

Stockholm School of Economics

Department of Economics

Master's Thesis

Switching Costs and Automobile Insurance Policies in Stockholm County

Abstract

The present thesis aims to estimate and give an understanding of any switching costs, (SCs) in the Stockholm County third party liability insurance policy (TPLIP) market. The SCs are estimated through a model developed by Shy (2002) and the data set contains premiums and market shares from the years 2001–05. The four largest insurance companies in Stockholm County are included in the investigation. These companies are Folksam, If, Länsförsäkringar Stockholm and Trygg-Hansa. In order to provide an additional understanding of any SCs interviews were held with staff, responsible for product and pricing, at each company. SCs as high as 80 percent of the annual premium were found, however, the model might overestimate the SCs. Evidence of different types of SCs was found through the analysis of the interviews. The size and variability of each type of SCs could not be determined. Dependent on how the SCs are measured, they are either higher or lower for customers holding TPLIPs for expensive automobiles compared to customers holding TPLIPs for normal automobiles. The prevalence of SCs in the market is to some extent in line with previous research. The size and variability is, however, not confirmed by previous research.

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Abbreviations and Acronyms

EES	Europeiska Ekonomiska Samarbetsområdet. In English: EEA, European Economic Area.
Folk	Folksam
LF	Länsförsäkringar Stockholm
SC	Switching Cost
SEK	Swedish Krona
SRA	Swedish Road Administration
TH	Trygg-Hansa
TPLIP	Third Party Liability Insurance Policy

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1 Introduction

It is often necessary to repurchase services which are used repeatedly or required during long periods of time. Often there are several, competing, suppliers of the services and customers can either stick to the incumbent supplier or switch to a competitor. If the customer sticks to a supplier there has to be something which causes this behavior. A customer might stick to the incumbent supplier because he is satisfied with how he is received by the company. A second customer might be less satisfied with how he is received, but he sticks to the incumbent supplier because a switch would require too much effort. A third customer might be fairly satisfied with the quality of the service purchased, however, the quality of corresponding services, offered by competing firms, might be too difficult to understand. Therefore he sticks to the incumbent supplier. These three customers stick to their incumbent supplier for seemingly different reasons. However, they have something in common. An economist would say that, for these three customers, the benefits of switching are too low, or the costs too high. The costs are called consumer switching costs, henceforth referred to as SCs. The present thesis investigates SCs in the Stockholm County¹ automobile insurance policy market.

In order to make a fair estimation and comparison of the SCs between companies the products/services chosen have to be homogenous across firms ex ante to purchase and seen as perfect substitutes from the customers' point of view. Services well suited for such a study are insurance policies for automobiles. In Sweden, there are three types of insurance policies for automobiles: third party liability insurance policies², third party insurance policies and comprehensive motor vehicle insurance policies (Konsumenternas Försäkringsbyrå 2005). The insurance policies chosen in the present thesis are the TPLIPs. This is an interesting service to investigate since it is compulsory for automobile owners (Trafikskadelagen (1975:1410)) [cit. TSL] and, to the knowledge of the author, there is no academic study on TPLIPs in Sweden. The data set was collected from Länsförsäkringar Stockholm and contains observations from the years 2001–05. The companies included in the data set are Folksam, If, Länsförsäkringar Stockholm and Trygg-Hansa.

1.1 Purpose

The purpose of the present thesis is to estimate, and give an understanding of, any SCs in two chosen areas in the Stockholm County TPLIP market at four different dates.

1.2 Definitions

In the present thesis the word *Bonus* denotes a decrease in the premium of a TPLIP. The bonus is specified for each customer and depends on the number of years during which he has had a driving license. The word *Discount* denotes a decrease in the premium due to other factors such as age and

¹ In this thesis Stockholm County is synonymous to Stockholms Län.

² Third party liability insurance policies, henceforth referred to as TPLIPs, are described in section 3.2.

number of additional services bought from the same company. Older drivers receive higher discount than younger drivers since they are considered less risky. A *Premium* is synonymous to the price of a TPLIP. The word *Quality* denotes how well the compensation/claim for an accident meets the customer's expectations. The words *firm* and *company* are used interchangeably.

1.3 Delimitations

The present thesis is limited to TPLIPs for regular automobiles with a weight under 3500kg that are not considered light trucks. The automobile models chosen are presented in *Appendix A*. The present thesis investigates data on TPLIPs from four specific dates during the years 2001–05. There was no observation available for 2004. Furthermore, the present thesis is limited to two zip-code areas in Stockholm County. The customers³ in this study, for which the premiums are calculated, have a maximum bonus and discount. The discount is due to the customers' age and not the number of products purchased from the company.

This thesis makes no claim on being valid either for Sweden or for Stockholm County as a whole. It is only valid for these two particular regions, specific automobile models and customers with the exact features and backgrounds of the ones in this study. For simplicity, it is assumed that the customers themselves carry out any switch between insurance companies. Brokerage firms, for example, are not engaged.

According to the interviews held, each of the four largest companies in the Stockholm County TPLIP market finds the three other firms, and no other firms, to be their major competitors. Therefore the present thesis is limited to the four largest companies; Folksam, If, Länsförsäkringar Stockholm and Trygg-Hansa. Furthermore, the TPLIP was chosen for the study because it is considered homogeneous across firms (TSL). In order for the service to be homogenous, the areas, for which it is developed, have to be of a comparable risk category (Green 2005). Furthermore, data on premiums and market shares was available for these two areas and the specified period of time.⁴ The time period, areas, automobile models and the type of customers were chosen by Länsförsäkringar Stockholm when the data set was created.

³ The customers in the present thesis are 40-year-old men.

⁴ For further justification regarding why the special data set was chosen see section 3.3.

1.4 Contribution

This master thesis contributes to the literature on SCs and insurance policy markets. There is to the knowledge of the author no paper on SCs in the Stockholm County TPLIP market and no paper that has applied Shy's (2002) model to this environment. Therefore it would be interesting to carry out this study based on real decision variables. With the conclusions drawn, the present thesis hopefully contributes to the understanding of consumer SCs in this type of market and for this type of service.

1.5 Method

The present thesis builds on a model developed by Shy (2002). This model is used in order to calculate any SCs in the Stockholm County TPLIP market. The calculations of SCs are based on a data set, which contains premiums and market shares. Furthermore, in order to see whether differences among SCs are significantly different from zero a regular t -test is carried out. Interviews were held with staff responsible for product and pricing at each company as well as staff at each firm's call-center. The investigation of the hypotheses is based on the calculations of SCs as well as the empirics from the interviews. The empirics from the interviews and the results from the calculations of the SCs are analyzed and discussed with the theoretical framework as the starting point. Furthermore, the results are compared to the conclusions drawn in previous research.

1.6 Structure

The structure of the present thesis is as follows. *Section 2* presents the theoretical framework, previous research and the model used in order to calculate the SCs. *Section 3* presents the insurance companies included in the study, the TPLIP, the data set and the empirics. In *section 4* the hypotheses are presented. *Section 5* presents the tests of the hypotheses as well as the analyses of the results. In *section 6* the summary and conclusion are presented. *Section 7* presents suggestions for further research and *section 8* presents the references. Finally *appendix A* and *B* present the automobile models included in the data set and, furthermore, the various services offered by the different companies.

2 Switching Costs

This section presents the theoretical framework and the different types of SCs that are defined in the literature. The present thesis focuses on SCs that occur for private customers in the situation when they switch from one firm to another.⁵ Thereafter, theory about experience goods and search goods is briefly presented. The last two parts of this section present the previous research chosen, as well as the model, later used for calculating SCs.

2.1 Switching Cost Theory

SC is a phenomenon described by many authors. There seems to be consensus about what switching costs are, when they occur and how they influence a market place in general. However, different authors subdivide SCs differently and in different amount of sub-concepts. The difference in subdivision is most likely due to that different SCs occur depending on which product/service is bought, switched from and/or switched to by the customer. The present thesis provides the definition as well as the subdivision of SCs found most useful when it comes to analyzing the market for TPLIPs. According to Farrell and Klemperer (2004), the simplest consequence of SCs is that firms, in a two period framework, charge low premiums in the first period (below production cost) and high premiums in the second period (above production cost). In the first period premiums are low in order to attract customers. These customers can be locked in and make, to the firm, valuable repurchases. The premiums charged in the second period are slightly below the customers' reservation price⁶.

In this thesis SCs are defined according to Klemperer (1995) and Farrell and Klemperer (2004). In the latter paper a customer is said to face "...a SC between sellers when an investment specific to his current seller must be duplicated for a new seller" (Farrell and Klemperer 2004, p. 2). Farrell and Klemperer divide SCs into three subgroups. *Learning costs* occur whenever a customer switches from one firm to another. However, these costs occur only during the first switch. If the customer re-switches there will be no learning costs. As opposed to learning costs *transaction costs* occur in both directions. For example, Klemperer (1995) mentions opening and closing fees for bank accounts. The cost for the search for information about a service fits under the definition transaction costs.⁷ *Contractual costs*, also called pecuniary SCs, include loyalty contracts as "frequent-flyer" programs offered by airlines (Farrell and Klemperer 2004). To these three types of SCs Klemperer (1995) adds three more. *Compatibility* includes the cost or limitation connected with the degree of compatibility among different services and their accessories purchased from one or several firms. *Uncertainty* about

⁵ A theoretical framework closely related to SCs is Customer Poaching (Fudenberg and Tirole 2000). Customer Poaching theory explains the complete opposite price pattern compared to SC theory. Customer Poaching could be prevalent in the Stockholm County TPLIP market. However it is beyond the scope of the present thesis.

⁶ With reservation price is meant the price charged by the incumbent supplier at which the customer switches to a competitor. The greater the SC, the greater the reservation price is supposed to be.

⁷ Search costs have, according to Farrell and Klemperer (2004), in many situations the same consequences as SCs.

services (substitutes) which are not previously used by the customer is considered a cost. It is especially the quality of the substitute that is taken into consideration. Klemperer (1995, p. 518) discussed yet another type of SC; “*Psychological costs of switching, or non-economic ‘brand loyalty’*”. Customers may stay with a firm even if they do not benefit economically. It is often the case that customers have different preferences before and after the purchase since they change their preferences in favor of the new service. Brehm (1956) called such an action to reduce cognitive dissonance. These six SCs make services perceived as homogenous ex-ante to purchase, perceived as heterogeneous ex-post to purchase (Klemperer 1995).

Table 1 Subdivision of SCs.

Switching costs overview:
Learning costs
Transaction costs
Contractual costs
Compatibility
Uncertainty
Brand loyalty

2.2 Experience and Search Goods

Lack of knowledge of the quality of a service could increase transaction and uncertainty costs. This section therefore briefly presents theory about experience goods and search goods.

Nelson (1970) describes that customers can obtain information about quality (unknown prior to purchase) through 1) search for price and quality and 2) purchasing the good, using it and through the use of it gain experience about its quality. The search is, according to this theoretical framework, required to take place prior to purchase. Nelson points out that information about price and information about quality are two different things; the latter is more expensive to obtain than the former. The lower the price of the service the less is the probability that the customer will search for information about its quality. According to Nelson, obtaining information about quality is often cheaper through experience than through search. Depending on how the information about specific goods or services is obtained they are either called search goods or experience goods. One way to obtain information about quality, through search, is through recommendations.

Shapiro (1983) has a similar approach to what in his paper is called experience goods. Information about new services is, according to Shapiro, often gained through experience of the service. This theory was developed under the assumption that all customers have identical initial expectations and that knowledge about the quality was gained immediately at purchase.

2.3 Previous Research

A great deal of literature investigates SCs and related issues. This section presents the most relevant previous research for the topic of the present thesis.

Previous research most closely related to the present thesis is first and foremost Shy (2002). Shy (2002) developed a model, with which SCs in the Israel cellular phone market and the Finnish bank deposit market were calculated. In the Finnish bank deposit market customers with a low value of time stayed or switched to the bank with the lowest fees and customers with a high value of time tended to stay with a bank even though the fees charged were high. Shy concluded that there were SCs in both these markets and that the size of the SCs, estimated by the model, was reasonable. Andersson and Berglund (2004) used a modified version of Shy's model in a paper about SCs in the Swedish housing mortgage market. They showed that the SCs amounted to approximately one third of the total interest⁸. Andersson and Berglund considered these SCs large and it was discussed whether or not the model overestimated the SCs. However, the results were considered in line with previous research.

Dahlby and West (1986) investigated the automobile insurance market in Alberta and looked at price dispersion in the market for TPLIPs. In Alberta TPLIPs are compulsory, the service is seen as homogenous and there are different premiums for different driver classes, ages, sex and geographical location. It was concluded that the price dispersion in this market was due to costly consumer search and not differences in the quality among firms. Young drivers did not search for information, instead they chose the same firm as their parents. Schlesinger and von der Schulenburg (1993) studied the German automobile insurance policy market. The paper investigated the role of information when consumers decided to buy from a particular company or switch to another. It was concluded that information about quality and price had a fundamental role when consumers made decisions about from which company to purchase. An additional paper that examined insurance markets is Nilssen (2000). This paper investigated an insurance market with asymmetric information and without commitments from consumers and insurers. The type of contract chosen by a customer was publicly known, but the accident record of the customer was not. From the two-period model used it was concluded that in equilibrium consumers are locked-in in the second period.

The Swedish Competition Authority has written a report, Konkurrensverket (2001), about customer mobility in the Swedish bank and insurance policy markets. Services investigated in the insurance policy market were house, home and automobile insurance policies. The insurance policy for automobiles was comprehensive motor vehicle insurance. The results showed that approximately 30 percent of the customers in the insurance policy market switch companies. What made customers switch were large differences in premiums among different companies. The average benefit from a switch had to be 26 percent of the average current premium in order for a customer to switch

⁸ The intended interest is the present value of the total interest for a loan.

company. Difficulties to survey different alternatives and companies as well as to estimate the benefits of a switch appeared to be the largest impediments for customers to switch. Regulation, law and new access codes for internet services appeared less impeding.

Due to the lack of previous research about SCs and automobile insurance policies, the following text provides research about SCs in other markets which was found to add to the understanding of the SCs in the present thesis. Knittel (1997) investigated interstate long distance rates. It was argued that the rates had not fallen after the divestiture of AT&T because of switching- and search costs. The conclusion was that switching- and search costs have provided the firms in the market with market power. A study about SCs in the gasoline market in the US was written by Borenstein (1991). It was argued that even competitive markets may suffer from price discrimination. Indications were found that customers, who are less likely to switch gas station, were targeted by price discrimination. Search costs may have an effect on pricing in markets thought of as competitive. Kim *et. al.* (2001) investigated how banks behave in the presence of SCs. The point estimate of SC was on average 4.1 percent, approximately one third of the market average interest rate on mortgages. According to Kim *et. al.*, established bank-borrower relationships provide banks with approximately one third of the average market share. Another study about banks and SCs was made by Sharpe (1997). This paper investigated the market for bank deposits and found that price markups were significantly influenced by household migration. Migration had a positive effect on the level of the deposit interest rate. Mariñoso (2001) investigated how firms used incompatibility among products in order to reduce competition and create SCs. The conclusion reached was, however, that endogenous SCs made intertemporal price competition increase. The increase in competition made firms prefer to offer compatible products.

2.4 The Model

This section presents the model developed by Shy (2002) and later applied to calculate the SCs. The model was chosen since it is straightforward and builds on assumptions which fit the TPLIP market fairly well. Furthermore, previous research has estimated trustworthy results with this model. Therefore it is found well suited for the present thesis.

The model is based on the following assumptions: the market analyzed is characterized by price competition, customers' demand is perfectly inelastic, customers' SCs occur in the second of two periods and there are no production costs. The SCs are identified by firms that set prices accordingly in order to maximize profit. Furthermore, the concept of the Nash-Bertrand equilibrium is applied. The model requires data on premiums and market shares for each company.

Price competition is, according to Svensk Försäkringsårsbok (2005), a reasonable assumption. Inelastic demand fits the TPLIP well since a customer will not purchase more TPLIPs due to a decrease in the premium. A customer who holds several TPLIPs in different companies will not

receive larger compensation compared to a customer who holds only one TPLIP (36§ Konsumentförsäkringslag (1980:38)). Furthermore, customers could be assumed to have a time horizon of one year since this is the period after which the insurance contract matures (Konsumentförsäkringslag (1980:38) and Johansson 2005).

The following text briefly describes the model. In the market there are two firms, A and B , which produce services A and B . N_A is the share of customers that have bought brand A (α customers) and N_B is the share of customers that have bought brand B (β customers). The prices charged by the firms are p_A and p_B . When a customer switches brand he has to incur the cost $S > 0$. The utility of each group of customers is denoted U_α and U_β . Each customer's utility from the next purchase is given by (1) below. All customers are assumed to have the same utility from a purchase. Therefore, the positive utility from the purchase is not taken into consideration, and hence the utility appears to be negative.

$$U_\alpha = \begin{cases} -p_A & \text{Stay with brand } A \\ -p_B - S & \text{Switch to brand } B \end{cases}$$

$$U_\beta = \begin{cases} -p_A - S & \text{Switch to brand } A \\ -p_B & \text{Stay with brand } B \end{cases} \quad (1)$$

The number of customers that buy from a specific firm during their next purchase is endogenously determined and denoted by n_A and n_B respectively. This, together with (1), gives

$$n_A = \begin{cases} 0 & \text{if } p_A > p_B + S \\ N_A & \text{if } p_B - S \leq p_A \leq p_B + S \\ N_A + N_B & \text{if } p_A < p_B - S \end{cases}$$

$$n_B = \begin{cases} 0 & \text{if } p_B > p_A + S \\ N_B & \text{if } p_A - S \leq p_B \leq p_A + S \\ N_A + N_B & \text{if } p_B < p_A - S \end{cases} \quad (2)$$

Each firm's profit as a function of the prices is then

$$\pi_A(p_A, p_B) = p_A n_A \text{ and } \pi_B(p_A, p_B) = p_B n_B \quad (3)$$

The nonnegative pair of prices $\langle p_A^N, p_B^N \rangle$ is a Nash-Bertrand equilibrium, if for a given p_B^N firm A chooses p_A^N to maximize π_A and for a given p_A^N firm B chooses p_B^N to maximize π_B . However such equilibrium does not exist. The highest prices the two firms can charge are $p_A = p_B + S$ and $p_B = p_A + S$ respectively, which are not consistent. Hence each firm's price deviates at any pair of $\langle p_A, p_B \rangle$.

Definition 1: *Undercutting.* A firm is said to undercut its rival if it sets prices according to the following example: firm i sets price $p_i < p_j - S$, where $i = A, B$ and $i \neq j$. Here the SC of a firm j customer is subsidized by firm i .

According to the definitions (2), if a firm manages to undercut its rival's price it sells to all customers and the rival sells to none of them, $n_A = N_A + N_B$ and $n_B = 0$.

Shy (2002, p. 74) points out that “The undercut-proof property is satisfied if there exists a pair of prices so that no firm can increase its profit by undercutting the rival firm, and no firm can increase its price without being profitably undercut by the competing firm.”

Definition 2: A pair of prices $\langle p_A^U, p_B^U \rangle$ is said to satisfy the *undercut proof property* (UPP) if

a) For given p_B^U and n_B^U , firm A chooses the highest price p_A^U subject to

$$\pi_B^U = p_B^U n_B^U \geq (p_A - S)(N_A + N_B).$$

b) For given p_A^U and n_A^U , firm B chooses the highest price p_B^U subject to

$$\pi_A^U = p_A^U n_A^U \geq (p_B - S)(N_A + N_B).$$

c) The distribution of consumers between the firms is determined in (2).

Along with Definition 2 firm B will not find it profitable to undercut firm A if A sets its highest price subject to the constraint. This gives that the inequalities hold as equalities.

2.4.1 The Extended Model

In the market analyzed there are more than two firms. Hence, according to Shy (2002), it is necessary to extend the model. Customers are assumed to have different SCs depending on which firm they initially bought from.

There are now $I \geq 2$ firms. The firms are indexed by i , $i = 1, \dots, I$ and set prices p_i , where $i = 1, \dots, I$. It is assumed that each firm considers undercutting one firm only.⁹ If the UPP is satisfied the firm with the largest clientele is assumed to be the most profitable firm. According to this logic the firm with the smallest clientele has the least to lose in terms of profit. The smallest firm could hence be assumed to have the strongest incentives to undercut the other firms.

From now on firms are indexed according to the size of their market share with firm 2 having smaller market share than firm 1: $N_1 > N_2 > \dots > N_I$. Firm $i \neq I$ sets its price with respect to the smallest firm I . The smallest firm sets its price with respect to the price set by the largest firm.

The brand i customer has SC S_i . It is assumed that all firms and customers know each S_i ($i = 1, \dots, I$). This gives that each firm $i \neq I$ takes p_I as given and maximizes p_i to satisfy

$$\pi_i = p_i N_i \geq (p_i - S_i)(N_i + N_I). \quad (4)$$

Firm i sets its price in order for firm I not to find it profitable to undercut. The SC for firm i customers, as a function of the prices of firm i 's and I 's services, is solved for using (4) when equality holds.

$$S_i = p_i - \frac{N_I p_I}{N_i + N_I}, \quad i \in \{1, \dots, I-1\}. \quad (5)$$

Since this function allows for different SCs it is possible to later in the present thesis calculate the SCs of different customers holding TPLIP in different firms, and for several different automobile models.

⁹ According to Shy (2002) the assumption made is adequate since price wars mainly occur between two firms only. Another idea would be that a firm tried to undercut all firms. Andersson and Berglund (2004) modified the model in order to take this into consideration. However, they pointed out that the result only differs from Shy's if the lowest price is not charged by the smallest firm. Shy's example is followed since during the dates of interest the smallest company charges the lowest prices. See section 3.3.

3 The Insurance Policy Market and Data

This section briefly presents the Stockholm County insurance policy market as well as the TPLIP. Furthermore, the data set, collected from Länsförsäkringar Stockholm, is presented. Parts of this section are based on material from interviews. The interviews were held in order to gain an understanding of the market as well as of ideas and strategies behind pricing. Some interviews were held by phone and others in person.

3.1 The Insurance Companies

According to data approximately 97 percent of the Stockholm County market for TPLIPs is captured by seven companies. These seven companies are Aktsam, Dial, Folksam, If, Länsförsäkringar Stockholm, Trygg-Hansa and Volvia. Dial and Volvia are owned by If and Aktsam is owned by Trygg-Hansa (Johansson 2005, Svensk Försäkringsårsbok 2005). Furthermore, Länsförsäkringar Stockholm and Folksam are mutually owned by their respective customers. Trygg-Hansa is owned by the Danish firm Codan and If by the Finnish firm Sampo. Folksam, If and Trygg-Hansa operate in Sweden as whole but Länsförsäkringar Stockholm is restricted to Stockholm County (Länsförsäkringar 2005a, Folksam 2005a, If 2005a, Trygg-Hansa 2005a).

Since the present thesis is limited to the four largest companies henceforth only those are taken into consideration. The size of an insurance company is in the present thesis measured according to their market share of TPLIPs, since this is the service of interest. The market share for each company does not include subsidiaries. For example, the market share for Trygg-Hansa does not include Aktsam. When size is measured by market share the four largest companies in Stockholm County at June 1, 2005 were Trygg-Hansa (19.4 percent), Folksam (17.2 percent), Länsförsäkringar Stockholm (16 percent) and If (13 percent). In addition to TPLIPs, these companies offer other services as well. Examples of such services are home-, pension- and life insurance policies. Bank services, as deposit accounts and mortgages, are also offered. However all companies do not offer the same variety of services. The services offered by each company are showed in *Appendix B*.

3.2 Third Party Liability Insurance Policy

This section describes the features of the TPLIP. Where no other references are made Swedish law, TSL, is the source of this section.

Automobile insurance policies are according to Konsumenternas Försäkringsbyrå (2005) divided into three types: TPLIP, third party insurance policy and comprehensive motor vehicle insurance policy.¹⁰

¹⁰ Third party insurance policy includes TPLIP extended with, among other things, compensation for theft. Comprehensive motor vehicle insurance policy includes the third party insurance policy, extended with compensation for physical damages caused by the driver.

The first type, the TPLIP, is compulsory according to Swedish law and has to be purchased and signed by the owner of the vehicle. For a motor vehicle registered at the SRA¹¹ it is possible to cancel an insurance policy in three different cases. These are: 1) the vehicle is no longer registered at the SRA, 2) the vehicle is temporarily deregistered and 3) if the policyholder's duty to insure the vehicle has ceased for other reasons. TPLIPs are reported and sold only by specific firms appointed by the government. Foreign EES-firms¹² are allowed to sell TPLIPs in Sweden according to the Swedish law (Lag (1998:293) om utländska försäkringsgivares verksamhet i Sverige). An insurance policy matures after one year and from that specific day the policyholder can either switch company or sign up for one additional year with the same company.

A TPLIP contract covers injuries on individuals inside and outside the insured vehicle as well as damages on property caused by use of the vehicle. However, damages to the vehicle itself are not covered unless they are caused by another vehicle. In the present thesis the TPLIP contracts offered by the four different companies are considered homogenous. They are homogenous in the sense that they, according to TSL, offer the same protection and customers view them as almost perfect substitutes (Johansson 2005). The difference among the TPLIPs is the excess fees. Excess fees are charged when the driver of the insured vehicle caused the accident, if the driver who caused the accident is younger than 24 and if certain crimes are committed in connection to the accident, like driving under the influence of alcohol. These three excess fees can be added on to each other depending on which criteria are fulfilled (Konsumenternas Försäkringsbyrå 2005, Johansson 2005).

3.3 The Data Set

The data set was chosen since it consists of actual decision variables. Länsförsäkringar Stockholm makes decisions and performs analysis of the market, and its competitors, with this data set as one of many background variables. Furthermore, since this is a study about consumer SCs, and consumer SCs affect how a specific firm sets its premiums¹³ in relation to competing firms, the real decision variables should be considered well suited for the study.

The data set contains between 20 and 23 different automobile models, depending on which observation is taken into consideration. Premiums are calculated for 10,000 km per year. The automobile models chosen are the most common from each risk category. The automobile models differ slightly among the observations and between the two areas. However, since each price category is represented through the whole sample the overall picture is not altered. Premiums and market shares are for the same zip-code areas in Stockholm County. Observations of premiums and

¹¹ Svenska Vägtrafikregistret.

¹² Insurance companies from the EES area are allowed to sell insurance policies in Sweden.

¹³ Premiums in the data set are calculated for customers holding only the TPLIP. The premiums in the data set are, according to Green (2005), easier to compare among the firms since only automobile insurance policies are taken into consideration. This is because the four firms do not follow the same criteria when discounts are given to customers. The here intended discount is due to their purchase of several insurance policies from the same company.

market shares are from approximately the corresponding dates. Insurance companies included in the data set are Folksam, If, Länsförsäkringar Stockholm and Trygg-Hansa.

How premiums, measured in the price level of 2003, have varied over time can be seen in *Figures 1–4*. The Swedish consumer price index from Statistics Sweden was used in order to obtain 2003 years price level. Premiums for the two regions are presented in separate figures. Unfortunately, information about premiums for more expensive automobiles were only available for Area 1. The observations are from the following dates: June 1, 2005, November 1, 2003, April 1, 2002, and October 1, 2001. There is unfortunately no observation available from 2004.

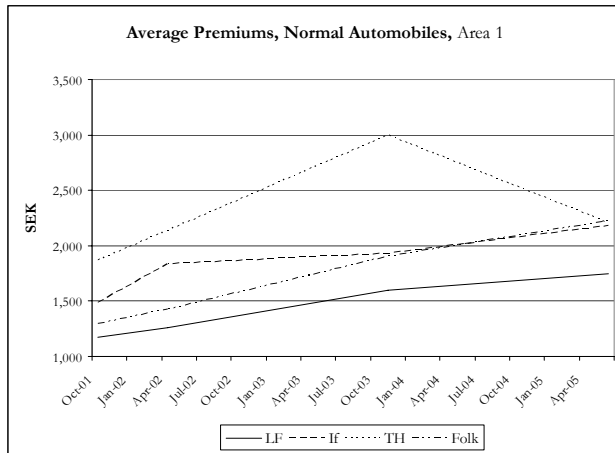


Figure 1 Average premiums for TPLIPs for normal automobiles in Area 1.

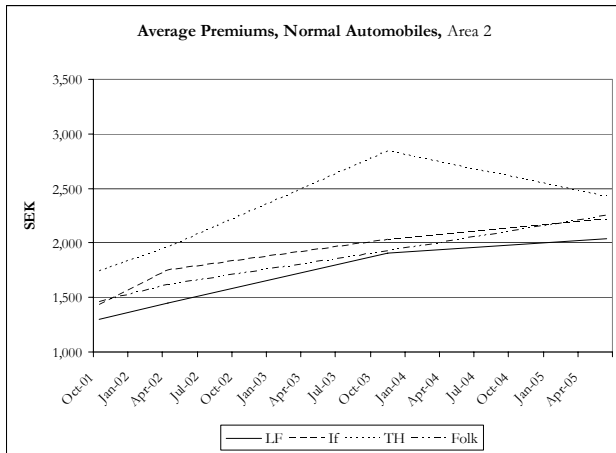


Figure 2 Average premiums for TPLIPs for normal automobiles in Area 2.

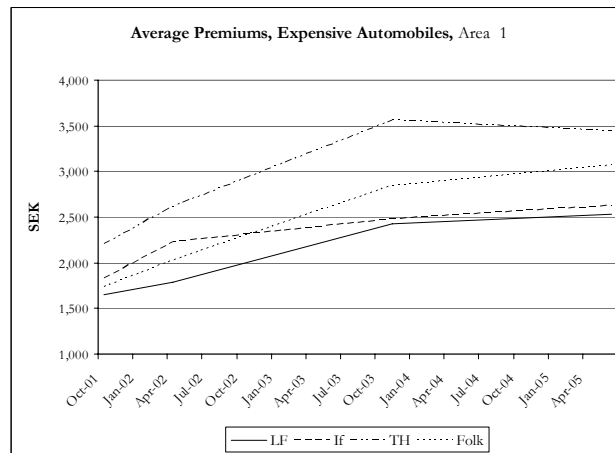


Figure 3 Average premiums for TPLIPs for expensive automobiles in Area 1.

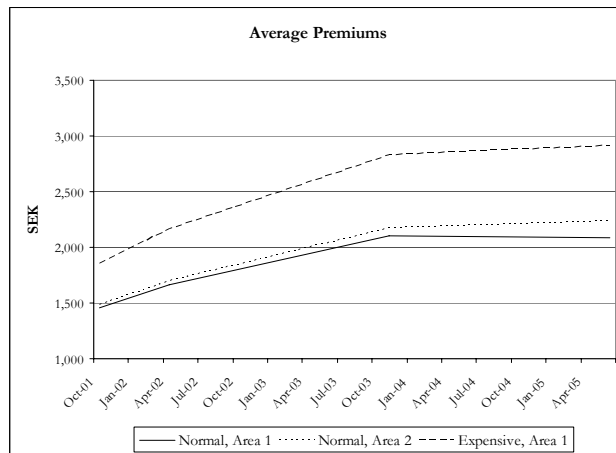


Figure 4 Average premiums for TPLIPs in both areas.

Table 2 Mean and standard deviation for premiums (SEK), (October 1, 2001 to June 1, 2005).

	Mean	St.D	
<i>LF</i>	1,445.45	273.86	<i>Area 1, Normal</i>
<i>If</i>	1,857.69	286.83	
<i>TH</i>	2,304.49	483.94	
<i>Folk</i>	1,710.38	427.88	
<i>LF</i>	2,096.63	445.54	<i>Area 1, Expensive</i>
<i>If</i>	2,287.92	350.64	
<i>TH</i>	2,958.71	653.36	
<i>Folk</i>	2,418.64	636.81	
<i>LF</i>	1,673.91	354.61	<i>Area 2, Normal</i>
<i>If</i>	1,855.96	339.33	
<i>TH</i>	2,240.51	489.59	
<i>Folk</i>	1,810.94	351.19	

Figures 5 and 6 plot the development of the market shares in the different areas. These figures plot data with smaller intervals between the observations compared to the data on the premiums. However, the following observations are most important since they correspond most accurately to the dates observed for the premiums: June 1, 2005, December 1, 2003, March 1, 2002 and December 1, 2001.

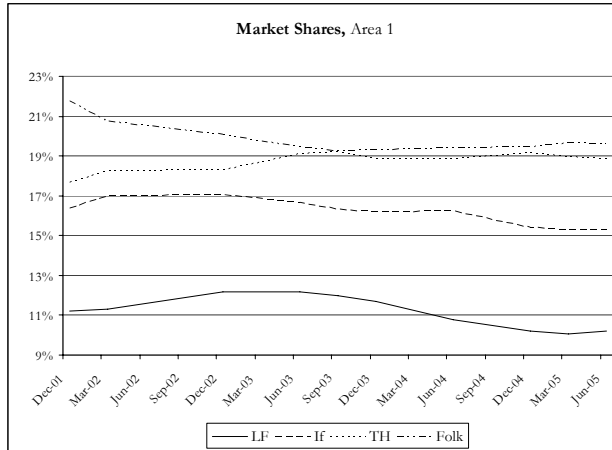


Figure 5 Market shares, in Area 1, for the four insurance companies.

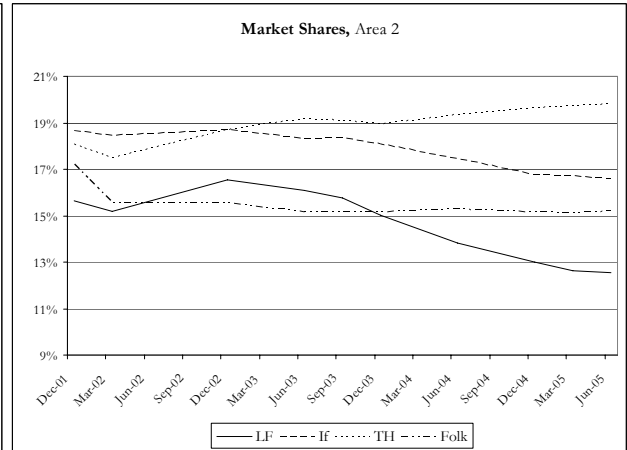


Figure 6 Market shares, in Area 2, for the four insurance companies

Table 3 Mean (percent) and standard deviation (percentage units) for market shares (December 1, 2001 to June 1, 2005).

	Mean	St.D	
<i>LF</i>	11.18	0.84	<i>Area 1</i>
<i>If</i>	16.17	0.65	
<i>TH</i>	18.72	0.49	
<i>Folk</i>	19.85	0.81	
<i>LF</i>	14.62	1.50	<i>Area 2</i>
<i>If</i>	17.81	0.86	
<i>TH</i>	19.00	0.74	
<i>Folk</i>	15.45	0.64	

3.4 The Market

According to Svensk Försäkringsårsbok (2005), both the competition in the Swedish TPLIP market and the number of newly insured automobiles has, during the last five years, been low. The number of new automobiles has, however, increased moderately during 2004. Furthermore, the insurance market is considered an oligopoly market. According to Johansson (2005) there are two major reasons why there are so few companies in the market. The first is the difficulty for companies to create the capital stock needed. The second is that Swedish firms in the TPLIP market have relatively low administration costs, which might make it complicated for foreign companies to compete profitably. On the other hand, Johansson points out that there should not be any difficulties for new companies to receive concession from the government.

Svensk Försäkringsårsbok (2005) points out that the TPLIP business is separated from the other divisions in the sense that it cannot rely on funds from the latter. During the period of interest the companies have turned four years of deficit into surplus and focus has been on consolidating current market shares. Since the TPLIP business now is in surplus customers do not have to anticipate any major increases in premiums. This relies, however, on the assumption that the number of accidents and injured people do not increase. On the other hand, the improved economic situation increases the probability of a price war. Johansson's (2005) view of the TPLIP business is that it runs in cycles with approximately ten years between the peaks. Periods with high profitability have been interrupted by price wars. His view is that neither firms, nor customers, gain from price wars in the long run. According to Johansson, the latest price war, as well as higher costs for damages, led to the increase in premiums by around 100 percent over the years 2001–04.

From the mid 90's the insurance companies in Sweden have been free to set premiums according to the criteria they find relevant (Johansson 2005). This led to systems with highly differentiated¹⁴ premiums and difficulties when comparing premiums among companies and regions (Green 2005). According to Johansson (2005), premiums in general are determined in order to cover for compensation and administration costs as well as allow a small buffer. They are calculated for the average customer who is a customer with full range needs, holding several insurance policies and with an overall discount. Folksam, however, offers no discount for customers holding several insurance policies. Folksam's strategy, compared to the other firms' strategies, is to give lower premiums when an insurance policy is held separately (Johansson 2005 and Eriksson 2005). Furthermore, Johansson (2005) points out that the total cost for holding several insurance policies should be approximately the same regardless of which company is taken into consideration.¹⁵ Except the discount, one advantage which also comes from purchasing many insurance policies from the same firm is that only one excess fee is charged in the case when several insurance policies are used.

¹⁴ Premiums are differentiated among individuals as well as among firms.

¹⁵ This should be the case only for identical individuals who live at, in all aspects, identical locations and hold identical insurance policies, for identical properties and goods.

Some firms may have an advantage in pricing insurance policies for specific automobile models. If may have such an advantage in pricing Volvos since they own the company Volvia.

According to Johansson (2005) most customers stick to the incumbent supplier because the perceived SCs exceed the benefits of a switch. To switch company means losing the discount. However, customers might as well obtain the same, or even higher, discount from other companies. The discount lost at a switch seems to be what matters and tend to make customers stick to their current company.

During the years of interest, 15 to 20 percent of the customers in the TPLIP market switch company (Johansson 2005). This is considered a high number (Johansson 2005 and Sandell 2005). Sandell (2005) had the opinion that mostly customers who lost bonuses, due to accidents¹⁶, switch company. According to Johansson (2005) most customers switch because of too high premiums. The switch could be beneficial if the new company, which does not have any record of damages for the customer, offers a lower premium. A higher bonus, offered by the competitor, is likely to cause this lower premium.¹⁷ According to Johansson (2005) and Sandell (2005) the TPLIP market typically suffers from asymmetric information. Over time, premiums can be lowered since the company receives more information about the customer the longer he stays. Information about a customer's accident record is confidential information. However, customers are often asked, before a purchase of a TPLIP, whether or not they have had an accident the latest year (Söderling 2005).

Another factor which differentiates groups of customers is, according to Johansson (2005), how sensitive they are to price changes. Young customers are in general more sensitive and switch more often than middle age customers. It is important to note that it is not possible to purchase the TPLIP from one company and the third party insurance and comprehensive motor vehicle insurance from another. All three have to be purchased from the same firm.¹⁸

According to Falconer (2005) new customers represent a higher risk compared to old, loyal customers. Johansson (2005) points out that the increased risk drives up the premiums overall for new customers. Battles for new/lost customers are other factors which contribute to higher premiums through increased administration costs. The more customers that leave a company, the higher the efforts required from the firm to maintain its market share.

¹⁶ When a certain bonus is reached the customer has an extra chance, i.e. that no bonus is lost after the first accident. Hence the premium in such a case is not increased after the first accident.

¹⁷ To switch after an accident became profitable when the old system, where companies shared records of damages, was banned.

¹⁸ According to Konsumenternas Försäkringsbyrå (2005) it is possible to extend the TPLIP in approximately the same way in all four companies. All four companies offer the same automobile insurance policies; TPLIP, third party insurance policy and comprehensive motor vehicle insurance policy. However, the content of each of them differ in terms of excess fees and conditions.

Customers do not, according to Johansson (2005), have perfect information about the quality of the insurance policy. Furthermore, few customers are assumed to actively search for information about quality. Friends and relatives are common sources for advice and information about the different companies and the perceived quality of the companies' services. For young first-time buyers recommendations from parents are probably the most common reason for choosing a specific company. The actual quality of the service purchased is not known to the customer until an accident occurs. However, quality could be assumed to be homogeneous among the four companies. One way to obtain information about quality or at least information about customer satisfaction is through Svenskt Kvalitetsindex (2005). According to this index, customers are in general satisfied with how their claims are received.¹⁹

¹⁹ Svenskt Kvalitetsindex (2005) does not provide details about TPLIPs. The index mentioned is for insurance policies in general.

4 Hypotheses

The TPLIP market is heavily regulated by law. Legislation allows cancellation of a contract only on the day of maturity, when the automobile is sold and/or deregistered. The companies in the Stockholm County insurance policy market offer a variety of different services. The more services bought from the same company, the larger the discount and hence the larger the incentives to stay with the company. Furthermore, the more services purchased from the same company the more time and effort should be required to switch company. A customer's value of time might be important in this case. Another aspect is that each year with a company adds to the bonus on the TPLIP. The longer one has been a customer of the same firm, the higher the bonus one stands to lose from switching. Furthermore, customers should tend to stay with a company that provides services which the customer is satisfied with. With this background information the present thesis investigates the following hypothesis:

Hypothesis 1: *There are SCs in the Stockholm County TPLIP market.*

Shy (2002) stated that customers with a high value of time tended to stay with a bank even though fees were high. A similar phenomenon should be prevalent in the TPLIP market in the sense that generally customers with a high income and a high value of time buy more expensive automobiles. SCs should according to this logic be higher for policyholders who hold insurance policies for more expensive automobiles. This leads to hypothesis 2:

Hypothesis 2: *SCs are on average higher for customers holding TPLIPs for expensive automobiles than for customers holding TPLIPs for normal automobiles.*

5 Model Results and Analyses

This section first presents the results from the test of hypothesis 1. Thereafter the results as well as the empirics from the interviews are analyzed. Finally, the results from the test of hypothesis 2 are presented and analyzed. The analyses of the results from the tests of the two hypotheses are hence presented in one section each.

5.1 Results from the Test of Hypothesis 1

Hypothesis 1 stated that there are SCs in the Stockholm County TPLIP market. This hypothesis is tested through calculation of the SCs with use of Shy's (2002) model presented earlier. With this model the SCs are calculated using data over premiums and market shares. The SCs are calculated as the cost of switching from each of the three larger companies to the smallest. The SCs for the customers of the smallest company is the cost of switching to the largest. *Figure 7–9* plot the SCs between firms of different sizes. It is important to have in mind that the sizes are not characterized by the same companies over time. For example, in the first observation If is the largest company, whereas Trygg-Hansa is the largest company in the last observation. The SCs plotted are the average SCs for each risk category of automobile models. SCs were calculated with the following formulas:

$$S_1 = p_1 - \frac{N_4 P_4}{N_1 + N_4} \quad S_2 = p_2 - \frac{N_4 P_4}{N_2 + N_4} \quad S_3 = p_3 - \frac{N_4 P_4}{N_3 + N_4} \quad S_4 = p_4 - \frac{N_1 P_1}{N_1 + N_4}$$

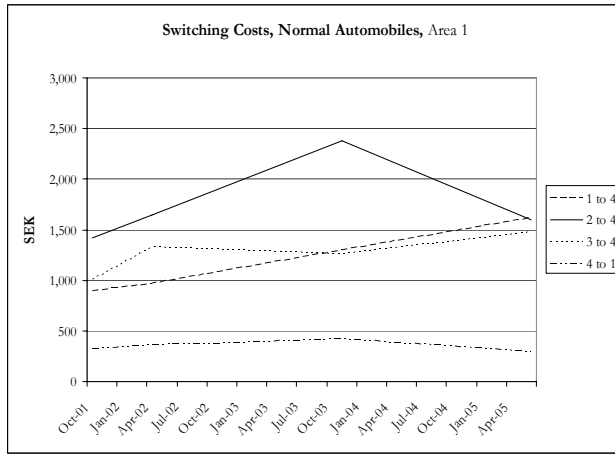


Figure 7 SCs for customers holding TPLIPs for normal automobiles in Area 1.

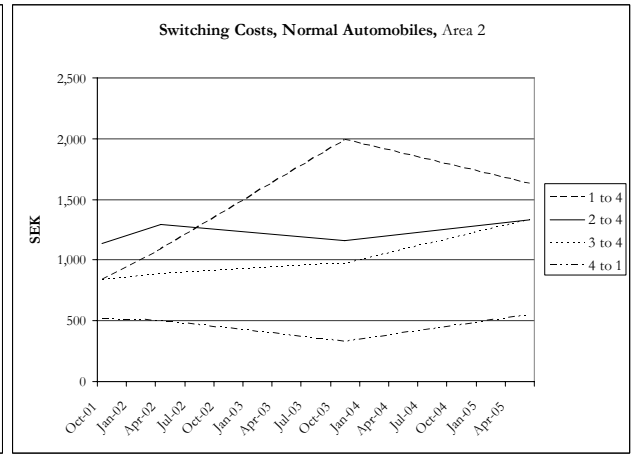


Figure 8 SCs for customers holding TPLIPs for normal automobiles in Area 2.

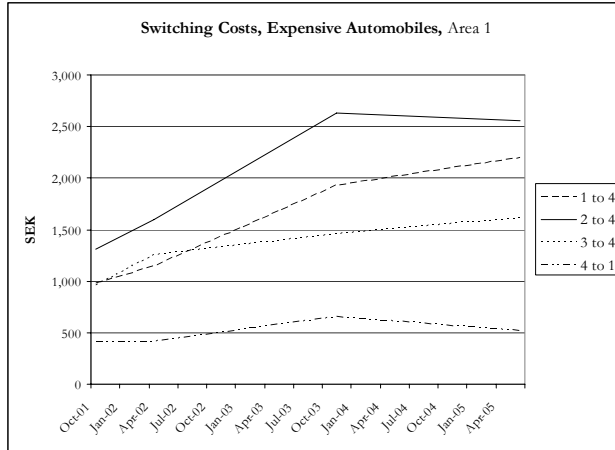


Figure 9 SCs for customers holding TPLIPs for expensive automobiles in Area 1.

Table 4 Mean and standard deviation for SCs (SEK), (October 1, 2001 to June 1, 2005).

	Mean	St. D.	
1 to 4	1,194.55	333.23	Area 1, Normal
2 to 4	1,759.62	426.88	
3 to 4	1,268.02	195.29	
4 to 1	345.16	57.76	
1 to 4	1,563.38	590.85	Area 1, Expensive
2 to 4	2,023.34	671.13	
3 to 4	1,321.44	281.47	
4 to 1	500.69	112.85	
1 to 4	1,389.25	521.26	Area 2, Normal
2 to 4	1,232.17	97.51	
3 to 4	1,007.41	221.97	
4 to 1	474.42	100.28	

Table 5 Ranking of the companies according to market shares. Company “1” is the largest.

	December 1, 2001	March 1, 2002	December 1, 2003	June 1, 2005	
1	Folk	Folk	Folk	Folk	Area 1
2	TH	TH	TH	TH	
3	If	If	If	If	
4	LF	LF	LF	LF	
1	If	If	TH	TH	Area 2
2	TH	TH	If	If	
3	Folk	Folk	Folk	Folk	
4	LF	LF	LF	LF	

The premiums are calculated for customers holding only the TPLIP. However, consider the situation where a customer is given a discount due to the purchase of several insurance policies from the incumbent supplier. Assume that the competitor does not give the corresponding discount and that the market shares are unaffected. In this case the absolute SCs, according to the model, will be lower

compared to the situation where neither the incumbent nor the competitor gives any discount. In a situation where both the incumbent and the competitor offer corresponding discounts the SC will be, according to the model, somewhere in-between the SC when no discount is given and when only the incumbent offers discount.

In the present thesis it is assumed that customers have a time horizon of one year when considering whether to switch firms or not. This horizon was due to the length of an insurance policy contract and the fact that it is generally not possible to switch companies after any other period of time. Figures 10–12 show SCs as a percentage of the average premium for each company. This comparison is made with SCs from a specific company and not a specific size of company. If the time horizon is extended the SCs measured as percentage of the discounted future premiums could be assumed to decrease. This result is valid under the assumption that future real premiums have the size of the premium of the date taken as a starting point.

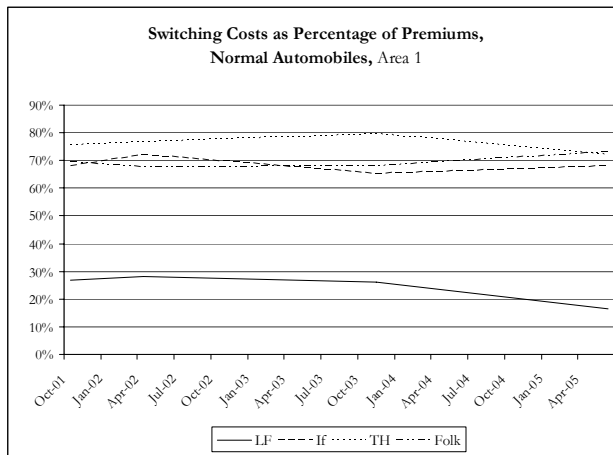


Figure 10 SCs as percentage of the premiums for customers holding TPLIPs for normal automobiles in Area 1.

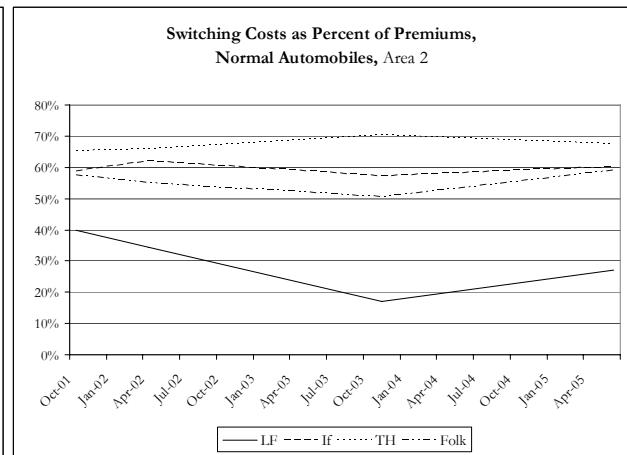


Figure 11 SCs as percentage of the premiums for customers holding TPLIPs for normal automobiles in Area 2.

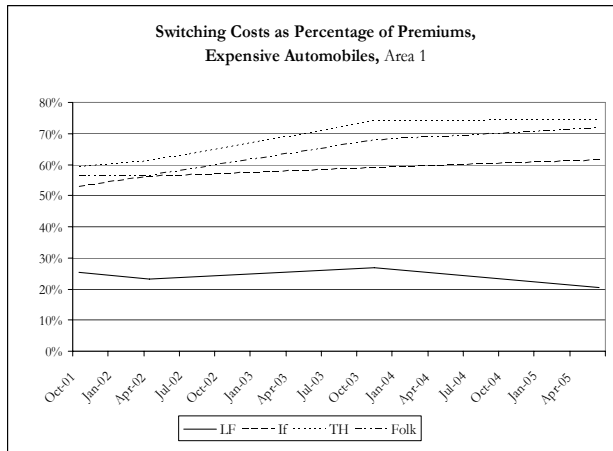


Figure 12 SCs as percentage of the premiums for customers holding TPLIPs for expensive automobiles in Area 1.

Table 6 Mean (percent) and standard deviation (percentage units) for SCs as percentage of the premiums (October 1, 2001 to June 1, 2005).

	Mean	St.D	
<i>LF</i>	24.49	5.40	<i>Area 1, Normal</i>
<i>If</i>	68.30	2.90	
<i>TH</i>	76.05	3.03	
<i>Folk</i>	69.53	2.43	
<i>LF</i>	23.99	2.82	<i>Area 1, Expensive</i>
<i>If</i>	57.33	3.72	
<i>TH</i>	67.07	8.10	
<i>Folk</i>	63.13	7.80	
<i>LF</i>	29.66	9.85	<i>Area 2, Normal</i>
<i>If</i>	59.62	2.10	
<i>TH</i>	67.28	2.14	
<i>Folk</i>	55.58	3.74	

5.2 Analysis

In this section the analysis of the results from the test of hypothesis 1 is carried out. The empirics from the interviews are analyzed as well. It is important to have in mind the limitations specified in the beginning of the thesis. The SCs calculated are only relevant for customers with the specific features of the customers for which the premiums were determined. However, the empirics from the interviews held allow a more detailed analysis, compared to what the data set allows, which also is carried through.

5.2.1 Comments on Figures and Tables

The results presented from the investigation of hypothesis 1 clearly show that there are SCs for customers of the four largest insurance companies in Stockholm County. In *Area 1*, *Absolute SCs* are *highest* for customers of company size 2, both for owners of normal and expensive automobiles. In *Area 2*, *Absolute SCs* are *highest* for customers of company size 1. *The lowest Absolute SCs* in *both areas* are found for customers of the smallest company. In *Area 1*, the highest and lowest standard deviations correspond to the highest and lowest SCs. In *Area 2* they do not correspond. Overall, there is an indication of an upward trend for the absolute SCs.

The *highest SCs, measured as percentage of the premiums* are found for customers of Trygg-Hansa, in *both areas*. The *lowest SCs* are found, in *both areas*, for customers of Länsförsäkringar Stockholm. In *Area 1*, the *highest* and the *lowest* standard deviations correspond, for customers with expensive automobiles, to the highest and lowest SCs. For owners of normal automobiles they do not correspond in either Area 1 or Area 2. Overall, there is no clear trend for the SCs measured as percentage of the premiums.

The SCs observable through Shy's (2002) model could be assumed to constitute a share of the SCs actually exploited when charging these premiums, given the market shares. Whether the size and volatility of the SCs found is reasonable or not is, however, difficult to determine. Since the variation comes through premiums and/or market shares it seems reasonable that the actual SCs do not have the exact same pattern. However, if it is the absolute SCs or the SCs measured as percentage of the premiums that matters to the customers is in the present thesis not possible to determine.

The perceived trend of overall increasing SCs should lead to reduced customer mobility and allow firms to increase premiums without losing customers. Through this scenario competition should be reduced. According the data and the interviews, premiums were increased as much as 100 percent, during the years of interest, and competition was low. Customer mobility was assumed to be around 20 percent, which was considered high. If mobility really was high, it contradicts the discussion above. Whether mobility did change during the period is not answered in the present thesis. If premiums are increased and no movements, or change in movements, of customers between companies occur, then SCs were in fact higher than previously exploited, or increased at the same time as the premiums. A uniform increase in premiums across the four companies could probably be assumed not to cause any shift in customer movements.

5.2.2 Empirics, Findings and Theory

The previous section states that SCs were found, but what types of SCs could be assumed to be prevalent? The interviews revealed many impediments for customers to switch companies. In this section the impediments revealed are sorted and discussed according to the theoretical framework.

Learning costs should be prevalent for a customer who has not performed a switch. First and foremost knowledge about when it is possible to cancel a contract has to be acquired. This information is available through TSL. These rules should be the same for all companies and could therefore be considered a one-time cost. It is difficult to say anything about the size of this type of SCs. It is reasonable to assume that it depends on a customer's value of time. Learning costs might also be higher for first time buyers.

Transaction costs could be limited to the time and effort spent on a switch. The time spent on the search for information about quality²⁰, and factors determining premiums, could, according to the author, be considered transaction costs. Further, the more insurance policies held by the customer, the more time is required in order to perform a switch. However, the size should in the case of TPLIPs be dependent on the value of time of each customer.

²⁰ See "Uncertainty".

Contractual costs are prevalent in the form of a lost bonus and discounts. Each year with a firm adds to the bonus and decreases the premium. Further, the discount and hence the contractual costs should be higher the more insurance policies that customer has purchased from the same firm. When a customer switches companies this bonus and discount is to some extent lost, unless the competitor offers a corresponding bonus and discount. The bonus and discount offered might be major reasons for customers to stick to their incumbent supplier. However, the customers who switch due to increased premiums, caused by accidents, might on the other hand gain in terms of a bonus. Hence, contractual costs should be low for high-risk customers and customers holding few insurance policies and high for low-risk customers and customers holding several insurance policies. In the case when the customer holds only the TPLIP, only the perceived risk should matter.

However, the results from a calculation of SCs, in the case when discount, due to purchase of several insurance policies from the same company, was given, contradicts the above discussion about contractual costs.²¹ If the discount given by the incumbent corresponds to the discount given by the competitor, then the SC should be unaffected.²² The calculated SCs capture an effect of the discount, but the effect is reversed compared to the previous discussion. The model is hence not developed to handle such discounts. In the model, a lower premium is interpreted as a sign of a lower SC. This is because it is assumed that, given the SC, the firm sets the premium as high as possible to maximize profits.

Compatibility costs could be prevalent. It is possible to do approximately the same extensions of TPLIPs in the four companies. However, compatibility costs could be prevalent for two reasons. Firstly, it is not possible to purchase the TPLIP from one company and the extensions from another. Secondly, minor compatibility costs could also exist since not all firms offer the same range of additional services. A customer who prefers holding both insurance policies and bank accounts in the same firm is limited to two firms, Folksam and Länsförsäkringar Stockholm. The size of this type of SC could be relatively large, partly because it is not possible to split the insurance policy for the automobile among companies. The more insurance policies the customers hold, the larger the compatibility cost. However, in the case when the customer holds the TPLIP only, the size of this cost should be small.

Uncertainty about the quality of the service purchased could be considered a cost. However, a customer who has not yet experienced an accident, and hence not received any compensation, should have the same “uncertainty cost” (disregarding information about quality) regardless of which company is taken into consideration. According to the empirics, customers do not search actively for information about quality. Information about quality is supposed mostly to be acquired through experience. Whether a higher premium signals higher quality is difficult to say due to how prices are

²¹ This discussion relies on the assumption that the discount is added and all else is constant/unchanged. The calculation is only mentioned, not carried out, in the present thesis.

²² This presupposes that the discounted prices are approximately equal across the firms taken into consideration.

determined and that quality was assumed to be approximately equal across companies. However, a customer cannot be sure that he will obtain the same quality as the one referred to by friends, organizations, investigations or advertisements. Hopefully the customer will never have to use the TPLIP and the exact quality will therefore remain unknown. According to this discussion TPLIPs should be classified more as an experience good than a search good. However, it contradicts Shapiro (1983) where customers were assumed to gain knowledge about the quality immediately at purchase. Customers, who consider themselves high-risk customers, most certainly put a greater value to high quality than low-risk customers do. If they are satisfied with the quality of the TPLIP provided by the current supplier they might stick to the incumbent. This is because the customer does not want to risk purchasing a lower quality TPLIP from a competitor. The experience good feature of TPLIPs could be assumed to amplify this behavior. If high-risk customers are more likely to use the TPLIP, the uncertainty costs should most likely be considered larger for these customers than for low-risk customers.

Psychological costs of switching might be prevalent in some cases. Reasonably some customers stick to the incumbent if they are satisfied with the overall service given by the firm. As long as no major increases in premiums occur customers tend to stay. They may convince themselves that the incumbent supplier is good enough. This is referred to as the cognitive dissonance phenomenon (Brehm 1956). The size of this type of SC is very difficult to determine.

These six SCs could hence be assumed to vary with a customer's value of time and risk profile. However, variations in these variables are not captured by the data set used in the present thesis. The variations in the calculated SCs are exclusively the variations which come from the variables in the model, i.e. market shares and premiums. Whether the variations in the calculated SCs correspond to the variation in the SCs perceived by the customer cannot be answered in the present thesis.

5.2.3 Results Compared to Previous Research

The results fit the picture given in Shy (2002) fairly well. Taking both areas into consideration, it is evident that the smallest firm has the customers with the lowest SCs. This firm also has the lowest premiums. The findings that the smallest firm charges the lowest premiums, both in absolute terms as well as measured as percentage of the premiums, are in accordance with theory; theory states that the smallest firm has the largest incentives to undercut the other firms. Neither Shy nor the present thesis could determine any specific ranking of the SCs among the three largest firms. Customers of the largest company could otherwise be supposed to bear the highest SCs. However, unlike the present thesis, Shy could determine the SCs found to be of reasonable size.

Andersson and Berglund (2004) found SCs which were considered large. The switching costs found for the Stockholm County TPLIP market could, according to the present thesis, be as high as 80 percent of the annual premium. This seems like very high SCs, even though it is not perfectly clear

what a high SC is for this specific market. The model used could, however, overestimate SCs. Andersson and Berglund discussed tendencies for overestimation as well. One reason for overestimation could be the time horizon²³, which maybe should be different. When a customer assumes the present market shares and premiums to endure over a foreseeable future but extends the time horizon to several years, the SCs measured as percentage of the discounted future premiums will most certainly be lower.

The findings of a) costly consumer search, b) that differences in premiums should not indicate difference in quality, and c) that young drivers tend to choose the same firm as their parents, are in line with the findings in Dahlby and West (1986). The homogeneity of the TPLIP is in line with their paper as well. The absence of customer search for information, found in the present thesis, could hence be due to too high search costs. This could as well contribute to the experience good feature of the TPLIP. Schlesinger and Schulenburg (1993) concluded that information about quality is important to the customer when he decides from which firm to buy. This might not be said to support the findings in the present thesis but gives a supportive view of the importance of information in automobile insurance markets. However, what is contradicting is that the latter paper found evidence that insurance policies were not seen as homogeneous. The TPLIPs investigated in the present thesis are close to homogeneous. A customer may, however, perceive them as heterogeneous ex-post to purchase. The Stockholm County TPLIP market was assumed to be characterized by asymmetric information and the accident records were private information to the companies. Since these findings are in line with Nilssen (2000), the findings of SCs in the present thesis could be found to be supported.

The customer mobility and the impediments found by Konkurrensverket (2001) to some extent support the findings of mobility made in the present thesis. The conclusion, that most customers switch due to too large price differentials, is in accordance with the findings of the present thesis. It is, however, difficult to say whether or not the size of the SCs found in the present thesis is confirmed by previous research. There are two main issues which limit the degree of support. The first is that Konkurrensverket investigated customers with several insurance policies and the insurance policy for automobiles was not the TPLIP. The second is that Konkurrensverket chose Sweden, and not Stockholm County, as the market.

The following text compares the findings made in the present thesis with findings made about other markets. It is reasonable to believe that the SCs provide the four firms with some degree of market power, as Knittel (1997) discussed. If this is the case, market power should increase over time since the absolute SCs, according to the findings, increase over time. Opposed to Borenstein (1991), it seems to be loyal, not disloyal customers, who benefit in terms of lower premiums. Since higher customer mobility was assumed to increase costs, the purpose of bonuses and discounts could be

²³ The time horizon varies most certainly among individuals.

seen as the creation of incentives for customer to stay. If 20 percent of the customers switch every year, 80 percent should be assumed not to switch. According to these figures, established customer relationships provide the firms with larger fraction of their market shares compared to what Kim *et al.* (2001) found. Increased costs, which in the long run lead to increased premiums, due to higher customer mobility, are not in line with Sharpe (1997). In the present thesis two causes of compatibility costs were found. However, almost identical services are offered by the four companies. These findings could be compared to what was concluded in Mariñoso (2001).

Finally, the previous research provides some arguments which support the findings of the present thesis. Least support is found for the size of SC and the increase in costs due to higher customer mobility.

5.3 Results from the Test of Hypothesis 2

Hypothesis 2 stated that SCs are on average higher for the customers holding TPLIPs for more expensive automobiles than for the customers holding TPLIPs for normal automobiles. In the test of hypothesis 2 data from the test of hypothesis 1 is used. The data used consists of the SCs for the customers holding TPLIPs for normal automobiles in Area 1, which is compared to the SCs in Area 1 for the customers holding TPLIPs for expensive automobiles. The comparison is made through plotting the difference in average SCs for the two types of customers within each size of firm. The average difference in the SCs is plotted as well. *Figures 13–16* show the difference between these two average SCs plotted in absolute values as well as percentage of the premiums of each company. “(E–N), 1” means the average SCs for the customers holding TPLIPs for Expensive automobiles minus the average SCs for customers holding TPLIPs for Normal automobiles, in a company of size 1, the largest company. “(E–N)/LF” is the same difference, however, measured as percentage of the annual premium charged by Länsförsäkringar Stockholm. In the latter example it is the company name, and not the size, that matters.

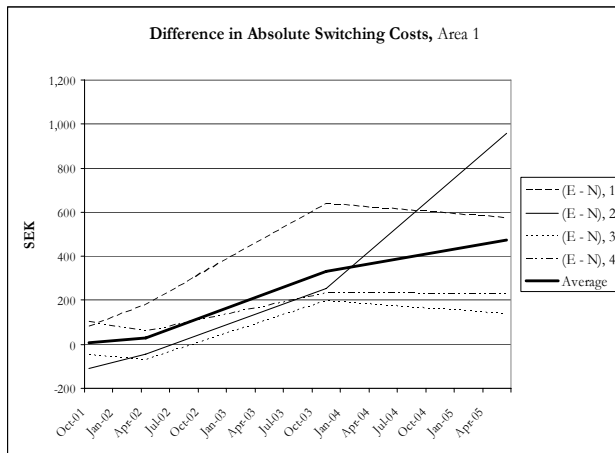


Figure 13 Differences in absolute SCs for customers in Area 1 sorted by company size.

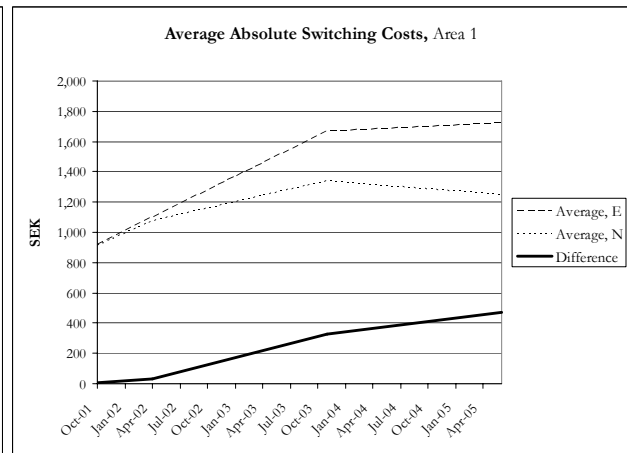


Figure 14 Average absolute SCs over all companies for each type of customer.

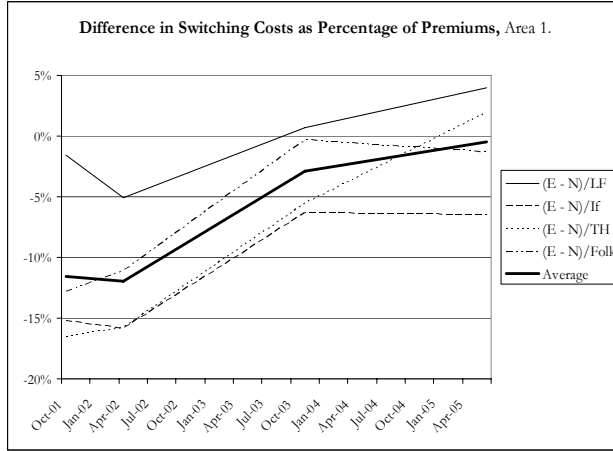


Figure 15 Differences in SCs as percentage of the premiums, sorted by company name.

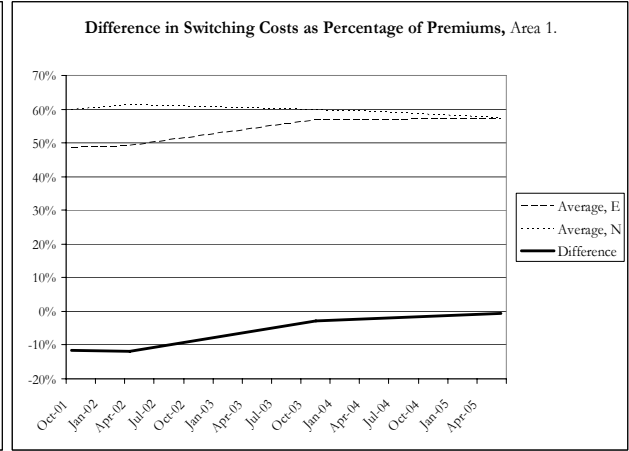


Figure 16 SCs as percentage of the premiums, average over all companies.

The average difference between the two means was tested, since such a test has more degrees of freedom compared to a test for the same difference for each company. A more differentiated picture is hence foregone in favor of a larger sample which is reasonable due to the small sample size. In order to test if the difference was significantly larger than zero a two-sided t -tests at a 5% level is performed. If H_0 is rejected it would provide some support for hypothesis 2. A two-sided test requires a larger difference than a one-sided and would in the case of a rejected H_0 provide larger support. A two-sided test does not exclude the possibility to find a negative, but significant difference. A negative difference could, according to the figures, exist in the case when SCs are calculated as a percentage of premiums. The t -statistica used tests for the difference between two means and the hypotheses are hence formulated as follows:

$$H_0 : \mu_E - \mu_N = D_0 \quad \text{and} \quad H_1 : \mu_E - \mu_N \neq D_0$$

The observed t -value is calculated as

$$t_{obs} = \frac{\bar{d} - D_0}{\hat{\sigma} / \sqrt{n}}$$

In the present thesis $D_0 = 0$. The critical t -values where $\alpha = 0.05$ and $n = 16$ are $\pm t_{n-1, \alpha/2}$ and ± 2.1314 . According to these results the null hypotheses is rejected since the absolute values of the observed t -values are larger than the critical t -values. Table 7 summarizes these results.

Table 7 Summary of t-tests for the difference between two means.

	Summary, <i>t</i> -tests	
	<i>Absolute values</i>	<i>Percentage of premiums</i>
<i>Hypothesis</i>	$H_0 : \mu_E - \mu_N = D_0$ $H_1 : \mu_E - \mu_N \neq D_0$	$H_0 : \mu_E - \mu_N = D_0$ $H_1 : \mu_E - \mu_N \neq D_0$
<i>Significance level (α)</i>	0.05	0.05
<i>Decision rule</i>	Reject H_0 if $ t_{obs} > t_{crit}$	Reject H_0 if $ t_{obs} > t_{crit}$
<i>Mean</i>	$\bar{d} = 210.3778$	$\bar{d} = -0.0671$
<i>Standard deviation</i>	$\hat{\sigma} = 288.7754$ $t_{obs} = 2.9141$ $t_{crit} = \pm 2.1314$	$\hat{\sigma} = 0.0701$ $t_{obs} = -3.8296$ $t_{crit} = \pm 2.1314$
<i>p-value</i>	0.0107	0.0016
<i>Decision</i>	Reject	Reject

5.4 Analysis

There seems to be a trend over this sample period toward larger differences in SCs. This is true for both the absolute SCs as well as the SCs measured as percentage of the premiums. The line which plots the average difference in absolute values is clearly above the value axis plotting zero difference. However, there are some individual differences that drop under that zero line. When SCs are measured as percentage of the annual premium, the difference is below zero. Some individual observations in the end of the sample period are, however, above zero.

According to the result from the test of hypothesis 2 H_0 is rejected in a two-sided *t*-test at the 5 percent level. This is true for both the difference measured in absolute SCs as well as percentage of premiums. The *p*-values for the tests are 0.0107 and 0.0016 which is much lower than the 5 percent tested for. Due to the small number of observations no general conclusion should be made.

The difference in absolute terms is significantly larger than zero, which is in line with what hypothesis 2 stated in section 4. However, when the SCs are measured as percentage of the premiums, the difference is significantly smaller than zero. The SCs, measured as percentage of the premiums of TPLIPs, for customers holding TPLIPs for expensive automobiles is according to this result smaller than corresponding SCs for customers holding TPLIPs for normal automobiles. It is important to note that this is the result for forward looking customers with a time horizon of one year. Whether these two different approaches have different implications for the customers is not possible to say in the present thesis. Whether the SCs are smaller or larger for owners of expensive automobiles than for owners of normal automobiles hence depends on which view of SCs is applied.

The SCs which are larger for customers with high value of time should be the *transaction costs* and the *learning costs*. It is in the present thesis not found evident whether or not *contractual costs*, *compatibility costs*, *uncertainty* and *brand loyalty* should be affected by the value of time.

Shy (2002) measured SCs as percentage of the average balance on the deposit account on the bank taken into consideration. The result from the test of hypothesis 2 and absolute difference is in line with the findings in Shy's paper. This result might hence indicate that customers with high income and higher value of time have higher SCs. However if it is correct to measure SCs in the TPLIP market in absolute values is not possible to determine in the present thesis. There is no direct support for either way of measurement of SCs in the literature chosen as previous research.

6 Summary and Conclusion

The present thesis touches the surface of the subject SCs in the Stockholm County TPLIP market. However, it provides, through the analysis of the data, some evidence for SCs overall. An indication for the different types of SCs, chosen as relevant for the Stockholm County TPLIP market, is found through the analysis of the empirics from the interviews.

The study is limited to the four largest insurance companies in Stockholm County, to specific customers with specific features and to the two particular areas in the county. The theoretical framework for SCs was presented as well as the model, constructed by Shy (2002), used in order to calculate the SCs. Thereafter the market, the four insurance companies, as well as the TPLIP were presented. The data set, collected from Länsförsäkringar Stockholm, contains premiums and market shares for the two areas of interest. The data set was rather small, between 20 and 23 automobile models per observation. Furthermore the hypotheses were stated. The investigation of hypothesis 1 revealed SCs as high as 80 percent of the annual premium of a TPLIP, given a time horizon of one year. Hypothesis 2 could be significantly confirmed at a 5 percent level. However, the difference in SCs among customers who own expensive automobiles and those who own normal automobiles was either positive or negative dependent on if the SC was measured in absolute terms or as a percentage of the premiums. Six different types of SCs from theory were applied on the results and empirics. *Learning- and transaction costs* could be assumed to depend on each customer's value of time. Learning costs might as well be higher for first time buyers. *Contractual costs and uncertainty* could reasonably be assumed to depend on the risk of each customer. *Compatibility costs* could be supposed to be small and the size of the *psychological costs* or *brand loyalty* is difficult to estimate.

Shy's (2002) model relied on a number of assumptions. The assumptions fit the Stockholm County TPLIP market fairly well. However it could be discussed to what extent firms actually know the customers' SCs. Firms should be aware of how their prices affect their market shares and through this awareness be able to estimate the SCs. Whether customers' utility should be assumed as homogenous could be discussed as well. It might be a reasonable assumption in the present thesis since the prices are calculated for a homogenous group of customers. Furthermore, the model does not take into account new customers entering the market. Even though the growth of the market has been moderate (Svensk Försäkringsårsbok 2005), a model, which takes new customers into account, would certainly perform a different estimation of the SCs. The SCs discovered might, according to the discussion, be overestimated, which was indicated by Andersson and Berglund (2004) as well. The possible overestimation might be dependent on the time horizon of the customers. Whether the assumption about zero production costs is correct could be discussed. When customers are attracted to the company through special campaigns the costs should be assumed, as indicated in the present thesis, not to be zero. However, during the years of interest the companies consolidated current market shares. The costs should hence be lower than in the case when campaigns are launched. Furthermore, the model is not constructed in order to calculate the SCs which come through

discounts for customers holding several insurance policies. When the model is applied to insurance policy markets, and markets with similar characteristics, this should be considered a drawback.

The sample size is small and no general conclusions should be made even for the specific type of customer and types of areas investigated. A larger sample should have made it possible to make more general conclusions. However, the present thesis focused on what was possible to conclude from the data set as well as the empirics from the interviews. The view of the market provided through the interviews is the view of staff responsible for products and pricing. It does not represent the view of the customers. Interviews with customer could probably provide a different view which could lead to different conclusions. Since premiums are set according to a large number of criteria, and since each company is free to choose these criteria, insurance policies in general will be difficult to investigate.

The present thesis contributes to the SC literature as an investigation of a very specific market. To the knowledge of the author it is the first study of its kind in Sweden. The present thesis could not determine if the size of the SCs was reasonable. Furthermore, it was not possible to determine whether the SCs for customers holding TPLIPs for expensive automobiles should be regarded as higher than the SCs for customers holding TPLIPs for normal automobiles. However, SCs were discovered and indications of different types of SCs were analyzed and interpreted. Furthermore, the findings were to some extent in line with previous research. Hopefully this thesis has provided the reader some understanding of the TPLIP market and the SCs discovered.

7 Further Research

To the best of the author's knowledge, this is the first academic investigation of SCs in the Stockholm County TPLIP market. The chosen method, data set, model and interviews provided the reader with an estimation and description of the SCs in the market. However, several issues would be interesting to investigate further. This section gives some suggestions.

- *Competition* in the Swedish, as well as the Stockholm County insurance policy market. For example, it was considered difficult for new companies to enter the market (Johansson 2005). A study could be similar to Konkurrensverket (2001) but aim more at the insurance policy market. A study which really looks into the specific areas and which takes into consideration the different risk of each area.
- *To apply a larger data set* could allow for more general conclusions. The area chosen could be any county and/or zip-code area for which data is available. More extensive, and a larger number of interviews can be held. As in Konkurrensverket (2001), interviews with customers in the chosen area should provide valuable insight into the decision making process of the customer.
- An investigation of *the sizes of each of the SCs* discovered would provide further understanding of the market. This topic is related to the above mentioned and could be based on interviews as well. Such an investigation could, for example, study whether high- and low-risk as well as high- and low income customers have different SCs, and how to measure these SCs (does absolute SCs or SCs measured as percentage of the premiums matter?).
- An investigation which applies a *model which takes more aspects into account*. It would, for example, be interesting to investigate how an in- and outflow of customers form the market would affect SCs. A model could as well take into account the effects of discounts and what happens when customers hold several insurance policies.

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Appendix A

In the following table the automobile models used for each year are presented. They are sorted according to area and whether they are considered as normal or expensive automobiles.

Table 8 Automobiles used in calculations of SCs, sorted by year, area, normal and expensive.

	June 1, 2005	November 1, 2003	April 1, 2002	October 1, 2001
<i>Area 1, Normal</i>	Saab 9-5	Saab 9-5	Saab 9-5	Saab 9-5
	Skoda okt	Skoda okt	Skoda okt	Skoda okt
	Opel Astr	Opel Astr	Opel Astr	Opel Astr
	Toyota Yar	Toyota Yar	Toyota Yar	Toyota Yar
	MB A-klass	MB A-klass	MB A-klass	MB A-klass
	Opel Zafira	Opel Zafira	Opel Zafira	Opel Zafira
	Ford Fokus	Ford Fokus	Ford Fokus	Ford Fokus
	Volvo 740	Volvo 740	Volvo 740	Audi 80Av
	Mazda 323	Mazda 323	Mazda 323	Mada 626
	BMW 330i 163kw	Audi 80Av Imp	Audi 80Av Imp	Volvo 740
			Mada 626	Mazda 323
<i>Expensive</i>	BMW M coupe	BMW Z8	BMW Z8	BMW Z8
	BMW 750i	BMW M coupe	BMW M3	BMW M3
	BMW x5	BMW 750i	BMW 750i	BMW 750i
	Porsche 911 Carrera	BMW x5	BMW x5	BMW x5
	Porsche 911 Cab	Porsche	Porsche	Porsche
	Porsche 911			
<i>Area 2, Normal</i>	Volvo V70	Toyota Aven	Toyota Aven	Toyota Aven
	Volvo V40	Renault Scenic	Renault Scenic	Renault Scenic
	Toyota Aven	Toyota Corolla	Toyota Corolla	Toyota Corolla
	Renault Scenic	Nissan Primera	Nissan	Nissan
	Toyota Corolla	Ford Esk	Ford Esk	Ford Esk
	Nissan Primera			
	Ford Esk			

Appendix B

Appendix B presents the different services, except TPLIPs, offered by each of the four insurance companies.

Table 9 Services offered by the four largest insurance companies in Stockholm County.

	Folksam	If	Länsförsäkringar Stockholm	Trygg-Hansa
Insurance policies				
<i>Home and house</i>	x	x	x	x
<i>Life</i>	x	x	x	
<i>Accidents</i>	x	x	x	x
<i>Vehicles*</i>	x	x	x	x
<i>Boats</i>	x	x	x	x
<i>Domestic animal</i>	x	x	x	
<i>Students</i>	x	x	x	x
<i>Companies**</i>	x	x	x	x
Bank services				
<i>Deposit accounts</i>	x		x	
<i>Pension guidance</i>	x		x	
<i>Mortgages***</i>	x		x	
<i>Funds</i>	x		x	

* The group "vehicles" includes for example motorcycles, mopeds, snowcats, trailers etc.

**The group "Companies" indicates only that insurance policies for companies and not private customers are offered. No examples of the types of services are provided, and they may differ between the companies.

*** The different types of mortgages are not specified in the present thesis.

Source: Folksam (2005b), (2005c), (2005d) and (2005e). If (2005b) and (2005c). Länsförsäkringar (2005b), (2005c) and (2005d). Trygg-Hansa (2005b) and (2005c).