

# MASTER'S THESIS

## **Improving Profitability Model in Insurance Industry, Considering Inflation The case Study of Automobile Insurance in Iran**

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*MSc PROGRAM IN MARKETING AND ELECTRONIC COMMERCE Joint*



2009

## ***Abstract***

Pricing is one of the critical practices of insurance industry. The premium price set by an insurance company must obtain profit for the company considering the indemnification of the accidents. Also this price must be at the rate that motivates people to purchase the service.

There are various models with various parameters considered for setting the premium rate of a specific type of insurance. The focus of this research is on the non-life insurance in general and on the auto property coverage insurance in particular. These models may not comply with the way that insurance companies set their premium rates. The lack of a feasible model which considers more related parameters to the environment may be the reason.

This research investigates the nonlife insurance pricing models and not only evaluates the existence parameters, but also evaluates the parameters that must be used in these models in order to make them more compatible with Iran's insurance market situation.

**Keywords:** insurance pricing, service pricing, pricing strategy, pricing approach, insurance premium.

## ***Acknowledgement***

Moving each step forward, I learned and enjoyed a lot while carrying out this research. I would like to earnestly thank all those who helped me with their valuable wisdom in this effort.

Initially, I thank my supervisor in Tarbiat Modares University, Dr. Amir Albadvi, for his continuous support and guidance. Then, I would like to extend my sincere gratitude to my supervisor in Luleå University of Technology, Professor Moez Limayem, for his genuine support, helpful ideas, and kind responses to my questions during the entire phases of this thesis.

I would like to give special thanks to PhD students at Tarbiat Modares University and my friends who assisted me in different stages of conducting this research especially in understanding Mathematical equations, obviating the research methodology and writing codes by Matlab Program: Mr.Koosha, Ms. Abdolvand, and Mr. Sadrpanah, and all classmates who provided competitive and fun environment for studying.

I also thank faculty members of Luleå University of Technology and Tarbiat Modares University, Deans, Directors, teaching and administrative staff, etc. for their support. They all gave me the honour of achieving Master degree.

Moreover, I would like to assert my warmest gratitude to my beloved family for their love, affection, and support they presented me in every stage of my life specifically in this momentous stage.

Maryam Farhadi

May 2009

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# Chapter One

## Introduction

### **1. Chapter One: Introduction**

*This chapter starts with definition of the problem that insurance companies may be encountered with in the field of pricing. The chapter continues with motivation and importance of pricing of insurance service in Iran. In the following the purpose of research and research questions are provided with some information and statistics about Insurance market in Iran and specifically some statistics in the field of auto property coverage in the subsequent section in order to provide a general idea about the field of this research and the environment in which the models will be simulated. Finally the structure of the thesis is provided.*

## 1.1. Problem Definition

Most people and organizations, in every kind of society need some sort of insurance cover. Insurance is an agreement by which one party (the insurer) promises to pay another party (the insured or policyholder) a sum of money if something happens which causes the insured to suffer a financial loss. Hence, in the case of accident the responsibility for paying such losses is transferred from policy holder to the insurer. In return for accepting the burden of paying for losses when they occur, the insurer charges the insured a price, the insurance premium. Setting the premium rate is the issue which has been discussed for many years. The premium price must be at the rate that motivates the policyholders to purchase a class of insurance. On the other hand the insurer must indemnify the insured in the case of accident. So not only the premium price must have to be a stimulant for people but it must also secure the insurer's profit (Bickelhaupt, 1983).

After exploring the literature and finding that pricing is one of the issues that every service provider is encountered with, we have found that among service companies, Insurance is the one with too many customers and a vast market among the other services in Iran. Also the non-life sector of insurance industry, which is the focus of the research accounted for the 42.4% of the market segmentation worldwide in 2005 (Datamonitor, 2005). Some statistics and information about Iran's insurance market and its magnitude are provided in section 1.2.1. Due to the vague area of investigation and unclear methods used in Iran for pricing the non-life insurance service, an initial and limited exploratory research, which was some sort of discussions with employees in the Iran's Central Insurance Company, was done. They pointed out that currently no mathematical model and specific method is being used in Iran for setting the premium price. They argued that premium is set based on the previous trends in the market, hence it is somehow conceptual.

According to the importance of the premium price, and, inasmuch as the structure of the economy is different in every country, different parameters may influence the premium price in different markets. Hence a specific pricing model needs to be customized for each market in order to generate the optimum premium in which both the insurer and the insured are satisfied. In other words, the question is, what is the optimal

premium pricing strategy for an individual insurance company and how is this related to the market.

## **1.2. Motivation**

Price is the only element of the marketing mix that produces revenue, while the other elements -product, place, and promotion- produce costs. Prices are the earliest marketing mix elements to adjust; product and service features, channels, and even promotion take more time. Price also communicates to the market and the company's intended value positioning of its product or service. Pricing decisions play a key role for every company's profitability and long-term survival (Kotler, 2003).

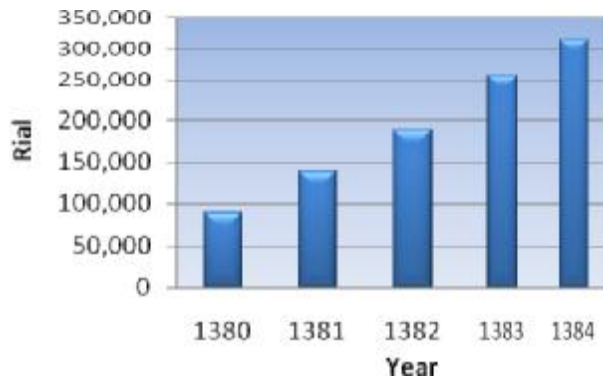
*“If effective product development, promotion and distribution sow the seeds of business success, effective pricing is the harvest. Although effective pricing can never compensate for poor execution of the first three elements, ineffective pricing can surely prevent those efforts from resulting in financial success.”* (Nagle and Holden, 1995; cited by Avlonitis and Indounas, 2005)

Pricing can either be implementing for product or service. Insurance service has been studied in this research due to the outstanding portion that it has in the types of services. According to the fact that pricing and setting the premium rate is one of the insurance companies practices and also due to the momentous role that pricing has in every kind of organization, specially the financial ones, insurance pricing has become an important and major issue in this field. Iran's insurance market information, which was a stimulus for conducting this research project, adds to the importance of this issue in Iran. This is provided in the next section.

### **1.2.1. Iran's Insurance Market**

Since the models extracted from literature, will be simulated with data from Iran's insurance market, and since among different insurance types, the auto property coverage is selected for this purpose, having a general perspective from key players and Iran's

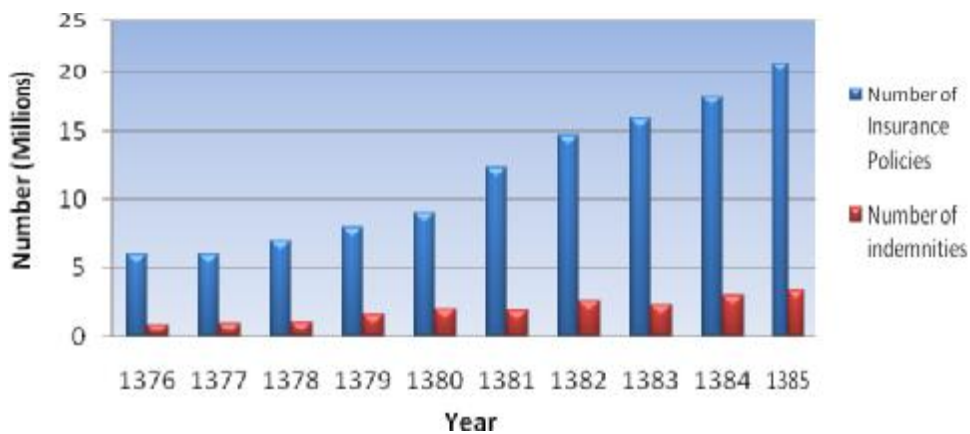
insurance market situation, and in particular in the auto property coverage field seems reasonable.



**Figure 1-1:** Percapita Insurance Premium

Source: (Iran's Central Insurance Company, 1386)

Figure 1.1, demonstrates the Iran's percapita insurance premium which was 88,887 Rials in 1380, and reaches 314,067 Rials in 1384. This shows the magnitude and the increasing trend of insurance market in Iran. This growth cannot be only relying on the probable increasing premium rate over time, because as it is obvious in Figure 1.2, the number of insurance policies had an increasing trend in the mentioned time period.

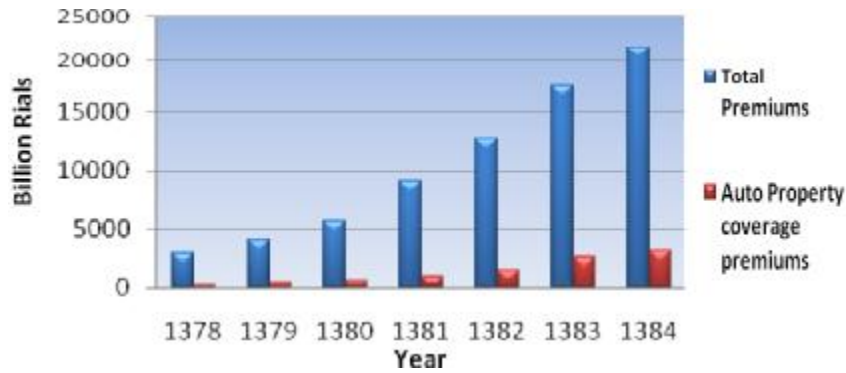


**Figure 1-2:** Number of Insurance Policies versus the Number of Indemnities

Source: (Iran's Central Insurance Company, 1386)

Figure 1.2, shows the number of insurance policies that industry, underwrote for all of the insurance types versus the number of indemnities. As it is obvious, the number

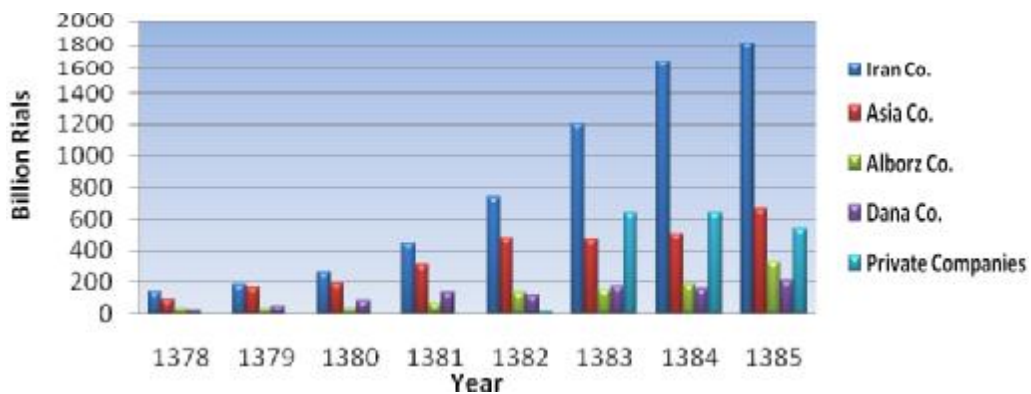
of underwritten insurance policies increased which reveals that passing time; people are more interested in buying insurance. This adds to the importance of setting the premium price that would not lead to decrease in the number of exposures.



**Figure 1-3:** Premiums Underwritten by Industry

Source: (Iran's Central Insurance Company, 1386)

Since the focus of this research is on auto property coverage insurance, some information in this field will make the context more decipherable. Figure 1.3, shows the amount of total premiums underwritten by industry versus the amount of auto property coverage premiums underwritten by industry.



**Figure 1-4:** Underwritten Auto Property Coverage Premiums by Companies

Source: (Iran's Central Insurance Company, 1386)

The total underwritten premium reaches 21531.5 billion Rials in 1384 from 3009.67 billion Rials in 1378. The auto property coverage premium in 1378 was 279.9

billion Rials- 9.3% of the total premium- that reaches 3143.6 billion Rials in 1384, which is 14.6% of the total premium.

The key players in the field of auto property coverage and the underwritten premiums by each of them from 1378 to 1385 are demonstrated in the Figure 1.4. Clearly Iran and Asia are the two biggest players during this period.

In today's rapidly changing and competitive insurance market, few methods have been examined in order to find the optimal strategy. This research may provide the reader with key terms in insurance pricing and some proposed models in this area. Also these statistics demonstrates the magnitude of the market and explains the importance of this research.

### **1.3. Purpose of Research and Research Questions**

Insurance pricing is one of the critical practices of insurance companies. Few models have been proposed for setting the premium rate, one of the challenging issues in this field. The purpose of this research is to examine the two extracted models from literature and find the most feasible one for the current market. Obviously the academic models are suffering from the lack of factors which are affective on pricing models in the real world, so the way the models set the premium rate are far different from the real world. Hence, this research is also hopeful to improve the models in order to have more close estimates from the real world.

The research questions are described below:

1. What are the applicable theoretical pricing models that can be used in the insurance industry?
2. What characteristics do the models lack in order to be more compatible with current context of insurance market in Iran?
3. How the above characteristics can be considered in the selected model? (Trying to find a new model that not only considers the current characteristics of the model, but also is more adaptable to the characteristics of Iran's market).

For the first question, a comprehensive and extensive exploratory study on literature has been done and two models have been extracted in this area. According to the conducted interviews with experts in the explanatory phase, these models seem to be adaptable with Iran's market situation. The main parameters considered in these models are average premium of the market, and breakeven rate which are related to the competitive-based pricing approach and cost-based pricing approach respectively. Iran's Insurance market is not only competitive due to the number of insurance companies in the market, but like every market, it also considers breakeven rate for setting the premium rate.

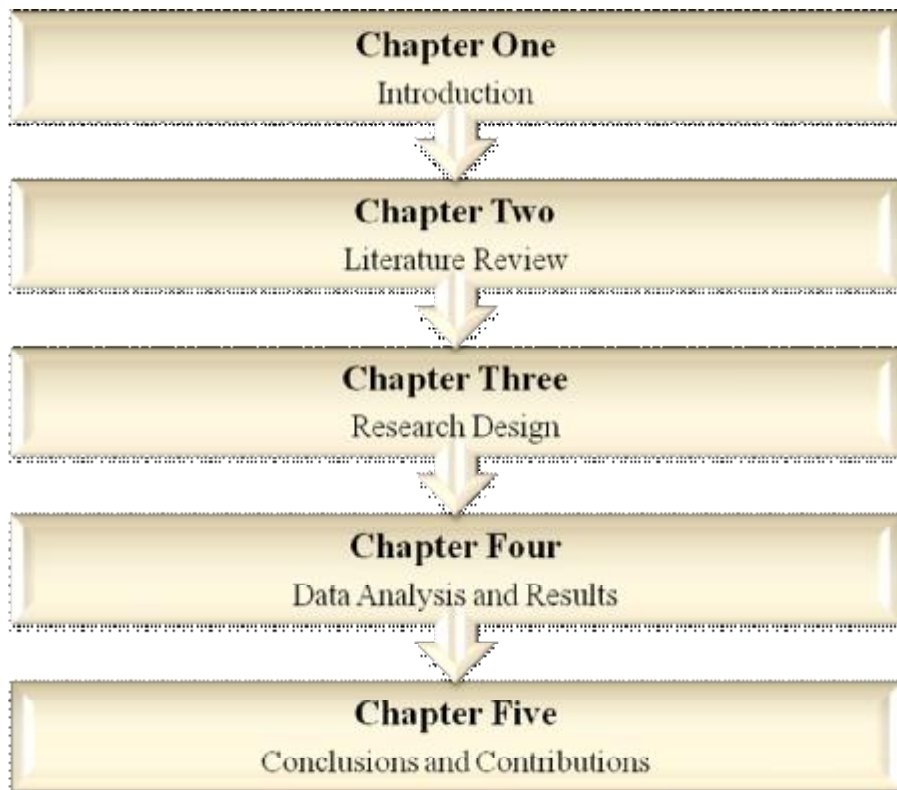
For the second question, an explanatory case study has been done with experts in insurance companies. Semi-structured interviews with experts, seems to be a useful tool for explanatory study. The models have been discussed with experts in the field of auto property coverage and the verbal data have been recorded.

For the third question, the new model has been developed through mathematical analysis. The parameters which seem to be crucial for the model but not considered in the original models have been considered in the new model. A few cases (insurance companies) were selected, the model has been applied for each of them, the results have been analyzed via Matlab program, and finally the challenges have been discussed.

#### **1.4. Structure of the Thesis**

This thesis consists of five chapters, as shown in Figure 1.5.

In this chapter an introduction to the research was given and research objectives and questions were clarified. In the second chapter, relevant theoretical areas and literature is presented. In the third chapter, research design appropriate for achieving the defined objective is explored. In the fourth chapter, data are analyzed and finally, in chapter five, conclusions as well as contributions and implications in addition to recommendations for further research is brought up.



**Figure 1-5:** Structure of the Thesis



## **Chapter Two**

### **Literature Review**

#### **2. Chapter Two: Literature Review**

*This chapter starts with definition of price and some related concepts in this field followed by pricing approach of services, concepts and characteristics of services. The chapter continues with concepts of insurance, characteristics, and different types of this service. Finally two models of pricing the insurance service have been discussed in detail.*

##### **2.1. The Concept of Price**

Price is the only element of the marketing mix that produces revenue; the other elements produce costs. Prices are the easiest marketing-mix element to adjust; product

features, channels and even promotion take more time. Price also communicates to the market the company's intended value positioning of its product or brand (Kotler, 2003). According to Stanton et al. (1993) price is the amount of money and/or items with utility needed to acquire a product. Utility is an attribute that has the potential to satisfy wants (Spingies & Du Toit, 1997).

The theory of prices centers on normative approaches to pricing derived from the field of microeconomics, which attempt to maximize the economic target variables, such as turnover and profit. Taking the cost and price-demand functions and assumptions about the behavior of competitors as a basis, these models yield profit and turnover-maximization prices both for individual products and for the components of entire product lines.

All these approaches share the conceptual assumption that consumers are economically rational (Hermann & Wricke, 1998). On the other hand, in behavioral science pricing models, the objective is to explain the actual, and sometimes limited rational behavior of consumers when they attend the price. The hypothetical constructs used to do so provide an indication of the activating and cognitive processes that take place in the consumers' mind (Gurumurthy and Little, 1994; cited by Herrmann and Wricke, 1998). Among the constructs most relevant to the theory of prices are interest in the price, the price reasonableness rating and the value-for-money rating. Interest in the price is defined as the desire of a consumer to seek out price information and to take it into account in a purchase decision. Price judgment behavior embraces all the behavioral patterns that occur when price information is absorbed and processed. In contrast with interest in the price, it is the cognitive elements of the price behavior that are subsumed under this term, rather than the activating elements. A price reasonableness rating refers solely to the price level, in other words it takes no account of the quality of the offered commodity or of the scope of the services provided. A value-for money rating, on the other hand, describes the price-performance ratio of the product (Hermann & Wricke, 1998).

Another definition provided by Sutherland and Gross (1991), emphasize that pricing correlates with the value of a product. A product or service has to have a price so that the prospective buyer knows what he or she will have to pay for that product or

service. In economic theory the concept of price describes the monetary value of an item. Price can be regarded as the exchange value of a product and it is closely linked to concepts such as benefit and value. Something of value – usually purchasing power – is exchanged for satisfaction or utility (Spingies & Du Toit, 1997).

## **2.2. Importance and Deficit of Pricing Studies**

At a microeconomic level, prices play a pivotal role in the functioning of the economic system as a whole and they indicate how resources shall be utilized, they are important both to producers and consumers, as they tend to determine what shall be produced and the distribution of this production to various claimants (Diamantopoulos & Mathews, 1995).

According to Alvonitis, Indounas, and Gounaris, (2005) and Alvonitis, Indounas, and Gounaris, (2006), a considerable number of authors have suggested the importance of pricing for every firm's profitability and long term survival. For instance, Nagle and Holden (1995) have argued:

*“If effective product development, promotion and distribution sow the seeds of business success, effective pricing is the harvest. Although effective pricing can never compensate for poor execution of the first three elements, ineffective pricing can surely prevent those efforts from resulting in financial success.”*

Price is a central issue both for marketing and economics. The determination of price and its importance not only for the firm and its customers but also for the whole economy have been investigated thoroughly and constitute the single most important issue of common interest and concern to both disciplines (Skouras, Avlonitis, & Indounas, 2005).

From a micro-economic perspective, or the perspective of the individual organization, price is the single most important decision in marketing. This derives from

the fundamental relationship between profit and price, which can be expressed simply as: Profit = Price – Cost, on a per unit basis (Rowley, 1997).

Moreover, Marn & Rosiello (1992), Finch, Becherer & Casavant (1998), Potter (2000), Shipley & Jobber (2001), and Kotler (2003) have suggested that pricing is the only element of the marketing mix that produces revenues for the firm, while all the others are related to expenses. In addition Urbany (2001), and Kotler (2003) has argued that pricing is the most flexible element in the marketing strategy in that pricing decisions can be implemented relatively quickly and at a low cost, comparing with the other elements of marketing strategy.

Pricing is traditionally recognized to play a central role in the functioning of the economic system. The three macro-economic functions of price are: allocation or rationing, or the balancing of the quantities demanded and those supplied; stimulation, and acting as an incentive for new players and products to enter a marketplace; and distributive whereby income is distributed between buyers and sellers. The price mechanism is the dominant force in resource allocation, income distribution and size and composition of output (Backman, 1965; cited by Rowley, 1997). Price is also important in relationships with customers. Price is the value placed on what is exchanged. Price represents the value at which a seller is prepared to exchange and the value at which the customer is prepared to participate in that exchange (Rowley, 1997).

Despite this significance of pricing as an element of marketing strategy, the empirical studies that have been conducted on this issue are very limited. This has led Nagle and Holden (1995) to point out that even nowadays pricing is the most neglected element of the marketing mix among marketing academics (Alvonitis, Indounas, & Gounaris, 2005; Avlonotis, Indounas, & Gounaris, 2006; Avlonotis & Indounas, 2006).

Also Hinterhuber (2004) has suggested that not only managers, but also academics, have shown little interest in the subject of pricing. Publications on this subject are not anywhere as numerous as publications on other classical marketing instruments such as product, promotion and distribution (Avlonitis & Indounas, 2006). Moreover, both commentators on the information marketplace and those on pricing decisions in general agree that while the pricing decision has a direct impact on profit, firm's sales revenue, and on all other elements of the marketing mix, price planning is one of the most