

LIQUIDITY RISK SITUATION OF TURKISH INSURANCE INDUSTRY AND
FIRM SPECIFIC FACTORS AFFECTING LIQUIDITY

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ABSTRACT

LIQUIDITY RISK SITUATION OF TURKISH INSURANCE INDUSTRY AND FIRM SPECIFIC FACTORS AFFECTING LIQUIDITY

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Recent changes in the insurance regulations and laws in Turkey lead insurance industry to gain further importance and turn the insurance industry one of the rising sectors in financial markets. However, while these favorable events for the insurance industry takes place in Turkish markets, on the global markets the economic crisis initiated with the collapse of US sub-prime mortgage markets deepened and the credit crunch arose in the aftermath. In the times of credit stress having good liquidity base is important for the firms. In recent economic crisis, liquidity related troubles resulted in bailouts or takeovers of giant financial companies. In order to prevent negative consequences of inadequate liquidity and to sustain financial stability, having appropriate level of liquidity is especially crucial for financial companies like insurers. In this thesis it is aimed to analyze the Turkish insurance sector's liquidity condition for the period between 2002 and 2008 with the help of liquidity ratios. Considering the nature of the business, a distinction is made between "non-life" and "life" insurance companies while assessing their liquidity ratios. Furthermore, panel data regression analysis is conducted to determine the firm specific factors affecting the liquidity decisions of non-life insurers operating in Turkey.

Keywords: Insurance, liquidity risk, ratio analysis, regression analysis, Turkey

ÖZ

TÜRKİYE SİGORTACILIK ENDÜSTRİSİNİN LİKİDİTE RİSKİ DURUMU VE LİKİDİTEYİ ETKİLEYEN FİRMAYA ÖZGÜ FAKTÖRLER

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Türkiye sigortacılık yönetmeliklerinde ve yasalarında yapılan yakın zamandaki değişiklikler, sigorta sektörünün daha çok önem kazanmasına ve sigorta sektörünün finansal piyasalarda yükselen bir sektör haline gelmesine yol açmıştır. Ancak, Türkiye Sigortacılık endüstrisinde bu olumlu değişiklikler gerçekleşirken, küresel piyasalarda Amerika'daki sub-prime mortgage piyasasının çöküşüyle birlikte başlayan ekonomik krizin derinliği artmış ve kredi daralmasına neden olmuştur. Kredi krizi olduğu dönemlerde iyi bir likiditeye sahip olmak firmalar için önemlidir. Yakın geçmişteki ekonomik krizde, likidite ile ilgili sorunlar büyük finansal şirketlerin batmasına ya da devralınmasına neden olmuştur. Likidite yetersizliğin olumsuz sonuçlarını önlemek ve finansal istikrarı sağlayabilmek için uygun düzeyde likiditeye sahip olmak, özellikle sigorta şirketleri gibi finansal şirketler için çok önemlidir. Bu tez Türkiye sigorta sektörünün likidite yapısını 2002-2008 yılları arasında likidite oranları yardımıyla ile incelemeyi amaçlamıştır. Hayat ve hayat dışı sigorta şirketlerinin likidite oranları yapıları gereği ayrı ayrı incelenmiştir. Buna ek olarak, Türkiye'de faaliyet gösteren hayat dışı sigorta şirketlerinin likiditesini etkileyen firmaya özgü faktörleri belirlemek için panel veri regresyon analizi yapılmıştır.

Anahtar Kelimeler: Sigorta, likidite riski, rasyo analizi, regresyon analizi, Türkiye

To My Family and İlker

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CHAPTER I

INTRODUCTION

Insurance is a financial agreement that redistributes the costs of unexpected losses a policyholder could not individually bear itself otherwise, among the pool of insurance members that are also under the exposure of the same risks in exchange for premium collections (Dorfman, 2005; Rejda, 2005; Williams, Smith, and, Young 1995). From its establishment to today's world economy, insurance system proved to be essential for well functioning financial markets and to secure the individuals or groups from huge unbearable losses (Başpınar, 2005).

The need of individuals to secure themselves and their economic and social status create a huge and essential industry in the world. As the industry grows, its functions and activities also become more and more complicated and are integrated to financial markets. Even in England, having a developed insurance industry, insurers established banks in order to invest their premiums (Başpınar, 2005). In addition, insurance companies are very important for financial intermediaries. Annually, life insurance companies collect billions of dollars in people's savings and reinvest them into economy. Property insurers also maintain billions of dollars in their reserve accounts that are invested in private enterprise economy (Dorfman, 2005). Moreover, they work closely with the banks.

Beside the fact that insurance industry has become an inseparable part of financial markets and interrelated with the global economy, insurance companies are also nested with the existence of reinsurance (Başpınar, 2005). An insurance company can transfer the part of the risk, believed to be over their financial strength, to any other insurance company called reinsurers. In addition, those reinsurers could also transfer some part of their risk to other

reinsurers. With this system, any realized risk, despite not directly insured by an insurance company, could affect the company directly through the reinsurance channel.

Considering the interrelated activities with the financial sector and reinsurance activity, it is inevitable for insurers to be unaffected from the financial or economic crisis. In fact, in some cases failure of a big insurance company cause crisis per se.

Today world economy is facing an important financial crisis, which triggered from the failure occurred in the US sub-prime mortgage system and spread all around the world. In 2008, the crisis evolved from liquidity crisis to solvency crisis, resulting in financial disaster causing rapidly increasing level of insolvencies given the shortage of liquidity in the credit markets, many bank failures in the United States and nationalizations in Europe and finally unprecedented volatility in both equity and fixed income markets (Brunnermeier, 2009).

The financial turmoil makes it harder for the banks to find the necessary liquidity they needed because it is getting difficult to borrow foreign loans. In addition, the increase in capital requirement, due to the losses arisen from unpaid credits of the financial institutions and due to decreasing value of real estates, increases the need for liquidity. Moreover, unexpected demand for liquidity to fund the sudden depletion in liabilities such as cash calls and deposit withdrawals resulted in selling assets at an unanticipated low price. As the banks are having difficulty in finding necessary funding, they are becoming tighter in their credit policies, which in turn affect the liquidity position of other sectors (TCMB, 2008). In fact, the financial market turmoil in 2007 and 2008 has led to the most severe financial crisis since the Great Depression and threatened to have large repercussions on the real economy as well (Brunnermeier, 2009).

Many companies in financial sector have been affected by the recent economic turmoil. Particularly, the downturn has had a profound effect on AIG, one of the largest international insurance companies, which nearly went bankrupt as a result of its exposure to credit default swaps (CDS) written for asset-backed securities and collateralized debt obligations. As the value of the assets underlying these instruments fell, AIG was forced to write down its positions. After downgraded by rating agencies, the company could not

sustain its positions and thus needed additional liquidity (entered in loss spiral see: Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997; Gromb and Vayanos, 2002). On September 16th, its share price fell over 90%. In order to limit the effect on already unstable financial markets, the US Government loaned AIG in exchange for a more than %75 of its equity stake (Brunnermeier, 2009).

Although AIG is seen as unique in the insurance sector; due to its large exposure to sub-prime related derivatives contracts, as the credit crisis has affected the higher grade securities, investment losses have been seen in the wider industry (Maslakovic, 2008).

The insurance industry is exposed to the credit risk on the assets side through investments and on the liabilities side through providing insurance coverage (Maslakovic, 2008). So far the extent of losses on both sides has been limited. Insurance companies typically have a minor exposure to mortgage-related assets and losses on insurance coverage have been limited to specialized lines of business such as mortgage guaranty policies, directors and officers claims and errors and omissions claims. Insurance companies (specifically life insurance companies) typically employ less leverage than banks and have longer-term liabilities and investments, so are better placed to avoid liquidity difficulties. Yet, the tighter credit market and a decline in investment returns is leading to losses throughout the industry.

Insurers have historically derived around 15-20% of their revenue from investment income. The downturn in securities markets in 2008 has resulted in a significant reduction in this revenue stream. Such credit worries could also result in a loss in new business premiums due to solvency concerns. Despite the limited impact of the credit crisis on the insurance industry so far, there may be longer-term consequences for the industry.

In addition, the negative consequences of the financial distress experienced by financial institutions not only affect the institution itself. Since those institutions provides services for a large number of people. The situation of financial institutions facing financial inadequacy or insolvency negatively affects depositor, customer or insured, the number of whom is expressed by millions.

Considering the current financial crisis and its ripple effects, once again the importance of the liquidity risk and its management is in the spotlight. The recent financial crisis has shown cases where financial institutions regardless of their size and reputation can financially struggle if a proper amount of liquidity is not maintained (Choi et.al, 2009). As liquidity risk is always one of the major concerns for both financial and nonfinancial companies there are plenty of methods established to monitor and manage this risk (Crouhy, Galai, and Mark, 2001; Hull, 2007; Das, 2006; Lore and Brodovsky, 2000).

One of the most commonly used measure that gives idea about financial soundness of the firms in terms of liquidity is ratio analysis which is a convenient way to summarize the financial condition and to compare performance among organizations (Williams, et. al., 1995).

This thesis aims to identify liquidity risk structure of the Turkish insurance industry. Turkish insurance sector's liquidity condition from 2002 to 2008 is analyzed through calculating the following ratios; liquid assets to total assets, liquidity, current, premiums and reinsurance receivables to total assets, agents receivables to total equity, total equity to total assets, working capital to written premiums. In addition, the growth rate of total assets, the growth rate of liquid assets and growth rate of current liabilities of insurance companies in Turkey are also examined. Considering the nature of the business, distinction is made between "non-life" and "life" insurance companies when assessing the liquidity ratios. In addition to this, the factors that determine the liquidity holdings of the Turkish insurance companies (particularly non-life insurance companies) are investigated through panel data regression analysis.

The outline of the thesis is as follows: In chapter 2 the fundamental terminology and concepts regarding the insurance industry is reviewed and history and structure of insurance industry is presented. Moreover, information about the insurance sector in the World and in Turkey is presented in this chapter. In chapter 3, literature about liquidity risk is reviewed; also, liquidity risk in insurance sector is explained and management of liquidity risk is mentioned. Chapter 4 is devoted to explaining the data and methodology used for liquidity risk analysis of Turkish insurance industry and presents the results of the ratio analysis. Chapter 5 covers the literature, model description, and empirical results

associated with the firm specific determinants of liquidity holdings of non-life insurance companies. Lastly, chapter 6 is the conclusion of the thesis.

CHAPTER II

THE FUNDAMENTAL CONCEPTS AND DEFINITIONS REGARDING INSURANCE INDUSTRY

In this chapter the fundamental concepts and definitions regarding insurance industry are presented to give idea about the insurance industry. This chapter has three main sections. In the first section the definition of insurance, types of insurance companies and insurance branches in Turkey are briefly stated. In the second section, operations and organizational structure of insurance companies is mentioned. In the last section, the historical development and overview of insurance industry in the world and in Turkey is presented.

2.1. Insurance Industry

2.1.1. Definition of Insurance

Insurance is a complicated and intricate mechanism; which is consequently difficult to define (Vaughan and Vaughan, 1995). There is no single definition for insurance. It can be defined from viewpoint of several disciplines (Rejda, 2005).

As a financial definition, “insurance is a financial arrangement that redistributes the costs of unexpected losses” (Dorfman M., 2005, pp.2). As a legal definition, “insurance is a contractual arrangement whereby one party agrees to compensate another party for losses” (Dorfman M., 2005, pp. 2). From individual point of view, insurance is an economic device whereby the individual exchange a small certain cost for a large uncertain financial loss that would exist in the absence of the insurance (Vaughan and Vaughan, 1995).

The Commission on Insurance Terminology of American Risk and Insurance Association has defined insurance as follows; “Insurance is the pooling of fortuitous losses by transfer of such risks to insurers, who agree to indemnify insurers for such losses, to provide other pecuniary benefits on their occurrences, or to render services connected with the risk” (William, et al., 1995, pp.20).

An insurance system redistributes the cost of losses by collecting a premium payment from every participant (insured) in the system and held insurer under the obligation to pay the insured’s claims in the event of the covered losses (Dorfman M., 2005).

Any insurance arrangement is subject to a unique set of principles established through centuries of statutory legislation, common law and other regulatory influences. The critical principles of insurance can be stated as follows:

- **Insurable Interest Principal:** A legitimate relationship or financial interest between the insured and the subject matter of insurance must exist.
- **Utmost Good Faith:** An obligation on insured and insurer to disclose material facts and avoid making untrue statements during formation of a contract.
- **Proximate Cause Principal:** The active efficient cause that sets in motion a train of events that brings about a result, without the intervention of another independent force.
- **Indemnity Principal:** Insured is restored to same financial position after loss as they were immediately beforehand; stated differently, the insured should not profit from a loss
- **Subrogation Principal:** Having granted indemnity, an insurer inherits all the insured’s rights and interests in the subject matter of insurance – e.g. salvage, pursue third parties for recovery.
- **Contribution Principal:** The right of an insurer to call on other insurers, also liable to an insured, to share the cost of an indemnity payment (www.tsev.org.tr).

People need insurance to reduce uncertainty and to finance their losses. As a mechanism, insurance is a social device under which two entities make or promise to make contributions to a fund from which the insurer promises to make payments to contributors who suffer accidental loss. As a product, insurance is a promise to pay in the event of a loss (Williams et. al, 1995; Dorfman, 2005; Rejda, 2005).

2.1.2. Types of Insurance Companies

Insurers can be classified into two broad categories: life insurers and non-life insurers (Williams et al., 1995). As can be inferred from its name, life insurers can write life and health insurance policies whereas the non-life insurers can write insurance other than life insurance. Also this classification could be named as life and health insurers and property and liability insurers or property and casualty insurers (Rejda, 2005).

In this section, I will briefly explain the differences between property-causalty and life/health insurers. This is because life/health insurers differ greatly in terms of operations, investment activities, vulnerabilities, and duration of liabilities from general insurers (Brockett, Cooper, Golden, and Pitaktong, 1994). Life insurers are said to function as "financial intermediaries" while general insurers function as "risk takers" (Chen, and Wong 2004).

2.1.2.1. Life and Health Insurance Segment

The fundamental idea underlying the life insurance is the fact that human life has an economic value which has an earning capacity that arise from the human personality, intelligence, health and strength. The insurable value of the ability of a person to generate income and the corresponding claim payment in case of the disability stemmed from death or injury is determined by actuarial techniques. Basically, the life insurer agrees to pay that determined amount upon the occurrence of the insured individuals' death or other event such as terminal illness in return for the premiums collected from policy owner. In a broad sense, life insurers can write life and health insurance (Williams et. al., 1995).

- **Life Insurance:** Traditional life insurance provides income for the survivors of an insured when he/she dies. It also can be used as an investment mechanism to provide income in the future. This is the case with annuities, pension funds and other variable products. Life insurance products used in this manner may provide tax benefits as well.
- **Health Insurance:** Policies that pay benefits such as Accidental Death or Dismemberment; Disability Income; Basic and Major Medical Expense. Accidents occur; illness and disability can result in considerable expense and loss of income. Insurers provide policies that pay health benefits.

2.1.2.2. Non-life (Property and Casualty) Insurance Segment

This segment includes all other type of insurance that are not included in the life insurance segment. This category includes variety of insurance braches, which can differ across countries. However, in a boarder sense, the non-life insurance category also divided as property and casualty insurance segment.

- **Property Insurance:** Property insurance protects insured from financial loss of property from perils such as fire, lightening and wind
- **Casualty Insurance:** Casualty insurance protects insured from financial loss due to accidents that injure others as a result of actions, premises or operations of the insured. An insured person sued by an injured person and found negligent in causing or in not preventing the injury is considered as legally liable.

2.1.3. Insurance Branches in Turkey

It is possible to classify insurance branches differently. In parallel with global insurance, there are two main insurance segments, life and non-life according to Turkish Insurance Legislation. Insurance companies have been allowed to operate either in life or non-life insurance branches since 1998 according to legislation.

There had been 10 branches in non-life group before the establishment of new Insurance Law (no: 5684). Those branches were fire, transport, compulsory third party liability, accident, personal accident, credit, legal protection, engineering, agriculture and health.

With the new legislation, companies started to operate in 18 branches of nonlife group and 7 branches of life group as of 01.01.2008. In current system, pure life insurance companies could also operate in health and casualty branches of non-life branches. If a life insurance company also operates in pension system, it can only work in casualty from non-life branches.

Health, casualty, land vehicles, railway vehicles, sea vehicles, transport, fire, general damages, land vehicle liability, air vehicle liability, sea vehicle liability, public liability, credit, fidelity guarantee financial loss, legal protection and support branches constitute non-life insurance branches. Life, health, casualty, marriage and birth, capital redemption and investment fund insurance branches are included in the life insurance segment (Insurance and Pension Annual Report, 2008).

2.2. Organizational Structure of Insurance Companies

2.2.1. Insurance Company Operations

The general insurance business model is based on generating both underwriting profit and investment income. Any event that money flows in or out of an insurance company will affect its profitability.

Generally speaking, financial transactions regarding an insurance company's activities can be grouped into four major categories:

- Collection of premium
 - Insurance premiums from all policyholders are paid into a pool, thereby putting the principle that the resources of the many will support the unfortunate few, into practice.

- Payment of operating expenses and claims
 - Valid claims are paid from the pool.
 - All company expenses, including policy administration costs are also paid out from the pool.
- Investment of funds
 - The pool of money that has been built up from premium income is invested in equity, bonds, real estate, cash investments etc.
- Receipt of investment income
 - The return from the investments is then put back into the premium and investment income pool.

If all the above factors have been well balanced, this profit fund can then be used to pay dividends to shareholders or policyholders, depending on ownership structure, and further investments in the business itself (Cammack, and Mehr 1972; Williams et. al., 1995; Rejda, 2005; Dorfman, 2005).

2.2.2. Insurance Company Organization

A traditional insurance organization typically has eight major functional areas;

- Sales: Distributes products/ generate demand.
- Underwriting: Selects and classifies the insured.
- Claims: Ensures that the insurance company fulfills its contractual promises to provide protection.
- Risk Management: Inspects insured premises to identify exposures to loss and assist in pointing out ways to reduce or minimize these exposures.
- Ratemaking: Determines rates through loss costs and loading of expenses.
- Investment: Maximizes returns by investing funds in securities and real estate.
- Reinsurance: Shifts part of the financial risk of one insurer to another.
- Policy Administration: handles the back office functions such as issuing policies.

As can be seen from the functions listed above, it is possible to say that insurance companies are complex organizations that comprise of many interdependent functions that contribute to overall performance. The two core capabilities that determine an insurance company's profitability reside within the underwriting and claims functions. More sophisticated underwriting/pricing and better management of claims costs are key to performance improvement. Underwriting refers to the process of writing business at the right price, terms and conditions to reflect the risk. On the other hand, the claims function is responsible for the management of incurred losses, which represents a significant and inevitable part of the insurance product proposition. At this point, the functionality of risk management in insurance sector is so crucial since risk management is intended to minimize the costs associated with assuming certain types of risk and providing prudent protection and efficient risk management also makes it possible to select the "best" (most profitable) insureds based on risk characteristics which ensures overall profitability (Mayerson,1962).

2.2.3. Key Performance Ratios

General insurer performance is measured by some key financial ratios which directly influence shareholder return (Williams et. al., 1995; Dorfman, 2005).

1) The Loss Ratio

The loss ratio, the incurred losses divided by the earned premiums, is comprised of the money paid on claims as well as the expenses to adjust those claims. It represents the portion of the premium returned to policyholders as insurance benefits. As the values of the incurred losses are not determined with certainty, the loss ratio usually is an estimate in actuality.

2) Expense Ratio

There are many different types of expense ratios however in general it refers to the underwriting expenses. The (underwriting) expense ratio, the total expenses divided by

written premiums, represents the portion of the premium consumed in act of writing the coverage. It is an indication of how efficiently an insurance company is running its operations: acquiring and managing or servicing business.

3) Combined Ratio

The combined ratio is the sum of the loss ratio and the expense ratio. It measures how well a company is doing in its core insurance operations. It represents the level of business expenses and outgoings in relation to the premium income. This is the key measure of operational effectiveness and efficiency.

4) Operating Ratio

The operating ratio is combined ratio less investment income ratio, which is a ratio of net investment income to net premiums earned. It measures an insurer's profitability per dollar of premium. It indicates the overall profitability of a company since it considers investments.

5) Investment Ratio

It is the ratio of, income derived from insurer's investments other than its insurance operations to the company's earned premiums. The investment ratio indicates investment return earned on premiums.

6) Premiums to Surplus Ratio

It is the ratio of net premiums written to policyholders' surplus, which is the difference between an insurer's assets and liabilities. As the policyholders' surplus is a cushion against adverse developments, premiums-to-surplus ratio measures the degree to which the insurer is vulnerable to adverse developments.

7) Policyholders' Surplus Ratio

It is a ratio of surplus to liabilities. The policyholder' surplus ratio is a direct test of the adequacy of assets to meet liabilities estimated at a point in time. It represents the largest percent increase of the claims that the insurer could take place that insurer can still meet estimated claims.

2.3. History and Overview of Insurance Industry

2.3.1. History of Insurance - World

The first type of insurance activities within the world financial history could be observed in Babylonian times, around 2100 B.C. The Code of Hammurabi was the first basic insurance policy. This policy was paid by the traders in the form of a loan to guarantee the safe arrival of their goods by caravan against possible dangers like robbery, bad weather and breakdowns. The importance of the Code of Hammurabi was the fact that the loss of caravan trader who was attacked by bandits was being shared between all other caravan traders and this was the first example for the loss sharing within the land transportation activities (www.tsrbsb.org.tr).

As time passed by, the needs for insurance increased. The Phoenicians and the Greeks wanted the same type of insurance with their marine trade. The Romans were the first to have burial insurance – people joined burial clubs which paid funeral expenses to surviving family members. In medieval times, the guilds protected their members from loss by fire and shipwreck, paid ransoms to pirates, and provided respectable burials as well as support in times of sickness and poverty (Marples, 2008).

There were many people in Carthaginians, Romans and Greeks, first examples of maritime nations, who lend money for the cargo carried by ships to cover the risk of not reaching the port. These people had the right to get back the money they lent and also to earn interest in

return for the risk born. The Church at those times could not accept those high levels of interests and after a while, interests earned by these activities (usury) were banned by the Church. This prohibition was important in history of insurance activities since it gave way to the rise of insurance idea (www.tsrsb.org.tr).

In the 14th century Italy was leading the marine trade and they needed insurance concept in terms of protection against losses. Therefore, the term “marine insurance” firstly came into existence in Italy. The earliest premium based insurance contract is a marine insurance contract on a ship “The Santa Clara” dated 1347 in Genoa. The policy is in the Italian language and appears in the form a maritime loan to avoid the canon (church) prohibition against usury (www.tsrsb.org.tr).

Policies were signed by individuals, either alone or in a group. They each wrote their name and the amount of risk they were willing to assume under the insurance proposal. That’s where the term **underwriter** came from (Marples, 2008).

The first legislation about insurance activities was passed in 1435 in Spain. Marine insurance was brought to England from Italy by the Lombard merchants who established themselves in London and controlled a large portion of British commerce in the 15th and 16th centuries. Insurance activities that started mainly in marine area then spread to the life insurance activities. Life insurance is probably an outgrowth of marine insurance. The earliest known life insurance policy was written in 1536 (Mayerson, 1962). Insuring of ships and cargos gave way to insuring of captain, passengers and ship’s crew.

In the second half of 17th century, two major events came into existence which was really crucial for the development of insurance activities. The first one was the usage of “Probability Calculations” that made it possible to benefit from statistical methods and techniques (www.tsrsb.org.tr).

Underwriters play a big part in the insurance industry. They are the ones who calculate the risk, based on statistics, and decide what the premiums will be. In 1693, the astronomer Edmond Halley created a basis for underwriting life insurance by developing the first

mortality table. He combined the statistical laws of mortality and the principle of compound interest. However, this table used the same rate for all ages. In 1756, Joseph Dodson corrected this error and made it possible to scale the premium rate to age (Marples, 2008).

The second one was the Great Fire of 1666 which devastated 373 of the 460 acres of the City of London and destroyed 13.200 of its 15.000 houses, besides many public buildings. Fire insurance was unknown before the Great Fire of London; the first of fire insurance companies were founded soon after that date (Mayerson, 1962). The new era started with the establishment of Lloyd's in 1688 in England. Toward the end of the seventeenth century, London's growing importance as a centre for trade increased demand for marine insurance. In the late 1680s, Edward Lloyd opened a coffee house that became a popular haunt of ship owners, merchants, and ships' captains, and thereby a reliable source of the latest shipping news. It became the meeting place for parties wishing to insure cargoes and ships, and those willing to underwrite such ventures. This was the beginning of the world-wide insurance operation now known as "Lloyd's of London". Today, Lloyd's of London remains the leading market for marine and other specialist types of insurance, but it works rather differently than the more familiar kinds of insurance (www.tsrbsb.org.tr).

As commerce grew so did the need for insurance. In the 17th and 18th centuries, British commerce was rapidly growing. As commerce grew, risks increased. In a way, progress was actually working against the insurance industry – there were more and more ways of goods being damaged or lost, as goods were shipped greater distances and by more advanced methods. Therefore, there were higher payouts for claims. The members of stock companies saw an opportunity for a profitable business there. In 1720 first two insurance corporations were chartered in England, the London Assurance Corporation and the Royal Exchange Assurance Corporation (Mayerson, 1962).

Insurance companies had to work together to find a solution to the challenge of large losses. So they got together and devised a system called **reinsurance** whereby losses were distributed among many companies. This system is now commonly used in all types of insurance.

The insurance industry was growing to huge proportions. The companies, despite being competitors, worked together to create productive systems that could be used throughout the industry. They needed to keep up with the requirements of the increasing amount of laws governing insurance. For example, the Workmen's Compensation Act of 1897 in Britain required employers to insure their employees against industrial accidents. This also fostered what is known today as public liability insurance, which came strongly into play when the automobile arrived on the scene.

In the 19th century, many societies were founded to insure the life and health of their members. Fraternal orders were created to provide low-cost insurance strictly for their members. Today, many of these fraternal orders and labor organizations still exist. Most employers offer group insurance policies for their employees, providing them with life insurance, sickness and accident benefits, and pensions. The need for protection against many risks in life made the term "insurance" so common in modern daily life (Marples, 2008).

2.3.2. The Overview of World Insurance Industry

Insurance sector's structure and size differs among countries. The size of the industry greatly related with the size of the economy. In addition to this, the structure of the market is mostly shaped by the regulations prevailing in the countries. In some developing countries state owned monopolies exist, as only domestic suppliers providing the services. In some countries, markets are quite concentrated while in others are not (Kwon, and Skipper 2007).

Gross direct written premium is the most commonly accepted measure of insurance market size (Kwon, and Skipper 2007). Global insurance industry is mainly made up of industrialized economies. "The top four countries accounted for nearly 60% of premiums in 2007. The US and UK alone accounted for 42% of world insurance, much higher than their 7% share of the global population. Emerging markets accounted for over 85% of the world's population but generated only around 10% of premiums" (Maslakovic, 2008, pp.3).

Europe is the most important region having % 41 of world insurance market shares, the life segment constitutes % 42 of the world life insurance market share with \$1,065bn premium written, and non-life segment composes %39 of world non-life insurance market share with \$631bn in 2008. Europe is followed by North America (\$1,450bn) and Asia (\$933bn).

In terms of countries, the U.S. has the biggest size having % 29 of total world insurance market share according to premium income. Japan is the second largest country having almost one third of the U.S. market share, %11, and followed by the U.K. having %10 of the total world market share.

The impact of the global crisis on the insurance industry has been limited in 2008 compared to the effect it had on the overall financial services sector. The industry was affected by the crisis at a later stage because of the regular income derived on insurance premiums, cautious attitude of the companies in their investments, and the legislation that imposes strict supervisory rules (Anadolu Sigorta Annual Report, 2008).

In 2008, insurance premiums written worldwide rose to USD 4,270 bn whereas, it was USD 4,127 bn in 2007. When the worldwide insurance premiums are examined, it is observed that the non-life insurance constituted USD 1,779 bn and the life business made a production of USD 2,490 bn in 2008. Premiums in real terms that are adjusted for inflation show a declining growth rate both in life and non-life industries in 2008 and this negative growth is observed for the first time since 1980.

Table 2.1- Real Premium Growth Rates in 2008 (%)

	Life	Non-life	Total
Industrialized Countries	-5.3	-1.9	-3.4
Emerging Markets	14.6	7.1	11.1
World	-3.5	-0.8	-2.0

Source: Swiss Re Sigma Study - World Insurance in 2008 - Swiss Re Economic Research & Consulting- www.swissre.com

In Table 2.1, it is seen that both in life and non-life insurance sectors, premium declined in real terms in industrialized countries, -5.3% and -1.9% respectively, whereas the case is the opposite in emerging markets in 2008, 14.6% and 7.1% respectively. The worldwide non-life premium production fell by 0.8% and life premiums fell by 3.5%. The major reason behind the decline in worldwide life insurance premium production is the negative growth (-5.3%) in industrialized countries which is mainly caused by the financial crisis in the second half of 2008.

The decline in worldwide real premiums in non-life business was lower than the life industry with 0.8% negative growth. In the industrialized countries, premiums written declined by 1.9%, but emerging markets had a positive growth in real terms (7.1%).

Though the stagnation caused by the global crisis combined with liquidity shortage gave rise to significant issues for a part of the financial services sector, the insurance industry was able to get through the first phase of the financial crisis without suffering from major negative impacts. The primary exceptions to this were AIG and Fortis. One of the biggest companies in the world, AIG was able to sustain its operations only by means of urgent loan in the amount of USD 85 billion extended by the Federal Reserve Bank (Anadolu Sigorta Annual Report, 2008).

The default of investment bank Lehman Brothers in September 2008 had tremendous effects on the collapse of credit markets globally. This event has ripple effects on financial markets. Particularly, insurance industry is much more affected after this financial crisis via the drop in the shareholder value.

Total losses caused by the natural disasters that occurred in 2008 are estimated to amount to USD 200 billion, while insured loss amount was nearly USD 45 billion. With these figures, 2008 has been the third year with highest losses after 2005 and 1995. The great majority of these losses resulted from meteorological events. Such great number of hurricanes had never occurred before in the first half of any year, and 2008 was marked by weather catastrophes that particularly hit America. Six tropical cyclones occurred along the American coasts, with Ike and Gustav being the most drastic ones among them; insured

losses of these two extraordinary events were determined as USD 30 billion and USD 5 billion, respectively. (Anadolu Sigorta Annual Report, 2008).

The financial crisis and increased meteorological risks also shape the expectations about Solvency II (which is a project that sets solvency standards for the insurers operating in EU), which was planned to be enforced in 2010 but has been postponed to 2012 (Anadolu Sigorta Annual Report, 2008).

2.3.3. History of Turkish Insurance Sector

2.3.3.1. Development of Insurance Industry in Ottoman Empire

In the financial environment of Turkey before second half of the 19th century, it is not possible to talk about insurance activities. Prior to that date, it is known that, in some of the Anatolian villages there were some unions established in order to compensate the community for damages they incurred and also provide the help when it is required. Furthermore, there were some craftsman formations which help its members in times of death and sickness. Yet, those establishments are not insurance in real terms, rather those are establishments settled with the idea of security, mutual aid and social solidarity.

While Europe recorded significant improvements in the insurance sector, the social characteristics of Ottoman society such as religious beliefs and financial environment blocked the development in insurance activities. However, fires that occurred in the second half of the 19th century which causes tremendous damages, had influenced individuals' approach to insurance and gave way to insurance activities come into existence. Especially, damage to many work places, homes, mosques and churches in famous Beyoğlu fire in the summer of 1870 (Great Fire of Pera) and the fact that foreigners and wealthy people who were working closely with foreigners lived there, contributed to the growth of insurance activities.

In 1872 the British insurance companies started the first insurance activities in Turkey with

their agencies. French followed British insurance companies and the first French companies began their operations in 1878. After that, activities of foreign insurance companies like German, Italian and Swiss ones helped insurance business to expand. Although these foreign companies were meeting the needed requirements, the absence of related insurance laws which make state responsible to control and audit insurance companies' activities led these companies operate as they wanted. They were operating depending on the decisions from the head quarters abroad and they were free in their actions since there did not exist any legal auditing authority.

These foreign insurance companies were underwriting their policies in English or French. In case of dispute, they were accepting the London courts or local courts that were located at the head quarter of relevant foreign insurance company as the legal authority. They were canceling policies whenever they wanted.

The first insurance companies acted freely in an environment, which is peculiar to foreign companies in the absence of regulations and legal authority. On the other hand, these companies did what they promised to their clients and made claims payment on time just to increase their publicity, increase their portfolio levels and make insurance business familiar to people in Turkey. However, through time these companies got the idea to benefit from capitulations that were given to them as privileges and this gave the impression that they could easily increase their earnings. Therefore, in a short period of time many insurance companies were established in Turkey and as a result of desire to make more money, the ethical concerns in insurance business were disregarded and unfair competition and misuse of expertise activities came into existence as well. Foreign insurance companies at those times were not paying claims payments even for the basic fire accidents.

In this environment, the first local insurance company Ottoman Public Insurance Company started to work in 1893. In the following years, foreign companies tended to act together in order to regularize insurance business in Turkey. In 12 July 1900 44 insurance companies, 43 of attendants were foreign companies, came together and set a fixed fire tariff. It was the first tariff in Turkey. Together with the set of tariff, it was decided to establish a trade union for fire insurance companies and a continuous auditing commission.

Despite of the positive works of trade union, not all of insurance companies in Turkey became members of the trade union and they continued to compete unfair and did the opposite of the decisions that were made by the trade union. By the legislations enacted in 1908 and 1914, foreign companies were tried to be taken under control.

Until the foundation of Turkish Republic, insurance sector in Turkey was mainly dominated by foreign companies (www.tsrbsb.org.tr).

2.3.3.2. Development of Insurance Industry in Turkish Republic

By the foundation of Turkish Republic, crucial actions were taken in insurance sector in terms of legal and institutional aspects. The legislation enacted in 1924 made insurance companies use Turkish language and prohibited the usage of English and French. In the same year Insurers Club was established. In 1927, the legislation about the auditing activity of insurance business and insurance companies was enacted.

By the legislation in 1927, it was made possible to audit the activities of local and foreign companies and this gave way to development of insurance business and the increase in the number of companies that were established with national capital. Following 2 years, it was decided to establish a joint stock company which would be managed by T. İş Bankası A.Ş. Therefore; in 1929 Milli Reasürans T.A.Ş. (National Reinsurance) was established. As of that year, reinsurance monopoly started in Turkey and all of local and foreign insurance companies were forced to allocate certain amount of premiums that they collected to Milli Reasürans (National Reinsurance). That company made people believe in insurance system, by forcing insurance companies to make their payments on time and overcoming the problem of unfair competition.

In parallel with these developments, insurance companies were under the control of Trade Ministry in 1939. The legislations enacted in 1987 made crucial changes to improve insurance companies in financial sector. Insurance companies were perceived as a part of fiscal structure and linked to Undersecretary of the Prime Ministry for Foreign Trade

according to the legislation enacted in 1989. Free Tariff System went into effect in May 1990, at Accident Insurance Policies (except compulsory insurances), Engineering and Agricultural Insurance Policies and in October 1990, at Fire and Transportation Insurance Policies.

The monitoring system of premiums based on agency current accounts was given up and the monitoring system on the policy basis was established to prevent collection problems of insurance premiums in January 1995.

Turkish Catastrophe Insurance Pool was established and the management role of this pool is given to Milli Reasürans T.A.Ş. after 1999 earthquakes. Meanwhile compulsory reinsurance transfer was completed in 31.12.2001.

Personal Pension System came into activity in October 27, 2003. As of 2008, there are 53 insurance and pension companies and one reinsurance company actively operating in Turkey. 30 of insurance and pension companies are operating in non-life insurance branch, 11 of them are operating in life and 12 of them are operating in pension branches. 11 of the 12 pensions companies operates in life insurance branch at the same time thus, there is only one company that merely operates in pension branch (www.tsrsb.org.tr)

2.3.4. The Overview of Turkish Insurance Industry

Turkish insurance industry has had consistent growth rates especially after the 2001 financial crisis; however global financial crisis has slowed down the growth rate of the insurance industry in Turkey and has led to negative real growth rate. Compared to other branches of insurance industry, the individual pension system which came into force in 2003 continued to show consistent growth rates even in the year 2008. The number of the participants and the total amount of contributions in the individual pension system rose respectively by 18% and 39% in 2008.

Total amount of assets in Turkish insurance market, increased by 19% and became 27.9

billion TL in 2008. Turkish insurance market provided 13,780 billion TL coverage to the economy in 2008 and this number is a good indicator for the importance of the insurance activities for Turkish economy.

Crucial adjustments with regards to legal area for insurance industry including the pension system had been made and put into force in 2008. The new legislation brought new standards to strengthen capital structure, technical reserves and asset allocation of insurance companies. The main initiative behind these adjustments was to make Turkish insurance market consistent with EU norms based on legal regulations.

Foreign companies show great interest in Turkish insurance market since the market in Turkey progressed successfully for the recent years. The following ratio is a good indicator for this fact: foreign capital share in paid in capital has risen to 51% in 2008 from 23% in 2006 (Insurance and Pension Annual Report, 2008).

2.3.4.1. Turkish Insurance Market's Global Position

In 2008, Turkey is ranked as the 36th country within 88 countries with a share of 0.21% in global premium production. With regards to total premium production in life business, Turkey has been 44th market with a share of 0.05% globally. According to the non-life premium volume, Turkey is ranked as the 27th country in 2008 with a share of 0.43% in global non-life premium production. According to the ratio of premium volume to GDP and premium volume per capita, Turkish insurance market has been 76th and 65th, respectively. Turkey has a premium per capita value of 116.1\$ in 2008. Details about Turkey's share in world premium production, share of premium in GDP and premium per capita based on years between 2002 and 2008 could be figured out in the Table 2.2 below.

As can be seen from Table 2.2, Turkey's share in world premium production in non-life insurance branch is more than life insurance branch for the period 2002-2008. Moreover, Turkey's premium production has a higher value in non-life sector than the life sector both in TL and USD currencies (could be seen in the Table 2.3.). It could be mentioned that non-life insurance branch is more operative than life insurance in Turkey and Turkish

insurance sector tends to grow fast, though it has still a small share in GDP (Insurance and Pension annual Reports, 2002-2008).

Table 2.2- Turkey's Share in Premium Production Details

	2002	2003	2004	2005	2006	2007	2008
Turkey's Share in World Premium Production (%)							
Total	0.09	0.11	0.14	0.17	0.19	0.23	0.21
Non-Life	0.18	0.21	0.27	0.33	0.38	0.50	0.43
Life	0.03	0.03	0.05	0.05	0.05	0.05	0.05
Share of Premium in GDP (%)							
World	8.14	8.06	7.99	7.52	7.52	7.49	7.1
Turkey	1.31	1.38	1.53	1.57	1.28	1.30	1.24
Premium Per Capita (\$)							
World	422.9	469.6	511.5	518.5	554.8	607.7	633.9
Turkey	31.5	49.84	67.69	76.96	89.0	130.8	116.1

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

Table 2.3- Turkey Premium Production Details based on Non-life vs Life Differentiation

	2002	2003	2004	2005	2006	2007	2008
World Premium Production (Billion \$)							
Total	2,626.9	2,958.3	3,243.9	3,445.8	3,674.9	4,060.9	4,269.7
Non-Life	1,090.7	1,275.6	1,395.2	1,442.2	1,549.1	1,667.8	1,779.3
Life	1,536.1	1,682.7	1,848.6	2,003.5	2,125.8	2,393.1	2,490.4

Table 2.3 Continued

Turkey Premium Production (Billion \$)							
Total	2.2	3.3	4.6	5.7	6.9	9.4	7.7
Non-Life	1.9	2.6	3.8	4.7	5.9	8.3	6.7
Life	0.4	0.7	0.8	1.0	1.0	1.1	1.0
Turkey Premium Production (Billion TL)							
Total	3.7	5.1	6.8	7.8	9.7	10.9	11.8
Non-Life	2.7	3.7	5.3	6.3	8.3	9.6	10.2
Life	1	1.4	1.5	1.5	1.4	1.3	1.6

Source: Sigma World Insurance Research 2002-2008 Swiss Re -(www.swissre.com), and General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002-2008 - www.sigortacilik.gov.tr

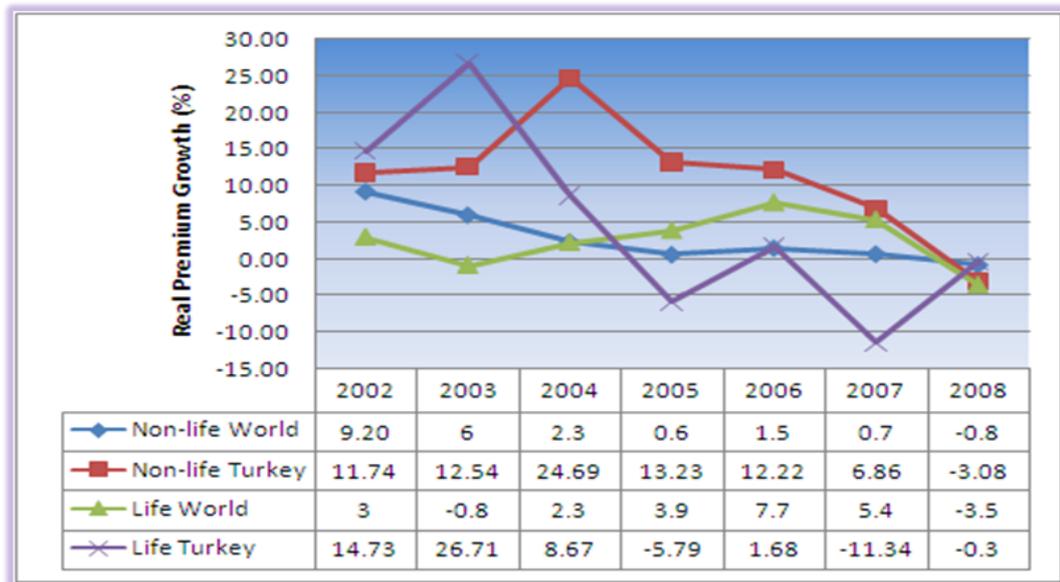


Figure 2.1- Real Premium Production Growth Rates

Source: Sigma World Insurance Research 2002-2008 Swiss Re -(www.swissre.com), and General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002-2008 – (www.sigortacilik.gov.tr)

When compared to world non-life real premium growth rates, Turkish non-life growth rates are higher than the world rates except for the year 2008; however, for life branch real premium growth rates, it is not possible to come to a decision like that since for years 2005, 2006 and 2007 Turkish life branch premium growth rate is lower than the world rate. Details about Turkish and world comparative growth rates for non-life and life industries based on years between 2002 and 2008 could be figured out in the Figure 2.1 above.

2.3.4.2. Insurance Sector's Position in Turkish Financial System

Table 2.4- Distribution of Turkish Finance Sector Balance Sheet Size in Billion

	2002	2003	2004	2005	2006	2007	2008
Financial Sector Total Assets	314.1	370.4	438.4	561.0	669.9	771.5	937.0
Insurance Sector Assets	5.8	8.1	10.5	15.4	18.6	23.4	27.9
Non-Life	2.6	3.6	4.9	7.8	9.1	11.4	13.0
Life / Pension	2.7	3.8	4.2	5.7	7.4	9.5	12.1
Life			0.7	0.9	1.0	1.2	1.4
Reinsurance	0.4	0.5	0.7	1.0	1.1	1.2	1.4
Insurance Share in Financial Sector (%)	1.84	2.18	2.39	2.74	2.78	3.03	2.98

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

When Turkish financial sector balance sheet is examined, it is observed that total assets size is about 937 billion TL in 2008. Insurance share in financial sector is about 3%. Total assets of Turkish insurance sector, including non-life, life/pension, life and reinsurance companies, reached to TL 27.9 billion TL in 2008. Regarding the asset size, insurance and

private pension sector including reinsurance companies grew by 19% in 2008. Non-life, life/pension and reinsurance companies constitute 47%, 48% and 5% of the total insurance sector in 2008, respectively in terms of assets size. Details about Turkish's financial sector total assets; insurance sector assets and insurance share in financial sector based on years between 2002 and 2008 could be figured out in the Table 2.4. (Insurance and Pension Annual Reports, 2002-2008).

2.3.4.3. General Indicators of Insurance Sector

Table 2.5- Number of Insurance Companies in Turkey

	2002	2003	2004	2005	2006	2007	2008
Non-life Company	36	35	32	31	32	35	36
Life Company	23	13	12	10	10	14	12
Life/Pension Company		10	10	10	10	9	11
Pension Company		1	1	1	1	1	1
Reinsurance Company	3	3	3	1	2	2	2
Total	62	62	58	53	55	61	62

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

Insurance and private pension activities in Turkey in 2008 are operated by total of 62 insurance and pension companies consisting of 36 non-life, 24 life/pension and 2 reinsurance companies. Details about number of insurance companies in Turkey based on

years between 2002 and 2008 could be figured out in the Table 2.5.

Table 2.6- Number of Foreign Capital Companies in Turkey

	2002	2003	2004	2005	2006	2007	2008
Non-life Company	9	11	14	19	22	9	11
Life/Pension Company	7	9	10	16	19	7	9
Total	16	20	24	35	41	16	20

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

In 2008, 41 of 62 insurance companies have foreign partners either direct or indirect. 41 insurance companies are composed of 22 non-life and 19 life/pension companies.

In 2008, Turkish insurance industry had 13250 agencies excluding bank insurance, 73 brokers and 901 loss adjusters. Details about number of agency, broker and loss adjusters in Turkey based on years between 2006 and 2008 could be figured out in the Table 2.7. below. When number of insurance industry's personnel is examined based on branches, it is observed that majority of insurance industry employees in Turkey is composed of non-life and life/pension companies (Table 2.7)

Table 2.7- Capacity of Employees in Insurance Sector

Number of Companies' Personnel	2004	2005	2006	2007	2008
Total	12,140	12,851	13,617	15,138	16,069
Non-Life	6,147	6,349	6,913	7,553	8,406
Life / Pension	4,912	5,403	5,61	6,265	6,446

Table 2.7 Continued

Life	889	914	902	1,119	1,014
Reinsurance	192	185	192	201	203
Number of Agency			15,322	16,011	13,250
Number of Broker			56	64	73
Number of Loss Adjuster			1,734	963	901

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

Shareholders' Equity Analysis

Table 2.8- Shareholder's Equity (million TL)

	2002	2003	2004	2005	2006	2007	2008
Non-life Company	1,046.7	1,330.8	1,586.0	4,001.0	4,098.3	5,713.4	5,621.6
Life/Pension Company	404.2	590.9	663.0	862.0	957.1	1,193.7	1,437.2
Reinsurance Company	114.1	141.0	206.0	466.0	536.7	708.3	666.7
Total	1,565.0	2,062.7	2,454.0	5,329.0	5,592.0	7,615.3	7,725.5

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

As can be seen from table 2.8, in 2008, total shareholders' equity for Turkish insurance market increased to 7,725 million TL and tripled from 2004 to 2008. For the first time in 2008, shareholders' equity for non-life and reinsurance companies decreased.

Table 2.9- Foreign Partners Share

	2004	2005	2006	2007	2008
Foreign Partners Share in Paid in Capital (%)	15.51	16.81	23	37.79	51.37
Non-life	11.92	13.64	19	37.69	51.2
Life/Pension	23.27	24.85	34	38.07	51.92
Foreign Partners' Share of Premium Volume (%)	18.69	20.48	30.33	41.15	53.03
Non-life	16.62	19.21	29.07	40.85	52.94
Life/Pension	25.69	26.02	36.45	42.77	53.46

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

Share of foreign capital in, paid in capital has increased from 11,92% to 51,20% for non-life branch companies and from 23,27% to 51,92% for life/pension companies from 2004 until 2008. When foreign capital share in paid in capital for Turkish insurance industry as a whole is examined, it is observed that in 2008 more than 50% of industry has foreign capital in paid in capital whereas this ratio is just 15% in 2004. It is a good indicator for continuous rise in foreign interest in Turkish insurance industry. Parallel to the rise in paid in capital from 2004 to 2008, foreign capital share in total premium production has risen from 18,69% to 53,03% for the industry as a whole (Table 2.9).

Composition of Assets – Liabilities / Shareholders' Equity

When the Table 2.10 which shows the composition assets – liabilities / shareholders' equity is analyzed, it is observed that starting from the year 2004 receivables have a rising percentage in the composition of total assets. Fixed assets' share in total assets has been declining since 2005 whereas the liquid assets remained same. The main initiative behind

the rise in receivables share and decline in the blocked assets share is the transitions from life insurance to private pension system and increases in private pension activities in Turkish insurance market.

Total asset of Turkish insurance sector has increased since 2002. However, return on average asset which is calculated by dividing a company's annual profit before tax by its total assets, has decreased since 2002 until 2006 since profit of insurance industry has declined. For the last 2 years this ratio has a rising trend.

Table 2.10- Assets - Liabilities / Shareholders' Equity Ratios (%)

	2002	2003	2004	2005	2006	2007	2008
Assets							
Liquid Assets	22.22	23.98	21.96	20.34	21.42	23.54	23.70
Receivables	22.22	20.00	23.10	25.08	33.22	36.22	37.49
Blocked Assets	40.74	40.64	41.06	32.99	27.47	23.51	24.59
Fixed Assets	12.96	11.82	11.13	20.29	17.33	16.03	10.08
Other	1.85	3.56	2.75	1.29	0.56	0.70	4.14
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Liabilities / Shareholders' Equity							
Liabilities	11.11	7.89	7.14	13.89	21.64	25.74	28.38
Technical Provisions	55.56	60.53	61.22	48.61	45.11	41	41.86
Shareholders' Equity	29.63	27.63	25.51	36.11	31.36	31.2	26.63
Other	4.07	3.95	6.12	1.39	1.89	2.06	3.13
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

Generally speaking, return on average equity has a similar pattern with the return on average assets for 2002-2008 periods that could be seen in the Figure 2.2.

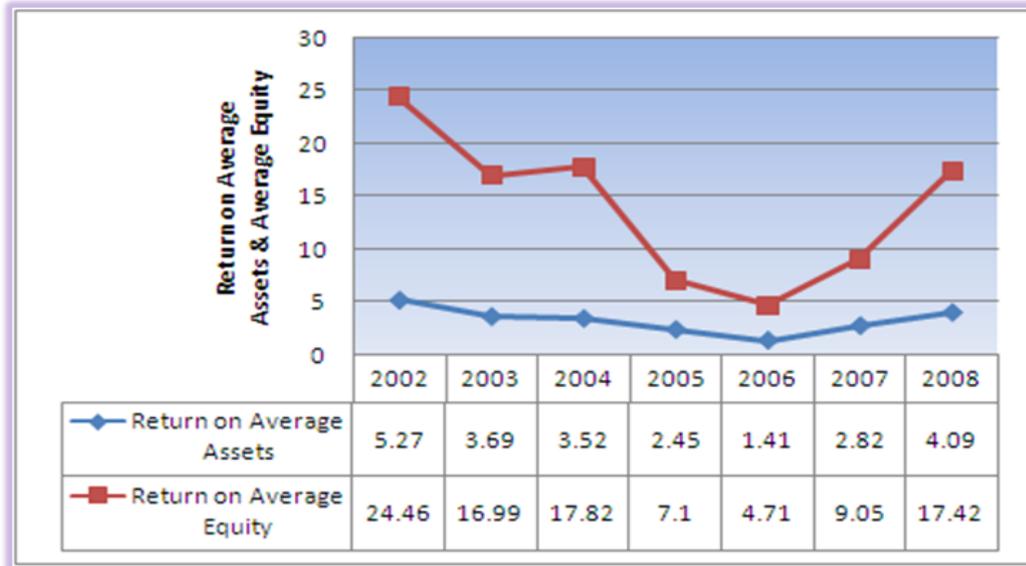


Figure 2.2- Turkish Insurance Industry Return on Assets Trend

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

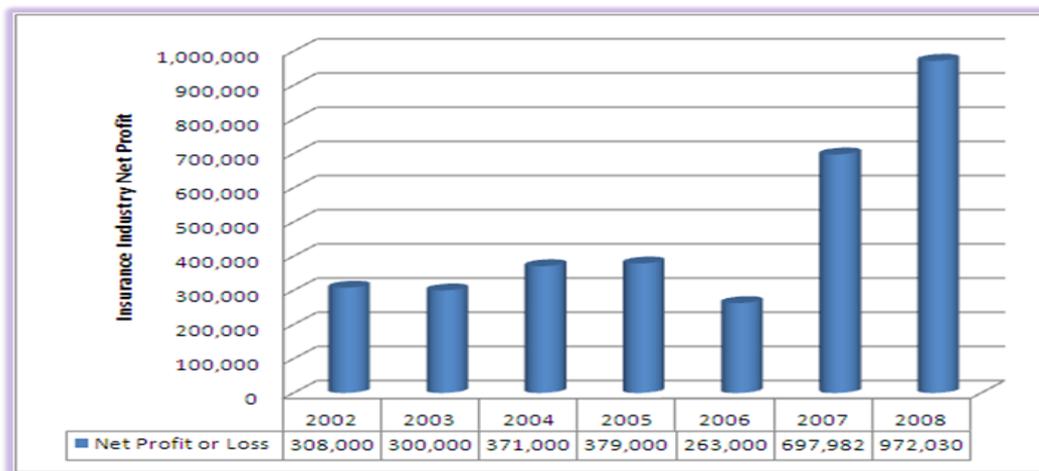


Figure 2.3- Turkish Insurance Industry Net Profits

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

When net profit amount for Turkish insurance market is analyzed, it is observed that net profits declined to the lowest level in 2006 with 263 million TL and 30.61% negative growth rate. Details about Turkish insurance market net profit amount and growth of net profit based on years between 2002 and 2008 could be figured out from Figure 2.3 and 2.4.



Figure 2.4- Turkish Insurance Industry Net Profit or Loss Growth Rates

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

Industry Profitability Ratios

When premium retention ratios for both non-life and life/pension companies is analyzed, no significant change is observed for 2004-2008 period. Loss ratio for non-life companies has a general rising trend for 2002-2008 periods and this ratio reached to highest value in 2008. On the other hand, technical profit ratio was highest in 2002 and lowest in 2006 and then had a rising trend for 2007, 2008. For life/pension companies, loss ratio had a similar pattern like non-life companies; the ratio had the lowest value in 2002 and reached to the highest value in 2008. On the contrary, paid loss ratio had a declining trend starting from the year 2002 and got the lowest value in 2008. Details about industry profitability ratios for the years between 2002 and 2008 could be seen from Table 2.11 below.

Table 2.11- Industry Profitability Ratios (%)

	2002	2003	2004	2005	2006	2007	2008
Non-life Companies							
Premium Retention			62.03	65.7	64.74	67.74	68.62
Loss Retention			64.74	74.61	72.56	74.06	75.03
Loss Ratio	60.55	64.83	63.63	67.15	68.71	64.93	75.3
Paid Loss Ratio	68.09	66.16	69	70.03	68	66.04	60.63
Technical Profit Ratio	9.3	4.41	7.28	2.51	0.5	2.58	4.38
Financial Profit Ratio			-2.17	3.43	3.53	3.57	4.14
Life/Pension Companies							
Premium Retention			90.8	92.52	91.38	92.38	91.95
Loss Retention			91.14	94.02	94.74	92.83	93.25
Paid Loss Ratio	97.06	96.41	98.23	94.66	94.72	92.27	85.58
Loss Ratio	73.95	80.69	79.42	85.12	84.47	80.78	91.16
<i>(Included Life Branch in 2008)</i>							
Technical Profit Ratio	10.86	6.89	18.4	2.53	8.68	12.46	-5.94
Financial Profit Ratio			-11.51	12.5	9.38	11.64	13.56

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

2.3.4.4. Private Pension Activities

Turkish private pension system which was founded by the Law dated April 07, 2001 and activated on October 27, 2003 has only one company working as pure pension company.

Table 2.12- Private Pension System General Indicators (million TL)

	2004	2005	2006	2007	2008
Number of Contract	349,011	725,822	1,208,341	1,600,157	1,932,686
Individual	281,389	563,250	930,213	1,237,844	1,501,412
Group	67,622	162,572	278,128	362,313	431,274
Number of Participant (according to plans)	337,897	696,508	1,101,700	1,494,601	1,756,597
Total Accumulation	288	1,219	2,836	4,603	6,400
Total Contribution	288	1,051	2,439	4,174	5,608

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

When number of contracts and participants in the pension system is analyzed in the figure 2.5, it is observed that both numbers have a rising trend since 2004 until 2008. The same increasing trend could also be seen in the total accumulation value and total contribution amounts for the last 5 years. On the other hand, when accumulation and contribution growth rates are analyzed, it is seen that both ratios have very high values in 2005, 323% and 264% respectively. However, starting from 2006 growth rates has a declining trend for both accumulation and contribution. Even though growth rates have a declining trend, in 2008 both ratios have values higher than 30% (see Figure 2.6.)

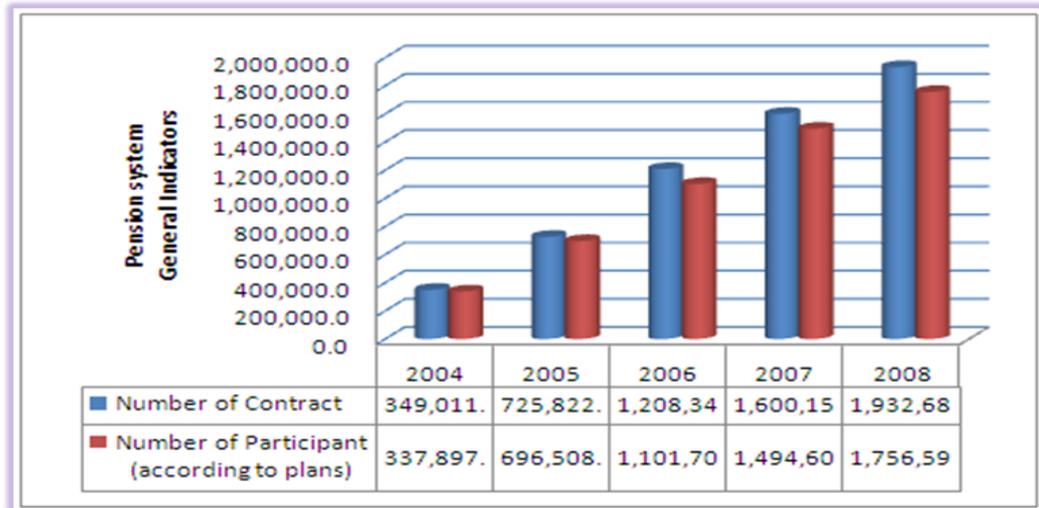


Figure 2.5- Turkish Private Pension System; General Indicators

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

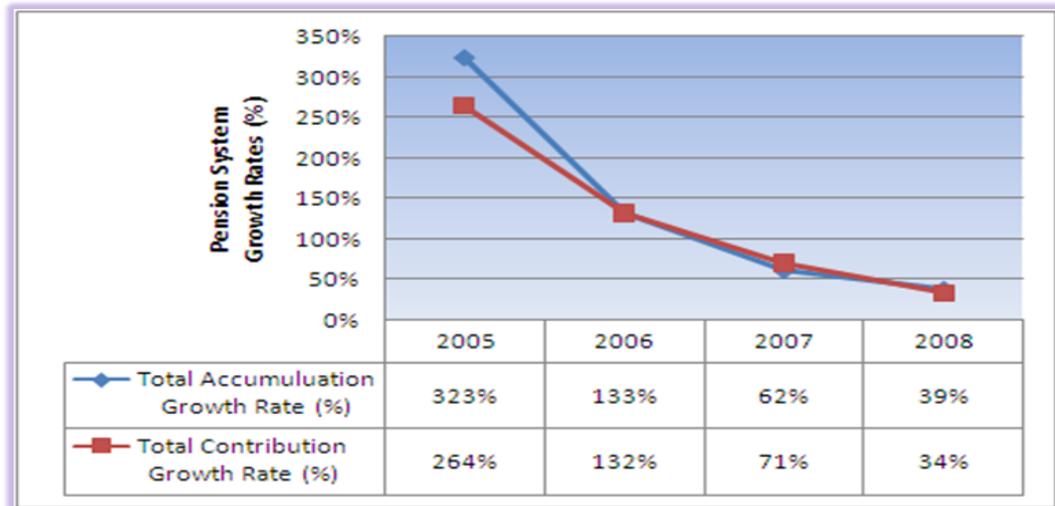


Figure 2.6- Turkish Private Pension System, Growth rates of Total Accumulation and Total Contribution

Source: General Directorate of Insurance, Turkey, Insurance and Pension Annual Reports, 2002- 2008 - www.sigortacilik.gov.tr

CHAPTER III

LIQUIDTY RISK IN INSURANCE INDUSTRY

This chapter aims to give information about the risks prevalent in the insurance sector, the liquidity risk in broader terms and its management. For this purpose this chapter constitutes three main sections. First section gives brief information about the risk structure of the insurance industry. In the second section the definition of liquidity and liquidity risk is present and also the liquidity risk in insurance sector is explained in detail. Third section designed to give idea about management techniques prevalent in the industry.

3.1. Risks in Insurance Industry

Insurance provides a vehicle for people to pool risks. It associates a potential hazard with a potential claim on the pool and allows people to contribute to this pool to meet other people's claims. Therefore, the core function in insurance is to intermediate risk itself. That is, bearing the risk is the service not just managing the risk in the service (Jenkins, 1999). Being aware of those risks is important for the insurers.

Insurers are facing several risks embedded in their business. Those risks could be classified differently. The conceivable risks chosen to be managed by the insurance industry could be classified according to two views; "*the actuarial view of risks*" which are adopted from the Society of Actuaries' risk classification taxonomy and "*the financial view of risks*" which are the standard financial risks increasingly proposed in the insurance industry (Babel and Santomero, 1997).

3.1.1. The Actuarial View of Risks

In the actuarial view of risk, both property liability insurers and life insurers and pensions make the classification of the risk in accordance with the framework proposed by the Society of Actuaries' Committee. Various categories of risk is named under four main categories; asset risks, pricing risks, asset liability matching risk, miscellaneous risks.

3.1.1.1. Asset risks

There is a possibility that borrowers of the insurer funds may default on their obligations to company or that the market value of an insurer's investment assets may decline. Such possibilities that will affect the assets value constitute asset risks. Asset risks also include interest rate risk, credit risk, market risk, and currency risks.

3.1.1.2. Pricing Risks

Insurers are pricing their services in return for which they meet their obligations to their policyholders. If an insurer's pricing is based on inadequate assumptions about future operating results regarding investment income, expenses, sales, lapses, frequency and severity of claims and losses and or mortality and morbidity, insurers may not be able to meet their obligations to their policyholders. The risk of mispricing which result in default on obligations, is called pricing risk.

3.1.1.3. Asset/Liability Matching Risk

The value of asset and liabilities of insurers might be affected differently from the interest rates or inflation. If the fluctuating rates cause an imbalanced change in values of assets and liabilities, the mismatch between values of assets and liabilities may cause insurers to be insolvent. Therefore, the asset/liability matching risk arises from the fluctuations in interest rates and or inflation.

3.1.1.4. Miscellaneous risks

Some risks, although represent real risk to insurers, are beyond the ability of insurers to predict and control. Some of those risks stems from changes in taxes and regulatory issues or changes in laws or legal interpretations that give rise to the risk of change in firms' obligations. The risks of managerial or employee misconduct and inadequate employee and sales agents training, "malfeasance", "malversation", product obsolescence are also included in this category. Moreover, the risk of unforeseen down grade of acquisition that could cause a "run" on the insurer's assets fall in this category.

3.1.2. The Financial View of Risks

Standard financial risk definitions are increasingly being proposed in the insurance industry (Babel and Santomero, 1997). Those risks encountered by insurers, can be broken into six general categories: actuarial, systematic, credit, liquidity, operational, and legal risks. Each risk types are explained briefly.

3.1.2.1. Actuarial risk

Insurers are issuing policies and other kinds of liabilities in order to raise funds. In this process, there is a possibility that they could overpay for the funds they receive or alternatively, receive too little for the risks they take over. Thus, the risk that arises from raising funds via the issuance of insurance policies and other liabilities is considered as actuarial risks. Also, the risk of underestimating underwriting losses, either due to inadequate forecasting methods or just due to the fluctuations around mean, belong to this type. Of course, the degree to which estimations will deviate from the mean will depend on the characteristics of the loss distribution, which in turn depend on the nature of the risks insured.

3.1.2.2. Systematic risk

Systematic risks are non-diversifiable risks that cause to change value of the asset and

liability due to change in systematic factors. It is sometimes referred to as market risk. This type of risks become significant to investors whenever a broad economic factor alters the value of assets owned or of claims issued. Variations in the general level of interest rates, in basis risk, and (especially for non-life insurers) in inflation, are of greatest concern to insurers. Because of the insurers' dependence on these systematic factors, most try to estimate the impact of these particular systematic risks on performance, attempt to hedge against them, and thus limit the sensitivity of their financial performance to variation in these non-diversifiable factors.

3.1.2.3. Credit Risk

Credit risk arises when the policyholders, counterparties or reinsurers fail to fulfill its pre-committed obligations. This can affect the investor holding the bond or lender of a loan contract, as well as other investors and lenders to the creditor. Therefore, the financial condition of the borrower, as well as the current value of any underlying collateral is of considerable interest to an insurer who has invested in the bonds or participated in a direct loan. The real risk from credit is the deviation of portfolio performance from its expected value. Accordingly, default rates themselves exhibit much fluctuation, as a portion of the default risk is result from the systematic risks; it is difficult to eliminate it completely. In addition to this, for insurers who take on highly illiquid assets due to the idiosyncratic nature of some portion of these losses remains a problem for creditors in spite of the beneficial effect of diversification on total uncertainty, the credit risk is not easily transferred.

3.1.2.4. Operational Risk

The *IAIS Glossary* defines operational risk as: “the risk arising from failure of systems, internal procedures and controls leading to financial loss. Operational risk also includes custody risk ” (International Association of Insurance Supervisors (IAIS), 2003). For the insurers, operational risk is associated with the problems of accurately processing claims and accurately processing, settling, and taking or making delivery on trades in exchange for cash. It also arises in record keeping, processing system failures, and compliance with

various regulations. As such, individual operating problems are small probability events for well-run organizations, but they expose a firm to outcomes that may be quite costly.

3.1.2.5. Liquidity Risk

Liquidity risk can best be described as the risk of a funding crisis. Unexpected events, such as a large claim or a write down of assets, a loss of confidence, or a legal crisis, can cause such funding crisis. As the insurers operate in markets where natural catastrophes may cause clustered claims payments or a sudden interest rate change may result in massive requests for policy withdrawals and surrenders, their liabilities can be said to be somewhat liquid. On the other hand, insurers' assets are sometimes less liquid, particularly where they invest in private placements and real estate. When the assets are not liquid enough to cover the liabilities due, it is likely for an insurer to become insolvent. Thus, it is important for an insurer to maintain sufficient liquidity to handle any demands for cash easily.

3.1.2.6. Legal Risk

Legal risks are arisen from significant and unexpected changes in legal environment and are endemic in financial contracting. Changes in the laws or regulations can alter validity of formerly well-established transactions even when all parties have previously performed adequately and are fully able to perform in the future. For example, changes in liability rules may alter the distribution of risks that may be covered by insurance policies. In addition, the activities of an institution's management, employees, and agents also give rise to legal risks. Fraud, violations of regulations or laws, and other actions can lead to catastrophic loss.

3.2. Understanding Liquidity and Liquidity Risk

In this section firstly, general definition of liquidity risk will be given. Secondly, liquidity risk in insurance industry will be discussed. Thirdly, liquidity risk measurement techniques will be presented.

3.2.1. Liquidity and Liquidity risk

The concept of the liquidity is used in two different ways. It can be used for describing the liquidity of the financial markets and instruments or for describing the liquidity of the financial institutions. A liquid market is one made up of liquid instruments which can be traded at the market price at all the times in normal or near normal amounts.

On the other hand, liquidity is also used in the sense of the solvency of the company. A business is liquid if it can make payments from its income stream, either from the return on its assets or by borrowing the funds from financial markets.

There are several definitions of liquidity risk; some of them are presented below:

Liquidity risk is the potential that an institution will be unable to meet its obligations, as they come due because of an inability to liquidate assets or obtain adequate funding or that it cannot easily unwind or offset specific exposures without significantly lowering market prices because of inadequate market depth or market disruptions (Lorent, 2008).

Liquidity Risk may be defined as the risk that a firm, though solvent, either does not have sufficient financial resources available to enable it to meet its obligations as they fall due, or can secure them only at excessive cost (Bartlett, Kelliher, Chaplin, Dowd, and O'Brien, 2005).

As can be inferred from liquidity definitions, there are two types of liquidity risks; one is the funding liquidity risk and the other one is the market liquidity risk.

Funding liquidity risk is the risk that the firm will not be able to efficiently meet both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the firm. It differs from the market liquidity risk, which is the risk that a firm cannot easily offset or eliminate a position without significantly affecting the market price because of inadequate market depth or market disruption. However, in many cases, the same factors may trigger both types of liquidity risk. (The Basel Committee on Banking Supervision, 2006).

Brunnermeier and Pedersen (2007) defines market liquidity as the difference between the transaction price and the fundamental value, and funding liquidity as a speculator's scarcity (or shadow cost) of capital.

Financial firms are especially sensitive to funding liquidity risk since debt maturity transformation is one of their key business areas (Lopez, 2008).

3.2.2. Liquidity Risk in Insurance Industry

In insurance industry, the risk of a funding crisis would inevitably be associated with an unexpected event, such as a large claim or a write down of assets, a loss of confidence or a legal crisis. Insurers' liabilities can be said to be somewhat liquid since, it is possible for insurers to receive clustered claims due to natural catastrophes, or massive requests for policy withdrawals and surrenders due to changing interest rates. On the other hand, their assets are sometimes less liquid, particularly where they invest in private placements, loans, long term bonds and real estate (Babel and Santomero, 1997; Cummins, Phillips, and Smith, 1998). Those illiquid assets are generally sold at price below the market value in case of an urgent need or in a financial crisis.

At the distressed times even liquidation of the liquid assets become costly since they needed to be sold at discounted prices. Moreover, when a firm in financial distress needs to sell assets the related counterparty will generally be another firm in the same industry which probably experiencing difficulties themselves, leading to decrease the value of asset sales (Schleifer and Vishny, 1992). Therefore, maintaining sufficient liquidity to respond to any cash demands is important in order not to lead large losses resulted from selling off illiquid assets at unfair prices.

Liquidity risk for the insurers can arise from, company specific factors as well. Policyholder and capital structure of the company, company size, asset and liability portfolio structure are critical for insurers. When a large amount of insurer's policies or contracts are held by a single or small group of policyholders liquidity risk faced by insurance company is higher since policy cancellations or claim payments would have

higher impact. Additionally, size of the company may also affect the access to capital markets. For small sized companies it might be harder to find as many funding resources as larger companies can (Colquitt et.al, 1999; Shiu, 2006). On the other hand, if a large company needs to liquidate some of its assets, markets could not be able to absorb billions of dollars thus the assets would be sold with a discount from fair value.

In addition to company specific risks, unexpected demand for liquidity may be triggered by a credit rating downgrade, loss of confidence as a result of negative publicity, economic distress or reported problems of other companies operating in the same or similar lines of business (NAIC, 2002). When analyzed according to product, region, industry, and creditor; lack of diversity in either the liability or the asset portfolio increase exposure to liquidity risk as well.

Moreover, the duration mismatch of the assets and liabilities make insurers more vulnerable to liquidity risk. In addition to this, if the company has insufficient ability to borrow short-term, when immediate cash demand arise, company will have hard time to cope with liquidity problems. Although, using a credit line is another source to cover the immediate liquidity need, in stress situation counterparty bank or the parent company could refuse the line (Bartlett et. al, 2005).

3.2.2.1. Importance of Liquidity Risk in Insurance Industry

Considering the financial services sector, it is generally believed that it is less likely for insurance companies to run into difficulties over liquidity issues, compared to the banks. (Lorent, 2008; Newton, et. al., 2009). Specifically, insurance run phenomenon is disregarded in the literature regarding the insurance regulations (Lorent, 2008). Morrison (2002) stated that insurance run is not a typical threat for the sector. One possible explanation for this statement depends on the difference between the rights of depositors and policyholders. Policyholders generally agreed to pay compensation for early withdrawal of the contract and the cancellation repayment and surrender of insurance products usually takes longer repayment period than bank deposits. However, when liquidity related difficulty struggle an insurance company it will have the same severe consequence; that is, company might ended up with insolvency. When the historic

insolvencies in the insurance industry and what currently happened to the insurance giant AIG is analyzed, the importance of the liquidity risk for the insurance industry could be understood.

During the 1970s, mismanagement of liquidity by investing heavily on particular investment, which could not be readily realized in short time or could not realize expectations at maturity date lead a number of life insurers to default (Newton, Sanders, and Wells, 2009). Moreover, in 90s, in United States, some of the major life insurance companies went insolvent as a result of policyholders' run (Brewer, and Mondschean, 1993). Also in 90s, large catastrophes that result in large losses compounded by inflation effect of the London market excess of loss catastrophe spiral caused liquidity related problems (Newton et al, 2009). A delay in collecting the reinsurance to pay out the claims is financed by borrowing from the banks or brokers in the form of short term loans against the expected reinsurance recoveries. However, when one of the insurers failed to meet the claims and resulted in a default, the credit channel is dried up thus, liquidity related problems were triggered.

In today's financial world, insurance companies have taken more active role as financial intermediaries. Especially, assimilation of banking type activities by the life insurers increases their liquidity risk (Das, Davies, and Podpiera, 2003). Insurers' role in economy gets larger and larger year by year. They involved in asset transformation, the premiums collected from policyholders are invested on financial markets, which makes insurance companies also vulnerable to the market risk or systemic risks other than the risk inherent in the business itself.

The recent financial downturn has had a profound effect on AIG, an insurance giant, which heavily invested in credit default swaps (CDS) written for asset-backed securities and collateralized debt obligations. As the value of the assets underlying these instruments fell, AIG was forced to write-down its positions. After downgraded by rating agencies, the company could not sustain its positions and thus needed additional liquidity.¹ The

¹ AIG has entered in loss spiral (Gromb and Vayanos, 2002; He and Krishnamurthy, 2008; Kiyotaki and Moore, 1997; Bernanke and Gertler, 1989; Fisher, 1933; Geanakoplos, 2003).

company nearly went bankrupt, on September 16th, its share price fell over 90%, and rescued by the US Government (Brunnermeier, 2008).

3.2.2.2. The Sources of the Liquidity Risk in Insurance Industry

As is understood from the historic or current liquidity related failures and definition of the liquidity risk, the sources of the liquidity risk for the insurers can be divided into two parts; asset-side liquidity risk and liability-side liquidity risk. Briefly, what AIG experienced is an example of the asset-side liquidity risk as the company struggled because of a decrease in the value of their assets. On the other hand the 90s liquidity related problems which initiated by catastrophes and caused insurers to find additional source to cover up large claim payments is an example of result of a liability-side liquidity risk.

3.2.2.2.1. Asset Side Sources of Liquidity Risk

The main function of the assets of the insurance companies is to serve for protecting policyholder's benefits. However, the policyholders' benefits could not be protected only by taking the claim payments under guarantee, but also the precautions should be taken in order to realize claim payments in timely manner. This could be maintained by holding high proportions of the asset portfolio as liquid assets (Pekiner, 1981). If the insurers fail to convert its assets into cash quickly they might not be able to obtain enough cash to pay the claims. Moreover, the value of the assets may drop in the selling process, which in turn increase need to liquidate more assets (Lorent, 2008). That is, the extent of the liquidity risk that would be faced by an insurer with more liquid assets would be relatively less than an insurer with less liquid assets (Shiu, 2006).

Liquidity problems can arise with investment assets. Particularly, an over-concentration of illiquid assets such as real estate or thinly traded securities may be especially risky. "Non-listed assets such as property, mortgages, and unquoted stocks may take months to realize. Insurers may not be able to realize assets such as subsidiaries or joint venture stakes. Premium and other debts can effectively be treated as unrealizable" (Bartlett et. al, 2005, pp.24). On the other hand, holding cash or holding listed bonds and equities, which can

usually be sold quickly to raise cash, in the asset portfolio, will decrease the level of liquidity risk faced by the insurers.

As the insurers need to be prepared for claim payments and also for particular large losses they need to hold cash reserves and other liquid assets. Having liquid asset portfolio will decrease the vulnerability to adverse liquidity outcomes (Shiu, 2006). However the type of the liquid asset in the portfolio will also affect the liquidity risk level of the insurers. If the insurer has derivatives like, swaps, futures, and put options sold by the firm that might need collateralization, and reinsurance or other contracts containing rating triggers, it becomes more vulnerable to liquidity risk (Joint Forum, 2006). As the insurers with more collateralized assets become more vulnerable to market risk and in return, in case of an adverse shock, they are also become more vulnerable to liquidity risk.

Lastly, some market trends have effects on the asset side of the insurers that will increase the liquidity risk. The proportion of the customer base, operating with large volumes of assets that can be relatively easily switched to other firms or products would be increased by the insurer's institutional business. The more the insurer engaged in the institutional business, the more it will be affected by the switch of the assets to other insurer, in return more vulnerable to liquidity risk (Joint Forum, 2006)

3.2.2.2. Liability-Side Sources of Liquidity Risk

From the liability side the policy surrenders and transfers are one of the main sources of the liquidity risk. Generally, this kind of surrender options are embedded in life insurers contracts. The insurance contracts that give right to policyholders to surrender a contract on guaranteed terms give rise to the liquidity risk. Since most of the policy outflows can readily be predicted, liquidity management can be done to assess liquid sources accordingly to cover these outflows. However, surrenders and transfer payments pose a significant risk to insurers' liquidity position since they can vary considerably. In order to meet the surrendering policies insurer may lose some of its liquid sources, such as on the realization of assets. Moreover the number of the policy surrender is of importance as liquidity needed increases accordingly. The credit down grade or unpleasant economic

condition may trigger many policy holders to surrender their policies, in such situations surrendering policies cause greater risk to insurers in terms of liquidity.

In addition, catastrophes or events causing huge claim payments, although some part is covered by the reinsurers depending on the contract between parties, may lead insurance companies to have liquidity problems. Despite the fact that the reinsurance reliance is precaution for that kind of events, there is still a residual liquidity risk that stems from the possibility of reinsurer's default or delay in the payments of the insurers in the troubled times (Bartlett et. al, 2005).

Additionally, liquidity risk is nested in the unit linked funds especially when the funds are linked to illiquid assets such as real estate. As these funds entitled the investors to demand redemptions, in case of realizing the linked illiquid asset the insurer may need to sell the asset at a discounted price resulting greater liquidity problems (Joint Forum, 2006).

Dividend payments, loan interest, and tax bills are generally predictable which allows liquidity to be arranged in advance. However, companies need to be aware of any contingent liabilities, such as contracts requiring collateral to be posted on credit down grades, which can be a hidden source of liquidity strain (Bartlett et. al. 2005, pp.24).

3.2.2.3. Liquidity Risk in Life Insurance Business

Insurance theory indicates that due to the sufficiently long-term nature of business of life insurers, they require less liquidity than the non-life insurers (Shiu, 2006). To clarify, life insurance contracts are generally long term basis due to statutory regulation of business. Moreover, the types of contract that life insurance companies issue commonly features high surrender charges which are either explicitly or implicitly stated in the schedule of cash buildup (Babel and Santomero, 1997). Existence of these charges lowers the vulnerability of the life insurers to liquidity risk that may arise from policy withdrawals.

The longer duration of liabilities in the life insurance industry, compared to banks and non-life insurers, and also high surrender charges make the occurrence of an insurance run less

likely (Lorent, 2008). However, this does not mean that liquidity risk management is not essential for life insurers. Especially, the historical evidence of the failure of the several well known life insurance companies, due to liquidity problems, emphasizes the importance of liquidity risk. When the failure of the US life insurers² in the 90s is investigated, well publicized investment problems together with the absence or the low levels of surrender charges causes companies to fail even though, some of them has large amount of liquid assets (Babel and Santomero, 1997). Equitable Life is also another example from United Kingdom;. In 2000, Equitable Life went into liquidity squeeze that arose from inability to honor guaranteed annuity policies due to low interest rates and long life expectancy. This led the company, to cut the pensions and retirement savings of its policyholders. However, as a result of the cut, many policyholders surrender their policies and took the company to court (Shiu, 2006). In the light of these examples, it can be stated that unless the liquidity risk is well managed by the life insurance companies they also face the same severe consequences.

Moreover, considering the recent trend of assimilation of banking type activities by the life insurance, it can be said that they became more vulnerable to liquidity risk (Das et. al, 2003). With the assimilation of saving products by life insurers, external factors such as legal environment, competition with other savings instruments and fluctuations of financial markets conditions affects policyholders more. Particularly in the existence of unit linked products, where the returns are linked to a fund and therefore does not guaranteed by the insurer, policyholders borne the investment risk. Thus, interest rate increase or decline in the stock market or any other related macroeconomic shock can induce a wave of surrenders. If the policyholders become concerned that too large number of policyholders want to withdraw their savings early, the insurance run may be triggered, policyholders even know that they will suffer from higher losses will start to surrender (Lorent, 2008).

Additionally, the existence of the embedded options, which permit buyers to withdraw funds in response to economic fluctuations, in the life insurers' policy contracts increases the liquidity risk of insurers. Furthermore, in the case of heavy investment in illiquid

² These insurers were ; First Capital Life, Fidelity Bankers Life, Executive Life of California, Executive Life of New York and Mutual Benefit

privately placed securities and real estate investments, liquidity risk of the life insurers increase (Cummins, 2001).

Lastly, embedded liquidity options, put options in funding agreements market value adjustment provisions, surrender charge provisions, loan provisions, group surrender options in Corporate-Owned life insurance business, benefit responsive options in group insurance contracts, separate account products, off-balance sheet guarantees, provisions in reinsurance treaties, derivative investments and liquidity backstops can be pointed as a sources of liquidity risk for the life insurance companies (NAIC, 2002).

3.2.2.4. Liquidity Risk in Non-Life Insurance Business

Non-life insurance companies have large liquidity needs by the very nature of the business. Occurrence or the amount of the claim payments is unpredictable. Therefore, cash flows are volatile providing the need for reasonable safety (Oppenheimer, and Schlarbaum, 1983; Lorent, 2008). The volatility of cash flows is critical for the insurers. Since, they might require liquidating some of its financial assets when the premium inflows are not enough to cover the outflows arose from claims (Berry-Stölzle, 2008). They are also subject to volatile cash outflows due to liability lawsuits, property catastrophes, and other contingent events affecting claim costs (Cummins et.al., 2001).

As Kim et. al (1998) emphasized, in the existence of volatile cash flows firms need to hold more liquid assets, so does the non-life insurers. To meet the claim payments non-life insurers' assets need to have high level of liquidity. Thus, generally, non-life insurers hold more liquid assets such as equities or bonds (Lorent, 2008).

Additionally, the policies are typically short term and annually renewable. Moreover, most of the policies do not feature cash values that are easily accessible through surrender. Therefore, policy surrenders are not as prevalent as it is in life insurance companies. However, some of the policies allow for the cancelation of the policies before the maturity and pay some portion of the premium to the policyholder.

On the property/casualty side of the business, the liquidity risk comes mostly from event risk such as terrorism or catastrophe risk like hurricane, floods and earthquakes. Reinsurance can be precaution in case of such events but, even slight, there is still possibility of reinsurer to fail to cover those huge claim payments in timely manner or the reinsurer to fail completely, leading liquidity problems. Yet still, reinsurance is one of the precautions to deal with such large obligations. Aside from reinsurance, diversifying the business with respect geographic conditions, industry or the type of the insured risk will be effective in avoiding such adverse events (Lorent, 2008).

Non-life insurers are also affected from some of the same sources of liquidity risks as life insurers. Investing heavily illiquid asset like real estate or having embedded options in the policy contracts can be stated as the sources of liquidity risk faced by non-life insurers as well.

Most policies do not feature cash values that are easily accessible through surrender, although some policies will allow insureds to cancel prior to maturity and receive a portion of their premium. Moreover, the policies are typically short term, renewable annually. (Babel and Santomero, 1997)

3.3. Measurement of Liquidity Risk

Developments in the financial markets in the past decade have increased the complexity of liquidity risk and its management. Liquidity risk management is of primary importance because a liquidity struggle at a single institution can have wide spread repercussions. Recent market turmoil that began in mid-2007 reemphasized the importance of liquidity to the functioning of financial markets. The reversal in market conditions illustrated how quickly liquidity can evaporate and that illiquidity can last for an extended period of time. Therefore it is of importance for an institution to assess the liquidity risk inherent and wisely manage the liquidity.

As well as other financial intuitions, insurance companies use variety of measures to monitor the level of liquidity risk to which they are exposed. Their risk measurement and

modeling techniques depends on their risk perception unless a compulsory measure is dictated by the regulations. Generally large scale insurers adopt risk models according to their structural features (Berk, 2005). With the increasing concern on risk measurement advanced internal risk assessment techniques become wide spread.

The metrics used to assess liquidity risk try to quantify both present and possible future level of the liquidity risk exposure. Ratio based measures evaluate the inherent liquidity risk based on the financial statement and give understanding of the liquidity situation. Stress test and scenario analysis evaluate the extent of the liquidity risk that will be faced under different scenarios and stressed situation. Market based measures such as variations in trading costs, implied volatilities regarding assets or liability values are incorporated to the risk assessment process via the liquidity value at risk models. Ratio analysis, stress test, scenario analysis and value at risk methods will be explained in the following sub sections.

3.3.1. Ratio Analysis

Like most of the financial institutions, well known financial ratios are used by insurers to determine their liquidity positions (Başpınar, 2005). Balance sheet strength is the most important area to evaluate, in determining a company's ability to meet its current and ongoing obligations (Shaked, 1985; Domoah and Simpson, 2009). Since financial ratios characterize the financial situation of the insurers' capacity to generate adequate cash for payment, they used as a basis for liquidity risk measurement by the insurers (Borde, Chambliss, and Madura 1994; Sharkey, 1996). Ratio analysis is critically important to a well run and comprehensive liquidity risk management process (Benn, 2008).

The concept of using liquidity ratios to assess the liquidity risk of a company seems fairly simple. However it is not as easy to interpret the ratios. Like any other ratios used in financial analysis, liquidity ratios are not relevant as absolute values. It is important to understand the trends over time for the analyzed entity and its position relative to other entities having similar characteristics. Therefore, comparison through different entities or analyzing the entities over time is more enlightening (Muntean and Pacurari, 2008). Furthermore, in Turkey, with the presence of the Solvency projects, the insurance

companies are obliged to calculate and present financial ratios to show their financial adequacy³. The circular notice released by the Undersecretariat of Treasury has determined five ratios for assessing the quality and liquidity of assets of the insurance companies. These ratios are the liquid assets to total assets ratio, liquidity ratio, current ratio, premiums receivables to total assets ratio and agent receivables to equity ratio. In addition to the compulsory ratios there are other liquidity ratios that are used in determining the liquidity situation of the insurers and help the insurers to understand the liquidity risk faced. Some of them are presented below.

1) Current Ratio

The current ratio, which measures the ability of the entity to pay its short term debts, is the ratio of current assets to current liability. It is a very common ratio for measuring the liquidity position of an entity. In many studies for measuring liquidity current ratio is used to identify liquidity position of the firms (Almagro and Solin, 1995; Bătrâncea, Bătrâncea., and Victor, 2007; NAIC, 2000; Panno, 2003; Başpinar, 2005; Pacurrari and Muntean, 2008).

A current ratio of 1 indicates that assets that the organization expects to be converted into cash in the near future are just sufficient to meet short term liabilities accruing during the same period. A ratio below 1 indicates that financing may be needed, whereas the ratio above 1 indicates that the organization's operations will generate a cash surplus in the near term (Herrington, 1994; Williams et. al,1995). In addition to this, if the entity has a ratio which is between 2-2,5 according to some professionals the company has favorable liquidity, "in the Anglo-American technical literature, it is said that current ratio has to be of at least 2 (Bătrâncea et. al., 2007). Basically the current ratio indicates the ability of insurers to meet their current liabilities with their current assets. Thus, the higher the current ratio the less liquidity risk an insurer has.

³ see the circular notice regarding financial structure and capital adequacy of insurance and reinsurance companies, released in official journal dated 20.10.2004 and numbered 65069

2) Liquidity Ratio

This ratio is calculated by dividing cash and cash equivalents plus short term financial assets and financial investments where investment risk belongs to the policy holder to current liabilities (Chen and Wong, 2004; Başpınar, 2005).

As the ratio presents the ability of the most liquid assets to cover the current liabilities, the higher the ratio the less the liquidity risk faced by the insurers. The ratio higher than 1 is preferable (Chen and Wong, 2004).

3) Liquid Assets to Total Assets Ratio

As the name implies, the liquid assets are the most liquid asset which can be easily realized at fair values in case of an immediate liquidity need. Therefore the higher the amount of the liquid assets in proportion to total asset the lower the liquidity risk present for the insurers (Shui, 2006).

This ratio is calculated by dividing the sum of cash plus bank account plus financial assets to total assets. This ratio should be greater than the industry average for a company to be less prone to liquidity risk (Başpınar, 2005).

4) Premiums and Reinsurance Receivables to Total Assets Ratio

Premiums and Reinsurance receivables is the sum of net premium receivables from insureds, receivables from intermediaries (agents) and receivables from insurance and reinsurance companies plus deposits with cedants and retrocedants.

Insured account is a receivables account on the asset side of the balance sheet of the insurers. This account keeps entries of the premium receivables from the issued policies by the insurance companies via direct sales channel (Koçak, 2000). Cedant is the name given

to the insurance company which underwrites and issues an original, primary policy to an insured and contractually transfers (cedes) a proportion of the risk to reinsurer. Retrocedant is the reinsurance company which transfers a proportion of the risk exceeding the retention amount to another reinsurer. Cedant and Retrocedant account is an asset account that presents the premium receivables due from the cedants and retrocedants (Aktuğlu, 1975). Deposits with cedants and retrocedants account records the proportion of the premiums that will be transferred to the related insurer.

Although the receivables, expected to be collected within a year or sooner, are the part of current assets, they do not meet immediate liquidity needs as they are subjected to contractual commitments such as due dates. Moreover, as they carry default risk they are not as preferable as liquid assets in terms of liquidity. In case of any delay or default regarding the receivables may lead to liquidity problems for insurers as well. Therefore the ratio premiums and reinsurance receivable to total asset ratio preferred to be smaller. The ratio should be smaller than the industry average (Başpınar, 2005).

5) Agents Receivables to Equity Ratio

Agents (intermediaries) receivables account records the premiums and commissions due from the intermediaries (Özkan, 1998). Receivables are not as easily converted into cash as liquid assets to meet liquidity needs as they are subjected to contractual commitments. Like the insurance receivables account here again the possibility of the default that may lead liquidity troubles existed. If the agents fail to pay their debt when they come due, the insurer may extend the period. But when that period passed, the related agent should immediately pay the debt otherwise the amount of the debt written off as loss (Aktuğlu, 1975). This lowers the equity. On the liability side of the insurer the more the equity base, the stronger the insurer's financial situation. Therefore for any loss occurred due to default of an agent will have less effect on the insurers having stronger equity base.

Although it seems to reflect more of the insurer's account receivable management ability rather than the pure liquidity of the insurer, all other things being equal, it is more likely that generally healthier firms reveal lower agents receivable to equity ratio than other

firms. This ratio preferred to be lower than the industry average. The lower the ratio the less liquidity risk insurance companies have (Kwon and Kim, 2007).

6) Cash Flow Ratio

Cash flow statement is a very important component of the financial statements. Considering the fact that liabilities are paid in cash, a comparison between current liabilities and cash flow generated by the operating activity becomes very important (Walsh, 2006; Wild, Subramanyam, and Halsey 2007; Muntean and Pacurari, 2008).

It is a ratio of cash flow from operating activities divided by current liabilities. The indicator measures the liquidity of the entity by comparing the cash flow generated by exploitation with current debts. The ratio evaluates the way in which current debts are covered by the cash flow generated by the activity of an entity. It avoids the problem of converting current assets into cash (Bătrâncea et. al., 2007). Therefore, the higher the cash ratio the lower the liquidity risk is.

7) Working Capital to Written Premiums Ratio

Working capital is the difference between the current assets and the current liabilities, which is a measure of liquidity (Bătrâncea et. al., 2007). Relating working capital to the profit and loss account, by dividing it, by the total premiums written gives more coherent understanding about the liquidity. This ratio often highlights a trend that could not be understood from the other ratios calculated from the balance sheet. This ratio indicates the ability of the company to provide liquidity out of its total premiums. The high ratio is preferable as it indicates the excess liquidity per written premiums that act as a cushion against unpredictable liquidity needs. The higher the working capital to total premiums written ratio the safer the insurer is.

8) Total Equity to Total Assets Ratio

This ratio is the ratio of total shareholders' equity to total assets. It determines financial strength of the entity. The higher the ratio the less liquidity risk the entity faces, because it means that the more assets are financed by the shareholders. This also holds for the insurance companies. In fact, the Solvency I and Solvency II basically set rules and standards for maintaining certain levels of capital to keep insurance companies solvent (Lorent, 2008; Ayadi, 2007; CEA, 2007). The more powerful the capital base of the insurance companies the less they face liquidity risk (Babel and Santomero, 1997; Nguyen, 2008).

9) Liabilities to Liquid Assets Ratio

It is the ratio of total liabilities to the liquid assets (Brockett et. al 1994 Ambrose and Seward 1988; Chen and Wong, 2004). It shows how much of the liabilities could be covered by the liquid assets. In other words, this ratio presents the insurer's ability to meet its claims (Carson, and Hoyt, 2000; Kwon, and Kim, 2007). The higher ratio implies less of the claim payments can be covered by the liquid assets therefore the liquidity risk will increase.

This ratio is also used for analyzing the liquidity condition of insurance companies by NAIC in IRIS⁴. It is expected to be less than or equal to 105% to consider that the company have adequate liquidity (Başpınar, 2005).

10) Quick Ratio

The quick ratio measures whether the firm has enough assets that can quickly be converted to cash to meet current liabilities. The quick ratio only includes cash, marketable securities and receivables in the numerator of the ratio. This ratio is very similar the current ratio

⁴ The Insurance Regulatory Information System (IRIS), serving as the baseline solvency screening system for the National Association of Insurance Commissioners (NAIC), involves calculating financial ratios for an insurer and comparing each ratio to its specified "usual range." For the liabilities to liquid assets ratio, critical value is %105, it is expected for health insurance company to have ratio lower than this value (Chen and Wong, 2004; Başpınar, 2005).

except the fact that the inventories are subtracted from the current asset since they are not as easily disposable as cash or marketable securities and receivables and subjected to the value loss due to spoilage, obsolescence etc. However, there is no “inventory” in the insurance business. Therefore, the quick ratio will be the same as the current ratio for the insurance companies (Herrington, 1994; Muntean and Pacurari, 2008). Therefore, the higher the quick ratio the lower the probability of facing liquidity problems for an insurance company is.

11) Growth of Total Assets

Insurance companies having higher assets growth can be accepted as carrying less liquidity risk since they assumed to be financially healthier and can easily access to capital markets in case of a funding need (Colquitt et. al, 1999; Shui, 2006). Although having higher asset growth is important for insurer to have less liquidity risk, the components of the assets leading that growth has critical importance. If the growth of total assets depend more on liquid assets’ growth, the liquidity risk of the insurance company reduced more. But, if the growth of the total assets depend more on the growth of illiquid assets, the liquidity risk increases. In order to understand liquidity risk positions of insurance companies the sources of the asset growth should be examined.

12) Growth of Liquid Assets

Liquid assets include cash and cash equivalents account and securities portfolio in which the maturity of the assets are less than one year. As liquid assets composed of the assets that are ready to cover obligations and assets can be easily realized at fair values in case of an immediate liquidity need, the growth of the liquid assets strengthen the insurer against liquidity risks.

However it is important to consider the liability side of the balance sheet of the insurers. If the liabilities with shorter maturities grow faster than the liquid asset, than the insurer will have troubles in matching the assets side to liabilities side.

13) Growth of Current Liabilities

Current liabilities due in shorter time, the insurers need to hold sufficient assets of appropriate nature, term and liquidity to enable them to meet those liabilities. As they grow in the liability portfolio the insurer need to hold more liquid assets accordingly. As it is mentioned earlier claim payments can not be predetermined with %100 percent certainty, since by nature occurrence of a hazard is uncertain. Although loss reserves are allocated for this reason there is still some level of uncertainty. The assets maturities would be selected to allow adequate margin for a possible surge of the claim payments (Patrik, 2001). Therefore possibility of the mismatch between the assets and liabilities occur when the current liabilities grow faster than the assets.

In this sense, growth of the current liabilities increases the liquidity risk. Yet still to have better understanding the growth of current liabilities should be compared to growth of total assets and liquid assets (IAIS, 1999; Başıpınar, 2005; Jedlicka and Jumah, 2006; Damoah and Simpson, 2009).

3.3.2. Stress Tests and Scenario Analysis

Stress test or scenario analysis cover important factors that makes risk management difficult or cause extraordinary profits or losses to financial institutions. These factors include the events that have low probability of occurrence but when realized result in huge losses, effect all major risks including market risk, credit risk and operational risks.

1) Stress Tests

Stress tests are a necessary tool to measure the possible damage that will caused by an extreme event. Stress tests can be used to identify and quantify the impact of different stress scenarios on an insurer's expected future financial position. Both firm specific and market wide shocks and the level and depth of stress can be incorporated in the stress testing. For example impact of a rating agency downgrade, as a firm-specific shock, can be

used to test the liquidity or scenarios that combine a firm-specific stress event with a time of general market stress can be utilized.

In stress tests analysis, the values subjected to market risk are evaluated, according to the changes in factors effecting the liquidity position such as changes in the exchange rates or interest rates or according to created shock values. Stress tests allow analyzing how the portfolio will be respond to extreme market conditions (Berk, 2005).

The insurers conduct liquidity stress testing as part of their solvency or asset/liability stress testing. Asset/liability testing involves modeling asset and liability cash flows under normal, stress, and catastrophic scenarios and is designed to ensure, among other things, that the following;

- Whether the company's assets exceed its liabilities
- Whether liquid assets will be available to meet the cash flow requirements of policyholder obligations as they fall due
- Whether the average life of a block of liabilities is maintained within a specified range of the average life of the underlying assets
- Whether the impact of a change in interest rates will be within tolerance limits.

2) Scenario Analysis

A scenario is a description of a group of external or internal variables that can reasonably be expected to have an impact on an insurance enterprise. Scenario analysis facilitates business decisions by taking into account a number of potential developments and possible future events in the business environment. It is used to analyze the outcome of highly uncertain events and their impact on an organization's profitability or competitive position. In practice scenarios provide mechanism for quantitatively evaluating the liquidity risk that insurers face (Swiss Re, 2009).

Insurers with the help of scenario analysis evaluate liquidity after crisis and construct funding plans accordingly. As a part of internal dynamic financial analysis, insurers conduct simulation analysis under different scenarios and measure what will happen to the liquidity position of the company. Historical scenarios, hypothetical scenarios and best case scenarios regarding the portfolio are designed to run simulations in order to measure the effects of the extreme events to insurer (Berk, 2005).

It is worth mentioning that scenarios are tested with retrospective testing for reasonableness, with stress test for seeing effects of reasonable extreme events and with sensitivity analysis to assess sensitivity of insurers to changes in assumptions (CAS, 1999). Stress test and scenario analysis are generally used together. Insurers design scenarios and attach probabilities to them. Given these scenarios, the existing portfolio must then be stress tested so as to analyze the impact on earnings and portfolio quality.

For a well managed insurance company short-term market fluctuations have a minimal impact on their liquidity because such firms maintain sufficient reserves in cash or near-cash instruments to ride out temporary periods of market stress. Therefore generally the developed scenarios involve the unfavorable change persisting for an extended period. Scenarios also developed by taking into account the technical risk as well as market risks. Scenarios developed for liquidity risk assessment may involve following;

- New business may grow faster than planned, leading to increased cash outlays for policy acquisition expenses and higher reserving and capital requirements.
- Expenses increasing faster than expected, forcing the firm to draw down its stock of cash and other liquid assets.
- Reinsurance failure when the primary insurer is facing a large claim or group of claims.
- Following a firm-specific stress event, no new premiums will be written and simultaneously higher lapse rates will be experienced resulting in reduction in premium income that will force the firms to utilize their assets to meet policy claims, with potentially significant alterations in the maturity structure of remaining assets and implications for cash flows in later time buckets.

There are also other types of stress test conducted by rating agencies. These tests apply various factors to the values of assets to reflect their market liquidity and other factors to the various types of liabilities to reflect the risk of unexpected payment demands emerging. The factors vary according to the scenario and time horizon (Berk 2005; Kong and Singh, 2005; Joint Form, 2006; Swiss RE, 2009).

3.2.3.3. Value at Risk

In recent years, Value at Risk (VaR) has become widely used measure that financial analysts use to quantify the market risk. Basically, VaR is used to determine the maximum potential loss in value of a portfolio of financial instruments with a given confidence interval over a certain horizon (Berkowitz, 2000; Berk, 2005). The regulations of European Union and Basel Committee enables firm to use internal VaR models provided that the determined criterions to measure market risk of financial institutions is maintained.

By referring the definition of the market liquidity risk, which is the risk for a firm to not to liquidate its assets at the mark to market value at the transactions, exogenous liquidity risk can be incorporated into the VaR models (Berkowitz, 2000; Ayaydin, 2002). The exogenous liquidity risk refers the liquidity risk that all market participants are exposed to.

Due to its conceptual simplicity and abundant application areas, the VaR models gains great popularity among financial practitioners. However, the VaR models have some flaws. That is, the VaR models may result in misleading values due to the methods used in calculations. The models also disregard the possible risks that can arise from extraordinary events. Also to construct these models analysts should have certain level of expertise and knowledge (Berk, 2005). “From a statistical point of view, VaR estimation entails the estimation of a quantile of the distribution of returns. The fact that return distributions are not constant over time poses exceptional challenges in the estimation” (Berkowitz, 2000, pp.8).

CHAPTER IV

LIQUIDITY SITUATION OF INSURANCE COMPANIES IN TURKEY

This chapter presents the ratio analysis used for liquidity risk analysis of Turkish insurance industry. The ratio analysis is divided into two subsections. First subsection explains the data. The second subsection starts with the explanation of the sample for the thesis and then presents results of the ratio analysis used in the thesis to analyze liquidity risk of Turkish non-life and life insurance companies separately. Last section is the conclusion.

Ratio analysis is used to determine liquidity risk of the insurance companies. The liquid assets to total assets ratio, liquidity ratio, current ratio, premiums and reinsurance receivables to total assets ratio, agent receivable to equity ratio, working capital to written premiums ratio, equity to total assets ratio, growth of total assets, growth of current liabilities and growth of liquid assets are used for determining the liquidity situation of the insurance companies through the analysis period; from 2002 to 2008. The explanations of the ratios are given in section 3.2.1.

Considering the nature of the business, non-life and life insurance companies are evaluated separately. As a starting point it should be mentioned that Private Pension System is established with the law no 4632 of Private Pension Savings and Investment System and becomes operational on 27 October 2003 (Insurance and Pension Reports, 2003). In Turkey private pension companies can also operate in life insurance business. Therefore, for the ratio analysis, the life insurance companies refer to insurance companies operating either in life or pension sector and/or both sectors.

Insurance market during the analysis period is very active. There are several takeovers and new entries into the market, some companies cease to operate and some companies went bankrupt during the analysis period. Yet, the ratio analysis includes all the non-life and life insurance companies as long as the data is available.

For the thesis, big five companies and rest of the smaller companies are chosen as a sample. The assets of the big five non-life insurance companies constitute more than 50 percent of the total size of the whole non-life insurers and the assets of the big five life insurance companies constitute more than 70 percent of the total asset of the whole life insurance companies throughout the analysis period. While analyzing the liquidity risk structure of the insurance companies averages of the big five insurance companies, average of the rest of the small insurance companies and industry averages are compared.

The big five non-life insurance companies in the analysis are Anadolu Sigorta , Aksigorta, Axa Oyak Sigorta, Allianz and Mapfre Genel and five large life insurance companies are Anadolu Emeklilik, Avivasa Emeklilik, Yapı Kredi Emeklilik, Allianz Emeklilik and Vakıf Emeklilik with respect to their assets size.

4.1. RATIO ANALYSIS

4.1.1. Data

The data for the analysis is gathered from Insurance Supervisory Board's annual reports released by Insurance Department of the Undersecretariat of Turkish Treasury for the periods between 2002 and 2008 from their web site. The data, presented in balance sheets, income statements and tables of domestic direct premium production of the insurance companies, are used to calculate ratios.

The asset side of the balance sheet of the insurance companies is composed of current and non-current assets while the liabilities side is composed of current liabilities, long-term liabilities and equity. Income statement of the insurance companies is composed of two

main part; technical and non-technical accounts. Technical account is mainly composed of technical income and technical outgoing that arises from business operations. While non technical account includes; investment income, investment charges, other charges and extraordinary income and charges⁵. The balance sheet and income statement are presented in detail at the appendix A.

During the analysis period, the non-life insurance companies of; Egs, Ege, G.I.C Dünya, Sanko and Kapital went bankrupt. Atradius, Coface, Cardiff and Dubai Grup Insurance newly entered in the market. Batı , Madgeburger, Merkez, Rumeli and T. Nippon Sigorta, were not actively operating in 2007 and 2008 while Demir Sigorta was not active in it operations in 2007. In addition through the analysis period some insurance companies were taken over by foreign companies or merged with them. Commercial Union Sigorta changed its name to Aviva Sigorta after 2003. İhlas Sigorta was taken over by HDI Sigorta in 2006. İsviçre Sigorta continues its operations under the name of Ergoisviçre Sigorta after 2006 since Swiss Re was taken over by Ergo. In 2006 Eureka Sigorta, Fiba Sigorta, Liberty Sigorta took over Garanti Sigorta, Finans Sigorta and Şeker Sigorta respectively. Large shares of Koç Allianz are taken over by Allianz and the company operates under this name after 2007. Similarly, SBN Sigorta took over Ticaret Sigorta in 2007. In 2007, Euro Sigorta, Mapfre Genel Sigorta and Zurich Sigorta entered in the insurance market by taking over, Toprak Sigorta, T. Genel Sigorta and TEB Sigorta, respectively.

The profile of the life insurance sector during the analysis period is similar to non-life sector. Bayındır Hayat Sigorta, Emek Hayat Sigorta, Şeker Hayat Sigorta went bankrupt in 2003, 2004 and 2005 respectively. Güneş Sigorta changed its name into Vakıf Emeklilik Aş. after 2002. Commercial Union Sigorta changed its name into Aviva Emeklilik after 2003 and took over Akhayat Sigorta in 2006. Doğan Hayat Sigorta left the market after 2005. Rumeli Hayat ceased its operations after 2006. İsviçre Hayat has been named as Ergoisviçre Hayat after 2006. In 2007, Deniz Emeklilik took over Global Hayat, which had already taken over Toprak Hayat in 2004. Similarly, in 2007, Aegon Emeklilik took over Ankara Hayat which had taken over İhlas Hayat in 2004. Also AIG Hayat, Allianz

⁵ According to the Insurance Accounting System Regulation, released in official journal dated 14.07.2007 and numbered 26582

Emeklilik, ING Emeklilik, Mapfre Genel Yaşam took over American Life Hayat, Koç Allianz Hayat, Oyak

Emeklilik, Genel Yaşam in 2007 respectively. Acıbadem Sağlık Hayat and Finans Emeklilik were established in 2004 and 2007, respectively. New Life entered and started its operation in 2008.

4.1.2. Results of Ratio Analysis

In this section the ratios are evaluated to make conclusions about the liquidity risk of the insurance companies operating in Turkey from 2002 to 2008. Considering the nature of the business, non-life and life insurance companies are evaluated separately.

The ratios are calculated for the periods for each insurer as long as the data is available; the other years are kept empty. Then the averages of the ratios over the years are taken for every insurer. Moreover the averages of the big five insurance companies and rest of the small companies and the averages of the whole industry are also calculated and shown in the tables. While analyzing the liquidity risk structure of the insurance companies averages of the big five insurance companies, average of the rest of the small insurance companies and industry averages are presented in the figures.

The ratio analysis is mainly conducted through comparison of averages of the big and small companies. This separation during the analysis is done since, in literature it is suggested that the liquidity holdings of large and small companies differ (Kim, Mauer, and Sherman 1998; Opler, Pinkowitz, Stulz, and Williamson 1999; Colquitt, Sommer, and Godwin, 1999; Ozkan and Ozkan, 2004; Afza and Adnan, 2007). With large assets base and less constraints in accessing to capital markets, big insurance companies are expected to be less vulnerable to liquidity risk. The differences in means are also statistically tested by Wilcoxon test (Wilcoxon, 1945). As can be seen from the Table 1 at the Appendix B, the results indicate that large and small non-life insurance companies have significant differences in averages of most of the liquidity ratios at 95% confidence level. The same statement can also be done for the life insurance companies. As can be seen from Table 2 at the Appendix B, averages of most of the liquidity ratios of large life insurers are significantly different than the small life insurers'.

At the beginning of each subsection the calculations of the ratios will be explained. Then the findings are analyzed in order to reach a conclusion about liquidity risk structure of Turkish insurance sector.

4.1.2.1. Ratio Analysis of Non-life Insurance Companies

4.1.2.1.1. Liquid Assets to Total Assets Ratio

This ratio is calculated by dividing liquid assets, which is the sum of cash plus bank plus financial assets, to total assets.

Non-life insurance companies have large liquidity needs by the very nature of their business. Occurrence or the amount of the claim payments can not be determined with certainty. To meet the claim payments, non-life insurers' assets need to have high level of liquidity. As the literature suggested, the non-life insurance companies with the liquid assets to total assets ratio that is above the industry average are expected to face less liquidity risk.

The averages of the big five non-life insurance companies in liquid assets to total asset ratio have been smaller than both the averages of the rest of the non-life insurance companies and the industry average throughout the period, except for 2003 (Table 1- Appendix C, Figure 4.1). While the averages of the liquid assets to total assets ratio of the smaller insurance companies, are higher than the industry average.

The industry average increased from 0.4 in 2002 to 0.6 in 2008 gradually. In similar way, averages of the big five insurance companies and averages of the smaller companies increased from 2002 to 2008. The trend can be seen from the figure 4.1 below.

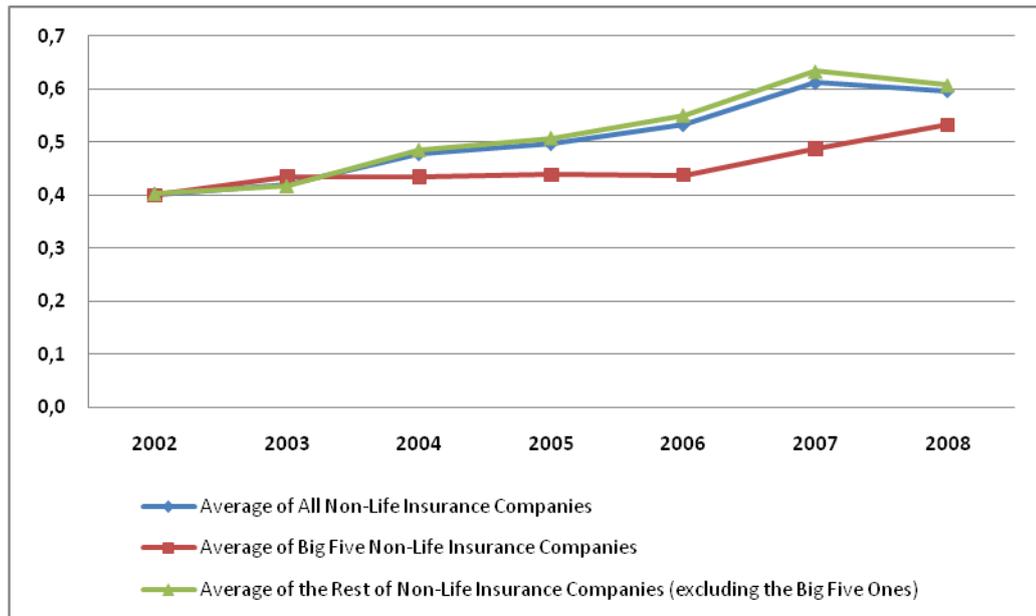


Figure 4.1 Liquid Assets to Total Assets Ratio of Non-Life Insurance Companies

It can be concluded that the larger non-life insurance companies hold less liquid assets in proportion to the total assets than the smaller non-life insurance companies thus, in case of a liquidity crisis, face higher liquidity risk. One of the reasons why large insurers hold less liquid assets in comparison to the industry average can be explained by the fact that the large insurance companies are subjected to less borrowing constraints and have less costly access to capital markets. However when the credit channels are narrowed this advantage might turn into disadvantage in terms of liquidity risk.

As it can be seen from Figure 4.1., big five insurance companies increased the average of the liquid asset to total assets ratio, which is stable on average around 0.43 from 2002 to 2006, in 2007 and 2008 gradually. This increase can be seen as a precaution taken by non-life insurers against the global financial crisis arose from the financial market turmoil in 2007 and 2008.

Interestingly, Merkez, Madgeburger T. Nippon and Batı Sigorta, the companies, not actively operating after 2006, on the average have liquid assets to total assets ratio above the industry average through the analysis period. It is also worth to mention that among the big

five non-life insurance companies, Ak Sigorta has liquid assets to total assets ratio on the average 0.25 over the period and has the highest liquidity risk compared to its peers.

In brief, on average %50 of the non-life insurance companies have liquid assets to total assets ratio that is higher than industry average and the ratios have increased through the analysis period. This indicates that non-life insurers pay attention to their liquidity position and take necessary actions to lower liquidity risk.

4.1.2.1.2. Liquidity Ratio

This ratio is calculated by dividing cash and cash equivalents plus financial assets and financial investments, where investment risk belongs to the policy holder to current liabilities. In the literature the ratio higher than 1 is preferable since it presents insurers ability to meet current liabilities with the liquid assets on hand. Thus, the higher the liquidity ratio is the less the liquidity risk is faced by the insurers.

Through the analysis period, it is observed that the average of the liquidity ratios of both big five insurance companies and smaller insurance companies is above 1. However, there is a slight difference between big five insurance companies and smaller insurance companies. Smaller insurance companies have higher liquidity ratio on average and the ratio has increased since 2005 from 0.95 to 1.49 while, for big insurance companies ratio remains stable around 1 through the analysis period. (Table 2 at Appendix C, Figure 2).

T. Nippon in 2006 and Madgeburger in 2007 and Cardif both in 2007 and 2008 have extremely large liquidity ratios that are excluded from the averages. Disregarding the bankrupt and non operating insurers, Güven Sigorta has the lowest ratio which is 0.51 on the average. Among the big five non-life insurers Aksigorta has the average liquidity ratio of 1.17, that is, despite the low liquid asset to total asset ratio Aksigorta has enough liquid assets to cover its short term liabilities. Approximately % 60 of the non-life insurers has liquidity ratio below 1 on the average over seven years. (Table 2 at Appendix C).

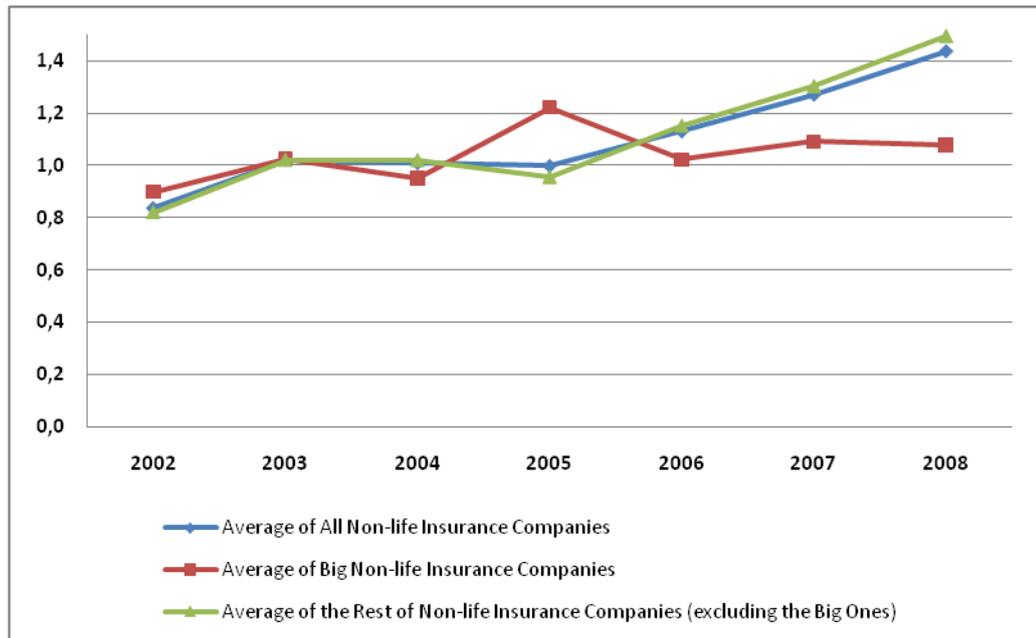


Figure 4.2. Liquidity Ratio of Non-life Insurance Companies

In brief results indicate that, on the average the liquid asset of the non-life insurers is adequate to cover their short term liabilities and the average of the liquidity ratio of smaller insurance companies is higher than big five insurance companies. In this context, the liquidity risk faced by the big five insurance companies is slightly higher than the smaller insurance companies.

4.1.2.1.3. Current Ratio

The current ratio is calculated by dividing the current assets to current liabilities. The current assets are composed of liquid assets plus receivables while current liabilities include all short term liabilities except life mathematical provisions and earthquake loss provisions.

In the literature the current ratio is expected to be at least one, indicating the ability of the non-life insurers to pay its short term debts with the assets that are expected to be converted into cash in the near future. If the ratio is below 1, the insurer faces higher

liquidity problems. Thus, the higher the current ratio the less liquidity risk an insurer faces. The current ratio above 2 is considered as favorable.

As it can be seen from Figure 4.3. and Table 3 at Appendix C, average current ratio of both of the groups in the analysis have been higher than 1.5. The average current ratio of the smaller non-life insurance companies has moved in the same way with the industry and it has increased from 1.5 in 2002 to 2.1 in 2008. On the other hand the average of the big five insurance companies has remain relatively stable during the period.

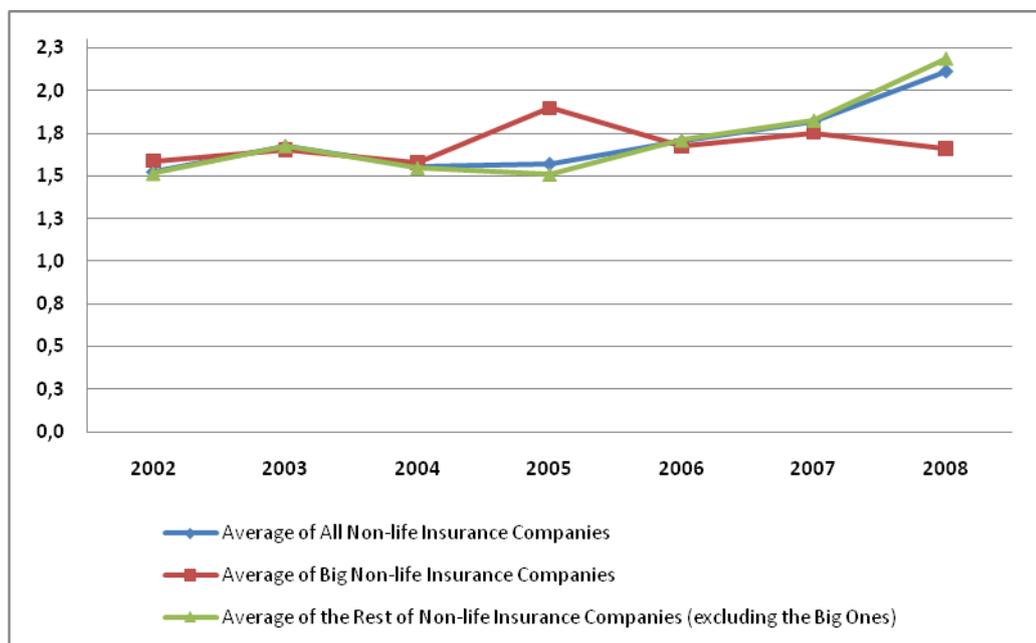


Figure 4.3. Current Ratio of Non-life Insurance Companies

Again, T. Nippon in 2006 and Madgeburger in 2007 and Cardif both in 2007 and 2008 are excluded from the averages due to their extremely large values. Disregarding the bankrupt and non operating insurers, all of the non-life insurers have the ratio above 1 on the average (Table 4. at Appendix C). Among the big five non-life insurers Aksigorta and Mapfre Genel have current ratios above 2 which imply that the companies express low liquidity risk.

These results indicate that non-life insurance sector on the average has adequate current assets which enable them to pay off their short term debts when they due. This situation implies that the liquidity risk which arises from the mismatch between assets and liability side of the balance sheet is not severe for the non-life insurers. In other words, the non-life insurers are able to cover the short term liabilities without bearing the risk related to liquidating illiquid assets.

4.1.2.1.4. Premiums and Reinsurance Receivables to Total Assets Ratio

This ratio is calculated by dividing premiums and reinsurance receivables, which is the sum of net premium receivables from insureds, receivables from intermediaries (agents) and receivables from insurance and reinsurance companies plus deposits with cedants and retrocedants, to total assets.

According to literature, non-life insurers that are managing their liquidity position well are expected to have smaller premiums and reinsurance receivables to total asset ratios than the industry average. Since any delay or default regarding the premiums and reinsurance receivables may lead to liquidity problems; higher ratio indicates higher liquidity risk to insurers.

When the Figure 4.4 is analyzed, it is understood that the averages of premiums and reinsurance receivables to assets ratio of the big five insurance companies have been lower than the smaller non-life insurers'. In addition, the average of premiums and reinsurance receivables to assets ratio of all non-life insurers decreased from 0.33 in 2002 to 0.23 in 2008 (Table 4 at Appendix C). Among the big five non-life insurers Anadolu and Allianz have the average ratio that is higher than the industry average for the analysis period. Not surprisingly the lowest ratios belong to insurers that have not been operating since 2006.

The results imply that the impact of a delay or default in the receivables to liquidity position of the insurer is lower for the big five non-life insurance companies than smaller ones regarding the period under analysis.

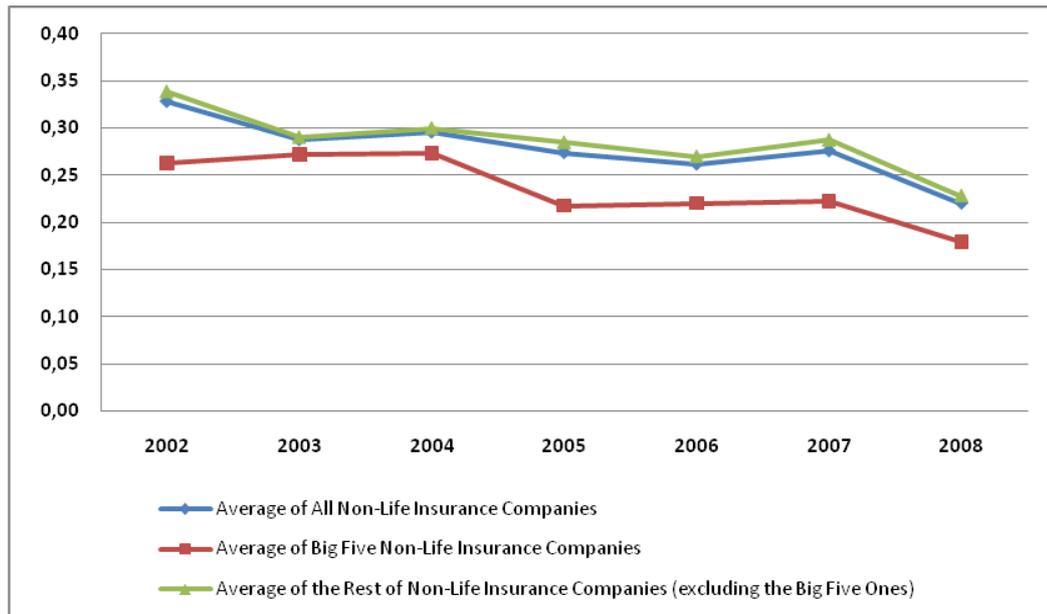


Figure 4.4. Premiums and Reinsurance Receivables to Total Assets Ratio of Non-life Insurance Companies

4.1.2.1.5. Agent Receivables to Equity Ratio

As the name implies, this ratio is calculated by dividing receivables from agents (intermediaries) from the asset side to equity presented in the liabilities side of the insurers' balance sheet. The ratio indicates the dependence on intermediaries which also decreases insurance companies' control over their receivables. If the insurer depends more on agents, it has less control over the cash inflows from the operations thus, it becomes more vulnerable to liquidity problems. Although the ratio seems to reflect more of the insurer's account receivable management ability rather than the pure liquidity of the insurer, all other being equal, it is more likely that financially sound firms reveal lower agents receivable to equity ratio than the industry average.

The ratio of Ankara Anonim Türk has been excluded since it is extremely large (Table 5 at the Appendix C). The average of agent receivables to equity ratio of big five non-life insurer has been lower than the smaller companies and relatively stable throughout the analysis period and ranged from 0.35 to 0.67 .On the other hand, the average of the agent

receivables to equity ratio of smaller insurance companies fluctuated between 0.72 and 1.22 (Table 5 at the Appendix C, Figure 4.5).

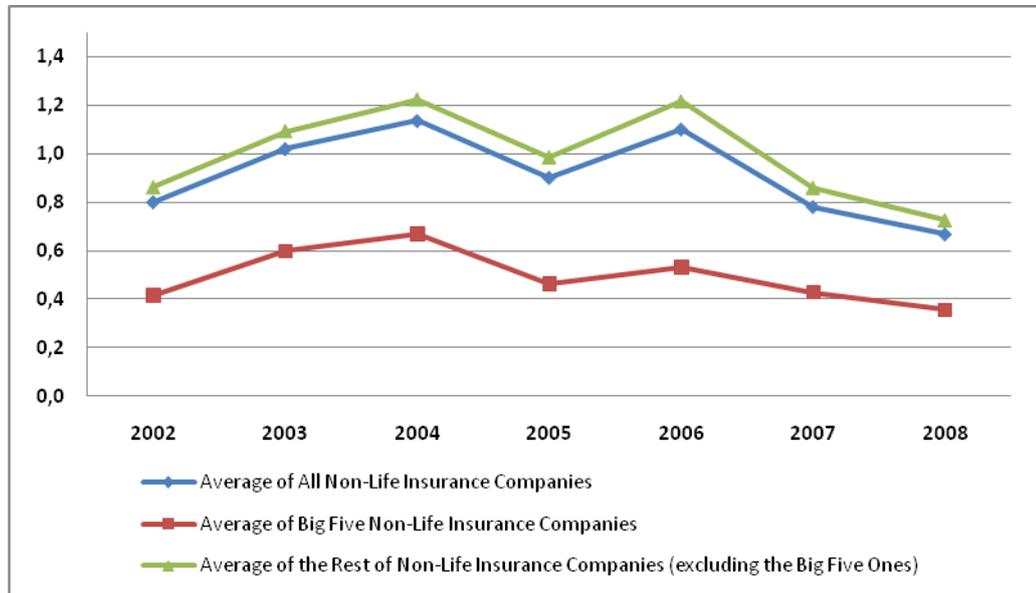


Figure 4.5. Agents Receivables to Equity Ratio of the Non-life Insurance Companies

This result indicates that smaller insurance companies use the intermediaries channel more in relative terms. Therefore they lose direct control over some of their cash inflow and become more vulnerable to liquidity risk. Also this result can be interpreted as the equity base of the big five insurance companies has been stronger than the smaller insurance companies. To conclude the larger insurance companies have been exposed to less liquidity risk that might arise from the intermediaries' channel.

4.1.2.1.6. Total Equity to Total Assets

As can be inferred from its name, the ratio is calculated by dividing total value of shareholders' equity to the total value of the assets. Insurers with relatively high levels of equity are expected, all else equal, to have a lower risk of insolvency. Therefore the ratio determines financial strength of the entity. Although the event driven risks such as a catastrophe or terrorism that lead huge amount of claim payment are generally compensated by the reinsurance channels, having adequate equity base is still of

importance for the non-life insurance companies to cover the risk that are not transferred to the reinsurers. In case of liquidity distress equity can be used to meet claims or other obligations. In addition, the ratio indicates how much of the assets are financed by shareholders. The higher the ratio the less liquidity risk the entity has.

When the Table 6 at the Appendix C and Figure 4.6 below is analyzed, it seen that the average of total equity to total assets ratio of big five non-life insurance companies have been higher than that of smaller non-life insurance companies. The averages of the total equity to total asset ratio of the big five non-life insurance firms have been almost twice as high as the industry average over the analysis period. When the seven years average of the ratio is examined, approximately %55 of the non-life insurance companies' total equity to total assets ratio is below the industry average.

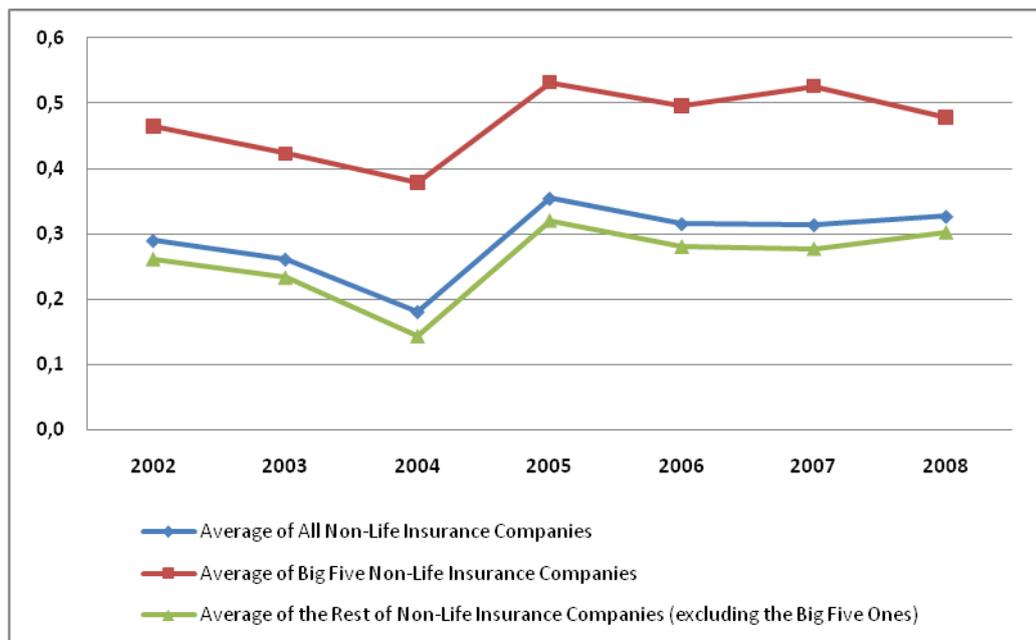


Figure 4.6 Total Equity to Total Asset Ratio of Non-life Insurance Companies

The average of the equity to assets ratio of both big five and smaller insurance companies have been fluctuating in the same pattern throughout period. The average of the equity to asset ratio of big five insurers have been fluctuated in a range between 0.38 and 0.53 while the average of this ratio of smaller companies have been fluctuated in a range between 0.14

and 0.32. The underlying reason is that the period under analysis corresponds to the changes of the regulations regarding the capital adequacy. These regulations have the same proportional effect on all non-life insurance companies.

These results indicate that the big five non-life insurance companies have been financially stronger than the smaller insurance companies. Therefore the ability of the big five non-life insurers to meet the liquidity related problems is higher.

4.1.2.1.7. Working Capital to Written Premiums

Whereas the previous liquidity ratios use balance sheets figures only, this ratio takes into account the ongoing operations as well. Working capital is the difference between the current assets and the current liabilities. The ratio is calculated by dividing the working capital to written premiums. This ratio indicates the ability of the company to provide liquidity out of its total premiums. The high ratio is preferable as it indicates the excess liquidity per written premiums that act as a cushion against unpredictable liquidity needs.

When Table 7 at Appendix C and Figure 4.7 below is analyzed it is seen that the average of the working capital to written premiums ratio of big five non-life insurance companies has followed more stable pattern than that of smaller non-life insurers. The ratio of big five non-life insurers has fluctuated in the range between 0.30 and 0.53 whereas; the ratio of smaller insurer has been fluctuated in the range between 0.17 and 0.89. When the averages over seven years are compared, it is seen that the big five non-life insurers has the ratio higher than smaller companies.

G.I.C Dünya, Demir, Merkez, Madgebureger, Batı, T. Nippon and Cardiff had very high ratios since their premium production is very low, therefore their values have been excluded from the averages. Among the big five insurers, seven years averages of working capital to premium ratio of Aksigorta and Mapfre Sigorta are above the industry average. Approximately %70 of the non-life insurers has the ratio below the industry average.

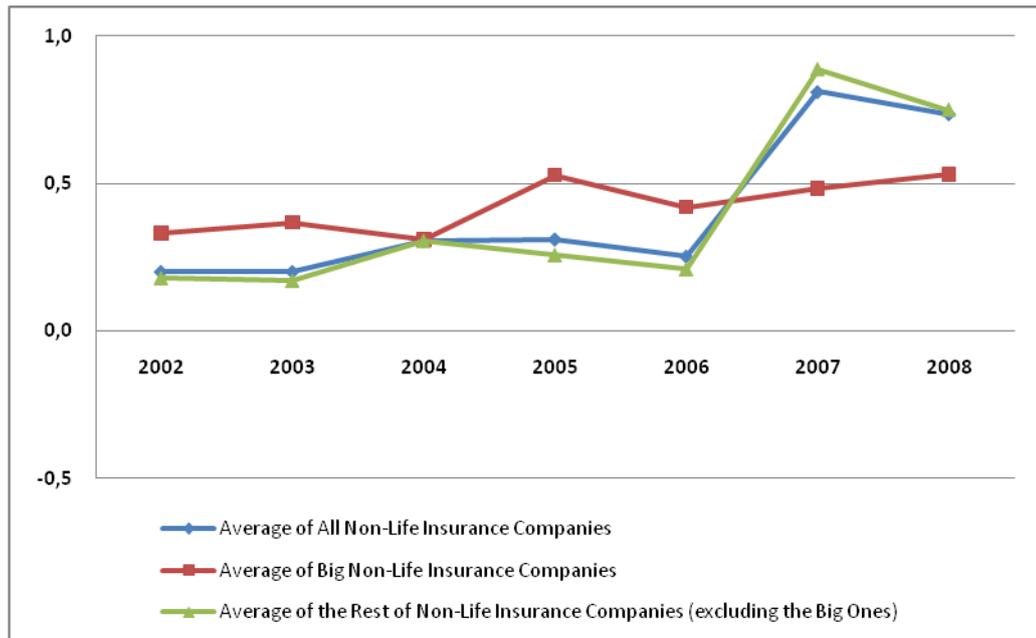


Figure 4.7. Working Capital to Written Premiums Ratio of Non-life Insurance Companies

In brief, analysis indicates that the larger insurers have been better in generating liquidity out of written premiums and thus are less vulnerable to the liquidity risk than the smaller non-life insurers.

4.1.2.1.8. Growth of Total Assets, Liquid Assets and Current Liabilities

Growth of total assets is calculated with the growth rate calculation method. That is, the total asset value of year t-1 is subtracted from year T and divided by total asset value of year T -1. The growth of liquid assets and growth of current liabilities are calculated with the same method. Table 8, 9 and 10 at the Appendix C and Figure 4.8, 4.9, 4.10 present the growth of total asset, liquid assets and current liabilities respectively.

Growth of total assets reduces the liquidity risk of the insurance company. However the source of this growth is of importance. Growth of illiquid assets increases the liquidity risk whereas the growth of the liquid assets strengthens the insurer against liquidity risks. Due

to nature of the non-life insurance business, it is of importance for an insurer to hold cash reserves and other liquid assets in order not to be vulnerable to adverse liquidity outcomes. The insurer with more liquid assets would be relatively unlikely to expose itself to liquidity risk than would an insurer with less liquid assets. Therefore, if the assets growth depend more on liquid assets' growth, the liquidity risk of the insurance company is reduced.

However it is important to consider the liability side of the balance sheet of the insurers. If the liabilities with shorter maturities grow faster than the liquid asset, than the insurer will have troubles in matching the assets side to liabilities side. In this sense, growth of the current liabilities increases the liquidity risk. In order to have better understanding of the growth of current liabilities, growth of total assets and growth of liquid assets should be examined together.

As can be seen from the Figure 4.8, growth of total assets of the big five non-life insurance companies and smaller companies have shown the same pattern except the period between 2004-2005 and 2007-2008. The sharp increase in the growth of the total asset of the big five insurers in the 2004-2005 period, resulted from the huge asset growth realized by Aksigorta. Aksigorta has increased their assets approximately four times. After then, the big five insurers have sustained average growth of total assets approximately 0.16 (Table 8 at Appendix C). On the other hand, smaller insurance companies' total assets keep growing their assets at an increasing rate after 2004-2005 period. This growth pattern is mainly due to the new market entrants. In brief, throughout the analysis period, non-life insurers have managed to increase their total assets about %27, on the average, per year (Table 8 at Appendix C).

To examine the source of the growth of the total assets, the growth of liquid assets of the non-life insurer can be analyzed from Table 9 at Appendix C and Figure 4.9. Throughout the period liquid asset of the non-life insurers have revealed a positive growth rate. When the non-life sector averages over seven years examined the average growth rate of liquid assets is higher for big five insurers. In addition, the industry average over seven years is approximately 0.38.

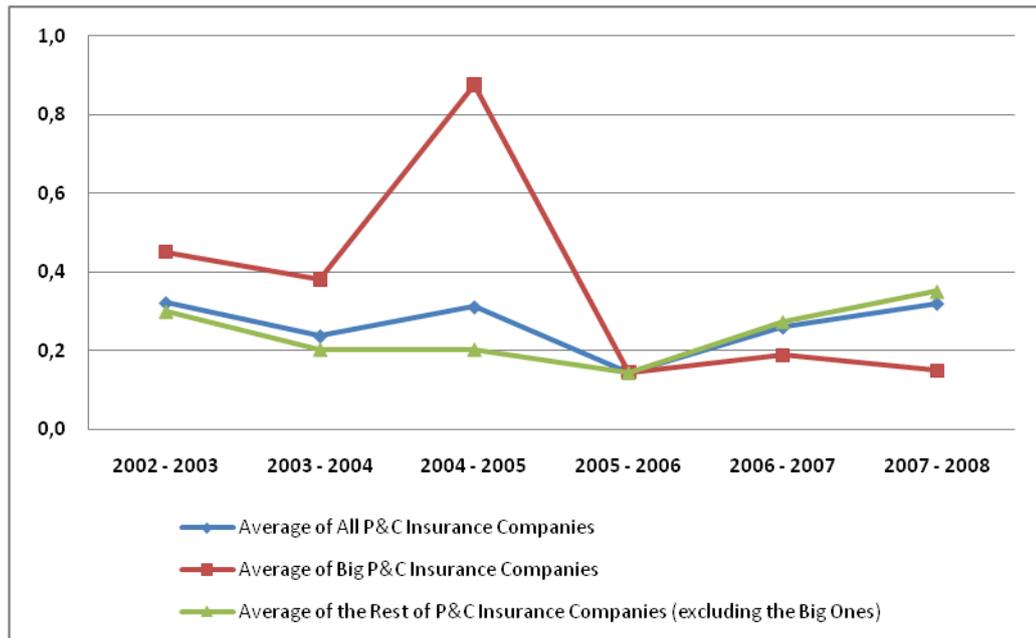


Figure 4.8. Growth of Total Assets of Non-life Insurance Companies.

When the growth of the current liabilities are examined from Table 10 at Appendix C and Figure 4.10 below, it can be seen that the average of growth of the current liabilities of the all non-life insurance companies is around 37 percent, except 2007-2008 period. Similar to total assets and liquid assets, current liabilities of the non-life insurers has revealed a positive growth rate pattern over the analysis period. The average growth of current liabilities of the big five non-life insurers has followed approximately the same growth pattern with the smaller insurers except for the period between 2007 and 2008.

When the average growth rates of the current liabilities, total assets and liquid assets are compared, it is seen that the growth rates are closer to each other yet, the liquid assets has the highest growth rates on average, except for the period 2003-2004 and 2007-2008. This indicates that the liquidity positions of the non-life insurers have been well managed. For the period 2007-2008, the increase in the current liabilities of the smaller insurance companies on the average has been more than increase in the liquid asset. This result implies that liquidity risk of smaller insurance companies has been increased.

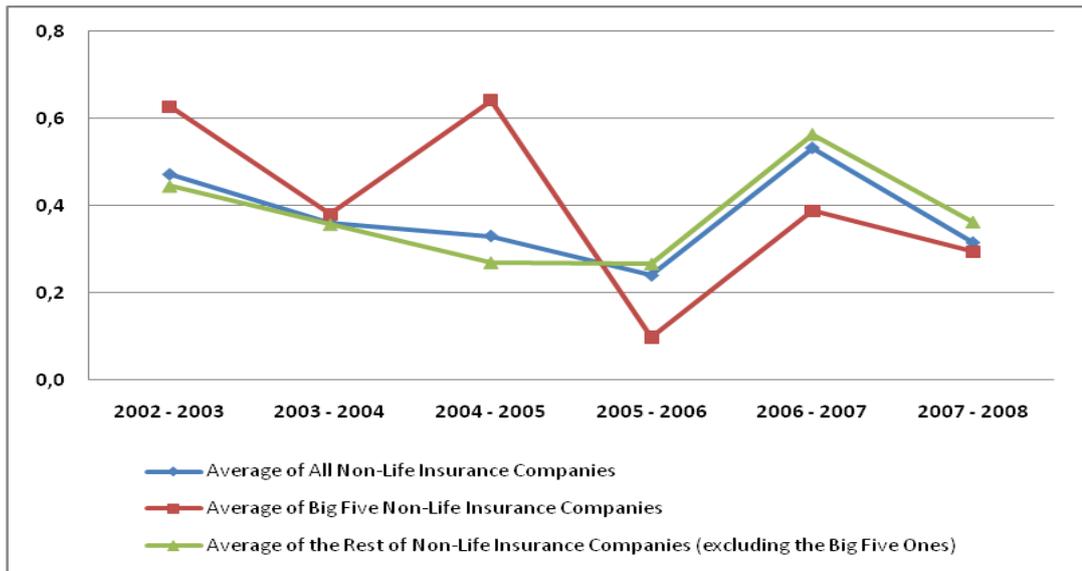


Figure 4.9. Growth of Liquid Assets of Non-life Insurance Companies

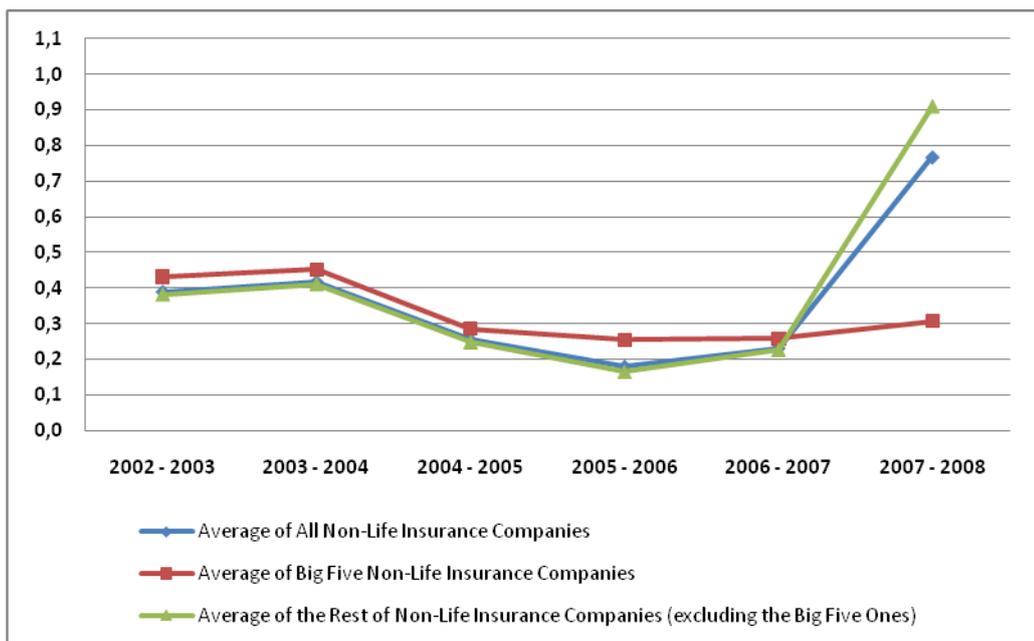


Figure 4.10. Growth of Current Liabilities of Non-life Insurance Companies

4.1.2.2. Ratio Analysis of Life Insurance Companies

4.1.2.2.1. Liquid Assets to Total Assets Ratio

As the literature suggested, the life insurance companies with liquid assets to total assets ratio above the industry average are expected to face less liquidity risk. When the Table 11 at the Appendix C and Figure 4.11 is examined, it is seen that life insurance companies on the average have hold very high liquid asset in proportion to their total assets approximately about 0.7. The averages of the smaller insurance companies have not fluctuated much, average ratios have changed in the range between 0.64 and 0.80 from 2002 to 2008. On the other hand, the average of the liquid assets to total assets ratio of the big five life insurance companies has decreased from 0.87 in 2003 to 0.47 in 2008.

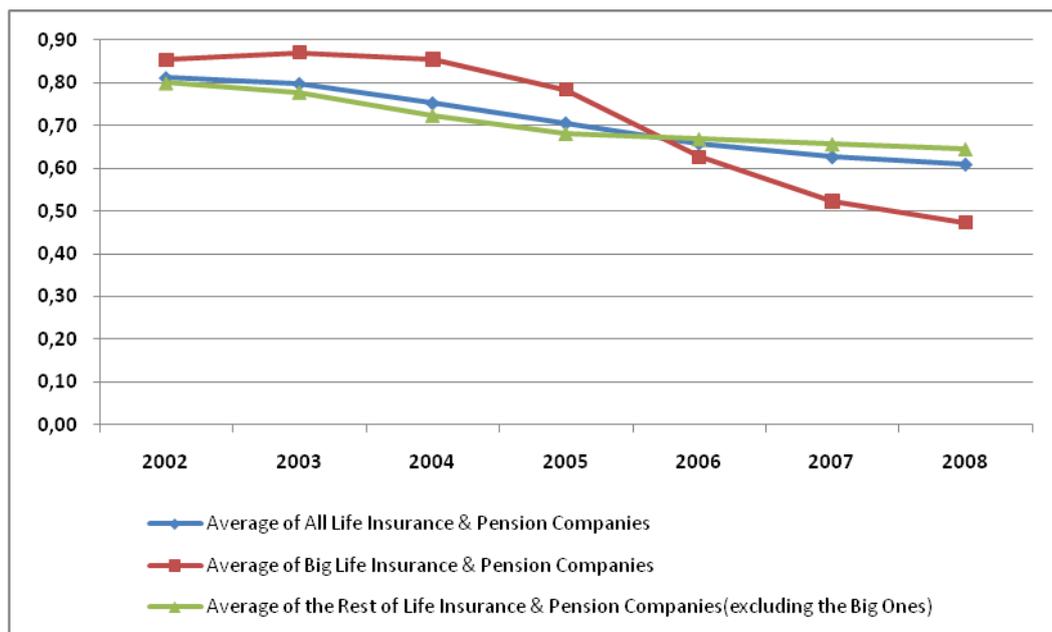


Figure 4.11 Liquid Assets to Total Assets Ratio of Life Insurance Companies

These results indicate that, in recent years, the larger life insurance companies have been holding less liquid asset in proportion to the total assets than smaller life insurance companies thus, in case of a liquidity crisis, larger life insurers face higher liquidity risk.

4.1.2.2.2. Liquidity Ratio

As the literature suggested the ratio higher than 1 is also preferable for the life insurance companies. Considering the nature of the life insurance business, the higher the liquidity ratio is, the less the liquidity risk is faced by the insurers.

Through the analysis period, the average of the liquidity ratios of both big five insurance companies and smaller insurance companies is far above 1. The life insurance industry average over seven years is approximately 3. Big five insurance companies have higher average liquidity ratios with greater fluctuation while, for smaller insurance companies ratio remains relatively stable in the range between 1.8 and 3.4 through the analysis period. (Table 12 at Appendix C, Figure 4.12). The sharp increase in the average of the big five insurers in 2005 is due to very high liquidity ratios of the Allianz Emeklilik and Aviva Emeklilik.

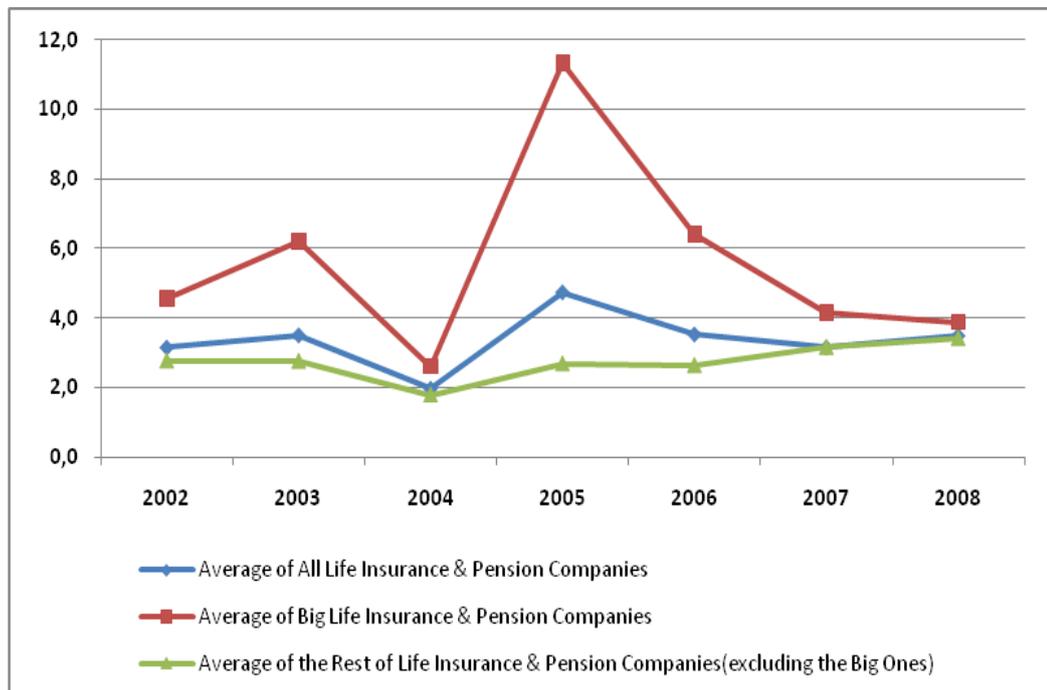


Figure 4.12. Liquidity Ratio of Life Insurance Companies

In brief results indicate that, on the average the liquid asset of the life insurers have been adequate to cover their current liabilities. When compared to their smaller peers, the larger insurers have been less exposed to the liquidity problems that may arise instantaneously, as they have enough liquid assets left after covering their short term obligations. Yet still smaller insurers have been adequately covering their short term obligations. Consequently, it can be said that liquidity risk faced by life insurers as a whole has not been serious.

4.1.2.2.3. Current Ratio

As suggested by literature, life insurers are expected to have enough liquid assets to cover their short term liabilities since their liabilities due mostly in longer term. Therefore, for the life insurers the current ratio below 1 indicates high level of liquidity risk. The current ratio above 2 is considered as favorable. In broad terms, the higher the current ratio the less liquidity risk a life insurer faces.

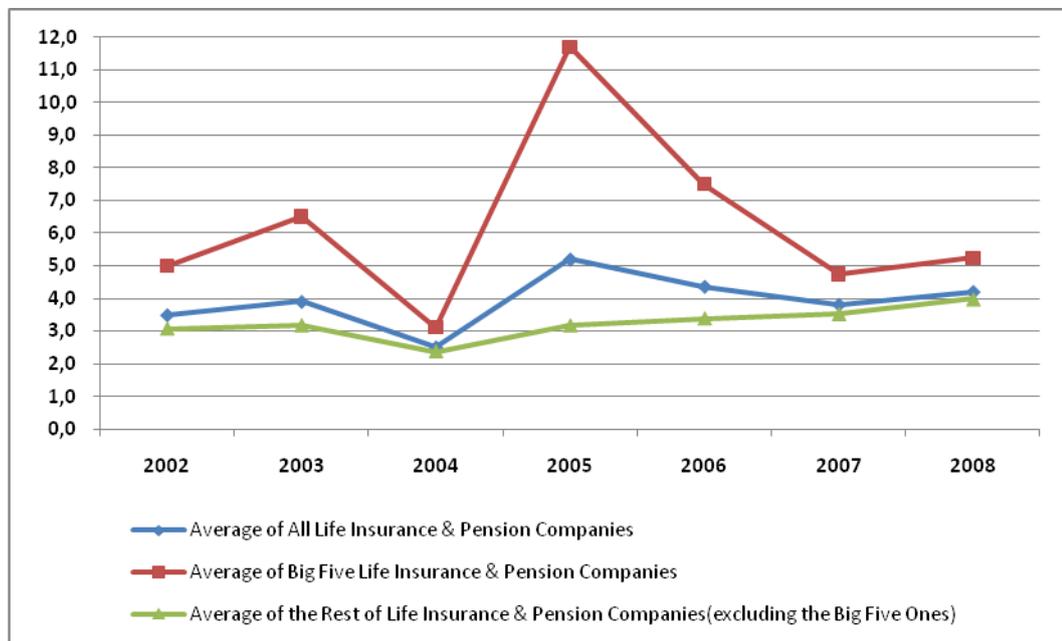


Figure 4.13 Current Ratio of Non-life Insurance Companies

As it can be seen from Figure 4.13. and Table 13 at Appendix C, average current ratio of both of the groups in the analysis have been higher than 2. The average current ratio of the smaller life insurance companies has followed smooth pattern over the year and has been approximately around 3. On the other hand the average of current ratio of the big five insurance companies fluctuates between 3.1 and 11.7 with an average of 6.2, during the period.

Results indicate that all life insurance companies' current assets have been higher than their current liabilities. As, the difference acts as a cushion against unexpected liquidity needs the life insurers can be considered as less vulnerable to liquidity problems that may arise from the mismatch between assets and liability side of the balance sheet.

4.1.2.2.4. Premiums and Reinsurance Receivables to Total Assets Ratio

According to literature, the receivables are least liquid assets among current assets thus, the higher the ratio is, the higher is the liquidity risk that life insurer faces.

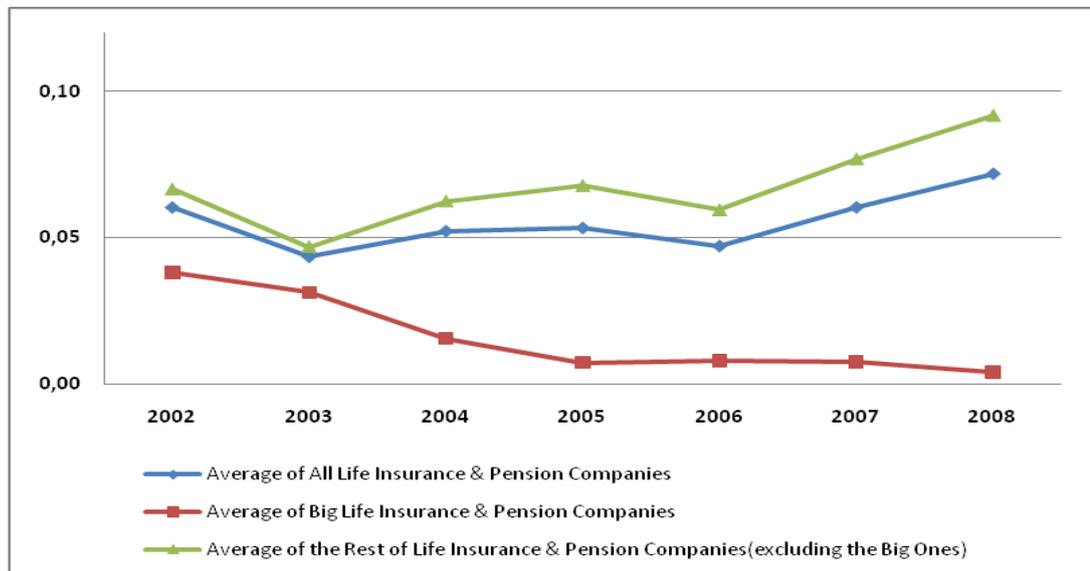


Figure 4.14. Premiums and Reinsurance Receivables to Total Assets Ratio of Life Insurance Companies

The averages of the premiums and reinsurance receivables ratio to total asset ratio of life insurance companies have been presented in Table 14 at Appendix C and Figure 4.14. As it is seen, the averages of both smaller and big five life insurers' have been lower than 0.1. The average of the all life insurance companies have been around 0.05. In addition, the average of the premiums and reinsurance receivables ratio to total asset ratio of big five life insurers has been decreased almost ten times, from 0.03 in 2002 to 0.003 in 2008.

These results show that liquidity positions of the life insurance companies have been less affected by a delay or default in the receivables. This situation is even more valid for the big five insurance companies.

4.1.2.2.5. Agent Receivables to Equity Ratio

As it is mentioned earlier, high dependence of the agents decrease insurers control over their cash inflows. Thus, the insurer becomes more vulnerable to liquidity risk. It is more likely that financially sound life insurers reveal lower agents receivable to equity ratio than industry average.

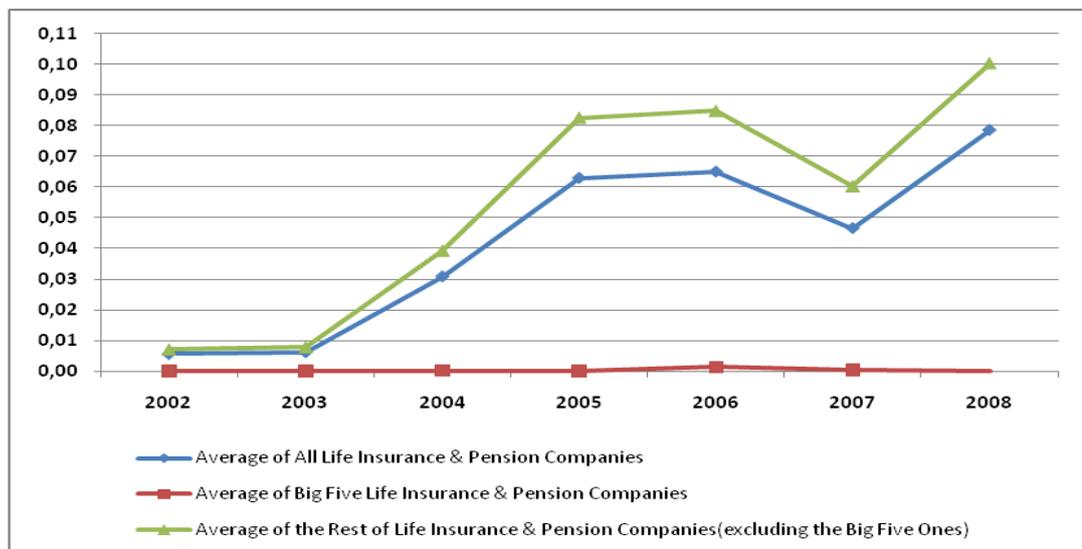


Figure 4.15. Agents Receivables to Equity Ratio of the Life Insurance Companies

When the Table 14 at Appendix C and Figure 4.15 are analyzed, it can be easily seen that the average of the agents receivables to equity ratio is almost zero for the big five insurance companies. Although the averages of the ratio have been very low for the smaller insurers, the ratio has increased from 0.007 in 2002 to 0.1 in 2008.

Throughout the analysis period only four companies have ratios above the industry average; these are Güven Hayat, Deniz Hayat, Ergoİsviçre Hayat and Axa Oyak Hayat. Especially, the agents receivables to equity ratio of Güven Hayat has been very high compared to its peers. On the contrary almost half of the life insurers have had no receivables from their agents.

This result indicates that, on the average, life insurance companies depended less on the intermediaries' channel for their operations. Therefore we can conclude that the liquidity problems that might arise from the intermediaries channel are not an important concern for the life insurers.

4.1.2.2.6. Total Equity to Total Assets

Life insurers with relatively high levels of equity are considered as financially strong. Since equity is a cushion against adverse developments, the insurers with strong equity base will be less vulnerable to risks. In this context, the higher the ratio the less liquidity risk the entity faces.

The average of total equity to total assets ratio of big five life insurance companies have been lower than that of smaller life insurance companies. The averages of the total equity to total asset ratio of the smaller life insurance firms have been more than twice as high as the big five life insurers' average over the analysis period. When the seven years averages of the ratios are examined, approximately half of the non-life insurance companies' total equity to total assets ratio is above the industry average.

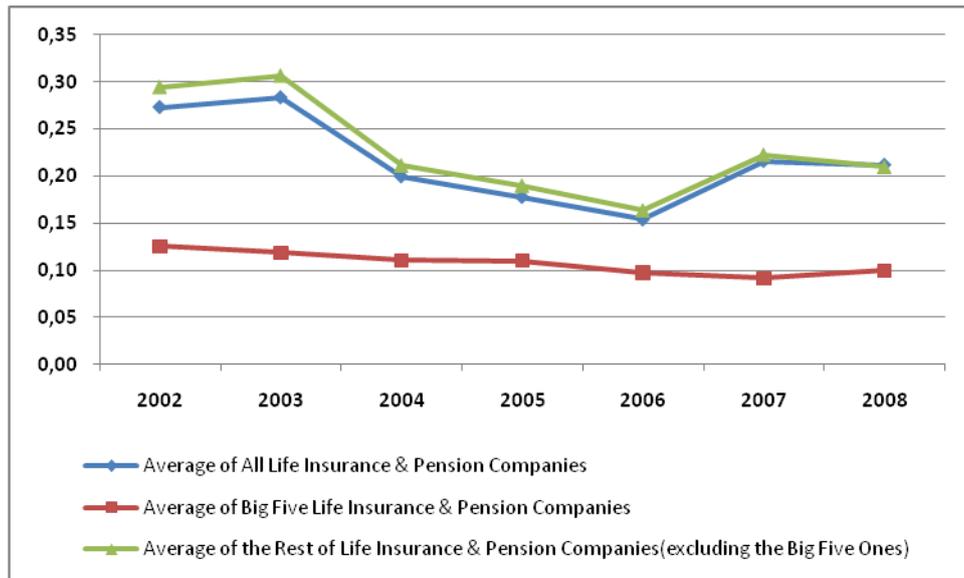


Figure 4.16 Total Equity to Total Asset Ratio of Life Insurance Companies

The averages of the equity to assets ratio of big five life insurance companies have been stable throughout period around 0.10 whereas, smaller insurer' averages have fluctuated in the range between 0.16 and 0.30.

These results indicate that the big five life insurance companies have undertaken higher risks than the smaller ones. Therefore in case of an insurance run, the larger companies are more vulnerable.

4.1.2.2.7. Working Capital to Written Premiums

Whereas the previous liquidity ratios use balance sheets figures only, this ratio takes into account the ongoing operations as well. This ratio indicates the ability of the company to provide liquidity out of its total premiums. The higher the ratio the better it is for a life insurer, as it indicates the excess liquidity per written premiums that act as a cushion against unpredictable liquidity needs.

Table 17 at Appendix C and Figure 4.17 below presents the averages of working capital to written premiums ratio of the life insurance companies. The averages of working capital to written premiums ratio of all life insurance companies have been higher than one throughout the period. The average of working capital to written premiums ratios of big five insurance companies have been higher than the smaller insurers.

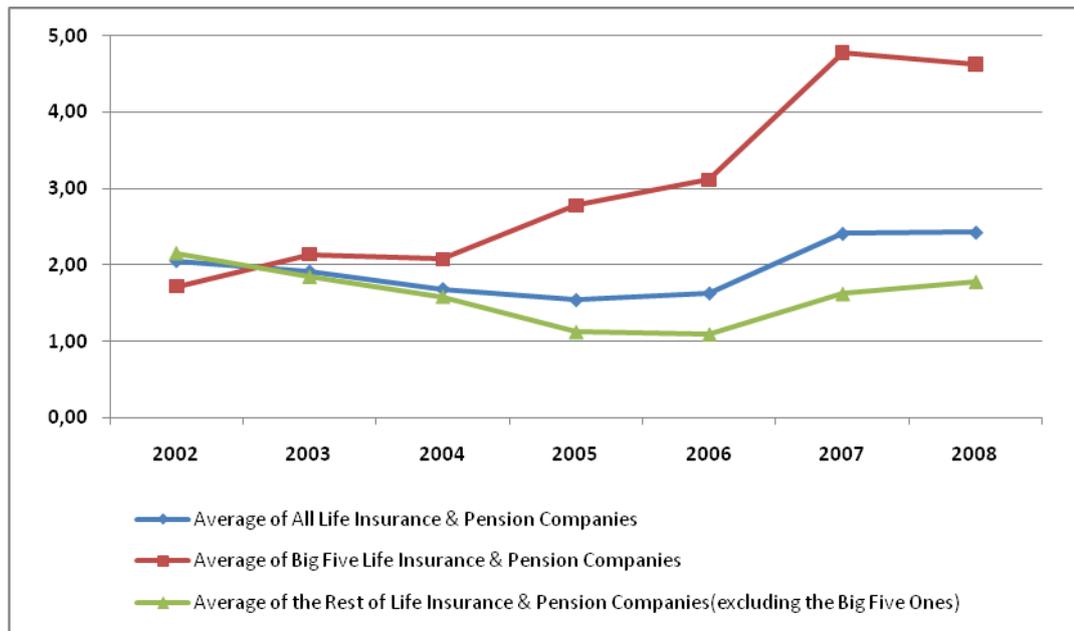


Figure 4.17. Working Capital to Written Premiums of Life Insurance Companies.

Şeker Hayat Yaşam has been excluded when calculating the averages as the firm had extremely high ratios. When the seven years averages are examined, it is seen that approximately %75 of the life insurers had ratio higher than 1.

The positive working capital to written premiums ratios of the life insurance firms imply that they hold excess liquidity per the premiums they produce that can be used as a cushion against liquidity problems. The big five insurers have been relatively less exposed to liquidity risk that may arise from unexpected claim payments or policy surrenders since they have higher amount of excess liquidity per unit of written premium.

4.1.2.2.8. Growth of Total Assets, Liquid Assets and Current Liabilities

Table 18, 19 and 20 at the Appendix C and Figure 4.18, 4.19, 4.20 present the growth of total assets, liquid assets and current liabilities of life insurance companies respectively.

The pattern of the current ratios and liquidity ratios of life insurers indicated that life insurers are holding adequate liquidity to meet their current liabilities. However, in order to have a deeper insight into the liquidity risk profile of the life insurers, the growth of current liabilities, growth of total assets and growth of liquid assets have been examined together.

The growth of total assets of the big five life insurance companies and smaller companies have provided positive growth rates throughout the period with the seven years' average of 0.39 and 0.45 respectively (Figure 4.18). Between 2002 and 2004 total asset of the big five insurance companies have increased more than twice. In addition their total assets continued to increase %30 on the average per year. While smaller insurance companies have maintained total asset growth rate of 0.45 on average throughout the years.

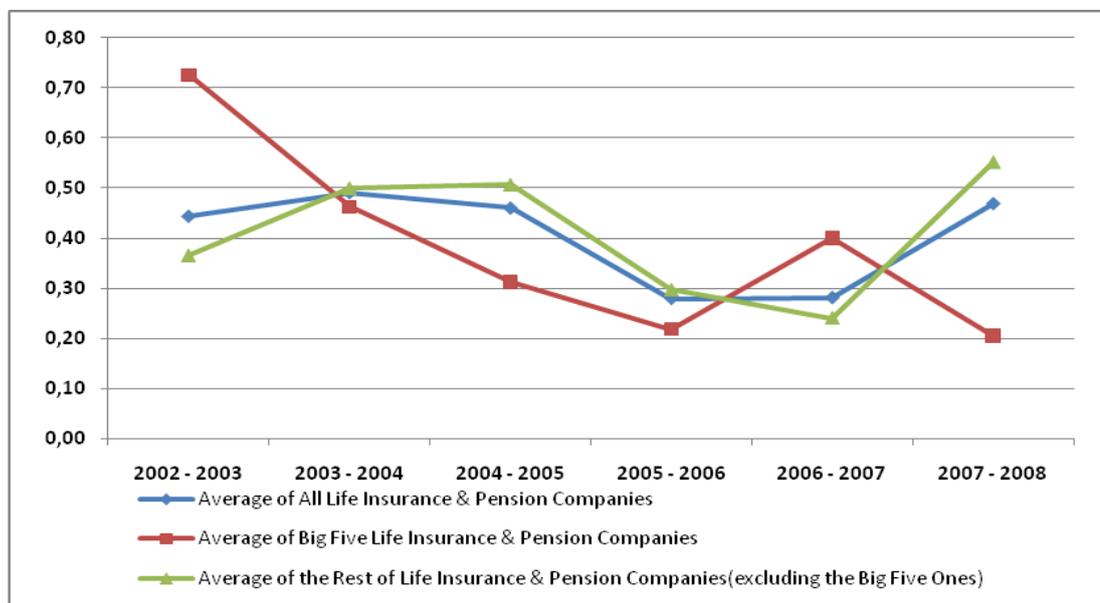


Figure 4.18. Growth of Total Assets of Life Insurance Companies.

The growth of liquid assets of the life insurer can be analyzed from Table 19 at Appendix C and Figure 4.19. Throughout the period liquid asset of the life insurers have revealed a positive growth rate on the average about 35 percent per year. When the big five insurers are compared with smaller insurers according to their growth rate averages over seven years, the average growth rate of liquid assets of smaller insurers is higher than big five insurers. Moreover, the growth of liquid asset of the big five insurers has decreased sharply from 2002 to 2006. In fact, from 2005 to 2006 liquid assets of big five insurers has even contracted. However this decrease was temporary, for the following years they have pursued positive growth.

When the averages of growth of the current liabilities of the life insurance companies are analyzed from Table 20 at Appendix C and Figure 4.20 below, it is seen that smaller insurers pursued higher growth rates than big five insurance companies on the average, specifically in periods 2002-2003, 2003-2004, 2004-2005 and 2007-2008. Similar to total assets and liquid assets, current liabilities of the life insurers has revealed a positive growth rate pattern over the analysis period. Aviva Emeklilik and Fianans Emeklilik had extremely high growth rates in 2003-2004 and 2007-2008 period respectively; that are excluded from the averages.

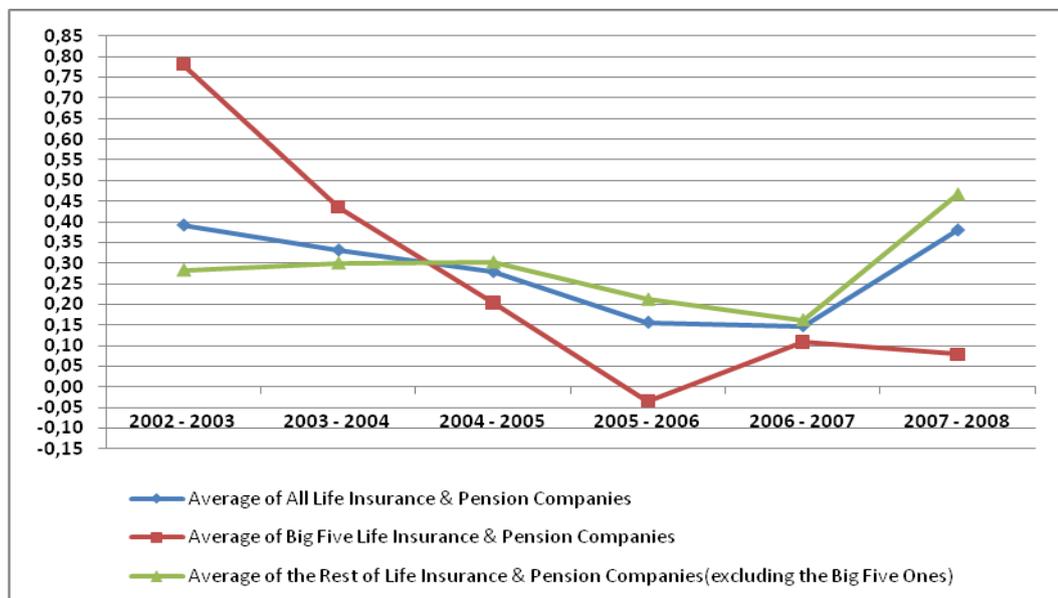


Figure 4.19. Growth of Liquid Assets of Life Insurance Companies

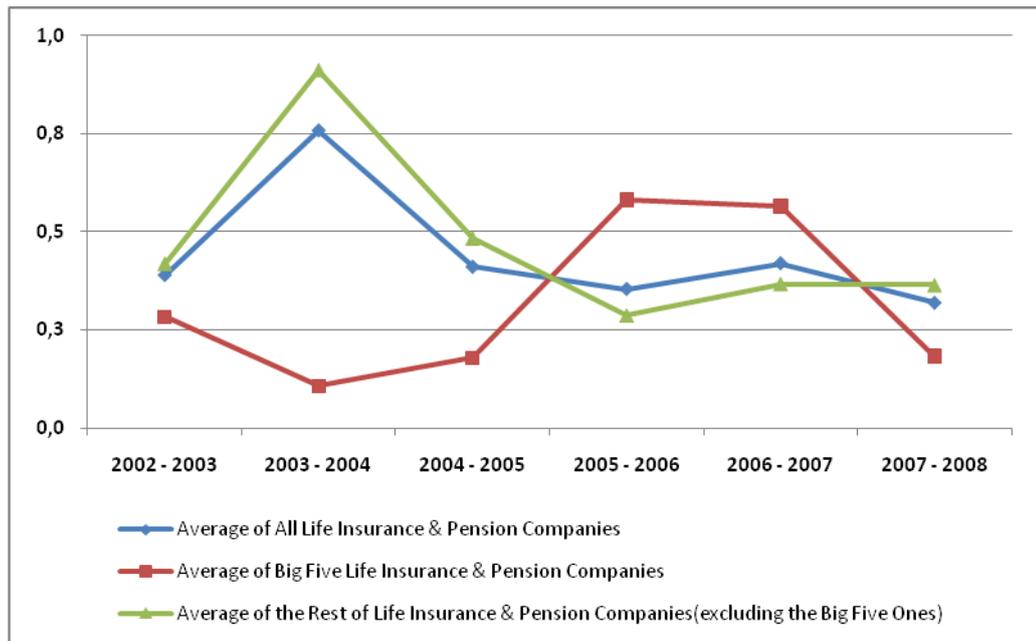


Figure 4.20. Growth of Current Liabilities of Life Insurance Companies

When the seven years' average growth rates of the current liabilities, total assets and liquid assets are compared, it is seen that the growth of liquid assets is lower than the growth of total assets. In addition the growth rate of current liabilities of the life insurers has been higher than growth rate of liquid assets. This indicates that the extent of the liquidity risk faced by life insurance companies has been increased.

4.2. Conclusion

In this section the liquidity risk profile of the non-life insurance companies and life insurance companies have been analyzed separately with the help of liquidity ratios for the period between 2002 and 2008

It can be concluded that both big five non-life insurance companies and smaller insurance companies hold high levels of liquid assets in their assets portfolio and this portion has

been increased over time. In addition, the non-life insurers have adequate liquid assets to meet their short term liabilities on average. However, the liquidity risk exposed by the smaller non-life insurance companies is higher than the big five non-life insurers. Underlying reasons can be stated as the following; short term liabilities of smaller non-life insurers are higher in proportion to their liquid assets, intermediaries have been used more by smaller non-life insurers and their equity base is not as strong as the big five non-life insurance companies.

For the life insurance sector, it can be concluded that the liquid assets of the life insurers adequately cover their current liabilities on the average. However, the proportion of the liquid assets in the life insurers' portfolio has been decreased. When the big five insurers are compared to their peers, it is seen that big five insurers have had lower total equity to total assets ratio and liquid assets to total asset ratio than the smaller insurers. Therefore liquidity problems that may arise from policy surrenders will have more severe consequences for larger insurers. On the other hand, their average current ratios and liquidity ratios are higher, and agent receivables and premium and reinsurance receivables are lower than the smaller insurers. Thus, the liquidity risk that may arise from mismatch between assets and liabilities has been relatively lower for the larger life insurance companies. Lastly, the growth rate of the current liabilities of the life insurers has been higher than growth rate of liquid assets, thus it can be said that, the extent of the liquidity risk faced by life insurance companies has been increased.

CHAPTER V

FIRM SPECIFIC FACTORS AFFECTING LIQUIDITY OF NON-LIFE INSURERS

In the previous chapter the liquidity structure of the non-life and life insurance companies in Turkey are examined separately via the help of ratio analysis. In this part, the firm specific factors affecting the liquidity situation of insurance companies is analyzed in the context of non-life insurance companies with panel data analysis from the period 2002 to 2008. As the number of the companies operating in the life insurance sector is small non-life insurance companies are chosen for the analysis. The data for the analysis is gathered from Insurance Supervisory Board's annual reports released by Insurance Department of the Undersecretariat of Turkish Treasury for the periods 2002 to 2008 from their web site.

For the panel data analysis, the data of 25 non-life insurer firms from 2002 to 2008 are included in the balanced panel data analysis. The computer program Eviews is used for the analysis. The data of bankrupt firms; Egs, Ege, G.I.C Dünya, Sanko, Kapital are disregarded from the data set. Moreover, newly entered firms' (Atradius, Coface, Cardiff and Dubai Grup) data started from 2007 and 2008 respectively is disregarded. Lastly the data of the insurers, Bati , Madgeburger, Merkez, Rumeli and T.Nippon, that have not been actively operating in 2007 and 2008 are excluded from the data set as well as Demir that was not active in 2007.

First section starts with the literature review and following section presents hypothesis development. In the third section, explanation of the model is given. The fourth section presents results of panel estimations, and then the fifth section presents the interpretations of the regression results. Last section is conclusion.

5. 1. Literature Review

The possible determinants that characterize the firm's liquidity decisions are analyzed under the framework of the trade off theory, Myers' pecking order theory, and Jensen's cash flow uncertainty theories (Kim et. al., 1998; Opler et. al. 1999; Colquitt et. al., 1999; Almeida et. al. 2002; Dittmar, Mahrt-Smith, and Servaes, 2002; Ferreira and Vilela, 2003; Ozkan and Ozkan, 2004; Nguyen, 2008; Afza and Adnan, 2007; Baum, Caglayan, and Talavera 2009).

The trade-off theory, grounded on Keynes' (1936) analysis of the demand for liquidity, postulates that the firms trade off the costs and benefits of corporate liquidity to set their optimal liquidity holdings. According to trade off theory, the main cost of liquidity is the opportunity cost of the capital due to the low return on liquid assets. While, reduction in the likelihood of financial distress, pursuance of investment policy when financial constraints are met and the contribution of the liquidity to reducing the costs of raising external resources or liquidating existing assets are stated as the main benefits (Ferreira and Vilela, 2004; Afza and Adnan, 2007). Moreover, when raising the external financing is costly according to transaction costs motive, firms hold more cash (Dittmar et. al., 2002).

The pecking order theory (Myers, 1984) emphasizes the existence of information asymmetry between managers and outside investors. The asymmetry increases the cost of external financing compared with internally generated cash flows (Nguyen, 2008). Therefore, theory states that to minimize asymmetric information costs and other financing costs, firms should finance investments first with retained earnings, then with safe debt and risky debt, and finally with equity (Ferreira and Vilela, 2004; Afza and Adnan, 2007). Almeida et. al. (2002) show that the more difficult it is to raise external funds, the higher the propensity to retain internal cash flows. The pecking order predicts that cash holdings are positively related to internal cash flows and negatively related to debt ratios as firms attempt to build conservative balances sheets before returning cash to investors.

The free cash flow theory of Jensen (1986) emphasizes the agency cost arising from the separation of ownership and management. The model suggests that managers may have an incentive to pursue objectives inconsistent with value maximization for their own benefit (Jensen and Meckling, 1976). When monitoring is weak and governance systems are poor, agency costs become more prevalent. According to theory, holding excess cash within the firm is supposed to be preferred by managers not only to maintain financial stability but also to protect their human capital invested in firm (Dittmar et. al., 2002). Therefore, according to theory, keeping liquid balance sheet increases managerial control and gives managers discretionary power over the firm's investment decision which also enable them to invest in projects that best suit their own benefits rather than shareholder's. In this context, leverage is considered to have a beneficial effect as it increases the incentives for debt holders to monitor the firm yet; the empirical evidence on the effect of corporate governance on cash holdings appears mixed (Nguyen, 2008).

A large body of literature has investigated the determinants of corporate liquidity generally by means of cash holdings of non financial firms (Gertler and Gilchrist, 1994; Kim et. Al.1998; Opler et al., 1997; Almedia 2002) or firms in general (Dittmar et. al., 2002; Ferreira and Vilela 2003; Ozkan and Ozkan, 2004; Afza and Adnan, 2007). Few of them focused on the insurance industry (Outreville 1987; Colquitt et. al., 1999; Shiu, 2006). Therefore, to construct the model in the present study both the former studies and industry specific literature is taken into account. In the following paragraphs, some important studies and their basic findings are summarized.

Opler et al., (1999) examine the determinants and the implications of the cash and marketable securities by publicly traded US firms showed that non-financial firms' liquidity is positively associated with growth opportunities and uncertainty in cash flows, but negatively related to firm size and credit rating.

Kim et al (1998) investigate the firm's decisions to invest in liquid assets by developing a model of optimal corporate investment in liquid assets based on the tradeoff between cost and benefits of holding liquid assets. In their model, they find that investment in liquidity is statistically positively related to the cost of external financing, the variance of the future

cash flows and future investment opportunities and negatively related to the return differential between physical assets and liquid assets.

Dittmar et. al. (2002) analyzed the possible effects of what agency cost theory suggests on corporate liquidity over a sample of 11,000 firms from 45 countries. They find that firms in countries with good shareholder protection hold up to twice as less cash as corporations in countries with no good shareholder protection. In addition, consistent with the importance of agency costs, they find that when it is easier to access capital markets managers hold larger cash balances. Their analysis indicates that investors in countries with poor shareholder protection are ineffective over controlling managers' incentive to hold excess cash balances.

Ferreira and Vilela (2004) investigate the determinants of corporate cash holdings in EMU (European Monetary Union) countries, including Germany, France, Netherlands, Italy, Spain, Finland, Belgium, Austria, Ireland, Luxemburg, Greece and Portugal. They found that cash holdings are negatively affected by leverage and size; whereas, investment opportunity set and cash flows positively affect the cash holdings. Additionally, they found that firms closely related with banks hold less cash for precautionary reasons. In line with, the managerial discretion theory, superior investor protection and concentrated ownership structure affect cash holdings negatively.

A more detailed analysis regarding the effect of agency cost on cash holdings is realized by Ozkan and Ozkan (2004), which presents evidence of the significant relation between managerial ownership and cash holding using the data of UK companies. They also find that cash holdings are statistically positively related to growth opportunities, and negatively related to leverage and bank debt. They show that managerial ownership tends to reduce cash balances. They use the mutual company versus stock company characteristics to analyze the effect of the managerial ownership as it is commonly done (see Pottier, 2007; Shiu 2006).

Mehar (2005) investigates the influences of equity financing on the liquidity position of a firm. The research conclude that equity financing plays a central role in determination of

the liquidity position and the important conclusion of his research is that; long-term debt may have an adverse impact on company's liquidity.

Nguyen (2008), by using the data of Japanese non financial firms, investigated the hypothesis that cash balances have a precautionary motive and serve to mitigate the volatility of operating earnings, which they use as a proxy for risk. In their model they include return on assets, earnings volatility, industry risk, size, leverage, dividend payout ratio and investment opportunities as independent variables to determine cash and cash equivalents. The analysis shows that cash holdings are positively associated with firm level risk, but negatively related to industry risk. Moreover, in line with the previous researches, cash holdings are found to be decreasing with the firm's size and debt ratio, and increasing with its profitability, growth prospects, and dividend payout ratio. Overall, the analysis strongly supports the theory of holding cash for precautionary reasons.

Most of the studies have analyzed the determinants of corporate liquidity using the data of the developed countries. Among a few studies, providing evidence for a developing country Afza and Adnan (2007) use non-financial Pakistani firms, the model in which firm size, growth opportunities, cash flow, net working capital, leverage, cash flow uncertainty and dividend payments are statistically analyzed to determine the impact of these factors on corporate cash holdings. Firm size, cash flow, and cash flow uncertainty positively affect the cash levels of the firm, whereas, growth opportunities, net working capital, leverage and dividend payments are found to be negatively influencing the corporate cash holdings. Another case study conducted by Ighodalo and Yuanjian (2007) analyze the corporate cash holdings using data of publicly listed Chinese firms. In this study, dividend payout, growth opportunities and large cash flows are found to positively affect the cash level whereas; firm size, leverage, debt structure and liquid asset substitutes negatively affect corporate cash level.

In this thesis, the variables that have possible impact on the corporate liquidity situation of non-life insurers are investigated. Aside from benefiting from the former theoretical and empirical literature the methodology of following three main articles is used for analyzing insurance specific characteristics.

Outrivelle (1987), using the terminology and data of property liability insurance companies, analyze the existence of economies of scale in the demand for cash balances by insurance companies with the help of time series and cross sectional regression analysis. The research provides empirical evidence in the insurance sector that is consistent with the literature on the demand for cash balances for manufacturing firms. Size, extent of reinsurance reliance, line of the insurers' portfolio, and type of the distribution system are to determine the cash demand. Yet, none of the insurance sector-specific features are found to be significant.

Colquitt et al. (1999) investigate the difference in cash holdings across property liability insurers. In their study, they determine firm-specific characteristics that are predicted to affect the extent of the cash holdings, through using ordinary least square regression analysis and random effects models. The cash plus short term investments are set as dependent variable and are estimated as a function of size, financial strength, group membership, variance of cash flows, duration of liabilities, organizational form leverage, investment opportunity, non invested assets and common stocks. They find that insurers with better access to cash through capital markets and/or through being group member hold relatively less cash. That is; larger, highly leveraged, and financially healthier non-life insurers in the USA are more likely to hold less cash whereas firms having more volatile cash flows tend to hold more cash.

Shiu (2006) analyzes the extent and effects of macroeconomic and firm specific factors on insurer liquidity in the context of UK life insurance companies. In order to determine the life insurers liquidity he establishes a model in which cash plus marketable securities over total assets used as a proxy for liquidity and regressed against a number of explanatory variables selected based on the theoretical and empirical literature. Interest rate level, equity returns, firm size, free assets ratio, return on assets, termination ratio, line of business concentration, claims ratio, expense ratio, termination ratio, organizational form, group membership, pension reserves to total reserves ratio and annuity reserves to total reserves ratios are used as explanatory variables in various models estimated by ordinary least square, static and dynamic regression analysis. The results indicate that the life office liquidity is an increasing function of equity returns, free asset ratio, termination rate, and claims ratio and a decreasing function of pension reserves to total reserve.

5.2. Hypotheses Development

The model analyzes the effect of firm specific factors on the insurer's liquidity in the context of non-life insurers operating in Turkey. Panel data analysis for the period 2002 to 2008 is applied. The variables are selected based on the theoretical and empirical literature. However, the availability of the data is an important concern for selecting the explanatory variables. As a result, the thesis models the liquid assets to total asset ratio as a function of firm specific factors including, firm size, investment opportunities, leverage, reinsurance-ceded to total premiums written, combined ratio, return on assets and a dummy variable designed for being publicly traded or not. The model has the following form;

$$LIQ_{it} = \alpha_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 REAS_{it} + \beta_4 LEVER_{it} + \beta_5 COMBN_{it} + \beta_6 AVGP_{it} + \beta_7 TRADED_{it} + \lambda_t + v_{ij}$$

where λ_t represents time-varying intercept (captures all of the variables that affect LIQ_{it} and that vary over time but are constant cross sectionally), v_{ij} represents the remaining disturbance (capturing everything that is left unexplained about LIQ_{it}), i cross-sectional units observed for dated periods (25 firms) and t the period of time (years 2002-2008).

Liquidity

In line with the literature the liquid assets to total assets ratio is used as a proxy for the liquidity (Kim et. al., 1998; Colquitt et.al, 1999; Ozkan and Ozkan, 2004; Nguyen, 2008). Liquid assets are defined as cash and cash equivalents plus marketable securities (Kim et. al, 1998; Başıpınar, 2005) and total assets are measured by their book value.

Firm Size

Size of the firm is considered as one of the important determinants of corporate liquidity. Previous studies of cash holdings of non-financial firms have investigated whether economies of scale exist in cash transactions (Vogel and Maddala, 1965; Opler, et al., 1999).

In the presence of scale economies substantial fixed cost component of security issuance cost is lower for larger firms so, the cost of external financing is smaller for larger companies (Barclay and Smith, 1996). Similarly, Kim et al. (1998) argue that larger firms are likely to face lower costs of external financing and therefore will hold lower levels of liquidity. It is also suggested that large firms have less information asymmetry than small firms (Ozkan and Ozkan, 2004). Therefore, small firms are more likely to face borrowing constraints than large firms (see, e.g., Whited 1992; Kim et. al. 1998).

On the other hand, based on their argument on free cash flow theory Ferreira and Vilela (2004), alternatively, suggest that larger firms may hold more cash. They argue that managers of the larger firms tend to hold more cash due to the fact that larger firms face superior managerial discretion as a result of having generally high number of shareholders and the firms holding larger amount of cash are less likely to be takeover targets. However, in Turkish insurance sector this argument does not hold. In the analysis period it is witnessed to the takeovers of larger insurers. Ownership structure is not supporting the proposed argument. Thus, considering the transaction costs associated with the raising external financing and borrowing constraints aroused from asymmetry of the information in terms of small firms, a negative relation between firm size and liquid assets holding is expected. The natural logarithm of the insurer's total assets is used as a proxy for firm size (Kim, et al., 1998; Opler, et al., 1999; Colquitt et. al, 1999; Ozkan and Ozkan, 2004; Afza and Adnan, 2007).

Leverage

Leverage is taken as a significant determinant of cash holdings in most of the studies. In accordance with the free cash flow theory and pecking order theory, most studies provide empirical evidence for a negative relationship between cash holdings and leverage (Kim et. al., 1998; Opler et.al., 1999; Colquit et. al, 1999; Dittmar et. al., 2002; Ozkan and Ozkan, 2004; Nguyen, 2008; Drobetz and Grünger; 2006). However, the theoretical explanations lead ambiguous expectations regarding the relationship between liquidity and leverage.

As suggested by pecking order theory firms borrow when the investments exceeds retained earnings, whereas, accumulate cash when retained earnings are larger than investments.

This relationship between cash holdings, debt and investments suggests that there is a negative relation between leverage and liquidity. As managerial discretion implies, managers subjected to less monitoring may tend to hold more liquid assets especially in the form of cash. In this context, leverage is regarded as having beneficial effects as it increases the incentives for debt holders to monitor the firm (Nguyen 2008). However, Colquitt et. al (1999) find this argument weak for insurance industry since they proposed that outside monitors such as policyholders, rating agencies or regulators concerning the solvency of the insurer less likely to force manager for reducing the excess cash balances, the safest assets. They present alternative explanations for a negative relation. Alternatively, they state that insurers with relatively more liabilities may face higher costs to service those liabilities, and thus may not be able to accumulate the same levels of cash as insurers with lower liabilities. Additionally, they state John (1993)'s argument that the firms with access to debt markets can use borrowing as a substitute for maintaining a stock of liquid assets. Therefore highly leveraged firms have a less need to maintain high liquidity.

On the other hand, from a tradeoff perspective, it would be harder and more costly for highly leveraged firms to raise external finance. Therefore, firms with high leverage may hold more cash in order to avoid the need to raise outside funding to take advantage of investment opportunities. In other words, with higher leverage, a firm faces a higher degree of uncertainty regarding future access to debt financing and desires higher precautionary liquidity holdings (Bruinshoofd and Kool 2002). With a different perspective, Panno (2003) state that firms with higher liquidity might support a relatively higher debt ratio, due to a greater ability to meet short-term obligations when they fall due. Thus, the firms with high debt ratios could be expected as the firms having high liquidity implying a positive relationship between a firm's liquidity position and its debt ratio.

In brief, the theoretical arguments provide conflicting predictions on the relationship between the leverage and the liquidity, thus, the empirical results are expected to be informative in this regard. Leverage is defined as total liabilities divided by total assets in the regression analysis.

Investment Opportunities

Existence of investment opportunities has been mentioned as an important determinant of liquidity in many studies (Kim et. al 1998; Opler et. al 1999; Colquitt et. al , 1999; Dittmar et. al., 2002; Almedia et. al. 2002; Ferreira and Vilela, 2003; Ozkan and Ozkan , 2004; Afza and Adnan, 2007; Niksanen and Nisksanen, 2008). Most of the studies suggested a positive relationship between investment opportunities and liquidity.

In the existence of an investment opportunity, having inadequate liquid reserves is costly since the firm has to bear the opportunity cost associated with giving up valuable investment. Therefore, in accordance with trade-off theory, firms with better investment opportunities are expected to hold more liquid assets especially in the form of cash (Dittmar et. al, 2002). Furthermore, to take advantage of investment opportunities, firms need financial sources. As pecking order theory suggests, they first turn in to the cash reserves to finance the investment. If the firms could not have adequate internal sources, they need to engage in costly external financing or else have to give up the investment. Thus, firms expecting growth opportunities are more likely to hold liquid assets in order to take advantage of those investment opportunities when they arise. Adapting this theoretical framework in the insurance industry Colquitt et. al. (1999) also find positive relation between the future investment opportunities and liquidity.

In this thesis, insurers having greater future investment opportunities are expected to hold higher liquid assets in order to capitalize the investment opportunities without having recourse to costly external financing.

In literature, most common proxies for investment opportunities rely on stock price but in Turkey few of the non-life insurers are traded publicly therefore this proxy will not be appropriate for the analysis (see; Kim et. al, 1998; Opler et. al, 1999; Dittmar et.al., 2002; Ferreira and Vilela, 2003; Ozkan and Ozkan 2004; Nguyen, 2005; Afza and Adnan 2007). Again, another alternative proxy for investment opportunities which is research and development expenditures will not be appropriate due to the nature of the insurance business.

In this thesis four variables are used separately as a proxy for investment opportunities. Average growth of the assets, average growth of surplus and average growth of net written premiums are defined as proxies for investment opportunities for the insurers by Colquitt et.al, (1999). These variables are calculated as taking average of the prior six years' growth rates regarding the assets, surplus and net written premiums. Alternatively, a measure of growth opportunities used by Niksanen and Niksanen (2008), the ratio of $Sale_t / Sale_{t-1}$, is adopted for the insurance industry. Total premium receipts were considered as sales, as done by Outreville (1987), thus, the ratio of $Total\ Premiums\ Received_t / Total\ premiums\ Received_{t-1}$ used as an alternative proxy for future investment opportunities. Underlying idea of these proxies is that firms which have exhibited high growth rates in the past have more growth opportunities also in the future. Therefore, a positive relationship between the corporate liquidity and the proxy of investment opportunities is expected. The proxies are included in the regression analysis separately.

Combined Ratio

The combined ratio is the sum of the claims ratio and the expense ratio. It represents the level of business expenses and outgoings in relation to the premium income. Furthermore, combined ratio is one of the important ratios used for determining underwriting performance of the insurers. As the ratio increases the underwriting performance decreases, since it indicates that the earned premiums are spent to cover the expenses and claim payments. The profits will decrease with unfavorable underwriting performance so does the ability of generating internal funds (Browne and Hoyt, 1995). Therefore following the pecking order theory high combined ratio will decrease ability to accumulate internal resources and expected to lower liquid assets holdings.

However, as the claims payments occur in cash, insurers with higher claims ratios require more liquid assets than those with low ratios. Similarly, the demand for cash balances increases as the expense ratio increases. Pursuant to precautionary motive for holding money, Shui (2006), provide evidence that both claims ratio and expense ratio has positive effect on liquidity. As both ratios operate in the same direction, the combined ratio captures possible effects of both variables on cash balances and save the degrees of freedom in the regression analysis.

The claims and expense ratios are calculated according to ratio calculation procedure released by the Head Directorate of Insurance. The directorate changed the procedure in 2005 however to be consistent the ratios for the year 2006 2007 and 2008 are calculated according to former procedure.

Profitability

As the pecking order theory suggested firms prefer retained earnings as a main source for financing investments and debt financing as second source and new equity issuance as last resort considering the costs associated with them. As the profitability of a firm identifies the firm's ability to generate internal cash flows, firms are expected to accumulate the cash during profitable periods according to pecking order theory (Ozkan and Ozkan, 2004). When firms become profitable, cash holdings are expected to increase so does the corporate liquidity (Dittmar et. al., 2002). It is generally thought that profit and liquidity have significant positive correlation (Mehar, 2005).

On the other hand, according to trade off model, more profitable firms may hold less liquid assets if they will expect future cash flows to increase their cash reserves. However, considering the nature of the non-life insurance industry in which policy contracts covers relatively shorter periods, holding less liquid assets today in expectation for future cash flow seems not appropriate for the sector.

In some of the studies the variable appears as cash flow following the same logic explained above to determine effect of ability of generating internal fund on firm's liquidity (see, Ferreira and Vilela, 2003; Afza and Adnan, 2007; Ighodalo and Yuanjian, 2007)

Return on assets ratio, is used as proxy for profitability to see the effect of profitability on the liquid assets holdings. Like it is done by Nguyen (2005), the ratio is measured as dividing operating earnings to total assets at the year end.

Ownership

In literature the studies investigating the effect of the ownership structure on liquidity holdings generally based on the difference between the mutual and stock companies. However in Turkey during the analysis period, there is no mutual insurance companies in which policyholders are at the same time owners of the company. So, in this thesis the ownership refers to the fact that whether the company is publicly traded or not.

Publicly traded stock companies are monitored more strictly than the private firms, since they are subjected to higher level of financial disclosure, greater regulatory scrutiny and wider investment analyst coverage. Therefore, the cost of asymmetry of information between the publicly traded firm and the outside market is expected to be lower (Pottier, 2007). As can be explained by the free cash flow theory, monitoring increase control over managerial power and reduce cost of managerial discretion. Since corporate liquidity holdings are generally positively related with the extent of the managerial discretion, the more a firm is subjected to monitoring and disciplining forces of the markets, the less excess liquidity is expected to be hold by the managers (Bruinshoofd and Kool, 2002).

Moreover, since, publicly traded insurers, like other publicly traded firms, have subjected to many regulations they are expected to be financially healthier which enables them to have better credibility in terms of lenders, that is; they have greater access to capital (Welch, 1989). The higher the capacity of the firm to rise external funding the lower its cash holdings are expected to be (Marchica and Mura, 2007). In other words, as stated by Opler et. al (1999), transaction costs associated with rising funds are expected to be lower for firms that have accessed public markets already. Therefore a negative relationship between being publicly traded and liquidity is expected. A dummy variable is assign for being publicly traded and given 1 as a value for determining effect of ownership structure.

Reinsurance Reliance (Reinsurance Ceded)

Reinsurance is basically form of insurance purchased by an insurer, by which reinsurance company agreed to indemnify the cedant insurer, for specified share of insurance claims

paid by the cedant insurer (Patrick, 2001). The nature and purpose of reinsurance is to reduce the financial cost to insurance companies arising from the potential occurrence of specified insurance claims. As claims are paid in cash, insurers need to hold proportional amounts of cash as a buffer against those potential claim payments. However, reliance on reinsurance may decrease the amount of cash hold for precautionary reasons so, may affect the liquidity holdings.

Moreover, in Turkey as regulations obliged the insurers have to provide covers and allocate provisions for every policy they issue. In order not to fail in covering the claim payments, insurers do not transfers the premiums allocated for the reinsurance to the reinsurance company. Instead, they hold the amount in the “deposits on insurance and reinsurance companies” accounts to stabilize their liquidity and pay only the interest to the reinsurance company (Başpınar, 2005). Therefore, it can be said that the existence of reinsurance serves as a caution against the immediate liquidity needs.

To determine the affect of reinsurance reliance on the liquidity holdings, a variable is included in the model. The ratio of reinsurance ceded to total net premiums written, is used, as it is used by Outrivelle (1987), to allow for the possibility that cash balances may be less pronounced for companies relying more on reinsurance. A negative significant relation between reinsurance ceded to total net written premiums and cash demand is determined in Outrivelle’s analysis. Additionally, this ratio also is used by Colquitt et. al. (1999) in their regression analysis. However, they found the variable statistically insignificant. In brief, a negative relationship between reinsurance ceded to total net written premiums and liquidity holdings is expected.

5.3. Model

The model analyzes the effect of firm specific factors on the insurer’s liquidity in the context of non-life insurers operating in Turkey panel data analysis for the period 2002 to 2008. The variables are selected based on the theoretical and empirical literature. However, the availability of the data is an important concern for selecting the explanatory variables. As a result, the model incorporates the firm specific factors described in section 5.2 to

explain liquidity. The model is in the following form;

$$LIQ_{it} = \alpha_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 REAS_{it} + \beta_4 LEVER_{it} + \beta_5 COMBN_{it} + \beta_6 AVGP_{it} + \beta_7 TRADED_{it} + \lambda_t + v_{ij}$$

where λ_t represents time-varying intercept (captures all of the variables that affect LIQ_{it} and that vary over time but are constant cross sectionally), v_{ij} represents the remaining disturbance (capturing everything that is left unexplained about LIQ_{it}), i cross-sectional units observed for dated periods (25 firms) and t the period of time (years 2002-2008).

Liquidity (LIQ)

In line with the literature the liquid assets to total assets ratio is used as a proxy for the liquidity (Kim et. al., 1998; Colquitt et.al, 1999; Ozkan and Ozkan, 2004; Nguyen, 2005). Liquid assets are defined as cash and cash equivalents plus marketable securities (Kim et. al.1998; Başpınar, 2005) and total assets are measured by their book value.

Firm size (SIZE)

The natural logarithm of the insurer's total assets is used as a proxy for firm size (Kim, et al., 1998; Opler, et al., 1999; Colquitt et. al, 1999; Ozkan and Ozkan, 2004; Afza and Adnan, 2007).

Leverage (LEVER)

Leverage, is defined as ratio of insurers total liabilities divided by total assets (Colquitt et. al,1999; Opler et.al, 1999) .

Average Growth of written Premiums (AVGP)

Average growth of written premiums is defined as proxy for investment opportunities for the insurers. The variable is calculated as taking average of the prior six years' growth rates regarding written premiums (Colquitt et.al, 1999).

Combined ratio (COMBN)

The combined ratio is the sum of the claims ratio and the expense ratio. The claims and expense ratios are calculated according to ratio calculation procedure released by the Head Directorate of Insurance. The directorate changed the procedure in 2005 however to be consistent the ratios for the year 2006, 2007 and 2008 are calculated according to former procedure. Thus ratios are calculated as the following

Claims ratio = (Paid Losses + Outstanding Loss Reserves - Outstanding Loss Reserves Brought Forward) / (Premium Received + Unearned Premium Reserves Brought Forward - Unearned Premium Reserves)

Expense ratio = (Paid commissions-received commissions+ personal expenses administrative expenses) / Premiums received

Return on Assets (ROA)

Return on assets ratio, is used as proxy for profitability to see the effect of ability of generating internal funds on the liquidity. As it is done by Nguyen (2005), the ratio is measured as dividing operating earnings to total assets at the year end.

Ownership (Traded)

A dummy variable is assign for being publicly traded and given 1 as a value for determining effect of ownership structure.

Reinsurance Reliance (REAS)

The ratio of reinsurance ceded to total net premiums written, is used to allow for the possibility that cash balances may be less pronounced for companies relying more on

reinsurance (Outrivelle, 1987; Colquitt et. al., 1999). Reinsurance ceded presents the amount allocated to reinsurers out of written premiums.

5.4 Data

The data for the analysis is gathered from Insurance Supervisory Board's annual reports released by Insurance Department of the Undersecretariat of Turkish Treasury for the periods 2002 to 2008 from their web site.

For the panel data analysis, the data of 25 non-life insurer firms from 2002 to 2008 are included in the balanced panel data analysis. The computer program Eviews is used for the analysis. The data of bankrupt firms; Egs, Ege, G.I.C Dünya, Sanko, Kapital are disregarded from the data set. Moreover, newly entered firms' (Atradius, Coface, Cardiff and Dubai Grup) data started from 2007 and 2008 respectively is disregarded. Lastly the data of the insurers, Batı, Madgeburger, Merkez, Rumeli and T.Nippon, that have not been actively operating in 2007 and 2008 are excluded from the data set as well as Demir that was not active in 2007.

5.5. Results

In this part, the results of the period fixed effect model⁶ will be presented to analyze the firm specific determinants affecting the liquidity of the non-life insurers. The regression analysis carried out with the help of Eviews based on balanced panel data over 25 firms spanning from 2002 to 2008.

⁶ The ordinary least square regression, one way and two way error components models are also estimated. Two way fixed effects model is not appropriate for the analysis since there are time invariant variables yet it still presented without having those variables. The results of the regression analysis presented according to the proxy used for the investment opportunities in Appendix D in Table 1, Table 2, Table 3 and Table 4 for Avgp, Avga , Avgs and Gprem respectively . The variables Avga , Avgs and Gprem found as insignificant therefore not presented in the text.

The correlation matrix in Table 5 at the Appendix D presents the coefficient of correlation of the variables used. The correlation matrix reveals that all the explanatory variables are correlated with the dependent variable and correlations are significantly different from zero at 5% level. The signs in the correlation coefficients are further confirmation of the expectations of the relationship of firms' liquidity with the explanatory variables.

To verify the stationary of the residuals panel unit root tests are carried out. Table 5.1 shows the unit root test results of Levin, Lin and Chu; Im, Pesaran and Shin W-stat; ADF-fisher and PP- Fischer test. All of the tests indicate that the null hypothesis is rejected, meaning that the residuals of the cross-sectional group are stationary

Table 5.1- Panel Unit Root Test Results

Method	Statistic	Prob.***	Cross-sections	Number of Observation
Null: Unit root (assumes common unit root process)				
Levin, Lin and Chu t	-205.175	0.0000*	25	150
Breitung t-stat	-356.711	0.0002*	25	125
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-155.098	0.0605**	25	150
ADF - Fisher Chi-square	939.397	0.0002*	25	150
PP - Fisher Chi-square	206.484	0.0000*	25	150
* and ** represents significance levels at 1 and 10 percent level respectively.				
*** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				

To obtain the robust coefficient standard errors, the Period SUR (PCSE) method, is applied (Beck and Katz, 1995). Table 5.2 represents results of the period fixed effects model. As it can be seen from Table 5.2, the firm size and combined ratio have negative signs that indicate negative relationship between variables and liquidity. The firm size and combined

ratio are statistically significant in 95 percent confidence level. In addition, the coefficient of reinsurance ceded to total net written premiums is also negative in conformity with what is expected and significant in 99 percent level. Moreover, as expected the coefficient of average growth rate of net written premiums as proxy for investment opportunities is positive and significant in 99 percent level. Although, coefficients of leverage and traded dummy variable found statistically insignificant, their signs postulates the expected effect on the liquidity.

Table 5.2- Estimation Results of Period Fixed Effects model

Independent Variables	Coefficient	Standard Error	t-Statistic	Probability
C	0.6596	0.1533	4.3039	0.0000
SIZE	-0.0240	0.0104	-2.3061	0.0224
ROA	0.0096	0.1321	0.0724	0.9424
REAS	-0.2691	0.0729	-3.6889	0.0003
COMBN	-0.0239	0.0104	-2.2978	0.0229
LEVER	0.0649	0.0728	0.8911	0.3742
AVGP	0.0594	0.0197	3.0206	0.0029
TRADED	-0.0113	0.0254	-0.4447	0.6571
R squared	0.6300			
Adjusted R2	0.6001			
F statistics	21.0832			
P value	0.0000			

The variation in firm specific characteristics explains 63 percent variation in the corporate liquidity. Adjusted R^2 implies that 60 percent variation in liquidity can be explained by the variations in dependent variables. F statistic representing overall significance of model is 21,008 and p value of the test statistics is zero up to four digits which indicates overall significance of the variables (Gujarati, 2005).

In order to check the poolability of the data across firms and time Chow's test for poolability is carried out (Frees, 2004; Baltagi, 2005; Baltagi, 2008) Under the null hypothesis of poolability of slopes across firms, the F-value is 0.0019 which is distributed as $F(120, 25)$, which does not reject the null hypothesis under the critical F value 2.29 at

1 percent significance level. Additionally, Chow test under the poolability of slopes across time yield F-value of 1.1680 which is distributed as F (42,119). This does not reject poolability across time since the critical F value is 1.76 at 1 percent significance level. Thus, panel data analysis is confidently proceeded. Table 6 in Appendix D presents statistics and critical F values for poolability of slope and intercepts across firms and time. Moreover, chow test procedure is explained in the Appendix E in detail.

Also to decide whether the fixed effects model or random effects model is preferred the Hausman test is carried out (Hausman and Taylor, 1981; Frees, 2004; Baltagi, 2005). Under the null hypothesis, the random effects are uncorrelated with the explanatory variables (Baltagi, 2005). The p value of the test over period random effects model is 0.0422 so, the null hypothesis is rejected with 95 percent confidence level. Thus, fixed effects model is preferred to the random effects model since assumption about no covariance between individual effects and explanatory variables does not hold.

Redundant fixed effect test is carried out to check the significance of the fixed effects. Under the null hypothesis the period fixed effects are redundant. Both Chi- square and F-test statistic values (27.4032 and 123.1492) and the associated *p*-values (0.0000 and 0.0000) strongly reject the null hypothesis, indicating that corresponding effects are statistically significant. The Table 7 in the Appendix D presents results of the redundant fixed effect tests.

The time fixed effects model indicates that the average value of the liquidity of the non-life insurers is also affected by the period developments. This can be interpreted as any change in a given time influence liquidity but in the same way for all firms. Lastly, the Durbin-Watson test statistic 1.74 is higher than the upper limit du (1.73) and lower than $4-du$ (2.27) which fails to reject the null hypothesis of autocorrelation indicating that the residuals are not autocorrelated at 1% significance level (Gurajatti, 2005).

5.6. Discussion

The results indicate that firm size is an important determinant of liquidity of non-life insurers in Turkey and that the liquidity of the non-life insurers decreases with size. In

other words, this negative coefficient indicates that larger insurers hold less liquidity than do smaller insurers. This finding is also in conformity with previous studies regarding non financial firms (Kim et. al. 1998; Opler et.al, 1999; Ferreira and Vilela, 2003; Nguyen, 2005; Niksanen and Niksanen, 2008, Drobetz and Grüninger, 2008) and also supports the finding of Colquitt et. al (1999) regarding non-life US insurers. This can be interpreted as the economies of scale affecting the liquidity of non financial firms affect liquidity of insurers as well. This result also supports the theoretical predictions of the tradeoff theory. However, the negative relationship is inconformity with the results of Afza and Adnan (2005) evidence from a non-developing country in which the cost of external financing is higher.

As another important common determinant of liquidity, investment opportunities also are significant and have positive effect. This result is in line with previous findings (see; Opler et. al, 1999; Colquit et. al, 1999; Almedia et. al., 2002; Ferreria and Vilela, 2004; Ozkan and Ozkan, 2004; Afza and Adnan, 2007; Niksanen and Nisksanen, 2008). This result provides significant evidence that liquidity is also valuable for the non-life insurers in the existence of good investment opportunities. In other words, non-life insurers with better investment opportunities are holding more liquid assets in proportion total assets to finance the investments with lower cost internal resources thereby, reducing the information asymmetric costs from external financing. Moreover, this result supports the trade off and pecking order theory.

Reinsurance ceded to total net written premiums ratio representing reinsurance reliance is found as significant determinant of liquidity of non-life insurers operating in Turkey. The negative coefficient of the variable is in conformity with expectations. This result indicates that non-life insurers in Turkey depending more on reinsurance hold less liquid assets since the presence of reinsurance contracts acts as safety net for liquidity needs. This result also supports the findings of Outrivelle (1987).

The expected sign of the combined ratio is ambiguous. According to empirical analysis combined ratio is also found significant determinant of the liquidity of non-life insurers with negative coefficient. This result indicates that an increase in combined ratio will decrease liquid assets in proportion to total assets. This can also be interpreted that poor

underwriting performance negatively affect the liquidity of the non-life insurers. As reported by Browne and Hoyt (1995), a high combined ratio could indicate unfavorable underwriting performance and thus lower the profitability which in turn lowers the ability to generate internal funds. However, the result is unconformity with the Shui's findings (2006) regarding the life insurers.

Interestingly, the results do not provide evidence for the relationship between leverage and liquidity. However, the negative sign suggests that the cost to serve the liabilities might be high so that insurers with high debt ratios may not be able to maintain same liquidity as insurers with lower liabilities. Or alternatively, non-life insurers substitute holding liquidity with debt. Although these possible explanations can be suggested for explaining negative relationship, there is no statistical evidence found to support them.

Similarly, there is no evidence to support the relationship between the return on assets and liquidity. The estimated coefficient of return on asset is negative in line with the expectations but found as insignificant. That is, we find no empirical evidence found to support the suggestions of the pecking order theory that internally generated funds are accumulated in profitable times by the non-life insurers.

The relationship between the traded dummy variable and liquidity could not be supported by our empirical results as well. However, the negative sign of the coefficient of the traded dummy variable, suggests that publicly traded non-life insurers have better access to the capital markets and/or facing less managerial discretion due to high monitoring. However, none of these effects seem to prevail.

Lastly, the significant time effects indicate that the liquidity of the non-life insurers is also affected by the unobservable common temporary factors. This can be interpreted as any change in a given time influence liquidity but in the same way for all non-life insurers. Possible explanation for the time effect may be associated to the regulatory changes occurred during the analysis period. For example, in 2006 income tax regulation regarding the insurers has changed and 5479 numbered law went into effect. Additionally, effects of liquidity crisis of 2001 and recent global financial crisis on the insurers' liquidity may be reflected through these time specific effects as well. In brief these time effects may capture

the effects of the changes in macroeconomic conjecture in a given year on the liquidity of the non-life insurers.

5.7. Conclusion

In this chapter, the firm specific factors affecting the liquidity decisions of non-life insurance companies operating in Turkey is analyzed over 25 firms spanning from 2002 to 2008. The possible determinants that characterize the firm's liquidity decisions are analyzed under the framework of the trade off model, Myers' pecking order theory, and Jensen's cash flow uncertainty theories.

In conformity with previous studies, the results provide evidence that non-life insurers' liquidity is significantly negatively related to firm size, reinsurance reliance and poor underwriting performance, while it is significantly positively related to investment opportunities. The analysis concludes no statistically significant effects of leverage, profitability and ownership structure on the liquidity of the non-life insurers.

The negative effect of the firm size on insurers' liquidity, provide evidence on the assumption that larger insurers facing lower cost of external financing. The result also suggests that the economies of scale affecting the liquidity of non-financial firms affect liquidity of non-life insurers as well. Furthermore, the negative effect of reinsurance reliance and poor underwriting performance on liquidity indicates that the non-life insurers reducing the underwriting risk by relying more on reinsurance or by having better pricing methods tend to have less liquid assets. Moreover, the results also suggest that non-life insurers with greater investment opportunities hold more liquidity presumably to take advantage of these opportunities as they arise. Finally, analysis reveals that unobserved time heterogeneity, as reflected in the period fixed effects, is significant in affecting liquidity decisions of non-life insurers.

This analysis has also implications for the insurance regulators and policy makers as well. The Turkish regulators and policy makers should pay attention to the factors that are particularly pertinent to Turkish non-life insurers when implementing policy changes

regarding the factors have affect on the liquidity. To clarify, the regulations regarding the for example compulsory provisions directly affect the liquidity decisions therefore any policy change in regulatory provisions will affect the liquidity of non-life insurers. Moreover, having qualified actuarial supervision will increase the underwriting performance which in turn affects the liquidity of insurers. Thus, regulators also concern with providing qualified actuarial services.

CHAPTER VI

CONCLUSION

The purpose of this thesis is to explore the liquidity risk structure of the Turkish insurance industry. For this purpose, the ratio analysis is used to analyze Turkish insurance companies' liquidity condition from 2002 to 2008. Considering the nature of the insurance industry, distinction is made between "non-life" and "life" insurance companies when assessing the liquidity ratios. In addition, the firm specific factors that determine the liquidity level of the Turkish insurance companies (particularly non-life insurance companies) are investigated through panel data regression analysis.

The thesis has several contributions in many aspects. First of all, there is no data that presents the liquidity ratios for all Turkish insurance companies. Therefore, in the thesis all ratios are calculated for each insurance company, listed in the Undersreccariat of Turkish Treasury, for each year. So, 52 non-life insurance companies and 44 life insurance companies which have been operating at least one year through the analysis period have been analyzed. The related ratios⁷ are calculated by using the data gathered from Insurance Supervisory Board's annual reports released by Insurance Department of the Undersecretariat of Turkish Treasury for the periods between 2002 and 2008 from their web site. In addition, the liquidity of insurance companies, either operating in non-life or life insurance industry, has been evaluated according to their size which is accepted as an important firm specific factor that affect liquidity situations of the companies. Therefore for the ratio analysis the averages of all ratios of whole industry, big five companies and

⁷ These ratios are liquid assets to total asset ratio, liquidity ratio, current ratio, premiums and reinsurance receivables to total assets ratio, agents receivables to total equity, total equity to total assets, working capital to written premiums, growth of liquid assets, growth of total assets, growth of current liabilities.

rest of the small companies, are calculated. While analyzing liquidity risk structure of the insurance companies via ratio analysis, averages of the big insurance companies, average of the small insurance companies and industry averages are compared. Secondly, literature regarding the liquidity determinants of firms operating in developing countries is very scarce and this study is the first one that investigates the effect of the firm specific factors on liquidity decisions of the Turkish insurance industry in the context of non-life insurers. For this purpose, initially, the possible firm specific factors have been examined under the framework of the trade off model, Myers' pecking order theory, and Jensen's cash flow uncertainty theories. The thesis models the liquid assets-to-total asset ratio as a function of firm specific factors including, firm size, investment opportunities, leverage, reinsurance-ceded to total premiums written, combined ratio, return on assets and a dummy variable designed for being publicly traded or not. Then the model is estimated by the panel data regression that is carried out over 25 non-life insurance firms spanning from 2002 to 2008.

The result of the ratio analysis indicated that, both big five non-life insurance companies and smaller insurance companies hold high levels of liquid assets in their assets portfolio and this portion has been increased over time. In addition, the non-life insurers have adequate liquid assets to meet their short term liabilities on average. However, the liquidity risk exposed by the smaller non-life insurance companies is higher than the big five non-life insurers. Underlying reasons can be stated as the following; short term liabilities of smaller non-life insurers are higher in proportion to their liquid assets, intermediaries have been used more by smaller non-life insurers and their equity base is not as strong as the big five non-life insurance companies.

For the life insurance sector, it can be concluded that the liquid assets of the life insurers adequately cover their current liabilities on the average. However, the proportion of the liquid assets in the life insurers' portfolio has been decreased. When the big five insurers are compared to their peers, it is seen that big five insurers have had lower total equity to total assets ratio and liquid assets to total asset ratio than the smaller insurers. Therefore liquidity problems that may arise from policy surrenders will have more severe consequences for larger insurers. On the other hand, their average current ratios and liquidity ratios higher, and agent receivables and premium and reinsurance receivables are lower than the smaller insurers. Thus, the liquidity risk that may arise from mismatch between assets and liabilities has been relatively lower for the larger life insurance companies.

Lastly, growth rate of the current liabilities of the life insurers has been higher than growth rate of liquid assets, thus it can be said that, the extent of the liquidity risk faced by life insurance companies has been increased on the average.

Throughout the analysis period, the liquidity risk faced in the life insurance sector has increased. While the non-life insurance companies respond the crisis period by taking precautions and increasing their liquidity levels.

The Wilcoxon test results indicate that large and small non-life insurance companies have significant differences in averages of most of the liquidity ratios at 95% confidence level. The same statement can also be done for the life insurance companies since averages of most of the liquidity ratios of large life insurers are significantly different than that of the small life insurers'. The findings of the analysis support the ratio analysis.

The results of the regression analysis are in conformity with previous studies. The results provide evidence that non-life insurers' liquidity is significantly negatively related to firm size, reinsurance reliance and poor underwriting performance, while it is significantly positively related to investment opportunities. The analysis concludes no statistically significant effects of leverage, profitability and ownership structure on the liquidity of the non-life insurers.

The negative effect of the firm size on insurers' liquidity, provide evidence on the assumption that larger insurers facing lower cost of external financing. The result also suggests that the economies of scale affecting the liquidity of non-financial firms affect liquidity of non-life insurers as well. Furthermore, the negative effect of reinsurance reliance and poor underwriting performance on liquidity indicates that the non-life insurers reducing the underwriting risk by relying more on reinsurance or by having better pricing methods tend to have less liquid assets. Moreover, the results also suggest that non-life insurers with greater investment opportunities hold more liquidity presumably to take advantage of these opportunities as they arise. Finally, analysis reveals that unobserved time heterogeneity, as reflected in the period fixed effects, is significant in affecting liquidity decisions of non-life insurers.

This analysis has also implications for the insurance regulators and policy makers as well. As the ratio analysis indicates that the smaller companies are facing higher liquidity risk than the larger insurance companies through the intermediaries channel, it can be suggested for the small insurers to consider mergers and increase their size to both maintain economies of scale and reduce risks. The Turkish regulators and policy makers should pay attention to the factors that are particularly pertinent to Turkish non-life insurers when implementing policy changes regarding the factors that have an effect on the liquidity. To clarify, the regulations regarding for example compulsory provisions directly affect the liquidity decisions therefore any policy change in regulatory provisions will affect the liquidity of non-life insurers. Moreover, having qualified actuarial supervision will increase the underwriting performance which in turn affects the liquidity of insurers. Thus, regulators also concern with providing qualified actuarial services.

The data availability is the main restriction in the thesis. The cash flow statements of the insurance companies are not displayed in the Insurance Supervisory Board's reports and the term structure of the assets and liabilities are not presented. Therefore analysis conducted through the available data. The main disadvantage of measuring the liquidity risk with the ratio analysis is that, it takes into account the historical data on hand, the thesis is informative about only the past liquidity risk profile of the insurers. In addition, the data is on yearly basis and the available data only covers seven years. Therefore the analysis done with more frequent and detailed data can help to obtain more accurate results.

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APPENDICES

APPENDIX A

BALANCE SHEET ITEMS

- 1. Assets
 - 1.1. Current Assets
 - 1.1.1. Cash and Cash Equivalents
 - 1.1.1.1. Cash
 - 1.1.1.2. Banks
 - 1.1.1.2. Other
 - 1.1.2. Financial Assets and Financial Investments Where Risk Belongs to Policy Holders
 - 1.1.3. Receivables from Operations
 - 1.1.3.1. Receivables from Insurance Operations
 - 1.1.3.2. Receivables from Reinsurance Operations
 - 1.1.3.3. Deposits on Insurance and Reinsurance Companies
 - 1.1.3.4. Loans
 - 1.1.3.5. Receivables from Pension Operations
 - 1.1.3.6. Daubtful Receivables from Operations
 - 1.1.4. Receivables from Related Parties
 - 1.1.5. Other Receivables and Assets
 - 1.1.6. Total Current Assets
 - 1.2. Non Current Assets
 - 1.2.1. Receivables from Operations
 - 1.2.3.1. Receivables from Insurance and Reinsurence Operations
 - 1.2.3.2. Deposits on Insurance and Reinsurance Companies
 - 1.2.3.3. Loans
 - 1.1.3.5. Receivables from Pension Operations
 - 1.1.3.6. Daubtful Receivables from Operations
 - 1.1.3.7. Total
 - 1.2.2. Receivables from Related Parties
 - 1.2.3. Other Receivables and Assets
 - 1.2.4. Fixed assets
 - 1.2.5. Intangible Assets
 - 1.2.6. Expenses and Income Accruals for Future Years
 - 1.2.7. Other Long Term Assets
 - 1.2.8. Total Long Term Assets
- 2. Liabilities
 - 2.1. Current Liabilities
 - 2.1.1. Financial Payables
 - 2.1.2. Payables on Operations

- 2.1.2.1. Payables on Insurance Operations
- 2.1.2.2. Payables on Reinsurance Operations
- 2.1.2.3. Deposits on Insurance and Reinsurance Companies
- 2.1.3.4. Payables on Pension Operations
- 2.1.3.5. Other Payables on Operations
- 2.1.3.6. Total Payables on Operations
- 2.1.3. Payables to Related Parties
- 2.1.4. Tax Payable and Other Payables and Reserves
- 2.1.5. Other Payables
- 2.1.6. Technical Provisions
 - 2.1.6.1. Provisions for Unearned Premiums
 - 2.1.6.2. Provisions for Unexpired Risks
 - 2.1.6.3. Mathematical Provisions
 - 2.1.6.4. Provisions for Outstanding Claims
 - 2.1.6.5. Provision for Bonus and Rebates
 - 2.1.6.6. Provisions for Policies where Investment Risk Belongs to Policy Holder
 - 2.1.6.7. Other Technical Provisions
 - 2.1.6.8. Total Technical Provisions
- 2.1.7. Provisions for Other Risks
- 2.1.8. Income and Expense Accruals for Future Months
- 2.1.9. Other Short Term Liabilities
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- 2.2. Long Term Liabilities
 - 2.2.1. Financial Payables
 - 2.2.2. Payables on Operations
 - 2.2.3. Payables to Related Parties
 - 2.2.4. Other Payable
 - 2.2.5. Technical Provisions
 - 2.2.5.1. Mathematical Provisions
 - 2.2.5.2. Provisions for Policies where Investment Risk Belongs to Policy Holder
 - 2.2.5.3. Other Technical Provisions
 - 2.2.5.4. Total Technical Provisions
 - 2.2.6. Provisions for Other Risks
 - 2.2.7. Other Liabilities and Provisions
 - 2.2.8. Income and Expense Accruals for Future Years
 - 2.2.9. Other Long Term Liabilities
 - 2.2.9. Total Long Term Liabilities
- 2.3. Shareholder's Equity
 - 2.3.1. Nominal Capital
 - 2.3.2. Unpaid Capital
 - 2.3.3. Net Differences on Capital Adjustment
 - 2.3.4. Total Paid Capital
 - 2.3.5. Capital Reserves
 - 2.3.5. Earning Reserves
 - 2.3.5.1. Legal Reserves
 - 2.3.5.2. Status and Extraordinary reserves
 - 2.3.5.3. Revolution of Financial Assets

- 2.3.5.4. Other Earning Reserves
- 2.3.5.1. Transferred Catastrophe Loss Reserves
- 2.3.5.2. Total Earning Reserves
- 2.3.6. Previous Year's Profits and Losses
- 2.2.7. Profits and Losses of the Financial Year
- 2.2.8. Total Shareholders' Equity

INCOME STATEMENT ITEMS

1. Technical Income for Non-life Business
 - 1.1. Written Premiums
 - 1.2. Change in Provisions for Unearned Premiums
 - 1.3. Change in Provisions for Unexpired Risks
 - 1.4. Allocated Investment Returns Transferred from the Non Technical Accounts
 - 1.5. Other Technical Income
2. Technical Outgoing for Non-life Business
 - 2.1. Paid Claims
 - 2.2. Change in Provisions for Outstanding Premiums
 - 2.3. Change in Provisions for Bonus and Rebates
 - 2.4. Changes in Other Technical Provisions
 - 2.5. Operating Expenses
3. Balance on The Technical Account for Non-life Business
4. Technical Income for Life Business
 - 4.1. Gross Written Premiums
 - 4.2. Change in Provisions for Unearned Premiums
 - 4.3. Change in Provisions for Unexpired Risks
 - 4.4. Investment Income for Life Business
 - 4.5. Unrealised gains on Investment
 - 4.6. Other Technical Income
5. Technical Outgoing for Non-life Business
 - 5.1. Paid Claims
 - 5.2. Change in Provisions for Outstanding Claims
 - 5.3. Change in Provisions for Life Assurance
 - 5.4. Technical Provisions for Life Insurance Investment Risk belongs to Policy Holders
 - 5.5. Change in other technical Provisions
 - 5.6. Operating Expenses
 - 5.7. Investment Charges
 - 5.8. Allocated Investment Return Transferred to the Non Technical Accounts
6. Balance on the Technical Account for Life Business
7. Pension Technical Income
 - 7.1. Fund Management Charges
 - 7.2. Administrative Expense Charges
 - 7.3. Entry Fees
 - 7.4. Administrative Expense in case of Premium Holidays
 - 7.5. Special Service Charges
 - 7.6. Investment Income on Fund Advances
 - 7.7. Other Technical Income

- 7.8. Investment Charges
- 7.9. Total
- 8. Pension Technical Outgoing
 - 8.1. Fund Management Charges
 - 8.2. Investment Losses and Fund Advances
 - 8.3. Operating Expenses
 - 8.4. Other Technical Expenses
 - 8.5. Total
- 9. Balance on the Technical Account for Pension
- 10. Investment Income
 - 10.1. Income and Profit from Financial Investments
 - 10.2. Value Readjustments on Investments
 - 10.3. Foreign Exchange Gains
 - 10.4. Income from Subsidiaries and Associates
 - 10.5. Income from Other Investments
 - 10.6. Allocated Investment Return Transferred from The Life Technical Account
 - 10.6.1. Income and Profit from Financial Investments
 - 10.6.2. Value Readjustments on Investments
 - 10.6.3. Foreign Exchange Gains
 - 10.6.4. Income from Subsidiaries and Associates
 - 10.6.5. Other
 - 10.6.6. Total
 - 10.7. Investment Income Total
- 11. Investment Charges
 - 11.1. Investment Management Charges and Losses on the Realization of Investment
 - 11.2. Value Readjustments on Investments
 - 11.3. Allocated Investment Return Transferred from The Non-life Technical Account
 - 11.4. Foreign Exchange Losses
 - 11.5. Depreciation Expense
 - 11.6. Other Investment Charges
 - 11.7. Investment Charges Total
- 12. Other Charges and Extraordinary Income
 - 12.1. Provisions
 - 12.2. Rediscount
 - 12.3. Insurance
 - 12.4. Foreign Exchange Losses
 - 12.5. Other Income Profit
 - 12.6. Other Outgoing and Losses
 - 12.7. Income/Outgoing and Profit/Loss for the Previous Year
 - 12.8. Total Extraordinary Income and Charges
- 13. Profit of the Financial Year
 - 13.1. Profit or Loss for the Financial Year
 - 13.2. Provisions for the Tax and other Legal Liabilities
 - 13.3. Net profit or Loss for the Financial Year

APPENDIX B

WILCOXON TEST RESULTS

Table I – Wil Coxon Tests Table for P&C Insurance Companies

RATIOS	Lower Critical Value	Upper Critical Value	<i>p</i> -value	Decision
Growth of Current Liabilities	-1,9600	1,9600	0,7488	Do not reject
Current Ratio	-1,9600	1,9600	0,0039	Reject
Growth of Liquid Assets	-1,9600	1,9600	0,0547	Do not reject
Liquidity Ratio	-1,9600	1,9600	0,6310	Do not reject
Growth of Total Assets	-1,9600	1,9600	0,0782	Do not reject
Liquid Assets to Total Assets	-1,9600	1,9600	0,1495	Do not reject
Agency Receivables to Total Equity	-1,9600	1,9600	0,0039	Reject
Total Equity to Total Assets	-1,9600	1,9600	0,0039	Reject
Working Capital to Total Premium	-1,9600	1,9600	0,0039	Reject
Premium Receivables to Total Assets	-1,9600	1,9600	0,0250	Reject

Table II – Wil Coxon Test Table for Life Insurance & Pension Companies

RATIOS	Lower Critical Value	Upper Critical Value	<i>p</i> -value	Decision
Growth of Current Liabilities	-1,9600	1,9600	0,2002	Do not reject
Current Ratio	-1,9600	1,9600	0,0181	Reject
Growth of Liquid Assets	-1,9600	1,9600	0,0547	Do not reject
Liquidity Ratio	-1,9600	1,9600	0,0088	Reject
Growth of Total Assets	-1,9600	1,9600	0,0250	Reject
Liquid Assets to Total Assets	-1,9600	1,9600	0,7494	Do not reject
Agency Receivables to Total Equity	-1,9600	1,9600	0,0017	Reject
Total Equity to Total Assets	-1,9600	1,9600	0,0017	Reject
Working Capital to Total Premium	-1,9600	1,9600	0,2774	Do not reject
Premium Receivables to Total Assets	-1,9600	1,9600	0,0017	Reject

APPENDIX C

RATIO ANALYSIS

Table I – Liquid Assets to Total Assets Ratio of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	0.5196	0.6166	0.5966	0.5827	0.5875	0.4867	0.4925	0.5546
AKSİGORTA	0.3299	0.4143	0.4045	0.1572	0.1052	0.1371	0.2286	0.2538
ALLIANZ							0.5546	0.5546
ANADOLU ANONİM TÜRK	0.5392	0.5503	0.5075	0.4294	0.4403	0.4954	0.5883	0.5072
ANKARA ANONİM TÜRK	0.3991	0.3646	0.3912	0.2594	0.3358	0.4888	0.4817	0.3887
ATRADIUS						0.9084	0.8368	0.8726
AVIVA			0.6431	0.6444	0.6550	0.6354	0.6433	0.6442
AXA OYAK	0.4441	0.4739	0.5438	0.6298	0.6566	0.7077	0.7256	0.5974
BAŞAK	0.5024	0.4765	0.3521	0.3259	0.3942	0.4709	0.4161	0.4197
BATI	0.2359	0.3110	0.3288	0.5480	0.7813	0.7664	0.7956	0.5381
BİRLİK	0.6135	0.6086	0.5420	0.5249	0.4883	0.5881	0.5553	0.5601
CARDIF							0.7497	0.7497
COFACE						0.8036	0.5562	0.6799
COMMERCIAL UNION	0.4973	0.5403						0.5188
DEMİR	0.2914	0.2363	0.1702	0.2058	0.3597	0.8535	0.8335	0.4215
DUBAI GROUP							0.4892	0.4892
EGE	0.6646							0.6646
EGS	0.2328							0.2328
ERGOİSVİÇRE					0.4821	0.5182	0.5983	0.5329
EUREKO						0.5638	0.5831	0.5735
EURO							0.5602	0.5602
FIBA						0.7406	0.7325	0.7365
FİNANS	0.2960	0.3841	0.4099	0.5357	0.6464			0.4544
GARANTİ	0.1121	0.2742	0.3608	0.4762	0.4705			0.3388
GENERALİ	0.3895	0.3783	0.3895	0.4245	0.3789	0.3621	0.3500	0.3818
G.I.C. DÜNYA	0.2699	0.2460	0.7359					0.4173
GÜNEŞ	0.2909	0.3017	0.3127	0.2701	0.3183	0.3395	0.3070	0.3057

Table I – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
GÜVEN	0.2828	0.3150	0.3329	0.3144	0.3933	0.3595	0.4412	0.3484
HDI					0.4138	0.5370	0.4414	0.4641
HÜR	0.4106	0.4149	0.4590	0.5106	0.5619	0.6037	0.6499	0.5158
IŞIK	0.3472	0.3713	0.4494	0.4516	0.5397	0.7204	0.7088	0.5126
İHLAS	0.1559	0.1686	0.2394	0.3081				0.2180
İSVİÇRE	0.5441	0.5311	0.4996	0.5118				0.5217
KAPİTAL	0.2051	0.1378						0.1714
KOÇ ALLIANZ	0.3491	0.4149	0.4433	0.4907	0.4870	0.5701		0.4592
LIBERTY						0.6203	0.7821	0.7012
MAGDEBURGER	0.8765	0.7735	0.8524	0.9694	0.9841	0.9778	0.9625	0.9137
MAPFRE GENEL							0.5673	0.5673
MERKEZ	0.8326	0.8376	0.9203	0.9660	0.9630	0.9628	0.9863	0.9241
RAY	0.3765	0.3703	0.3940	0.4207	0.4239	0.4621	0.3510	0.3998
RUMELİ	0.4886	0.5156	0.5046	0.5414	0.6168	0.4466	0.4048	0.5026
SANKO	0.1345	0.0982						0.1163
SBN							0.5723	0.5723
ŞEKER	0.2293	0.2699	0.2150	0.2975	0.2649			0.2553
TEB	0.2245	0.2482	0.5240	0.3938	0.3872	0.4212		0.3665
TİCARET	0.5799	0.6896	0.7097	0.7729	0.8789	0.8039		0.7391
T. GENEL	0.2972	0.3188	0.2764	0.4878	0.5024	0.5265		0.4015
T. NİPPON	0.4844	0.6126	0.6916	0.8509	0.8815	0.9075	0.8678	0.7566
TOPRAK	0.6377	0.6509	0.7325	0.8002	0.7788	0.7625		0.7271
YAPI KREDİ	0.3922	0.3627	0.3568	0.3044	0.3407	0.3918	0.4636	0.3732
ZURICH							0.4230	0.4230
Av. All Non-Life Ins. Companies	0.4021	0.4200	0.4778	0.4970	0.5328	0.6123	0.5973	0.5056
Av. of Big Non- Life Ins. Companies	0.4005	0.4345	0.4351	0.4390	0.4383	0.4874	0.5329	0.4525
Av. of the Rest (excluding the Big Ones)	0.4024	0.4175	0.4857	0.5081	0.5510	0.6339	0.6077	0.5152

Table II – Liquidity Ratio for Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	0.6775	0.7193	0.7040	0.8348	0.8034	0.6565	0.7516	0.7353
AKSİGORTA	0.9976	1.4024	1.3530	1.5498	0.8477	1.0543	1.0221	1.1753
ALLIANZ							0.8527	0.8527
ANADOLU ANONİM TÜRK	1.0421	1.0141	0.9138	0.9510	0.8892	0.9578	1.0109	0.9684
ANKARA ANONİM TÜRK	0.6904	0.4525	0.5165	0.3503	0.3442	0.7199	0.6504	0.5320
ATRADIUS						2.6780	1.4410	2.0595
AVIVA			0.9455	0.9939	1.0389	0.9410	1.0132	0.9865
AXA OYAK	0.6684	0.6881	0.7517	0.9540	1.0120	1.0412	1.0420	0.8796
BAŞAK	0.8818	0.7209	0.5302	0.5366	0.4869	0.6163	0.5931	0.6237
BATI	0.3512	0.5041	0.4683	0.7731	0.6534	0.4302	0.2084	0.4841
BİRLİK	1.1869	0.9682	0.7471	0.6487	0.6457	0.8368	0.8501	0.8405
CARDIF						27.1740	10.6586	18.9163
COFACE						2.4839	0.6375	1.5607
COMMERCIAL UNION	0.6761	0.6434						0.6597
DEMİR	0.4185	0.3662	0.3391	0.3773	0.6239	3.0617	2.8321	1.1455
DUBAI GROUP							1.7621	1.7621
EGE	1.0854							1.0854
EGS	0.2590							0.2590
ERGOİSVİÇRE						0.7511	0.8505	0.8008
EUREKO						0.9617	1.0398	1.0007
EURO							0.7918	0.7918
FIBA						1.2033	1.2326	1.2180
FİNANS	0.4484	0.5213	0.4954	0.6560	1.0319			0.6306
GARANTİ	0.1744	0.4924	0.6526	0.7104	0.8075			0.5675
GENERALİ	0.6802	0.6056	0.5249	0.5259	0.4489	0.4412	0.5057	0.5332
G.I.C. DÜNYA	0.1206	0.1086	0.1583					0.1291
GÜNEŞ	0.6448	0.5259	0.5218	0.5388	0.5804	0.5780	0.4797	0.5528

Table II – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Avera ge
GÜVEN	0.5444	0.4571	0.5349	0.4111	0.5645	0.5514	0.5513	0.5164
HDI					0.5283	0.6818	0.5982	0.6028
HÜR	0.5854	0.5672	0.6003	0.6605	0.7126	0.7884	0.8398	0.6792
IŞIK	0.4684	0.4635	0.6281	0.6503	0.8073	1.3563	1.1733	0.7925
İHLAS	0.2480	0.2436	0.3170	0.4412				0.3124
İSVİÇRE	0.8063	0.7469	0.6832	0.7445				0.7452
KAPİTAL	0.3069	0.0973						0.2021
KOÇ ALLIANZ	0.5610	0.6841	0.6980	0.7258	0.7416	0.8711		0.7136
LIBERTY						0.9046	2.0319	1.4682
MAGDEBURGER	5.0530	9.4734	6.5277	3.3749	3.5830	16.891	4.1709	7.0107
MAPFRE GENEL							1.4584	1.4584
MERKEZ	1.3903	1.5337	2.0525	2.5285	2.6416	2.5845	2.8962	2.2325
RAY	0.6504	0.5550	0.5310	0.5115	0.4728	0.6098	0.4617	0.5418
RUMELİ	1.6750	1.7964	2.5065	1.2542	1.0680	1.5458	2.8716	1.8168
SANKO	0.3399	0.4888						0.4144
SBN							0.9879	0.9879
ŞEKER	0.3473	0.3811	0.3139	0.5845	0.3900			0.4033
TEB	0.3610	0.3683	0.7556	0.6001	0.5491	0.5188		0.5255
TİCARET	1.4055	2.4962	2.1784	2.7064	6.4174	5.0812		3.3809
T. GENEL	1.2250	1.3381	1.0340	1.9273	1.6251	1.5318		1.4469
T. NIPPON	0.8113	1.1414	0.9728	0.8526	114.84	1.9930	1.2987	17.416
TOPRAK	1.5839	1.5335	1.7554	2.0005	1.8742	1.5654		1.7188
YAPI KREDİ	0.7566	0.6328	0.5692	0.5621	0.5773	0.6611	0.8089	0.6526
ZURICH							0.5515	0.5515
Av. All Non-Life Ins. Companies	0.8367	1.0215	1.0088	0.9980	1.1299	1.2706	1.4362	1.1002
Av. of Big Non- Life Ins. Companies	0.8988	1.0254	0.9501	1.2216	1.0231	1.0912	1.0772	1.0411
Av. of the Rest (excluding the Big Ones)	0.8204	1.0208	1.0196	0.9549	1.1521	1.3038	1.4960	1.1097

Table III – Current Ratio of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	1.2370	1.1113	1.1260	1.3729	1.3322	1.3234	1.5071	1.2871
AKSİGORTA	1.8385	2.2505	2.2094	2.5930	1.8403	1.8432	1.6489	2.0320
ALLIANZ							1.3848	1.3848
ANADOLU ANONİM TÜRK	1.7264	1.6752	1.6046	1.7038	1.5924	1.5848	1.5952	1.6404
ANKARA ANONİM TÜRK	1.4374	1.0909	1.2385	1.3035	1.0000	1.4395	1.3274	1.2625
ATRADIUS						2.9264	1.7130	2.3197
AVIVA			1.4285	1.5073	1.5641	1.4668	1.5606	1.5055
AXA OYAK	1.2890	1.2182	1.2164	1.4431	1.4789	1.4258	1.3856	1.3510
BAŞAK	1.4907	1.2951	1.2825	1.2225	0.9715	1.0654	1.0849	1.2018
BATI	1.2022	1.3641	1.1999	1.2606	0.8007	0.5397	0.2619	0.9470
BİRLİK	1.8660	1.5404	1.3166	1.1947	1.2808	1.3871	1.4959	1.4402
CARDIF						27.9208	13.3487	20.6348
COFACE						3.0426	1.0545	2.0485
COMMERCIAL UNION	1.2981	1.1561						1.2271
DEMİR	1.2701	1.1921	0.6890	1.6151	1.5398	3.1930	3.0304	1.7899
DUBAI GROUP							2.2574	2.2574
EGE	1.4126							1.4126
EGS	0.8913							0.8913
ERGOİSVİÇRE						1.2413	1.3590	1.3002
EUREKO						1.6297	1.6970	1.6634
EURO							1.2763	1.2763
FIBA						1.6014	1.6587	1.6300
FİNANS	1.4397	1.3093	1.1686	1.1971	1.5694			1.3368
GARANTİ	1.1930	1.4786	1.5632	1.3164	1.6192			1.4341
GENERALİ	1.3614	1.3080	1.1785	1.1081	1.0737	1.1131	1.2021	1.1922
G.I.C. DÜNYA	0.2249	0.1971	0.2134					0.2118
GÜNEŞ	1.4410	1.2056	1.1938	1.1939	1.1773	1.1852	1.1164	1.2162

Table III – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
GÜVEN	1.2636	1.0522	1.1816	0.9696	1.1501	1.1955	0.9622	1.1107
HDI					1.1740	1.1968	1.3135	1.2281
HÜR	1.0924	1.0027	1.0266	1.1330	1.1523	1.1870	1.1994	1.1133
IŞIK	1.1853	1.1097	1.3010	1.3666	1.4608	1.8571	1.6004	1.4116
İHLAS	0.9141	0.8745	0.9600	1.0137				0.9406
İSVİÇRE	1.3644	1.2776	1.2467	1.2613				1.2875
KAPİTAL	1.1879	0.2765						0.7322
KOÇ ALLIANZ	1.3775	1.2847	1.3141	1.3164	1.3698	1.4524		1.3525
LIBERTY						1.3213	2.4058	1.8636
MAGDEBURGER	5.7549	12.2420	6.7992	3.4815	3.6410	17.2754	4.3335	7.6468
MAPFRE GENEL							2.2864	2.2864
MERKEZ	1.5555	1.5833	2.1151	2.5543	2.6840	2.6337	2.9365	2.2946
RAY	1.2539	1.1726	1.0645	1.0688	1.0022	1.2064	1.1757	1.1349
RUMELİ	2.4867	1.9313	2.5187	1.2596	1.7224	3.4356	7.0939	2.9211
SANKO	1.0799	1.2844						1.1821
SBN							1.6451	1.6451
ŞEKER	1.1000	1.0577	1.0385	1.4457	1.2501			1.1784
TEB	1.5452	1.2681	1.2914	1.3918	1.2520	1.0730		1.3036
TİCARET	2.3042	3.2512	2.9595	3.5281	7.2002	5.7229		4.1610
T. GENEL	1.7138	1.8337	1.5503	2.4332	2.0953	2.4656		2.0153
T. NİPPON	1.5290	1.7805	1.3601	0.9812	129.3579	2.1783	1.4965	19.8119
TOPRAK	2.2762	2.1328	2.2726	2.4153	2.2861	1.9552		2.2230
YAPI KREDİ	1.3634	1.1468	1.1056	1.1380	1.1566	1.2177	1.3412	1.2099
ZURICH							1.2066	1.2066
Av. All Non-Life Ins. Companies	1.5269	1.6751	1.5542	1.5739	1.7047	1.8158	2.1132	1.7091
Av. of Big Non- life Ins. Companies	1.5862	1.6525	1.5790	1.8979	1.6753	1.7544	1.6602	1.6869
Av. of the Rest (excluding the Big Ones)	1.5168	1.6790	1.5496	1.5116	1.7109	1.8272	2.1887	1.7120

Table IV – Premium Receivables to Total Assets of Non- Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	0.4082	0.3144	0.3449	0.3626	0.3349	0.4812	0.3206	0.3667
AKSİGORTA	0.2526	0.2315	0.2473	0.1005	0.1167	0.0971	0.1081	0.1648
ALLIANZ							0.2706	0.2706
ANADOLU ANONİM TÜRK	0.3048	0.3296	0.3296	0.2784	0.2773	0.2664	0.2259	0.2874
ANKARA ANONİM TÜRK	0.3134	0.4622	0.4741	0.5524	0.5694	0.4496	0.3807	0.4574
ATRADIUS						0.0797	0.1491	0.1144
AVIVA			0.3194	0.3015	0.3099	0.2896	0.2559	0.2952
AXA OYAK	0.3532	0.3572	0.2997	0.2480	0.2528	0.2177	0.1406	0.2670
BAŞAK	0.3159	0.3437	0.4443	0.3678	0.3335	0.2929	0.2290	0.3324
BATI	0.5564	0.4449	0.3726	0.1794	-0.1512			0.2804
BİRLİK	0.3262	0.3331	0.3982	0.3811	0.4359	0.3164	0.3031	0.3563
CARDIF							0.0038	0.0038
COFACE						0.1701	0.3262	0.2482
COMMERCIAL UNION	0.4478	0.4246						0.4362
DEMİR	0.4788	0.3931	0.0971	0.1182	0.0941		0.0174	0.1998
DUBAI GROUP							0.0314	0.0314
EGE	0.1637							0.1637
EGS	0.3431	0.0000						0.1716
ERGOİSVİÇRE					0.3241	0.3131	0.2652	0.3008
EUREKO						0.3605	0.2973	0.3289
EURO							0.2550	0.2550
FİBA						0.2276	0.1572	0.1924
FİNANS	0.6398	0.5700	0.5029	0.3921	0.3067			0.4823
GARANTİ	0.6344	0.4791	0.0050	0.3238	0.4299			0.3745
GENERALİ	0.3700	0.4283	0.4388	0.4367	0.4623	0.4980	0.3639	0.4283
G.I.C. DÜNYA	0.0237	0.0033	0.4760					0.1677
GÜNEŞ	0.3195	0.3713	0.3607	0.3051	0.3082	0.3398	0.3161	0.3315

Table IV – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
GÜVEN	0.3258	0.3737	0.3419	0.3385	0.3427	0.3572	0.2275	0.3296
HDI					0.4421	0.3502	0.3416	0.3780
HÜR	0.2936	0.2970	0.3090	0.3176	0.2282	0.2110	0.1397	0.2566
IŞIK	0.4709	0.4679	0.4306	0.4280	0.3771	0.2371	0.1653	0.3681
İHLAS	0.3223	0.3695	0.4180	0.3607				0.3676
İSVİÇRE	0.3452	0.3670	0.3841	0.3216				0.3545
KAPİTAL	0.4212	0.1334						0.2773
KOÇ ALLIANZ	0.3866	0.3307	0.3583	0.3504	0.3344	0.3623		0.3538
LIBERTY						0.2411	0.0948	0.1679
MAGDEBURGER	0.0000	0.0000	0.0092	0.0009	0.0157			0.0052
MAPFRE GENEL							0.1505	0.1505
MERKEZ	0.0976	0.0260	0.0266	0.0000	0.0000			0.0300
RAY	0.3461	0.3670	0.3587	0.4200	0.4377	0.4317	0.4220	0.3976
RUMELİ	0.2346	0.0011	0.0011	-0.0003	-0.0002			0.0473
SANKO	0.2724	0.1555						0.2140
SBN							0.2080	0.2080
ŞEKER	0.3624	0.3561	0.3569	0.3044	0.4448			0.3649
TEB	0.5423	0.3935	0.3190	0.4967	0.4680	0.4201		0.4399
TİCARET	0.1884	0.1373	0.1948	0.2097	0.0611	0.0832		0.1457
T. GENEL	0.1131	0.1105	0.1314	0.1105	0.1200	0.1671		0.1254
T. NİPPON	0.2765	0.1799	0.1964	0.0657	0.0000			0.1437
TOPRAK	0.2688	0.2280	0.1920	0.1490	0.1506	0.1633		0.1920
YAPI KREDİ	0.2901	0.2828	0.3225	0.2693	0.2860	0.2801	0.2390	0.2814
ZURICH							0.4054	0.4054
Av. All Non-Life Ins. Companies	0.3280	0.2875	0.2957	0.2739	0.2617	0.2757	0.2202	0.2775
Av. of Big Non- Life Ins. Companies	0.2628	0.2719	0.2733	0.2176	0.2202	0.2221	0.1791	0.2353
Av. of the Rest (excluding the Big Ones)	0.3386	0.2901	0.2998	0.2847	0.2697	0.2873	0.2281	0.2855

Table V – Agency Receivables to Total Equity Ratio of Non- Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	1.3119	1.6608	1.8941	1.0961	1.2827	1.7863	1.4366	1.4955
AKSİGORTA	0.0000	0.0000	0.0000	0.1011	0.1139	0.1034	0.1332	0.0645
ALLIANZ							0.5079	0.5079
ANADOLU ANONİM TÜRK	0.6715	0.7919	0.8306	0.5534	0.6362	0.5326	0.5074	0.6462
ANKARA ANONİM TÜRK	0.6607	2.7849	2.1568	1.9722	13.3804	1.0500	1.0348	3.2914
ATRADIUS						0.0000	0.3175	0.1587
AVIVA			1.6571	1.2154	1.1125	0.8772	0.6709	1.1066
AXA OYAK	1.2721	1.3531	1.4367	0.8790	0.8773	0.6737	0.4561	0.9926
BAŞAK	0.9342	1.0142	1.5166	0.9340	2.9077	1.1453	0.7102	1.3089
BATI	1.2701	1.4023	1.8966	0.1583	1.0036			1.1462
BİRLİK	0.7617	1.1367	2.5799	2.0368	2.6455	1.0614	0.8927	1.5878
CARDIF							0.0042	0.0042
COFACE						0.0000	1.7904	0.8952
COMMERCIAL UNION	2.5436	4.9304						3.7370
DEMİR	1.9092	-0.0200	0.0063	0.0023	0.0000		0.0000	0.3163
DUBAI GROUP							0.0000	0.0000
EGE	0.6744							0.6744
EGS	-3.315							-3.3152
ERGOİSVİÇRE					1.1702	1.0166	0.8238	1.0035
EUREKO						0.8174	0.7133	0.7653
EURO							0.8742	0.8742
FIBA						0.5914	0.3781	0.4848
FİNANS	2.0188	2.5823	4.4549	2.1812	0.9541			2.4383
GARANTİ	2.0962	1.3348	1.3472	0.8814	1.1219			1.3563
GENERALİ	0.9801	1.2612	2.2048	2.0366	2.3262	2.6863	1.0672	1.7946
G.I.C. DÜNYA	0.0000	0.0000	0.0000					0.0000
GÜNEŞ	0.5654	0.7796	0.9532	0.6133	0.7034	0.8005	0.8484	0.7520

Table V – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
GÜVEN	0.7122	1.3867	0.8940	1.1147	1.0661	0.7050	1.0581	0.9910
HDI					2.3221	1.7619	1.1581	1.7474
HÜR	1.0797	1.1998	1.3876	1.5958	1.2593	0.8212	0.5269	1.1243
İŞİK	1.9572	2.6202	1.6075	1.3716	1.2451	0.4618	0.3559	1.3742
İHLAS	0.7931	1.1762	1.7112	1.2662				1.2367
İSVİÇRE	1.2191	1.4209	1.5715	1.1781				1.3474
KAPİTAL	1.5774	-0.3158						0.6308
KOÇ ALLIANZ	0.9927	0.6885	0.8331	0.6746	0.8957	0.6566		0.7902
LIBERTY						-0.7449	0.1609	-0.2920
MAGDEBURGER	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
MAPFRE GENEL							0.1753	0.1753
MERKEZ	0.9728	0.0394	0.0231	0.0000	0.0000			0.2071
RAY	0.8132	1.1263	1.5460	2.5571	3.8324	1.4371	1.3776	1.8128
RUMELİ	0.0931	-0.0003	-0.0003	-0.0005	-0.0010			0.0182
SANKO	0.3660	0.0039						0.1850
SBN							0.4906	0.4906
ŞEKER	1.2789	1.7497	1.6201	0.7868	2.8376			1.6546
TEB	1.5836	1.1351	0.9073	1.6118	1.7571	1.8641		1.4765
TİCARET	0.3210	0.1491	0.2588	0.2759	0.0005	0.0984		0.1839
T. GENEL	0.1338	0.1590	0.2377	0.1058	0.1349	0.1738		0.1575
T. NİPPON	0.4254	0.4439	0.0000	0.0000	0.0000			0.1739
TOPRAK	0.1182	0.1781	0.2062	0.2626	0.3102	0.2750		0.2250
YAPI KREDİ	0.0037	0.4961	0.5992	0.4641	0.5043	0.4036	0.2951	0.3941
ZURICH							1.8911	1.8911
Av. All Non-Life Ins. Companies	0.7997	1.0197	1.1356	0.9008	1.1007	0.7798	0.6663	0.9147
Av. of Big Non- Life Ins. Companies	0.4140	0.5985	0.6676	0.4628	0.5316	0.4280	0.3560	0.4942
Av. of the Rest (excluding the Big Ones)	0.8618	1.0923	1.2222	0.9851	1.2145	0.8598	0.7260	0.9945

Table VI – Total Equity to Total Assets Ratio of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	0.2216	0.1481	0.1540	0.2796	0.2485	0.2376	0.2003	0.2128
AKSİGORTA	0.5934	0.6245	0.6117	0.8681	0.8445	0.8651	0.7527	0.7372
ALLIANZ							0.3454	0.3454
ANADOLU ANONİM TÜRK	0.4136	0.3734	0.3566	0.4536	0.4121	0.4596	0.3962	0.4093
ANKARA ANONİM TÜRK	0.3554	0.1403	0.2015	0.2596	0.0245	0.3210	0.2570	0.2228
ATRADIUS						0.6608	0.4190	0.5399
AVIVA			0.1802	0.2319	0.2499	0.3146	0.3479	0.2649
AXA OYAK	0.2607	0.2490	0.2011	0.2787	0.2839	0.3147	0.2951	0.2690
BAŞAK	0.3257	0.2881	0.2762	0.3769	0.1123	0.2233	0.2892	0.2702
BATI	0.3211	0.2816	0.1765	0.2911	-0.1958			0.1249
BİRLİK	0.3441	0.2430	0.1458	0.1756	0.1568	0.2899	0.3345	0.2414
CARDIF							0.8979	0.8979
COFACE						0.6728	0.0521	0.3625
COMMERCIAL UNION	0.1532	0.0793						0.1163
DEMİR	0.1833	0.2438	0.3418	0.4541	0.4215	0.0000	0.7038	0.3355
DUBAI GROUP							0.6884	0.6884
EGE	0.2432							0.2432
EGS	-0.085							-0.0852
ERGOİSVİÇRE					0.2735	0.3005	0.2893	0.2878
EUREKO						0.4071	0.4205	0.4138
EURO							0.2917	0.2917
FIBA						0.3772	0.3976	0.3874
FİNANS	0.3066	0.2183	0.1109	0.1782	0.3198			0.2268
GARANTİ	0.2330	0.2913	0.2968	0.2924	0.3089			0.2845
GENERALİ	0.3445	0.3208	0.2061	0.1928	0.1560	0.1792	0.2868	0.2409
G.I.C. DÜNYA	-1.550	-1.5536	-3.6497					-2.2512
GÜNEŞ	0.4951	0.3797	0.3539	0.4538	0.4025	0.3962	0.3497	0.4044

Table VI – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Avera ge
GÜVEN	0.3645	0.2022	0.2934	0.2205	0.2165	0.3338	0.1891	0.2600
HDI					0.1836	0.1956	0.2528	0.2107
HÜR	0.2649	0.2426	0.2156	0.1957	0.1719	0.2189	0.2196	0.2185
IŞIK	0.2195	0.1598	0.2487	0.2705	0.2958	0.4591	0.3889	0.2917
İHLAS	0.3334	0.2822	0.2224	0.2584				0.2741
İSVİÇRE	0.2760	0.2487	0.2337	0.2688				0.2568
KAPİTAL	0.2429	-0.4168						-0.0869
KOÇ ALLIANZ	0.3138	0.3349	0.3070	0.3161	0.2724	0.3381		0.3137
LIBERTY						-0.3062	0.5337	0.1138
MAGDEBURGE R	0.7498	0.8143	0.7251	0.7128	0.7253	0.0000	0.0000	0.5325
MAPFRE GENEL							0.6033	0.6033
MERKEZ	0.0238	0.3540	0.5099	0.4436	0.4422	0.0000	0.0000	0.2533
RAY	0.3729	0.2833	0.2161	0.1587	0.1034	0.2422	0.2297	0.2295
RUMELİ	0.6325	0.5547	0.6167	0.5684	0.4225	0.0000	0.0000	0.3993
SANKO	0.5563	0.7071						0.6317
SBN							0.4168	0.4168
ŞEKER	0.2544	0.1771	0.1912	0.3465	0.1510			0.2240
TEB	0.2682	0.2859	0.2571	0.2636	0.2186	0.1837		0.2462
TİCARET	0.5238	0.6627	0.5997	0.5765	0.6592	0.8418		0.6439
T. GENEL	0.6300	0.5344	0.4164	0.7437	0.6672	0.6524		0.6074
T. NİPPON	0.3274	0.2875	-0.0339	0.0020	0.4491	0.0000	0.0000	0.1474
TOPRAK	0.4889	0.4502	0.4571	0.4572	0.4259	0.4857		0.4608
YAPI KREDİ	0.4278	0.3835	0.3326	0.4020	0.3569	0.3898	0.4170	0.3871
ZURICH							0.1762	0.1762
Av. All Non-Life Ins. Companies	0.2897	0.2611	0.1804	0.3546	0.3155	0.3047	0.3269	0.2904
Av. of Big Non- Life Ins. Companies	0.4423	0.4233	0.3786	0.5320	0.4960	0.5260	0.4786	0.4681
Av. of the Rest (excluding the Big Ones)	0.2651	0.2331	0.1437	0.3204	0.2808	0.2774	0.3024	0.2586

Table VII – Working Capital to Total Premium Ratio of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
AIG	0.1614	0.0814	0.0830	0.2009	0.1763	0.1520	0.3347	0.1700
AKSİGORTA	0.3198	0.4649	0.4531	0.6359	0.3272	0.4214	0.4175	0.4342
ALLIANZ							0.2626	0.2626
ANADOLU ANONİM TÜRK	0.4722	0.4279	0.3708	0.3956	0.3401	0.3555	0.4576	0.4028
ANKARA ANONİM TÜRK	0.2123	0.0564	0.1263	0.1270	0.0000	0.2564	0.2310	0.1442
ATRADIUS						8.4739	1.7473	5.1106
AVIVA			0.2293	0.2974	0.3282	0.3118	0.4661	0.3266
AXA OYAK	0.1561	0.1211	0.1241	0.2749	0.2895	0.2873	0.3291	0.2260
BAŞAK	0.3458	0.2100	0.1313	0.1159	-0.0178	0.0431	0.0677	0.1280
BATI	0.1154	0.1978	0.1170	-4.648	-74.835			-15.811
BİRLİK	0.4497	0.3910	0.2149	0.1536	0.1760	0.2424	0.3645	0.2846
CARDIF							44.356	44.356
COFACE						1.4354	0.0756	0.7555
COMMERCIAL UNION	0.1546	0.0985						0.1265
DEMİR	0.1881	1.8801	-	123.66			14.293	-26.824
DUBAI GROUP							9.8913	9.8913
EGE	0.3549							0.3549
EGS	-0.0713							-0.0713
ERGOİSVİÇRE					0.0000	0.1345	0.2610	0.1319
EUREKO						0.3093	0.3951	0.3522
EURO							0.3331	0.3331
FIBA						0.3221	0.4260	0.3741
FİNANS	0.2705	0.1396	0.0819	0.1111	0.2855			0.1777
GARANTİ	0.0865	0.2311	-	0.1502	0.2624			0.1339
GENERALİ	0.1331	0.1228	0.7761	0.0645	0.0427	0.0654	0.1409	0.1922
G.I.C. DÜNYA	-5.2899	5,748.0						2871.3
GÜNEŞ	0.1472	0.0909	0.0826	0.0807	0.0758	0.0848	0.0691	0.0902

Table VII – (Continued)

NON-LIFE INSURANCE COMPANIES	2002	2003	2004	2005	2006	2007	2008	Aver age
GÜVEN	0.1273	0.0319	0.1046	0.0209	0.0937	0.1176	-0.0275	0.0610
HDI					0.0819	0.1017	0.1997	0.1278
HÜR	0.0564	0.0019	0.0190	0.1020	0.1104	0.1585	0.1891	0.0910
IŞIK	0.0981	0.0641	0.1603	0.2195	0.2405	0.4811	0.4336	0.2425
İHLAS	- 0.0507	-0.0700	- 0.0208	0.0062				- 0.0338
İSVİÇRE	0.2190	0.1745	0.1478	0.1501				0.1729
KAPİTAL	0.1041	-1.5320						- 0.7140
KOÇ ALLIANZ	0.1918	0.1769	0.1959	0.1885	0.1953	0.2595		0.2013
LIBERTY						0.2141	1.5491	0.8816
MAGDEBURGE R					38,681. 2761			38681. 2761
MAPFRE GENEL							1.1852	1.1852
MERKEZ	4.3145	-5.3710	329.50	58.233	668.242			210.98 38
RAY	0.0897	0.0815	0.0352	0.0389	0.0012	0.1169	0.1319	0.0707
RUMELİ	0.7746	1.1868						0.9807
SANKO	0.0347	0.5740						0.3044
SBN							0.3137	0.3137
ŞEKER	0.0585	0.0372	0.0215	0.2032	0.1195			0.0880
TEB	0.2189	0.1621	0.2129	0.2305	0.1478	0.0532		0.1709
TİCARET	0.8672	1.7988	1.2568	1.0758	12.6804	4.8626		3.7569
T. GENEL	0.5180	0.6507	0.4026	1.1463	0.9480	1.0952		0.7935
T. NİPPON	0.4300	0.5151	1.8983	- 4.7500	31,405. 4301			6280.7 047
TOPRAK	0.6127	3.3546	1.3909	1.7581	1.6328	1.4315		1.6968
YAPI KREDİ	0.1623	0.0751	0.0572	0.0747	0.0898	0.1337	0.2282	0.1173
ZURICH							0.1686	0.1686
Av. All Non-Life Ins. Companies	0.2010	0.2008	0.3060	0.3112	0.2530	0.8118	0.7372	0.4030
Av. of Big Non- Life Ins. Companies	0.3315	0.3683	0.3093	0.5282	0.4200	0.4838	0.5304	0.4245
Av. of the Rest (excluding the Big Ones)	0.1896	0.1698	0.3053	0.2570	0.2091	0.8865	0.7496	0.3938

Table VIII – Growth of Total Assets of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Averag e
AIG	0.3894	0.5357	0.5443	0.2114	0.1039	0.9182	0.4505
AKSİGORTA	0.4537	0.1683	2.8958	0.0322	0.4536	-0.2181	0.6309
ALLIANZ						0.2586	0.2922*
ANADOLU ANONİM TÜRK	0.3790	0.4908	0.3994	0.1954	0.1403	0.0948	0.2833
ANKARA ANONİM TÜRK	0.3966	0.9276	0.2111	0.3536	0.2512	0.0627	0.3671
ATRADIUS						0.4666	0.4666
AVIVA			0.3957	0.3144	0.3006	0.4921	0.3591*
AXA OYAK	0.5087	0.4814	0.4056	0.2328	0.2738	0.3487	0.3752
BAŞAK	0.2279	0.0660	0.2177	0.0876	0.1538	0.4786	0.2053
BATI	0.3215	0.1179	-0.6825	-0.4364	-0.4433	-0.4955	-0.2697
BİRLİK	0.5186	0.3929	0.4093	0.4360	0.0858	0.1764	0.3365
CARDIF							
COFACE						1.0232	1.0232
COMMERCIAL UNION	0.1916	0.4604					
DEMİR	0.0730	-0.2905	-0.1890	-0.0592	-0.0867	0.5450	-0.0012
DUBAI GROUP							
EGE							
EGS							
ERGOİSVİÇRE					0.1812	0.4032	0.3385*
EUREKO						0.3897	0.4213*
EURO						0.6146	0.1911*
FIBA						0.3557	0.7045*
FİNANS	1.7403	0.5362	0.5877	0.5318			
GARANTİ	0.7027	0.4225	0.4509	0.2457			
GENERALİ	0.4211	0.4476	0.0582	0.1170	0.0643	0.8642	0.3287
G.I.C. DÜNYA	0.0774	-0.5611					-0.4946
GÜNEŞ	0.4245	0.2088	0.4321	0.0801	0.2416	0.3233	0.2851

Table VIII – (Continued)

NON-LIFE INSURANCE COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Avera ge
GÜVEN	0.4688	0.6774	0.4980	0.1524	0.1852	-0.0133	0.3281
HDI					0.4874	0.2618	0.3746
HÜR	0.4871	0.5083	0.3673	0.3008	0.0521	0.2178	0.3222
IŞIK	0.1813	0.4446	0.2681	0.2503	0.6721	0.1728	0.3315
İHLAS	0.2397	0.3036	0.3404				-0.0291
İSVİÇRE	0.5231	0.4427	0.1750				
KAPİTAL	-0.479						-0.7392
KOÇ ALLIANZ	0.4522	0.4398	0.2808	0.1179	0.2043		
LIBERTY						0.5166	0.361*
MAGDEBURGER	-0.016	-0.130	0.1014	-0.0393	0.0699	0.1237	0.0182
MAPFRE GENEL						0.2586	0.243*
MERKEZ	-0.398	-0.293	0.1161	-0.0028	0.1036	0.0662	-0.0679
RAY	0.4646	0.1931	0.1239	0.1342	0.2938	0.3371	0.2578
RUMELİ	- 0.3586	- 0.0087	- 0.1430	-0.2382	-0.2865	-0.0800	-0.1858
SANKO	- 0.0528						-0.5264
SBN						1.0279	0.575*
ŞEKER	0.3706	0.1481	0.3523	0.1980			
TEB	0.7845	0.2990	0.5809	0.4643	0.4449		
TİCARET	0.2743	-0.044	-0.241	-0.2976	2.7252		
T. GENEL	0.4609	0.3242	0.3970	0.1458	-0.0657		
T. NİPPON	-0.156	-.3453	-0.176	-0.1486	-0.0499	-0.1065	-0.1637
TOPRAK	0.6255	-0.037	0.0593	-0.0625	-0.0532		
YAPI KREDİ	0.2421	0.2482	0.4112	0.2116	0.2290	0.0534	0.2315
ZURICH						0.4225	0.499*
Av. All Non-Life Ins. Companies	0.3218	0.2368	0.3113	0.1427	0.2593	0.3204	0.2654
Av. of Big Non-Life Ins. Companies	0.4509	0.3809	0.8757	0.1448	0.1881	0.1485	0.3648
Av. of the Rest (excluding the Big Ones)	0.2555	0.1720	0.1699	0.1193	0.2290	0.2979	0.2072
*The growth rates of the firms are calculated by using the data of the firms which have been previously taken over and/or merged with and the averages over seven years calculated accordingly. The averages are stated in the row of the company which has been currently operating. To illustrate, large shares of Koç Allianz are taken over by Allianz and the company operates under this name after 2007. Thus between 2007 and 2008 the growth rate of the Allianz has been calculated by using the data of Koç Allianz and the average of the seven years are presented in the row that belongs to Allianz. See 4.1.1 for further information about firms							

Table IX – Growth of Liquid Assets of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Average
AIG	0.6489	0.4860	0.5082	0.2214	-0.0855	0.9410	0.4533
AKSİGORTA	0.8254	0.1408	0.5136	-0.3093	0.8944	0.3040	0.3948
ALLIANZ						0.2246	0.4043*
ANADOLU ANONİM TÜRK	0.4075	0.3748	0.1840	0.2259	0.2830	0.2999	0.2958
ANKARA ANONİM TÜRK	0.2758	1.0682	-0.1971	0.7523	0.8216	0.0472	0.4613
ATRADIUS						0.3511	0.3511
AVIVA			0.3986	0.3361	0.2617	0.5105	0.4233*
AXA OYAK	0.6101	0.6997	0.6280	0.2852	0.3731	0.3827	0.4965
BAŞAK	0.1647	-0.2124	0.1272	0.3154	0.3785	0.3063	0.1800
BATI	0.7426	0.1819	-0.4709	-0.1965	-0.4540	-0.4763	-0.1122
BİRLİK	0.5064	0.2405	0.3649	0.3357	0.3079	0.1107	0.3110
CARDIF							
COFACE						0.4003	0.4003
COMMERCIAL UNION	0.2946	0.7382					
DEMİR	-0.1299	-0.4890	-0.0194	0.6446	1.1666	0.5090	0.2803
DUBAI GROUP							
EGE							
EGS							
ERGOİSVİÇRE				0.1736	0.2698	0.6199	0.3518*
EUREKO					0.5773	0.4372	1.0326*
EURO					-0.0729	0.1864	0.1543*
FIBA					0.6921	0.3409	1.0252*
FİNANS	2.5556	0.6392	1.0751	0.8485			
GARANTİ	3.1636	0.8719	0.9147	0.2309			
GENERALİ	0.3804	0.4904	0.1532	-0.0030	0.0172	0.8018	0.3067
G.I.C. DÜNYA	-0.0183	0.3132					-0.2350
GÜNEŞ	0.4774	0.2527	0.2374	0.2726	0.3247	0.1965	0.2935

Table IX – (Continued)

NON-LIFE INSURANCE COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Average
GÜVEN	0.6363	0.7729	0.4145	0.4417	0.0832	0.2113	0.4266
HDI				1.2158	0.9306	0.0370	0.6835*
HÜR	0.5027	0.6684	0.5210	0.4317	0.1304	0.3110	0.4275
IŞIK	0.2632	0.7485	0.2743	0.4943	1.2317	0.1540	0.5277
İHLAS	0.3405	0.8517	0.7250				
İSVİÇRE	0.4866	0.3572	0.2036				
KAPİTAL	-0.6497						-0.6497
KOÇ ALLIANZ	0.7263	0.5382	0.4179	0.1094	0.4098		
LIBERTY					2.699	0.9120	0.8460*
MAGDEBURGER	-0.1319	-0.0415	0.2525	-0.0248	0.0631	0.1061	0.0372
MAPFRE GENEL						0.2611	0.4236*
MERKEZ	-0.3941	-0.2227	0.1715	-0.0059	0.1035	0.0921	-0.0426
RAY	0.4407	0.2694	0.1999	0.1430	0.4103	0.0156	0.2465
RUMELİ	-0.3231	-0.0300	-0.0805	-0.1322	-0.4833	-0.1661	-0.2025
SANKO	-0.3084						-0.3084
SBN						0.4439	0.4966*
ŞEKER	0.6132	-0.0854	0.8709	0.0669			
TEB	0.9732	1.7421	0.1882	0.4396	0.5721		
TİCARET	0.5156	-0.0125	-0.1732	-0.2013	2.4073		
T. GENEL	0.5673	0.1480	1.4652	0.1801	-0.0208		
T. NİPPON	0.0679	-0.2610	0.0138	-0.1179	-0.0219	-0.1456	-0.0775
TOPRAK	0.6593	0.0837	0.1572	-0.0877	-0.0730		
YAPI KREDİ	0.1486	0.2282	0.2037	0.3563	0.3144	0.3402	0.2652
ZURICH						0.4283	0.7239*
Av. All Non-Life Ins. Companies	0.4717	0.3610	0.3304	0.2401	0.5322	0.3154	0.3751
Av. of Big Non-Life Ins. Companies	0.6273	0.3803	0.6417	0.0983	0.3879	0.2945	0.4050
Av. of the Rest (excluding the Big Ones)	0.4449	0.3574	0.2706	0.2674	0.5636	0.3632	0.3778
*The growth rates of the firms are calculated by using the data of the firms which have been previously taken over and/or merged with and the averages over seven years calculated accordingly. The averages are stated in the row of the company which has been currently operating. To illustrate, large shares of Koç Allianz are taken over by Allianz and the company operates under this name after 2007. Thus between 2007 and 2008 the growth rate of the Allianz has been calculated by using the data of Koç Allianz and the average of the seven years are presented in the row that belongs to Allianz. See 4.1.1 for further information about firms							

Table X – Growth of Current Liabilities of Non-Life Insurance Companies

NON-LIFE INSURANCE COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Average
AIG	0.5531	0.5183	0.2720	0.2691	0.1190	0.6955	0.4045
AKSİGORTA	0.2984	0.1826	0.3213	0.2629	0.5232	0.3451	0.3222
ALLIANZ						0.2510	0.3039*
ANADOLU ANONİM TÜRK	0.4463	0.5257	0.1377	0.3111	0.1911	0.2317	0.3073
ANKARA ANONİM TÜRK	0.9465	0.8120	0.1838	0.7833	-0.1290	0.1592	0.4593
ATRADIUS						1.5108	1.5108
AVIVA			0.3304	0.2783	0.3929	0.4029	0.3246*
AXA OYAK	0.5641	0.5559	0.2828	0.2115	0.3346	0.3815	0.3884
BAŞAK	0.4248	0.0708	0.1137	0.4498	0.0890	0.3573	0.2509
BATI	0.2140	0.2721	-0.6795	-0.049	-0.1708	0.0814	-0.0553
BİRLİK	0.8467	0.6077	0.5719	0.3420	0.0091	0.0934	0.4118
CARDIF						1.5218	1.5218
COFACE						4.4561	4.4561
COMMERCIAL UNION	0.3604	0.1828					
DEMİR	0.0730	-0.295	-0.1890	-0.059	-0.0867	0.5450	-0.0012
DUBAI GROUP							
EGE							
EGS							
ERGOİSVİÇRE					0.1907	0.4307	0.3425*
EUREKO					0.3244	0.3293	0.3971*
EURO						1.3454	0.3508*
FIBA					0.4511	0.3091	0.7143*
FİNANS	2.0581	0.7251	0.5671	0.1750			
GARANTİ	0.4748	0.4123	0.7590	0.0829			
GENERALİ	0.5504	3.4896	-0.5591	0.1679	0.0350	0.5718	0.7093
G.I.C. DÜNYA	0.0899	1.1640					0.6269
GÜNEŞ	0.8117	0.2624	0.1983	0.1814	0.3303	0.4418	0.3710

Table X – (Continued)

NON-LIFE INSURANCE COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Average
GÜVEN	0.9491	0.5150	0.8401	0.0499	0.1089	0.2115	0.4458
HDI					0.4959	0.1819	0.4259*
HÜR	0.5508	0.5765	0.3824	0.3269	0.0217	0.2308	0.3482
IŞIK	0.2767	0.2901	0.2308	0.2036	0.3285	0.3339	0.2773
İHLAS	0.3646	0.4227	0.2394	0.8508			
İSVİÇRE	0.6048	0.4840	0.1045	0.2404			
KAPİTAL	0.1045						0.1045
KOÇ ALLIANZ	0.4156	0.5076	0.3636	0.0858	0.2002		
LIBERTY					0.5945	-0.149	0.2717*
MAGDEBURGER	-0.537	0.3910	1.4226	-0.0814	-0.775	3.4797	0.6500
MAPFRE GENEL						0.3246	0.3344*
MERKEZ	-0.4507	-0.4192	-0.0491	-0.0485	0.1277	-0.0249	-0.1441
RAY	0.6885	0.3266	0.2458	0.2365	0.0935	0.3414	0.3220
RUMELİ	-0.3688	-0.3048	0.8376	0.0191	-0.643	-0.5509	-0.1684
SANKO	-0.5190						-0.5190
SBN						6.4269	1.4529*
ŞEKER	0.4701	0.1102	0.0050	0.5990			
TEB	0.9345	0.3364	0.4962	0.5733	0.6638		
TİCARET	-0.1466	0.1316	-0.3345	-0.6631	3.3033		
T. GENEL	0.4349	0.4857	0.3226	0.3996	0.0389	0.4349	
T. NİPPON	-0.2409	-0.1329	0.1568	-0.9935	55,368	0.3112	-0.1799
TOPRAK	0.7138	-0.0533	0.0154	-0.0262	0.1099		
YAPI KREDİ	0.3733	0.3656	0.2188	0.3206	0.1479	0.0952	0.2536
ZURICH						0.3437	0.5580*
Av. All Non-Life Ins. Companies	0.3898	0.4177	0.2542	0.1791	0.2316	0.7677	0.3734
Av. of Big Non-Life Ins. Companies	0.4319	0.4515	0.2856	0.2542	0.2576	0.3068	0.3312
Av. of the Rest (excluding the Big Ones)	0.3825	0.4114	0.2481	0.1647	0.2265	0.9100	0.3905

*The growth rates of the firms are calculated by using the data of the firms which have been previously taken over and/or merged with and the averages over seven years calculated accordingly. The averages are stated in the row of the company which has been currently operating. To illustrate, large shares of Koç Allianz are taken over by Allianz and the company operates under this name after 2007. Thus between 2007 and 2008 the growth rate of the Allianz has been calculated by using the data of Koç Allianz and the average of the seven years are presented in the row that belongs to Allianz. See 4.1.1 for further information about firms

Table XI – Liquid Assets to Total Assets Ratio of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ACIBADEM SAĞLIK H.			0.4843	0.4896	0.6257	0.6176	0.6314	0.5697
AEGON EMEKLİLİK							0.3878	0.3878
AIG HAYAT						0.9275	0.9294	0.9285
AKHAYAT	0.9181	0.8643	0.6682	0.3514	0.6168			0.6838
ALLIANZ EMEKLİLİK							0.6503	0.6503
AMERICAN LIFE HAYAT	0.9583	0.9624	0.9438	0.9258	0.9308			0.9442
ANADOLU HAYAT	0.8806	0.9003	0.8882	0.8334	0.7038	0.6295	0.5954	0.7759
ANKARA HAYAT	0.8231	0.7047	0.7382	0.8872	0.4766	0.3604		0.6650
AVIVA EMEKLİLİK			0.7761	0.7329	0.5457	0.3117	0.2636	0.5260
AXA OYAK HAYAT	0.8730	0.7966	0.8345	0.9143	0.9187	0.9191	0.9254	0.8831
BAŞAK HAYAT	0.7184	0.8237	0.8675	0.6916	0.6428	0.5753	0.5105	0.6900
BAYINDIR HAYAT	0.5138	0.6009						0.5573
BİRLİK HAYAT	0.9651	0.6916	0.7560	0.9877	0.9873	0.9827	0.9536	0.9034
CARDIF HAYAT							0.4877	0.4877
CIV HAYAT							0.9269	0.9269
COMMERCIAL UNION HAYAT	0.7778	0.8010						0.7894
DEMİR HAYAT	0.6132	0.6211	0.7450	0.8220	0.7946	0.8094	0.7774	0.7404
DENİZ EMEKLİLİK						0.9344	0.9076	0.9210
DOĞAN HAYAT	0.8379	0.8604	0.6570					0.7851
EMEK HAYAT	0.7513	0.7676	0.7890					0.7693

Table XI – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ERGOİSVİÇRE HAYAT					0.7956	0.7751	0.8048	0.7919
FINANS EMEKLİLİK						0.7497	0.6900	0.7198
FORTIS EMEKLİLİK				0.4555	0.3454	0.2627	0.2231	0.3217
GARANTİ HAYAT	0.7643	0.7346	0.5322	0.3664	0.2897	0.2356	0.2111	0.4477
GENEL YAŞAM	0.8934	0.6327	0.5572	0.5212	0.5488	0.4610		0.6024
GLOBAL HAYAT			0.9776	0.9261	0.8887			0.9308
GÜNEŞ HAYAT	0.8999							0.8999
GÜVEN HAYAT	0.9389	0.9222	0.7823	0.7512	0.7610	0.8262	0.7475	0.8185
ING EMEKLİLİK							0.0927	0.0927
İHLAS HAYAT	0.4750							0.4750
İSVİÇRE HAYAT	0.7791	0.7117	0.6546	0.7107				0.7140
KOÇ ALLIANZ HAYAT	0.7660	0.8109	0.8493	0.8417	0.7517	0.7009		0.7868
MAPFRE GENEL YASAM							0.4557	0.4557
NEW LIFE						0.6782	0.6543	0.6663
OYAK EMEKLİLİK		0.5988	0.2626	0.1195	0.1059	0.0962		0.2366
RUMELİ HAYAT	0.9750	0.9933	0.9968	0.9876	0.9721			0.9850
ŞEKER HAYAT	0.6792	0.7778	0.7927					0.7499
TOPRAK HAYAT	0.9228	0.9404						0.9316
VAKIF EMEKLİLİK		0.9324	0.8829	0.7750	0.6043	0.5298	0.4539	0.6964
YAPI KREDİ YAŞAM	0.9438	0.9080	0.8778	0.7361	0.5266	0.4437		0.7393
Av. All Life Ins. & Pension Com.	0.8116	0.7982	0.7528	0.7060	0.6587	0.6266	0.6093	0.7090
Av. of Big Life Ins. & Pen. Com.	0.8536	0.8705	0.8549	0.7838	0.6264	0.5231	0.4728	0.7122
Av. of the Rest (excluding the Big Ones)	0.8000	0.7781	0.7244	0.6817	0.6688	0.6570	0.6452	0.7079

Table XII – Liquidity Ratio of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ACIBADEM SAĞLIK H.			0.9820	1.0205	1.1616	1.5177	1.1882	1.1740
AEGON EMEKLİLİK							3.1189	3.1189
AIG HAYAT						1.0698	7.1484	4.1091
AKHAYAT	5.6454	3.8089	1.4831	1.3196	0.0611			2.4636
ALLIANZ EMEKLİLİK							7.2355	7.2355
AMERICAN LIFE HAYAT	1.6780	1.5788	1.6294	1.0110	1.0328			1.3860
ANADOLU HAYAT	1.4831	1.8550	1.9564	0.9872	0.8220	0.7186	0.6643	1.2124
ANKARA HAYAT	1.7433	2.1431	1.4677	1.2521	0.5338	0.4004		1.2567
AVIVA EMEKLİLİK			2.1320	30.788	20.790	6.8852	6.0033	13.319
AXA OYAK HAYAT	2.3633	2.0151	2.2094	8.5274	6.6132	5.7233	6.5532	4.8579
BAŞAK HAYAT	1.7688	2.9447	3.2076	4.6630	3.5740	2.4186	2.1291	2.9580
BAYINDIR HAYAT	1.0105	1.2570						1.1337
BİRLİK HAYAT	5.3126	2.3640	2.5536	4.2907	5.5108	5.2432	5.0259	4.3287
CARDİF HAYAT							0.8207	0.8207
CIV HAYAT							9.0940	9.0940
COMMERCIAL UNION HAYAT	14.722	21.116						17.919
DEMİR HAYAT	1.7010	1.6348	2.2666	1.2327	4.2560	3.5174	2.4993	2.4440
DENİZ EMEKLİLİK						4.5120	4.2672	4.3896
DOĞAN HAYAT	4.7010	8.1775	1.7217					4.8667
EMEK HAYAT	1.5588	1.4084	1.3891					1.4521

Table XII – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ERGOİSVİÇRE HAYAT					5.3116	4.0042	7.0755	5.4638
FINANS EMEKLİLİK						3.9742	1.2390	2.6066
FORTIS EMEKLİLİK				5.7957	3.5339	2.8840	2.4470	3.6651
GARANTİ HAYAT	3.8259	3.3758	0.9665	0.5146	0.3926	0.2971	0.2601	1.3761
GENEL YAŞAM	4.1086	2.7673	2.0186	2.8287	3.2768	1.8438		2.8073
GLOBAL HAYAT			4.0735	1.6041	1.2542			2.3106
GÜNEŞ HAYAT	1.5000							1.5000
GÜVEN HAYAT	1.9071	2.0873	1.7134	0.9206	2.1421	2.5242	1.6233	1.8454
ING EMEKLİLİK							2.4856	2.4856
İHLAS HAYAT	1.4111							1.4111
İSVİÇRE HAYAT	2.9853	3.0711	3.1437	4.3188				3.3797
KOÇ ALLIANZ HAYAT	2.9035	3.4897	5.5238	22.2445	8.6224	7.0888		8.3121
MAPFRE GENEL YASAM							1.9182	1.9182
NEW LIFE						3.8812	1.7325	2.8068
OYAK EMEKLİLİK		3.6012	0.3790	2.4495	2.4582	3.0347		2.3845
RUMELİ HAYAT	2.2095	1.6287	1.6252	1.1409	1.0088			1.5226
ŞEKER HAYAT	2.0530	1.8472	1.1092					1.6698
TOPRAK HAYAT	3.7734	3.9239	0.0000					2.5658
VAKIF EMEKLİLİK		3.7320		0.8772	0.6943	5.2553	4.8172	3.0752
YAPI KREDİ YAŞAM	2.2241	0.8554	1.8541	1.7730	1.1151	0.7929		1.4358
Av. All Life Ins. & Pension Com.	3.1561	3.5079	1.9742	4.7410	3.5317	3.1572	3.4931	3.3659
Av. of Big Life Ins. & Pen. Com.	4.5665	6.2096	2.6090	11.3341	6.4088	4.1565	3.8781	5.5935
Av. of the Rest (excluding the Big Ones)	2.7643	2.7575	1.7863	2.6806	2.6326	3.1574	3.4090	2.7411

Table XIII – Current Ratio of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Avera ge
ACIBADEM SAĞLIK H.				0.2128	0.0434	0.1673	0.4958	1.7903
AEGON EMEKLİLİK								3.3007
AIG HAYAT							-0.825	4.3842
AKHAYAT	6.0548	1.3383	2.4639	0.3100	-0.607			3.4717
ALLIANZ EMEKLİLİK								7.3656
AMERICAN LIFE HAYAT	1.7303	0.3761	0.1973	0.8304	0.1424			1.4512
ANADOLU HAYAT								1.4247
ANKARA HAYAT	1.7966	0.6686	1.6045	0.3134	1.1080	0.2206		1.5830
AVIVA EMEKLİLİK								14.747
AXA OYAK HAYAT	2.6096	0.4182	0.1594	-	0.4039	0.2045	0.0232	5.2723
BAŞAK HAYAT	2.1386	-	0.9907	-	0.8511	0.6543	0.2961	3.1045
BAYINDIR HAYAT	1.7112	-	0.0038					1.7549
BİRLİK HAYAT	5.4475	1.9967	0.1581	0.0718	0.4210	0.5255	0.5106	4.6629
CARDIF HAYAT								1.6827
CIV HAYAT								9.4076
COMMERCIAL UNION HAYAT								19.381
DEMİR HAYAT	2.2755	0.0837	0.0976	1.3081	-0.655	0.2585	0.7086	2.9952
DENİZ EMEKLİLİK							1.2686	4.6619
DOĞAN HAYAT	5.4234	-	4.1191					5.6773
EMEK HAYAT	1.6520	-	-					1.5380

Table XIII – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ERGOİSVİÇRE HAYAT						0.3079	- 0.3642	6.4771
FINANS EMEKLİLİK							12.647	2.9788
FORTIS EMEKLİLİK					0.9167	0.3421	0.6352	4.1331
GARANTİ HAYAT	4.4639	0.3987	3.7482	2.0691	1.2685			2.1887
GENEL YAŞAM	4.5420	0.5145	0.3097	-0.1463	0.1221	0.6354		4.6265
GLOBAL HAYAT				1.9494	0.3777			2.3654
GÜNEŞ HAYAT								1.5981
GÜVEN HAYAT	1.9246	0.1947	0.4046	2.1709	0.5198	0.0401	0.8810	2.1929
ING EMEKLİLİK								2.7805
İHLAS HAYAT	1.4541							1.4541
İSVİÇRE HAYAT	3.5046	0.1597	0.0230	-0.1051				4.0824
KOÇ ALLIANZ HAYAT								8.6454
MAPFRE GENEL YASAM								4.1844
NEW LIFE							1.3845	3.6579
OYAK EMEKLİLİK			15.481	-0.7748	0.7445	0.1610		3.0492
RUMELİ HAYAT	2.2582	0.8403	0.1001	0.6202	-0.168			1.5434
ŞEKER HAYAT	2.5758	0.0909	1.0347					1.9751
TOPRAK HAYAT	3.8547	0.0859	96.982					3.2299
VAKIF EMEKLİLİK						0.8545		2.9335
YAPI KREDİ YAŞAM							0.3289	2.1391
Av. All Life Ins. & Pension Com.	3.4957	3.9063	2.5037	5.2077	4.3721	3.8181	4.2119	3.9308
Av. of Big Life Ins. & Pen. Com.	4.9965	6.5125	3.1177	11.703	7.5045	4.7539	5.2457	6.2621
Av. of the Rest (excluding the Big Ones)	3.0787	3.1824	2.3744	3.1776	3.3932	3.5257	3.9822	3.2449

Table XIV – Premium Receivables to Total Assets of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ACIBADEM SAĞLIK H.			0.3122	0.3159	0.2178	0.2492	0.2031	0.2596
AEGON EMEKLİLİK							0.0035	0.0035
AIG HAYAT						0.0359	0.0227	0.0293
AKHAYAT	0.0214	0.0111	0.0041	0.0018	0.0015			0.0080
ALLIANZ EMEKLİLİK							0.0032	0.0032
AMERICAN LIFE HAYAT	0.0261	0.0236	0.0308	0.0430	0.0476			0.0342
ANADOLU HAYAT	0.0514	0.0373	0.0116	0.0076	0.0046	0.0029	0.0025	0.0168
ANKARA HAYAT	0.0250	0.0132	0.0083	0.0070	0.0062	0.0070		0.0111
AVIVA EMEKLİLİK			0.0287	0.0047	0.0045	0.0025	0.0029	0.0086
AXA OYAK HAYAT	0.0502	0.0809	0.0782	0.0539	0.0526	0.0535	0.0364	0.0579
BAŞAK HAYAT	0.1492	0.0425	0.0061	0.0035	0.0012	0.0019	0.0039	0.0298
BAYINDIR HAYAT	0.3304	0.2100						0.2702
BİRLİK HAYAT	0.0019	0.0057	0.0076	0.0058	0.0041	0.0071	0.0147	0.0067
CARDIF HAYAT							0.3702	0.3702
CIV HAYAT							0.0156	0.0156
COMMERCIAL UNION HAYAT	0.0526	0.0387						0.0456
DEMİR HAYAT	0.2014	0.1887	0.1737	0.1068	0.1429	0.1356	0.1468	0.1566
DENİZ EMEKLİLİK						0.0279	0.0243	0.0261
DOĞAN HAYAT	0.0901	0.0264	0.0075					0.0413
EMEK HAYAT	0.0442	0.0416	0.0488					0.0449

Table XIV – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Avera ge
ERGOİSVİÇRE HAYAT					0.0837	0.1312	0.0722	0.0957
FINANS EMEKLİLİK						0.0462	0.1234	0.0848
FORTIS EMEKLİLİK				0.0010	0.0038	0.0055	0.0044	0.0037
GARANTİ HAYAT	0.0811	0.0635	0.0469	0.0330	0.0202	0.0099	0.0164	0.0387
GENEL YAŞAM	0.0120	0.0059	0.0168	0.1626	0.1486	0.2048		0.0918
GLOBAL HAYAT			0.0079	0.0062	0.0153			0.0098
GÜNEŞ HAYAT	0.0142							0.0142
GÜVEN HAYAT	0.0080	0.0077	0.1921	0.2086	0.2061	0.1593	0.1888	0.1387
ING EMEKLİLİK								
İHLAS HAYAT	0.0144							0.0144
İSVİÇRE HAYAT	0.1128	0.1082	0.1683	0.1356				0.1312
KOÇ ALLIANZ HAYAT	0.0645	0.0543	0.0097	0.0040	0.0052	0.0037		0.0235
MAPFRE GENEL YASAM							0.1725	0.1725
NEW LIFE						0.1564	0.1439	0.1502
OYAK EMEKLİLİK		0.0000	0.0071	0.0000	0.0000	0.0000		0.0014
RUMELİ HAYAT	0.0033	0.0005	0.0011	0.0000	0.0000			0.0010
ŞEKER HAYAT	0.0075	0.0088	0.0073					0.0079
TOPRAK HAYAT	0.0199	0.0048						0.0124
VAKIF EMEKLİLİK		0.0116	0.0203	0.0136	0.0217	0.0262	0.0102	0.0173
YAPI KREDİ YAŞAM	0.0078	0.0146	0.0070	0.0060	0.0032	0.0021	0.0012	0.0060
Av. All Life Ins. & Pension Com.	0.0604	0.0435	0.0523	0.0534	0.0472	0.0604	0.0719	0.0556
Av. of Big Life Ins. & Pen. Com.	0.0381	0.0313	0.0154	0.0072	0.0078	0.0075	0.0039	0.0159
Av. of the Rest (excluding the	0.0666	0.0468	0.0625	0.0678	0.0595	0.0770	0.0919	0.0674

Table XV – Agency Receivables to Total Equity Ratio of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ACIBADEM SAĞLIK H.			0.0000	0.000	-0.0065	0.0000	0.0000	-0.0013
AEGON EMEKLİLİK							0.0094	0.0094
AIG HAYAT						0.0039	0.0025	0.0032
AKHAYAT	- 0.0101	- 0.0049	- 0.0051	0.000	-0.0010			-0.0042
ALLIANZ EMEKLİLİK							-0.0005	-0.0005
AMERICAN LIFE HAYAT	0.0000	0.0000	0.0000	0.0128	0.0124			0.0050
ANADOLU HAYAT	0.0005	0.0004	0.0006	0.0003	0.0002	0.0001	0.0001	0.0003
ANKARA HAYAT	0.0023	0.0054	0.0027	0.0000	0.0035	0.0320		0.0077
AVIVA EMEKLİLİK			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AXA OYAK HAYAT	0.0772	0.1049	0.0986	0.0886	0.1766	0.1400	0.1068	0.1133
BAŞAK HAYAT	0.0016	0.0015	0.0011	0.0000	0.0000	0.0000	0.0002	0.0006
BAYINDIR HAYAT	0.0000	0.0000						0.0000
BİRLİK HAYAT	0.0002	0.0010	0.0022	0.0016	0.0010	0.0024	0.0004	0.0013
CARDIF HAYAT							0.0003	0.0003
CIV HAYAT							0.0202	0.0202
COMMERCIAL UNION HAYAT	0.0000	0.0000						0.0000
DEMİR HAYAT	0.0220	0.0000	- 0.0336	0.0000	0.0000	0.0000	0.0000	-0.0017
DENİZ EMEKLİLİK						0.1283	0.0458	0.0870
DOĞAN HAYAT	0.0054	0.0023	- 0.0306					-0.0076
EMEK HAYAT	0.0000	0.0000	0.0000					0.0000

Table XV – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ERGOİSVİÇRE HAYAT					0.0315	0.0615	0.2539	0.1157
FINANS EMEKLİLİK						0.0000	0.0000	0.0000
FORTIS EMEKLİLİK				0.0000	0.0000	0.0000	0.0000	0.0000
GARANTİ HAYAT	0.0267	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0038
GENEL YAŞAM	- 0.0060	0.0115	0.0035	0.0000	0.0000	0.0000		0.0015
GLOBAL HAYAT			0.0000	0.0028	0.0268			0.0099
GÜNEŞ HAYAT	0.0000							0.0000
GÜVEN HAYAT	0.0035	0.0157	0.6338	1.0935	1.1130	0.6546	1.3681	0.6975
ING EMEKLİLİK							0.0000	0.0000
İHLAS HAYAT	0.0000							0.0000
İSVİÇRE HAYAT	0.0011	0.0035	0.0130	0.1227				0.0351
KOÇ ALLIANZ HAYAT	0.0001	0.0000	0.0001	- 0.0001	0.0001	- 0.0003		0.0000
MAPFRE GENEL YASAM							0.0000	0.0000
NEW LIFE						0.0002	0.0000	0.0001
OYAK EMEKLİLİK		0.0000	0.0231	0.0000	0.0000	0.0000		0.0046
RUMELİ HAYAT	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000
ŞEKER HAYAT	0.0038	0.0000	0.0000					0.0013
TOPRAK HAYAT	0.0000	0.0000						0.0000
VAKIF EMEKLİLİK		0.0000	0.0000	0.0000	0.0077	0.0022	0.0002	0.0017
YAPI KREDİ YAŞAM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Av. All Life Ins. & Pension Com.	0.0056	0.0061	0.0308	0.0630	0.0650	0.0488	0.0822	0.0430
Av. of Big Life Ins. & Pen. Com.	0.0001	0.0001	0.0001	0.0000	0.0016	0.0004	0.0000	0.0004
Av. of the Rest (excluding the Big Ones)	0.0071	0.0078	0.0394	0.0826	0.0848	0.0639	0.1004	0.0552

Table XVI – Total Equity to Total Assets Ratio of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Avera ge
ACIBADEM SAĞLIK H.			0.1279	0.0250	0.2012	0.2397	0.1507	0.0584
AEGON EMEKLİLİK							0.1748	0.1748
AIG HAYAT						0.1330	0.1392	0.1361
AKHAYAT	0.3777	0.3714	0.2226	0.1098	0.4225			0.3008
ALLIANZ EMEKLİLİK							0.1180	0.1180
AMERICAN LIFE HAYAT	0.1363	0.0864	0.1003	0.0842	0.0988			0.1012
ANADOLU HAYAT	0.1194	0.1349	0.1333	0.1540	0.1418	0.1219	0.1029	0.1297
ANKARA HAYAT	0.2423	0.3962	0.2206	0.2914	0.1071	0.0997		0.2262
AVIVA EMEKLİLİK			0.0645	0.0916	0.0692	0.0393	0.0333	0.0596
AXA OYAK HAYAT	0.0770	0.1164	0.1044	0.1231	0.1211	0.1483	0.1708	0.1230
BAŞAK HAYAT	0.3897	0.4776	0.2969	0.2653	0.2051	0.1940	0.1491	0.2826
BAYINDIR HAYAT	0.0658	0.0671						0.0665
BİRLİK HAYAT	0.8000	0.6722	0.6376	0.6405	0.5797	0.5498	0.4460	0.6180
CARDIF HAYAT							0.4039	0.4039
CIV HAYAT							0.7712	0.7712
COMMERCIAL UNION HAYAT	0.1200	0.0740						0.0970
DEMİR HAYAT	0.2657	0.2128	0.2484	0.3332	0.2921	0.2965	0.2752	0.2748
DENİZ EMEKLİLİK						0.1898	0.3990	0.2944
DOĞAN HAYAT	0.2569	0.3684	0.1176					0.2476
EMEK HAYAT	0.0682	0.0718	0.0804					0.0735

Table XVI – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Avera ge
ERGOİSVİÇRE HAYAT					0.2854	0.2140	0.2029	0.2341
FINANS EMEKLİLİK						0.7944	0.4150	0.6047
FORTIS EMEKLİLİK				0.1002	0.0499	0.0467	0.0574	0.0636
GARANTİ HAYAT	0.3904	0.2457	0.0626	0.0815	0.1085	0.1157	0.1279	0.1617
GENEL YAŞAM	0.0995	0.1118	0.1384	0.1401	0.1217	0.1181		0.1216
GLOBAL HAYAT			0.4452	0.3790	0.2484			0.3575
GÜNEŞ HAYAT	0.1553							0.1553
GÜVEN HAYAT	0.3506	0.3530	0.2987	0.1781	0.1673	0.2043	0.1283	0.2401
ING EMEKLİLİK							0.0754	0.0754
İHLAS HAYAT	0.4115							0.4115
İSVİÇRE HAYAT	0.2134	0.2593	0.2011	0.2030				0.2192
KOÇ ALLIANZ HAYAT	0.1198	0.1435	0.1426	0.1330	0.1218	0.1147		0.1292
MAPFRE GENEL YASAM							0.1407	0.1407
NEW LIFE						0.6408	0.1406	0.3907
OYAK EMEKLİLİK		0.8167	0.3072	0.1397	0.0994	0.0858		0.2898
RUMELİ HAYAT	0.2970	0.1515	0.1488	0.1344	0.0363	0.0000	0.0000	0.1097
ŞEKER HAYAT	0.6541	0.5673	0.2756					0.4990
TOPRAK HAYAT	0.5534	0.5734						0.5634
VAKIF EMEKLİLİK		0.1086	0.1275	0.1125	0.1100	0.1102	0.1247	0.1156
YAPI KREDİ YAŞAM	0.1116	0.1312	0.0850	0.0599	0.0441	0.0719		0.0839
Av. All Life Ins. & Pension Com.	0.2729	0.2831	0.1994	0.1776	0.1538	0.2181	0.2001	0.2150
Av. of Big Life Ins. & Pen. Com.	0.1252	0.1184	0.1106	0.1102	0.0974	0.0927	0.1014	0.1080
Av. of the Rest (excluding the Big Ones)	0.3139	0.3288	0.2241	0.1986	0.1714	0.2530	0.2260	0.2451

Table XVII - Working Capital to Total Premium Ratio of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ACIBADEM SAĞLIK H.			0.4048	0.4185	0.2731	0.4847	0.3136	0.3789
AEGON EMEKLİLİK							5.2377	5.2377
AIG HAYAT						0.2550	2.1553	1.2052
AKHAYAT	6.7105	2.0176	1.8873	0.5679				2.7958
ALLIANZ EMEKLİLİK							7.0384	7.0384
AMERICAN LIFE HAYAT	0.9551	0.9176	1.0246	0.1923	0.2017			0.6583
ANADOLU HAYAT	1.3819	1.5800	1.9630	0.5540	0.6124	0.7188	0.9344	1.1064
ANKARA HAYAT	0.7547	1.0940	1.3036	1.1013	0.7858	1.0327		1.0120
AVIVA EMEKLİLİK			1.4140	3.1089	4.0174	7.1986	4.0162	3.9510
AXA OYAK HAYAT	1.2229	0.9310	1.1798	2.3415	2.1827	2.0023	2.7313	1.7988
BAŞAK HAYAT	0.6564	0.9305	1.7236	1.6321	1.3175	1.0488	0.8020	1.1587
BAYINDIR HAYAT	0.2936	0.3966						0.3451
BİRLİK HAYAT	5.5977	2.4749	1.4009	1.4206	1.1354	1.1793	1.1129	2.0459
CARDIF HAYAT							0.9975	0.9975
CIV HAYAT							3.5617	3.5617
COMMERCIAL UNION HAYAT	1.4807	1.7392						1.6100
DEMİR HAYAT	0.6467	0.5389	0.9244	0.5685	1.4352	1.2177	1.1931	0.9321
DENİZ EMEKLİLİK						0.9366	1.0983	1.0174
DOĞAN HAYAT	1.0908	2.2290	1.5359					1.6185
EMEK HAYAT	1.8419	2.2526	3.0196					2.3714

Table XVII – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002	2003	2004	2005	2006	2007	2008	Average
ERGOİSVİÇRE HAYAT					1.2636	1.2732	3.5289	2.0219
FINANS EMEKLİLİK						7.0160	0.4197	3.7179
FORTIS EMEKLİLİK				2.1258	1.5975	2.1989	2.0270	1.9873
GARANTİ HAYAT	1.3239	1.0516	1.0338	1.0082	1.1379	1.4251	1.7591	1.2485
GENEL YAŞAM	3.1231	3.3073	1.9625	1.7866	1.7778	1.2935		2.2085
GLOBALHAYA			2.7988	1.4219	0.7722			1.6643
GÜNEŞ HAYAT	1.9701							1.9701
GÜVEN HAYAT	2.9655	2.3058	1.3873	0.3382	1.1826	1.3483	1.1008	1.5184
ING EMEKLİLİK								
İHLAS HAYAT	1.9493							1.9493
İSVİÇRE	0.8724	0.9421	0.7696	0.8056				0.8474
KOÇ ALLIANZ HAYAT	1.2716	1.2438	1.9143	5.3822	5.2642	6.0285		3.5174
MAPFRE GENEL YASAM							1.4901	1.4901
NEW LIFE						1.6200	0.7339	1.1770
OYAK EMEKLİLİK								
RUMELİ	2.6710	2.0505	3.0350	1.1833	0.2802			1.8440
ŞEKER HAYAT								
TOPRAKHAYAT	3.9064	6.1060						5.0062
VAKIF EMEKLİLİK		0.7248		0.5505	0.6759	4.1563	5.2572	2.2729
YAPI KREDİ YAŞAM	2.5055	5.4047	3.0189	4.3093	5.0058	5.8013	5.8918	4.5625
Av. All Life Ins. & Pension Com.	2.0542	1.9161	1.6851	1.5409	1.6273	2.4118	2.4273	1.9518
Av. of Big Life Ins. & Pen. Com.	1.7220	2.1385	2.0776	2.7810	3.1151	4.7807	4.6276	3.0346
Av. of the Rest (excluding the Big Ones)	2.1519	1.8466	1.5870	1.1275	1.0959	1.6221	1.7802	1.6016

Table XVIII – Growth of Total Assets of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Average
ACIBADEM SAĞLIK H.			0.2467	-0.0707	0.5450	0.1455	0.2166
AEGON EMEKLİLİK						0,2216	0,5227*
AIG HAYAT					0,1874	0.1703	0,2042*
AKHAYAT	0.6758	0.7447	1.2163	-0.9896			0.4118
ALLIANZ EMEKLİLİK						0,1851	0,2442*
AMERICAN LIFE HAYAT	0.2891	0.2601	0.1577	0.1608			
ANADOLU HAYAT	0.4425	0.1440	0.2105	0.1181	0.2458	0.2035	0.2274
ANKARA HAYAT	1.3961	0.7027	-0.0677	0.6729	0.2105		
AVIVA EMEKLİLİK			0,4727	0,2676	1,1020	0,2004	0,5151*
AXA OYAK HAYAT	0.3253	0.2135	0.2949	0.0836	0.0419	0.1637	0.1871
BAŞAK HAYAT	0.4205	1.0590	0.5100	0.5264	0.2508	0.2858	0.5088
BAYINDIR HAYAT	0.0597						0.0597
BİRLİK HAYAT	0.8606	0.1445	0.1937	0.8258	0.4583	0.4921	0.4958
CARDIF HAYAT							
CIV HAYAT							
COMMERCIAL UNION HAYAT	0.5527	0.4953					
DEMİR HAYAT	0.0282	0.2688	0.1377	0.2293	0.0212	0.2640	0.1582
DENİZ EMEKLİLİK						1.2089	1.2089
DOĞAN HAYAT	0.5465	0.4114					0.4790
EMEK HAYAT	-0.1305	-0.1075					-0.1190

Table XVIII – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	Average
ERGOİSVİÇRE HAYAT					0.0121	0.0819	0.1877*
FINANS EMEKLİLİK						3.6229	3.6229
FORTIS EMEKLİLİK				0.5413	0.4398	0.6337	0.5383
GARANTİ HAYAT	0.2839	0.8764	1.3737	1.1890	0.7246	0.5521	0.8333
GENEL YAŞAM	0.4404	0.0848	0.2791	0.2343	0.0955		
GLOBAL HAYAT			0.2260	0.1226			
GÜNEŞ HAYAT	2.6038						
GÜVEN HAYAT	0.3312	0.3593	0.7743	0.1029	0.1289	0.3369	0.3389
ING EMEKLİLİK						0.2635	1.3940*
İHLAS HAYAT	1.3961						
İSVİÇRE HAYAT	0.3060	0.1386	0.1324	0.4552			
KOÇ ALLIANZ HAYAT	0.5155	0.1760	0.2315	0.1666	0.1905		
MAPFRE GENEL YASAM						0.2774	0.2352*
NEW LIFE						0.1032	0.1032
OYAK EMEKLİLİK		2.9559	2.1970	0.9771	0.5765		
RUMELİ HAYAT	0.3316	0.0939	0.1480	-0.2531	-0.1834	-0.3539	-0.0362
ŞEKER HAYAT	- 0.1429	0.1988					
TOPRAK HAYAT	0.1080						
VAKIF EMEKLİLİK		- 0.4435	0.3661	0.3035	0.2560	0.1907	0.5461*
YAPI KREDİ YAŞAM	- 0.4852	1.9416	0.2802	0.2340	0.2079	0.2438	0.4037
Av. All Life Ins. & Pension Com.	0.4434	0.4910	0.4600	0.2787	0.2803	0.4689	0.4696
Av. of Big Life Ins. & Pen. Com.	0.7259	0.4627	0.3122	0.2180	0.4004	0.2047	0.3873
Av. of the Rest (excluding the Big)	0.3650	0.4994	0.5062	0.2966	0.2403	0.5515	0.4861
*The growth rates of the firms are calculated by using the data of the firms which have been previously taken over and/or merged with and the averages over seven years calculated accordingly. The averages are stated in the row of the company which has been currently operating. To illustrate, Mapfre Genel yaşam took over Genel Yaşam in 2007. Thus between 2007 and 2008 the growth rate of the Mapfre Genel Yaşam is calculated by using the data of Genel Yaşam and the average of the seven years are presented in the row that belongs to Mapfre Genel Yaşam. See 4.1.1 for further information about firms							

Table XIX – Growth of Liquid Assets of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	Average
ACIBADEM SAĞLIK H.			0.2603	0.1876	0.5251	0.1711	0.2861
AEGON EMEKLİLİK						0.3143	0.3473*
AIG HAYAT						0.1726	0.1981*
AKHAYAT	0.5776	0.3488	0.1656	-0.9818			0.0276
ALLIANZ EMEKLİLİK						0.0995	0.2180*
AMERICAN LIFE HAYAT	0.2947	0.2357	0.1357	0.1671			
ANADOLU HAYAT	0.4748	0.1287	0.1358	-0.0557	0.1142	0.1383	0.1560
ANKARA HAYAT		0.7837	0.1205	-0.1013	-0.0846		
AVIVA EMEKLİLİK			0.3907	-0.0562	0.2007	0.0153	0.2664*
AXA OYAK HAYAT	0.2092	0.2712	0.4188	0.0887	0.0424	0.1716	0.2003
BAŞAK HAYAT	0.6288	1.1685	0.2038	0.4188	0.1195	0.1409	0.4467
BAYINDIR HAYAT	0.2393						0.2393
BİRLİK HAYAT	0.3335	0.2510	0.5595	0.8251	0.4514	0.4479	0.4781
CARDIF HAYAT							
CIV HAYAT							
COMMERCIAL UNION HAYAT	0.5990	0.4488					
DEMİR HAYAT	0.0415	0.5218	0.2552	0.1884	0.0401	0.2140	0.2102
DENİZ EMEKLİLİK						1.1455	1.1455
DOĞAN HAYAT	0.5880	0.0778					0.3329
EMEK HAYAT	-0.1117	-0.0826					-0.0971

Table XIX – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	Average
ERGOİSVİÇRE HAYAT					- 0.0140	0.1235	0.2014*
FINANS EMEKLİLİK						3.2547	3.2547
FORTIS EMEKLİLİK				0.1687	0.0953	0.3874	0.2171
GARANTİ HAYAT	0.2341	0.3594	0.6341	0.7308	0.4024	0.3911	0.4587
GENEL YAŞAM	0.0201	- 0.0447	0.1963	0.2998	- 0.0798		
GLOBAL HAYAT			0.1614	0.0772			0.1193
GÜNEŞ HAYAT							
GÜVEN HAYAT	0.3076	0.1530	0.7037	0.1174	0.2256	0.2096	0.2862
ING EMEKLİLİK						0.2171	0.5183*
İHLAS HAYAT	1.0513						
İSVİÇRE HAYAT	0.1930	0.0472	0.2295	0.6292			
KOÇ ALLIANZ HAYAT	0.6043	0.2316	0.2205	0.0419	0.1101		
MAPFRE GENEL YAŞAM							
NEW LIFE						0.0644	0.0644
OYAK EMEKLİLİK		0.7348	0.4555	0.7508	0.4333		
RUMELİ HAYAT	0.3566	0.0977	0.1374	-0.265			
ŞEKER HAYAT	- 0.0185	0.2218					
TOPRAK HAYAT	0.1292						0.1292
VAKIF EMEKLİLİK		-0.473	0.1990	0.0165	0.1013	0.0201	0.4329*
YAPI KREDİ YAŞAM	-0.504	1.8438	0.0735	-0.117	0.0176	0.1235	0.2394
Av. All Life Ins. & Pension Com.	0.3914	0.3309	0.2787	0.1560	0.1476	0.3794	0.3593
Av. of Big Life Ins. & Pen. Com.	0.7815	0.4360	0.2039	-0.034	0.1088	0.0793	0.2625
Av. of the Rest (excluding the Big Ones)	0.2830	0.3000	0.3021	0.2119	0.1614	0.4677	0.3786
*The growth rates of the firms are calculated by using the data of the firms which have been previously taken over and/or merged with and the averages over seven years calculated accordingly. The averages are stated in the row of the company which has been currently operating. To illustrate, Mapfre Genel yaşam took over Genel Yaşam in 2007. Thus between 2007 and 2008 the growth rate of the Mapfre Genel Yaşam is calculated by using the data of Genel Yaşam and the average of the seven years are presented in the row that belongs to Mapfre Genel Yaşam. See 4.1.1 for further information about firms							

Table XX– Growth of Current Liabilities of Life Insurance & Pension Companies

LIFE INSURANCE & PENSION COMPANIES	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	Average
ACIBADEM SAĞLIK H.			0.2128	0.0434	0.1673	0.4958	0.2298
AEGON EMEKLİLİK						-0.8313	0.5140*
AIG HAYAT						-0.8245	0.1440*
AKHAYAT	1.3383	2.4639	0.3100	-0.607			0.8762
ALLIANZ EMEKLİLİK						0.0772	0.2552*
AMERICAN LIFE HAYAT	0.3761	0.1973	0.8304	0.1424	0.1423		
ANADOLU HAYAT	0.8806	0.9003	0.8882	0.8334	0.7038	0.6295	0.7759
ANKARA HAYAT		1.6045	0.3134	1.1080	0.2206		
AVIVA EMEKLİLİK			0.7761	0.7329	0.5457	0.3117	0.5260*
AXA OYAK HAYAT	0.4182	0.1594	-0.632	0.4039	0.2045	0.0232	0.0961
BAŞAK HAYAT	-0.0216	0.9907	-0.1720	0.8511	0.6543	0.2961	0.4331
BAYINDIR HAYAT	-0.0038						-0.0038
BİRLİK HAYAT	1.9967	0.1581	-0.0718	0.4210	0.5255	0.5106	0.5900
CARDIF HAYAT							
CIV HAYAT							
COMMERCIAL UNION HAYAT	0.1149	13.3493					
DEMİR HAYAT	0.0837	0.0976	1.3081	-0.656	0.2585	0.7086	0.3001
DENİZ EMEKLİLİK						1.2686	1.2686
DOĞAN HAYAT	-0.0871	4.1191					2.0160
EMEK HAYAT	-0.0168	-0.0699					-0.0433

Table XX – (Continued)

LIFE INSURANCE & PENSION COMPANIES	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	Average
ERGOİSVİÇRE HAYAT					0.3079	-0.364	0.0577*
FINANS EMEKLİLİK						12.647	12.6476
FORTIS EMEKLİLİK				0.9167	0.3421	0.6352	0.6313
GARANTİ HAYAT	0.3987	3.7482	2.0691	1.2685	0.8531	0.5892	1.4878
GENEL YAŞAM	0.5145	0.3097	-0.146	0.1221	0.6354		
GLOBAL HAYAT			1.9494	0.3777			1.1636
GÜNEŞ HAYAT	0.5007						
GÜVEN HAYAT	0.1947	0.4046	2.1709	-0.519	0.0401	0.8810	0.5286
ING EMEKLİLİK						0.4860	0.1542*
İHLAS HAYAT	0.6686						
İSVİÇRE HAYAT	0.1597	0.0230	-0.105	0.3247			
KOÇ ALLIANZ HAYAT	0.3348	-0.222	-0.697	1.6879	0.3502		
MAPFRE GENEL YAŞAM						0.2136	0.2748*
NEW LIFE						1.3845	1.3845
OYAK EMEKLİLİK		-0.775	0.7445	0.1610			
RUMELİ HAYAT	0.8403	0.1001	0.6202	-0.169			0.3480
ŞEKER HAYAT	0.0909	1.0347					0.5628
TOPRAK HAYAT	0.0859	-0.167					
VAKIF EMEKLİLİK		0.2677	1.1208	0.2841	-0.855	0.1128	0.2386*
YAPI KREDİ YAŞAM	0.2877	0.3120	0.1227	0.4038	0.4310	0.3289	0.3143
Av. All Life Ins. & Pension Com.	0.3899	0.7577	0.4109	0.3546	0.4197	0.3194	0.5140
Av. of Big Life Ins. & Pen. Com.	0.2834	0.1070	0.1787	0.5815	0.5654	0.1830	0.3289
Av. of the Rest (excluding the Big Ones)	0.4195	0.9108	0.4835	0.2879	0.3677	0.3648	0.5525

*The growth rates of the firms are calculated by using the data of the firms which have been previously taken over and/or merged with and the averages over seven years calculated accordingly. The averages are stated in the row of the company which has been currently operating. To illustrate, Mapfre Genel Yaşam took over Genel Yaşam in 2007. Thus between 2007 and 2008 the growth rate of the Mapfre Genel Yaşam is calculated by using the data of Genel Yaşam and the average of the seven years are presented in the row that belongs to Mapfre Genel Yaşam. See 4.1.1 for further information about firms

APPENDIX D

RESULTS OF REGRESSION ANALYSIS

TABLE 1. Result of Regression Analysis when AVGP is used as proxy for investment opportunities Dependent variable :Liquid Assets to Total Assets							
Variables	OLS * Coeff. (P-value)	PeriodFE Coeff. (P-value)	PeriodRE Coeff. (P-value)	CrossFE Coeff. (P-value)	CrossRE Coeff. (P-value)	FE Coeff. (P-value)	RE Coeff. (P-value)
CONS	0,5662 (0,0044)	0,6595 (0,0000)	0,6467 (0,0001)	0,5403 (0,4939)	0,5662 (0,0088)	0,9113 (0,1126)	0,6434 (0,0001)
SIZE	-0,0114 (0,3518)	-0,0240 (0,0224)	-0,0226 (0,0279)	-0,0028 (0,9645)	-0,0114 (0,4332)	-0,0460 (0,3271)	-0,0225 (0,0296)
ROA	-0,5653 (0,0001)	0,0095 (0,9424)	-0,0275 (0,8347)	-0,7457 (0,0332)	-0,5653 (0,0116)	-0,0055 (0,9797)	-0,0294 (0,8255)
REAS	-0,3444 (0,0002)	-0,2690 (0,0003)	-0,2760 (0,0002)	-0,2629 (0,4185)	-0,3444 (0,0126)	-0,0946 (0,5001)	-0,2677 (0,0003)
LEVER	0,0871 (0,3518)	0,0649 (0,3742)	0,0673 (0,3498)	-0,0348 (0,8919)	0,0871 (0,3125)	0,0126 (0,9333)	0,0664 (0,3579)
COMBN	-0,0423 (0,0058)	-0,0238 (0,0229)	-0,0251 (0,0201)	-0,0384 (0,1019)	-0,0423 (0,0478)	-0,0227 (0,0090)	-0,0253 (0,0192)
AVGP	0,0663 (0,0100)	0,0594 (0,0029)	0,0603 (0,0021)		0,0663 (0,0112)		0,0604 (0,0021)
TRADED	-0,0281 (0,3962)	-0,0113 (0,6571)	-0,0129 (0,6046)		-0,0281 (0,1577)		-0,0131 (0,6000)
R ²	0,2520	0,6299	0,2380	0,3327	0,2520	0,6886	0,2084
R ² -adj	0,2206	0,6000	0,2061	0,1993	0,2206	0,5930	0,1752
F-stat	8,0395	21,083	7,4536	2,4939	8,0395	7,2028	6,2813
P vlaue	0,0000	0,0000	0,0000	0,0001	0,0000	0,0000	0,0000
Durbin watson	2,4387	1,7366	1,7848	2,6677	2,4387	1,9805	1,8377
Hausman Statistic			χ^2 (13.05) (0.0422)		χ^2 (12.97) (0.0236)		χ^2 (47.57) (0.0000)

Table 2. Result of Regression Analysis when AVGA is used as proxy for investment opportunities Dependent variable :Liquid Assets to Total Assets					
VARIABLES	OLS ^a Coefficient (P-value)	PeriodFE Coefficient (P-value)	PeriodRE Coefficient (P-value)	CrossRE Coefficient (P-value)	RE Coefficient (P-value)
CONS	0.7296 (0,0001)	0.8612 (0,0000)	0,8499 (0,0000)	0.7295 (0,0001)	0,8516 (0,0001)
SIZE	-0.0232 (0.0419)	-0.0364 (0.0009)	-0,0353 (0,0002)	-0.0232 (0.0426)	-0,0355 (0,0019)
ROA	-0.6647 (0,0000)	-0.0482 (0.7361)	-0,0818 (0,5248)	-0.6646 (0,0000)	-0,0765 (0,6190)
REAS	-0.3817 (0.0000)	-0.2912 (0.0003)	-0,2981 (0,0000)	-0.3816 (0.0000)	-0,2970 (0,0000)
LEVER	0,0034 (0.9681)	-0,0266 (0.7140)	0,0249 (0,6902)	0,0034 (0.9682)	0,0252 (0,7311)
COMBN	-0.0325 (0,0279)	-0.0134 (0,1510)	-0,0144 (0,1907)	-0.0325 (0,0284)	-0,0143 (0,0546)
AVGA	0.1914 (0,0720)	0.0929 (0.2997)	0,0988 (0,2088)	0.1914 (0,0730)	0,0979 (0,2570)
TRADED	-0.0328 (0,3267)	-0.0164 (0.5652)	-0,0178 (0,4716)	-0.0327 (0,3283)	-0,0176 (0,3771)
R ²	0.2366	0,6103	0,1999	0,2366	0,2005
R ² -adj	0.2046	0,5788	0,1663	0,2046	0,1670
F-stat	7.3955	19.3984	5.9596	7.3955	5.9837
P vlaue	0,0000	0,0000	0,0000	0,0000	0,0000
Durbin watson	2.379	1.6806	1,7257	2.379	1,8377
Hausman Statistic				χ^2 (8.54) (0.1288)	

LIQ= Cash and Cash Equivalents plus Marketable Securities to total asset, SIZE=natural logarithm of total asset, ROA= operating earnings to total assets, REAS=reinsurance ceded to total net written premiums, LEVER= total liabilities to total assets, COMBN= sum of expense and claims ratio, AVGA=average growth of assets, TRADED=dummy variable equal to one if the company being publicly traded and 0 otherwise

^a White heteroscedasticity correction procedure is applied since white test result indicates existence of heteroscedasticity with p value associated with the chi-square χ^2 (7) is 0.0005 suggesting that the null hypothesis of constant error variance is rejected.

Table 3 Result of Regression Analysis when AVGS is used as proxy for investment opportunities Dependent variable :Liquid Assets to Total Assets					
VARIABLES	OLS * Coefficient (P-value)	PeriodFE Coefficient (P-value)	PeriodRE Coefficient (P-value)	CrossRE Coefficient (P-value)	RE Coefficient (P-value)
CONS	0.8235 (0.0000)	0.9041 (0.0000)	0.8964 (0.0000)	0.8235 (0.0004)	0.8974 (0.0000)
SIZE	-0.0244 (0.0339)	-0.0379 (0.0006)	-0.0369 (0.0001)	-0.0244 (0.0731)	-0.0370 (0.0001)
ROA	-0.6292 (0.0000)	-0.0011 (0.9936)	-0.0333 (0.7925)	-0.6292 (0.0057)	-0.0293 (0.8167)
REAS	-0.3654 (0.0001)	-0.2715 (0.0009)	-0.2782 (0.0001)	-0.3654 (0.0126)	-0.2773 (0.0001)
LEVER	0.0271 (0.7467)	-0.0396 (0.5837)	0.0391 (0.5232)	0.0271 (0.7421)	0.0392 (0.5215)
COMBN	-0.0309 (0.0380)	-0.0118 (0.1956)	-0.0127 (0.2476)	-0.0309 (0.1402)	-0.0126 (0.2508)
AVGS	0.0060 (0.7827)	0.0162 (0.3762)	0.0156 (0.3273)	0.0060 (0.7385)	0.0157 (0.3240)
TRADED	-0.0393 (0.2409)	-0.0179 (0.5326)	-0.0195 (0.4311)	-0.0393 (0.0718)	-0.0193 (0.4346)
R ²	0.2220	0.6094	0.1970	0.2220	0.1977
R ² -adj	0.1894	0.5779	0.1634	0.1894	0.1640
F-stat	6.8079	19.3262	5.8555	6.8079	5.8787
P vlaue	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin watson	2.354	1.6857	1.7274	2.354	1.7223
Hausman Statistic			χ^2 (5.18) (0.6380)	χ^2 (10.88) (0.0537)	χ^2 (76.17) (0.0000)

LIQ= Cash and Cash Equivalents plus Marketable Securities to total asset, SIZE=natural logarithm of total asset, ROA= operating earnings to total assets, REAS=reinsurance ceded to total net written premiums, LEVER= total liabilities to total assets, COMBN= sum of expense and claims ratio, AVGS=average growth of surplus, TRADED=dummy variable equal to one if the company being publicly traded and 0 otherwise

^a White heteroscedasticity correction procedure is applied since white test result indicates existence of heteroscedasticity with p value associated with the chi-square χ^2 (7) is 0.0001 suggesting that the null hypothesis of constant error variance is rejected.

Table 4 Result of Regression Analysis when GPREM is used as proxy for investment opportunities
Dependent variable :Liquid Assets to Total Assets

VARIABLES	OLS * Coefficient (P-value)	PeriodFE Coefficient (P-value)	PeriodRE Coefficient (P-value)	CrossFE Coefficient (P-value)	CrossRE Coefficient (P-value)	FE Coefficient (P-value)	RE Coefficient (P-value)
CONS	1,2047 (0,0001)	0,8661 (0,0012)	0,8827 (0,0012)	1,5526 (0,0049)	1,2083 (0,0001)	0,8796 (0,2267)	0,8558 (0,0018)
SIZE	-0,0440 (0,0033)	-0,0362 (0,0085)	-0,0364 (0,0074)	-0,0696 (0,0438)	-0,0442 (0,0040)	-0,0461 (0,3829)	-0,0356 (0,0121)
ROA	-0,5392 (0,0159)	0,1154 (0,6057)	0,0779 (0,7243)	-1,0648 (0,0002)	-0,5602 (0,0125)	-0,1029 (0,7302)	0,0044 (0,9841)
REAS	-0,3646 (0,0004)	-0,3045 (0,0008)	-0,3098 (0,0006)	0,0233 (0,9031)	-0,3565 (0,0007)	0,0206 (0,8940)	-0,2595 (0,0041)
LEVER	-0,0971 (0,3087)	-0,0239 (0,7638)	-0,0282 (0,7206)	-0,2619 (0,1331)	-0,0973 (0,3196)	0,0245 (0,8856)	-0,0060 (0,9393)
COMBN	-0,1124 (0,2855)	0,0520 (0,6030)	0,0427 (0,6656)	-0,1854 (0,2669)	-0,1157 (0,2764)	-0,0007 (0,9957)	0,0280 (0,7807)
GPREM	-0,0558 (0,1876)	-0,0342 (0,3331)	-0,0352 (0,3208)	-0,0450 (0,4682)	-0,0557 (0,1860)	-0,0314 (0,4614)	-0,0356 (0,3101)
TRADED	-0,0356 (0,3255)	-0,0328 (0,3063)	0,0334 (0,2909)		-0,0353 (0,3488)		-0,0321 (0,3317)
R ²	0,2008	0,5732	0,2396	0,3622	0,1939	0,6917	0,1516
R ² -adj	0,1614	0,5358	0,2021	0,2014	0,1542	0,5840	0,1098
F-stat	5,0983	15,335	6,3934	2,2523	4,8818	8,9108	3,6270
P vlaue	0,000034	0,0000	0,000002	0,0011	0,000058	0,0000	0,0012
Durbin watson	2,2531	1,5662	1,6236	2,5674	2,2754	2,0665	1,7727
Hausman Statistic			χ^2 (5.18) (0.6380)		χ^2 (10.79) (0.0949)		χ^2 (76.17) (0.0000)

LIQ= Cash and Cash Equivalents plus Marketable Securities to total asset, SIZE=natural logarithm of total asset, ROA= operating earnings to total assets, REAS=reinsurance ceded to total net written premiums, LEVER= total liabilities to total assets, COMBN= sum of expense and claims ratio, GPREM= the ratio of Total Premiums Received / Total premiums Received_{t-1}, TRADED=dummy variable equal to one if the company being publicly traded and 0 otherwise

^a White heteroscedasticity correction procedure is applied since white test result indicates existence of heteroscedasticity with p value associated with the chi-square χ^2 (7) is 0.0001 suggesting that the null hypothesis of constant error variance is rejected.

Table. 5 Correlation Matrix

TRADED	ROA	SIZE	LEVER	REAS	COMBN	GPREM	AVGS	AVGP	AVGA	LIQ	Variable
-0,1821 0,0257	-0,2361 0,0036	-0,2586 0,0014	0,0348 0,0473	- 0,2298 0,0047	0,2266 0,0053	-0,1183 0,0149	0,0717 0,0384	0,2674 0,0009	0,0717 0,0383	1,0000 -----	LIQ
-0,1000 0,2232	0,1293 0,1148	-0,0825 0,3154	-0,2000 0,0141	0,1466 0,0734	-0,0847 0,3027	0,0770 0,3488	0,2808 0,0005	0,4482 0,0000	1,0000 -----		AVGA
-0,1915 0,0189	-0,1745 0,0327	-0,4077 0,0000	-0,3430 0,0000	0,0218 0,7914	0,4430 0,0000	0,0519 0,5284	0,1155 0,1593	1,0000 -----			AVGP
-0,0039 0,9624	-0,0892 0,2776	0,0183 0,8243	-0,0413 0,6159	- 0,0983 0,2313	-0,0165 0,8410	0,0427 0,6042	1,0000 -----				AVGS
-0,0378 0,6458	0,1744 0,0328	-0,0118 0,8861	-0,0085 0,9181	- 0,0224 0,7853	-0,0983 0,2315	1,0000 -----					GPREM
-0,1034 0,2078	-0,6360 0,0000	-0,4248 0,0000	-0,1994 0,0145	- 0,0976 0,2346	1,0000 -----						COMBN
-0,0221 0,7882	0,0206 0,8020	-0,1411 0,0850	0,0123 0,8808	1,0000 -----							REAS
-0,2566 0,0015	0,0360 0,6617	-0,2801 0,0005	1,0000 -----								LEVER
0,4377 0,0000	0,1188 0,1475	1,0000 -----									SIZE
0,0298 0,7173	1,0000 -----										ROA
1,0000 -----											TRADED

Table 6. Chow Tests for Poolability of Intercept and Slopes			
Poolability of intercept	F-statistic	Critical F value	Decision
Across firm	0.2663	2.25*, 2.29**	DNR
Across time	4.5977	1.73*, 1.48**	Reject
Poolability of slopes	F-statistic	Critical F value	Decision
Across firm	0.0019	2.29*, 1.76**	DNR
Across time	1.1680	1.76*, 1.50**	DNR
<p>Note: The test statistics of poolability of intercepts distributed as $F(144, 25)$ and $F(48,119)$ across firm and time respectively. The test statistics of poolability of slopes distributed as $F(120,25)$ and $F(42,119)$ across firm and time respectively. * and ** represents critical F value with %1, %5 percent significance level respectively. (Gujarati, 2005)</p>			

Table 7. Redundant Fixed Effects Test			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	1,0650	-24,145	0,3908
Cross-section Chi-square	28,4122	24	0,2430
Period F	27,4032	-6,161	0.0000
Period Chi-square	123,1492	6	0.0000

APPENDIX E

POOLABILITY TESTS

1. Poolability across Firms

The F-test described by Baltagi (2005) is used for testing poolability of intercepts and slopes across firms. The F-test is the following:

$$F_{\text{obs}} = \frac{(e'e_1 - e'_1e_1 - e'_2e_2 - \dots - e'_Ne_N)(N-1)K'}{(e'_1e_1 - e'_2e_2 - \dots - e'_Ne_N) / N(T - K')}$$

Under H_0 , F_{obs} is distributed as $F((N-1)K', N(T - K'))$. Hence the critical region for this test is defined as:

$$F_{\text{obs}} > F((N-1)K', N(T - K'); \alpha_0)$$

where K is the number of regressors and $K' = K+1$, N is the number of cross sections and T is the number of years. The restricted sums of squares (RRSS) was obtained from the OLS on the pooled model and the unrestricted residual sums of squares (URSS) was obtained from summing the RSS from 25 individual firm OLS regressions each with only 2 degrees of freedom. In this case, there are $(N-1)K'$ restrictions and the URSS has $N(T - K')$ degrees of freedom. Therefore the critical F value, distributed as $F(144, 25)$, is 2.25 at 1 percent significance level. The test statistic is 0.2663 that is, the test result does not reject the null hypothesis of poolability of intercepts across firms.

To test the stability of the slopes only, the same Chow test is utilized, however the RRSS is now that of the cross sectional fixed effects regression with firm dummies only. The number of restrictions becomes $(N-1)K$ for testing the stability of the slopes across firms. The critical F value is 2.29 at 1 percent significance level and distributed as $F(120, 25)$. The calculated F value is 0.0019

2. Poolability Across Time

The following test statistic described by Baltagi (2005) was applied to test for poolability of intercepts and slopes across time. The F test is the following;

$$F_{\text{obs}} = \frac{(e'e - e_1'e_1 - e_2'e_2 - \dots - e_N'e_N)(T-1)K'}{(e_1'e_1 + e_2'e_2 + \dots + e_N'e_N) / T(N-K')}$$

Under H_0 , F_{obs} is distributed as $F((T-1)K', T(N-K'))$. Hence the critical region for this test is defined as:

$$F_{\text{obs}} > F((T-1)K', TN - TK'; \alpha_0)$$

where α_0 denotes the level of significance of the test, K is the number of regressors, N is the number of cross sections and T is the number of years.

For poolability of intercepts across time the RRSS was again obtained from the OLS on the pooled regression but now the URSS was obtained from summing the RSS of the 7 OLS regression for each period. The critical F value is 1.73 distributed as $F(48,119)$ and the Chow test yields 4.5976. The null of poolability was rejected at the 1 percent level of significance for equation

To test the stability of the slopes only, again Chow test is utilized, however the RRSS is now that of the period fixed effects regression with time dummies only. The number of restrictions becomes $(T-1)K$ for testing the stability of the slopes across time. The critical F value is 1.76 at 1 percent significance level and distributed as $F(42,119)$ and Chow test under the poolability of slopes across time yield F-value of 1.168. Thus, does not reject poolability across time since the critical F value is 1.76 at 1 percent significance level.