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Ownership Structure and Firm Performance: Evidence from the Icelandic Financial Crisis

by

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EXECUTIVE SUMMARY

In this thesis I use a sample of 116 listed and non-listed Icelandic firms to analyze whether ownership structure affects firm value both before and during the Icelandic financial crisis. Although there is some variation in the ownership pattern of Icelandic firms, the majority has a concentrated ownership structure. Accordingly, I am most interested in analyzing whether this ownership concentration improved performance during the crisis due to better alignment of interest between controlling and outside shareholders or if it diminished performance because of minority shareholder expropriation. Related to this main analysis, I also look at what other factors diminish or enhance expropriating behavior, such as cross-ownership and identities of shareholders. My findings show that ownership concentration is negatively related to performance after the crisis hit Iceland in 2008, but positively related to performance before the onset of the crisis. This is evident when I use return on equity (ROE) as a measure of performance.

ACKNOWLEDGEMENTS

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Reykjavík, July 2011
Álfrún Tryggvadóttir

Table Of Contents

1. INTRODUCTION

The interest in corporate governance issues and ownership structure in relation to firm performance has increased steadily throughout the years, especially in light of recent financial crisis and corporate scandals. Ownership structure is an important determination of the degree of agency problem within firms. A well-designed structure can help mitigate agency problems and consequently, contribute to firm value while certain ownership structures increase agency costs and adversely affect firm value. This is especially vital to understand at times of economic turmoil when the main monitoring mechanisms often fail to work. Likewise, it is important for outside investors to know that the governance structure of firms they invest in will both serve their best interests in times of economic stability and instability. Crisis times provide a good period for analyzing the effects of ownership structure on firm performance since investors often ignore inadequate corporate governance practices during an economic boom (Rajan and Zingales, 1998). Also, since financial crisis is usually a very sudden and unpredictable event it is difficult for firms to quickly adjust their governance structures in response to future financial crisis. Accordingly, using crisis period data to analyze the effects of corporate governance practices on firm value allows us to avoid the endogeneity problems that often plague corporate governance researches (Liu *et al*., 2010).

In the corporate governance literature there are different attitudes regarding concentration of ownership and firm value, mostly depending on the financial and legal environment that firms operate within. Some scholars (Berle and Means, 1932; Jensen and Meckling, 1976) show that a more concentrated ownership reduces the conflict of interest between managers and shareholders while others (Anderson and Reeb 2003; Nagar *et al.*, 2008) find that this leads to conflicts of interest between majority and minority shareholders. The ownership structure of Icelandic firms makes the analysis of the effect of ownership concentration noteworthy. The market is characterized by a high concentration of firms and it is also very small, indicating that Icelandic firms rely on internal governance mechanisms to minimize agency conflicts. Another striking feature of the Icelandic environment is the low number of listed firms, and this number has diminished steadily since the economic collapse, probably because firms feel constrained by the lack of liquidity within the market.

The Icelandic financial crisis was a harsh shock to the whole country and to firms within the Icelandic market and is still an ongoing process facing people and firms within the country. During the economic boom in Iceland little attention was paid to governance practices and the general notion was a 'whatever works best to maximize profits' approach. Accordingly, few firms were prepared to handle the economic downfall due to weak internal structures. Iceland is a particularly interesting case to study the effects of internal governance mechanisms, since one of the main reasons for the severity of the crisis appears to be a collection of governance failures, a careless liberalization process and a reckless *laissez fair* attitude of the Icelandic government (Sigurjónsson, 2010).

In this thesis, I focus on one corporate governance mechanism, i.e. ownership structure, and analyze whether a single structure was better for firms both before and during the crisis period. This analysis takes on a multi-facade approach where I take into account different factors, such as identities of different shareholders and cross-ownership.

1.1 The aim of the research

The reason for my interest in this matter is twofold. First and foremost, I think that this topic is one of the most fascinating issues within the finance literature, mainly because how intertwined it is with human nature and human behavior. Secondly, what struck me when I started analyzing the topic is the lack of research done on the matter in Iceland. It has been shown during other financial crisis (e.g. the Asian financial crisis) how important ownership structure is in determining the extent of the severity of crisis. This also caught my attention and further raised my interest in this matter. To my knowledge, this important matter has only been analyzed by Þröstur O. Sigurjónsson (2010), who made a case study of the Icelandic banking collapse with the purpose of examining the crisis in relation to critical governance issues. He found that complex ownership issues of firms, such as cross-ownership and close managerial relationship, played an important role in the severity of the economic downfall in Iceland. Although partly similar to my approach, his method is also quite

different since my goal is to mostly use quantitative methods to see how agency problems and ownership structure affects firm value.

Furthermore, a report made by the Special Investigation Commission, published in April 2010 by a team of specialists with the aim to '*seek the truth relating to the events leading to, and the causes of, the downfall of the Icelandic banks in 2008, and related events',* discussed the role of governance issues in the economic collapse.[1] This report is unquestionably a great historical proof of the events leading up to and causing the crisis. However, much like the work of Sigurjónsson (2010), although partly similar, it is also very different from what I do here. Nevertheless, both works have helped me with vital information on corporate governance issues in Iceland although my goal here is to shed new light on the possible role of agency problems and ownership structure on the Icelandic financial crisis.

Watching the collapse of the Icelandic financial system in the fall of 2008 greatly shaped me as a student of economics. Shortly after the onset of the crisis I took the course 'Corporate Governance and Firm Value' and soon realized that this was a topic that I wanted to focus on in my master's thesis. Consequently, I started reading more about corporate governance practices around the world and especially corporate governance and firm value at times of financial crisis. Most of the articles on this topic have been written about the crisis that hit Asia in the end of the 20th century and, like I mentioned earlier, I saw that this topic was somewhat absent in the discussion of possible reasons for the crisis in Iceland. I was especially interested in the relationship between majority and minority shareholders and the possible governance issues arising between these two parties. Since the prevailing structure in Icelandic firms is a concentrated ownership structure, I found it perfect to analyze whether this concentration of ownership served as a control mechanism or expropriating tool for large shareholder during the financial crisis.

For me, it was also interesting to be the first one (to my knowledge) to take this perspective on corporate governance in analyzing the Icelandic market and hopefully be able to present some interesting results that can tribute to the literature. This will

[1] A commission that focused on analyzing critical factors that influenced the economic collapse in

hopefully shed new light on the necessity for corporate governance reforms in the Icelandic market. In my opinion, it is extremely important to analyze whether weaknesses in corporate governance regulations had anything to do with the crisis since good corporate governance standards are vital if the Icelandic financial world regain the trust of foreign investors.

1.2 Problem definition

The main purpose of this thesis is to understand the effect of ownership structure on performance both before and during the Icelandic financial crisis, and examine the evidence of minority shareholder expropriation. To cover this I have constructed a research question that captures the main purpose of this thesis:

RQ: *Did concentration of ownership in Icelandic firms positively affect firm performance due to better alignments of interests between controlling and outside shareholders, or did it weaken performance due to expropriation of minority shareholders?*

In order to answer this question I start out by going through the financial and legal environment, corporate governance practices and the financial meltdown in Iceland so the reader can get a better idea of how the financial framework in Iceland is and what can possibly have caused the financial meltdown. In order to go into more depth to answer this question I have constructed several testable hypotheses where I shed light on the nature of concentration of ownership in relation to firm value. Those include the effects of shareholder's identities, the influence of cross-ownership, alignment of interest when ownership reaches a certain degree and the contestability of the largest shareholders. All of the aforementioned hypotheses have the purpose of supporting the conclusion of my main research question.

I use two well-known measures to determine company performance; i.e. return on assets (ROA) and return on equity (ROE), and for my analysis I use a sample of large and medium-sized non-listed companies, as well as those Icelandic companies listed on the stock exchange. Due to the high concentration of ownership among Icelandic

companies I use the 50% cutoff when distinguishing between concentrated and dispersed ownership. These methods will be further explained in different parts of the thesis.

1.3 Delimitations of the research

In this thesis I gather information through statistical information and direct research. The financial information for the non-listed firms was obtained from CreditInfo, a leading company in gathering financial and business information on Icelandic firms, and the ownership information I gathered myself through Bureau van Dijk's Orbis database. I also obtained the financial data for the listed firms from both Orbis and financial statements. I focus on firms listed on the Iceland Stock Exchange (approx. 6% of the sample) and the largest non-listed firms with available accounting information. CreditInfo provided me with information on the 200 largest non-listed firms and from that sample I could obtain the necessary ownership information from 112 firms. Since the non-listed firms in the sample are the largest firms *with accounting data available* it means that the sample does not necessarily include the largest firms in Iceland. In fact, part of the sample includes rather small companies with relatively low operating revenues, indicating that my sample could include some outliers. I control for this by removing extreme outliers and running the regression both with the outliers and without them, in order to see if they influence the overall results.

Most similar researches focus on listed firms, which is quite logical since all necessary data is much easier to find on listed firms than on non-listed ones. In Iceland, however, only 12 firms are listed on the stock exchange so this was not possible for me to do.[2] Therefore I had to take the aforementioned approach and focus on the largest firms in the Icelandic market with available data. This caused some drawbacks for my study, many of which were quite difficult to tackle. One of them

[2] Of these 12 companies, four are from the Faroe Islands and one is from the U.S. (Century Aluminum Company) and although they are listed in Iceland I don't think they capture they corporate governance issues I am analyzing in this thesis since they are not Icelandic.

was the smallness of the analyzed companies and consequent lack of data, and due to that I had to use fewer control variables than initially planned.[3]

Another obvious delimitation is how large the field of corporate governance is and consequently I had to focus on a limited area. During this process I wanted to cover a broader area and address all the problems I could identify, but this simply would have been way too broad and not possible considering the given timeframe. Also, it is my opinion that the selected topic is very relevant for the discussion of possible factors that influenced the collapse in Iceland.

Although Orbis is high-quality database containing vital information, it is obvious that such a large database can never be 100% accurate for all the included firms. I make random tests on the numbers used for the listed firms since those were both available in Orbis as well as public financial information, and the numbers were quite accurate. I also make random tests on changes in ownership structure over time since some firms only had ownership information available for 2007 and 2008 and it was clear that the ownership structure does not change significantly over time.

Since my sample is relatively small compared to other studies on this matter it is appropriate to comment on this smallness, especially in regards to robustness. The relative smallness of my sample indicates that it could be harder to find significant relationships from the data and could also mean that my sample happened to include firms of similar features. However, although my sample is small *compared to other studies* it should also be mentioned that Iceland is a much smaller country than most other countries in the world and with a comparatively small financial market. Therefore, a sample of 116 firms should give a rather clear idea of the ownership issues facing Icelandic companies. This is further supported by the fact that I analyze some of the largest firms in Iceland.

Some of the firms in my sample do not have ownership data available for 2009 and I have to use data from 2008 instead. Although there is always a chance that the

[3] My initial plan was to use sales growth as a control variable but this proofed impossible to do since it would have made my sample more than 20% smaller and for this type of research, the sample is small as it is. Consequently I had to disregard sales growth as a control variable.

ownership structure changes over time, quite a few scholars have pointed out that ownership does not in general change much over time and that it's not all that important to have the exact ownership structure on a given time to make valid analysis (e.g. Faccio and Lang, 2002; La Porta *et al.*, 1999).

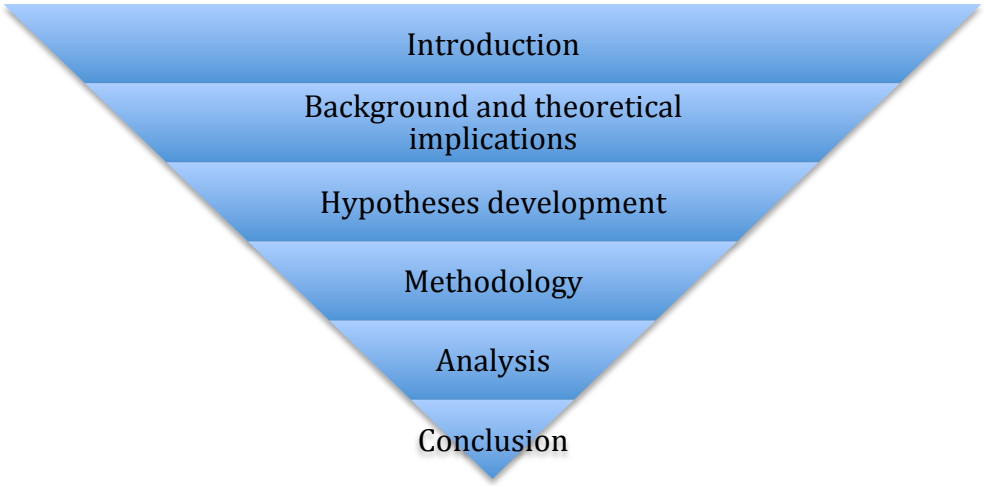
I omit financial companies from my sample since this is something that is the general process for others doing similar research. I simply assume that this omission is beneficial for the analysis and does not create a bias in my results. This will be further discussed in section 4.

Another possible bias is the financial environment in Iceland. In the literature on corporate governance and firm value, there are different conclusions in relation to ownership concentration and firm value depending on the legal environment of countries. La Porta *et al*. (1998) argue that in countries with poor investor protection, ownership becomes a substitute for legal protection since only large shareholders can hope to receive a return on their investment, while in countries where the legal environment is solid, investors are willing to take minority positions (Burkart and Panunzi, 2006). Although Iceland can be considered as having a proper legal environment, La Porta *et al.* (2002) argue that countries with small capital markets generally have low investor protection and a weak capital market. This makes some of the assumptions in this thesis twofold. For my sample I assume that Iceland has a fairly strong investor protection although not as strong as, for example, the other Nordic countries. This is further supported by a publication by Djankov *et al*., (2008) who found that Iceland has a relatively low anti-self-dealing value, at least when compared to the other Nordic countries.

Lastly, it is worth commenting on my setting, i.e. the single-country analysis. Although it might appear as if a single-country focus would make the study weaker, there are some scholars (e.g. Miller, 2004; Leung and Horwitz, 2009) that argue that a single-country setting is more desirable.

1.4 Structure

This thesis is structured in the following way. The next chapter is titled background and has the purpose of introducing to the reader relevant information on the Icelandic legal and financial landscape, as well as the background story to the financial meltdown in Iceland. After the background chapter I will take the reader through relevant theoretical implications related to my hypotheses development and subsequently introduce the six hypotheses I have constructed. This chapter is followed by a more thorough methodological part where I present my data, sample, variables, validity of the data, etc. Then I will continue on to the analysis part where I discuss the results from my model and the testing of the hypotheses. The last two parts of the thesis includes concluding remarks and suggestions for further research.



2. BACKGROUND

The purpose of this chapter is to provide the reader with relevant background information on the Icelandic financial and legal systems. Here I will also describe the most common corporate governance practices and have a short section on what possibly caused the financial meltdown. By doing this, the reader should get a clearer picture of how Iceland went from having an underdeveloped financial market to having a fast-growing global market, and then how this all collapsed in the fall of 2008.

2.1 The history of the Icelandic financial market

Up until World War II, Iceland's economy was highly underdeveloped and the living standards within the country were very low. After the War, however, Iceland's financial climate changed drastically, with high economic growth and improved living standards. The Central Bank of Iceland (CBI) was established in 1961. Although the bank was formally independent, it was required by law to support the economic policy of the government, and up until the 1970s there were no major problems with this system. This however changed after inflation went up following the oil crises in the 1970s, when interest rates were kept relatively low regardless of the accelerating inflation. In the 1980s, the first steps were taken to deregulate interest rates and in 1986, the CBI no longer had the power to regulate interest rates of commercial banks and savings banks, leading to greater competition in financial markets and rising interest rates. This was done in response to the rigorous restrictions of Icelandic financial markets. The financial sector was opened up to international capital and the taxation system underwent a complete renovation, with the Icelandic tax rates being lowered considerably and being amongst the lowest in Europe (Sigurjónsson, 2010).[4] At the same time, in 1985, the Iceland Stock Exchange was established.[5]

In the 1990s Iceland experienced considerable financial growth due to extensive free market reforms and was considered as having one of the highest levels of economic

[4] Although they have gotten higher after the financial crisis

[5] Source: the Central Bank of Iceland (www.sedlabanki.is) and Sigurjonsson (2010).

freedom in the world, although it has dropped down to 44th place in the 2011 ranking.[6] In the beginning of the 21th century the controversial privatization process of the Icelandic banks was finalized. Initially the plan was to have ownership of the banks relatively dispersed, but when the state got an offer to sell the banks with a single owner holding a large stake, they accepted. This has been identified as one of the sources for the severity of the economic crisis that Iceland is facing today.

The privatization of the four formerly state-owned banks initially stimulated strong growth in the financial system. The process was somewhat different from the norm in other countries. Most countries had privatized their institutions with at least some foreign ownership, and although this was initially the plan, the Icelandic government backed away from that decision and let domestic entities gain controlling interests in the banks. The problem with this was that these controlling investors had no prior experience in commercial banking and the privatization process was treated as an isolated procedure when it should have been a part of a progressive process (Sigurjónsson, 2010). According to the Report of the Special Investigation Commission (2010) the Icelandic government, led by Prime Minister Davíð Oddsson, paved the way for ownership structures in the Icelandic financial market when allowing large investors to own considerable amounts in financial firms. Initially, Prime Minister Oddsson was opposed to the idea of a concentrated ownership structure when privatizing the banks but quickly changed his mind when political acquaintances became interested in owning a majority share in Landsbankinn. This political cronyism led to a situation where inexperienced bankers bought a 45% share in Landsbankinn for $140 million, which was not even the highest bidding price. In the beginning of the privatization process, the Icelandic government had created a governmental privatization committee with the task of finding potential foreign buyers. Shortly after that, the leading political parties became actively involved in the privatization process with the aforementioned results. One member resigned from the committee after it had been made known who the buyers were and the price they got, and was quoted saying that he had never experienced as unprofessional methods in a privatization process before.[7]

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[6] Source: http://www.heritage.org/index/country/iceland

[7] Article published in the Icelandic newspaper *Fréttablaðið* on the 12th of September 2002.

In the paper, *'The Icelandic Bank Collapse: Challenges to Governance and Risk Management'*, Sigurjónsson (2010) discusses the role of corporate governance issues in the collapse of the Icelandic banks. According to Sigurjónsson, the lack of critical insight and transparency into core processes because of the laissez-faire attitude prevailing in Icelandic society prevented sufficient public debate to stimulate reasonable criticism of both government and industry. After the liberalization of the financial markets through deregulation and privatization initiated by the government, there was a great change in mentality towards business culture in Iceland, where risk-taking was embraced. Sigurjónsson (2010) argues that governance issues at the firm level were of such a scale that they ultimately facilitated the collapse, and that close managerial relationship, cross-ownership and cross-lending established unfavorable conditions for regulatory authorities, while at the same time temporary favorable circumstances for the business environment. Table 1 in appendix 1, shows the financial evolution in Iceland.

2.2 The legal system in Iceland

Iceland is a civil law country and accordingly, written law characterizes the Icelandic legal system. In civil law, the sources recognized as authoritative are principally legislation, especially codifications in constitutions or statues passed by the government. Civil law systems are different from common law systems in the substantive content of the law, the operative procedures of the law, legal terminology, the way in which authoritative sources of law are recognized, the institutional framework within which the law is applied, and the education and structure of the legal profession. Civil law can be divided into three different genres: *French civil law* (prevails for example in France, Italy, and Spain)*, German civil law* (prevails for example in Germany, Japan, and China) and lastly, *Scandinavian civil law,* existing in the Scandinavian countries of Denmark, Norway and Sweden. Finland and Iceland inherited the system from their neighbors.[8]

According to La Porta *et al.* (1997), the differences in the nature and effectiveness of financial systems in different countries can, to a certain degree, be traced back to the

[8] Source: Britannica (see references for details).

differences in investor protections against expropriation by insiders, as reflected by legal rules and the quality of their enforcement. Moreover, they present evidence showing that the rules protecting investors and the quality of their enforcement differ greatly across countries, and vary systematically by legal origin (e.g. civil law versus common law).

2.3 Corporate governance in Iceland[9]

In Iceland, here has been increased attention on the liability of directors and the status of shareholders in recent years, much of which can be attributed to the creation of a regulated stock market in the mid 1980s. Icelandic company law is governed by two main pieces of legislation: the Act on Public Limited Companies and the Act on Private Limited Companies. The former deals with major limited companies, including those listed on the stock exchange while the latter deals with privately held limited companies not listed on the stock exchange. Both the acts include similar rules about the liability of directors and managers. Although the structure of private companies is allowed to be simpler, the management structure of both limited and private companies is a two-tiered system in which the board of directors and the management board mutually handle the actual management of the company and bear responsibility for its operation. In both pieces of legislations, directors and managers are held responsible for willful or negligent damage caused to the company or to its shareholders, creditors and third parties.

In 2004, the Icelandic Stock Exchange, the Icelandic Chamber of Commerce and the Confederation of Icelandic Employers published guidelines on good corporate governance standards in Iceland for registered companies, and in 2005, a new legislation was introduced on market abuse, takeovers and prospectuses. There is no legal responsibility for Icelandic companies to have employee representative on company boards or to allow employees to influence company management in any other way. Although several proposals have been introduced to parliament to revise

[9] The information for this part are obtained from an article written by Áslaug Björgvinsdottir in 2004 (see references)

these legislations, none have been passed and trade unions and workers' associations have not shown the will to try and change these regulations.

A company's board of directors supervises the whole company and monitors its operations, while the managing directors oversea the daily operations under the supervision of the board and must obey the rules set forth by the board. Thus, the board is authorized to reach decisions under the direction of daily operations and can also participate in these operations. This also means that the division of work between the board and the management board, their function and influence can vary greatly from one company to another. There are also rules for the board of directors, such as that the majority of the board of directors should consist of people who are not managing directors and that no member of the managing board can be chosen as chairman of the board of directors.

A shareholders' meeting has the highest authority in company matters and always holds the power to decide unless law assigns the decision elsewhere. That is, a company's board must obey the decisions suggested in a shareholder meeting and the meeting is the only legal venue for shareholders to exercise their right to influence the company. One of the main functions of a shareholders' meeting is to elect members of the board of directors and the general rule is that the meeting elects the majority of the board, although a third party has the right to appoint one or more directors. Minority shareholders have a special right to choose representatives on the board, and this is quite unusual; e.g. a minority controlling 33.3% of the votes can elect two members of the board. This minority's right when electing the boards of limited companies is in this respect completely different from the legal privileges of minority shareholders in other Nordic countries, where the majority can appoint every member of the board unless otherwise required in the articles of associations. There are three types of procedures in electing directors: majority voting, proportional voting and cumulative voting. Shareholders controlling at least $1/5^{th}$ of the share capital can demand proportional voting or cumulative voting to elect directors, and in companies with 200 or more shareholders, shareholders controlling at least $1/10^{th}$ of the share capital are allowed to make this type of demand. There has however not been carried out any formal survey on the extent to which these rules are applied in Icelandic limited companies.

In limited companies, the general principle is that voting rights are in direct proportion with share capital ownership, although it may be determined that specific shares have increased voting weight without specific limitations or that shares entail no voting rights. This permission of allowing share issuance without voting rights was introduced in 1994 and the explanation given with this permission was that 'this innovation, among other things, would provide companies the opportunity of raising capital without affecting the voting ratios between former and new owners; in addition, the public would be given the change to purchase shares as an investment…' (Björgvinsdóttir, 2004: 60). It was also stated that by providing this opportunity in Iceland it would stimulate the economy and transactions in shares and companies would have less need to seek domestic or foreign loan capital. This could also give owners of nonvoting shares the right to dividends or special remedies if the company paid no dividends. Despite this authorization for non-voting shares, dual-class shares and shares with superior voting rights, companies with so-called A and B shares are not at all common in Iceland and the *common principle is one-share/one-vote*. This pattern is completely different from the general pattern in Denmark where it is quite common for limited companies to use both dual-class shares and limit the exercise of voting rights.

Increased share transactions on the Icelandic Stock Exchange and the internationalization of Icelandic limited companies have brought on increased discussion of directors' salaries and other remuneration, since it is a fact that directors enjoy increased remuneration. The shareholders' meetings decide annually the directors' salaries while the board of directors decides the salary in terms of employment for the managing director. Unlike in Denmark, there are no substantive rules for determining directors' salaries or other remuneration in Iceland. The Danish regulations limit director payments to an amount not exceeding what is regarded as customary and the payments should be justifiable in light of the financial status of the company or group. The Icelandic regulations do however forbid a member of the board of directors from favoring someone at the cost of the shareholders or the company and also forbids a shareholders' meeting from making such decisions.

In 2003 new rules regarding increased transparency were introduced and the main purpose of these rules was to 'ensure transparency regarding directors' financial interests, the access of investors to standardized information that could be significant for the value of shares, and, finally, greater credibility in the Icelandic securities market' (Björgvinsdóttir, 2004: 64). Moreover, listed companies are obliged to provide the Iceland Stock Exchange with information on all payments to managing directors and to individual members on the board, as well as to publish such information in annual financial statements. These regulations are considered a step forward in corporate governance reforms in Iceland since Icelanders are now setting their own rules to improve the regulatory system and attempting to prevent directors from abusing power for their own benefits.

2.3.1 Revision of corporate governance regulations after the crisis

After the economic collapse in 2008, guidelines on Icelandic corporate governance were revised from the previous edition in 2004. The Iceland Chamber of Commerce, NASDAQ OMX Iceland hf. and the Confederation of Icelandic Employers published the revised guidelines in 2009.[10] The new edition took account of similar guidelines from other countries and of the recommendations of the European Commission and the Organization for Economic Co-operation and Development (OECD). In this revised edition there is a thorough discussion of the role of board of directors in Icelandic companies and it is stated that these guidelines are both suitable for listed and non-listed companies, as well as companies owned by the state and local authorities. Listed firms are obliged to follow these guidelines but as for non-listed companies, which provide the vast majority of Icelandic companies, the goal of these guidelines is to strengthen and promote firms although strict compliance is not mandatory, and it is quite clear that many firms do not follow these guidelines. For the companies that do not follow these guidelines, the basic requirement is that they follow the rule of 'comply or explain', which implies that if companies do not follow the guidelines in all matters, they must explain the reason for it in the annual accounts or in the annual report.

[10] Source: Iceland Chamber of Commerce

In the guidelines it is stated that one of the main responsibilities of the board of directors is to '*ensure that the interests of all shareholders are guarded at all times, as Directors of the Board are not to act specifically in the interests of the parties who gave them support in their election to the board'*.

In relation to size and composition of the board, the guidelines state that the board of directors should be of the size and composition that makes it possible for the board to fulfill its duties efficiently and with integrity. Furthermore, it is required that directors must be diverse and have a wide range of capabilities, experience and knowledge. It is also recommended that only one board director should be from among day-to-day managers in a company. There are also guidelines on the independence of directors where it is stressed that the majority of directors must be independent of the company and its day-to-day managers, and that at least two directors must be independent of the company's significant shareholders. It is also stated that the board itself evaluates whether directors are independent of the company and its shareholders or not.

2.4 The financial meltdown in Iceland

It should be familiar to most that Iceland is going through severe financial crisis and that the Icelandic economy has plunged into a deep economic slump. Although the crisis surely is the result of an external financial shock, reaching its peak with the fall of Lehman Brothers in September 2008, the extreme severity of the crisis in Iceland is due to weaknesses in the internal financial mechanism. This includes ineffective bank supervision, aggressive expansion strategies by the Icelandic banks and inadequate macroeconomic policies (OECD, 2009).[11] In the years leading up to the crisis, Iceland experienced a great economic boom and the three largest banks in Iceland, Glitnir, Kaupthing and Landsbankinn, drastically exceeded the size of the Icelandic economy as a whole. Figure 2.1 shows this:

[11] OECD: Economic survey of Iceland 2009

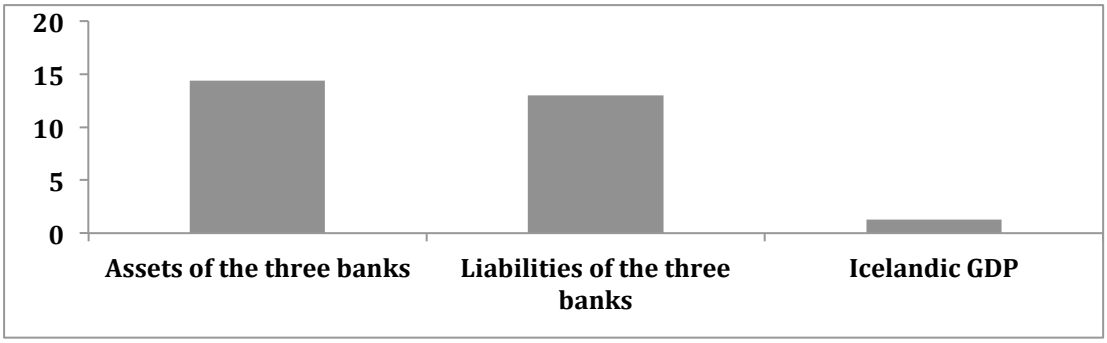

Figure 2.1 shows the assets of the three largest Icelandic banks in comparison to Iceland's GDP (Source: Iceland Chamber of Commerce)

This boom was fuelled by aggressive expansion strategies of the Icelandic banks, as well as favorable external market conditions. In 2003-2007 the Icelandic economy grew very rapidly, with average economic growth rate of 5.51% and a growth rate of more than 7% in 2004-2005 (Spruk, 2010). Although the Icelandic central bank raised interest rates in order to try and keep the inflation within target limits at the high growth rate, it failed to keep the inflation down and with the high interest rates it became especially feasible for households to borrow in foreign currencies (Spruk, 2010).

Figure 2.2 shows the failed attempts of keeping inflation within target limits although the CBI tried to control the inflation by increasing the discount rate. The bank was however criticized for not being bold enough when increasing the discount rate and for being too slow in reactions to the coming problems when danger-signs emerged (Matthiasson, 2008).

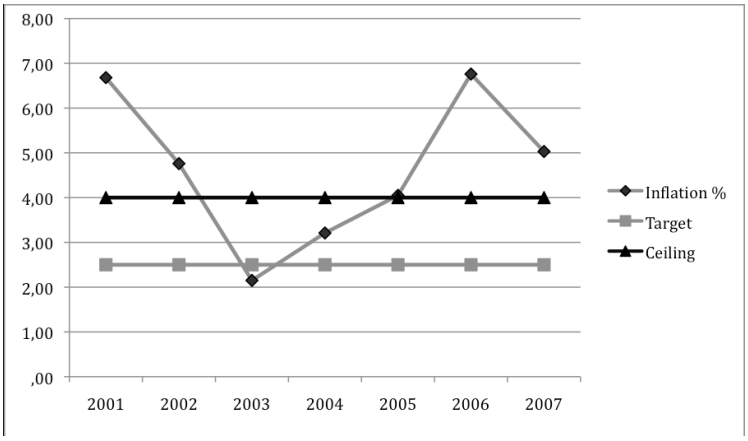

Figure 2.2: an illustration of how the CBI tried to keep inflation within target limits by showing the inflation, the inflation target and the ceiling representing the maximum value acceptable (Source: Matthiasson, 2008).

The high interest rate in Iceland also led foreign investors to borrow money from countries with low interest rates and then invest in Iceland, in order to get high returns on their investment, which in turn led to the over-appreciation of the Icelandic króna. That is, the króna appreciated despite the enormous external payments deficit that Iceland was running. Figure 2.4 shows the external balance of the economy.

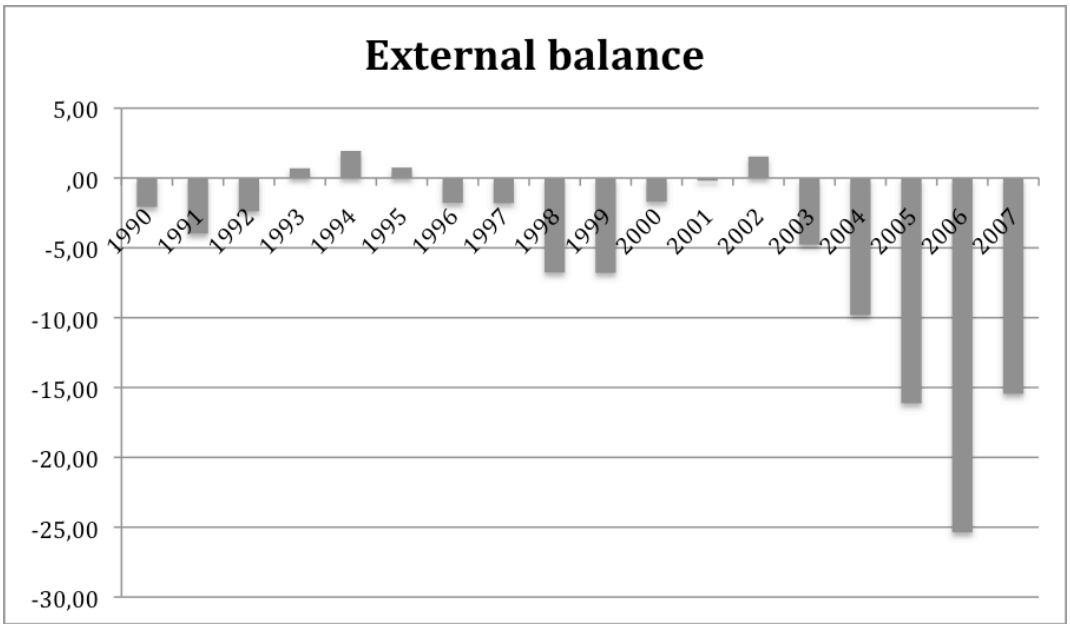

Figure 2.3 shows the external balance of the Icelandic economy in percentage of GDP (Source: Matthiasson, 2008).

Thus, there were macroeconomic imbalances already at play as early as 2005, and the Central Bank did by no means handle this overheating of the economy. Consequently, when the crisis hit Iceland in the fall of 2008 the Icelandic króna depreciated rapidly, much because of unsatisfactory macroeconomic policy in the years before the crisis. Then in 2008 when the three banks all collapsed, although the same happened in many developed countries, the collapse was extremely brutal in Iceland because of how vulnerable the banks were after being exposed to massive equity market risk due to the aggressive strategies they imposed (OECD, 2009). Also, because of how large the banking sector had grown compared to the Icelandic economy, the Central Bank could only act as a lender of the last resort to the extent of its foreign currency reserves and the ability to borrow at foreign exchange, since the króna's effective real exchange rate deteriorated (Spruk, 2010). And in turn, the severe depreciation of the

króna, who lost two thirds of its value, meant that the inflation increased rapidly and in January 2009, it was measured at 18.6% (Spruk, 2010).

It is clear that the aforementioned privatization of the Icelandic banks in the end of the 20th century marked a big change in ownership structure in the Icelandic financial environment. With the new owners came new corporate governance practices. The banks no longer served as 'normal' banks where the main purpose was to keep money for those who wanted to save and to lend money at a higher interest rate to those who needed to borrow money, and thus, the difference in interests being the most important source of income (Rannsóknarskýrslan, bindi 8: 12).[12] The newly privatized Icelandic banks were anything but normal banks and in the next years they would gain remarkable control over the Icelandic financial environment. This imbalance in the size of the banking sector in comparison to Iceland's economy is one of the main reasons behind the deepness of the recession. Moreover, the rapid lending growth of the banks led to a situation where the bank's asset portfolios were filled with high risk and little quality.

2.5 Weaknesses in the internal governance controls

Although many Icelanders wanted to believe that Iceland both had one of the fastest-growing economies in the world, as well as having a solid and transparent business practices, this proofed to be awfully far from the reality. The truth was that the Icelandic financial culture had been built upon close ties between businesses and politicians. Although Iceland had always been like this, presumably one of the dangers that small countries face, this pattern became increasingly apparent after the privatization of the Icelandic banks. Like I discussed earlier, politicians preferred that the banks were sold to insiders connected to the ruling parties (the right wing Independence party and Progressive party), which led to close ties between the two ruling parties and the banks. According to Schwartz (2010) each party was connected to a bank, each bank to a circle of firms and politicians sat on the boards of the banks of the connected firms. Under these circumstances, it became difficult for regulatory authorities to criticize the situation due to the political pressure to ignore massive self-

[12] Most of the Icelandic banks both served as regular banks and investment banks.

dealing. As an example of how intertwined politics and banking had become it is worth mentioning that Davíð Oddsson, the prime minister who was in charge of the bank privatization, became the director of the central bank in 2004.

Cross-holdings and self-dealing by the Icelandic banks led to a situation where the bank's offshore assets were grossly over-valued. This situation was brought to the attention of the international financial services company Merrill Lynch in early 2006, which described the situation in Iceland as being risky in an assessment report. With this, Merrill Lynch stated its concern regarding the co-investing of the banks and their shareholders, and how they sometimes provide both equity and debt financing[13]. Also, in the report, Merrill Lynch pointed out that the Icelandic banks had to pay a much higher spread rate than other European financial institutions in the same risk group. The rate was more similar to the ones paid by financial institutions in emerging markets. Moreover, in 2008, Merrill Lynch again stated its concerns fir the Icelandic financial situation when a specialist criticized the Icelandic government because of the lack of attention the high credit default swap spread had received. This comment was called a 'strange agenda' and unfound by then Minister of Culture and Education, Þorgerður K. Gunnarsdóttir, who also asked if the Merrill Lynch specialist was perhaps in of re-education.[14] This kind of attitude towards criticism of the alarming situation in Iceland was typical for Icelandic authorities.[15]

Djankov *et al.* (2008) provide a proof for this hidden un-transparent situation in Iceland when they presented a measure of legal protection of minority shareholders against the expropriation by corporate insiders (the anti-self-dealing index). The results of the paper show that Iceland is unlike many other Western countries due to a lower anti-self-dealing value. Another example of the weaknesses in the Icelandic business culture is how the 10 largest business owners owned approximately 40 of the 100 largest corporations (Sigurjónsson, 2010), indicating how little diversity existed. When corporations own significant stakes in each other, if one link in the cross-

[13] The article was published in Morgunblaðið on the 8th of March 2008 (http://www.scribd.com/doc/19606822/Merrill-Lynch-Icelandic-Banks-Not-What-You-Are-Thinking).

[14] Ms. Gunnarsdóttir was acting as Prime Minister in the absence of then Prime Ministed Geir H. Haarde.

[15] Source: The Report by the Special Investigation Committee (http://sic.althingi.is/pdf/RNAvefurKafli21Enska.pdf).

owning chain fails, there is the risk of extensive collapse. Even worse, if financial institutions were amongst the corporations involved in such cross-ownership, there is even higher risk at stake due to the possible damage that would be caused if the chain falls (Sigurjónsson, 2010). This is exactly what happened in Iceland. There was also another hidden agenda behind this cross-ownership structure – i.e. corporations were counting profits or losses many times over with the purpose of offsetting each other's earnings or in order to overstate profits and consequently artificially increase stock prices leading to increased financial vulnerability. Also, following the economic boom in Iceland it became increasingly common that large shareholders gained control over smaller shareholders and received funds from the corporations in the form of pure money or favorable interest rates. Larger shareholder also received more favorable borrowing terms and enjoyed additional dividend payments (Ibid).

3. Literature review and hypothesis development

The literature serves the purpose of providing the reader with an overview of existing theories on corporate governance and firm value. Here I will also discuss the relevant literature related to my hypotheses development and show how I build on existing theories in order to construct my own research. Firstly I provide a general overview of corporate governance and relevant literature within the field. I will then turn my focus towards agency problems in close corporations and corporate governance issues at crisis times. Following this I will have a presentation of the hypotheses I have developed and the theoretical background for each hypothesis development.

3.1 Literature overview

The field of corporate governance can in many ways be traced back to the groundbreaking work of Adolf Berle and Gardiner Means (1932), *The Modern Corporation and Private Property*. In the book, the authors state their concern of the separation of ownership and control in large U.S. corporations and the potential problems that this separation creates. This conflict of interest between corporate insiders and outsiders has important implications for the extent of agency problems within corporations.

According to the OECD website, corporate governance is defined as the

> '*procedures and processes according to which an organization is directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among the different participants in the organization – such as the board, managers, shareholders and other stakeholders – and lays down the rules and procedures for decision-making.'*

The debate of the relationship between ownership structure and firm performance is well documented, and most scholars agree that ownership structure is one of the main corporate governance factors influencing the extent of firms' agency costs. The traditional perspective of agency problems (Berle and Means, 1932; Jensen and

Meckling, 1976) maintains that conflict of interest between managers and dispersed shareholders is the most common type of agency problems. This perspective has however been criticized in more recent years, and today there is increased focus on another kind of agency problem; i.e. the conflict of interest between large controlling shareholders and minority shareholders (e.g. La Porta et al., 1999).

Up until recently little was known about the control of corporations outside the United States, and the general notion was that the governance problems facing U.S. firms were universally applicable. Since ownership in most large U.S. corporations is relatively dispersed the majority of corporate governance issues arise because of this separation of ownership and control. Accordingly, most of the literature has been centered on problems created by this separation. However, in most of Western Europe, there is a different structure prevailing; i.e. widely held corporations are in the minority and relatively few firms are listed (Becht and Mayer, 2000). Accordingly, in many cases, there are different corporate governance problems facing firms in Europe than for example facing firms in the U.S. (e.g. La Porta *et al.*, 1999). Although concentration of ownership has been honored throughout the years as a structure that would possibly solve agency problems in widely held corporations by such scholars as Berle and Means (1932) and Jensen and Meckling (1976), this is not necessarily the case. It is true when a single large shareholder, being an extreme case of concentrated ownership structure, has a controlling stake, he can effectively monitor managers and solve the agency problems between atomistic shareholders and managers. If, however, there are private benefits to be obtained by control there is the danger that the controlling shareholder can expropriate minority shareholders by for example taking on projects that are not beneficial for all, or diverting funds towards the generation of private benefits. Likewise, the latter appears to be a problem that many firms in Continental Europe (and other civil law countries) are facing.

3.1.1 Agency problems in close corporations

Although most of the research on ownership structure and firm value has been focused on large listed firms around the world, it is a fact that only a small minority of firms around the world are listed on a stock exchanges and most firms are small or

medium sized. As an example, more than 90% of all firms in the U.S. are close corporations (Nagar *et al.*, 2008). The plausible reason for this gap in the literature are the difficulties in obtaining data for non-listed firms since they have minimal requirements to make data publications available, while information on listed firms is public. This historic gap has caught the attention of some scholars and more recently, there have been publications focused on non-listed firms in Europe (e.g. Gutiérrez and Tribó, 2005; Hol and Wijst, 2006; Arosa et al, 2010) and in the U.S. (e.g. Nagar *et al*, 2008).

Unlike listed ones, non-listed companies are usually characterized by a high concentration of ownership and the corporate governance issues arising under such circumstances are normally those between minority and majority shareholders, where the ones holding majority use their power to reap private benefits at the expense of the small shareholders. The most common ownership pattern in non-listed firms is when multiple controlling shareholders each have a stake smaller than that necessary for control, but when combined with the stake of other shareholders, the combined holding is large enough to control the company (Gutiérrez and Tribó, 2005). This structure obviously makes it easy for those in control to pursue private interests, often at the expense of non-controlling shareholders. Another common structure is simply when a large shareholder owns enough to control a company, i.e. more than 50% share, and can use this power to his advantage. Nagar *et al.* (2008) find that firms with control concentration above 50% perform worse than those where control is shared, when analyzing close U.S. corporations.

3.1.2 Corporate governance and crisis

Leung and Horwitz (2009) state that, according to behavioral finance research, public equity owners are more concerned about the quality and structure of board of directors when firms are negatively affected by financial crisis, such as happened with Enron in the United States and Parmalat in the European Union. Most of the recent studies on the topic of firm value and ownership structure at crisis times have focused on the East-Asian financial crisis and the vast majority of them have shown that differences in ownership structures across firms play a big role in changes in firm

value during the crisis. There have been a few studies on this matter in European civil law countries. For example, Desender *et al.* (2008) analyze a sample of listed Spanish firms and find that during financial crisis, ownership concentration is negatively associated with stock market performance while insider ownership is positively related to performance.

The reason why it is important to look at this topic at times of crisis is because it allows us to see how strong the corporate governance of different firms is when times get tough, which is extremely important for shareholders to know. Desender *et al.* (2008) quote Baek *et al.* (2004) when arguing that the advantage of focusing on crises period is that it allows us to examine explicitly the effect of corporate governance on firm value by using a measure for ownership structure immediately before the crisis to describe changes in performance. They further argue that this method largely eliminates any spurious causality.

According to Johnson *et al*. (2000), measures of corporate governance, especially the effectiveness of protection for minority shareholders, are a better measure of the extent of exchange rate depreciation and stock market decline than standard macroeconomic measures. A plausible explanation for this is that in countries with weak corporate governance, worse economic prospects result in more expropriation by managers and consequently a larger fall in asset prices. Investor protection is especially central when understanding the patterns of corporate finance in different countries (La Porta *et al*., 2000). In many countries, the lack of investor protection leads to the expropriation of minority shareholders and this has been related to underperformance (e.g. Santiago-Castro and Brown, 2009). Corporate insiders who control the firm's assets can use them to their own advantage in ways that are detrimental to the interests of minority or outside investors. This can both be in the form of diverting corporate assets to themselves or by using corporate assets to pursue investment strategies that benefit them, but not the outside investors.

3.2 Hypotheses development

In the following sections I present the hypotheses I have formulated and the literature related to these formulations. The hypotheses are all selected in relation to probable governance issues facing Icelandic firms and based on similar approaches taken by different scholars within the field.

3.2.1 Concentration of ownership

There are two conflicting theoretical viewpoints in the literature on the protection of minority shareholders and firm value; the *alignment theory* and the *expropriation theory*. The former suggests that a more concentrated ownership structure reduces the conflict of interest between managers and shareholders; i.e. lower agency costs and increases firm value. This is consistent with the classical Type I agency problem, which assumes a widely dispersed ownership structure for most listed firms. This condition is common in the U.S. and the U.K. and the goal is to minimize problems that arise from the separation of ownership and control and reduce agency costs (Leung and Horwitz, 2009). The level of these costs depends, among other things, on statutory and common law and the resourcefulness of human beings in formulating contracts (Jensen and Meckling, 1976). Quoting Jensen and Meckling directly 'both the law and the sophistication of contracts relevant to the modern corporation are the products of a historical process in which there were strong incentives for individuals to minimize agency costs' (1976; 72). This condition of dispersed ownership structure is quite common in for example the U.S. although non-U.S. firms are often controlled by a single large shareholder (e.g. La Porta *et al*, 1999).

The expropriation theory on the other hand states that a more concentrated ownership structure increases the probability of conflicts between minority and majority shareholders. There are some scholars who have found evidence to supports this (e.g. La Porta *et al.* 1999; Schleifer and Vishny 1997; Johnson *et al.* 2000) and suggest that a concentrated ownership structure is more widespread and creates the Type II agency problem of a conflict of interest between majority and minority shareholders (Leung and Horwitz, 2009). Type II agency problem is defined by Morck (2008) as occurring if an individual acts as an agent when social welfare would be higher if he acted for

himself, while Type I occurs if an individual acts for himself when social welfare would be higher if he acted as an agent. That is, type II agency problem happens when a director is dutiful to his CEO even though he shares little in his excesses, while type I happens when top managers fail to act in the best interest of minority shareholders and act in their own best interest instead.

In this scenario where type II agency problem prevails, controlling shareholders have the power to use corporate resources for the own private interest at the expense of the public shareholder (Leung and Horwitz, 2009). This type of expropriation of minority shareholders would be most expected during a financial meltdown, when key monitoring devices that are supposed to protect minority shareholders fail to work. According to the expropriation theory, there should be a greater loss of confidence by minority shareholders in companies with concentrated management structure. This is also a reaction to crony capitalism and minority shareholders have the tendency to pull out because of this lack of trust. The overall results are that firms with more concentrated management experience a sharper decline in stock returns in times of financial meltdown (Leung and Horwitz, 2009). This problem is more likely to be severe in countries with poor investor protection.

The above discussion of concentrated versus dispersed ownership led me to formulate my first hypothesis, which is presented below with a detailed description of the expected outcome.

Hypothesis 1: *Firms where control is shared perform better than those with a single large shareholder*

This hypothesis is built on a study made by Nagar, Petroni and Wolfenzon (2008) on governance issues in a sample of close U.S. corporations. The authors hypothesize that firms with shared control solve the governance problems between minority and majority shareholders, and consequently show higher performance than firms with concentrated ownership. They find evidence to support this hypothesis. Nagar *et al*. (2008) assume that a firm has diluted control if no owner has a stake greater than, or equal to, 50% since that means that no single shareholder has absolute control. When using the 50% cutoff there is one important implication that has to hold, i.e. the

common principle has to be one-share-one-vote among the analyzed firms. This is because under this assumption, ownership is closely linked to control and the ownership share of the largest shareholder can be used as a measure of his control rights. If, however, firms have dual class shares ownership might not be a good proxy for control rights.[16] For my sample, this method can be used since the common principal in Iceland is one-share-one-vote for private limited companies (Björgvinsdóttir, 2004), or at least give some justification for the use of ownership as a proxy for control rights. Although there might be some problems related to the use of ownership as a proxy, Nagar *et al*. (2008) and Dyck and Zingales (2004) reason for the use of a 50% threshold when indicating whether a firm has dispersed ownership or not, by stating that no individual shareholder has absolute majority in that case. They also argue for this being a realistic assumption since collective action problems are not likely in close corporations due to the small number of owners – it would be easy for shareholders to collectively block the decisions of any owner with less than 50% ownership. [17] The main idea between the hypotheses development is the recommendation of legal scholars (e.g. O'Neal and Thompson, 1985) that the main shareholder surrenders some control to minority shareholders at the outset in order to improve performance.

To test this hypothesis I follow what Nagar *et al*. (2008) have done and identify firms where the largest shareholder owns 50% or less of the shares as firms with dispersed ownership. I am assuming that firms where control is shared perform better than those where a single shareholder has 51% or greater control and I believe that this is especially evident after the onset of the crisis. The reason for this assumption is that I think that ownership structure had a strong influence on the severity of the crisis in Iceland and that the structure of the majority of Icelandic firms is representative of this problem.

To test the hypothesis I simply construct a dummy variable that takes the value of one if a single shareholder has a stake of 50% or less and zero otherwise.

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[16] Dual class shares create different classes of shareholders with different voting rights

[17] Collective action problems are defined by Wikipedia as: '*the situation in which several individuals would all benefit from a certain action, which, however, has an associated cost making it implausible that anyone individually will undertake it'.*

3.2.2 The alignment of interest hypothesis

Following the first hypothesis, I also want to test the *alignment of interest* hypothesis, originally set forth by Jensen and Meckling (1976), stating that the existence of significant managerial ownership mitigates agency costs. Although I am not focusing on managerial ownership in this thesis, I still want to analyze whether this approach can be used in a more general manner. As discussed above, the alignment of interest hypothesis suggests that a more concentrated managerial ownership reduces agency costs and increases firm value by aligning the interests of managers and shareholders (e.g. Shleifer and Vishny, 1986). Following this, I want to test whether having a shareholder who has control within the 75%-100% interval actually increases firm value. Since I previously assumed that a single shareholder with more than a 50 percentage ownership stake would lower firm value, I am assuming that the 51%-75% ownership interval is bad for firm performance, but as ownership increases above 75% I am interested in seeing whether it improves firm value or if perhaps it simply has an increased negative impact on firm value.

Morck, Shleifer and Vishny (1988) find that managerial ownership increases firm value up to a certain point but after that, managers become entrenched and pursue private benefits at the expense of outside investors. Stulz (1988) also finds an inverted u-shaped relationship between managerial ownership and firm value. When the negative entrenchment effect outweighs the incentive benefits of managerial ownership, the value of the firm starts to decline. In general, the literature suggests that the positive incentive effect relates to the share of cash-flow rights held by large shareholders and that the negative entrenchment effect can be traced to the share of control rights held by large shareholders (Claessens *et al*., 2002). This relationship is far more extreme outside the U.S. since it is more likely in non-U.S. firms that the largest shareholder establishes control over a firm despite little cash-flow rights (i.e. the largest shareholder can control a firm's operations with a relatively small direct cash-flow stake).

Claessens *et al.* (2002) hypothesize that the more control is in the hands of the largest shareholder the more entrenched he or she becomes and consequently, more likely to extract private benefits at the expense of minority shareholders. They find that the

larger the wedge is between control and ownership rights, the lower the firm value and that corporations with no separation of control and ownership rights have the highest value. Again, the relationship here is not monotone since corporations with moderate levels of separation (11%-15%) are valued higher than those with lower separation levels (1%-10%).

Pagano and Roell (1998) analyze the optimal design of the ownership structure of a company and find that, in firms with a single controlling shareholder, when expropriation is likely to be severe the ownership stake of the non-controlling shareholders should be more concentrated. Also, Bennedsen and Wolfenzon (2000) suggest that in firms where expropriation is expected, the firms should have a larger controlling group with a larger joint stake. This leads me to my second testable hypothesis:

Hypothesis 2: *If there is a controlling shareholder, the larger his/her stake, the smaller his/her incentive to engage in expropriation activities*

I test the hypothesis by using the identification I made when testing hypothesis 1 and test whether firms with a large controlling shareholder perform better than those with a medium sized controlling shareholder. I again use the measure used by Nagar *et al.* and identify firms with a controlling stakeholder with a stake between 76-100% and firms with a stake between 51-75%. The former are firms with a high concentration owner and the latter a medium-sized owner and the former should perform better according to hypothesis 1. Since the 75% cutoff is not grounded in theory (unlike the 50% cutoff), I also perform several sensitivity tests on the choice of the 75% cutoff by moving the interval down to 70-100% and then up to 80-100% stake.
Since I want to test whether there is a U-shaped relationship here I construct a set of dummies, not only for the 76-100% but I will also test if there is a U-relationship when the ownership is in the 0-30% interval. I construct four dummy variables, *0-30%, 31-50%, 51-75%, 76-100%*. The dummies take the value of one if the ownership stake of the controlling shareholder is lower or equal to 30%, between 31% and 50%, between 51 and 75% and between 76% and 100%. The 51-75% group is expected to be the group where expropriation is most likely and, consequently, performance lowest since this is the group where shareholders have high ownership

stakes but not large enough to incur high expropriation costs. According to the alignment of interest theory, the 76-100% group is expected to demonstrate higher performance than the 51-75% group, although I am a bit skeptical whether this relationships holds for Icelandic firms. The 31-50% should show high performance, while the 0-30% group is somewhat of a question mark and could be expected to show weak performance if the theory presented by Morck *et al.* (1988) holds. Therefore, the pattern could be described as firstly showing an U-shaped relationship, with performance being low when the controlling ownership stake is low, then increasing as the controlling stake reaches the 31-50% stake group, then when we reach the 51-75% zone, performance should be rather weak but rise when the incentive effect kicks in with more than 75% stake in a company. This relationship is shown in figure 3.1.

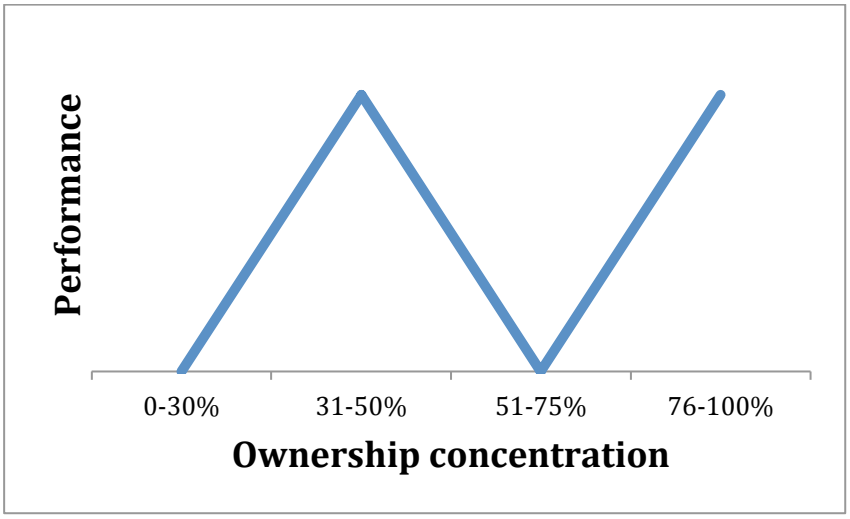

Figure 3.1: The suggested relationship between ownership concentration and performance.

Some scholars (e.g. Gutiérrez and Tribó, 2004) have combined the dummies with a continuous variable that captures the minimum stake necessary to win control and the number of members that can form a coalition for control. I will not include this variable here but when I test for the contestability of shareholder power the Herfindahl indexes I do, however, control for the number of shareholders.

3.2.3 Governance issues in close corporations

Here I want to take into account blockholders, whom I define as a shareholder holding 10% or more control. The vast majority of Icelandic firms are non-listed with only 12 firms being registered on the Iceland Stock Exchange.[18] Since the main governance problem facing close corporations is the one between majority and minority shareholders, I am assuming that the most common governance structure in Icelandic companies is representative of this problem, i.e. either one large shareholder or several medium-sized shareholders. This leads me to my third hypothesis:

Hypothesis 3: *The firms within my sample are either ones with a single large shareholder or firms with several medium-sized blockholders*

This hypothesis is built on what Gutiérrez and Tribó (2004) suggest when analyzing non-listed firms in Spain. They rest on Zwiebel (1995) and Gomes and Novaes (2000) who suggest that there is a threshold holding size beyond which the largest blockholder will not be challenged by other investors, and that in equilibrium, if control is to be shared among different blockholders, their stakes should be of similar size and these owners should be of similar type, respectively. Zwiebel's (1995) model is the base for this hypothesis formation in Gutiérrez and Tribó. Here I will simply divide the sample of firms into categories according to their blockholders' /shareholder structure in order to test if this hypothesis holds.

3.2.4 The contestability of shareholder power

The Pagano and Röel (1998) model predicts that in firms with a single controlling shareholder, the non-controlling shareholders should be more concentrated when expropriation is likely to be more severe (Gutiérrez and Tribó, 2004). Lehman and Weigand (2000) analyze a large sample of German corporations and find evidence that the presence of a strong second largest shareholder increases firm performance. Gomes and Novaes (2005) find that increasing the number of shareholders makes rent extraction and private benefit taking less likely, since more shareholders now have to

[18] As of the begninning of December 2010, since then at least one firm (Össur) has deregisterd.

agree on a preferred project. Bennedsen and Wolfenzon (2000) develop a model where an initial owner chooses an ownership structure with multiple large shareholders with the purpose of preventing a single shareholder in taking unilateral actions that might hurt other shareholders. That is, by diluting control among several shareholders it becomes increasingly difficult for a single shareholder to take one-sided actions.

Hypothesis 4: *An increase in the contestability of the controlling shareholder's power affects firm value in a positive way*

Here I want to analyze how an increase in the contestability of the controlling shareholder's power affects firm performance. Similar to what Maury and Pajuste (2005) do when analyzing a sample of listed firms in Finland, I use the Herfindahl index to test the hypothesis, measured by the sum of squares of the differences between the first and the second largest voting stakes, and the second and the third largest voting stakes $(shrdir1-shrdir2)^2 + (shrdir2-shrdir3)^2$. I also use another measure taken from Maury and Pajuste called HI_concentration. HI_concentration is a proxy for the total concentration of the shareholders' voting power and calculated as the sum of the squared ownership stakes held by the three largest shareholders (shrdir1+shrdir2+shrdir3)^2. Maury and Pajuste do however note that the assumption that the marginal cost of stealing increases with the number of coalition partners is inconsistent with other studies (e.g. Faccio *et al*. 2001) who find mixed results regarding the effect of the presence of multiple blockholders. Accordingly, although I assume that both measures are negatively related to firm value, the results could go either way.

3.2.5 Shareholders coalitions and identities

The identity of shareholders is quite important when analyzing firm value and ownership structure. This relationship between shareholders' identities and firm value has been extensively analyzed (e.g. Maury and Pajuste, 2004; Claessens *et al*., 2002) and most scholars find some link between identities' and firm value. Here, I want to build on what has already been done and analyze if there are certain types of

shareholder, or a certain combination of the largest shareholders, that makes minority expropriation more likely. This hypothesis is based on what Maury and Pajuste (2005) have done when analyzing a sample of listed firms in Finland. They propose that the marginal cost of private benefit extraction differs across industries. For example, if the controlling shareholder were a financial institution the marginal cost would be higher than if it would include a family. This is because the opportunity cost of getting caught is evidently higher for financial institutions, which are closely scrutinized by regulatory authorities, than for families. Many other scholars (e.g. Lehmann and Weigand, 2000; Burkart *et al.* 2003; Claessens *et al.*, 2002) have stressed the importance of the identity of the shareholders for understanding corporate governance issues. I have constructed a fairly open hypothesis in relation to the identity of the largest shareholders and certain assumptions regarding the potential outcomes will be discussed below.

Hypothesis 5: *There is a relationship between the identity of the largest shareholder/blockholders and firm value*

In my sample, the vast majority of firms have industrial firms as the largest owner (approximately 70%).[19] It is however difficult to form expectations on how this ownership type affects firm value, although Gutiérrez and Tribó (2004) show that firms as owners have lower value than for example families as owners.

Families/individuals are the second largest owner type (approximately 19%) and there are mixed results on the relationship between family ownership and firm performance. Maury and Pajuste (2005) suggest that families are more prone to private benefit extraction if they are not monitored by another strong blockholder and that two families can make profit diversion easier. I also test for this relationship; i.e. when two families represent the largest and the second largest shareholder. On the other hand, if a family is combined with a non-family owner, there should be positive effects on performance. Claessens *et al.* (2002) also show that separation of cash flow rights and control rights is quite common in family-controlled firms, indicating that there might be incentives to harm minority shareholders. Faccio *et al.* (2001) find that

[19] I refer to table 5.4 for a distribution of shareholders' identities.

family control affects minority shareholders in a negative manner when analyzing firms in East Asia, where transparency is relatively low. Maury (2006), however, finds that active family control is actually related to higher firm performance when analyzing firms in Western Europe, where investor protection is generally high. Anderson and Reeb (2003) and McConaughy *et al.* (1998) find that family firms generally have higher profitability and valuation than non-family firms. Anderson and Reeb (2003) also find that the positive relationship with firm value becomes smaller when the ownership stake exceeds 30%.

The suggested results for my sample are quite vague since it could well be that family control affects firm value in a positive way due to the fairly stable legal environment in Iceland. Conversely, most of the family-controlled firms in my sample have high family control (i.e. higher than the 30% suggested by Anderson and Reeb) so this could affect firm value in a negative way, but could also mean that there is much incentive for the controlling family to focus on the firm's welfare. Consequently, the proposed relationship could either be positive or negative.

The third largest owner type is financial institutions. Here, I am also a bit confused in determining the suggested results. Maury and Pajuste (2005) state that the opportunity cost of getting caught for diverting a firm's profits is apparently high for financial institutions that are supervised by regulatory authorities and accordingly financial institutions are less likely to engage in inappropriate value diversion. The Icelandic financial institutions however are not exactly known for their integrity and the Icelandic Financial Supervisory Authority was notoriously sleepy when monitoring financial institutions in Iceland. In view of the aforementioned, I find it difficult to assume which way the relationship goes.

To test this hypothesis, I take into consideration both the identity of the largest shareholder and also the identity of other large shareholders. I test this hypothesis by constructing several dummy variables, both in regards to the three largest shareholder types (industrial companies, individuals/families, and financial institutions), and combinations when I take into account the second and third largest ownership type.

3.2.6 Cross ownership and performance

In this last testable hypothesis I want to focus on cross ownership of Icelandic firms. Cross ownership is an ownership pattern where the same person owns two or more related companies and therefore indirectly controls the companies in the ownership-chain. It can also refer to a situation where an investor owns significant blocks of stock in several different companies that do business with the company owned by that investor. In both circumstances, the main purpose is to strengthen business relationships between the parties involved and to control the level of competition that exists within the marketplace. Cross-ownership can lead to a situation where a market appears to be competitive but in reality there exists a so-called 'invisible oligopoly'. This type of ownership structure can be extremely complicated and difficult to monitor.

Hypothesis 6: *Firms who are controlled through complex cross-ownership structures show weaker performance. This is especially evident after the onset of the crisis.*

Claessens et al. (2002) find, when analyzing East Asian firms, that control is often increased beyond ownership stakes through pyramids and cross-holdings among firms. They further define pyramiding as *the ultimate ownership of a firm running through a chain of ownership of intermediate corporations* and cross-holdings *as horizontal and vertical ownership links among corporations that can enhance the control of a large, ultimate shareholder.* Furthermore, Claessens *et al.* (2002) state that complex ownership structures and group-affiliated corporations increase entrenchment opportunities for large shareholders. Moreover, Bennedsen and Nielsen (2006) find that disproportional mechanism such as dual class shares, pyramids or cross-ownership, influences the entrenchment problem. They present a model where they analyze firms based on disproportional ownership structure and find that these firms have on average 0.18 lower market-to-book ratio than the average firm with proportional ownership structure.

In my sample approximate 17% of firms have complex cross ownership relations. Cross-ownership among Icelandic companies is identified as one of the reasons for the severity of the crisis in Iceland.

Firms can be involved in cross-ownership because of ownership connections, financial dependence, or control connections. According to the Icelandic Financial Supervisory Authority, firms or individuals are defined as being financially dependent when there is a chance that if one of them becomes financially distressed, it will affect other firms/individuals within the cross-ownership chain.

When I identify these cross-owned companies, I both follow the ownership stake presented in the Orbis database; i.e. I single out firms that are registered in the Orbis database as being held through a chain of linked parties. Although I can identify most of the cross-owned firms in this manner there are some firms that are owned through this structure but cannot be clearly identified in Orbis. Here, the report of the Special Investigation Commission once again comes in handy since they identify the largest groups through which firms are owned and I can single out the firms with missing data by looking at the analysis made by the Commission.

3.3 Concluding comments on the hypothesis development

Throughout the process of writing this thesis I went through many different approaches to finally come to the conclusion that the hypotheses presented above would be best suited to understand governance problems in Icelandic firms. I do, however, also present results from two other dummies that I constructed but did not directly take into consideration in the literature, i.e. the effects of board composition. When I started writing this thesis I had a broader focus and collected data on CEO duality and female representatives on the board of directors. I quickly saw that I had to either take on a board focus or focus on firm concentration since doing both would have been too vast, as the literature on the effects of board composition is a special genre within the corporate governance literature (e.g. Fama and Jensen, 1983; Baysinger and Butler, 1985). Nevertheless, I thought it would be interesting for the reader to see the results and they will be presented in section 5.2.7.

4. DESIGN OF THE RESEARCH

I have now explained the basis for my hypotheses development, the theoretical implications behind the hypotheses and the expected outcomes. In this section I present the design of my research; i.e. the data I use, the data collection, my sample and the general methodology of my research.

4.1 The study

I carry out my study by comparing the largest Icelandic firms, both listed and non-listed, throughout the years 2007-2009, and try to observe whether a certain ownership pattern led to economic underperformance and the possible expropriation of minority shareholders' rights.[20] By doing this I can analyze whether differences in ownership structure at the firm level explain differences in firm performance before, and during, the Icelandic financial crisis. The reason for the chosen period is that I want to analyze changes in the relationship between ownership structure and performance both right before and right after the financial crisis hit Iceland in 2008.

This study takes into account a single country that is characterized by a concentrated ownership structure and a legal protection of minority shareholders that is not weak, but not as strong as in common law countries and evidently not as strong as in the other Scandinavian civil law countries (cf. Djankov *et al*., 2008).[21] Moreover, the Icelandic stock market is very small and undeveloped and can consequently be characterized as being rather immature and thin. A thin market is a market with a low number of buyers and sellers where few transactions take place. Consequently, prices in such a market are often more volatile and assets are less liquid. La Porta *et al.* (1998) find a link between a thin equity market and a weak corporate governance system and Yurtoglu (2003) argues that this relationship leads to slower economic growth, and if countries improve their corporate governance systems, they can expect better investment and growth performance.

[20] The largest firms that had accouting measures available throughout the years 2007-2009.

[21] Scandinavian civil law countries have better shareholder protection than French civil law countries, but weaker than common law countries, e.g. U.S. and U.K.

Gutiérrez and Tribó (2008) find that minority shareholder expropriation is more observable in firms where (i) monitoring is difficult (i.e. in medium and large firms), (ii) there are restrictions on the transfer of shares (i.e. in closed firms), and (iii) there are increased opportunities for self-dealing through transfer prices (i.e. in firms controlled by other firms). Moreover, the paper made by Gutiérrez and Tribó is one of the first papers to look at the minority expropriation problem in non-listed firms, and I partly base my research partly on their paper.[22] Moreover, the frequently-cited Finnish study made by Maury and Pajuste (2005) analyzing the effects of multiple large shareholders on the valuation of firms by using data on Finnish listed firms is used extensively as well. The use of this study is also very useful since the Finnish and the Icelandic legal environments are somewhat similar. Lastly, it is worth mentioning the study made by Nagar *et al.* (2008), which is the bases for my first hypothesis formation and proofed very valuable to me throughout this process.

4.2 The sample and sources

I use a sample of 116 firms in the period 01-01-2007 until 31-12-2009, a total of 348 observations. The sample includes a total of 341 observations after I remove extreme outliers. By both taking into account listed and non-listed firms a broader picture emerges of different firms in the Icelandic market. Similar to what has been done by most researchers in this field (e.g. Maury and Pajuste, 2005; Leung and Horwitz, 2009), financial firms, such as banks and insurance companies, are excluded from the final sample since their valuation ratios are not comparable to those of non-financial firms.

Initially, I wanted to analyze the firms up until the end of the fiscal year of 2010, but the availability of data for the non-listed companies proofed to be a hindrance. The necessary financial data was only available for the year 2009 and therefore the sample ranges from 2007 to 2009. The original sample consisted of 208 firms but due to the lack of ownership information for some of the companies, the sample size decreased to 116. For the listed firms I obtained the necessary variables from the companies' annual reports (available online) and from Bureau van Dijk's *Orbis* database. For the

[22] To their knowledge at least.

non-listed companies I obtained the necessary information through Creditinfo, a leading company in providing credit related information to the Icelandic market. Non-listed firms are not obliged to disclose information on performance publically and consequently it was difficult for me to obtain the necessary material and if it hadn't been for the goodwill of the people at Creditinfo, I wouldn't have been able to make this study.

For the ownership data I use Bureau Van Dijk's *Orbis* database, which contains financial and ownership information for more than 80 million firms all over the world. Since I am mostly dealing with non-listed firms (approximately 95% of the sample) in a country characterized by a high concentration of ownership I identify the three largest shareholders in a company, although in many cases there is only one large shareholder. For the most majority of the listed firms the number of shareholders is much higher and I test for this when analyzing the concentration of the largest owners. Moreover, I identify a shareholder as having majority control if he/she owns more than 50% stake in a company and I classify blockholder's as a shareholder having a stake between 10% and 50%. The 10% threshold has been extensively used in the literature, for example by Maury and Pajuste (2005) and Attig *et al.* (2008) and is suitable for me since there are few shareholders with less than 10% share in the companies under analysis.[23] Moreover, Nagar *et al*. (2008) have used the 50% threshold, as well as Dyck and Zingalez (2004), so the use of the 50% cutoff also has some theoretical precedence in the finance literature.

The Orbis database registers shareholders according to country of origin, industry, name and type. It also lists shareholders according to direct and total ownership stake and the ownership stakes in Orbis are voting stakes, not cash-flow stakes. Although I do not focus on the separation of voting rights and cash flow rights directly, I do control for the effects of cross-ownership in order to shed some light on intriguing ownership incentives. A total ownership stake held by a shareholder is the sum of the stakes held directly and/or indirectly through firms controlled by the shareholder, while direct ownership stake is the stake held directly by a shareholder.

[23] The 5% level has also been used, for example by Thomsen *et al.* (2006)

In my sample there are nine different identities of shareholders. Those are:

C: Industrial companies

I: One or more known individuals or families

E: Mutual and pension fund/Nominees/Trust/Trustee

F: Financial companies

B: Bank

H: Self ownership

L: Other unnamed shareholders, aggregated

A: Insurance companies

P: Private equity firms

In my sample, over 70% of the firms have industrial companies as the largest owner. The second largest owner group is individual/families, making up approximately 19% og the sample and then there are financial firms and banks, each consisting of approximately 2.6%. I combine these two groups since banks and financial firms can be considered closely related.[24] Since financial accounting practices can vary widely between regions and industries, Bureau van Dijk uses a standard accounting template, which makes figures across industries directly comparable. This is obviously very helpful.[25]

Like mentioned earlier, I take into account the three largest shareholders since it is uncommon that Icelandic firms have more than three major shareholders. In fact, the sample shows that of the firms analyzed 47 have two shareholders (approximately 41%) and 27 firms have three shareholders or more (approximately 23.5%). When I test hypothesis 3 I will have a more thorough analysis of the distribution of shareholders within the examined firms. I sort the owners by placing the largest one first and then the second one, and lastly the smallest owner.

[24] See table 5.4 for the distribution of ownership among different types of owners.

[25] Although I am only focusing on a single country this is useful when comparing data from different industries.

The firms in the sample are labeled with an industry code according to the industry they operate within. The classification is based on an Icelandic industry classification system called ÍSAT and was provided to me with the financial information I obtained from Creditinfo. I use an industry dummy as a control variable for my sample and in order to make them more manageable I combine some of these categories. I refer to section 4.3.2 for a listing of the different industries.

All of the financial data is in Icelandic Krónas (ISK) for the non-listed firms, therefore when I obtain the financial information for the listed firms I change the values from U.S. dollars into ISK when appropriate[26].

4.2.1 Validity of the data

There is always a chance that the data from the *Orbis* database might not be 100% accurate for all of the firms. Although this might be the case, the errors should not be that large that they influence the overall result of the thesis.

In regards to the financial data from CreditInfo, I assume that the data is accurate although it can of course always be that this is not 100% the case. Again, I assume that any minor errors will not affect the overall results of this thesis.
Some of the existing literatures on the relationship between ownership structure and firm value are cross-country studies (e.g. Lemmon and Lins, 2003; Mitton, 2002), and according to Leung and Horwitz (2009) cross-country studies generally suffer from noisy variables, a high likelihood of an endogenous relationship between the dependent and explanatory variables, and severe correlated omitted-variables problems.[27] Miller (2004) suggests that it is better to focus on one country or region in order to control for the effect of factors that differ across countries and that this approach will lead to a better research design.

Like I discussed earlier, I do not include financial companies in my sample, which of course could create a bias, but since other scholars have extensively used this method,

[26] I use the average exchange rate for each year provided by the Central Bank of Iceland.
[27] Unrelated variables that could plausibly affect the dependent variable.

I assume that this does not have significant impact on the results. Also, eliminating companies with insufficient data could create a bias, but then again this was necessary and given the time and resource constraints, searching for the missing data elsewhere would have been too time consuming.

In order to measure control dilution I use a quite simple approach; i.e. the 50% cutoff. This method is based on Nagar *et al*. (2008) where they argue that this way it is guaranteed that no one shareholder has absolute control. The approach does, however, raise some concerns. One being that ownership of shares does not imply control since shares may have different voting rights. Despite of this, there is a justification for using this method when analyzing Icelandic companies since the general principle in Iceland is the aforementioned one-share/one-vote. Furthermore, this technique is strongly integrated in the corporate governance literature (e.g. Bennedsen and Wolfenson, 2000; Grossman and Hart, 1988; La Porta *et al.,* 1999). This gives me a justification for using the terms concentration of control and concentration of ownership interchangeably. Also, this cutoff is sensible when analyzing predominately close corporations since there are usually few owners who can easily block the decisions of smaller owners.

4.3 Variables

I use three different types of variables in this thesis – performance variables, control variables and ownership variables. Additionally, I use a number of dummy variables throughout my hypotheses testing. I will explain each group in more details below.

4.3.1 Performance variables

I use return on assets (ROA) as the main measure of performance. Gutiérrez and Tribó (2004) quote Gilson and Gordon (2003) when arguing for ROA being the best measure of performance when dealing with minority expropriation problems. Gilson and Gordon argue that the best opportunities for private benefit extractions are usually through direct dealings by the controlling shareholders with the controlled firm. This can be in the form of transfer pricing, transfer of assets from the controlled

corporation to the controlling shareholder etc. Accordingly, minority expropriation problems are likely to be reflected either in low revenues, excessive production costs or in the inefficient employment of assets and these factors will result in a reduction in margins or asset rotation, and will be reflected in a lower ROA. Furthermore, Claessens and Tzioumis (2006) argue that ROA reflects management efficiency in using the available assets to generate profit.

Return on assets is an indicator of how profitable a company is relative to its total assets and gives an idea of how efficient management is at using its assets to generate earnings. The formula for ROA is:

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

ROA can also be calculated by dividing EBIT by total assets but either way, the result is a percentage indicating the proportion of profit a company invests in assets.[28] As an example, if ROA is 25%, a company produces $1 of profit for every $4 it has invested in assets and consequently, the higher the ROA the better the management is in earning increasing profit on each dollar of investment.

ROA can vary substantially and is highly dependent on the industry and is best compared to firms operating within the same field. This is because some industries are very asset intensive and require a large initial asset investment in order to operate while others are less dependent on large asset investments. Due to this, it is necessary for me to create industry dummies as control variables in my regression analysis.

As an alternative performance measure I use return on equity (ROE). ROE measures a firm's profitability by showing how much profit a firm generates with the money shareholders have invested. It is calculated in the following way:

$$ROE = \frac{Net\ Income}{Equity}$$

[28] Information from: http://www.investopedia.com/articles/fundamental/04/012804.asp

Like ROA, ROE is useful for comparing the profitability of a firm to other firms operating within the same industry. ROE has also been used when analyzing the effects of ownership structure on firm performance by for example Santiago-Castro and Baek (2003) and Nogata *et al*. (2009).

I test all of my hypotheses two times - firstly with ROA as a performance measure, and secondly with ROE as a performance measure. If the results are different depending on the performance measure, I will make relevant comments when presenting the results.

ROA vs. ROE

ROA and ROE are both widely used performance measures for companies and both give a good insight into a company's financial structure and prosperity. ROA tells us how efficient a company is at earning returns per dollar of assets while ROE tells us how efficiently it uses the invested capital. Although both measures give the same indication, ROE tends to be more stable and give a more accurate income picture from period to period. The downside of ROE is that it does not take financial risk into consideration. The main difference between the two ratios is financial leverage. That is, since ROE only weighs net income against owners' equity it does not say much about how well a company uses its financing from borrowing and bonds. Such a company may deliver an impressive ROE without actually being more effective at using the shareholders equity for the company's growth. ROA, however, can help us see how well a company puts both these forms of financing to use since it is a denominator. Therefore it is important to look at both measures. If, for example, ROA is low or if a company is carrying a lot of debt, a high ROE can give investors a false impression about a company's fortune. In my sample, I made a random sample of companies with above-average ROE and saw that in many instances those companies also have above-average leverage. Moreover, it is worth mentioning that when I set up a correlation matrix a correlation of approximately 0.5 is found between the two measures, indicating that they do a fairly good job of describing the same pattern in relation to the independent variables.[29]

[29] Table 4.1 shows the correlation matrix.

4.3.2 Control variables

The control variables were selected in accordance to similar studies made on this topic (e.g. Gutiérrez and Tribó, 2004; Maury and Pajuste, 2005; Leung and Horwitz, 2009). The selected variables are firm size, financial leverage, tangibility of assets and firm age. These variables are selected because they have been shown to have simultaneous effect on both ownership structure and performance (Gutiérrez and Tribó, 2004).

Firm size is measured as the logarithm of assets and is included since it has been shown that size can affect firm performance and firm's ability to recover after financial crisis (Mitton, 2002). Larger firms are expected to be more difficult to monitor (Gutiérrez and Tribó, 2004) and according to Maury and Pajuste (2005) size is expected to have a negative effect on firm value since larger firms are in a more mature stage of their life cycle, thus smaller companies have better growth opportunities. On the other hand, Claessens *et al.* (2005) maintain that larger companies are less likely to suffer a financial distress, which should have a positive effect on firm value. Although I assume that size affects firm value negatively, it is difficult to predict beforehand the influence on company performance.

Leverage is measured by the book value of all long-term liabilities divided by total assets and is included because firms with high debt leverage should be more harmfully affected in times of financial distress. Although leverage can play a disciplinary role by limiting the free cash flow at hand it is also more difficult for highly leveraged firms to raise equity finance since they are more likely to experience sharper declines in equity value (Maury and Pajuste, 2005; Leung and Horwitz, 2009). Therefore, there is not a clear prediction of the relation between leverage and firm value but I expect it to be negative, especially after 2007.

Asset tangibility is calculated as the ratio of tangible assets divided by total assets. According to Maury and Pajuste (2005), it is likely that firms with lower asset tangibility generate most of their cash flow through a higher proportion of intangible assets (for example in the form of human capital). Moreover, according to Gutiérrez and Tribó (2004), firms with relatively high portion of intangible assets are

presumably more difficult to monitor and the higher the monitoring cost the more significant the private benefit extraction. Accordingly, I assume a negative relationship between asset tangibility and performance.

Age is simply 2009 minus the year of incorporation and the expected relationship is difficult to predict, although Gutiérrez and Tribó (2004) argue that younger firms should be more difficult to monitor since there is no past record of performance.

As a control variable I also include industry dummies, mainly because ROA and ROE are both industry dependent variables. Since the companies within my sample operate within numerous different industries.[30] I merge similar industries together so that the dummy variables are more manageable. After combining similar industries I end up with five different industry dummies, representing (1) *wholesale and retail, (2) finance and real estate, (3) travel and logistic, (4) energy, aluminum and chemicals* and *(5) agriculture.*

4.3.3 Ownership variables

For this part of the study I use the Bureau van Dijk's *Orbis* database, which contains ownership information on companies worldwide. I identify the ownership stakes of the largest owners in each firm, preferably the three largest stakes, but as discussed earlier not all of the firms have three owners, some have two and the majority has a single owner. I then classify each owner according to its identity, like I discussed previously.

In approximately 70% of the analyzed firms, the largest owner is an industrial company. Individuals or families represent the largest owner in approximately 19% of the firms. Financial companies or banks are the largest owners in approximately 5% of the firms. Mutual and pension fund/nominees/trust/trustee in approximately 2% of the firms and then private equity firms, insurance companies and other unnamed shareholders represent the largest owner in less than 1% of the firms.

[30] Icelandic companies are classified according to industries based on the ISAT classification system and this data was obtained from CreditInfo.

The second largest owner is an industrial company in more than 50% of the firms, individual or family in more than 30% of the firms, a financial company or a bank in more than 10% of the cases and a pension fund/nominees/trust/trustee and other unnamed shareholder in approximately 4% of the firms.

As for the third largest owner, again industrial companies represent the vast majority of this group, approximately 53%, individual or family is the second largest group approximately 28%, financial companies represent the third largest owner in more than 10% of the firms and mutual and pension fund/nominees/trust/trustee and self ownership represent approximately 7% of this group. For an overview of the largest owners please refer to the tables in section 5.1.

The Orbis database uses the *Independence Indicator* provided to classify firms according to their independence. Orbis grades firms with*: A+, A or A-* if no shareholder has more than 25% of direct or total ownership in a firm (i.e. independent companies), *B+, B or B-* if no shareholder is recorded with more than 50% of direct, indirect or total ownership or if one or more shareholders are recorded with more than 25% of direct or total ownership, *C+ or C* if no shareholder is recorded with more than 50% of direct ownership or if one shareholder is recorded with more than 50% of total ownership (i.e. indirectly majority owned companies), and lastly *D* if one shareholder is recorded with more than 50% of direct ownership (i.e. directly majority owned companies).[31] There was a considerable amount of firms that were marked *U,* indicating that the ownership structure was unknown, and those firms were eliminated from the sample. Although I do not directly use the A, B, C and D classification it was helpful for me in the beginning to use this categorization to get a better overview of how Orbis classifies the ownership structure of firms.

I take the ownership data from the last available point in time for each firm and assume that ownership structure does not change much over time. This is something that, for example, La Porta *et al.* (1999) assume as well. In order to see if this

[31] The signs next to the letters (+ / -) indicate the degree of certainty that Orbis puts on the accuracy of the classification, based on the number of identified shareholders. The sign + indicates very high certainty, while the sign – indicates low certainty.

assumption holds I made a few random tests where the A, B, C and D classification mentioned above came in handy. This way I could quickly grasp that ownership changed very little over the analyzed years.

4.3.4 Dummy variables

Throughout the hypotheses testing I use multiple dummy variables. In order to distinguish between different types of owners I use several dummies. I also use dummies for different sectors (industry dummies) that are included in all of the regressions. As for time effects, I also use year dummies. Table 2 in appendix 1 describes each dummy more thoroughly. Also, Table 2 in appendix 1 demonstrates all the variables used in the thesis.

4.4 Regression analysis

When running the regression analysis to test the hypotheses I use the Mac version of SAS, called JMP. Although a thorough description of regression analysis is beyond the scope of this thesis, I include a short introduction to the matter here.

Regression analysis is a method for measuring the relation between two or more variables; i.e. the dependent variable (in my case ROA and ROE) and the explanatory variables, and see whether the explanatory variables can be used to predict variations in the dependent variable. In my case, I have several explanatory variables and therefore use a multiple linear regression model, which can be written in the following way:

$$Y = ß_0 + ß_1X_1 + ß_2X_2 + \ldots + ß_nX_n + \varepsilon$$

Where Y represents the dependent variable, ß is a parameter estimate that explains variations in the dependent variables, X is represents the independent variables and ε denotes the error term (Gujarati, 2003).

The multiple linear regression model is an extension of the simple linear regression model, where a single explanatory variable is plotted against the dependent variable. This allows us to directly observe the linear tendency between the two variables. The least square approach is used to determine this line of best fit by squaring the distance between a data point and the regression line. This allows us to make a close approximation of this distance instead of having to solve an equation exactly. There will, however, always be some residual part since not all of the variation in the dependent variable can be described by the independent variables. The coefficient of determination, R^2, tells us how reliable the model is, i.e. how much the variation in the dependent variable is described by the independent variables. R^2 varies from 0 to 1, with 1 being a perfect fit and a very reliable model but 0 indicating an ill-fitting model.

I assume a normal distribution for my model with a mean of μ and a variance of σ^2. That is, μ is explained by the independent variables, the parameter estimates and the error term. When presenting the results of the regression models I am especially interested in the p-values since they give me the significance level of each β-parameter. I will also inform the reader of the significance of my results, i.e. whether the results are significant at the 1%, 5%, 10% or 25% level.

Multicollinearity

When we are dealing with a multiple regression model there is always a danger of multicollinearity; i.e. when two or more independent variables are highly correlated it is difficult to see which variable explains changes in the dependent variable. Therefore, the independent variables are collinear. When this happens, the overall p value is low, but at the same time the individual p values are high, indicating that the model fits the data well even though none of the independent variables has a significant impact on predicting Y. If multicollinearity is found within a given dataset the best approach is best to remove the unnecessary variable.

I have set up a correlation matrix to test for multicollinearity among the variables. Lind *et al.* (2008) argue that 0.7 is an upper limit for correlation coefficients. That is, if the correlation value exceeds 0.7 there is a concern for negative effects. The results

do not give a reason for concern since all of the values, aside from one, are below 0.7.[32] The matrix is presented in Table 4.1 below.

Table 4.1: The correlation matrix for the control variables and the dependent variables.

Correlation Coefficients Matrix

Sample size	11	*Critical value (2%)*	2.82144						
		ROA	*ROE*	*SIZE*	*LEVERAGE*	*ASSETS TANGIBILITY*	*Log_Age*	*Log HI_differen*	*Log HI_concentr*
ROA	**Pearson Correlation Coefficient**	*1.*							
	R Standard Error								
	t								
	p-value								
	H0 (2%)								
ROE	**Pearson Correlation Coefficient**	*0.52493*	*1.*						
	R Standard Error	*0.08049*							
	t	*1.85019*							
	p-value	*0.09732*							
	H0 (2%)	*accepted*							
SIZE	**Pearson Correlation Coefficient**	*-0.24298*	*-0.20247*	*1.*					
	R Standard Error	*0.10455*	*0.10656*						
	t	*-0.75145*	*-0.62027*						
	p-value	*0.47157*	*0.55046*						
	H0 (2%)	*accepted*	*accepted*						
LEVERAGE	**Pearson Correlation Coefficient**	*-0.51453*	*0.04496*	*0.2116*	*1.*				
	R Standard Error	*0.0817*	*0.11089*	*0.10614*					
	t	*-1.80015*	*0.13501*	*0.64952*					
	p-value	*0.10537*	*0.89557*	*0.53223*					
	H0 (2%)	*accepted*	*accepted*	*accepted*					
ASSETS TANGIBILITY	**Pearson Correlation Coefficient**	*-0.18126*	*-0.1966*	*0.60281*	*0.64444*	*1.*			
	R Standard Error	*0.10746*	*0.10682*	*0.07074*	*0.06497*				
	t	*-0.55295*	*-0.60153*	*2.26651*	*2.52836*				
	p-value	*0.59377*	*0.56233*	*0.04965*	*0.03232*				
	H0 (2%)	*accepted*	*accepted*	*accepted*	*accepted*				
Log_Age	**Pearson Correlation Coefficient**	*-0.57924*	*-0.54999*	*-0.18083*	*0.12893*	*-0.06924*	*1.*		
	R Standard Error	*0.07383*	*0.0775*	*0.10748*	*0.10926*	*0.11058*			
	t	*-2.13178*	*-1.97561*	*-0.55159*	*0.39005*	*-0.20823*			
	p-value	*0.06184*	*0.07962*	*0.59466*	*0.70557*	*0.83968*			
	H0 (2%)	*accepted*	*accepted*	*accepted*	*accepted*	*accepted*			
Log HI_differen	**Pearson Correlation Coefficient**	*0.29343*	*0.04355*	*0.49607*	*-0.20727*	*0.35393*	*-0.57018*	*1.*	
	R Standard Error	*0.10154*	*0.1109*	*0.08377*	*0.10634*	*0.09719*	*0.07499*		
	t	*0.92081*	*0.13079*	*1.71398*	*-0.63561*	*1.13526*	*-2.08219*		
	p-value	*0.38117*	*0.89882*	*0.12068*	*0.54085*	*0.28559*	*0.06703*		
	H0 (2%)	*accepted*	*accepted*	*accepted*	*accepted*	*accepted*	*accepted*		
Log HI_concentr	**Pearson Correlation Coefficient**	*0.34479*	*0.15059*	*0.40456*	*-0.13196*	*0.29401*	*-0.52667*	*0.89249*	*1.*
	R Standard Error	*0.0979*	*0.10859*	*0.09293*	*0.10918*	*0.10151*	*0.08029*	*0.02261*	
	t	*1.10193*	*0.45697*	*1.32714*	*-0.39936*	*0.92283*	*-1.85866*	*5.93581*	
	p-value	*0.29909*	*0.65852*	*0.21714*	*0.69894*	*0.38017*	*0.09602*	*0.00022*	
	H0 (2%)	*accepted*	*accepted*	*accepted*	*accepted*	*accepted*	*accepted*	*rejected*	

R

Variable vs. Variable	*R*
Log HI_concentr vs. Log HI_differen	0.89249
ASSETS TANGIBILITY vs. LEVERAGE	0.64444
ASSETS TANGIBILITY vs. SIZE	0.60281
Log_Age vs. ROA	-0.57924
Log HI_differen vs. Log_Age	-0.57018
Log_Age vs. ROE	-0.54999
Log HI_concentr vs. Log_Age	-0.52667
ROE vs. ROA	0.52493
LEVERAGE vs. ROA	-0.51453
Log HI_differen vs. SIZE	0.49607
Log HI_concentr vs. SIZE	0.40456
Log HI_differen vs. ASSETS TANGIBILITY	0.35393
Log HI_concentr vs. ROA	0.34479
Log HI_concentr vs. ASSETS TANGIBILITY	0.29401
Log HI_differen vs. ROA	0.29343
SIZE vs. ROA	-0.24298
LEVERAGE vs. SIZE	0.2116
Log HI_differen vs. LEVERAGE	-0.20727
SIZE vs. ROE	-0.20247
ASSETS TANGIBILITY vs. ROE	-0.1966
ASSETS TANGIBILITY vs. ROA	-0.18126
Log_Age vs. SIZE	-0.18083
Log HI_concentr vs. ROE	0.15059
Log HI_concentr vs. LEVERAGE	-0.13196
Log_Age vs. LEVERAGE	0.12893
Log_Age vs. ASSETS TANGIBILITY	-0.06924
LEVERAGE vs. ROE	0.04496
Log HI_differen vs. ROE	0.04355

I also use the *variance-inflating factor* (VIF) as another method of detecting multicollinearity. VIF shows the speed with which variance and covariance increase and how the variance of an estimator is inflated by the presence of multicollinearity (Gujarati, 2003). It is written in the following way:

[32] The two variables whose correlation is above 0.7 are the Herfindahl indexes used when testing the concentration of shareholders (cf. Hypothesis 4).

$$VIF = \frac{1}{1 - R_i^2}$$

As the extent of collinearity increases, the variance of an estimator increases and we can clearly see from the equation above that if there is no collinearity between X_2 and X_3 ($R^2 = 0$) VIF will be 1. The general rule is, that if VIF>5, there is fairly high multicollinearity and if it exceeds 10, a variable is said to be highly collinear. This will happen if R^2 exceeds 0.9 (Gujarati, 2003).

Heteroscedasticity

Although the classical linear regression model assumes that the variance of each disturbance term u_i is some constant number equal to σ^2 (i.e. the assumption of homoscedasticity), this is not always the case. Heteroscedasticity can arise because of several factors, for example because of the presence of outliers, because of an incorrectly specified regression model, or because of skewness in the distribution of one or more regressors included in the model. Since heteroscedasticity is more likely to be a problem in cross-sectional data than in time series data I will assume a constant variance, as well as a correctly specified regression model. In regards to the outliers, there are some extreme outliers in the ROE sample and because of this I cut out those outliers and find that the sample becomes much more realistic.

Robustness

Due to the small sample size and a single-country focus there is a chance that my results might not be as robust as they could be if the focus would be on a larger, cross-country sample. Kumar (2004) identifies three important issues in regards to robustness when analyzing the effect of ownership structure on firm performance. Firstly, whether the results are robust to the performance measure, secondly the issue of time dependence of the results and thirdly, the sample selection bias. Kumar (2004) argues that the relationship between firm value and ownership structure might differ depending on the value of the firm. Like I have discussed in previous sections I make several robustness tests such as removing extreme outliers and setting up a correlation matrix.

Since my sample is comparatively small, although it captures a relatively large share of the Icelandic market, there is an increased necessity for testing the precision of the parameters. To control for the robustness of the model I perform some sensitivity tests. Nagar *et al.* (2008) argue that for younger firms, ownership structure is more of an endogenous variable. This is because in older firms, ownership structure is likely to have been designed for past conditions while in relatively young firms, ownership structure has most likely risen in response to current conditions. I take this into account when I run the regressions and present the results in the end of chapter 5.

In my model, I assume that all the independent variables (Y's) have a constant variance of σ^2, meaning that the variation in ROA and ROE will be independent of the level of the performance measures. Like mentioned previously, I also assume that the mean of Y is μ and is a linear function of x and if this assumption holds, the plotted values should lie together but spread randomly around zero in the residual diagram. I will not make separate tests for this but assume that this holds for my model.

Endogeneity

Like I have mentioned several times before, the issue of ownership being an endogenous variable has raised the interest of some scholars (e.g. Liu *et al*., 2010; Leung and Horwitz 2009; Thomsen *et al*., 2006). Demsetz (1983) argues that ownership is an endogenous variable and that ownership structure has no equilibrium effect and Thomsen *et al*. (2006) state that studies that have treated ownership structure as an endogenous variables appear to be insignificant. Thus, using crisis periods to analyze whether ownership structure influences firm performance allows us to avoid the endogeneity problems that have apparently been troublesome for corporate governance researchers. This is because the suddenness of financial crisis makes it difficult for firms to quickly adjust their governance structures. This research should therefore have the potential of presenting a valuable source of information on ownership structure that does not suffer from endogenous issues.

5. ANALYSIS

In this section I go through the testing of the hypotheses presented in section three and how I use the regression analysis to test the variables presented in section four. In order to summarize my data set I start out by presenting the descriptive statistics, and then I present the results from my hypotheses.

5.1 Descriptive statistics

Before applying the regression analysis I summarize the mean, median and standard deviation for the dependent variables and the continuous explanatory variables. For the dummy variables, I present the relevant distribution.

Dependent variables: The mean of ROA is 9%, the median is 7% while the standard deviation is 0.19, see Table 5.1. These numbers appear to give a reasonably clear picture of ROA since there are no extreme outliers presented in return on assets. When looking at ROE on the other hand the mean is 68%, which is very high. The very high standard deviation (6.92) further supports this. The high average is due to outliers in the ROE sample and the median of 20% is closer to being the true ROE average. When I eliminate outliers from the ROE sample I get an approximate average of 26%. When I calculate the average for each year, ROA has the highest average in 2009 (12%) but the lowest in 2008 (7%), while ROE has the highest average in 2007 (31%) and the lowest in 2009 (25%).

Table 5.1: The summary statistics for the dependent variables used in the analysis.

	Mean	Median	St. dev.
ROA	0.09	0.07	0.19
ROE	0.68	0.20	6.92

The summary statistics for the control variables are presented in Table 5.2.

Table 5.2: The summary statistics for the control variables used in the analysis.

	Mean	Median	St. dev.
SIZE	6.04	6.04	1.01
LEVERAGE	0.36	0.30	0.35
ASSETS TANGIBILITY	0.51	0.56	0.32
AGE	17.89	13	17.19

Ownership variables: Table 5.3 shows the mean, median and standard deviation of the largest shareholder for all of the firms (labeled shareholder 1) and the mean, median and standard deviation for the second and third largest shareholders for the relevant firms. Out of the sample, approximately 41% of the firms have a second shareholder and approximately 24% of the firms have a third largest shareholder.

Table 5.3: The summary statistics for the three largest shareholders.

	Mean	Median	St. dev.
Shareh. 1	75.70%	98.00%	28.58%
Shareh. 2	28.96%	27.33%	15.26%
Shareh. 3	15.06%	12.07%	9.06%

Table 5.4 shows the distribution of the owner identities. As for the identities of the largest owners, industrial companies are the largest in all of the three shareholder groups, individuals or families the second largest and financial institutions or banks are the third largest owners in all of the groups. When there is more than one shareholder in a company, industrial companies are most often combined with other industrial companies as owners. The combination of industrial companies and families is also fairly common. When families are the largest owners, it is quite common that they are teamed up with other families as owners. This will be further elaborated on when I test hypothesis six.

Table 5.4: The summary statistics for the distribution of the identities of the largest owners.

	Largest	2nd largest	3rd largest
Industrial companies	71.30%	54.17%	53.57%
Individuals/families	19.13%	31.25%	28.57%
Financial/banks	5.22%	10.42%	10.71%
Other	4.35%	4.17%	71.43%

In the sample, approximately 67% of the firms have a large owner (defined as an owner with more than 50% ownership stake), and the rest, 33% have an owner with

smaller ownership stake. This tells us that 67% of the firms have a concentrated ownership structure while 33% has a dispersed structure, as it is defined for testing hypothesis one.

5.2 Regression analysis

In this section I will present the results from the regression analysis used to test the hypotheses discussed earlier. All the regressions are run with JMP, the Mac version of SAS. All the relevant regression results are presented in appendix 2. It should be noted here that for most of the regressions, the results for 2008 were insignificant and will therefore not be further elaborated on in the discussion of the results. Also, the results for the industry dummies are insignificant and therefore I do not discuss them any further.

5.2.1 Testing hypothesis 1

In my first hypothesis I theorize that firms where control is shared perform better than those with a single large shareholder. In order to test this I categorize the ownership stake of the largest owner into two categories: firms where there is no shareholder with more than 50% stake and those where there is a single shareholder with 51% stake or more. I am aware that this hypothesis is very broad since both categories are relatively large, and accordingly, when testing hypothesis 2, I will make similar tests on smaller stakeholders' groups in order to see if the same relationship holds when I divide the sample up to smaller groups. When testing hypothesis 2, I analyze whether this relationship is perhaps U-shaped – i.e. performance decreases as ownership gets more concentrated, but as concentration gets higher than 75%, performance starts to increase again (alignment effect).

Here, I create a dummy variable that takes the value of 1 when firms have dispersed ownership and the value of 0 when firms have concentrated ownership and regress it on the control variables discussed above.

I start out by testing this hypothesis with ROA as a dependent variable and find that the results for all years are insignificant; i.e. there does not appear to be a significant relationship between performance and ownership structure when I simply divide the sample up in the two broad groups and use ROA as a performance measure.

When I test hypothesis 1 with ROE as the dependent variable I get more interesting results, see Table 5.5. I can see that in 2007, firms with dispersed ownership show considerable worse performance than firms who have concentrated ownership ($p<0.05$). When I turn to 2009, however, I can see that performance is negatively related to ownership concentration in a more extreme manner than the positive relationship in 2007 ($p<0.05$).

Table 5.5: Regression results from testing the 0-50% vs. 51-100% concentration of shareholders on ROE for 2007 and 2009. P-values are presented in the parenthesis and the * indicates the significance level, where * p-value<0,1, ** indicates p-value<0,05, *** p-value<0,01.

	ROE	
VARIABLE	**2007**	**2009**
Disper_Dummy	-0.673**	0.740**
	(0.0262)	(0.0141)

These results are very interesting and in accordance with my predictions, indicating that when the crisis effect kicked in the expropriation effect became visible, probably due to worse monitoring mechanisms. Although it has been theorized that concentrated ownership can serve as a control mechanism at times of financial turmoil, this does not appear to be the case in Iceland. In firms with high concentration of ownership majority shareholders appear to have used weaker monitoring mechanisms to their advantage and expropriated minority shareholders at the cost of firm value. This finding is in accordance with the expropriation theory.

5.2.2 Testing Hypothesis 2

For hypothesis 2 I want to see if the *alignment effect* kicks in when the ownership level of the controlling shareholder is very high. That is, the incentives of the

controlling shareholder(s) are better aligned with the interests of minority shareholders when he or she has a very large (above 75%) ownership stake. This is why I created the aforementioned HIGHCON group where I place firms who have a shareholder owning more than 75% stake. Therefore, I include an additional dummy when testing hypothesis 2 representing the firms who have a single large shareholder with more than 75% stake. Since the 75% cutoff is not grounded in the theory (cf. Nagar *et al*, 2008) I also change the category from 75% to 80% and then back down to 70% in order to see if there is any difference in the results.

Here I also want to test the u-relationship discussed earlier – i.e. whether there is a negative relationship between firm performance and highly dispersed ownership (0-30%), a positive relationship when ownership increases above 30% and then again when we reach the 50% stake performance weakens again.

I start out by testing all the groups with ROA as the dependent variable. For the 0-30% and the 31-50% groups the results are insignificant in all the years. When I turn to the 51-75% group I find a significant positive relationship in 2009 at the 10% level ($p<0.10$). Although this finding is interesting and gives me a reason to believe that most of the bad expropriating effects come from firms within the HIGHCON group I am still reluctant to make drastic assumptions here. This is mostly because I have not obtained much significant results from ROA so far and these results appear to be somewhat far-fetched. For the last group, the one representing the 76-100% stake, there is an insignificant relationship in all the years. When I change the group to 70-100% I find a weak negative significant relationship in 2007 ($p<0.25$) but get insignificant results for the other years. Lastly, I change the groups' stake to 80-100% and find insignificant results. Accordingly, it does not appear to make much difference when I vary the stake of the last group by 5% up and down.

When I run the regression on ROE I find a clear negative relationship between performance and 0-30% ownership stake in 2007 ($p<0.05$), see Figure 5.1. Then again, in 2009 there is a very positive relationship between performance and an ownership stake in the 0-30% range ($p<0.01$). For the 31-50% and the 51-75% stake groups the results are insignificant for all years.

When I use ROE and test the most concentrated group (76-100%) I find a positive relationship with performance in 2007, which is in accordance with what I found out when I tested hypothesis 1. This relationship is significant at the 5% level ($p<0.05$). When I test for 2007 and move the stake down to 70-100% and 85-100%, both results are significant although only at the 10% level.[33] Again, when I run the regression for the most concentrated group for 2009, I get a significant ($p<0.05$) negative result, similar to the findings in hypothesis 1. The results are also significant for the 70-100% and the 85-100% groups.

These findings are in accordance with what I found when testing hypothesis 1 and gives me a reason to believe that the two extremes, 0-30% and 76-100%, have the most explanatory power for the whole sample. That is, the firms within these two groups show the most visible trend and the firms within the other two groups weaken the explanatory power of the regression results. This is further confirmed by the p-value ($p<0.01$) for the 0-30% group in 2009 *vs.* a p-value at the 5% level for the 0-50% group in the same year.

The results discussed above are shown in Figure 5.1.

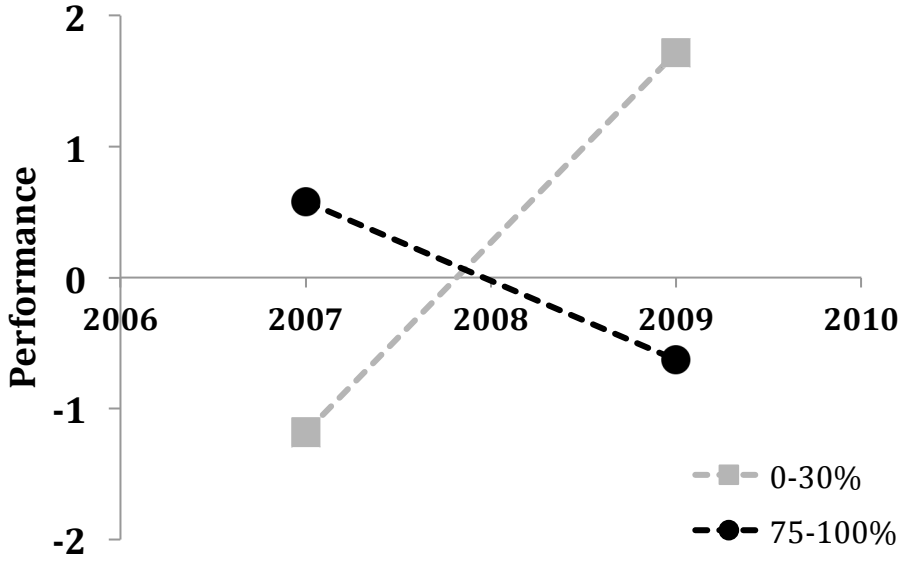

Figure 5.1: The relationship between firm value (ROE) and the two extreme groups; 0-30% and 76-100%, for 2007 and 2009.

[33] Regression results not presented

From the results discussed above it is clear that the aforementioned u-relationship does not hold for my sample, which is relatively easy to understand since it was initially developed for managerial ownership. If I had found that the alignment effect had kicked in after the onset of the crisis for the 76-100% group it would have made my results for 2009 in hypothesis 1 biased. This is because the majority of the 51-100% group is made up of firms with very high concentration of ownership and it would have made little sense if the negative effect of ownership concentration in 2009 would have mainly been from the 51-75% group, which makes up a relatively low portion of the whole sample, and that the 76-100% group would have been positively related to performance.

5.2.3 Testing Hypothesis 3

For hypothesis 3 I assume that firms in Iceland are either have a single large shareholder (defined as a shareholder with more than 50% stake), or several medium-sized blockholders (defined as a shareholder holding more than 10% stake).

When I divide my sample to see if hypothesis 3 holds, I find that the single large shareholder group takes up 59.13% of the sample and the group of several medium-sized blockholders takes up 30.43% of the sample. From this it is clear that the majority of the firms constitute the aforementioned assumption made in hypothesis 3. There is, however, another group that takes up the rest of the sample, consisting of firms with one large shareholder (with <50% stake) followed by another small shareholder. This group represents 10.43% of the sample.

These results somewhat support my hypotheses that the majority of firms in Iceland have an ownership structure that represents the governance problems that close corporations commonly suffer from; i.e. the one between minority and majority shareholders. I do, however, believe that the group of several medium-sized blockholders includes firms who do not suffer from this conflict of interest between minority and majority shareholders. The hypotheses is based on a study made in a Spanish context (cf. Gutiérrez and Tribó, 2004) and it is likely that it is more common

in Spain than in Iceland that several medium-sized shareholders form a coalition for control.

5.2.4 Testing Hypothesis 4

Hypothesis 4 states that an increase in the contestability of the controlling shareholder's power affects firm value positively as opposed to firms where there is a single controlling shareholder. Here I use the Herfindahl index (HI_differences), measured by the sum of squares of the differences between the first and the second largest voting stakes, and the second and the third largest voting stakes, and the HI_concentration measure, which is calculated as the sum of squares of the three largest voting stakes. Both measures are assumed to be negatively associated with performance. In order to control for skewness I transform both measures into logarithms. If HI_differences is zero, the log(HI_differences) is set equal to the lowest value of log(HI_differences) among all other observations. There are four cases of this in my sample.

When I run the regression with ROA as the dependent variable I get insignificant results for all the years.

When I run the regression with ROE as the dependent variable I see a positive relationship between HI_Diff and HI_Conc and performance in 2007, indicating that the more concentrated the ownership is and the more concentration among shareholders, the better the firm performance, see Table 5.6. In 2009, however, there is a negative relationship between firm performance and ownership concentration and shareholder concentration. This further supports the findings from hypothesis 1 and 2.

Table 5.6: Regression results from testing the concentration of shareholders with the Herfindahl indexes on ROE for 2007 and 2009. P-values are presented in the parenthesis and the * indicates the significance level. * p-value<0,1 and ** p-value<0,05., *** p-value<0,01.

	ROE	
VARIABLE	**2007**	**2009**
HI_Diff	0.39*	-0.375*
	(0.063)	(0.0727)
HI_Conc	1.152**	-1.223**
	(0.0094)	(0.0054)

Although there are relatively few shareholders in most firms I still want to include a regression where I take into account the number of shareholders, since the Herfindahl indexes only account for the three largest shareholders. I do this by creating a continuous variable representing the number of shareholders that is multiplied with the Herdindahl indexes. The results are different from the original results and indicate that the two herfindahl indexes have different effects on performance; i.e. HI_differences is negatively related to performance in 2007, while HI_concentration is positively related to performance ($p<0.05$). On the other hand, in 2009, HI_differences is positively related to performance while HI_concentration and performance are negatively related ($p<0.05$). In my sample, less than 14% of the firms have more than three shareholders and therefore it is likely that combining the Herfindahl indexes with the number of shareholders makes the results biased. This is because the firms who have more than three shareholders are all performing relatively well and have low herfindahl indexes before I multiply them with the number of shareholders. However, after the multiplication these low indexes become relatively high and the values more spread.

The number of shareholders is negatively related to performance in 2007 and positively related to performance in 2009.

5.2.6 Testing Hypothesis 5

My fifth hypothesis analyzes the identity of the three largest shareholders and whether shareholder's characteristics affect firm performance. I perform this analysis on the three main shareholder types, *industrial firms, family firms, financial firms* and *banks,* and created a variable for each type. Financial firms and banks are combined and represent a single group. I also test for the combination of shareholders – e.g. does it affect performance negatively if two families are among the three largest shareholders or if two industrial companies are among the three largest shareholders.

I start out by testing for the effects of having an industrial company as the largest shareholder. I use a dummy, which takes the value of 1 if firms have industrial companies as a largest owner and zero otherwise.

When I run the regression with ROA as the dependent variable, the results are insignificant. ROE on the other hand shows a positive relationship between firm value and industrial companies as the largest shareholder in 2007 ($p<0.25$) and a negative relationship between the two variables in 2009 (again, $p<0.25$), see Table 5.7.

Table 5.7: Regression results from testing the effects of having an industrial firm as the largest owner on ROE for 2007 and 2009. P-values are presented in the parenthesis and the * indicates the significance level. * p-value<0,1, ** p-value<0,05, *** p-value<0,01. These results are significant on the 25% level.

	ROE	
VARIABLE	**2007**	**2009**
Industr_firm_dummy	0.45	-0.449
	(0.1491)	(0.1496)

Since it is difficult to make clear assumptions from these regression results I also run the regression without including a year dummy in order to see the overall results over the whole period. This gives me a significant ($p<0.1$) and positive relationship showing that the overall effect of having a firm as the largest owner has a positive effect on performance. If, however, I look at the results when taking the year

dummies into account it is evident that having a firm as the largest owner was beneficial before the crisis, but after the onset of the crisis these benefits turned into disadvantages.

Next I test for the effects of having families as the largest shareholder. For 2007, ROA is negative and slightly significant (almost at the 25% level) while the other years are insignificant. ROE is also negatively significant in 2007 when I test for the effects of family ownership on performance ($p<0.05$), see Table 5.8. On the other hand, when I turn to 2009, there is a positive relationship between families as owners and performance ($p<0.1$).

Table 5.8: Regression results from testing the effects of family ownership on ROE for 2007 and 2009. P-values are presented in the parenthesis and the * indicates the significance level. * p-value<0,1, ** p-value<0,05, *** p-value<0,01

	ROE	
VARIABLE	**2007**	**2009**
Family_dummy	-0.729**	0.684*
	(0.045)	(0.0581)

This indicates that families do not engage in expropriating behavior but serve as a monitoring mechanism in periods of economic instability. There are several plausible reasons for the negative effect of family ownership before the crisis. In section 3.1.6 I discussed the possible outcomes of family ownership based on what different scholars had found where some find a negative relationship between the two variables, while others find a positive one. It can be that during economic stability, families are not the best owners, but when times get tough they come together and family ownership serves as a control mechanism. In this relation it will also be interesting to see if having two families as the largest owners influences performance and this will be done shortly.

When I run the regression to test for the effects of having financial institutions and banks as the main owners, the results are insignificant for both ROA and ROE. In order to see if pooling financial institutions and banks together makes the results

biased I also test each group separately, but also get insignificant results. The plausible reason for this is how few firms were controlled by financial institutions and consequently there is no clear pattern.

Looking at instances when there are two industrial firms among the largest owners, the results for ROA are significantly negative in 2009 ($p<0.25$). The same applies when I use ROE as a dependent variable where there is an even more dramatic negative relationship between performance and two industrial firms as owners ($p<0.25$). The results for the other years are insignificant. This supports what I found before when analyzing the effects of having a single firm the largest owner and further indicates that firm ownership was bad after the onset of the crisis – perhaps because many of the firms who were owners were financial distressed as well.

ROA shows insignificant results when I test for the relationship between performance and two families as the largest owners. The effect of having two families among the largest owners shows a strong negative relationship with performance in 2007 when I use ROE as the dependent variable ($p<0.05$). In 2008, there is a slightly weaker negative relationship ($p<0.25$) and in 2009 there is a very strong positive relationship between two families as the largest owners and performance ($p=0.0001$). The results are shown in Table 5.9 below.

Table 5.9: Regression results from testing the effects of having two families among the largest shareholders on ROE for 2007 and 2009. P-values are presented in the parenthesis and the * indicates the significance level. * p-value<0,1, ** p-value<0,05, *** p-value<0,01.

	ROE	
VARIABLE	**2007**	**2009**
Two_family_dummy	-1.139**	1.824***
	(0.0189)	(0.0001)

These results show that when two families are the largest owners it has a significant positive influence on performance after the onset of the crisis, while two families negatively affect firm value before the crisis. This further indicates that families serve as a control mechanism at times of economic turmoil.

5.2.7 Testing Hypothesis 6

For hypothesis six I want to see if cross ownership affects firm performance negatively. To do this I create a dummy that takes the value of 1 if firms are owned through cross ownership and 0 otherwise.

ROA shows a slight positive relationship between cross-ownership and performance in 2007 ($p<0.25$) and a slight negative relationship between the two in 2008 ($p<0.25$) and 2009, although the relationship in 2009 is only significant at the 50% level.

When I use ROE to test for the effects of cross-ownership I find the same pattern but much more extreme; i.e. a strong positive relationship in 2007 ($p<0.25$) and a strong negative relationship between firm performance and cross-ownership in 2008 and 2009 ($p<0.25$). These results are in accordance with my predictions and further indicate that firms involved in cross-ownership were the ones who were hit the earliest by the bad crisis effects, due to the negative effects in 2008.

5.2.8 Concluding remarks on hypotheses

In Figure 5.2 I have gathered the numerical conclusions from the tested hypotheses presented above which demonstrates selected significant results. Although the figure does not include the significance levels it still gives a good picture of how each variable influences performance in both 2007 and 2009, right before and right after the financial crises started in Iceland. The conclusions are clear: Before the crises, concentrated ownership and firms owned by industrial firms perform well whereas firms with dispersed ownership and family firms perform worse. After the crises, however, this has completely switched where the firms with concentrated ownership and those owned by industrial firms perform badly and the firms with dispersed ownership and family owned firms perform better.

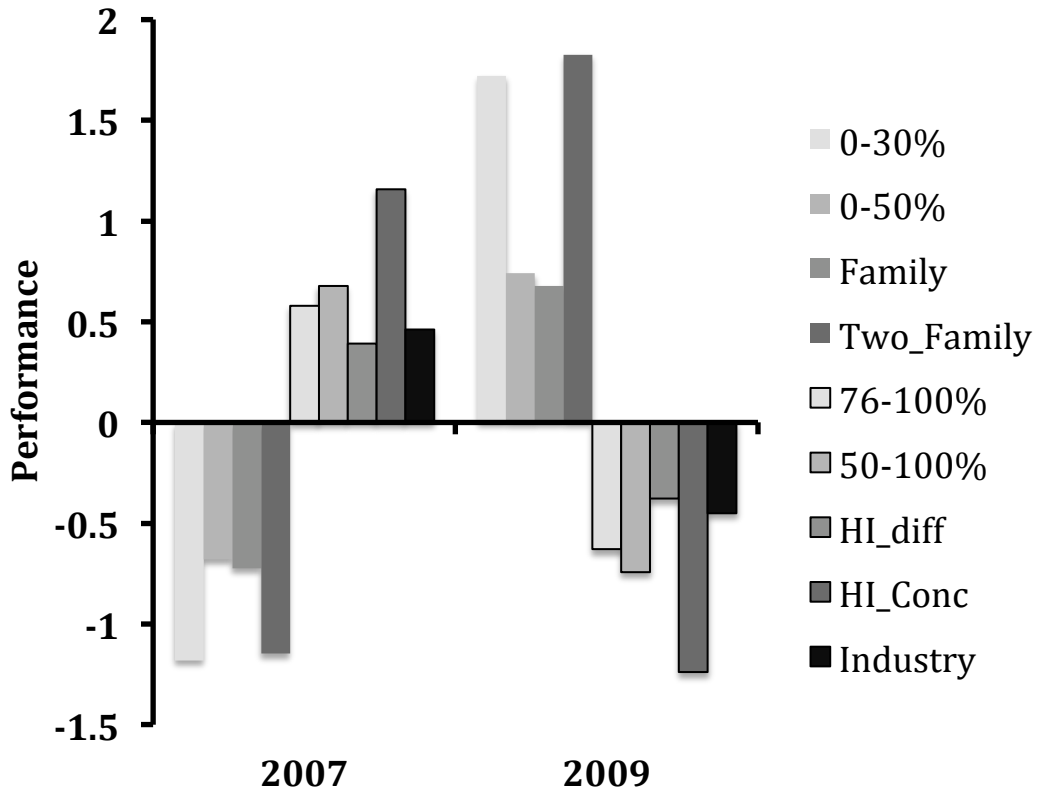

Figure 5.2: A demonstration of the relationship between selected significant variables and ROE in 2007 and 2009.

As I mentioned in section 3.3 I collected data on CEO duality and female representatives on boards of directors although I do not directly include the results in the thesis. I do, however, want to quickly mention the results here.

To begin with, I simply wanted to analyze whether the composition of boards had an effect on firm performance and I decided to both test for the presence of female representatives on the board of directors, as well as CEO duality; i.e. when the CEO of a company is also a member of the board of directors. I start out by testing for the effect of female representatives on the board of directors, i.e. I create a dummy that takes the value of 1 if there is a female representative and 0 otherwise. The results are insignificant for both ROA and ROE. I then test for the effects of CEO duality on performance where I also create a dummy that takes the value of 1 if there is CEO duality and 0 otherwise. For ROA I get insignificant results while the results are somewhat of a question mark when I use ROE as the dependent variable. In 2007 the results are not significant. Then, in 2008 I get a strong positive relationship between CEO duality and performance ($p<0.1$) while in 2009, there is a strong negative

relationship between the two variables (this is however only significant at the 25% level). Table 5.10 demonstrates the results.

Table 5.10: Regression results from testing the effect of CEO duality on ROE for 2008 and 2009. P-values are presented in the parenthesis and the * indicates the significance level where * is p-value<0,1, ** p-value<0,05, *** p-value<0,01.

	ROE	
VARIABLE	**2008**	**2009**
Duality_dummy	0.74*	-0.521
	(0.076)	(0.22)

I also see if it makes a difference when I remove all firms from the sample that are seven years or younger in order to control for the aforementioned endogeneity of ownership. When I run the regression with ROE I get the same results as before but more extreme numbers in most of the cases, indicating that younger firms have some influence on the whole sample although the trend among the variables is mostly the same. Lastly, I decided to run a regression to see if listed firms outperformed their non-listed peers but did not get significant results.

6. CONCLUSION

The vast majority of Icelandic firms are non-listed with a high concentration of ownership. These firms usually have a small number of shareholders and my findings show that the dominant ownership structure in Icelandic firms is representative of the possible corporate governance issues that close corporations face; i.e. conflicts of interest between minority and majority shareholders. It is interesting to consider why firms have chosen the ownership that prevails among Icelandic firms. Is it planned beforehand in order to have majority control, or is it simply something that happened along the way since, I assume, that many Icelandic firms started out as small family firms and then grew big during the economic boom in Iceland. It can well be that the latter is the case. That is, that Icelandic firms simply did not pay much attention to governance practices and were careless in regards to adequate governance standards, and then when the crisis hit, those firms with high concentration of ownership got hit harder due to this lack of satisfactory governance mechanisms.

My findings show that ownership structure has considerable impact on firm performance at times of crisis since performance changes significantly in relation to ownership structure, with firm value being negatively related to ownership concentration after the onset of the financial crisis. This applies both when I divide my sample up to two broad groups, i.e. 0-50% and 51-100%, as well as when I divide the sample up into smaller sub-groups. My findings also show that as the contestability of the largest shareholder increases, it positively affects firm value after the onset of the crisis, and the same applies to the number of shareholders. The identity of the largest owner(s) also has an impact on firm performance. The results show that family ownership is positively related to performance after the beginning of the crisis and the same applies to two families in the circle of largest owners. Firm ownership, on the other hand, is negatively related to performance after the crisis hit Iceland. This could imply that the family firms that did not grow big during the boom were not hit as hard when the crisis hit Iceland, or it could imply that families stick together and do a good job of protecting firm value during a financial crisis. As for cross-ownership, the results are similar to what I predicted, i.e. negative impact on firm performance after the onset of the crisis. Also, the positive influence of cross-ownership before the crisis started is not surprising since some of the firms included

in that sample embraced risk-taking and aimed high when the economy blossomed in Iceland.

Overall, my findings are in accordance with what I initially predicted, although I am surprised by how extreme the effect of ownership is on firm performance at times of financial crisis. Although the crisis in Iceland has been a devastating event, I must say that getting the chance to analyze this relationship at this point in time is extremely valuable.

7. SUGGESTIONS FOR FURTHER RESEARCH

In light of the recent financial scandals and difficulties among firms operating in Iceland, it has become increasingly common that winding-up committees and banks take over companies in distress. This could be interesting to look at in relation to the so-called *'zombie firms'* (inefficient firms that Japanese banks have supported financially) that emerged in Japan in the 1990s and contributed to the prolonged weak economic situation within the country. It is important that banks are aware of that short-term growth that might be found in taking over a firm in distress, do not compensate for the possible outcome if Iceland turns into a zombie-firm-land. An analysis of bank ownership and firm value after the crisis is something to pay close attention to and could be an interesting topic for further research.

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APPENDICES

APPENDIX 1

Tables

Table 1 shows the financial development in Iceland from 1979 and up until the privatization of the banks.

Event	*Year*
Financial Indexation Permitted	1979
Liberalization of domestic bank rates	1984-1986
Iceland Stock Exchange established	1985
Interest Rate Act: Interest rates fully liberalized	1987
Stepwise liberalization of capital movement begins	1990
Treasury overdraft facility in the Central Bank closed	1992-1993
New foreign exchange regulations marks the beginning of the liberalization of cross-boarder capital movements	1992
Interbank market for foreign exchange established	1993
Iceland becomes a founding member of the EEA	1994
Long term capital movements fully liberalized	1994
Short term capital movements fully liberalized	1995
Foreign direct investment liberalized in accordance with EEA agreement	1995
Interbank money market	1998
Interbank FX swap market	2001
Privatization of state owned banks completed	2003

Table 2: A list of all the variables used.

Variables	Description
ROA	Net income/total assets
ROE	Net income/total equity
Size	Log of total assets
Leverage	Long-term liabilities divided by total assets
Asset tangibility	Ratio of tangible assets divided by total assets
Firm age	Log of firm's age
HI_differences	$(shrdir1-shrdir2)^2 + (shrdir2-shrdir3)^2$
HI_concentration	(shrdir1+shrdir2+shrdir3)^2
Total shareholders	Continuous variable for the number of shareholders in each firm
Year dummies	Dummy variable representing each year that takes the value of one for the year under investigation and zero otherwise
Dispersed dummy	Dummy that takes the value of one if a firm has no shareholder with majority control and zero otherwise
0-30% dummy	Dummy that takes the value of one if the largest owner has a 0-30% stake and zero otherwise
31-50% dummy	Dummy that takes the value of one if the largest owner has a 31-50% stake and zero otherwise
51-75% dummy	Dummy that takes the value of one if the largest owner has a 51-75% stake and zero otherwise
76-100% dummy	Dummy that takes the value of one if the largest owner has a 76-100% stake and zero otherwise
Industrial dummy	Dummy variable that takes the value of one if the largest owner is an industrial firm and zero otherwise
Family dummy	Dummy variable that takes the value of one if the largest owner is a family and zero otherwise
Financial dummy	Dummy variable that takes the value of one if the largest owner is financial institution and zero otherwise
Two family dummy	Dummy variable that takes the value of one if two families are among the largest owners and zero otherwise
Two industrial dummy	Dummy variable that takes the value of one if two industrial firms are among the largest owners and zero otherwise
Cross dummy	Dummy variables that takes the value of one if a firm is identified as having a cross-ownership and zero otherwise

Appendix 2

2.1 Regression results for hypothesis 1

Results for ROA

Response ROA

Summary of Fit

RSquare	0.109894
RSquare Adj	0.091183
Root Mean Square Error	0.182934
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.375833	0.196548	5.8732
Error	333	11.143830	0.033465	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2620552	0.056532	4.64	<.0001*	.
SIZE	-0.022119	0.009357	-2.36	0.0187*	1.3144661
LEVERAGE	0.0227033	0.033178	0.68	0.4943	1.3688662
ASSETS TANGIBILITY	-0.151569	0.039986	-3.79	0.0002*	1.6815823
Log_Age	0.0384163	0.024925	1.54	0.1242	1.0543543
H1_Testing	-0.008875	0.021972	-0.40	0.6865	1.0698221
Year dummy_2007	-0.009002	0.02113	-0.43	0.6704	1.0125121
(H1_Testing-0.31965)*(Year dummy_2007-0.33431)	0.0320606	0.045039	0.71	0.4771	1.0044098

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.115513
RSquare Adj	0.09692
Root Mean Square Error	0.182356
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.446178	0.206597	6.2127
Error	333	11.073485	0.033254	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2691701	0.055965	4.81	<.0001*	.
SIZE	-0.021815	0.009315	-2.34	0.0198*	1.3110101
LEVERAGE	0.026626	0.032954	0.81	0.4197	1.3590511
ASSETS TANGIBILITY	-0.154427	0.039726	-3.89	0.0001*	1.6703673
Log_Age	0.0384186	0.024845	1.55	0.1230	1.0542417
H1_Testing	-0.010273	0.021909	-0.47	0.6395	1.0704384
Year dummy_2008	-0.035045	0.021099	-1.66	0.0977	1.0068538
(H1_Testing-0.31965)*(Year dummy_2008-0.32845)	-0.011417	0.045443	-0.25	0.8018	1.0013391

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.120119
RSquare Adj	0.101624
Root Mean Square Error	0.18188
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.503856	0.214837	6.4944
Error	333	11.015808	0.033081	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	332	11.014008	0.033175	18.4304
Pure Error	1	0.001800	0.001800	Prob > F
Total Error	333	11.015808		0.1840
				Max RSq
				0.9999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2467205	0.055784	4.42	<.0001*	.
SIZE	-0.022776	0.009296	-2.45	0.0148*	1.3124655
LEVERAGE	0.0225272	0.032883	0.69	0.4938	1.3602304
ASSETS TANGIBILITY	-0.148617	0.039671	-3.75	0.0002*	1.6744692
Log_Age	0.0389585	0.024782	1.57	0.1169	1.0543796
H1_Testing	-0.00928	0.021836	-0.42	0.6711	1.068918
Year dummy_2009	0.0433927	0.02087	2.08	0.0384*	1.0034941
(H1_Testing-0.31965)*(Year dummy_2009-0.33724)	-0.022955	0.044642	-0.51	0.6075	1.0070637

Effect Tests

Effect Details

Results for ROE

Response ROE

Summary of Fit

RSquare	0.021414
RSquare Adj	0.000843
Root Mean Square Error	1.224626
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	10.92834	1.56119	1.0410
Error	333	499.40293	1.49971	Prob > F
C. Total	340	510.33127		0.4021

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3820916	0.378444	1.01	0.3134	.
SIZE	0.0249156	0.062639	0.40	0.6911	1.3144661
LEVERAGE	-0.0658	0.222105	-0.30	0.7672	1.3688662
ASSETS TANGIBILITY	-0.253555	0.26768	-0.95	0.3442	1.6815823
Log_Age	-0.126057	0.166857	-0.76	0.4505	1.0543543
H1_Testing	0.0515273	0.147089	0.35	0.7263	1.0698221
Year dummy_2007	0.0528032	0.141454	0.37	0.7092	1.0125121
(H1_Testing-0.31965)*(Year dummy_2007-0.33431)	-0.673158	0.301509	-2.23	0.0262*	1.0044098

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.006519
RSquare Adj	-0.01436
Root Mean Square Error	1.233911
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.32698	0.47528	0.3122
Error	333	507.00429	1.52254	Prob > F
C. Total	340	510.33127		0.9483

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3854241	0.378689	1.02	0.3095	.
SIZE	0.0267245	0.063031	0.42	0.6718	1.3110101
LEVERAGE	-0.043849	0.222985	-0.20	0.8442	1.3590511
ASSETS TANGIBILITY	-0.259116	0.268808	-0.96	0.3358	1.6703673
Log_Age	-0.126716	0.168113	-0.75	0.4515	1.0542417
H1_Testing	0.0476693	0.148247	0.32	0.7480	1.0704384
Year dummy_2008	-0.004486	0.142764	-0.03	0.9750	1.0068538
(H1_Testing-0.31965)*(Year dummy_2008-0.32845)	-0.072664	0.307488	-0.24	0.8133	1.0013391

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.024539
RSquare Adj	0.004034
Root Mean Square Error	1.222669
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	12.52319	1.78903	1.1967
Error	333	497.80809	1.49492	Prob > F
C. Total	340	510.33127		0.3040

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	332	497.78389	1.49935	61.9566
Pure Error	1	0.02420	0.02420	Prob > F
Total Error	333	497.80809		0.1010
				Max RSq
				1.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4070417	0.375004	1.09	0.2785	.
SIZE	0.0267489	0.062491	0.43	0.6689	1.3124655
LEVERAGE	-0.085787	0.221049	-0.39	0.6982	1.3602304
ASSETS TANGIBILITY	-0.245502	0.266686	-0.92	0.3579	1.6744692
Log_Age	-0.126959	0.166592	-0.76	0.4465	1.0543796
H1_Testing	0.0485489	0.146792	0.33	0.7411	1.068918
Year dummy_2009	-0.052027	0.140294	-0.37	0.7110	1.0034941
(H1_Testing-0.31965)*(Year dummy_2009-0.33724)	0.7405327	0.300101	2.47	0.0141*	1.0070637

Effect Tests

Effect Details

2.2 Regressions for hypothesis 2

0-30% ROA

Response ROA

Summary of Fit

RSquare	0.108805
RSquare Adj	0.090072
Root Mean Square Error	0.183046
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.362207	0.194601	5.8080
Error	333	11.157457	0.033506	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2618388	0.056514	4.63	<.0001*	.
SIZE	-0.022516	0.009364	-2.40	0.0167*	1.3147159
LEVERAGE	0.0186864	0.032643	0.57	0.5674	1.3234695
ASSETS TANGIBILITY	-0.147465	0.039347	-3.75	0.0002*	1.6262511
Log_Age	0.038543	0.025242	1.53	0.1277	1.0800054
Year dummy_2007	-0.009197	0.021136	-0.44	0.6638	1.0118081
H2_0-30%	-0.012083	0.040506	-0.30	0.7657	1.0503171
(Year dummy_2007-0.33431)*(H2_0-30%-0.06745)	-0.033059	0.083056	-0.40	0.6909	1.0010279

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.116037
RSquare Adj	0.097455
Root Mean Square Error	0.182302
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.452743	0.207535	6.2447
Error	333	11.066920	0.033234	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2682898	0.055891	4.80	<.0001*	.
SIZE	-0.022206	0.009315	-2.38	0.0177*	1.3116964
LEVERAGE	0.0240877	0.032448	0.74	0.4584	1.3183613
ASSETS TANGIBILITY	-0.150566	0.039071	-3.85	0.0001*	1.6166545
Log_Age	0.0381798	0.025139	1.52	0.1298	1.0800163
H2_0-30%	-0.01206	0.040382	-0.30	0.7654	1.0524372
Year dummy_2008	-0.034556	0.021079	-1.64	0.1021	1.0055537
(H2_0-30%-0.06745)*(Year dummy_2008-0.32845)	0.0518284	0.085456	0.61	0.5446	1.0032167

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.119354
RSquare Adj	0.100842
Root Mean Square Error	0.18196
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.494277	0.213468	6.4474
Error	333	11.025387	0.033109	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	332	11.023587	0.033204	18.4464
Pure Error	1	0.001800	0.001800	Prob > F
Total Error	333	11.025387		0.1840
				Max RSq
				0.9999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.245513	0.055761	4.40	<.0001*	.
SIZE	-0.023084	0.009304	-2.48	0.0136*	1.3135325
LEVERAGE	0.0186754	0.032318	0.58	0.5637	1.3127657
ASSETS TANGIBILITY	-0.144364	0.039044	-3.70	0.0003*	1.6204852
Log_Age	0.0391387	0.02509	1.56	0.1197	1.0798376
H2_0-30%	-0.01324	0.040261	-0.33	0.7425	1.0500787
Year dummy_2009	0.0433021	0.020878	2.07	0.0388*	1.0034495
(H2_0-30%-0.06745)*(Year dummy_2009-0.33724)	-0.01739	0.082557	-0.21	0.8333	1.000928

Effect Tests

Effect Details

31-50% ROA

Response ROA

Summary of Fit

RSquare	0.110583
RSquare Adj	0.091887
Root Mean Square Error	0.182863
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.384467	0.197781	5.9147
Error	333	11.135197	0.033439	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.261461	0.05651	4.63	<.0001*	.
SIZE	-0.022009	0.009391	-2.34	0.0197*	1.3250722
LEVERAGE	0.0220345	0.033146	0.66	0.5067	1.3672642
ASSETS TANGIBILITY	-0.151151	0.040669	-3.72	0.0002*	1.740913
Log_Age	0.0369052	0.024643	1.50	0.1352	1.0314212
H2_30-50%	-0.005287	0.024248	-0.22	0.8275	1.0766377
Year dummy_2007	-0.009043	0.021123	-0.43	0.6689	1.0126159
(H2_30-50%-0.2346)*(Year dummy_2007-0.33431)	0.0464512	0.049562	0.94	0.3493	1.0043026

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.115981
RSquare Adj	0.097398
Root Mean Square Error	0.182308
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.452044	0.207435	6.2413
Error	333	11.067619	0.033236	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2686565	0.055949	4.80	<.0001*	.
SIZE	-0.021701	0.009349	-2.32	0.0209*	1.3211629
LEVERAGE	0.0251576	0.032927	0.76	0.4454	1.3575581
ASSETS TANGIBILITY	-0.153715	0.040405	-3.80	0.0002*	1.7288485
Log_Age	0.0367291	0.024566	1.50	0.1358	1.0312336
H2_30-50%	-0.006768	0.024178	-0.28	0.7797	1.0769702
Year dummy_2008	-0.034943	0.021088	-1.66	0.0985	1.0063697
(H2_30-50%-0.2346)*(Year dummy_2008-0.32845)	-0.031057	0.050086	-0.62	0.5356	1.0014933

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.119429
RSquare Adj	0.100918
Root Mean Square Error	0.181952
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.495209	0.213601	6.4519
Error	333	11.024454	0.033106	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	332	11.022654	0.033201	18.4449
Pure Error	1	0.001800	0.001800	Prob > F
Total Error	333	11.024454		0.1840
				Max RSq
				0.9999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.24615	0.055817	4.41	<.0001*	.
SIZE	-0.0227	0.009336	-2.43	0.0156*	1.3228583
LEVERAGE	0.0210004	0.032884	0.64	0.5235	1.3593139
ASSETS TANGIBILITY	-0.147723	0.040379	-3.66	0.0003*	1.7333915
Log_Age	0.0375336	0.024518	1.53	0.1268	1.0312399
H2_30-50%	-0.005293	0.024116	-0.22	0.8264	1.0756124
Year dummy_2009	0.0432829	0.020877	2.07	0.0389*	1.0033977
(H2_30-50%-0.2346)*(Year dummy_2009-0.33724)	-0.018001	0.049061	-0.37	0.7139	1.0076167

Effect Tests

Effect Details

51-75% ROA

Response ROA

Summary of Fit

RSquare	0.124753
RSquare Adj	0.106355
Root Mean Square Error	0.181401
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.561871	0.223124	6.7806
Error	333	10.957793	0.032906	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2540585	0.056086	4.53	<.0001*	.
SIZE	-0.022521	0.009271	-2.43	0.0157*	1.3122964
LEVERAGE	0.0244288	0.032425	0.75	0.4517	1.3296463
ASSETS TANGIBILITY	-0.150842	0.038974	-3.87	0.0001*	1.6246366
Log_Age	0.038391	0.024442	1.57	0.1172	1.0310996
H2_50-75%	0.0847296	0.036443	2.32	0.0207*	1.0034529
Year dummy_2007	-0.00892	0.020946	-0.43	0.6705	1.0118238
(H2_50-75%-0.07918)*(Year dummy_2007-0.33431)	-0.074227	0.077298	-0.96	0.3376	1.0033208

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.130593
RSquare Adj	0.112318
Root Mean Square Error	0.180795
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.634985	0.233569	7.1457
Error	333	10.884678	0.032687	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2597602	0.055507	4.68	<.0001*	.
SIZE	-0.02193	0.009232	-2.38	0.0181*	1.3099153
LEVERAGE	0.0278411	0.032217	0.86	0.3881	1.3214387
ASSETS TANGIBILITY	-0.154284	0.03873	-3.98	<.0001*	1.615143
Log_Age	0.0380444	0.024358	1.56	0.1193	1.0309132
H2_50-75%	0.0854352	0.036323	2.35	0.0193*	1.0035451
Year dummy_2008	-0.034881	0.020902	-1.67	0.0961	1.0053581
(H2_50-75%-0.07918)*(Year dummy_2008-0.32845)	-0.057549	0.076971	-0.75	0.4552	1.0008463

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.140917
RSquare Adj	0.122858
Root Mean Square Error	0.179718
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.764233	0.252033	7.8032
Error	333	10.755430	0.032299	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	332	10.753630	0.032390	17.9947
Pure Error	1	0.001800	0.001800	Prob > F
Total Error	333	10.755430		0.1862
				Max RSq
				0.9999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2358548	0.055168	4.28	<.0001*	.
SIZE	-0.022708	0.009182	-2.47	0.0139*	1.3114703
LEVERAGE	0.024894	0.031977	0.78	0.4368	1.3174899
ASSETS TANGIBILITY	-0.148269	0.038542	-3.85	0.0001*	1.6187674
Log_Age	0.0386473	0.024214	1.60	0.1114	1.0310174
H2_50-75%	0.0854558	0.036106	2.37	0.0185*	1.0035091
Year dummy_2009	0.0432997	0.02062	2.10	0.0365*	1.0033281
(H2_50-75%-0.07918)*(Year dummy_2009-0.33724)	0.1323497	0.076542	1.73	0.0847	1.0027292

Effect Tests

Effect Details

76-100% ROA

Response ROA

Summary of Fit

RSquare	0.11048
RSquare Adj	0.091781
Root Mean Square Error	0.182874
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.383169	0.197596	5.9084
Error	333	11.136494	0.033443	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2771723	0.058826	4.71	<.0001*	.
SIZE	-0.022672	0.009354	-2.42	0.0159*	1.3145829
LEVERAGE	0.0150118	0.032922	0.46	0.6487	1.3487147
ASSETS TANGIBILITY	-0.142298	0.039775	-3.58	0.0004*	1.6649476
Log_Age	0.0340198	0.024839	1.37	0.1717	1.047797
H2_75-100%	-0.019195	0.020705	-0.93	0.3546	1.0480553
Year dummy_2007	-0.009682	0.021121	-0.46	0.6470	1.0122868
(H2_75-100%-0.60117)*(Year dummy_2007-0.33431)	-0.006098	0.04286	-0.14	0.8870	1.0013699

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.117834
RSquare Adj	0.09929
Root Mean Square Error	0.182117
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.475244	0.210749	6.3543
Error	333	11.044419	0.033166	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2811279	0.058099	4.84	<.0001*	.
SIZE	-0.022126	0.009306	-2.38	0.0180*	1.3118333
LEVERAGE	0.0197561	0.032718	0.60	0.5464	1.3431515
ASSETS TANGIBILITY	-0.145614	0.039479	-3.69	0.0003*	1.6539892
Log_Age	0.0338245	0.024735	1.37	0.1724	1.047674
H2_75-100%	-0.017934	0.020623	-0.87	0.3852	1.048449
Year dummy_2008	-0.03425	0.021066	-1.63	0.1049	1.0064006
(H2_75-100%-0.60117)*(Year dummy_2008-0.32845)	0.027016	0.043074	0.63	0.5310	1.0018657

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.121627
RSquare Adj	0.103163
Root Mean Square Error	0.181725
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.522732	0.217533	6.5872
Error	333	10.996931	0.033024	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	332	10.995131	0.033118	18.3988
Pure Error	1	0.001800	0.001800	Prob > F
Total Error	333	10.996931		0.1842
				Max RSq
				0.9999

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2604802	0.057999	4.49	<.0001*	.
SIZE	-0.023195	0.009289	-2.50	0.0130*	1.3125908
LEVERAGE	0.0140311	0.032606	0.43	0.6672	1.3397796
ASSETS TANGIBILITY	-0.138963	0.039443	-3.52	0.0005*	1.6580522
Log_Age	0.0344732	0.024683	1.40	0.1635	1.0477823
H2_75-100%	-0.018705	0.02057	-0.91	0.3638	1.0475417
Year dummy_2009	0.0429924	0.020852	2.06	0.0400*	1.0034584
(H2_75-100%-0.60117)*(Year dummy_2009-0.33724)	-0.018616	0.042501	-0.44	0.6617	1.0034284

Effect Tests

Effect Details

0-30% ROE

Response ROE

Summary of Fit

RSquare	0.022072
RSquare Adj	0.001515
Root Mean Square Error	1.224214
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	11.26420	1.60917	1.0737
Error	333	499.06707	1.49870	Prob > F
C. Total	340	510.33127		0.3799

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3689749	0.377968	0.98	0.3297	.
SIZE	0.0257858	0.062624	0.41	0.6808	1.3147159
LEVERAGE	-0.030442	0.218317	-0.14	0.8892	1.3234695
ASSETS TANGIBILITY	-0.274709	0.26315	-1.04	0.2973	1.6262511
Log_Age	-0.092574	0.168818	-0.55	0.5838	1.0800054
H2_0-30%	-0.217672	0.270905	-0.80	0.4223	1.0503171
Year dummy_2007	0.055942	0.141357	0.40	0.6925	1.0118081
(H2_0-30%-0.06745)*(Year dummy_2007-0.33431)	-1.187025	0.555476	-2.14	0.0333*	1.0010279

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.011079
RSquare Adj	-0.00971
Root Mean Square Error	1.231076
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	5.65378	0.80768	0.5329
Error	333	504.67749	1.51555	Prob > F
C. Total	340	510.33127		0.8095

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3789782	0.377426	1.00	0.3161	.
SIZE	0.0256019	0.062903	0.41	0.6843	1.3116964
LEVERAGE	-0.035795	0.219117	-0.16	0.8703	1.3183613
ASSETS TANGIBILITY	-0.264242	0.263844	-1.00	0.3173	1.6166545
Log_Age	-0.084049	0.169765	-0.50	0.6209	1.0800163
H2_0-30%	-0.247944	0.272698	-0.91	0.3639	1.0524372
Year dummy_2008	-0.008424	0.142344	-0.06	0.9528	1.0055537
(H2_0-30%-0.06745)*(Year dummy_2008-0.32845)	-0.565036	0.577083	-0.98	0.3282	1.0032167

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.036572
RSquare Adj	0.01632
Root Mean Square Error	1.215104
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	18.66397	2.66628	1.8058
Error	333	491.66731	1.47648	Prob > F
C. Total	340	510.33127		0.0853

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3871752	0.372366	1.04	0.2992	.
SIZE	0.0274824	0.06213	0.44	0.6585	1.3135325
LEVERAGE	-0.044672	0.215815	-0.21	0.8361	1.3127657
ASSETS TANGIBILITY	-0.268582	0.260729	-1.03	0.3037	1.6204852
Log_Age	-0.084862	0.167548	-0.51	0.6128	1.0798376
H2_0-30%	-0.25117	0.268859	-0.93	0.3509	1.0500787
Year dummy_2009	-0.048731	0.139423	-0.35	0.7269	1.0034495
(H2_0-30%-0.06745)*(Year dummy_2009-0.33724)	1.7156593	0.551304	3.11	0.0020*	1.000928

Effect Tests

Effect Details

31-50% ROE

Response ROE

Summary of Fit

RSquare	0.011644
RSquare Adj	-0.00913
Root Mean Square Error	1.230724
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	5.94225	0.84889	0.5604
Error	333	504.38902	1.51468	Prob > F
C. Total	340	510.33127		0.7879

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3660172	0.380329	0.96	0.3366	.
SIZE	0.0229681	0.063205	0.36	0.7165	1.3250722
LEVERAGE	-0.062769	0.22308	-0.28	0.7786	1.3672642
ASSETS TANGIBILITY	-0.230001	0.273717	-0.84	0.4014	1.740913
Log_Age	-0.120316	0.165854	-0.73	0.4687	1.0314212
H2_30-50%	0.1063601	0.163195	0.65	0.5150	1.0766377
Year dummy_2007	0.0511839	0.142166	0.36	0.7191	1.0126159
(H2_30-50%-0.2346)*(Year dummy_2007-0.33431)	-0.386069	0.333567	-1.16	0.2479	1.0043026

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.007632
RSquare Adj	-0.01323
Root Mean Square Error	1.233219
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.89483	0.55640	0.3659
Error	333	506.43644	1.52083	Prob > F
C. Total	340	510.33127		0.9217

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3806287	0.378466	1.01	0.3153	.
SIZE	0.0230818	0.063239	0.36	0.7153	1.3211629
LEVERAGE	-0.052924	0.222737	-0.24	0.8123	1.3575581
ASSETS TANGIBILITY	-0.230558	0.27332	-0.84	0.3995	1.7288485
Log_Age	-0.120897	0.166175	-0.73	0.4674	1.0312336
H2_30-50%	0.1065246	0.163551	0.65	0.5153	1.0769702
Year dummy_2008	-0.002182	0.142649	-0.02	0.9878	1.0063697
(H2_30-50%-0.2346)*(Year dummy_2008-0.32845)	0.1173133	0.338805	0.35	0.7294	1.0014933

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.009593
RSquare Adj	-0.01123
Root Mean Square Error	1.232
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	4.89558	0.69937	0.4608
Error	333	505.43569	1.51782	Prob > F
C. Total	340	510.33127		0.8626

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3974936	0.377938	1.05	0.2937	.
SIZE	0.023648	0.063217	0.37	0.7086	1.3228583
LEVERAGE	-0.068342	0.222661	-0.31	0.7591	1.3593139
ASSETS TANGIBILITY	-0.22776	0.273409	-0.83	0.4054	1.7333915
Log_Age	-0.122019	0.166011	-0.74	0.4629	1.0312399
H2_30-50%	0.1047583	0.163287	0.64	0.5216	1.0756124
Year dummy_2009	-0.049328	0.141358	-0.35	0.7273	1.0033977
(H2_30-50%-0.2346)*(Year dummy_2009-0.33724)	0.2704376	0.332192	0.81	0.4162	1.0076167

Effect Tests

Effect Details

51-75% ROE

Response ROE

Summary of Fit

RSquare	0.007273
RSquare Adj	-0.0136
Root Mean Square Error	1.233443
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.71140	0.53020	0.3485
Error	333	506.61987	1.52138	Prob > F
C. Total	340	510.33127		0.9309

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3577067	0.381358	0.94	0.3489	.
SIZE	0.0283127	0.063038	0.45	0.6536	1.3122964
LEVERAGE	-0.019304	0.220476	-0.09	0.9303	1.3296463
ASSETS TANGIBILITY	-0.287904	0.265003	-1.09	0.2781	1.6246366
Log_Age	-0.11726	0.166194	-0.71	0.4810	1.0310996
H2_50-75%	0.1212224	0.247798	0.49	0.6250	1.0034529
Year dummy_2007	0.0546858	0.142424	0.38	0.7012	1.0118238
(H2_50-75%-0.07918)*(Year dummy_2007-0.33431)	0.0921633	0.525591	0.18	0.8609	1.0033208

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.006793
RSquare Adj	-0.01409
Root Mean Square Error	1.23374
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.46678	0.49525	0.3254
Error	333	506.86450	1.52212	Prob > F
C. Total	340	510.33127		0.9423

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3835098	0.378777	1.01	0.3120	.
SIZE	0.026862	0.062996	0.43	0.6701	1.3099153
LEVERAGE	-0.024496	0.219847	-0.11	0.9113	1.3214387
ASSETS TANGIBILITY	-0.279479	0.264291	-1.06	0.2911	1.615143
Log_Age	-0.116315	0.16622	-0.70	0.4846	1.0309132
H2_50-75%	0.1205134	0.247869	0.49	0.6271	1.0035451
Year dummy_2008	-0.006048	0.142638	-0.04	0.9662	1.0053581
(H2_50-75%-0.07918)*(Year dummy_2008-0.32845)	0.0665289	0.525247	0.13	0.8993	1.0008463

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.00736
RSquare Adj	-0.01351
Root Mean Square Error	1.233388
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.75599	0.53657	0.3527
Error	333	506.57529	1.52125	Prob > F
C. Total	340	510.33127		0.9287

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3974234	0.378614	1.05	0.2946	.
SIZE	0.0274837	0.063015	0.44	0.6630	1.3114703
LEVERAGE	-0.026363	0.219456	-0.12	0.9045	1.3174899
ASSETS TANGIBILITY	-0.283946	0.264512	-1.07	0.2838	1.6187674
Log_Age	-0.116789	0.166181	-0.70	0.4827	1.0310174
H2_50-75%	0.1199497	0.247794	0.48	0.6287	1.0035091
Year dummy_2009	-0.048206	0.141513	-0.34	0.7336	1.0033281
(H2_50-75%-0.07918)*(Year dummy_2009-0.33724)	-0.159417	0.525301	-0.30	0.7617	1.0027292

Effect Tests

Effect Details

76-100% ROE

Response ROE

Summary of Fit

RSquare	0.019535
RSquare Adj	-0.00108
Root Mean Square Error	1.225801
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	9.96938	1.42420	0.9478
Error	333	500.36189	1.50259	Prob > F
C. Total	340	510.33127		0.4696

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4479212	0.394307	1.14	0.2568	.
SIZE	0.0243864	0.062702	0.39	0.6976	1.3145829
LEVERAGE	-0.054025	0.220675	-0.24	0.8067	1.3487147
ASSETS TANGIBILITY	-0.24694	0.266608	-0.93	0.3550	1.6649476
Log_Age	-0.130248	0.166497	-0.78	0.4346	1.047797
H2_75-100%	-0.082171	0.138785	-0.59	0.5542	1.0480553
Year dummy_2007	0.0528085	0.141574	0.37	0.7094	1.0122868
(H2_75-100%-0.60117)*(Year dummy_2007-0.33431)	0.5820452	0.28729	2.03	0.0436*	1.0013699

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.007115
RSquare Adj	-0.01376
Root Mean Square Error	1.233541
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.63081	0.51869	0.3409
Error	333	506.70046	1.52162	Prob > F
C. Total	340	510.33127		0.9348

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4548733	0.393527	1.16	0.2486	.
SIZE	0.0261751	0.063032	0.42	0.6782	1.3118333
LEVERAGE	-0.048561	0.22161	-0.22	0.8267	1.3431515
ASSETS TANGIBILITY	-0.251118	0.267407	-0.94	0.3484	1.6539892
Log_Age	-0.131063	0.167538	-0.78	0.4346	1.047674
H2_75-100%	-0.081088	0.139688	-0.58	0.5620	1.048449
Year dummy_2008	-0.003401	0.142689	-0.02	0.9810	1.0064006
(H2_75-100%-0.60117)*(Year dummy_2008-0.32845)	0.0445633	0.291753	0.15	0.8787	1.0018657

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.007115
RSquare Adj	-0.01376
Root Mean Square Error	1.233541
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.63081	0.51869	0.3409
Error	333	506.70046	1.52162	Prob > F
C. Total	340	510.33127		0.9348

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4548733	0.393527	1.16	0.2486	.
SIZE	0.0261751	0.063032	0.42	0.6782	1.3118333
LEVERAGE	-0.048561	0.22161	-0.22	0.8267	1.3431515
ASSETS TANGIBILITY	-0.251118	0.267407	-0.94	0.3484	1.6539892
Log_Age	-0.131063	0.167538	-0.78	0.4346	1.047674
H2_75-100%	-0.081088	0.139688	-0.58	0.5620	1.048449
Year dummy_2008	-0.003401	0.142689	-0.02	0.9810	1.0064006
(H2_75-100%-0.60117)*(Year dummy_2008-0.32845)	0.0445633	0.291753	0.15	0.8787	1.0018657

Effect Tests

Effect Details

2.3 Regression results for hypothesis 4

HI_differences ROA

Response ROA

Summary of Fit

RSquare	0.105589
RSquare Adj	0.086085
Root Mean Square Error	0.185222
Mean of Response	0.086468
Observations (or Sum Wgts)	329

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.300084	0.185726	5.4136
Error	321	11.012582	0.034307	Prob > F
C. Total	328	12.312666		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2641436	0.084652	3.12	0.0020*	.
SIZE	-0.021692	0.009492	-2.29	0.0229*	1.3121957
LEVERAGE	0.0164762	0.034065	0.48	0.6290	1.3117839
ASSETS TANGIBILITY	-0.144741	0.040346	-3.59	0.0004*	1.614163
Log_Age	0.0307952	0.02559	1.20	0.2297	1.0547425
Log HI_differen	-0.00088	0.015795	-0.06	0.9556	1.0337138
Year dummy_2007	-0.00987	0.021762	-0.45	0.6505	1.0107383
(Log HI_differen-3.59027)*(Year dummy_2007-0.33435)	-0.036875	0.032829	-1.12	0.2622	1.0003863

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.113614
RSquare Adj	0.094285
Root Mean Square Error	0.184389
Mean of Response	0.086468
Observations (or Sum Wgts)	329

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.398893	0.199842	5.8778
Error	321	10.913773	0.033999	Prob > F
C. Total	328	12.312666		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2666299	0.08382	3.18	0.0016*	.
SIZE	-0.021168	0.00944	-2.24	0.0256*	1.3097311
LEVERAGE	0.0222045	0.033876	0.66	0.5126	1.3090023
ASSETS TANGIBILITY	-0.148399	0.040066	-3.70	0.0002*	1.6062514
Log_Age	0.0307616	0.025474	1.21	0.2281	1.0546194
Log HI_differen	-5.155e-6	0.015728	-0.00	0.9997	1.0342517
Year dummy_2008	-0.037862	0.021721	-1.74	0.0823	1.0067208
(Log HI_differen-3.59027)*(Year dummy_2008-0.32827)	0.0392691	0.033156	1.18	0.2371	1.0011305

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.114386
RSquare Adj	0.095073
Root Mean Square Error	0.184309
Mean of Response	0.086468
Observations (or Sum Wgts)	329

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.408394	0.201199	5.9229
Error	321	10.904272	0.033970	Prob > F
C. Total	328	12.312666		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2467538	0.083881	2.94	0.0035*	.
SIZE	-0.022391	0.009439	-2.37	0.0183*	1.3106098
LEVERAGE	0.0168792	0.033765	0.50	0.6175	1.3015305
ASSETS TANGIBILITY	-0.142008	0.040076	-3.54	0.0005*	1.6084196
Log_Age	0.0313375	0.025464	1.23	0.2194	1.0547564
Log HI_differen	-0.000686	0.015715	-0.04	0.9652	1.0335226
Year dummy_2009	0.0464868	0.021521	2.16	0.0315*	1.0028449
(Log HI_differen-3.59027)*(Year dummy_2009-0.33739)	0.0000665	0.032625	0.00	0.9984	1.0002544

Effect Tests

Effect Details

HI_differences ROE

Response ROE

Summary of Fit

RSquare	0.020367
RSquare Adj	-0.001
Root Mean Square Error	1.178036
Mean of Response	0.260653
Observations (or Sum Wgts)	329

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	9.26138	1.32305	0.9534
Error	321	445.47415	1.38777	Prob > F
C. Total	328	454.73553		0.4655

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VI
Intercept	0.4908796	0.538401	0.91	0.3626	
SIZE	0.0260038	0.060367	0.43	0.6669	1.312195
LEVERAGE	-0.190441	0.216659	-0.88	0.3801	1.311783
ASSETS TANGIBILITY	-0.149531	0.256606	-0.58	0.5605	1.61416
Log_Age	-0.186517	0.162758	-1.15	0.2527	1.054742
Log HI_differen	-0.017053	0.100456	-0.17	0.8653	1.033713
Year dummy_2007	0.0394878	0.138407	0.29	0.7756	1.010738
(Log HI_differen-3.59027)*(Year dummy_2007-0.33435)	0.3896709	0.208797	1.87	0.0629	1.000386

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.010294
RSquare Adj	-0.01129
Root Mean Square Error	1.184077
Mean of Response	0.260653
Observations (or Sum Wgts)	329

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	4.68091	0.66870	0.4769
Error	321	450.05462	1.40204	Prob > F
C. Total	328	454.73553		0.8511

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4777979	0.538258	0.89	0.3754	.
SIZE	0.0263904	0.06062	0.44	0.6636	1.3097311
LEVERAGE	-0.203929	0.217539	-0.94	0.3492	1.3090023
ASSETS TANGIBILITY	-0.140713	0.257289	-0.55	0.5848	1.6062514
Log_Age	-0.186592	0.163583	-1.14	0.2549	1.0546194
Log HI_differen	-0.016933	0.100997	-0.17	0.8670	1.0342517
Year dummy_2008	0.0699722	0.139484	0.50	0.6163	1.0067208
(Log HI_differen-3.59027)*(Year dummy_2008-0.32827)	-0.01651	0.212915	-0.08	0.9382	1.0011305

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.021217
RSquare Adj	-0.00013
Root Mean Square Error	1.177525
Mean of Response	0.260653
Observations (or Sum Wgts)	329

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	9.64815	1.37831	0.9940
Error	321	445.08738	1.38657	Prob > F
C. Total	328	454.73553		0.4354

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.5144755	0.535905	0.96	0.3378	.
SIZE	0.0295809	0.060305	0.49	0.6241	1.3106098
LEVERAGE	-0.195201	0.215717	-0.90	0.3662	1.3015305
ASSETS TANGIBILITY	-0.156337	0.256038	-0.61	0.5419	1.6084196
Log_Age	-0.187339	0.162689	-1.15	0.2504	1.0547564
Log HI_differen	-0.014871	0.100403	-0.15	0.8823	1.0335226
Year dummy_2009	-0.108634	0.137498	-0.79	0.4301	1.0028449
(Log HI_differen-3.59027)*(Year dummy_2009-0.33739)	-0.375281	0.208434	-1.80	0.0727	1.0002544

Effect Tests

Effect Details

HI_concentration ROA

Response ROA

Summary of Fit

RSquare	0.108417
RSquare Adj	0.089675
Root Mean Square Error	0.183086
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.357341	0.193906	5.7847
Error	333	11.162323	0.033520	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.297675	0.141898	2.10	0.0367*	.
SIZE	-0.022691	0.009408	-2.41	0.0164*	1.3266306
LEVERAGE	0.0180158	0.0328	0.55	0.5832	1.3356603
ASSETS TANGIBILITY	-0.147087	0.039434	-3.73	0.0002*	1.6327868
Log_Age	0.0360069	0.024946	1.44	0.1498	1.0543832
Log HI_concentr	-0.008694	0.032002	-0.27	0.7860	1.0464591
Year dummy_2007	-0.009338	0.021144	-0.44	0.6590	1.0120934
(Log HI_concentr-3.76862)*(Year dummy_2007-0.33431)	0.0127051	0.066108	0.19	0.8477	1.001776

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.1149
RSquare Adj	0.096295
Root Mean Square Error	0.182419
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.438513	0.205502	6.1755
Error	333	11.081150	0.033277	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2964055	0.141016	2.10	0.0363*	.
SIZE	-0.022219	0.009364	-2.37	0.0182*	1.3237993
LEVERAGE	0.0234365	0.032612	0.72	0.4729	1.3300681
ASSETS TANGIBILITY	-0.150375	0.039179	-3.84	0.0001*	1.6234975
Log_Age	0.035873	0.024853	1.44	0.1499	1.0542276
Log HI_concentr	-0.006988	0.031904	-0.22	0.8268	1.0476363
Year dummy_2008	-0.034474	0.0211	-1.63	0.1032	1.0062731
(Log HI_concentr-3.76862)*(Year dummy_2008-0.32845)	-0.002418	0.067109	-0.04	0.9713	1.0023706

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.119134
RSquare Adj	0.100617
Root Mean Square Error	0.181982
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.491511	0.213073	6.4338
Error	333	11.028152	0.033118	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2770845	0.14073	1.97	0.0498*	.
SIZE	-0.023148	0.009341	-2.48	0.0137*	1.3236765
LEVERAGE	0.0179635	0.03246	0.55	0.5804	1.3240322
ASSETS TANGIBILITY	-0.144277	0.03912	-3.69	0.0003*	1.6264608
Log_Age	0.0364832	0.024796	1.47	0.1421	1.0544017
Log HI_concentr	-0.007689	0.031805	-0.24	0.8091	1.046161
Year dummy_2009	0.0431428	0.020882	2.07	0.0396*	1.0035034
(Log HI_concentr-3.76862)*(Year dummy_2009-0.33724)	-0.007419	0.065487	-0.11	0.9099	1.0011378

Effect Tests

Effect Details

HI_concentration ROE

Response ROE

Summary of Fit

RSquare	0.026859
RSquare Adj	0.006402
Root Mean Square Error	1.221215
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	13.70674	1.95811	1.3130
Error	333	496.62453	1.49136	Prob > F
C. Total	340	510.33127		0.2432

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.0934997	0.946486	0.10	0.9214	.
SIZE	0.0256868	0.062753	0.41	0.6826	1.3266306
LEVERAGE	-0.026789	0.218783	-0.12	0.9026	1.3356603
ASSETS TANGIBILITY	-0.285128	0.263033	-1.08	0.2791	1.6327868
Log_Age	-0.107755	0.166394	-0.65	0.5177	1.0543832
Log HI_concentr	0.0747768	0.213462	0.35	0.7263	1.0464591
Year dummy_2007	0.0557547	0.141031	0.40	0.6928	1.0120934
(Log HI_concentr-3.76862)*(Year dummy_2007-0.33431)	1.1518492	0.440948	2.61	0.0094*	1.001776

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.006585
RSquare Adj	-0.0143
Root Mean Square Error	1.23387
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.36061	0.48009	0.3153
Error	333	506.97066	1.52243	Prob > F
C. Total	340	510.33127		0.9469

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.0506754	0.953825	0.05	0.9577	.
SIZE	0.0300559	0.063336	0.47	0.6354	1.3237993
LEVERAGE	-0.022048	0.220587	-0.10	0.9204	1.3300681
ASSETS TANGIBILITY	-0.284356	0.265001	-1.07	0.2840	1.6234975
Log_Age	-0.108632	0.168106	-0.65	0.5186	1.0542276
Log HI_concentr	0.0838875	0.215795	0.39	0.6977	1.0476363
Year dummy_2008	-0.007445	0.142718	-0.05	0.9584	1.0062731
(Log HI_concentr-3.76862)*(Year dummy_2008-0.32845)	0.0874677	0.453921	0.19	0.8473	1.0023706

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.029651
RSquare Adj	0.009253
Root Mean Square Error	1.219461
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	15.13169	2.16167	1.4536
Error	333	495.19958	1.48709	Prob > F
C. Total	340	510.33127		0.1831

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.0406313	0.943029	0.04	0.9657	.
SIZE	0.0312523	0.062593	0.50	0.6179	1.3236765
LEVERAGE	-0.032787	0.217516	-0.15	0.8803	1.3240322
ASSETS TANGIBILITY	-0.294863	0.262146	-1.12	0.2615	1.6264608
Log_Age	-0.106963	0.166157	-0.64	0.5202	1.0544017
Log HI_concentr	0.0899296	0.213125	0.42	0.6733	1.046161
Year dummy_2009	-0.05148	0.139927	-0.37	0.7132	1.0035034
(Log HI_concentr-3.76862)*(Year dummy_2009-0.33724)	-1.228689	0.438828	-2.80	0.0054*	1.0011378

Effect Tests

Effect Details

2.4 Regression results for hypothesis 5

Industrial firms ROA

Response ROA

Summary of Fit

RSquare	0.109414
RSquare Adj	0.090693
Root Mean Square Error	0.182984
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.369825	0.195689	5.8444
Error	333	11.149839	0.033483	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2705098	0.058846	4.60	<.0001*	.
SIZE	-0.02291	0.009399	-2.44	0.0153*	1.3256935
LEVERAGE	0.017001	0.032766	0.52	0.6042	1.3343499
ASSETS TANGIBILITY	-0.145964	0.039506	-3.69	0.0003*	1.6406149
Log_Age	0.039129	0.024991	1.57	0.1184	1.0593393
Ownersh. Dummy_C	-0.010853	0.022488	-0.48	0.6297	1.0417781
Year dummy_2007	-0.009431	0.021131	-0.45	0.6557	1.0119902
(Ownersh. Dummy_C-0.71848)*(Year dummy_2007-0.33431)	0.0234526	0.046794	0.50	0.6166	1.0029462

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.116866
RSquare Adj	0.098302
Root Mean Square Error	0.182216
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.463122	0.209017	6.2952
Error	333	11.056542	0.033203	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2755818	0.058146	4.74	<.0001*	.
SIZE	-0.022462	0.009347	-2.40	0.0168*	1.3220379
LEVERAGE	0.0225854	0.03254	0.69	0.4881	1.3271097
ASSETS TANGIBILITY	-0.149297	0.039223	-3.81	0.0002*	1.6308033
Log_Age	0.0388238	0.024884	1.56	0.1197	1.0591593
Ownersh. Dummy_C	-0.010315	0.022395	-0.46	0.6454	1.0419048
Year dummy_2008	-0.034363	0.021069	-1.63	0.1038	1.0055671
(Ownersh. Dummy_C-0.71848)*(Year dummy_2008-0.32845)	-0.035842	0.046856	-0.76	0.4448	1.0006477

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.119747
RSquare Adj	0.101243
Root Mean Square Error	0.181919
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.499194	0.214171	6.4715
Error	333	11.020469	0.033095	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2533441	0.058064	4.36	<.0001*	.
SIZE	-0.023339	0.009339	-2.50	0.0129*	1.323942
LEVERAGE	0.0177764	0.032422	0.55	0.5839	1.3218152
ASSETS TANGIBILITY	-0.14308	0.039202	-3.65	0.0003*	1.6343884
Log_Age	0.0393349	0.024841	1.58	0.1143	1.0590083
Ownersh. Dummy_C	-0.010656	0.022356	-0.48	0.6339	1.0416119
Year dummy_2009	0.0432328	0.020873	2.07	0.0391*	1.003357
(Ownersh. Dummy_C-0.71848)*(Year dummy_2009-0.33724)	0.0129654	0.046232	0.28	0.7793	1.0013145

Effect Tests

Effect Details

Family ROA

Response ROA

Summary of Fit

RSquare	0.11243
RSquare Adj	0.093773
Root Mean Square Error	0.182673
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.407591	0.201084	6.0260
Error	333	11.112072	0.033370	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2522808	0.059189	4.26	<.0001*	.
SIZE	-0.021326	0.009554	-2.23	0.0263*	1.3744068
LEVERAGE	0.0144326	0.03282	0.44	0.6604	1.3432819
ASSETS TANGIBILITY	-0.145835	0.039263	-3.71	0.0002*	1.6259865
Log_Age	0.0379471	0.024631	1.54	0.1244	1.0325753
Ownersh. Dummy_I	0.0147055	0.026439	0.56	0.5784	1.0759154
Year dummy_2007	-0.009451	0.021093	-0.45	0.6544	1.0118504
(Ownersh. Dummy_I-0.18475)*(Year dummy_2007-0.33431)	-0.062152	0.054217	-1.15	0.2525	1.0057298

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.117297
RSquare Adj	0.098742
Root Mean Square Error	0.182172
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.468518	0.209788	6.3215
Error	333	11.051145	0.033187	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2578081	0.058687	4.39	<.0001*	.
SIZE	-0.020928	0.009517	-2.20	0.0286*	1.3711317
LEVERAGE	0.022683	0.032583	0.70	0.4868	1.3312696
ASSETS TANGIBILITY	-0.150245	0.039018	-3.85	0.0001*	1.6145587
Log_Age	0.0375894	0.024563	1.53	0.1269	1.0325028
Ownersh. Dummy_I	0.0142269	0.026375	0.54	0.5900	1.0765859
Year dummy_2008	-0.034297	0.021065	-1.63	0.1044	1.0056357
(Ownersh. Dummy_I-0.18475)*(Year dummy_2008-0.32845)	0.0449414	0.054519	0.82	0.4103	1.0010986

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.119896
RSquare Adj	0.101395
Root Mean Square Error	0.181904
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.501055	0.214436	6.4806
Error	333	11.018609	0.033089	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2368377	0.058526	4.05	<.0001*	.
SIZE	-0.021894	0.009511	-2.30	0.0220*	1.373469
LEVERAGE	0.0162957	0.032568	0.50	0.6171	1.3339685
ASSETS TANGIBILITY	-0.144137	0.039015	-3.69	0.0003*	1.6191374
Log_Age	0.037899	0.024524	1.55	0.1232	1.0323048
Ownersh. Dummy_I	0.0135862	0.026332	0.52	0.6062	1.0762929
Year dummy_2009	0.0430093	0.020873	2.06	0.0401*	1.0035923
(Ownersh. Dummy_I-0.18475)*(Year dummy_2009-0.33724)	0.0160793	0.053539	0.30	0.7641	1.0077148

Effect Tests

Effect Details

Financial ROA

Response ROA

Summary of Fit

RSquare	0.110073
RSquare Adj	0.091366
Root Mean Square Error	0.182916
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.378080	0.196869	5.8840
Error	333	11.141583	0.033458	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2694537	0.057557	4.68	<.0001*	.
SIZE	-0.024918	0.010067	-2.48	0.0138*	1.521684
LEVERAGE	0.0172863	0.032688	0.53	0.5973	1.3290026
ASSETS TANGIBILITY	-0.142618	0.039882	-3.58	0.0004*	1.6731503
Log_Age	0.0412653	0.025466	1.62	0.1061	1.1008266
Ownersh. Dummy_F/B	0.0317979	0.048572	0.65	0.5131	1.2022301
Year dummy_2007	-0.009625	0.021127	-0.46	0.6490	1.0124319
(Ownersh. Dummy_F/B-0.05279)*(Year dummy_2007-0.33431)	0.0521406	0.094073	0.55	0.5798	1.002242

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.115954
RSquare Adj	0.09737
Root Mean Square Error	0.182311
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.451701	0.207386	6.2396
Error	333	11.067963	0.033237	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2749052	0.056921	4.83	<.0001*	.
SIZE	-0.024307	0.010017	-2.43	0.0158*	1.5168205
LEVERAGE	0.0223706	0.03257	0.69	0.4927	1.3282148
ASSETS TANGIBILITY	-0.147017	0.039582	-3.71	0.0002*	1.6590402
Log_Age	0.0406908	0.025377	1.60	0.1098	1.1004085
Ownersh. Dummy_F/B	0.03038	0.048398	0.63	0.5306	1.2015684
Year dummy_2008	-0.034511	0.021078	-1.64	0.1025	1.0053583
(Ownersh. Dummy_F/B-0.05279)*(Year dummy_2008-0.32845)	0.0206916	0.093947	0.22	0.8258	1.0058113

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.115954
RSquare Adj	0.09737
Root Mean Square Error	0.182311
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.451701	0.207386	6.2396
Error	333	11.067963	0.033237	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2749052	0.056921	4.83	<.0001*	.
SIZE	-0.024307	0.010017	-2.43	0.0158*	1.5168205
LEVERAGE	0.0223706	0.03257	0.69	0.4927	1.3282148
ASSETS TANGIBILITY	-0.147017	0.039582	-3.71	0.0002*	1.6590402
Log_Age	0.0406908	0.025377	1.60	0.1098	1.1004085
Ownersh. Dummy_F/B	0.03038	0.048398	0.63	0.5306	1.2015684
Year dummy_2008	-0.034511	0.021078	-1.64	0.1025	1.0053583
(Ownersh. Dummy_F/B-0.05279)*(Year dummy_2008-0.32845)	0.0206916	0.093947	0.22	0.8258	1.0058113

Effect Tests

Effect Details

Two firms ROA

Response ROA

Summary of Fit

RSquare	0.110761
RSquare Adj	0.092068
Root Mean Square Error	0.182845
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.386690	0.198099	5.9254
Error	333	11.132973	0.033432	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2608486	0.05646	4.62	<.0001*	.
SIZE	-0.021788	0.009483	-2.30	0.0222*	1.3513091
LEVERAGE	0.0178171	0.032625	0.55	0.5853	1.3248906
ASSETS TANGIBILITY	-0.149451	0.039892	-3.75	0.0002*	1.6752953
Log_Age	0.0371819	0.02463	1.51	0.1321	1.0305369
Own. Dummy_CC	-0.007925	0.025112	-0.32	0.7525	1.0493253
Year dummy_2007	-0.009304	0.021118	-0.44	0.6598	1.0122995
(Own. Dummy_CC-0.20528)*(Year dummy_2007-0.33431)	0.0490191	0.051779	0.95	0.3445	1.0021146

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.115248
RSquare Adj	0.096649
Root Mean Square Error	0.182383
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.442864	0.206123	6.1967
Error	333	11.076799	0.033264	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2678911	0.055918	4.79	<.0001*	.
SIZE	-0.021513	0.009447	-2.28	0.0234*	1.347983
LEVERAGE	0.0241921	0.032455	0.75	0.4566	1.3178143
ASSETS TANGIBILITY	-0.153367	0.039663	-3.87	0.0001*	1.6645123
Log_Age	0.0366669	0.024566	1.49	0.1365	1.0303902
Own. Dummy_CC	-0.008265	0.025052	-0.33	0.7417	1.0495824
Year dummy_2008	-0.034656	0.021089	-1.64	0.1013	1.0056777
(Own. Dummy_CC-0.20528)*(Year dummy_2008-0.32845)	0.013537	0.052535	0.26	0.7968	1.0012099

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.123178
RSquare Adj	0.104746
Root Mean Square Error	0.181564
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.542146	0.220307	6.6829
Error	333	10.977517	0.032966	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2458898	0.055639	4.42	<.0001*	.
SIZE	-0.022514	0.00941	-2.39	0.0173*	1.3494085
LEVERAGE	0.0174974	0.032253	0.54	0.5878	1.3132163
ASSETS TANGIBILITY	-0.146096	0.039535	-3.70	0.0003*	1.668768
Log_Age	0.0373224	0.024456	1.53	0.1279	1.0304055
Own. Dummy_CC	-0.007232	0.02493	-0.29	0.7719	1.0487885
Year dummy_2009	0.0433121	0.020832	2.08	0.0384*	1.0033779
(Own. Dummy_CC-0.20528)*(Year dummy_2009-0.33724)	-0.063267	0.051366	-1.23	0.2189	1.001191

Effect Tests

Effect Details

Two families ROA

Response ROA

Summary of Fit

RSquare	0.111788
RSquare Adj	0.093117
Root Mean Square Error	0.18274
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.399553	0.199936	5.9872
Error	333	11.120110	0.033394	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2505684	0.057469	4.36	<.0001*	.
SIZE	-0.020516	0.00951	-2.16	0.0317*	1.3607238
LEVERAGE	0.008571	0.033881	0.25	0.8004	1.4305537
ASSETS TANGIBILITY	-0.143684	0.039447	-3.64	0.0003*	1.6400848
Log_Age	0.0353947	0.024695	1.43	0.1527	1.037184
Own. Dummy_II	0.0372036	0.036576	1.02	0.3098	1.1290014
Year dummy_2007	-0.009884	0.021111	-0.47	0.6400	1.0128563
(Own. Dummy_II-0.09091)*(Year dummy_2007-0.33431)	-0.046302	0.072308	-0.64	0.5224	1.008802

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.118
RSquare Adj	0.09946
Root Mean Square Error	0.182099
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.477325	0.211046	6.3645
Error	333	11.042338	0.033160	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2567855	0.056994	4.51	<.0001*	.
SIZE	-0.020309	0.009467	-2.15	0.0327*	1.3579428
LEVERAGE	0.0153483	0.033627	0.46	0.6484	1.4191032
ASSETS TANGIBILITY	-0.147071	0.039191	-3.75	0.0002*	1.6302276
Log_Age	0.0352152	0.024606	1.43	0.1533	1.0369664
Own. Dummy_II	0.0346726	0.03653	0.95	0.3432	1.1340702
Year dummy_2008	-0.03345	0.021079	-1.59	0.1135	1.0078439
(Own. Dummy_II-0.09091)*(Year dummy_2008-0.32845)	0.0483754	0.075401	0.64	0.5216	1.0081694

Effect Tests

Effect Details

Response ROA

Summary of Fit

RSquare	0.121318
RSquare Adj	0.102847
Root Mean Square Error	0.181757
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.518859	0.216980	6.5681
Error	333	11.000804	0.033035	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2352796	0.056783	4.14	<.0001*	.
SIZE	-0.021228	0.009456	-2.24	0.0254*	1.3599509
LEVERAGE	0.0104917	0.033474	0.31	0.7541	1.4114861
ASSETS TANGIBILITY	-0.141301	0.039148	-3.61	0.0004*	1.6328192
Log_Age	0.0355419	0.024558	1.45	0.1488	1.0368236
Own. Dummy_II	0.0344464	0.036309	0.95	0.3435	1.1246237
Year dummy_2009	0.0429898	0.020856	2.06	0.0401*	1.0035195
(Own. Dummy_II-0.09091)*(Year dummy_2009-0.33724)	-0.001612	0.071743	-0.02	0.9821	1.0038894

Effect Tests

Effect Details

Industrial firms ROE

Response ROE

Summary of Fit

RSquare	0.022521
RSquare Adj	0.001973
Root Mean Square Error	1.223933
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	11.49305	1.64186	1.0960
Error	333	498.83822	1.49801	Prob > F
C. Total	340	510.33127		0.3652

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.1768377	0.393609	0.45	0.6535	.
SIZE	0.0383663	0.062871	0.61	0.5421	1.3256935
LEVERAGE	-0.002809	0.219163	-0.01	0.9898	1.3343499
ASSETS TANGIBILITY	-0.333258	0.264249	-1.26	0.2081	1.6406149
Log_Age	-0.166837	0.167156	-1.00	0.3190	1.0593393
Ownersh. Dummy_C	0.2755292	0.150419	1.83	0.0679	1.0417781
Year dummy_2007	0.0568659	0.141338	0.40	0.6877	1.0119902
(Ownersh. Dummy_C-0.71848)*(Year dummy_2007-0.33431)	0.4526301	0.312995	1.45	0.1491	1.0029462

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.015903
RSquare Adj	-0.00478
Root Mean Square Error	1.22807
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	8.11567	1.15938	0.7687
Error	333	502.21560	1.50815	Prob > F
C. Total	340	510.33127		0.6139

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.1935019	0.391882	0.49	0.6218	.
SIZE	0.0386003	0.062996	0.61	0.5405	1.3220379
LEVERAGE	0.0029278	0.219306	0.01	0.9894	1.3271097
ASSETS TANGIBILITY	-0.3256	0.264348	-1.23	0.2189	1.6308033
Log_Age	-0.168792	0.167707	-1.01	0.3149	1.0591593
Ownersh. Dummy_C	0.2757718	0.150937	1.83	0.0686	1.0419048
Year dummy_2008	-0.009334	0.141997	-0.07	0.9476	1.0055671
(Ownersh. Dummy_C-0.71848)*(Year dummy_2008-0.32845)	0.0011857	0.315791	0.00	0.9970	1.0006477

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.022355
RSquare Adj	0.001804
Root Mean Square Error	1.224037
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	11.40841	1.62977	1.0878
Error	333	498.92286	1.49827	Prob > F
C. Total	340	510.33127		0.3706

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.2122555	0.390681	0.54	0.5873
SIZE	0.0384032	0.062834	0.61	0.5415
LEVERAGE	-0.0055	0.218149	-0.03	0.9799
ASSETS TANGIBILITY	-0.328493	0.26377	-1.25	0.2139
Log_Age	-0.169852	0.167144	-1.02	0.3103
Ownersh. Dummy_C	0.2768598	0.15042	1.84	0.0666
Year dummy_2009	-0.049045	0.140442	-0.35	0.7271
(Ownersh. Dummy_C-0.71848)*(Year dummy_2009-0.33724)	-0.449227	0.31107	-1.44	0.1496

Effect Tests

Effect Details

Family ROE

Response ROE

Summary of Fit

RSquare	0.02636
RSquare Adj	0.005893
Root Mean Square Error	1.221527
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	13.45244	1.92178	1.2879
Error	333	496.87883	1.49213	Prob > F
C. Total	340	510.33127		0.2554

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.5702278	0.395793	1.44	0.1506	.
SIZE	0.0051419	0.063889	0.08	0.9359	1.3744068
LEVERAGE	-0.019573	0.219463	-0.09	0.9290	1.3432819
ASSETS TANGIBILITY	-0.276536	0.262552	-1.05	0.2930	1.6259865
Log_Age	-0.126813	0.164707	-0.77	0.4419	1.0325753
Ownersh. Dummy_I	-0.291645	0.176798	-1.65	0.1000	1.0759154
Year dummy_2007	0.0524659	0.14105	0.37	0.7102	1.0118504
(Ownersh. Dummy_I-0.18475)*(Year dummy_2007-0.33431)	-0.728715	0.362545	-2.01	0.0452*	1.0057298

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.014148
RSquare Adj	-0.00658
Root Mean Square Error	1.229164
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	7.22014	1.03145	0.6827
Error	333	503.11113	1.51084	Prob > F
C. Total	340	510.33127		0.6867

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.5939835	0.395977	1.50	0.1346	.
SIZE	0.0046426	0.064212	0.07	0.9424	1.3711317
LEVERAGE	0.0063058	0.219845	0.03	0.9771	1.3312696
ASSETS TANGIBILITY	-0.286986	0.263263	-1.09	0.2765	1.6145587
Log_Age	-0.129958	0.165731	-0.78	0.4335	1.0325028
Ownersh. Dummy_I	-0.293661	0.177958	-1.65	0.0999	1.0765859
Year dummy_2008	-0.009288	0.142128	-0.07	0.9479	1.0056357
(Ownersh. Dummy_I-0.18475)*(Year dummy_2008-0.32845)	0.0353789	0.367855	0.10	0.9234	1.0010986

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.024992
RSquare Adj	0.004496
Root Mean Square Error	1.222385
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	12.75426	1.82204	1.2194
Error	333	497.57701	1.49423	Prob > F
C. Total	340	510.33127		0.2913

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.6158811	0.393294	1.57	0.1183	.
SIZE	0.0046229	0.063912	0.07	0.9424	1.373469
LEVERAGE	-0.02796	0.218854	-0.13	0.8984	1.3339685
ASSETS TANGIBILITY	-0.278443	0.262182	-1.06	0.2890	1.6191374
Log_Age	-0.131937	0.164801	-0.80	0.4239	1.0323048
Ownersh. Dummy_I	-0.297384	0.176953	-1.68	0.0938	1.0762929
Year dummy_2009	-0.046566	0.140269	-0.33	0.7401	1.0035923
(Ownersh. Dummy_I-0.18475)*(Year dummy_2009-0.33724)	0.6841022	0.35978	1.90	0.0581	1.0077148

Effect Tests

Effect Details

Financial ROE

Response ROE

Summary of Fit

RSquare	0.007504
RSquare Adj	-0.01336
Root Mean Square Error	1.233299
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.82964	0.54709	0.3597
Error	333	506.50163	1.52103	Prob > F
C. Total	340	510.33127		0.9250

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.349346	0.388077	0.90	0.3687	.
SIZE	0.0343105	0.067873	0.51	0.6135	1.521684
LEVERAGE	-0.02113	0.220397	-0.10	0.9237	1.3290026
ASSETS TANGIBILITY	-0.288718	0.268899	-1.07	0.2837	1.6731503
Log_Age	-0.130158	0.171702	-0.76	0.4490	1.1008266
Ownersh. Dummy_F/B	-0.084825	0.327493	-0.26	0.7958	1.2022301
Year dummy_2007	0.0550995	0.14245	0.39	0.6992	1.0124319
(Ownersh. Dummy_F/B-0.05279)*(Year dummy_2007-0.33431)	0.3345888	0.634281	0.53	0.5982	1.002242

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.00627
RSquare Adj	-0.01462
Root Mean Square Error	1.234065
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.19998	0.45714	0.3002
Error	333	507.13129	1.52292	Prob > F
C. Total	340	510.33127		0.9535

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3744665	0.385303	0.97	0.3318	.
SIZE	0.0336989	0.067807	0.50	0.6195	1.5168205
LEVERAGE	-0.028296	0.220468	-0.13	0.8980	1.3282148
ASSETS TANGIBILITY	-0.287186	0.267929	-1.07	0.2846	1.6590402
Log_Age	-0.129535	0.171776	-0.75	0.4513	1.1004085
Ownersh. Dummy_F/B	-0.083733	0.327606	-0.26	0.7984	1.2015684
Year dummy_2008	-0.005734	0.142675	-0.04	0.9680	1.0053583
(Ownersh. Dummy_F/B-0.05279)*(Year dummy_2008-0.32845)	0.074038	0.635933	0.12	0.9074	1.0058113

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.007825
RSquare Adj	-0.01303
Root Mean Square Error	1.233099
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	3.99359	0.57051	0.3752
Error	333	506.33769	1.52053	Prob > F
C. Total	340	510.33127		0.9165

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.3881643	0.384798	1.01	0.3138
SIZE	0.0343274	0.067806	0.51	0.6130
LEVERAGE	-0.036583	0.220054	-0.17	0.8681
ASSETS TANGIBILITY	-0.285577	0.268219	-1.06	0.2878
Log_Age	-0.130295	0.171655	-0.76	0.4484
Ownersh. Dummy_F/B	-0.085761	0.327381	-0.26	0.7935
Year dummy_2009	-0.048876	0.141504	-0.35	0.7300
(Ownersh. Dummy_F/B-0.05279)*(Year dummy_2009-0.33724)	-0.410557	0.635328	-0.65	0.5186

Effect Tests

Effect Details

Two firms ROE

Response ROE

Summary of Fit

RSquare	0.00802
RSquare Adj	-0.01283
Root Mean Square Error	1.232978
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	4.09281	0.58469	0.3846
Error	333	506.23847	1.52024	Prob > F
C. Total	340	510.33127		0.9112

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.3710806	0.380729	0.97	0.3304	.
SIZE	0.0229961	0.063944	0.36	0.7194	1.3513091
LEVERAGE	-0.027547	0.219998	-0.13	0.9004	1.3248906
ASSETS TANGIBILITY	-0.256024	0.269001	-0.95	0.3419	1.6752953
Log_Age	-0.11911	0.166087	-0.72	0.4738	1.0305369
Own. Dummy_CC	0.0890606	0.169338	0.53	0.5993	1.0493253
Year dummy_2007	0.0521834	0.142404	0.37	0.7143	1.0122995
(Own. Dummy_CC-0.20528)*(Year dummy_2007-0.33431)	0.1699525	0.34916	0.49	0.6268	1.0021146

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.009125
RSquare Adj	-0.0117
Root Mean Square Error	1.232291
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	4.65679	0.66526	0.4381
Error	333	505.67449	1.51854	Prob > F
C. Total	340	510.33127		0.8779

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4043046	0.377814	1.07	0.2853	.
SIZE	0.0203513	0.06383	0.32	0.7501	1.347983
LEVERAGE	-0.029618	0.219288	-0.14	0.8926	1.3178143
ASSETS TANGIBILITY	-0.249386	0.267985	-0.93	0.3527	1.6645123
Log_Age	-0.120156	0.165982	-0.72	0.4696	1.0303902
Own. Dummy_CC	0.0951864	0.169264	0.56	0.5743	1.0495824
Year dummy_2008	-0.002969	0.142493	-0.02	0.9834	1.0056777
(Own. Dummy_CC-0.20528)*(Year dummy_2008-0.32845)	0.3064827	0.354957	0.86	0.3885	1.0012099

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.012562
RSquare Adj	-0.0082
Root Mean Square Error	1.230152
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	6.41064	0.91581	0.6052
Error	333	503.92063	1.51328	Prob > F
C. Total	340	510.33127		0.7516

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.41298	0.376968	1.10	0.2741	.
SIZE	0.0217278	0.063753	0.34	0.7335	1.3494085
LEVERAGE	-0.038858	0.218525	-0.18	0.8590	1.3132163
ASSETS TANGIBILITY	-0.247899	0.267861	-0.93	0.3554	1.668768
Log_Age	-0.120014	0.165695	-0.72	0.4694	1.0304055
Own. Dummy_CC	0.0934982	0.168907	0.55	0.5803	1.0487885
Year dummy_2009	-0.046884	0.141145	-0.33	0.7400	1.0033779
(Own. Dummy_CC-0.20528)*(Year dummy_2009-0.33724)	-0.466025	0.348022	-1.34	0.1815	1.001191

Effect Tests

Effect Details

Two families ROE

Response ROE

Summary of Fit

RSquare	0.029654
RSquare Adj	0.009256
Root Mean Square Error	1.219459
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	15.13335	2.16191	1.4538
Error	333	495.19793	1.48708	Prob > F
C. Total	340	510.33127		0.1830

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4648352	0.383502	1.21	0.2263	.
SIZE	0.0127687	0.063463	0.20	0.8407	1.3607238
LEVERAGE	0.0284421	0.226096	0.13	0.9000	1.4305537
ASSETS TANGIBILITY	-0.315796	0.263241	-1.20	0.2311	1.6400848
Log_Age	-0.092099	0.164794	-0.56	0.5766	1.037184
Own. Dummy_II	-0.343142	0.244079	-1.41	0.1607	1.1290014
Year dummy_2007	0.0622488	0.140881	0.44	0.6589	1.0128563
(Own. Dummy_II-0.09091)*(Year dummy_2007-0.33431)	-1.138605	0.482527	-2.36	0.0189*	1.008802

▸ Effect Tests

▸ Effect Details

Response ROE

Summary of Fit

RSquare	0.019532
RSquare Adj	-0.00108
Root Mean Square Error	1.225803
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	9.96759	1.42394	0.9477
Error	333	500.36369	1.50259	Prob > F
C. Total	340	510.33127		0.4698

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.5252167	0.383653	1.37	0.1719	.
SIZE	0.0074432	0.063728	0.12	0.9071	1.3579428
LEVERAGE	0.0734087	0.226361	0.32	0.7459	1.4191032
ASSETS TANGIBILITY	-0.323162	0.263814	-1.22	0.2215	1.6302276
Log_Age	-0.102623	0.165634	-0.62	0.5360	1.0369664
Own. Dummy_II	-0.405083	0.245899	-1.65	0.1004	1.1340702
Year dummy_2008	-0.020212	0.141895	-0.14	0.8868	1.0078439
(Own. Dummy_II-0.09091)*(Year dummy_2008-0.32845)	-0.761298	0.507566	-1.50	0.1346	1.0081694

▸ Effect Tests

▸ Effect Details

Response ROE

Summary of Fit

RSquare	0.055048
RSquare Adj	0.035184
Root Mean Square Error	1.203397
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	28.09255	4.01322	2.7712
Error	333	482.23872	1.44816	Prob > F
C. Total	340	510.33127		0.0082*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.5242318	0.375957	1.39	0.1641	.
SIZE	0.0109148	0.062609	0.17	0.8617	1.3599509
LEVERAGE	0.0230614	0.221626	0.10	0.9172	1.4114861
ASSETS TANGIBILITY	-0.322036	0.259198	-1.24	0.2150	1.6328192
Log_Age	-0.097435	0.162596	-0.60	0.5494	1.0368236
Own. Dummy_II	-0.39124	0.240396	-1.63	0.1046	1.1246237
Year dummy_2009	-0.049968	0.138085	-0.36	0.7177	1.0035195
(Own. Dummy_II-0.09091)*(Year dummy_2009-0.33724)	1.8243996	0.475004	3.84	0.0001*	1.0038894

Effect Tests

Effect Details

2.5 2.5 Regression results for hypothesis 6

Cross-ownership ROA

Response ROA

Summary of Fit

RSquare	0.136781
RSquare Adj	0.113309
Root Mean Square Error	0.180694
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	9	1.712447	0.190272	5.8276
Error	331	10.807216	0.032650	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2702305	0.057652	4.69	<.0001*	.
SIZE	-0.018481	0.009443	-1.96	0.0512	1.3722773
LEVERAGE	0.012467	0.032408	0.38	0.7007	1.3386587
ASSETS TANGIBILITY	-0.131858	0.039362	-3.35	0.0009*	1.6702117
Log_Age	0.0341795	0.024382	1.40	0.1619	1.0341214
Cross_Dummy	-0.060121	0.027533	-2.18	0.0297*	1.132878
Year dummy_2007	-0.034421	0.023982	-1.44	0.1522	1.3367817
Year dummy_2008	-0.050651	0.024015	-2.11	0.0357*	1.3285091
(Cross_Dummy-0.17302)*(Year dummy_2007-0.33431)	0.0658168	0.063584	1.04	0.3014	1.3519063

Response ROA

Summary of Fit

RSquare	0.136781
RSquare Adj	0.113309
Root Mean Square Error	0.180694
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	9	1.712447	0.190272	5.8276
Error	331	10.807216	0.032650	Prob > F
C. Total	340	12.519663		<.0001*

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2358099	0.056909	4.14	<.0001*	.
SIZE	-0.018481	0.009443	-1.96	0.0512	1.3722773
LEVERAGE	0.012467	0.032408	0.38	0.7007	1.3386587
ASSETS TANGIBILITY	-0.131858	0.039362	-3.35	0.0009*	1.6702117
Log_Age	0.0341795	0.024382	1.40	0.1619	1.0341214
Cross_Dummy	-0.060121	0.027533	-2.18	0.0297*	1.132878
Year dummy_2008	-0.01623	0.024167	-0.67	0.5023	1.3453814
Year dummy_2009	0.0344206	0.023982	1.44	0.1522	1.3425673
(Cross_Dummy-0.17302)*(Year dummy_2008-0.32845)	-0.072245	0.063038	-1.15	0.2526	1.3266577

Response ROA

Summary of Fit

RSquare	0.132123
RSquare Adj	0.113879
Root Mean Square Error	0.180636
Mean of Response	0.090141
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	1.654135	0.236305	7.2421
Error	333	10.865529	0.032629	Prob > F
C. Total	340	12.519663		<.0001*

Lack Of Fit

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.2285796	0.055927	4.09	<.0001*	.
SIZE	-0.018718	0.009435	-1.98	0.0481*	1.3707532
LEVERAGE	0.0116982	0.032227	0.36	0.7168	1.3245668
ASSETS TANGIBILITY	-0.130299	0.039273	-3.32	0.0010*	1.6636617
Log_Age	0.0342834	0.024373	1.41	0.1605	1.0340128
Cross_Dummy	-0.060435	0.027523	-2.20	0.0288*	1.1327758
Year dummy_2009	0.042567	0.020728	2.05	0.0408*	1.0035579
(Cross_Dummy-0.17302)*(Year dummy_2009-0.33724)	-0.029723	0.055226	-0.54	0.5908	1.0012739

Cross-ownership ROE

Response ROE

Summary of Fit

RSquare	0.01502
RSquare Adj	-0.00569
Root Mean Square Error	1.22862
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	7.66529	1.09504	0.7254
Error	333	502.66598	1.50951	Prob > F
C. Total	340	510.33127		0.6505

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.4081668	0.383243	1.07	0.2876	.
SIZE	0.0194361	0.064193	0.30	0.7622	1.3715192
LEVERAGE	-0.023219	0.220255	-0.11	0.9161	1.3374237
ASSETS TANGIBILITY	-0.306416	0.267594	-1.15	0.2530	1.6695955
Log_Age	-0.112116	0.165785	-0.68	0.4993	1.0340932
Cross_Dummy	0.1144206	0.187142	0.61	0.5413	1.1320185
Year dummy_2007	0.0529467	0.141868	0.37	0.7092	1.0118324
(Cross_Dummy-0.17302)*(Year dummy_2007-0.33431)	0.5888335	0.372155	1.58	0.1145	1.0017384

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.009
RSquare Adj	-0.01183
Root Mean Square Error	1.232369
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	4.59314	0.65616	0.4320
Error	333	505.73814	1.51873	Prob > F
C. Total	340	510.33127		0.8819

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.426838	0.381805	1.12	0.2644	.
SIZE	0.0193964	0.064314	0.30	0.7632	1.3683573
LEVERAGE	-0.021066	0.220423	-0.10	0.9239	1.3313249
ASSETS TANGIBILITY	-0.304897	0.26764	-1.14	0.2554	1.660027
Log_Age	-0.112305	0.166273	-0.68	0.4999	1.0338735
Cross_Dummy	0.1190311	0.187749	0.63	0.5265	1.1324487
Year dummy_2008	-0.005683	0.142494	-0.04	0.9682	1.0055609
(Cross_Dummy-0.17302)*(Year dummy_2008-0.32845)	-0.291671	0.373527	-0.78	0.4354	1.001389

Effect Tests

Effect Details

Response ROE

Summary of Fit

RSquare	0.015121
RSquare Adj	-0.01166
Root Mean Square Error	1.232264
Mean of Response	0.279867
Observations (or Sum Wgts)	341

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	9	7.71658	0.85740	0.5646
Error	331	502.61469	1.51847	Prob > F
C. Total	340	510.33127		0.8258

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|	VIF
Intercept	0.460869	0.388098	1.19	0.2359	.
SIZE	0.0196213	0.064401	0.30	0.7608	1.3722773
LEVERAGE	-0.024376	0.22101	-0.11	0.9122	1.3386587
ASSETS TANGIBILITY	-0.306937	0.268437	-1.14	0.2537	1.6702117
Log_Age	-0.112244	0.166279	-0.68	0.5001	1.0341214
Cross_Dummy	0.1137953	0.187768	0.61	0.5449	1.132878
Year dummy_2008	-0.037913	0.164807	-0.23	0.8182	1.3453814
Year dummy_2009	-0.067607	0.163548	-0.41	0.6796	1.3425673
(Cross_Dummy-0.17302)*(Year dummy_2008-0.32845)	-0.583108	0.429896	-1.36	0.1759	1.3266577
(Cross_Dummy-0.17302)*(Year dummy_2009-0.33724)	-0.596356	0.433616	-1.38	0.1700	1.3264105

Effect Tests

Effect Details