is difficult to say at times if an individual is concealing relevant information or if this individual is just unaware. When it comes to adverse selection the term contract theory is an important matter. Contract theory states how agents construct contractual arrangements in the presence of asymmetric information. In this context, asymmetric information consists of adverse selection and moral hazard.

⁹ Dhalby, B. 1981. Adverse selection and pareto improvements through compulsory insurance. Public choice Vol 37: 547-558

There are some assumptions coupled with the contract theory.

1. Under adverse selection, observationally equivalent agents are likely to be faced with menus of contracts, among which they are free to choose.
2. Within the menu, contracts with more comprehensive coverage are sold at a higher (unitary) premium.
3. Within the menu, contracts with more comprehensive coverage are chosen by agents with higher accident probabilities.

These are basic assumptions related to the problem of adverse selection. Methods have been developed to prove the existence of adverse selection. The overall conclusion from previous decades is that adverse selection is present and it does play a role in the health care sector. Individuals with high-risk do take up more coverage. A popular method that researchers use to test for adverse selection in health care insurance is to find a relationship between the level of coverage that individuals take up and the health costs that they incur in the future. Cohen (2008) did a large number of studies to examine whether the coverage-risk correlation was really significant in insurance markets. The conclusion was that it was not significant in all insurance markets, but it was significant for health care. They also argue that the reason why it wasn't present in all insurance markets might be due to the fact that work in some studies is still in inconclusive stage.¹⁰

Experimental evidence in the Brazilian health care market shows that there is a positive significant relationship between contract comprehensiveness and hospitalization.¹¹ In addition, (He 2009) illustrated a negative and significant relationship between age and the likelihood of having bought insurance. Meaning that individuals that died at an earlier age were more likely to have bought health insurance. (He 2011) Later conducted a research and concluded that individuals with lower mortality risk are more likely to end a contract than are those with higher mortality risk; and that conditional on contract termination, lower-risk individuals appear to end policies of greater face value than do higher-risk individuals.

In 2006 Chiappori introduced the term “coverage risk correlation”. This term defines a positive correlation between risk and coverage, which is consistent with the findings of

¹⁰ Cohen A., P. Siegelman. 2010. Testing for adverse selection in insurance markets. *The journal of risk and insurance* Vol 77, No 1:39-84

¹¹ Resende M., R. Zeidan. 2010. Adverse selection in health Insurance market: some empirical evidence. *Eur J Health Econ* Vol. 11:413–418

previous research. Even though adverse selection can have great impact on the economy and discourage the market from reaching its optimal, some critics believe that the role of adverse selection is minimal or that there is even a reverse affect of adverse selection which is advantageous selection. This is when only the low-risk individuals insure themselves. We will broadly discuss this topic in chapter five.

§2.4 Risk-sharing in health care insurance

In the previous chapter I discussed 3 possible costs that are accompanied with adverse selection; efficiency losses from individuals' being allocated to the wrong plans; risk-sharing losses, because premium variability is increased; and losses from insurers distorting their policies to improve their mix of insurers. If insurance companies allocate individuals to the wrong health plans they can make big losses. When high-risk individuals are appointed low premiums, but end up making a lot of health costs, this will have to come directly out of the pocket of the health care insurance company. The optimal situation will be one where every individual is appointed to their specified risk plan. This is in the best interest of the insurance company and the insurer. The premium that all individuals pay are used to cover all the health costs together, this is so-called risk-sharing. If the variability of the premium increases than individuals will have to cover mostly for their own costs. The variability of the premium is based on the individuals own health care expenditures and not on the average of all individuals. It is in the best interest of any insurance company to attract only the low-risk individuals, this adds to a better mix of their risk.

(Pauly 2006) argues that in the private sector there is not much adverse selection present and if it is of influence, it is caused by government regulation which requires insurers to ignore information about risk that they actually have. In chapter 3 we will continue on the topic of government intervention in health care insurance in different countries primarily Netherlands and the United States and take notice on the system that they apply and how they try to tackle the problem of adverse selection.

Chapter 3: Government Intervention

§3.1 Health care insurance in the Netherlands.

The Netherlands is ranked as one of the countries with the best health care systems in the world. In the beginning of 2006 the government implemented a new system of health care insurance. This new system was introduced to improve the quality and efficiency of the health care market. Before this new system, 65% of the population was covered with social insurance and the other 35% was covered with private insurance. The method of insurance was based on different factors such as income, work situation, age and state of health. After the transformation only one standard coverage was available, this is a private health care insurance with social conditions. The government offers a premium reduction for all individuals with a low income. The system obliges every individual to be insured in the Netherlands. Even though it is obligatory for individuals to be insured, they do have the freedom to change from health care insurers every year.

The Dutch government is also subsidizing the system to make the coverage more affordable for everyone. The coverage consists of a basic package that is equal under all health care insurance companies and is priced around €100 per month. The basic package consists out of different needs of an individual such as visits to a general practitioner, dentist, and physiotherapist. But these are covered to a certain extent. At the point where the individual will need extra care the coverage will not be applied. In order for individuals to insure themselves against this, they will have to take on additional coverage. For individuals who want more coverage than just the basic package they can choose to upgrade this. This component is where the private insurers compete in. Each health care insurance company offers additional coverage containing different medical elements.

This system does not differentiate between individuals and makes it obligatory for all health care insurance companies to accept all individuals. The biggest problem with this is that the company cannot avoid attracting the high-risk individuals; this creates a possibility for adverse selection. Even though health care insurance companies are obligated to accept individuals they can come up with loopholes to avoid this. For example they can only promote to college students or accounting firms in the hopes of attracting only low-risk

individuals. Lower educated people have more health problems and have a shorter life expectancy than higher educated.¹²

To avoid the risk that health care insurance companies might create loopholes to avoid this problem, the government came up with a solution. Insurers are entitled to compensation for high-risk individuals. Each company receives an allowance out of the “risk-equalization” fund, the more high-risk individuals that a company has, the more allowance this company will receive. This allowance is based on amount of days in hospital, medication rates. This eliminates the incentive that a health insurance company might have to avoid attracting high-risk individuals.

The Dutch government is debating on whether they should end this allowance. If governments do so, the health care insurance companies have no support anymore if they are faced with a bad mix of individuals. This may make health care insurance companies face losses since they would still have to accept all individuals. Companies will increase the price of the basic coverage and make it less affordable for individuals.

The system provides incentives for both the individual and the health care insurance company to make the best choice for their selves. The Dutch system is still seen as a work in progress system that still has changes to undergo. Changes such as the price of the basic coverage and ending the risk equalization fund. The more relevant issue is to observe if the system is actually doing what it is intended to do. One of its intentions is to solve the problem of adverse selection. Adverse selection cannot fully be solved but the Dutch system does provide an efficient framework to reduce it. The trade-off between investing in the health care system and reducing adverse selection is an issue for the Dutch government. Due to the bad economic situation, the Dutch government is economizing on all grounds and the health care department is no exception.

Even though the system is a good framework for reducing adverse selection it is also a costly framework. The Netherlands is one of the countries with the highest health care expenditure in the world. Estimated at 14.9%. This number has been increasing over the past few years. It is too early to say whether this system will be successful in the future, but it does contain a strong framework. The performance of this system can also not be well estimated in the

¹² Groot, W., H. van den Bink. 2006 What does education do to our health? Measuring the effects of education on health and civic engagement: proceedings of the Copenhagen symposium –OECD.

economic situation at this moment. Health care systems are usually implemented for a longer time period and are focused more on long-term performance.

§3.2 Health care insurance in the United States

In the United States health care is provided mainly by many different private insurance companies. In the public sector the government provides health care through programs such as Medicare, Medicaid, TRICARE and the Children's health Insurance program. The government tries to fund all the health care expenses in this area itself. US citizens in the public on average only pay 12% of their health expenditures out of pocket.

Most of the individuals in the United States are insured through their employers. The public health care insurance is offered for individuals of low income and the elderly. The United States is the country that spends most on health care insurance, approximately 17.4% of their GDP. From a recent research that was conducted by CMC, Centers for Disease Control and Prevention, study shows that 48.2 million individuals under the age of 65 are uninsured and this account for 18.2% of the total society. What also stands out is that most of the individuals in the USA are insured through private insurance companies. 61.2% of individuals under the age of 65 are insured through private insurers. Some individuals have insurance available at no costs at all, but still decide not to be covered. Even though the government tries to offer insurance at no cost at all, we have seen in previous chapters that there are some complications regarding this issue. The system does address the problem of adverse selection in the lower-income groups. Considering that health care is provided at almost no-cost at all for lower-income groups, in a perfect system where all of these individuals would be insured, there would be risk-sharing. The problem is that risk-sharing only works if the whole population is insured and not only a specific group.

Even though this is the case, adverse selection may be reduced by having all of these individuals in the low-income group insured. Social programs get subsidized by the government for the amount of individuals that they insure. If they only have the high-risk individuals, the risks cannot be equally shared. The public system may be improved by facilitating the enrolment into these social programs and even making it obligatory for individuals from a certain income group to enroll themselves into these programs. There are still some holes that need to be filled in the public system. The Dutch health care system also

consisted once out of public and private insurers and this gradually changed over time. Big changes should not be made instantly but it is a progress that takes a lot of time, especially if you are dealing with a complex system such as health care. Baby steps have to be made in order to book progress.

Even though there is much talk that the health care system in the United States does not perform well on the basis on participation rate, quality and efficiency especially considering the amount of money that they spend on health care, it does contain a key element that reduces adverse selection. Many of the individuals that are insured in the United States do this through their employer. Many other countries are also issued health insurance through their employers. Being insured through your employer is seen as a good way in tackling adverse selection¹³. Insurance companies want to reduce their risk by dividing it among all the insured individuals. In big companies the insurance companies get a large pool of workers, where the risk is easily divided equally. Being insured through the employer makes it obligatory for low-risk individuals to also take up insurance. In a country such as the USA employer-provided health insurance is being promoted through the federal tax system. This is because the federal tax system provides a subsidy for employer-provided health insurance; premiums for health insurance paid by the employer are not taxed.

To understand this better I will illustrate this with a simple mathematical example. Suppose an employee has a wage of \$40,000 per year, her income is taxed at 35% and her employer does not provide any kind of health insurance. The employee takes out a health care insurance that is worth \$3000 per year. If the employer were to offer the employee a health care plan for the same amount, the employee would be better off. If the employer takes away \$3000 from the salary, then the employee will not lose \$3000, but will lose $(\$3000 * 0.65) = \1950 . So instead of paying initially \$3000 for health care insurance, the employee is paying \$1950 for health care insurance. It is in the best interest of the employee to become insured through their employer.

Even though the US has the most costly health care systems it performs really badly compared to other countries. In 2010 a research was conducted by the common health fund to compare countries in terms of quality, efficiency, accessibility and equity. The countries

¹³ Harvey S., T.Gayer.2010. Public Finance. New York; McGraw-Hill/Irwin.

involved in this research were Australia, the UK, Netherlands, New Zealand, Canada and Germany. The USA received on average the lowest score. Netherlands had the best overall score. Health insurance is not obligatory in the United States and the government tries to intervene with the system as less as possible. In order to reduce adverse selection, the best way is to have the whole population to be insured. Nevertheless health care insurance is a crucial topic for the Americans at the moment and there is much talk for introducing a new system.

In the past few years some researchers have looked at the possibility of the United States taking over the Dutch health care system. (Naik 2007, Schut 2008). (van de Ven et al 2008) argues that there are many elements that the United States can take over from the Dutch system such as the part where all health care providers are private and compete in order to be more efficient and provide better quality of health care insurance. We also have to realize that the whole system does take a lot of time and cannot be fully implemented in only a few years. Enthoven and Ven & Ven argue that the implementation of a Dutch model in the US could extend its best practices to the whole population.¹⁴ The system will tackle the problem of uninsured individuals due to their obliged participation in the health care system and also make health care insurance companies accept all of these individuals.

¹⁴ Okma K. 2008. Learning and mislearning across borders: what can we (not) learn from the 2006 health care reform in the Netherlands? J health polit policy law. Vol no. 33:1057-1071.

Chapter 4: Dealing With Adverse Selection

§4.1 Researchers proposed solutions for adverse selection

Over the years researchers have proposed solutions in order to reduce the problem of adverse selection. In the chapter I will discuss these methods and also recognize them from the previous chapter regarding how governments adapted these solutions to their systems. These methods will be closely examined to find their benefits and disadvantages.

In 1998 (Cutler et al) did research regarding the adverse selection in health care insurance, they showed with empirical evidence that adverse selection was present in health care insurance and they compared different health care packages that can be offered to the public. At the time of the research companies were looking at individual's characteristics such as geographic location, health status and individuals preferences and assign them to their appropriate plans. The problem with this solution is that even though companies have discovered more tools to look up individual characteristics, not all can be determined. This also goes against the norm of a society and the right that all individuals should be treated equally to assign individuals to a certain coverage based on their attributes.

Another solution might be to standardize all health care plans (Dutch system). This would mean that all health care plans would offer same coverage. If all companies offered the same coverage, this would leave no room for competition on the standard coverage level. In the Netherlands, health care insurance companies compete on the additional coverage that they offer.

The researchers came up with 4 different methods to tackle or reduce adverse selection. The best way to tackle adverse selection according to Garber is by adjusting for risk. He proposes 4 ways to do this.

Premium subsidies—This method is known as the most common and used measure for combating adverse selection. The measure simply subsidizes the premium of the most generous coverage. It is assumed that high-risk individuals are the ones who usually have generous coverage. It tries to make individuals with high-risk not conceal any relevant information and avoid the problem of adverse selection. If generous premiums are subsidized it will be more affordable for high-risk individuals to take up more generous coverage. With these subsidies,

high-risk individuals will not have to conceal information anymore, since they are paying a relatively low price. The whole point of medical care is to try to make individuals healthier. So if they are given the right care this may also contribute to having a better pool of individuals. Premium subsidies might not be the best measure because it deters competition among health care insurance providers and it does not take into account the actual risk of individuals. It only assumes that individuals with a generous health care plan are probably individuals that have a high risk, but this may not always be the case.

Reinsurance-- Reinsurance is when a health care insurance company purchases insurance from another insurance company to cover for possible losses they might incur from high-risk individuals. This will lower the chances that health care insurance companies deny individuals that want to become insured. Since the health care insurance company is already insured for possible losses it will have no incentive to reject these individuals. It also gives companies the opportunity to calculate the premium at a lower price, since they do not have to take high-risk individuals that much into consideration anymore. The problem with this is that the problem of adverse selection will be shifted to another insurance market.

Prospective and retrospective adjustments--There is also the prospective and retrospective adjustments, these adjustments adjust for risk ex ante and ex post. At the end of a period or in the beginning the risk is calculated and individuals are offered a premium. Then companies will look at their actual spending and individuals will have to pay the difference between their premium and their actual expenditures. When individuals are covered they pay less than they would have paid for the same health care if they were not covered. The additional health care that they consume that is not in their coverage will be more expensive than if they would have been covered for this. Thereby this is an incentive for individuals to take up their appropriate coverage.

4.2 Combining different ideas for one optimal solution

In order to have an effective health care system, different factors should be taken into consideration. The first one being the opportunity for all individuals to become insured. This can be split into two components which are, being accepted by a health care insurance company and also the amount that is required for the premiums. What can be admired about the Dutch system is that all individuals are obligated to be accepted. In addition, the basic package is affordable for the average individual. For individuals for whom this is not the case,

they can get subsidies from up to €60, making the costs of health care around only €50 per month. Countries that have equalization funds make it easier for health care insurance to not carry the burden of high-risk individuals.

§4.3 Solutions with behavioral insights

Previous solutions are based on the rational expectation from individuals. Behavioral economic theories have some insights on how individuals make decisions under these circumstances which are not consistent with the rational theory. In the rational decision making theory individuals' main goal is to maximize their wealth/utility. In order for policy makers to create policies that will work optimally in a society, they have to look at the cognitive process that an individual goes through in order to predict what system will work the best for them.

Time preference-- When individuals are asked to make decisions they prefer to receive money sooner than later. In the constant discounted utility theory, individuals discount outcomes at a constant rate. But this is not always the case, some individuals diminish the outcome of the future, because they see it so far away. In the presence of risk, people value the present more than they value the future. This is also known as the temporal discount rate.

In for example the car industry, there are campaigns which allow individuals to not pay insurance for a certain period. After this period they would still have to pay the full price of the insurance. It seems as if individuals are receiving a good bargain, but on average they are paying more than the normal price. In the health care system, mostly individuals are asked to pay a fixed premium each year. By creating a scheme that has an upward sloping premium price, (the premium price increases over time) policy makers can make it more attractive for individuals to take up health care insurance. They can do this without having to change the average premium price.

Choice paradox—Individuals are not alike in their health status and have different preferences. Health care insurance coverage is created based on several factors that might be attractive for certain individuals. Since there are so many individuals, companies try to offer as many different types of coverage as possible. In addition, a lot of countries have many health care insurance providers which keep the market competitive and efficient. This is done in the hopes of making it easier for individuals to find a coverage that satisfies their needs at a

right price. But due to the fact that individuals are overwhelmed with all the choices they have, they may find themselves in a situation of status quo and decide not to choose anything at all. If countries would limit the different types of coverage and the amount of health care insurance providers, it would be easier for consumers to make a choice. The Dutch system offers one standard coverage for everyone and the 4 biggest health care insurance companies cover about 90% of the whole market.

Weighting probabilities—Kahneman and Tversky came up with the concept probabilistic insurance. Probabilistic insurance is an insurance policy involving a small probability that in case of a hazardous situation the consumer will not be reimbursed.¹⁵ It is assumed that all types of insurance are probabilistic, including health care insurance. Evidence show that consumers demand more than a 20% reduction in the premium in order to be compensated for 1% risk default. (Wakker et al 1997) calculated that premium reduction should be equal to the default risk. According to the prospect theory, when it comes to probabilities, individuals overweight extreme outcomes and underweight intermediate outcomes. For example individuals want a larger reduction in their premium if the default risk changes from 0% to 2%, then if this number would change from 80% to 82%.

Due to the complexity of health care insurance coverage, individuals are not fully aware what exactly they are covered for. Therefore even if there was a 0% chance that they would not be reimbursed in case of an illness or a hazardous event, they would still question this. Complexity of coverage does decrease the take up rate, especially under low-risk individuals. Since low-risk individuals are already reluctant when it comes to purchasing insurance, the chance of a default risk does not help.

Prompted choice— In the past few years there have been many research conducted on organ donations in order to increase the amount of organ donors. Even the social networking site facebook added the option to display yourself as an organ donor on your facebook account. A research done in Britain showed that 27% of the population was an organ donor despite of the fact that 65% were willing to donate their organs and 91% were in favor of organ donation.¹⁶

¹⁵Wakker, P., R.Thaler, A.Tversky. 1997. Probabilistic Insurance. Journal of Risk and Uncertainty, Vol. 15:7–28

¹⁶Milton, A., O. Letwin. 2010. Applying behavioral insight to health. The Cabinet Office Behavioral Insights Team.

In order to increase this number, the government introduced the prompted choice, as for example when you become a member of a certain bank, you also have the choice to choose to become an organ donor. This brings awareness to the public and also facilitates the process of applying to donate your organ. This method can also be applied to health care insurance.

A good way to do this is to couple the choice of taking up health care insurance to situations where possible health care expenditures can be made. For example the government can oblige every company to offer their employees an insurance package when they apply for a job. After receiving the job they will be given the choice to also apply for health care insurance.

The opportunity for health care insurance company to reinsure themselves is a possible alternative for the equalization fund. The only problem is that adverse selection shifts slightly to these insurance companies. But these insurance companies have a better mix of types of insurance and are thereby better in calculating the risk and sharing the risk among different types of insurance. For health care insurance companies not to price the premiums too high due to these high-risk individuals they can insure themselves and have a good mixture of high and low-risk individuals.

It is a good sign that possible solutions have been discovered to reduce or tackle the problem of adverse selection. The problem with these solutions is that most researchers and policy makers do not take the behavioral aspect into account. As previously discussed individuals do deviate from the rational decision making process.

Chapter 5: Advantageous Selection

§5.1 What is advantageous selection?

I will now introduce a new term which is “advantageous selection”. Advantageous selection is the opposite of adverse selection and is also called propitious selection. It implies that risk-averse individuals try to protect their health by taking measures such as living a healthy life and also by buying insurance. The opposite, which is the risk-seeking individuals are assumed to take less care of their health and neither buy health care insurance to cover themselves. This term assumes that risk-averse individuals are the ones who take care of themselves making them less vulnerable to injuries or health issues. Risk-averse individuals are more likely to insure themselves against this risk and are also likely to pay more than the health care insurance company is offering based on their average risk calculations.

Advantageous selection implies that people do not only want to maximize their wealth, but want to protect themselves at high cost just to live a longer and healthier life. Some individuals may argue that this is irrational behavior, because the costs of health care are exceeding the benefits. But an individual’s health can only be valued by that individual and if he/she values his/her health more than the costs of it, than this is consistent with the rational theory. Countries invest a lot of money in order to equalize the risk in a society and make it possible for all individuals to be insured. Adverse selection makes a policy more complex and costly due to all the factors that need to be considered to protect health care insurance companies and also support low-risk individuals to take up health care insurance.

Advantageous selection makes policies less complex because factors for reducing the problem of adverse selection do not have to be taken into consideration. Governments can use some of the resources that they put in the health care department to allocate in other sectors without doing any harm to this department. Considering that the health care premium is based on a calculated average, risk-averse individuals might even be willing to pay more for health care insurance than they are paying now to protect themselves.

§5.2 Testing for Advantageous selection

Before advantageous selection was considered the opposite of adverse selection it was first researched as propitious selection. There were some findings more than two decades ago on propitious selection in health care insurance. (Hemenway 1990) found three scenarios where propitious selection was present, and one of these was related with motorcyclists, helmets and health care. Motorcycling compared to other form of transportation are one of the most dangerous and is known to have more accidents and more fatal accidents. It is also a fact that when motorcyclists wear helmets, it reduces drastically the probability of experiencing a fatal accident. According to adverse selection, these motorcyclists should have a greater probability of being insured, since they are considered high-risk individuals. There are also two types of motorcyclists the ones that wear helmets and the ones that do not. The motorcyclists with no helmets are considered more risk-seeking.

Research conducted in a specific year in different hospitals showed that the majority of motorcyclists who had an accident were not insured, this was also the case in states where there was a low unemployment rate and health care insurance was provided through colleges and if under age through their parents. Research also showed that in a specific year 27% of motorcycle accidents with a helmet had no insurance and 47% of motorcycle accident without a helmet had no insurance. These findings are inconsistent with the theory of adverse selection and was named propitious selection.

Research on advantageous selection is still not fully developed. But several researchers have been successful in indentifying advantageous selection. Empirical tests that have been done on adverse selection and failed to prove the existence of it such as in the car insurance industry (Chiappori et al 2000) and in long term health care insurance (McGarry et al 2006) have made other researchers wonder if the opposite of adverse selection is true; advantageous selection. (McGarry et al 2006) focused on the market for long term health care insurance, but made his research applicable for more types of insurance. In their research they concluded that individuals do have private information about their risk type. Despite this private information they did not find a positive relationship between risk type and coverage. They argue that risk is not the measure for coverage but the individual's preferences. They found that wealthier individuals and individuals who are more risk-averse are more likely to be insured.

It is assumed that individuals who are risk averse are the one who take better care of their health and are therefore more healthy, but a study conducted by (Fang et al 2008) concluded on the bases of research that they have conducted, that risk-averse individuals are not necessarily the healthy individuals and that advantageous selection is not related to the type of risk of an individual. In their research they found three new types of evidence that contributed to the non-existence of adverse selection and to the existence of advantageous selection.

Amount of coverage-- They showed that there exists a negative relationship between coverage and ex post expenditures. This led them to conclude that no adverse selection was present and therefore also concluding that they were dealing with advantageous selection. Individuals with insurance coverage incurred in total \$4000 less medical expenditures than individuals without insurance coverage.

Several sources— Instead of using behavioral proxies such as risk to test for advantageous selection, they chose a direct measure of risk aversion that was provided to them from the data of their respondents. Several sources were used to test for advantageous selection such as income, education, planning horizon.

Thinking process-- risk is not the main source to determine advantageous selection; in their research they showed that the mental process of each individual strongly influenced advantageous selection. For example they found out that the evidence for advantageous selection was more evident in females than in males.

(Madhavi 2005) proved that low-risk individuals preferred to continue purchasing health care insurance even though they were paying more than the value of the coverage. In markets for short-term health care insurance and annuities the empirical evidence is consistent with the prediction of adverse selection and moral hazard models. In contrast, a negative relationship between insurance coverage and claim frequency exists in markets for long term-life insurance, long-term care, and Medigap.¹⁷

(Bolhaar 2010) researched advantageous selection in dynamic frameworks and unlike the previous researchers he concluded that adverse selection did arise in a market for health care insurance. He did find one contribution to advantageous selection which is a positive relationship between precautionary effort and insurance purchase.

¹⁷ Huang, R., A Muermann and L. Tzeng. "Hidden Regret and Advantageous Selection in Insurance Markets." "PARC Working Paper Series, WPS 07-09.

The general conclusion with regards to the empirical evidence on advantageous selection shows that in the last years there has been a rising interest on the concept. This may be due to the economic crisis where governments are focusing more on each of their departments and trying to find ways to cut costs. Research showed that the probability of taking up insurance is not directly correlated with an individual's risk type, but there are many other different factors, such as risk-aversion, income and mental process and individuals preferences for health care insurance coverage.

§5.3 Loss aversion in the health care market.

Loss aversion is a behavioral economic concept from Kahneman and Tversky's (1979) prospect theory that states that individuals dislike losses more than they like gains. Most individuals would not bet money on a game if the gains are equal to the losses. Like loss aversion, risk-averse individuals want to be compensated more for the losses that they might incur than for the gains. Loss-aversion can be a plausible explanation for why individuals insure themselves. They prefer paying for insurance even though they might not incur any health costs, then not paying for insurance and then having to pay much more on their health care expenditures if they do get ill. This is consistent with the theory that they value losses more than gains. In health care, loss aversion can be interpreted three ways;

New policy-- In the past years many countries have been debating on their health care system and reforms. In order to reduce the problem of adverse selection and bring change in the policy, actions have to be taken to introduce a new reform. Loss aversion does play an important role on changes in a society since it implies that individuals are not willing to give up what they currently have to risk having gains in the future. Health care systems do not show results immediately when implemented. This takes time and this adds to the level of risk of a new policy. Since the future of a new health care system is uncertain, individuals do not want to take a risk on this. By wanting to stay with the current policy, loss aversion makes it hard for better developed policies to be introduced.

Health care take up--The second form of interpretation has to do with the current system. (Slovic et al 1977) argued that individuals do consider the loss-aversion factor when taking up health care insurance. Individuals who are covered pay less for the same health care if they were not covered. This is considered to be a gain. Individuals pay a premium in order to be

covered in the future in case of losses. The loss of the premium paid now has to result in a gain in the coverage that they will be receiving. Since the loss is valued more than gain, the premium has to be less than the expected gain in order for individuals to take up health care insurance. Individuals might avoid taking up health care insurance. When health care insurance companies calculate the premium, they try to equalize the premium to the gain that the individuals is expected to receive. They do not take into consideration that individuals want to receive more, than what they are paying for in advanced.

Risk-Aversion-- Another way to interpret loss aversion in health care is that individuals insure themselves against losses even though it is not likely that they will benefit from this insurance in the future. They prefer to pay now for a premium then risk having losses in the future. This concept of loss-aversion explains advantageous selection. Individuals who take care of themselves and are concerned with their health are the ones who are most probable to take up health care insurance. This makes the mix of insured favorable for insurance companies. Health care insurance only cover the segment of the market which incur the least expenditures.

Chapter 6: Recommendation for future research.

§6.1 researching on individual's mental process

In previous chapters, when testing for adverse selection, the explanation can be influenced by many other factors. Measures that have been used are not perfect, because they look more at the ex-post situation. Meaning they look at for example the expenditure that has been already made and the amount of coverage that the individual has. In my opinion, when dealing with individuals who conceal information, the mental process is the determinant factor. By finding what the triggers are that influence the mental process, solutions for adverse selection can be constructed more optimally. Research has to be done, in order to observe if individuals do conceal relevant information to be better off in the context of health care. Since individual's health is also uncertain, the research has to also include how individuals act under uncertainty. I therefore propose a more behavioral approach to test for the existence of adverse or advantageous selection in health care.

In my opinion, the best way to find out how individuals act in a certain situation and what decision they make under uncertainty is to observe them by creating a behavioral survey. There are different kinds of behavioral experiments. There are active experiments and observational experiments. In the case of health care, observational experiments are a good start to form ideas on how individuals map out their mental process. The first step to conduct a behavioral experiment is to do much research of the empirical evidence of the topic. This paper contains a lot of information of the empirical evidence that will be useful in creating hypotheses for this experiment.

Hypotheses for such an experiment can be;

1. H0: There is a positive relationship between risk-averse individuals and insurance coverage.
H1: There is no relationship between risk-averse individuals and insurance coverage.

2. H0: There is a positive relationship between being insured and health care expenditures.

H1: There is no relationship between being insured and health care expenditures.

To test for adverse selection, moral hazard and an individual's risk preference should also be considered. Moral hazard is one of the determinant factors why measures for adverse selection are not perfect. Therefore if moral hazard is tested and ruled out for an individual it gives more insight in the existence of adverse selection. The survey can consist out of questions covering all topic, or different surveys relating to each of the three topics given to the same sample of individuals and compare them on an individual level.

Moral Hazard--To test for moral hazard, an experiment can be conducted by splitting the individuals into two groups. One group will be aware that they are covered and the other group will not be aware if they are covered or not. This is given with a 50% chance. This will determine whether individuals take actions based on the fact that they are insured or not. Moral hazard has to be also checked for events that occur once in a lifetime and events that occur frequently. Individuals are more likely to participate in dangerous events if they are only done once, then if it is frequently done. By participating in a dangerous event it might make the person more aware after, of how dangerous the event really is and how easily he/she could have been hurt. Individuals get a good feeling by just saying that they have for example sky-dived, even if it was only once. Hypothesis for moral hazards can be:

1. H0: There is a positive relationship between coverage and the increase of an individual's health expenditures.

H1: There is no relationship between coverage and the increase of an individual's expenditures.

The survey may include questions for both groups such as:

1. The chances of getting injured in a sky-diving accident is 35%, with insurance coverage you will be 100% insured in case of any injury and will have no costs. Without insurance coverage the costs of your injury will be at least \$5000. When you're on vacation this summer and get the chance to go sky-diving. Will you go sky-diving or not?

2. In some countries, governments supply each year free vaccines to prevent individuals from getting a virus. If an individual is covered there are no costs at all to go to the doctor and receive medication. If an individual is not covered and he attains this virus, he will have to go to the doctor and buy the recommended medication for this virus. All of this will cost this individual \$200. Will you go and take the vaccine shot or not?

Risk preference—to avoid the problems that actions are influenced by the risk preference of an individual, this element should also be tested in the survey. As can be seen in the previous questions from moral hazard they are sensitive to risk-averse or risk-seeking individuals. As for example in question one, an individual might not want to go sky-diving not because she is afraid that she isn't covered, but because sky-diving is an extreme sport that a lot of individuals do not want to take part in and this may be due to their risk aversion of getting injured, not due to the costs of it. Questions in the survey should determine if these individuals are risk-averse, risk-neutral or risk-seeking. Examples: Hypothesis for risk-preference can be:

H0: There is a positive relationship between risk-seeking individuals and health care expenditures.

H1: There is no relationship between risk-seeking individuals and health care expenditures.

The survey may include questions such as:

1. It is known that during traffic hours the accident rate on I-95 doubles. Unfortunately your work ends at this hour. The other option is to take the Turnpike, in which you will arrive at home 1 hour later. Would you take I-95 or play it safe and take the Turnpike?
2. Imagine a situation where you can purchase insurance for \$100. There is a 50% chance of becoming sick and using the coverage and a 50% chance of not getting sick. If you are not covered you would have to pay \$200 for the medical costs. Will you insure yourself or not?
3. Individuals who earn a certain amount of income are obliged to pay tax. The taxing of income mostly occurs through an individual's employers. There are several individuals who have a home company and are not checked by anyone to pay tax. There is a 5 % chance that if the government will find out and you will be

penalized. Would you offer to make tax payments or avoid tax and risk the small percentage of getting caught?

Concealing relevant information— After adjusting for moral hazard and risk preference, the research should focus on the adverse selection element. To test whether individuals do conceal information in the health care system, the survey should present related scenarios to test them for this. The scenarios should highlight whether individuals choose to conceal relevant information in their own benefits without thinking about the consequences it has on others. If individuals make health care decisions without thinking about the consequence for the society it may be due to two reasons. One of them being that they only care for themselves and the second one is that they are not aware that decisions they make have negative consequences for other individuals. To avoid this mix up, both of these scenarios should be tested. Hypothesis for adverse selection might be:

H0: There is a positive relationship between individuals who are more social and individuals who reveal relevant information.

H1: There is no relationship between individuals who are more social and individuals who reveal relevant information.

The survey can include questions such as:

1. Individuals who earn a certain amount of income are obliged to pay tax. The taxing of income mostly occurs through an individual's employers. There are several individuals who have a home company and are not checked by anyone to pay tax. There no chance that the government will find out. Would you offer to make tax payments or avoid tax and risk the small percentage of getting caught?
2. A prisoner's dilemma game is given by the following illustration. Both player one and player two have the choice to choose between C and D and the payoffs are given as follow. If you are player one, which option will you choose if you have no information about who player two is, and what his option will be?
3. A prisoner's dilemma game is given by the following illustration. Both player one and player two have the choice to choose between C and D and the payoffs are given as

follow. If you are player one, which option will you choose if you have no information about who player two is, but that his choice is C?

4. A prisoner's dilemma game is given by the following illustration. Both player one and player two have the choice to choose between C and D and the payoffs are given as follow. If you are player one, which option will you choose if you know that player 2 is a close friend and his option is C?

		II	
		C	D
I	C	3, 3	1, 4
	D	4, 1	2, 2

§6.2 sample for behavioral experiment.

In chapter 3, I compared the Dutch health care system with the health care system in the United States. In my opinion the health care system in Netherlands is performing relatively up to standards, so I would focus more on the health care market in the United States. For individuals to relate to the survey, data should be combined in a country where health care insurance is not obligatory. Individuals who are obliged to take up health care insurance are not a good measure for this experiment since most of them have been insured all their lives. They have never been in a state where they were not covered. This would make the survey less applicable for real practice. Therefore I think a country such as the United States would be a good area to do research on for adverse selection.

After selecting for a specific country, the sample of the population and the age group should be determined. Health care is an issue that is dealt with by the whole society, therefore I think a random sample should be conducted when choosing the individuals that will take part in the survey. The sample should not consider income or employment. Since one of the main factors of considering health care is also the price of it. By not considering income, we will not have a biased opinion from individuals with too low of an income to take up health care, or too high of an income that they don't mind taking up health care since they don't feel the costs of

it. The sample should be modified with age, and the age group of 18-65 would be an appropriate age group. In the United States most children leave their parents' houses at the age of 18. This makes them at this age responsible individuals that should be concerned about their health. Health is also related to age and at a certain age, individuals become less concerned with the risks associated with health. With these risks I mean accidents or injuries. But of course we know that the older an individual gets, the more health costs this individual will incur. The maximum of 65 is an appropriate age for elderly individuals since after this age elderly are obliged to be insured through Medicare.

§6.3 Expectations of the experiment.

By including all the elements that influence the result of adverse selection such as moral hazard and risk preference, these results will be a good measure to reach an optimal conclusion about the existence of adverse or advantageous selection.

From these results we can conclude on the basis of each individual if moral hazard is present in decision making situations. By concluding the existence of moral hazard by each individual, we can measure adverse selection better on this specific individual. Since moral hazard is also ongoing researched in the health care market. In this case individuals who are more careless when they are insured are considered to be the bad type and high risk.

We can also conclude if individuals are driven by their risk preference. And if different risk types are determinant factors in the health care sector. What has also been argued in previous chapters is, if risk-averse individuals are healthier than risk-seeking individuals. To determine this, data has to be collected from the individuals whom did the survey. As you can see, to come to a general conclusion, a research is not only based on one specific experiment, but it can also have supporting research. In this case that would be collecting data from the individuals to test their level of health. It is also interesting to observe how healthy these individuals think they are. Individuals have a tendency to be over-confident when it comes to personal attributes.

One of the problems in this test, is to what extent can we believe that the correspondents of the survey are giving us an honest question or not. This is why behavioral surveys cannot always be reliable. Individuals sometimes choose options that they would not choose in reality. This is due to the fact that there are much more factors present in reality. Such as the

availability to do something, or an individual might be risk-seeking but if they have a family to take care of, they would think twice before taking a certain action. This may not be the case on a survey.

There is still a broad window for much research to be done on this topic. As time passes, the mindset of individuals also changes. Therefore additional research will never be undervalued. Adverse selection relates to specific attributes of individuals, and these attributes do not stay the same over time or even during a specific time period. Such as in a financial crisis, individuals tend to be more risk-averse due to the severity of their situation. In times of war individuals also have different preferences and give more value to specific things that were not as valuable as before, such as spending time with family and friends.

Chapter 7: Testing for information asymmetry.

§7.1 Purpose of this chapter

This chapter aims to address the difficulty of trying to prove either adverse or advantageous selection. Opinions about both situations are widely divided. This is due to the fact that there aren't perfect measures for either adverse selection or advantageous selection. Lately with the introduction of behavioral factors, the situation is pointing more towards advantageous selection. But will researchers ever come with a mutual agreement? More research is always welcome, but in my opinion we should focus more on avoiding the problem of adverse selection then to test if it is actually there.

This is due to the fact that adverse selection and advantageous selection are really hard to estimate. And the opinions about both situations are widely divided among researchers. There have been so many decades of experiments done, and even though they continue to prove adverse selection or advantageous selection there will never be one mutual agreement. Therefore the focus should shift more on other ways to tackle the situation.

One of the main findings in the past has been the relationship between the amount of coverage that an individual takes up and the expenditures of this individual. This relationship indicates existence of adverse selection, but this relationship is also influenced by other factors. One of the main factors that influence this relationship is another information asymmetry problem which is called moral hazard. Moral hazard in health care insurance can be defined as a tendency to take more risks when it comes to an individual's health, because the individual is aware of the fact that he is insured and will be covered for damages incurred. This means that one of the reasons that individuals with more coverage have more health care expenditures is because they tend to become more risk-seeking when they have health care insurance coverage.

In addition, one can also argue that when covered health care becomes less expensive for an individual. Individuals that have minor issues regarding their health will go to see a doctor faster than an individual that is not covered. This has to do with the fact that the covered

individual already paid a premium, therefore he will not have any extra costs for visiting this doctor, unlike an individual that is not insured.

This relationship also does not correct for possible fatal injuries that an individual might incur that have expensive medical costs. Accidents cannot be implemented in the equation as an error term. Even though it is unpredictable, it is not an exception that individuals have accidents. According to statistics, 115 individuals in the United States die every day in a car accident; this is equivalent to one death every 13 minutes. This is exactly why the positive relationship between the amount of coverage and an individual's health care expenditures are not due to the fact that individuals are high-risk. The health care expenditures might also be determined by random events, such as car accidents.

§7.3 The implications of testing for information asymmetry in health care

In testing for information asymmetry, the researcher assumes that one of the parties involved in the transaction have private information that is not known for the other party. If this information is used in the sole benefit of the individual and is in the disadvantage of the insurance company it is seen as adverse selection. The opposite applies for advantageous selection. This information makes both parties better off.

An individually more often than not, does not know in advanced if they will be in an accident or incur a fatal disease. Researchers cannot estimates accidents or illnesses, therefore a large part of health care expenditures are not known by the individual before they apply for health care insurance. What they can research are the individuals that already experienced these accidents or illnesses and decided to take up health care at that moment. But in the case of these individuals, it is also known for the health care insurance company that they are high-risk individuals, so there is no private information being concealed.

In the case of individuals that do know that they may have a high probability of incurring high costs in the future such as risk-seeking individuals, it is still hard to determine this. It takes up a lot of time and effort for a health care insurance company to monitor every move of their customers. The best they can do is to check their previous medical papers and attributes such as income, job, age etc. All these attributes give the health care insurance company a better understanding of the individual, but they are not perfect measures for determining the risk of an individual.

§7.4 Solutions for the complexity of testing for information asymmetry

There are many individuals that act in their own self-interest when it comes to money and if they have the chance to be better off by concealing information they will do this. There are also many individuals that are very concerned with their health and go to great lengths in order to stay healthy. Both of these scenarios occur in the real world. Therefore arguments can be presented for both adverse and advantageous selection. The real issue is which of these situations are significant for policies. Due to the complexity of the testing of information asymmetry, we should not focus only creating better methods to test this information asymmetry but creating better methods to deal with the problem of information asymmetry.

Over the years, many policies have been created with the intention of reducing the adverse selection in health care. The goal of the testing for information asymmetry is to give policy designers more insights, to develop better policy designs. The focus should shift more on designing policies to combat adverse selection. The Dutch system is highly capable in doing just that for their health care sector. It tries to avoid the problem of adverse selection by having all of the society insured.

For a country, it should be in their best interest to have all individuals insured. By insuring all individuals the risk is shared among the society and health care insurance companies can estimate their premiums on the average risk. The only reason why adverse selection plays a role in health care is because, health care insurance is not obligatory in all countries. One of the reasons for this is that countries are not able to subsidize the low-income individuals with their insurance premium. It then becomes an issue for these individuals, because they are not financially capable to take up health care insurance. This is one of reasons why health care insurance becomes optional in some countries. It is also in some countries such as the US against the constitution to force individuals to insure themselves.

In a democratic country, individuals should be allowed to make their own decisions, especially when it has to do with their own health. But these decisions may have negative externalities for other individuals. For example in countries where the whole society is not insured, the premium tends to increase, according to the demand and supply curve. Even for individuals that want to insure themselves, it may be too costly for them to do so. The whole idea of health care insurance is to protect individuals from incurring large expenditures when they face illnesses or accidents or just routine medical checkups. The system should therefore

be constructed to achieve this goal. Health care insurance policies should not only protect the best interest of the health care insurance companies but also of the society. By this I mean that health care insurance companies should not be profit maximizing companies, but companies that serve the community and try not to have losses.

For countries in which it is too costly to subsidize the premium, health care insurance companies can make a better division in the different coverage that they offer to individuals. If individuals are high-risk they would have to insure themselves better to cover for their medical costs. Such as the basic premium for the Dutch system, it only covers basic needs for the average health of an individual. There is also an amount which a certain medical service can be used. For example the insurance only covers 5 hospitalizations per year. For individuals who think they will spend more time in the hospital, it is better to take up additional coverage than to pay the out of pocket costs of the extra hospitalizations.

At the end of the day, even if we conclude that only high-risk individuals insure themselves, what are the drastic changes that policies and insurance companies will make? I don't think it is morally acceptable to deny an individual access to health care insurance. Health care companies do try to maximize profits and prefer individuals who do not incur a lot of costs. Maybe this is the whole problem of health care. We should have health care insurance companies who act solely in the best interest of a society. Health care is very costly and the government should make it as affordable as possible for individuals. In a world where we want to construct the best policies, we should also change the mindset of individuals. Health care insurance companies want honest customers who reveal all their information, but individuals also want health care insurance companies to reveal all their information and receive a good coverage for the price that they are paying.

Chapter 8: Conclusion

Individuals are known to have private information that is not available for health care insurance companies. This private information leads many people to suggest that individuals with higher risk have a higher probability of being insured and have a more generous coverage.

Countries design their health care systems in a particular way, in order to give high-risk individuals the chance to obtain health care insurance and also subsidize health care insurance companies with their health care expenditures. Netherlands is seen as one of top countries regarding their health care system.¹⁸ Their system is constructed with the guidelines of reducing adverse selection in mind. They oblige all health care insurance companies to accept each individual and make it mandatory for individuals to be insured. Thereby sharing the risk among the society and also making it affordable for low-risk and high-risk individuals.

There have been many proposed solutions by researchers to reduce or even avoid the problem of adverse selection. Such as health care insurance companies re-insuring themselves at other insurance companies. Adjusting for risk before or after the coverage period and even subsidizing health care insurance companies, who have many high-risk individuals insured. All these solutions do not take behavioral insights into account.

Policy makers should consider the mental process of individuals when they are designing a system. This will help policies seem more attractive to the individuals and they will be more willing to apply for health care insurance. Individuals for example value their losses more than their gains. They deviate from the constant-discount utility function and value the present more than they value the future. All these insights help to construct a more efficient health care system. In my opinion, the ultimate goal of each country should be to make sure that all of their individuals are covered for health care. As stated previous chapters, by insuring the whole society, the risk will be shared and this will decrease the problem of adverse selection.

Many researchers have been successful in providing significant evidence on the existence of adverse selection in health care insurance. The main findings suggest that there is a positive

¹⁸ Davis, K., C. Schoen, K. Stremikis. 2010. Mirror, Mirror on the wall: How the performance of the US Health care performs internationally. Common health fund.

relationship between the amount of coverage that an individual has and the health care expenditures that they incur in the future. The implication with this relationship is that it may not be the answer of adverse selection, but maybe a consequence of moral hazard.

Individuals with health care insurance may act less careless since they know that they are insured. Individuals with health care insurance can also use health care at a lower costs, this also influences why the amount of coverage that individuals obtain is positively correlated with the health expenditures they incur in the future. Because there are so many factors influencing individuals' health and their mental process it is hard to conclude whether there is a problem of adverse selection. In chapter 6, I proposed an experiment to test adverse selection on the bases of behavioral surveys. Behavioral surveys are very efficient in mapping out the cognitive process of an individual. By adjusting for risk-preference and moral hazard in these surveys, the tools to estimate adverse selection become more efficient.

My preference for future research goes out to behavioral surveys. I recommend future researchers to also test the elements that also have influence on their results. Such as moral hazard and risk preference. One relationship does not only explain one problem, but might be influenced by several variables. By testing for these additional problems, a more accurate conclusion can be made. Not all factors that are of influence can be determined, but the more variables that are tested, the more accurate the result becomes.

Even though opinions are shifting more towards advantageous selection; adverse selection is still a problem in many countries. In my opinion it is not a serious problem as long as these companies use tools to address this problem. These tools are earlier mentioned, such as compulsory insurance and risk-equalization funds. If these options are not available for some countries then I'm of opinion that adverse selection will make health care companies less efficient. The risk is not shared among the whole society and without risk-equalization funds; health care companies will go out of their way to make sure they only insure low-risk individuals. In the case of adverse selection, only the high-risk individuals will insure themselves and this is not optimal for the health care insurance companies. Without the risk-equalization fund they will have no compensation for these individuals and they might incur losses.

Finally we conclude that advantageous selection is positive for the health care insurance market. Research is steadily proving more situations with advantageous selection, but the strong empirical evidence of adverse selection still receives the upper hand. Even though health care insurance companies prefer to insure low-risk individuals, it is in the best interest of a society for everyone to be insured, especially high-risk individuals. Individuals who are not insured and encounter health care cost will have to pay a lot of money. These individuals may not be financially able to pay for these expenditures, and they will either go in debt or worsen their condition by not having appropriate health care. The society may also have to support these individuals financially, since no hospital will refuse emergency care. It is in the best interest of the government to avoid both of these issues and insure the whole society.

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