KADİR HAS UNIVERSITY
SCHOOL OF GRADUATE STUDIES
FINANCE AND BANKING MASTER PROGRAM

# EFFECT OF FAMILY CONTROLLED FIRMS ON COST OF EQUITY

Evidence of Turkish Listed Firms During 2008 Financial Crisis

ABDULRAHMAN QAHTAN

SUPERVISOR: DR. BELMA OZTURKKAL

MASTER’S THESIS

ISTANBUL, FEBRUARY, 2020

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Submitted to the School of Graduate Studies of Kadir Has University in partial fulfillment of the requirements for the degree of Master's in the Discipline Area of Finance and Banking under the Program of Finance and Banking master program.

ISTANBUL, FEBRUARY, 2020

DECLARATION OF RESEARCH ETHICS /
METHODS OF DISSEMINATION

I, ABDULRAHMAN QAHTAN, hereby declare that;

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# **ACCEPTANCE** AND **APPROVAL**

This work entitled **EFFECT OF FAMILY CONTROLLED FI** RMS ON COST OF **EQUITY** EVIDENCE OF TURKISH L1STE D FIRMS DURING **2008** FINANCIAL CRlSlS prepared bi ABDULRAHMAN QAHTAN has been judged to be successful at the defense exam held on 5, FEBRUARY 2020 and accepled by our jury as MASTER’S THESIS.

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Dean of School of Graduate Studies

DATE OF APPROVAL: / /

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EFFECT OF FAMILY CONTROLLED FIRMS ON COST OF EQUITY EVIDENCE OF TURKISH LISTED FIRMS DURING 2008 FINANCIAL CRISIS

## ABSTRACT

Previous studies believed in the failure of corporate governance in preventing or decreasing the consequences of a financial crisis, especially in the recent global economic crises, which in turn put forth several financial phenomena in these critical times. One of these phenomena is agency problems and the matters of expropriation among shareholders.

Prior studies claim that at times of crises, the incentive for the expropriation of major shareholders over other minority shareholders is more frequently observed in firms controlled by families or individuals, unlike the non-family-controlled firms in which the incentive is less evident.

This study examines the relationship between the family-controlled companies and the agency cost conspicuous to the cost of equity capital, where at the time of the economic crisis in Turkey in 2008 had a major role in the result.

The data was collected from publicly traded firms of Bist All Share (XUTUM) including 331 companies in the Turkish stock exchange market. The time period was determined as, from 2006 until 2010, two years before and after the economic crisis in 2008, by using secondary data method in gathering financial data and ultimate ownership, excluding the financial sector for its different structure. According to the previous results which were inconsistent with the study data. The results show that there is no significant difference in cost of equity for family-controlled firms and non-family-controlled firms in Turkey.

**Keywords:**
corporate governance; family control; agency problems; Turkish financial crisis

AİLE ŞİRKETLERİNİN ÖZ SERMAYE MALİYETİ ÜZERİNDEKİ ETKİSİ 2008 MALİ KRİZİ ESNASINDA HALKA AÇIK TÜRK ŞİRKETLERİ ÖRNEĞİ

# ÖZET


Önceki çalışmalar, şirket yönetiminin mali bir krizin, özellikle de bu kritik zamanlarda ortaya birçok ekonomik olgu koyan yakın zamandaki ekonomik krizlerin önlenmesinde ya da etkilerinin azaltılmasında başarısız olduğuna inanmıştır. Bu olaylardan biri de vasıta problemi ve hissedarlar arası el koyma meseleleridir.

Bir önceki araştırmalar kriz zamanlarında, hissedarların çoğunluğunun azınlıkta olan hissedarların malına el koyma dürtüsünün genellikle böyle bir dürtünün daha az olduğu aile şirketi olmayan şirketlerin aksine aile ya da bireyler tarafından yönetilen şirketlerde gözlemlendiğini iddia etmektedir.

Bu araştırma, aile şirketleri ile 2008 yılındaki ekonomik kriz zamanında sonuçta büyük bir rolü olan öz sermaye maliyetinde belirgin olan vasıta maliyeti arasındaki ilişkiyi incelemektedir.

Veriler Türk menkul kıymetler borsasındaki 331 şirketi kapsayarak Bist All Share (XUTUM) halka açık şirketlerinden toplanmıştır. Zaman aralığı, 2008'deki ekonomik krizden iki yıl önce ve iki yıl sonra olmak üzere 2006'dan 2010'a kadarki zaman olarak belirlenip farklı yapısından ötürü mali sektörü dışarıda bırakarak mali verileri ve son mülkiyeti bir araya getirmede ikinci veri metodunu kullanarak belirlenmiştir Sonuçlar, Türkiye'deki aile kontrolündeki ve aile kontrolündeki olmayan firmaların özkaynak maliyetinde önemli bir fark olmadığını göstermektedir.



**Anahtar kelimeler:**

şirket yönetimi; aile yönetimi; vasıta problemleri; Türk mali krizi

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## Dedication

I dedicate my dissertation work to my family. A special gratitude for my father and my mother who are the source and the power behind my successful education. My wife and my daughters, they are the ones who have given me a great portion of their time to support me in completing my thesis.

I dedicate this paper to Tawkol Karman and her foundation, my thanks to her for always supporting my academic career and giving me an irreplaceable opportunity. To my supervisor, Dr. Belma Ozturkkal who was my guidance to submit my dissertation with patience and prudence.

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# LIST OF TABLES

# 1. INTRODUCTION

Corporate governance is the system of rules, practices, and processes by which a firm is directed and controlled, (Investopedia.com, 2019). This means that corporate governance aligns the interest among managers and shareholders to deal with management engagements that could be either costly affecting the firm market position or increase the evaluability of firms. Moreover, many theories have defined the dynamics of corporate governance. One of them is agency theory Wim, E., & Leen, P. (2016). Agency theory argues that shareholder interests need protection from the majority shareholders, considering effective corporate governance mechanisms will decrease the conflict of both sides of the agency theory the management and shareholders, (Donaldson, L., & Davis, J. H. 1991). Based on this, we can say that CG is a system of laws to regulate different corporate affairs to improve their performance, but the question here is to what extent these laws help improve performance and under what conditions these laws are efficient.

Furthermore, agency theory is defined by Jensen, M., & Meckling, W. (2012) as a contract between different sides; in a contract; the agent and the principal authorized the agent to undertake decisions in accordance with the interests of the principal. If that the case maximizing utility for both sides has been achieved, it is not lucid to assume that the agent and principal will reach a no-cost and the agent will always make sufficient decisions as well.

Corporate governance in a prospect view of Claessens, S., & Yurtoglu, B. B. (2013) is described as the division into two classifications; the first one is the function of firms in terms of shareholders' performance, growth, efficiency, and financial structure. The second one is the framework and regulation the firms are working and operating in, as the source of these rules stems from a legal system, the legal system, and financial markets. Additionally, corporate governance has manifested a failure in its mechanisms in handling the recent global crisis that has impacted the overall economy and specific firms' values and caused mistrust towards corporate governance for its inability to recognize potential repercussions of economic crises. Claessens, S., &

Yurtoglu, B. B. (2013)

Despite the successive economic crises, studies assume that there were movements of capital toward the emerging markets due to the impressive success and acceleration in economic evolution. Moreover, the competition in these countries is bearable, which reveals an impressive growth rate, which was a major factor in attracting foreign capital. An example of the successfully emerging economy is the Turkish emerging market which itself has become one of the most advanced economies among the developing countries in the Middle East. ( Arı, A., & Cergibozan, R. (2014).

Turkish emerging market professed that generally shareholders are controlled by family members. It is asserted that 80% of shares owned and controlled by family members with greater voting rights result in a crucial conflict, which appears to be so in this situation as a conflict between the majority-controlling shareholders and minority owners, a substitute for the well-known conflict between managers and principles. Yurtoglu, B. (2000). What is more interesting is that the family-controlled firms are associated with high market value compared to firms with no family control, Ararat, M., & Dallas, G. (2011).

General literature work done in Turkey generally observes that the association between monitoring financial performance and corporate governance mechanisms, by implementing specific empirical measurements or ratios and valuation models such as Accounting profitability return on assets (ROA) or Market performance Tobin’s Q (“governance-to-value” studies) (Bianco and Casavola, 1999; Black et al., 2003; Kyereboah-Coleman et al., 2006; Kim and Yoon, 2007; Raja and Kumar, 2007).

For this reason, due to the lack of studies on the side of decreasing the costs of companies instead of firm’s value, this paper will contribute a better intellectual understanding of the research question and will underline the critical role the family firms have in Turkish emerging market and other markets in future studies

Instead of carrying out the efficiency of the corporate governance and looking into it from different contexts as the perspective of agency cost reduction, specific attention was paid to the 2008 economic crisis that hit the Turkish market, by including companies as nonfamily-controlled firms and family-controlled firms. It was concluded that the family and individuals' members represent the largest proportion in Turkey and around the world as well. In short, emerging economies have a great lack of legal protection for investors, as well as an increase in the agency cost ratios, (North, 1990; Wright et al., 2005).

La Porta, Lopez-de-Silanes, and Shleifer (1999). report that 30% of ownership held and controlled by family businesses results in aggravating the information problem for the firm among shareholders, in the Turkey case, it has been proved that ownership structure impacts the firms' performance, furthermore, if in case the presence of high level of ownership concertation it's related to decreasing in dividend payout; more interestingly, to family members in the board associated with low dividend payments as well.

Additionally, (2002), Anderson and Reeb (2003), in their study they did not distinguish family ownership from the control and management of families, later, Claessens et al. (2002) and Cronqvist and Nilsson (2003), in their study, differentiated the effect of family ownership on controlling and voting right but ignored the fact that management is important too. More details will be mentioned in chapters separately.

To assess the problem of the research question, this paper will employ the cost of equity capital as a proxy for agency cost, instead of the firm value by following recent papers conducted on Asian emerging markets, Boubakri, N., Guedhami, O., & Mishra, D. (2010). Seeing the problem from a different perspective, believing that literature studies focused on corporate governance give a rise to the firm value mainly based on expected cash flow, (Claessens et al., 2002; La Porta et al., 2002), current research, on the other hand, brought attention to decreasing agency cost, thus minimized the risk premium asked by shareholders, hence cost of equity capital; however, it brought out the higher level in agency cost during financial crises (Guedhami & Mishra, 2009, Chen, Chen, & Wei, 2009).

Earlier empirical study has shown a positive relationship among family businesses and the cost of equity capital, particularly during and after the Asian financial crunch, (Boubakri, Narjess Guedhami, Omrane Mishra, Dev, 2010). Furthermore, the study conducted in Asia using 566 firms in eight Asian countries over the Asian financial crisis period 1969-1999, it has been found that family control significantly show no sign of relation with firm cost of equity before the Asian crisis, in contrast, they find family control to be related to a greater cost of equity capital during and after the Asian financial crisis. It implies that these crises make the investors tend to be more cautious and ask for a more high-equity premium. As an addition to the empirical studies, data from Claessens et al.'s (2000) to identify the family-controlled corporation database have been obtained. Moreover, they estimate that it is best for the cost of equity approving discounted cash flow valuation to hold ex-*ante* as way to see cost of equity capital, using four models of cost of equity, Ohlson and Juettner-Nauroth (2005; OJ), Easton (2004; ES), Gebhardt, Lee, and Swaminathan (2001; GLS), and Claus and Thomas (2001; CT) following Dhaliwal et al. (2006), and (2006) and Hail and Leuz (2006).

On the contrary, Chen K., Chen Z., & Wei K. (2009) emphasize that corporate governance negatively influences the cost of equity capital in the developing markets. They discuss corporate governance issues and find that corporate governance records negatively significant in reducing the agency cost in the emerging market which has poor legal protection. Furthermore, in their result, they stated that institutional investors in firms with suitable and good quality of corporate governance agree to buy shares with a higher premium on condition in countries with weak legal protection for investors. In their empirical study, they made a survey in Asian countries by measuring the cost of equity capital using the ex-ante as a proxy for the cost of equity.

All demonstrated that the cost of equity appeared to significant within family firms exclusively in the time of financial crisis cost of equity increase, which makes investors aware of family members' presence in these firms.

All of that motivated me to answer the question of what the “effect of family-controlled firms on the cost of equity capital during a financial crisis in the Turkish market” is.

This paper aimed to contribute in several ways. It identifies the relation of specific ownership structure type to the effectiveness of the cost of equity capital. It assesses the relation of the family-controlled firms and non-family-controlled firms with their cost of equity pre-post, during and post-crisis of listed Turkish firms. This paper mainly attempts to conduct a hypothesis test on whether it is likely to see a positive relationship between family control and the cost of equity capital during the crisis.

Lastly, this paper is organized according to the most important and related topic to the issue, starting with the first chapter which opens by giving a summary of how this research will appear in the general framework. Chapter two demonstrates an overview of the literature covering several topics. The definition of the General Corporate governance, and intellectual understanding of imperative studies of corporate governance, then this study moves on to specific topic CG in the emerging market and how these markets perform, finally it gives a quick glance over the theoretical framework of corporate governance in terms of agency cost. Chapter three includes ownership structure in relation to a variety of concerns, and it moves to ownership concentration as the ongoing part of the overall issue, and the most relevant topic to the research is the family firm literature explaining how various ownerships theories and studies have pertaining to them. Finally, this chapter is about the related subject, but it is focused on Turkish literature, comprising of the recent agenda. Chapter four is about the methodology of this paper, as it gives an introductory overview of the dataset and the sources of these data, also the reason why this paper attempted to use the particular approach, finally specific details of techniques and tests used to clarify the problem of the research are included. Chapter 5 is the last chapter with the last statistical analysis results and relations, to be followed by the recommendations at last.

# 2. LITERATURE REVIEW AND HYPOTHESIS

## 2.1. Corporate Governance Overview

Over the past decade, the financial organizations experienced a numerous shift in the position of the private sector, mainly in mature economies and job opportunities. Increasingly, market-based approaches have begun to be chosen as an alternative implementation in country-market policies, and comprehension of the consequence of the private sector in producing welfare and market stability has increased as well. On the other hand, private sectors may face challenges in their way of developing governance systems because they are the primary responsibility for the corporate governance and its evaluation; there may be obstacles to governance, namely, solving ethical problems at work and adapting laws with the purpose of protecting all parties of interests in different institutions. OECD Principles of CG (1964).

More generally, Corporate Governance is defined by Robert Mueller as he clarifies that "governance is concerned with the intrinsic nature, purpose, integrity, and identity of the institution, with a primary focus on the entity's relevance, continuity, and fiduciary aspects. Governance involves monitoring and overseeing strategic decision, socio-economic and cultural context, externalities and constituencies of the institution", Robert K. Mueller (1981).

Earlier studies show the need for corporate governance for better firm performance and value (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, (1997, 1998, 2002), corporate governance allows companies to obtain sources of funds and reduce capital costs, which results in the profitability of companies and the satisfaction of shareholders. Claessens, S., & Yurtoglu, B. B. (2013) another study emphasized that corporate governance positively affects banks' efficiency. Mustafa, S., Işıl, E., & Ceylan, F. (2016).

Emerging markets are the focus of CG attention because they face various problems and differences unlike the developed markets (Black, 2001; Bebchuk and

Hamdani, 2009). In addition, the most important of these differences is the fact that the emerging market has different ownership, which is intensively owned by the controlling family as well as the weak investors' protection. Probably due to the lack of quantification, yet more importantly, the trust and reputation play a role in markets with unstable legal enforcement authorities, Bebchuk Ararat, M., Black, B. S., & Yurtoglu, B. B. (2017) has constructed Turkey Corporate Governance Index while aiming to test the market value and profitability which apparently show a higher market value with fixed and higher firms-value with random effect in their results.

The studies of corporate governance in the merging market can be classified into sets of studies as country-level governance, and firm-level governance. Yurtoglu, B. B., De Carvalho, A. G., Kim, W., Khanna, V. S., & Black, B. S. (2015)

In the meantime, the world is channeling its interest in the emerging economies as a new chance to compensate for the loss in the developing economies, with a special focus on emerging markets. Much paperwork on corporate governance influence firms by providing better access to financing, at the same time, it decreases the cost of capital, leading to better performance. Claessens, S., & Yurtoglu, B. B. (2013). Another empirical study done in Turkey has shown that good corporate governance is related to better firm performance and value. In that study, their empirical evidence was obtained by using panel data with self-collecting data on corporate governance practices and firm value and Profitability data of Borsa Istanbul from the year 2006 until 2012; like board size, board procedures, disclosure, ownership structure, shareholder rights, and Tobin's q were included in addition to building Corporate governance index to figure whether firm-level could predict Tobin’s q and profitability, Ararat, M., Black, B. S., & Yurtoglu, B. B. (2017).

On the other hand, a study claims that countries with weak corporate governance result in a lack of performance and an increase in the incentive for managers to expropriation minorities. They examined the effect of corporate governance mechanisms on the stock market value. They concluded that poor legal institutions for corporate governance lead to a decline in the stock market and exchange rate depreciation, which is caused by corporate governance, and it indicates the inability to minimize agency conflicts, especially the managers' expropriation of the minority. They used different measurements in their paper. The first one is the measuring crisis: nominal exchange rate depreciation of IFC's (Johnson, S., Boone, P., Breach, A., & Friedman, E. (2000)), index, measuring economic condition using standard macroeconomic aggregates, and lastly, evaluating institutions by using report of corporate governance in LLSV of legal system, corruption, rule of law., Johnson, S., Boone, P., Breach, A., & Friedman, E. (2000).

## 2.2. Emerging Economies

Emerging markets have an adequate economic characteristic which appears to have been attracting investment prospects. Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. (2000), emphasized those emerging countries, which increasingly grow in their ability potentials as these economies embrace economic liberalization as the main engine of growth. In a different perspective offered by Aggarwal, R., Inclan, C., & Leal, R. (1999), they believe that emerging economies were influenced by global financial trends such as volatility in emerging markets during the period 1985–1995 of global hyperinflation. However, it is not the general judgment on the emerging market. There is a study which has developed a model to understand the drives of the emerging market, and it sees no correlation between developed and developing countries, thus it can be inferred that the small amount of investment leads to lower in portfolio risk for the foreign investors Divecha, A., Drach, J., & Stefek, D. (1992).

All of this puts us in a position to face of questions about the performance of the emerging economy, especially the Turkish economy, and the realization of the real variables by affecting it through the interpretation of the economic conditions taking place in a country. In a broader scope, emerging markets are riskier for investors at the firm-level and country-level, yet it is essential that investors have sufficient tools and information for such markets. Ararat, M., & Dallas, G. (2011). This study observes that the Turkish economy is a convenient environment to focus on, besides, the availability of the necessary data to complete this  paper.

# 3. THEORETICAL FRAMEWORK

There are many different schools that explain the dynamics of the CG and the essence of its work and its impact on companies. like, Agency theory, Stakeholder theory, and Stewardship theory. Wim, E., & Leen, P. (2016).

## 3.1. Stewardship theory

As an alternative to agency theory, stewardship theory manager under this theory was believed to be a better steward of firms' asset and managers were unlikely to be opportunistic. However, this theory neglects the issue of a motivational problem among executives. The theory sees the organizational structure, the authorities and responsibilities granted to managers, which in turn helps executives to take effective decisions to serve the company and it considers this procedure to be the main major performance difference. Thus, the main focus of this theory is not to motivate managers but to promote participation in effective decisions among chairmen and executives. Donaldson, L., & Davis, J. H. (1991). The theory sees the manager as an honest person who has no negative intentions and proceeds in accordance with the law. Tricker, (1994)

### 1.3.1. Principal Agent relationships and agency costs theory:

Capital and client is the relationship between the capital represented by the owner of liquidity and the author of the regulations, and laws in the company and the client who is the decision-maker in accordance with the laws and regulations with his experience and skills by employing them to serve the interests of both parties in an effective manner. Stratling, (2001).

Through the relationship between the capital and the client, an effective mechanism to work the required balance of assets and to distribute their uses in order to raise the value of the company can be reached. On the other hand, this relationship may be negatively attributed to the company by furnishing the client with powers that may be misused by the client eventually. Stratling, (2001).

On the other hand, agency cost is a type of internal company expense that comes from the actions of an agent acting on behalf of a principal, Investopedia 2019. In other words, this theory assumes that the nature of the work between managers and principles is based on conflict. The agent often works to increase his wealth in line with the decisions he makes while taking the advantage of the administrative position in the organization, and the principal whose main objective is to produce better market value for the corporation. Whereas, Jensen and Meckling, elucidate the agency costs as "the sum of (1) the costs of creating and structuring contracts between the principal and the agent, (2) the monitoring expenditures by the principal, (3) the bonding expenditures by the agent, and (4) the residual loss." Jensen and Meckling (1976).

The conflict between managers and investors in aligning the interest of each other derives from the separation of ownership and control in a firm. Hence it can be deduced that perhaps the major success in many corporations is the separation of ownership and control.

This paper it will study the major conflict in this situation is among controlling shareholders and minority shareholders instead of the well-known conflict between managers and principles, in contrast, there are firms with managers who have significant ownership interests like in Microsoft which has a substantial influence in the market, and yet has fewer conflicts among manager and shareholders

However, do CG principles apply in distressing times when the agency problems increase and incentive for expropriation appears to make welfare for the biggest shareholders and ignore minority shareholders?

### 1.3.2. Property rights theory and Transaction-Cost Economics

This theory grants a different concept than the agency theory, i.e. through previous definitions of the client theory, which in turn focused on one of the pillars of this theory, namely the (contract) between the Principle and the agent.

The theory of Property rights denotes the right to own assets, which includes:

- the right to use it,
- the right to attain an income from its use
- The right to transfer all or some rights into an asset.

Furthermore, it takes the disparities between the individuals in the company into consideration, for example, that the managers have the right to use or manage assets and in return, the shareholders have the right to attain income and own the shares property. (Stratling, 2001).

It includes "(1) the maladaptation costs incurred when the transactions drift out of alignment... (2), the haggling costs incurred if bilateral efforts are made to correct ex-post misalignments, (3), the setup and running costs associated with the governance structure (often not the courts) to which disputes are referred, and (4) the bonding costs of effecting secure commitments" Williamson, (1988).

Furthermore, transaction costs theory involves economics, finance, marketing, organization theory, political science, sociology, and strategic management (Carroll et al., 1999), while the agency theory is included in accounting, economic, corporate finance, and management activities. Eisenhardt, (1989).

# 4. OWNERSHIP STRUCTURE AND FAMILY CONTROL

Berle and Means (1932) were the first to lay the framework of studying the separation of ownership and control, which later contributed to the formation of the concept of agency problems. The difference in ownership of capital has a direct impact on the performance of companies through the effectiveness of the relationship between managers and capital owners (shareholders), Berger and Patti (2000). In general, CEOs are considered to have a significant role in the company through various decisions to guide the company's performance for better market value. (Finkelstein and Hambrick, 1996).This, in turn, performs several administrative decisions, including planning, organization, and control, all of which are considered as the pillar of firms’ activities at all levels. (Fayol, 1949).

From the context above, it is needed to clarify some terminologies before going further in detail since ownership and management are core issues for the matters regarding the corporate governance mechanisms (Daily, Dalton, & Canella, 2003). While the agency problem persists, as the managers are not free from the controlling shareholders, which causes exploitation of the company's resources for the benefit of the managers in order to enhance their self-profit as a consequence, it decreases firms’ performance. Yurtoglu, B. B. (2000).

## 4.1. OWNERSHIP CONCENTRATION:

Ownership concentration is defined as a part of the firms' internal corporate governance techniques that elucidate the extent to which way an owner can have the ability to control the company's decisions. This means that the dominant shareholder’s access to a greater power furnishes him with a better ability to monitor and restrain the power of the board of directors Madhani, P. M. (2016). Contrarily ownership concentration may lead to agency problems among the minority and majority shareholders which cause a conflict of interest (Pound, 1988).

Concluded that the company management is key for better firm performance in situations where the company separates ownership and control, individual claims have arisen in response to this matter which we can summarize as agreement and disagreement about ownership and management related to the firm’s value, Lasfer, M., & Faccio, M. (2005). A study conducted on the UK market in comparison to the US market considered the lack of connection between ownership structure and companies’ value in contrast to the US market.

Ownership structure influences the agency problems among shareholders and managers Claessens, S., & Yurtoglu, B. B. (2013). A high level of ownership concentration is assumed to be in favor of the firms in order to reduce many issues caused by ownership and control such as restraining the motivations in increasing the private wealth of a major shareholder. (Jensen and Meckling, 1976), another supporting the claim, García, J. P., Familiar, C. D. E., & Salamanca, U. De. (2008) suggest that the more concentration ownership in the hands of the families is correlated with better firms’ value, only in the case that concentration level is higher, which significantly could decrease the value of the firm. A study conducted in Australian publicly listed firms over the period 2000-2005 by examining annual panel data, as they examined the possibility of board and audit committee independence to be fairly impressed by ownership concentration and observe the impact of board and audit committee independence on the firm value. It is concluded that board independence has not been affected by the ownership concentration and it is suggested that board independence improves firm value especially in firms with higher ownership concentration, Setia-Atmaja, L. Y. (2009). Moreover, according to a study conducted in China, the decline in ownership structure as a result of a regime regulation shift in (China 2001) had a gradational effect of the board's independence on firm performance. They scrutinized this effect during the period of 2003–2008 when the independent directors' ratio was constant. However, implementing market-based (Tobin's Q) as a proxy of firms ‘value and accounting-based measure (ROA) produced a noticeable decline in ownership concentration among Chinese publicly listed firms. Additionally, they titled the issue that board independence and firm performance increase influentially as ownership concentration steadily drops. However, this could not be the case due to the nature of ownership, and it is statistically and economically positively significant in closely held firms. Li, K., Lu, L., Mittoo, U. R., & Zhang, Z. (2015).

The further study prepared in Latin American countries analyzes a unique data set of publicly traded firms based in six Latin American countries as they gathered accounting information to construct dividends from DataStream for the period 2007 to 2014 of non-financial firms trading in Latin American. The study dividend policy was derived from the mutual effect among ownership concentration and structure. They believed if firms were either highly concentrated or when the largest investor was recognized as an individual, the general tendency to pay fewer and have self-benefits from minority shareholders would be extremely evident. Gonzalez, M., Molina, C. A., Pablo, E., & Rosso, J. W. (2017)

## 4.2. FAMILY CONTROLLED FIRMS

The family firms according to different literature could be defined as the firms owned or co-founder is in top management and has substantial cash flow rights, Heck and Scannell (1999) Bona-Sanchez et al. (2007). Furthermore, family businesses or individuals could be defined as controlling shareholders when they have a promotion of 20% of voting rights. McAdam et al. (2010). Nevertheless, the empirical results attempting to distinguish the family-controlled firm from the non-controlled firms are still inconclusive (Daily and Dollinger 1991)

Based on the study presented by La Porta, Lopez-de-Silanes, and Shleifer (1999), the percentage of ownership held and controlled by family businesses record 30% ownership. It appears to raise many issues like asymmetric information or expropriation of the minority owners especially in economies with low shareholders protection. However, it is seen that even though the presence of strong investors and protection of major shareholders tends to increase their wealth and expropriate minority shareholders. Expropriation is defined by Claessens, Djankov, et. al as “the process of using one's control powers to maximize own welfare and redistribute wealth from others", Claessens, Djankov, Fan, and Lang (2000).

Seemingly the lack of literature, especially in emerging economies about family firms, influences the company's financial decisions compared to non-family firms as a major player in the market. McConaughy, D. L., Walker, M. C., Henderson, G. V., & Mishra, C. S. (1998). Moreover, family firms' studies have smaller extent evidence correlating to firms' value. Moreover, family-controlled firms act in the best interest of the company.

According to many studies, family-controlled firms can be categorized based on ownership and control which may decrease or increase the required rate of return (cost of equity). Hence it impacts monitoring cost: "Family members have many dimensions of exchange with one another over a long horizon and therefore have advantages in monitoring and disciplining related decision agents." Demsetz and Lehn (1985), Fama and Jensen (1983). Additionally, family firms highly productive in contrast to non-family firms for their alignment in their goals within managers and shareholders, specifically "because they are either the same individual or they have a kin relationship". (Martínez et al., 2007).

However, in other cases, it is stated that family firms demonstrate better performance in case of a family member acting as CEO. Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003) compared the firm value of family and non-family firms and found that family firms performed better. Similarly, Maury, B. (2006) record higher significance between family control firm value and operating performance contrasting to non-family firms. Comparing family firms and non-family firms, it has been defined that the agency cost is less in family firms than in non-family firms. Adhikari, H. P., & Sutton, N. K. (2016). Another study reports a better market position if the existence of a family member is as either an executive or as a board member, Andres (2011).

A study showed that family firms tend to have less independent board directors, as a result, they engage in higher dividend and debt ratios, thus mitigating agency cost in family-controlled firms depends on the corporate governance mechanisms, like debt and dividend which are considered as a more effective tool in decreasing families' expropriation minority shareholders. Setia-Atmaja, L., Tanewski, G. A., & Skully, M. (2009).

A study done in Taiwan proposed that family firms have no tendency to issue dividends among shareholders in which the market considers the dividend payout is an indicator of success in the field. Wu, M., Ni, Y., & Huang, P. (2019). Alternatively, (Mork et al., 1988; Shleifer and Vishny, 1997; Carlin and Mayer, 1999; Johnson et al., 2000) stated that over ownership concentration, especially in the businesses run by family firms could have a negative effect on the overall firm value due to the expropriation of minority owners for incentive, when the majority of the shareholders take advantage of their power in order to transform any benefits to another owned interest or to use the firm's asset for their own advantage.

Silva, F., & Majluf, N. (2008). Claim that performance of a company depends mainly on the ownership concertation as well as the family-controlled firms that do not have any effect on performance, moreover, they said that family and business group control the main proportion of the total companies in the emerging market, unlike the developed countries which seem to be another substantial matter. In general, developed countries related to the agency problem remain mainly focused on the issue of the relation of managers and shareholders. On the other hand, in developing markets (i.e. emerging markets) the mainstream is focused on the relationship among minority and majority of the shareholders.

And in this context, Lemmon, M. L., & Lins, K. V. (2003) in their study of the relationship between the ownership structures on the value of companies at the beginning of the 1997 Asian financial crisis, they studied 800 companies in eight Asian countries. Accordingly, it was proposed that in financial distress periods the controlling shareholder has a tendency to expropriate minority shareholders. Furthermore, the presence of private welfare of the controlling shareholders is dependent on the absence of strong legal protection of minority shareholders Coffee Jr., J. C. (2005). Perhaps ownership structure is a major concern in terms of agency theory, in which the prevalent concern is the conflicts among managers and shareholders. While corporate governance mechanisms rely on ownership as a tool for firm performance, Daily, C. M., Dalton, D. R., & Cannella, A. A. (2003) said that the hypothesis could be as below:

**H1. There is a positive relationship between family control and cost of equity in a time of financial crisis**

On the other hand, Lasfer, M., & Faccio, M. (2005) in their empirical results, opposed the idea of firm value and that the performance is related to the ownership or board structure; by arguing that unlike professional managers, boards members have interest in outside investors. Accordingly, Demsetz, H., & Villalonga, B. (2001), in their study, suggest no significant relationship between ownership structure and performance. Furthermore, Yeh, Lee, and Woidtke (2001) summarize that agency problem evidently and is likely to be within the family firms which hold a major position for the board director. Fan and Wong (2002) in their study conducted on East Asian firms, find a further positive relation in market position declension and family ownership.

It catches attention that the exploitation of corporate governance mechanisms by the ownership and control of family businesses are present in the various sectors of the world's economies, especially in emerging economies, in which firms take advantage of the administrative position and exploit these positions in favor of personal wealth.

In a previous study carried out by La Porta et al. (1998), with samples from 49 countries, found that one out of three, shareholders with most shares have significant concentration and are controlled by the family firms. A similar study of the three Asian countries, suggests the dominance of family firms Claessens et al. (2000b). It underlines that family-controlled firms are all over the world, for instance, Peugeots in France, Quandt's in Germany, and Agnellis in Italy have major shareholding rights hence control the biggest firms. (Barca and Becht, 2001; Faccio and Lang, 2002).

In short, Villalonga and Amit (2006) explain that family firms or individuals controlling shareholder encounter with two types of agency problems, firstly: the largest shareholder and its sufficient monitoring system to reduce the alignment interest furthermore, as it is claimed that family-controlled firms have better monitoring on managers. (e.g., Anderson and Reeb, 2003a; and Ben-Amar and Andr´e, 2006). Secondly, the largest shareholder using their power derived from their voting right and have control in building private benefits in addition family members have greater incentive to increase their wealth (e.g., Fama and Jensen, 1983; Shleifer and Vishny, 1997; and Bozec and Laurin, 2008) besides, the incentive to expropriate the minority shareholder. When all of these are taken into account, the hypothesis can be expressed as below:

**H2a: There is a positivity in the relationship between the cost of equity and higher voting right**

**H2b: There is a positivity between the cost of equity and controlling shareholders**

Even though the country maintains greater investor protection. Villalonga and Amit (2006). In the opposite perspective, in some countries with a high level of a protection system for investors and a high level of ownership concentration like in the UK, Canada, South Africa have less evidence in expropriation shareholders. Nenova, T., (2003). Meanwhile, East Asian countries record a high level of ownership contraption with family-controlled firms as it is prevalent in this market to drive most companies to decrease dividend payouts. (Faccio et al. 2001a).

As an exception to the largest shareholder, it appears as the conflicts in this situation are diluted in case the largest shareholder is an institution such as a bank, an investment foundation, or a widely held company. Villalonga and Amit (2006).

We conclude that under such circumstances in which investor protection is weak, the proportion of opportunism and exploitation of minority investors by the individuals or families significantly increases.

Three major studies focused on the relationship between ownership controlled by a family and another major shareholder; (2002), Anderson and Reeb (2003), in their study didn’t distinguish family ownership of the control and management of families, the next one, Claessens et al. (2002) and Cronqvist and Nilsson (2003) in their study distinguished the family businesses’ effect on controlling and voting right but they ignored the fact that management is important too.

# 5. LITERATURE IN TURKEY

## 5.1. BACKGROUND OF THE FINANCIAL CRISIS IN TURKEY

Turkey has experienced economic problems for a long period since the establishment of its economy, such as the large inflation in the 1970s which Turkey suffered from despite all the programs and fiscal policies adopted to get rid of inflation, all of which proved to be only temporary doses to control inflation. Such attempts exacerbated the problem again in the early 1980s and then extensive fiscal laws and policies were enacted to change the economic situation, which resulted in essential financial reforms in the structure of the Turkish economy in the early 1980s and the beginning of the 1990s. Davoodi, H. (1997).

With the succession of Turkish economic crises, the Turkish economic system has sought to adjust monetary laws and policies with every economic problem, such as the five economic crises that emerged with the beginning of the 1990s starting in the years 1929, 1958, 1978, 1994 and finally 2001. However, the radical changes of the 1990s did not help to stop the economic crisis in 2001 and the poor performance of the financial sector was blamed for it. Hereafter the 2001 crisis, the 2008 Global Financial Crisis (GFC) 2008 is considered one of the severe financial distress that influenced the Turkish economy. Mehmet Yalçın (2012).

The financial crisis in 2008 which started in the US has worsened the economy around the world. Generally, the source of this crisis is the mispricing and a huge default in credits of US Market which leads to serious and devastating consequences, and the fact that mortgage brokers were encouraged by loans fast movement in the market and just increased the volume of issued mortgages (Buchanan, 2008).

As collateral damage by the global crisis, Turkey was hit in 2008, making the economy vulnerable to several declines, for instance, immense shrinkage in GDP due to the collapse in foreign demand which in turn led to a vast failure in exports Rawdanowicz, Ł. (2010) The years from 2006-2008, Turkey recorded a declension in export growth by

22.0% Cömert & Çolak. (2014) . Moreover, the growth rate decreased drastically starting from years 2007=4.66, 2008=0.65, 2009= -4.82 Cömert, H., and E.N. Uğurlu (2015). Besides this, the Financial Account/GDP average in 2005-08 = 7.31 and the year 2009 declined to 1.66. As the beginning crisis started in 2007 in the Turkish market, inflation and current account reached to a high level by the year 2007 and recorded 8.76 inflation and -5.838 current account, furthermore, General Gov Gross Debt as %of GDP declined from 74% in 2002 to 39.91%. However, the External Debt Stocks as %of GDP in 2002 from 13.43%, increased to 19.60% in 2007, Cömert, H., & Uğurlu, E. (2015)

The most remarkable difference between 2001, and 2008 is that crises' speed to recover faster, it represented the crisis of 2001 less able to recover from the severity of the economic blow to the Turkish economy. The Turkish economic crisis in 2008 was one of the most important crises that the Turkish economy has overcome, given that the economic recession has not reached higher levels compared to previous crises, in addition to the existence of a good economic and financial structure that helped Turkey to stand up again. Kılınç, M., Kılınç, Z., & Turhan, M. I. (2012).

Among the repercussions of the 2008 crisis, the high unemployment rate and low-income rate, which in turn were one of the consequences of the economic deterioration of this period can be listed, Kaya Bahçe, S. A., & Memiş, E. (2013). It calls the need to focus on the specific issue of the firms reacting toward the changes in the market, overall how specifically family firms that have control over high proportion on the market in Turkey responded to the 2008 crisis, compared to the non-family firms.

In more detail, throughout the financial distress period, family-controlled firms take the advantage to expropriate other shareholders in sequence to increase their own benefits, Boubakri, N., Guedhami, O., & Mishra, D. (2010). In addition, the study assesses the association between family control and the cost of equity as a proxy of agency costs, to indicate that the empirical study records no significant relation between family-controlled firms and the cost of equity before the Asian crisis. More interestingly the paper finds a significant relationship during and after the crisis, with family-controlled and agency cost This explains why some papers show no association between family-controlled and firm market value, Filatotchev, I., Lien, Y.-C., & Piesse, J. (2005), or cost of capital, (Chen, Kevin C W Chen, Zhihong Wei, K C John 2009). When these points are considered, the hypothesis can be formulated as below:

**H3a: There is a relationship between the cost of equity and family-controlled firms in the 2008 financial crisis**

**H3b: There is no relationship between the cost of equity and family-controlled firms after or before the 2008 financial crisis**

In another study on family-controlled firms, shareholders experienced an even more decline in equity values among other shareholders during a crisis, with the claim that crisis in Korea had negative effects on all companies with different ownership structures, whereas family firms with majority shareholding suffered even more decline in equity value. In the empirical study they used stock prices from the daily return file, and stock database and Stock Database of the Korea Securities Research Institute (KSRI) and annual statistics ownership structure and other governance characteristics, Baek, J. S., Kang, J. K., & Suh Park, K. (2004).

However, although the expropriation of minority reasoned by large shareholdings is implied, this study believes that there is a gap in such research explaining the relation between the family control firms and the cost of equity capital during the financial crisis of Turkey. In order to clarify the form of the incentives of exploration in such a specific time within the family-controlled corporations, this study will focus on the period of financial crises between 2006-2010.

## 5.2. CORPORATE GOVERNANCE AND FIRMS VALUE

In this section the I will present an overview of the literature on corporate governance and firms' value in the context of Turkish literature, and after that, I will discuss the prior studies on the family businesses in the context of Turkish literature as well.

After the collapse of developed economies in recent financial crises, it made investors desperately look forward to a new flexible market with high growth levels, which was evident in the emerging market. Even though the market had opportunities it, experienced difficulties in cooperating with new rules and reforming corporate governance.

However, a developing market like Turkey, with emerging economy institutions that are mostly controlled by few major shareholders and where legal protection is weak, which provokes agency problem that is likely to surface where minority shareholders suffer from domination conflicts like asset stripping, self sells or purchasing of equity; it is clear that corporate governance has a huge task in such market with trying to adopt several ownership characteristics in order to securer the Turkish market Ararat, M., & Ugur, M. (2003).

Since then, the capital market boards have greatly shifted the corporate governance by making core changes in legal and framework of overall companies. In the Borsa Istanbul market with following the standards of corporate governance was issued in July 2003, therefore listed firms recommended to acquire these standards by the year 2004. As a result, it increased transparency and reorganized the market potentials Ararat, M., & Orbay, H. (2014).

Ararat, M., & Orbay, H. (2014). summarized the core problems of current corporate governance in Turkey fall under these points:

- "Concentrated ownership and economic power associated with complex and opaque control structures with still significant state stake in some industries,
- Uncontested power of controlling shareholders due to low floatation rates, limited institutional shareholding, and weak equity culture,
- Unclear separation of management and control roles, ineffective boards, weak firm-level formal control systems

- Market abuse (market manipulation, insider trading) as a result of the above
- Weaknesses in enforcement" Ararat, M., & Orbay, H. (2014).

As a result, a massive body of study papers have been focusing on corporate governance and its effectiveness on the firms positions in market and its value, in addition, different direction of studies determined whether companies structures differ from their financial performance, even though, the disparity reality in different documented result and relation on corporate governance and performance is a major sign that these relations still not indecisive.

One of the most well-known articles that contain interesting matters, has shown that not all the significant results in emerging countries are not always identical and would be affected by different factors "For example, state ownership is associated with better performance in some countries, such as in China; in others, such as in Turkey, the correlation is negative. This difference, which can be attributed to many factors, is usually contingent on the incentive structures for public officials" Ararat, M., & Dallas, G. (2011).

Yurtoglu, B. B., De Carvalho, A. G., Kim, W., Khanna, V. S., & Black, B. S. (2015), find that financial transparency in financial information predicts higher market value in Turkey, but find that board and ownership structure, shareholder rights, board procedure, and control of individuals in Turkey documented less significant results. Unlike Kilic, M. (2015), who proposed that financial discloser unrelated to firms' value regardless of the board size in Turkey listed firms, in addition, Bayrakdaroglu, A., Ersoy, E., & Citak, L. (2012). examined board size related to firm performance and found no significance, on the other hand, found ownership concentration to be significantly related to all performance

However, another observation of the study focused on panel data analysis of 164 firm-year observations of the Istanbul Stock Exchange (ISE) covering four years period of 2005-2008, emphasized that the existence of a positive relation in corporate governance with high ranking index has a better market performance. Gürbüz, An Osman Aslı

Aybars, Ö. K. (2010).

Chen, K. C. W., Chen, Z., Wei, K. C. J., Porta, R. L. A., Lopez-de-silanes, F., Shleifer, A., … Klapper, L. F. (2005) in their study covering 498 firms, in 25 emerging markets among which Turkey is included, claim that the firm-level corporate governance negatively influence the cost of equity capital in these 25 emerging markets and substantially required to better shareholders protection on the country and firm-level of corporate governance and this will reduce the cost of equity.

Through study presented by (Al-Najjar, B., & Kilincarslan, E. (2016) as a case of a remarkable decline in dividends payout ratios in the Turkish stock market, in detail their statistical results showed that there is a negative relationship linked to the foreign ownership and state ownership. The study also confirms that the relationship between family ownership and paying dividends are almost non-existent, in short. There is no enough evidence to assure the more ownership concentration is linked with payment of dividends in the Turkish emerging market. In this respect Sener, P., & Akben Selcuk, E. (2019) agree on the positive relation associated with dividend and the existence of family in boards of directors, this relation becomes less affective when greater levels of family ownership is observed, moreover the low dividend payout tendency in family ownership will defiantly make investors cautious in their investment decision and in which firm to invest (family). Ciftci, I., Tatoglu, E., Wood, G., Demirbag, M., & Zaim, S. (2019), found that family-controlled firms led to better improvement, which suggests families taking risks of poor performance in the firm.

Kula, V. (2005) initiated a study on board of directors and firms' value and showed a positive relation to the firm's value besides that the separation of chairman and manager positions lead to greater firm's market performance "only to the level of adoption of resource acquisition role" Kula, V. (2005).

Oba, B., Ozsoy, Z., & Atakan, S. (2010) in a study on the Istanbul Stock Exchange (ISE) on how board members are interrelated to the family businesses assuming that the board arrangement in family-controlled firms, managers act in the interest of stakeholders, unlike the other ownership types, they record conflicts concerns and disparity.

Furthermore, revealing that the presence of the foreign ownership in the shareholders' structure operating in Turkey evidently performs better than the domestic preserved ones with respect to return on assets, Orbay, H., & Yurtoglu, B. B. (2006). Yurtoglu, B. B. (2000) show lower return on assets, and market value related to concentrated ownership and pyramidal structures. Many works of literature in the Turkish context have focused on the relation between corporate governance and its impact on firm performance.

# 6. METHODOLOGY

The main objective of this paper is to test the extent of the impact of the family on the cost of capital in reducing cost of equity in the period before and after the Turkish economic crisis in 2008, following a prior study research paper done on the Asian countries, as it serves as an opportunity to implement it into the Turkish case, in which there is not any study of this sort.

## 6.1. AIM AND OBJECT

This paper follows in such way to collect data based on the quantitative data of the sub-data and here, we show the most important advantages and disadvantages of secondary quantitative data on the main data

- To explore the underlying factors that cause the emergence of agency cost among companies especially the firms controlled by family members
- To assess the relationship between the family firms and non-family firms with agency cost
- To see the different effect of cost of equity pre-post, during, and post-financial crisis
- Give clear identification of the incentives of family members
- See the relation of voting rights of a family-firm with non-family firms
- evaluate the overall results and bring forth a recommendation

## 6.2. RESEARCH METHODS

This paper implies the quantitative and secondary data to provide a good claim for the topic. It is compulsory to clarify the core differences between quantitative methods over qualitative methods, besides their advantages and disadvantages in comparison to the primary data.

## 6.3. PRIMARY AND SECONDARY DATA

Here are some of the most important characteristics of secondary data in The Social Science introduction by (Riley et aI., 2000).

- Save a lot of resources, most important time and money.
- You need a few requirements compared to the main data.
- It tends to be more credible, especially when the data is collected.
- Easy to examine, understand and make available to me

The cons of the secondary data lie on the fact that it has been collected for distinctive research purpose, which differs from this paper's questions or subjective. There is an obstacle in collecting this kind of secondary data, for instance, having access to specific data could be costly to assess. Furthermore, using presented data without looking for the aimed of the writer could lead to misleading results

## 6.4. QUANTITATIVE AND QUALITATIVE METHODS

### 4.6.1. SAMPLE AND DATA SOURCES:

The list of collected data on BIST ALL SHARES contains 330 firms listed on the Bursa Istanbul in August 2018 from Public Disclosure Platform (PDP). This study has excluded the financial sector due to the different nature of their functional and financial structure, (Baker et al., 2018). The samples are confined to 236 firms (72 percent). The final samples observe the time periods for two years before and two years after the 2008 financial crisis by including 236 firms.

The data collected on the ultimate ownership for the family businesses were recorded for every single firm in the BIST ALL SHARE index. Also, historical information from Public Disclosure Platform (PDP) data, and the annual reports of the firms to identify the family-controlled firms among non-family-controlled firms in which families hold a significant part of the capital have been investigated to find that **family** members retain significant **control** over the company, or **family** members hold top management, a firm is considered ultimately owned by family or individual in case they have proportion of more than 20% of either cash flow or control right, Astrachan and Shanker (2003). Moreover, the study includes firms with 50% of either cash flow or control rights in order to compare the result of the analysis. Accordingly, in the study a group of 18 family groups were added to the comparison classified from a published empirical study of Ararat, M., Black, B. S., & Yurtoglu, B. B. (2014), and used them as a proxy for the family firms and their subsidiaries and linked them to the data sample

The cost of equity capital that was obtained from several sources, was manually recorded and obtained from Bloomberg Terminal, collecting every data to build up well-structured panel data of every single variable.

Financial predictors (leverage, growthAP, and size) of the firms were taken from the historical data from Bloomberg, Statistica, and Annual Reports.

The size of a firm calculated as the natural logarithm of the real total asset was as in Turkish Lira collected from Bloomberg and was calculated by the cumulation of the inflation for each year throughout 2006-2010 and deflate the asset price from nominal to real price starting from the second year.

The data inflation (Year to Year % Changes) data was collected from the Turkish Statistical Institute (TURKSTAT). the inflation rate for every year is inflation as the end of the year for each year in (Turkish Lira) drawn from the (TURKSTAT) in Turkish Lira at https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Statistics/Inflation+Data

### 4.6.2. VARIABLES OF THE STUDY:

*Dependent variable.* Represented by the cost of equity capital obtained from Bloomberg Terminal database, the data are the percentage (%) of cost of equity in Turkish Lira for every individual firm in the dataset

*Independent variables.* the family-controlled firm is a dummy variable manually collected, equal to 1 when the ultimate owner of the firm is a family, and 0 if otherwise. The identification process of the family and non-family firms in this paper followed two works of literature. First, family or individuals have more than 20% of either cash flow or control rights. Astrachan and Shanker (2003) besides the fact that this study will be comparing 50%, 20%, and the 18 groups of family controll, of the results. Second, a firm is a family firm if two or more family member serves as a director. Gomez-Mejia et al. (2003); McAdam et al (2010).

Voting right is voting rights of cash flow in percent (%) of the controlling shareholder (for both family and not family firms) in Turkish Lira, that is extracted from Public Disclosure Platform (PDP)

*Controlling Variable.* Following previous papers, this paper included four controlling variables. First, the size of the firm calculated as the natural logarithm of total sales. Second, this study-controlled leverage measured as total debt over total assets, and Debt/Equity ratio, finally, (growthAP) growth opportunities measured as (price per share divided by earnings per share) all of the data of the controlling data are in Turkish Lira

Control variable as suggested by the literature. Company size is the natural logarithm of the total assets (in Turkish Lera) likely to have a negative relation with the cost of equity capital (Francis, LaFond, Olsson, & Schipper, 2005; Gebhardt et al., 2001).

The firm's growth opportunity (Growth) in (TL), the price per share divided by earnings per share (P/E) is likely to have a positive relationship with the cost of equity capital (Dhaliwal et al., 2006; Lee, Ng, & Swaminathan, 2004).

Firm leverage (Leverage), leverage measured as total debt over total assets in Turkish Lira as firm's leverage financed by debt or by financed by equity with total debt over total equity measurement is likely to have positive relation with cost of equity capital (Dhaliwal et al., 2006; Gode & Mohanram, 2003).

### 4.6.3. The Empirical Model

This paper organized the collected data in a panel data structure and employed a fixed-effect model to identify the relationships between the family cost of equity and family-controlled firms. Furthermore, this method was selected because it assesses the heterogeneity of the individual (group) and/or time effects by using a fixed-effect with the dummy variable method. To reduce the influence of the outliers, this study winsorized all the variables at the first and 99 percentiles (Campbell et al., 2008) using the help of the Stata software.

$Y_{it}=\beta_0+\beta_1 X_{it}+\gamma_2 D2_i+\cdots+\gamma_n DT_i+\delta_2 B2_t+\cdots+\delta_T BT_t+u_{it}$.

**Model (1):** $COEC_{it}=\beta_0+\beta_{1(50\%)}fmly\_cntrl_{it}+\beta_1 control\ variables_{it}+\beta_1 indsutry\ fixed\ effect_{it}+\delta_T\ years\ effect+u_{it}$

**Model (2):** $COEC_{it}=\beta_0+\beta_{1(20\%)}fmly\_cntrl_{it}+\beta_1 control\ variables_{it}+\beta_1 indsutry\ fixed\ effect_{it}+\delta_T\ years\ effect+u_{it}$

**Model (3):** $_{it}=\beta_0+\beta_{1(18\ group)}\ fmly\_cntrl_{it}+\beta_1 control\ variables_{it}+\beta_1 indsutry\ fixed\ effect_{it}+\delta_T\ years\ effect+u_{it}$

There are two independent variables, as family control and voting rights explain the depending variable cost of equity and three controlling variables as size, leverage, and growth.

**Table 1:** Variable Description

| VARIABLE DESCRIPTION | |
|---|---|
| *DEPENDENT VARIABLES* | |
| COEC | Firm's cost of equity as a percentage in (Turkish Lira) collected from the Bloomberg database for firms of the study for every single firm in the index of BIST ALL SHARE |
| *INDEPENDENT VARIABLES* | |
| Fmly_cntrl | A dummy variable equal to 1 for family-controlled firms, and 0 otherwise. According to *Astrachan and Shanker (2003),* a firm is considered to be ultimately owned by family or individual in case that they have promotion of more than 20% of either cash flow or control rights, however, I assumed that if firms' cash flow equal or more than 50% means it is a family firm in order to show a valid results. This data are drawn from the Public Disclosure Platform (PDP), by adding third way to identify family firms is by taking a group of 18 family firms data drawn from Ararat, M., Black, B. S., & Yurtoglu, B. B. (2014), |
| Vot_r | Voting rights of the controlling shareholder. It is in percent in TL taken from Public Disclosure Platform (PDP) database |
| *CONTROL VARIABLES* | |
| size | size of the firm calculated as the natural logarithm of the real total asset was as in Turkish Lira collected from Bloomberg and calculated by the cumulation of the Inflation for each year for the period of 2006-2010 and deflate the asset price from nominal to real price starting from the second year.<br>The data inflation (Year to Year % Changes) data was collected from the Turkish Statistical Institute (TURKSTAT). the inflation rate for every year is inflation as the end of the year for each year in (Turkish Lira) drawn from the (TURKSTAT) in Turkish Lira at https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Statistics/Inflation+Data |
| grwthAP | Is growth opportunities as the market-to-book ratio (price per share divided by earnings per share), drawn from the Bloomberg database in (Turkish Lira) |
| levreg | as total debt over total assets, drawn from the Bloomberg database as in (Turkish Lira) |
| DebtEqu | Debt divided by equity show financial, liquidity ratio, drawn from the Bloomberg database in (Turkish Lira) |
| 4.SECT | CONSTRUCTION AND PUBLIC WORKS |
| 6.SECT | EDUCATION, HEALTH, SPORTS AND OTHER SOCIAL SERVICES |
| 7.SECT | ELECTRICITY GAS AND WATER |
| 8.SECT | FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT |
| 10.SECT | MANUFACTURING INDUSTRY |
| 11.SECT | MINING |
| 15.SECT | TECHNOLOGY |
| 16.SECT | TRANSPORTATION |
| 17.SECT | TRANSPORTATION, TELECOMMUNICATION AND STORAGE |
| 18.SECT | WHOLESALE AND RETAIL TRADE, HOTELS AND RESTAURANTS |
| 19.SECT | WHOLESALE TRADE |

**Table 2:** Summary Firms by Sectors

| **SECTORS** | **Freq.** | **Percent** |
|---|---|---|
| | | |
| ADMINISTRATIVE AND SUPPORT SERVICE ACTI | 15 | 0.91 |
| AGRICULTURE, FORESTRY AND FISHING | 10 | 0.61 |
| CHEMICALS, PETROLEUM RUBBER AND PLASTIC | 5 | 0.30 |

| | | |
|---|---|---|
| CONSTRUCTION AND PUBLIC WORKS | 45 | 2.73 |
| CONSUMER TRADE | 5 | 0.30 |
| EDUCATION, HEALTH, SPORTS AND OTHER SOC | 30 | 1.82 |
| ELECTRICITY GAS AND WATER | 45 | 2.73 |
| FABRICATED METAL PRODUCTS, MACHINERY AN | 5 | 0.30 |
| FINANCIAL INSTITUTIONS | 470 | 28.48 |
| MANUFACTURING INDUSTRY | 736 | 44.61 |
| MINING | 20 | 1.21 |
| NON-METALLIC MINERAL PRODUCTS | 5 | 0.30 |
| PROFESSIONAL, SCIENTIFIC AND TECHNICAL | 5 | 0.30 |
| REAL ESTATE ACTIVITIES | 10 | 0.61 |
| TECHNOLOGY | 85 | 5.15 |
| TRANSPORTATION | 10 | 0.61 |
| TRANSPORTATION, TELECOMMUNICATION AND S | 39 | 2.36 |
| WHOLESALE AND RETAIL TRADE, HOTELS AND | 100 | 6.06 |
| WHOLESALE TRADE | 10 | 0.61 |
| | | |
| **Total** | **1,650** | **100.00** |

**Table 3**: Summary of Family and Non-Family Firms

| **Family controle** | **Freq.** | **Percent** |
|---|---|---|
| | | |
| Not Family Firms | 310 | 34.68 |
| Family Firms | 584 | 65.32 |
| | | |
| **Total** | **894** | **100.00** |

# 7. THE EMPIRICAL RESULT

With the help of STATA software, the empirical analysis uses the time fixed effect regression to explain a set of variables which are shown in Table 1, and the correlation of sets of variables is in Table 7, and the result of the two-regression model are in Table 12 and 13.

**Table 4**: Summary Variables: Cost of Equity by Categories of Family Control (All Numbers in Turkish Lira)

| **Cost of Equity (%)** Turkish Lira | **mean** | **SD** | **N** |
|---|---|---|---|
| Nonfamily Firms | 9.454151 | 1.82535 | 530 |
| Family Firms | 9.784419 | 1.690888 | 353 |
| **Total** | **9.586183** | **1.779224** | **883** |

**Table 5**: Summary for Variables: Cost of Equity by Categories of 50% Family Control by Years (**All Numbers in Turkish Lira)**

| **Cost of Equity** (%) Turkish Lira | **MEAN** | **SD** | **N** |
|---|---|---|---|
| **2006** | | | |
| Nonfamily Firms | 9.191919 | 1.81921 | 99 |
| Family Firms | 9.315152 | 1.595305 | 66 |
| Total | 9.241212 | 1.729161 | 165 |
| **2007** | | | |
| Nonfamily Firms | 9.62451 | 1.914635 | 102 |
| Family Firms | 10.07353 | 1.856221 | 68 |
| Total | 9.804118 | 1.898812 | 170 |
| **2008** | | | |
| Nonfamily Firms | 10.39352 | 1.857004 | 108 |
| Family Firms | 11.02571 | 1.63332 | 70 |
| Total | 10.64213 | 1.794584 | 178 |
| **2009** | | | |
| Nonfamily Firms | 9.150909 | 1.340118 | 110 |
| Family Firms | 9.533784 | 1.06466 | 74 |
| Total | 9.304891 | 1.247918 | 184 |
| **2010** | | | |
| Nonfamily Firms | 8.918018 | 1.799404 | 111 |
| Family Firms | 9.024 | 1.503225 | 75 |
| Total | 8.960753 | 1.682796 | 186 |

As it is seen in table the change in the cost of equity capital over years seems to be obvious, but the year 2008 has a high cost of equity mean values in both categories with **10.39 and 11.026**, but family-controlled firms have a higher value compared to the non-family-controlled firms.

**Table 6**: Summary for Variables: Cost of Equity by 18 Firms Group (All Numbers in Turkish Lira)

| **Firms Group** | | | **YR** | | | |
|---|---|---|---|---|---|---|
| **Group** | **2006** | **2007** | **2008** | **2009** | **2010** | **Total** |
| **Nonfamily Firms** | | | | | | |
| Means | 9.061165 | 9.6757009 | 10.682759 | 9.3285714 | 9.0421488 | 9.5618375 |
| STD | 1.8409947 | 1.8443612 | 1.8936634 | 1.3271061 | 1.7411085 | 1.8349487 |
| Frequencies | 103 | 107 | 116 | 119 | 121 | 566 |
| **Family Firms** | | | | | | |
| Means | 9.5403226 | 10.022222 | 10.566129 | 9.2615385 | 8.8092308 | 9.629653 |
| STD | 1.4918862 | 1.9837602 | 1.6048026 | 1.0966843 | 1.5703028 | 1.6770805 |
| Frequencies | 62 | 63 | 62 | 65 | 65 | 317 |

In this table the change in the cost of equity capital over years seems to be not obvious, but the year 2008 has a high cost of equity mean values in both categories (family and non-family) with **10.68 and 10.57**.

**Table 7:** Matrix of Correlations in (All Numbers in Turkish Lira)

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| (1) YR | 1.000 | | | | | | | | |
| (2) SECT | 0.012 | 1.000 | | | | | | | |
| (3) CoEC | -0.121 | 0.052 | 1.000 | | | | | | |
| (4) fmly_cntrl | 0.003 | 0.109 | 0.117 | 1.000 | | | | | |
| (5) vot_r | 0.027 | 0.034 | -0.005 | 0.180 | 1.000 | | | | |
| (6) levreg | 0.149 | 0.032 | 0.053 | -0.027 | -0.102 | 1.000 | | | |
| (7) grwthAP | 0.013 | -0.025 | -0.008 | 0.054 | -0.056 | 0.156 | 1.000 | | |
| (8) DebtEqu | -0.022 | 0.017 | 0.094 | -0.067 | -0.115 | 0.411 | 0.164 | 1.000 | |
| (9) size | 0.122 | 0.090 | 0.021 | -0.073 | -0.074 | 0.076 | -0.049 | -0.019 | 1.000 |

**Table 8:** Fixed Effect Regression Models With 20% Ownership (All Numbers in Turkish Lira)

| | (1)<br>CoEC | (2)<br>CoEC | (3)<br>CoEC | (4)<br>CoEC | (5)<br>CoEC | (6)<br>CoEC |
|---|---|---|---|---|---|---|
| Fmly_cntrl | 0.547** | 0.624*** | 0.555*** | 0.469** | 0.308* | 0.297* |
| | (2.62) | (3.84) | (3.45) | (3.01) | (2.41) | (2.45) |
| vot_r | 0.00618 | 0.00470 | 0.00446 | 0.00331 | 0.000868 | |
| | (1.22) | (1.23) | (1.16) | (0.90) | (0.27) | |
| levreg | 0.550 | 0.742 | 0.773 | 0.599 | | |
| | (0.78) | (1.67) | (1.73) | (1.45) | | |
| grwthAP | -0.0000356 | 0.00196 | 0.00162 | | | |
| | (-0.02) | (1.15) | (0.95) | | | |
| size | 0.0904 | 0.118* | | | | |
| | (1.56) | (2.53) | | | | |
| DebtEqu | 0.00178 | | | | | |
| | (0.89) | | | | | |
| 2007.YR | 0.679** | 0.567** | 0.570** | 0.579** | 0.550** | 0.550** |
| | (2.83) | (2.69) | (2.68) | (2.86) | (3.06) | (3.07) |
| 2008.YR | 1.474*** | 1.304*** | 1.305*** | 1.347*** | 1.381*** | 1.381*** |
| | (6.06) | (6.15) | (6.13) | (6.55) | (7.79) | (7.79) |
| 2009.YR | -0.170 | -0.194 | -0.223 | -0.0659 | 0.0370 | 0.0374 |
| | (-0.49) | (-0.94) | (-1.08) | (-0.33) | (0.21) | (0.21) |
| 2010.YR | -0.601* | -0.804*** | -0.737*** | -0.590** | -0.308 | -0.308 |
| | (-2.27) | (-3.92) | (-3.60) | (-2.97) | (-1.75) | (-1.75) |
| 4.SECT | 0.500 | 0.635 | 0.915 | 1.271 | 1.273 | 1.285 |
| | (0.47) | (0.65) | (0.94) | (1.41) | (1.55) | (1.57) |
| 6.SECT | -0.00141 | 0.665 | 0.524 | 0.198 | -0.601 | -0.588 |
| | (-0.00) | (0.69) | (0.54) | (0.21) | (-0.72) | (-0.71) |
| 7.SECT | 1.067 | 1.196 | 1.294 | 0.982 | 0.880 | 0.894 |
| | (1.08) | (1.32) | (1.43) | (1.09) | (1.10) | (1.12) |
| 8.SECT | 3.431 | 2.226 | 2.226 | 2.208 | 1.644 | 1.640 |
| | (1.91) | (1.63) | (1.62) | (1.59) | (1.58) | (1.58) |
| 10.SECT | 1.045 | 1.042 | 0.949 | 0.993 | 0.752 | 0.761 |
| | (1.28) | (1.31) | (1.19) | (1.23) | (1.02) | (1.03) |
| 11.SECT | 2.298* | 2.104* | 1.958* | 1.950* | 1.719* | 1.729* |
| | (2.20) | (2.39) | (2.22) | (2.19) | (2.09) | (2.11) |
| 15.SECT | 1.074 | 1.428 | 1.340 | 1.398 | 1.183 | 1.191 |
| | (1.22) | (1.72) | (1.61) | (1.67) | (1.54) | (1.56) |
| 16.SECT | 1.313 | -0.438 | -0.532 | -0.483 | 0.0874 | 0.0900 |
| | (1.04) | (-0.44) | (-0.54) | (-0.48) | (0.10) | (0.10) |
| 17.SECT | 1.192 | 1.207 | 1.007 | 1.017 | 0.962 | 0.968 |
| | (1.30) | (1.41) | (1.17) | (1.17) | (1.20) | (1.21) |
| 18.SECT | 1.654 | 1.485 | 1.282 | 1.451 | 1.337 | 1.349 |
| | (1.86) | (1.77) | (1.52) | (1.72) | (1.76) | (1.78) |
| 19.SECT | 2.918 | 2.474* | 2.630* | 2.652* | 1.775* | 1.780* |
| | (1.62) | (2.43) | (2.58) | (2.57) | (1.98) | (1.98) |
| 5.SECT | | | | 2.181 | 2.308* | 2.302* |
| | | | | (1.78) | (2.10) | (2.09) |
| 14.SECT | | | | 1.380 | 0.262 | 0.248 |
| | | | | (1.00) | (0.29) | (0.28) |
| 12.SECT | | | | | 0.657 | 0.677 |
| | | | | | (0.63) | (0.65) |
| _cons | 6.308*** | 6.035*** | 7.550*** | 7.660*** | 8.165*** | 8.211*** |
| | (5.47) | (5.86) | (8.95) | (9.03) | (10.59) | (10.93) |
| *N* | 361 | 583 | 583 | 645 | 883 | 883 |

*t* statistics in parentheses

$^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

**Table 9:** Fixed Effect Regression Models With 50% Ownership (All Numbers in Turkish Lira)

| | (1)<br>CoEC | (2)<br>CoEC | (3)<br>CoEC | (4)<br>CoEC | (5)<br>CoEC | (6)<br>CoEC |
|---|---|---|---|---|---|---|
| Fmly_cntrl | 0.395$^{*}$ | 0.409$^{**}$ | 0.367$^{**}$ | 0.281$^{*}$ | 0.238$^{*}$ | 0.227 |
| | (2.14) | (2.91) | (2.62) | (2.07) | (2.00) | (1.92) |
| vot_r | 0.000161 | -0.00206 | -0.00160 | -0.00168 | -0.00240 | |
| | (0.03) | (-0.56) | (-0.43) | (-0.48) | (-0.79) | |
| levreg | 0.595 | 0.728 | 0.758 | 0.597 | | |
| | (0.84) | (1.63) | (1.69) | (1.44) | | |
| grwthAP | -0.000321 | 0.00174 | 0.00146 | | | |
| | (-0.14) | (1.02) | (0.85) | | | |
| size | 0.0823 | 0.106$^{*}$ | | | | |
| | (1.42) | (2.28) | | | | |
| DebtEqu | 0.00161 | | | | | |
| | (0.80) | | | | | |
| 2007.YR | 0.683$^{**}$ | 0.568$^{**}$ | 0.570$^{**}$ | 0.580$^{**}$ | 0.550$^{**}$ | 0.549$^{**}$ |
| | (2.83) | (2.68) | (2.68) | (2.85) | (3.06) | (3.06) |
| 2008.YR | 1.467$^{***}$ | 1.305$^{***}$ | 1.306$^{***}$ | 1.348$^{***}$ | 1.378$^{***}$ | 1.379$^{***}$ |
| | (6.01) | (6.12) | (6.11) | (6.52) | (7.76) | (7.77) |
| 2009.YR | -0.205 | -0.205 | -0.231 | -0.0694 | 0.0380 | 0.0369 |
| | (-0.59) | (-0.99) | (-1.11) | (-0.35) | (0.22) | (0.21) |
| 2010.YR | -0.633$^{*}$ | -0.800$^{***}$ | -0.740$^{***}$ | -0.588$^{**}$ | -0.307 | -0.307 |
| | (-2.39) | (-3.88) | (-3.60) | (-2.95) | (-1.75) | (-1.75) |
| 4.SECT | 0.548 | 0.681 | 0.931 | 1.203 | 1.193 | 1.154 |
| | (0.51) | (0.69) | (0.95) | (1.33) | (1.45) | (1.41) |
| 6.SECT | -0.388 | 0.202 | 0.119 | -0.138 | -0.820 | -0.885 |
| | (-0.36) | (0.21) | (0.12) | (-0.15) | (-0.99) | (-1.08) |
| 7.SECT | 0.965 | 1.086 | 1.188 | 0.875 | 0.728 | 0.683 |
| | (0.97) | (1.19) | (1.30) | (0.97) | (0.91) | (0.85) |
| 8.SECT | 3.397 | 2.195 | 2.198 | 2.183 | 1.629 | 1.640 |
| | (1.88) | (1.60) | (1.59) | (1.57) | (1.57) | (1.58) |
| 10.SECT | 0.797 | 0.776 | 0.718 | 0.802 | 0.598 | 0.566 |
| | (0.97) | (0.97) | (0.89) | (0.99) | (0.81) | (0.77) |
| 11.SECT | 1.987 | 1.709 | 1.617 | 1.678 | 1.512 | 1.485 |
| | (1.87) | (1.93) | (1.82) | (1.87) | (1.83) | (1.80) |
| 15.SECT | 0.890 | 1.229 | 1.169 | 1.239 | 1.049 | 1.021 |
| | (1.00) | (1.48) | (1.40) | (1.47) | (1.37) | (1.33) |
| 16.SECT | 1.009 | -0.843 | -0.887 | -0.758 | -0.141 | -0.137 |
| | (0.79) | (-0.84) | (-0.88) | (-0.75) | (-0.16) | (-0.15) |
| 17.SECT | 0.880 | 0.869 | 0.722 | 0.782 | 0.779 | 0.755 |
| | (0.96) | (1.01) | (0.84) | (0.90) | (0.97) | (0.94) |
| 18.SECT | 1.468 | 1.282 | 1.118 | 1.318 | 1.203 | 1.171 |
| | (1.64) | (1.51) | (1.32) | (1.55) | (1.58) | (1.54) |
| 19.SECT | 2.501 | 2.065$^{*}$ | 2.250$^{*}$ | 2.357$^{*}$ | 1.556 | 1.553 |
| | (1.38) | (2.00) | (2.17) | (2.25) | (1.72) | (1.71) |
| 5.SECT | | | | 1.865 | 2.047 | 2.075 |
| | | | | (1.51) | (1.85) | (1.87) |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14.SECT | | | | 1.093 | -0.0419 | -0.0134 |
| | | | | (0.78) | (-0.05) | (-0.01) |
| 12.SECT | | | | | 0.467 | 0.380 |
| | | | | | (0.45) | (0.37) |
| _cons | 7.206*** | 7.080*** | 8.354*** | 8.332*** | 8.605*** | 8.508*** |
| | (6.53) | (7.16) | (10.19) | (10.08) | (11.43) | (11.46) |
| *N* | 361 | 583 | 583 | 645 | 883 | 883 |

*t* statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Table 10:** Fixed Effect Regression Models with 18 Groups (All Numbers in Turkish Lira)

| | (1)<br>COEC | (2)<br>COEC | (3)<br>COEC | (4)<br>COEC | (5)<br>COEC | (6)<br>COEC |
|---|---|---|---|---|---|---|
| Fmly_cntrl | 0.0558 | 0.104 | 0.0944 | -0.0990 | 0.0271 | 0.0366 |
| | (0.29) | (0.55) | (0.63) | (-0.70) | (0.22) | (0.30) |
| Vot_r | 0.00275 | 0.00278 | 0.000388 | -0.000784 | -0.00155 | |
| | (0.55) | (0.56) | (0.10) | (-0.22) | (-0.50) | |
| levreg | 0.593 | 0.666 | 0.787 | 0.561 | | |
| | (0.83) | (0.93) | (1.74) | (1.34) | | |
| grwthAP | 0.000299 | 0.000134 | 0.00161 | | | |
| | (0.13) | (0.06) | (0.93) | | | |
| DebtEqu | 0.00121 | 0.00113 | | | | |
| | (0.60) | (0.56) | | | | |
| lnsize | 0.0715 | | | | | |
| | (1.20) | | | | | |
| 2007.YR | 0.686** | 0.688** | 0.567** | 0.580** | 0.549** | 0.548** |
| | (2.83) | (2.83) | (2.64) | (2.84) | (3.05) | (3.05) |
| 2008.YR | 1.474*** | 1.476*** | 1.296*** | 1.338*** | 1.377*** | 1.378*** |
| | (6.00) | (6.01) | (6.03) | (6.46) | (7.74) | (7.75) |
| 2009.YR | -0.175 | -0.192 | -0.230 | -0.0694 | 0.0379 | 0.0374 |
| | (-0.50) | (-0.55) | (-1.10) | (-0.34) | (0.21) | (0.21) |
| 2010.YR | -0.619* | -0.579* | -0.752*** | -0.596** | -0.307 | -0.306 |
| | (-2.32) | (-2.18) | (-3.64) | (-2.99) | (-1.74) | (-1.74) |
| 4.sec | 0.518 | 0.631 | 0.824 | 1.301 | 1.224 | 1.193 |
| | (0.48) | (0.58) | (0.82) | (1.42) | (1.48) | (1.45) |
| 6.sec | -0.455 | -0.481 | 0.0724 | -0.159 | -0.843 | -0.885 |
| | (-0.41) | (-0.44) | (0.07) | (-0.17) | (-1.02) | (-1.08) |
| 7.sec | 1.170 | 1.208 | 1.336 | 1.130 | 0.811 | 0.775 |
| | (1.16) | (1.20) | (1.45) | (1.24) | (1.01) | (0.97) |
| 8.sec | 3.363 | 3.347 | 2.115 | 2.289 | 1.606 | 1.603 |
| | (1.84) | (1.83) | (1.52) | (1.63) | (1.53) | (1.53) |
| 10.sec | 0.916 | 0.853 | 0.805 | 0.961 | 0.665 | 0.637 |
| | (1.10) | (1.02) | (0.99) | (1.18) | (0.90) | (0.86) |
| 11.sec | 2.315* | 2.187* | 1.850* | 1.864* | 1.678* | 1.655* |
| | (2.19) | (2.08) | (2.08) | (2.08) | (2.04) | (2.01) |
| 15.sec | 0.982 | 0.927 | 1.245 | 1.320 | 1.118 | 1.096 |
| | (1.10) | (1.04) | (1.48) | (1.56) | (1.45) | (1.43) |
| 16.sec | 1.420 | 1.314 | -0.528 | -0.472 | 0.0946 | 0.0900 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (1.12) | (1.03) | (-0.53) | (-0.47) | (0.10) | (0.10) |
| 17.sec | 1.005 | 0.881 | 0.819 | 0.911 | 0.855 | 0.835 |
| | (1.09) | (0.96) | (0.94) | (1.04) | (1.06) | (1.04) |
| 18.sec | 1.578 | 1.436 | 1.250 | 1.494 | 1.304 | 1.277 |
| | (1.74) | (1.60) | (1.47) | (1.76) | (1.71) | (1.68) |
| 19.sec | 2.875 | 2.958 | 2.525$^{*}$ | 2.742$^{**}$ | 1.762 | 1.743 |
| | (1.57) | (1.62) | (2.42) | (2.61) | (1.94) | (1.92) |
| 5.sec | | | | 2.249 | 2.264$^{*}$ | 2.266$^{*}$ |
| | | | | (1.82) | (2.04) | (2.04) |
| 14.sec | | | | 1.369 | 0.0718 | 0.0817 |
| | | | | (0.98) | (0.08) | (0.09) |
| 12.sec | | | | | 0.409 | 0.343 |
| | | | | | (0.39) | (0.33) |
| _cons | 7.228$^{***}$ | 8.091$^{***}$ | 8.273$^{***}$ | 8.302$^{***}$ | 8.571$^{***}$ | 8.509$^{***}$ |
| | (6.49) | (9.48) | (10.03) | (10.02) | (11.35) | (11.43) |
| *N* | 361 | 361 | 583 | 645 | 883 | 883 |

*t* statistics in parentheses

$^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

In comparison to previous studies, it appears that the results of the companies 'size came significantly positive, and this contradicts what most previous studies have reached. Accordingly, I exclude this variable because it is ineffective in all the models presented above.

**Table 11**: Fixed Effect Regression Best Fit Model With 50% Family Ownership (All Numbers in Turkish Lira)

| CoEC | Coef. | Sig | St.Err. | t-value | p-value | [95% Conf | Interval] |
|---|---|---|---|---|---|---|---|
| fmly_cntrl | 0.374 | ** | 0.184 | 2.03 | 0.043 | 0.012 | 0.737 |
| vot_r | 0.000 | | 0.005 | 0.01 | 0.993 | -0.010 | 0.010 |
| levreg | 0.644 | | 0.708 | 0.91 | 0.363 | -0.748 | 2.036 |
| grwthAP | -0.001 | | 0.002 | -0.23 | 0.822 | -0.005 | 0.004 |
| DebtEqu | 0.002 | | 0.002 | 0.75 | 0.451 | -0.002 | 0.005 |
| 2006b.YR | 0.000 | | . | . | . | . | . |
| 2007.YR | 0.685 | *** | 0.241 | 2.84 | 0.005 | 0.211 | 1.160 |
| 2008.YR | 1.473 | *** | 0.244 | 6.03 | 0.000 | 0.992 | 1.954 |
| 2009.YR | -0.218 | | 0.349 | -0.62 | 0.533 | -0.905 | 0.469 |
| 2010.YR | -0.591 | ** | 0.264 | -2.24 | 0.026 | -1.111 | -0.072 |
| 3b.SECT | 0.000 | | . | . | . | . | . |
| 4.SECT | 0.749 | | 1.057 | 0.71 | 0.479 | -1.330 | 2.827 |
| 6.SECT | -0.412 | | 1.091 | -0.38 | 0.706 | -2.558 | 1.733 |
| 7.SECT | 1.055 | | 0.998 | 1.06 | 0.291 | -0.908 | 3.019 |
| 8.SECT | 3.434 | * | 1.806 | 1.90 | 0.058 | -0.118 | 6.986 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10.SECT | 0.767 | | 0.823 | 0.93 | 0.352 | -0.851 | 2.386 |
| 11.SECT | 1.865 | * | 1.058 | 1.76 | 0.079 | -0.217 | 3.947 |
| 15.SECT | 0.844 | | 0.888 | 0.95 | 0.343 | -0.902 | 2.589 |
| 16.SECT | 0.923 | | 1.279 | 0.72 | 0.471 | -1.594 | 3.440 |
| 17.SECT | 0.770 | | 0.915 | 0.84 | 0.401 | -1.030 | 2.570 |
| 18.SECT | 1.340 | | 0.892 | 1.50 | 0.134 | -0.414 | 3.095 |
| 19.SECT | 2.672 | | 1.816 | 1.47 | 0.142 | -0.900 | 6.244 |
| Constant | 8.208 | *** | 0.848 | 9.68 | 0.000 | 6.539 | 9.877 |

| | | | |
|---|---|---|---|
| Mean dependent var | 9.793 | SD dependent var | 1.770 |
| R-squared | 0.220 | Number of obs | 361.000 |
| F-test | 4.788 | Prob > F | 0.000 |
| Akaike crit. (AIC) | 1388.080 | Bayesian crit. (BIC) | 1469.746 |

**** p<0.01, ** p<0.05, * p<0.1*

**Table 12**: Fixed Effect Regression Best Fit Models With 20% Family Ownership (All Numbers in Turkish Lira)

| Cost of equity | Coef. | Sig | St.Err. | t-value | p-value | [95% Conf | Interval] |
|---|---|---|---|---|---|---|---|
| fmly_cntrl | 0.509 | ** | 0.207 | 2.45 | 0.015 | 0.101 | 0.917 |
| vot_r | 0.006 | | 0.005 | 1.12 | 0.264 | -0.004 | 0.016 |
| levreg | 0.607 | | 0.706 | 0.86 | 0.391 | -0.781 | 1.994 |
| grwthAP | 0.000 | | 0.002 | -0.12 | 0.907 | -0.005 | 0.004 |
| DebtEqu | 0.002 | | 0.002 | 0.83 | 0.408 | -0.002 | 0.006 |
| 2006b.YR | 0.000 | | . | . | . | . | . |
| 2007.YR | 0.683 | *** | 0.241 | 2.84 | 0.005 | 0.209 | 1.156 |
| 2008.YR | 1.479 | *** | 0.244 | 6.07 | 0.000 | 1.000 | 1.959 |
| 2009.YR | -0.186 | | 0.348 | -0.53 | 0.594 | -0.870 | 0.499 |
| 2010.YR | -0.557 | ** | 0.264 | -2.11 | 0.035 | -1.075 | -0.039 |
| 3b.SECT | 0.000 | | . | . | . | . | . |
| 4.SECT | 0.722 | | 1.054 | 0.69 | 0.494 | -1.351 | 2.796 |
| 6.SECT | -0.055 | | 1.100 | -0.05 | 0.960 | -2.220 | 2.109 |
| 7.SECT | 1.161 | | 0.991 | 1.17 | 0.242 | -0.788 | 3.110 |
| 8.SECT | 3.468 | * | 1.801 | 1.93 | 0.055 | -0.074 | 7.011 |
| 10.SECT | 0.998 | | 0.818 | 1.22 | 0.223 | -0.611 | 2.607 |
| 11.SECT | 2.148 | ** | 1.043 | 2.06 | 0.040 | 0.097 | 4.200 |
| 15.SECT | 1.012 | | 0.884 | 1.14 | 0.253 | -0.727 | 2.750 |
| 16.SECT | 1.203 | | 1.261 | 0.95 | 0.341 | -1.277 | 3.683 |
| 17.SECT | 1.053 | | 0.911 | 1.16 | 0.249 | -0.740 | 2.845 |
| 18.SECT | 1.504 | * | 0.887 | 1.70 | 0.091 | -0.241 | 3.248 |
| 19.SECT | 3.081 | * | 1.801 | 1.71 | 0.088 | -0.462 | 6.624 |
| Constant | 7.463 | *** | 0.886 | 8.43 | 0.000 | 5.721 | 9.205 |

| | | | |
|---|---|---|---|
| Mean dependent var | 9.793 | SD dependent var | 1.770 |
| R-squared | 0.224 | Number of obs | 361.000 |
| F-test | 4.907 | Prob > F | 0.000 |
| Akaike crit. (AIC) | 1386.108 | Bayesian crit. (BIC) | 1467.774 |

**** p<0.01, ** p<0.05, * p<0.1*

**Table 13**: Fixed Effect Regression Best Fit Model with 18 Group Companies (All Numbers in Turkish Lira)

**Linear regression**

| COEC | Coef. | Sig | St.Err. | t-value | p-value | [95% Conf | Interval] |
|---|---|---|---|---|---|---|---|
| Fmly_cntrl | 0.104 | | 0.188 | 0.55 | 0.582 | -0.267 | 0.474 |
| Vot_r | 0.003 | | 0.005 | 0.56 | 0.578 | -0.007 | 0.013 |
| levreg | 0.666 | | 0.715 | 0.93 | 0.352 | -0.741 | 2.072 |
| grwthAP | 0.000 | | 0.002 | 0.06 | 0.954 | -0.004 | 0.005 |
| DebtEqu | 0.001 | | 0.002 | 0.56 | 0.573 | -0.003 | 0.005 |
| 2006b.YR | 0.000 | | . | . | . | . | . |
| 2007.YR | 0.688 | *** | 0.243 | 2.83 | 0.005 | 0.210 | 1.165 |
| 2008.YR | 1.476 | *** | 0.246 | 6.01 | 0.000 | 0.993 | 1.960 |
| 2009.YR | -0.192 | | 0.351 | -0.55 | 0.585 | -0.882 | 0.499 |
| 2010.YR | -0.579 | ** | 0.266 | -2.18 | 0.030 | -1.102 | -0.057 |
| 3b.sec | 0.000 | | . | . | . | . | . |
| 4.sec | 0.631 | | 1.086 | 0.58 | 0.561 | -1.504 | 2.766 |
| 6.sec | -0.481 | | 1.097 | -0.44 | 0.661 | -2.638 | 1.677 |
| 7.sec | 1.208 | | 1.004 | 1.20 | 0.230 | -0.768 | 3.183 |
| 8.sec | 3.347 | * | 1.825 | 1.83 | 0.068 | -0.244 | 6.937 |
| 10.sec | 0.853 | | 0.832 | 1.02 | 0.306 | -0.784 | 2.491 |
| 11.sec | 2.187 | ** | 1.052 | 2.08 | 0.038 | 0.119 | 4.256 |
| 15.sec | 0.927 | | 0.892 | 1.04 | 0.300 | -0.828 | 2.681 |
| 16.sec | 1.314 | | 1.271 | 1.03 | 0.302 | -1.186 | 3.814 |
| 17.sec | 0.881 | | 0.921 | 0.96 | 0.339 | -0.930 | 2.692 |
| 18.sec | 1.436 | | 0.898 | 1.60 | 0.111 | -0.331 | 3.203 |
| 19.sec | 2.958 | | 1.825 | 1.62 | 0.106 | -0.633 | 6.549 |
| Constant | 8.091 | *** | 0.853 | 9.48 | 0.000 | 6.413 | 9.768 |

| | | | |
|---|---|---|---|
| Mean dependent var | 9.793 | SD dependent var | 1.770 |
| R-squared | 0.211 | Number of obs | 361.000 |
| F-test | 4.546 | Prob > F | 0.000 |
| Akaike crit. (AIC) | 1392.115 | Bayesian crit. (BIC) | 1473.781 |

**** p<0.01, ** p<0.05, * p<0.1*

By comparing the results of the three models, it becomes clear that the difference in both models does not seem to be expressive.

- The fitted models in table (12) and table (13) show no significant for any variable
- The controlling variables (vot_r, levreg, grwthAP, DebtEqu) are not significant.
- Years 2007-2009 have higher cost of equity.

The overall model recorded R2 22% and f-test with 5.578 as Falk and Miller (1992) suggested that R2 values must be = or > 0.10 in order for the variance explained of a particular endogenous construct to be deemed adequate.

Lastly, by viewing the constructing of data and it is valid and considering the amount of the missing data, it is an adequate decision to bring precise judgment on current result, which doesn't have enough evidence to reject the null hypothesis ($H_0$) and not reject the alternative hypothesis ($CH_1$).

## 7.1. FINDINGS SUMMARY

### 1.7.1. Family-controlled firms

As the family control variable is observed to show no significant result compared to non-family firms in affecting the cost of equity capital. It is clear that the study did not find sufficient evidence to prove the findings of previous literature which leads to questions about the reasons. first, possibly emerging markets differ in their systems and economic structure, accordingly, it may be better to apply this study on a large scale that includes emerging countries, The other reason, which may be the lack of finding a reliable available source of data, also the lack of this type of studies made it difficult to predict real results.

The result showed less evidence on controlling variables which were the opposite of the expectation of how these variables may contribute to the cost of equity

### 1.7.2. Voting right

Unfortunately, the voting right happens to have no significant evidence and have low statistical prove that family uses their power of voting right and control in building private benefits which claimed by (e.g., Fama and Jensen, 1983; Shleifer and Vishny, 1997; and Bozec and Laurin, 2008). thus, the voting right effect may be too weak to be able to influence firms' cost of equity. It can be thought that it might refer to the reason that families tend to keep their market share as long as possible over time. Therefore, they have no intention to expand their shareholdings and voting power to avoid takeovers activities and protect their own interests.

### 1.7.3. Cost of equity in the 2008 financial crisis

As this study have found in the results regarding the cost of equity capital and its relationship to family companies, thus the lack of sufficient evidence to prove this, on the other hand there is a strong relationship between the cost of equity capital among both companies group in the years 2008 and 2007, and that is a natural result in the time of financial crisis that impact various countries in the world, including the Turkish market. This part of finding is support by Boubakri, N., Guedhami, O., & Mishra, D. (2010) claims.

# 8. CONCLUSIONS.

Constructing an intellectual understanding of family businesses and its effect on matters of cost of equity as a proxy for agency cost is the major discussion of this paper. Which fail to reject they null hypothesis because there is no enough evidence to reject the null hypothesis ($H_0$) and not reject the alternative hypothesis ($CH_1$).

**The results show that there is no significant difference in cost of equity for family-controlled firms and non-family-controlled firms in Turkey.**

All of that said reasons behind the result could be explained as following. First reason is the weakness and difficulty of finding data for many companies, which reduced the number of observations in the study and based on these results, it is not satisfactory enough to prove the hypothesis.

The second reason is the presence of significantly missing data, which calls for not rushing to judge the preliminary results of this study.

Unfortunately, the results of the analysis don’t seem to support the main claim which asserts that family-controlled firms have greater incentive to expropriate minority shareholders compared to non-family-controlled.

As a part of the process of collecting the data, it seems the lack of data sources and access to the findings seem to be ineffective to support the claims or expectations. For example, in the result, the size variable is not negatively associated with the cost of equity, which is inconsistent with prior studies, Boubakri, N., Guedhami, O., & Mishra,D. (2010), beside the insignificant in company’s growthAP and leverage. The missing data has added more problems to the result rationality, uplifting the data with a large number of missing values compared to the observation.

This study needs further work on finding with proper data source and enrichment of the data is highly required for multiple countries with broader data and information for development.

Based on all the previously mentioned notes the study will suggest several recommendations:

- First, this study can be reformulated more and with a wider data number so that satisfactory results and recommendations are reached to help other researchers understand and apprehend what was presented in this type of study by taking the accuracy and credibility of the study into account in the first place.

- This study requires more revisions and for this, it is better to carry out such a study, but on a large scale including several countries for instance, countries that fall within the definition of developing countries such as the Middle East, where the developing countries experience a shortage and weak assimilation of research in general and of corporate governance research, in particular. Likewise, the expansion of such studies and providing empirical evidence for several countries will have an intellectual and research return for different researchers and decision-makers

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# 10. CURRICULUM VITAE

| | |
|---|---|
| Personal Information | |
| Name Surname | Abdulrahman Mohammed Qahtan |
| Place and Date of Birth | Yemen, 01.03.1985 |
| Education | |
| Undergraduate Education *05.02 2020* | Master of Finance and Banking, Kadir Has University |
| Graduate Education *23. Nov 2014* | Bachelor of Business Administration - University of Science and Technology-Yemen |
| Foreign Language Skills | English |
| Work Experience | Freelancer since 2014 |
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# APPENDIX A

| Reference | Variables | country | year | notes |
|---|---|---|---|---|
| McConaughy, D. L., Walker, M. C., Henderson, G. V., & Mishra, C. S. (1998) | -(ME/BE)<br>-Growth<br>-Sales/Employee<br>-Cash Flow/Employee<br>-Gross Margin<br>-Net Margm<br>-Total Asset Turnover | USA | 1986-1988 | market-to-book equity (ME/BE) ratios is the same to Tobin's Q used by Morck et al. (1988) |
| Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). | -Spread<br>-family firm<br>-Duration<br>-Rating<br>-Size<br>-Age<br>-Leverage<br>-Risk<br>-Perform | USA | 1993 through 1998 | Lehman Brothers Bond Database (LBBD) and the S&P 500 Industrial Index |
| Maury, B. (2006) | - Tobin's q<br>- Return on assets<br>- Family firms<br>- Control minus ownership<br>- Firm size<br>- Capital expenditures / sales<br>- Sales growth<br>- Total debt/ total capital<br>- Antidirector rights | Western European | 3-year period 1996–1998 | -There are 5232 firms.<br>-The countries included are Austria (46 firms), Belgium (30), Finland (73), France (209), Germany (259), Ireland (39), Italy (59), Norway (76), Portugal (9), Spain (58), Sweden (104), Switzerland (75), and the UK (635) |
| Adhikari, H. P., & Sutton, N. K. (2016) | - Transaction Value<br>- RELSIZE<br>- Market Value<br>- Log(Market Value) (LMVL)<br>- Return on Asset (ROA)<br>- Cash holding (CHLD)<br>- Institutional Ownership (INSOWN)<br>- Age of the CEO<br>- RISK | USA | 1993 - 2006 | - Anderson and Reeb (2003, 2004) sample of family and non-family firms in the S&P 500 universe.<br>- obtained the mergers and acquisitions data from Thompson Reuters. |
| Setia-Atmaja, L., Tanewski, G. A., & Skully, M. (2009) | debt, board independence, board size, family control, non-family blockholders, firmsize, growth opportunity, business risk, investment, DRP, tax paid | Australian | 2000 to 2005 | The sample is based on Australian Stock Exchange (ASX) firms |
| Wu, M., Ni, Y., & Huang, P. (2019). | -Cash dividend ratio<br>-Stock dividend ratio<br>-Family firms<br>-Current ratio<br>-Debt ratio<br>-Asset turnover ratio<br>-Earning ability<br>-Firm value<br>-Firm scale | Taiwan – developed country | 2008 to 2012 | study, 3091 firm-year data collected for the firms listed on the Taiwan Stock Exchange (TWSE). |
| Silva, F., & Majluf, N. (2008). | -Tobin's q<br>-ROA<br>-family owned firms<br>-voting rights<br>-Assets is the book value<br>-Equity is the market value<br>-Leverage | Latin America | during the year 2000 and/or 2003 | -The data come from the trading of all non-financial Chilean corporations<br>-The sample includes 331 firm-year observations Using Accounting data and stock prices from Santiago Stock Exchange |
| Lemmon, M. L., & Lins, K. V. (2003) | - Cash flow rights leverage dummy<br>-Rule of law measure<br>-Log of total assets<br>-Debt to total assets ration<br>-Industry dummy | Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand | 1995/1996 | They collect data from world scope for Asian countries |
| Lasfer, M., & Faccio, M. (2005) | -(MGMT) is the proportion of equity held by managers.<br>-($MGMT^2$) is its square value.<br>-#DIR is the number of directors in the board.<br>-NECHAIR is a dummy variable equal to 1 if the position of chairman is covered by a non-executive director, 0 otherwise.<br>-%NED is the proportion of non-executive to total directors.<br>-P/E<br>-BLEV is the book leverage.<br>-LN(TA) natural logarithm of total assets. | Uk London | June 1996 to June 1997. | |

| | | | | |
|---|---|---|---|---|
| Demsetz, H., & Villalonga, B. (2001). | - Tobin's Q,<br>- Percentage of shares owned by management, AvMH.<br>- Percentage of shares owned by the five largest shareholders, A5.<br>- Advertising expenditures as a fraction of sales revenues, Av(ad/s).<br>- Research and development expenditures as a fraction of sales revenues, Av(rd/s). (e).<br>- Expenditures on fixed plant and equipment as a fraction of sales revenues, Av(fix/s).<br>- The value of debt as a fraction of the book value of assets Av(debt/a).<br>- For some regressions, the four-firm market concentration ratio, CR4.<br>- Firm performance, AvQ.<br>- Market risk of stock, Mktr.<br>- Firm-specific risk, Se.<br>- Firm size as measured by book value of assets, Avassets.<br>- The value of debt as a fraction of the book value of assets. | USA | 1976-1980 | sample is a 223-firm random subsample of the sample in the original Demsetz and Lehn study. With ownership and accounting variables data collected |
| Yeh, Lee, and Woidtke (2001) | - Tobin's Q<br>-family control<br>-high family control<br>-Debt/Asset<br>-Advertising/ Asset<br>-R&D/asset<br>-natural log of asset | Taiwan | 1994 and 1995 from | their definition of ownership relies on control rights, and not on cash flow rights |
| Villalonga and Amit (2006) | -Family firm<br>-Founder<br>-Firm age<br>-Family ownership stake Shares<br>-Control-enhancing mechanisms<br>-Family vote-holdings in excess of shares owned<br>-Governance index<br>-Nonfamily blockholder ownership<br>-Nonfamily outside directors<br>-Tobin's q<br>-Industry- adjusted q<br>-ROA<br>-Market risk (beta)<br>-Idiosyncratic risk<br>-Diversificatio | USA | 1994–2000. | panel of 52,787 shareholder-firm-yea. Phases of database at the individual shareholder level that covers, for each firm-yea<br>Next: aggregates our shareholder-level database from Phase I |
| Nenova, T., 2003 | - Dual-class firm Total<br>- Total value of control-block votes as a share of firm market value Rule<br>- Rule of law<br>- Investor protection<br>- Takeover regulations<br>- Charter provisions<br>- Shapley value<br>- Firm size<br>- Dividend ratio<br>- Cumulative limited-voting<br>- Registration costs for MV<br>- Log difference in Turnover | dual-class firms in 18 countries | 1995 | stock market capitalization in the sample by country and Turkey is included |

The table shows family and non-family businesses according to my manual method of collecting this information,

**Note**: The companies whose type has not been determined are among the companies excluded from the study, whether they are financial companies or companies that have been excluded because there are no data on them.

These firms listed on the Bursa Istanbul was collected information from Public Disclosure Platform (PDP) www.kap.org, the firms' websites, and annual reports

# APPENDIX B

Table of 18 group of family businesses and their subsidiaries controlled by families were taking from the empirical study of Ararat, M., Black, B. S., & Yurtoglu, B. B. (2014) https://doi.org/10.2139/ssrn.2277768 . also, the number of public companies were identified from Public Disclosure Platform (PDP) www.kap.org, at the year of 2019 of the database last notifications updates

| Group Name | Controller | Founded | No of Public Companies |
|---|---|---|---|
| Anadolu | Yazıcı & Özilhan Families | 1949 | 7 |
| Akfen | Akin Family | 1976 | 3 |
| Akkök | Dinckök Family | 1952 | 4 |
| Alarko | Alaton & Garih Families | 1951 | 3 |
| Borusan | Kocabıyık Family | 1944 | 2 |
| Cukurova | Karamehmet Family | 1935 | 2 |
| Dogan | Dogan Family | 1961 | 5 |
| Dogus | Dogus Family | 1951 | 3 |
| Eczacibasi | Eczacibasi Family | 1942 | 3 |
| Enka | Tara & Gülcelik Families | 1957 | 1 |
| Ihlas | Ören Family | 1970 | 5 |
| Is Bank | Isbank's own pension fund | 1924 | 4 |
| Koc | Koc Family | 1926 | 11 |
| Oyak | Turkish Armed Forces (assistance and pension fund) | 1961 | 10 |
| Sabanci | Sabanci Family | 1943 | 10 |
| Yasar | Yasar Family | 1945 | 4 |
| Yildiz | Ülker Family | 1944 | 4 |
| Zorlu | Zorlu Family | 1953 | 3 |

# APPENDIX C

Details of 18 family firms and their subsidiaries in the BIST firms of the table (2)

| Company Name | ID | Group | controller | Founded | No of Public Companies |
|---|---|---|---|---|---|
| AKFEN GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | AKFGY | Akfen | Akin Family | 1976 | 3 |
| AKIN TEKSTİL A.Ş. | ATEKS | | | | |
| EDİP GAYRİMENKUL YATIRIM SANAYİ VE TİCARET A.Ş. | EDIP | | | | |
| ALARKO CARRIER SANAYİ VE TİCARET A.Ş. | ALCAR | Alarko | Alaton & Garih Families | 1951 | 3 |
| ALARKO GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | ALGYO | | | | |
| ALKİM KAĞIT SANAYİ VE TİCARET A.Ş. | ALKA | | | | |
| AKENERJİ ELEKTRİK ÜRETİM A.Ş. | AKENR | Akkök | Dinckök Family | 1952 | 4 |
| AKMERKEZ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | AKMGY | | | | |
| AKSA AKRİLİK KİMYA SANAYİİ A.Ş. | AKSA | | | | |
| AKİŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | AKSGY | | | | |
| ÇELİK HALAT VE TEL SANAYİİ A.Ş. | CELHA | Dogan | Dogan Family | 1961 | 5 |
| DOĞTAŞ KELEBEK MOBİLYA SANAYİ VE TİCARET A.Ş. | DGKLB | | | | |
| DİTAŞ DOĞAN YEDEK PARÇA İMALAT VE TEKNİK A.Ş. | DITAS | | | | |
| DOĞAN ŞİRKETLER GRUBU HOLDİNG A.Ş. | DOHOL | | | | |
| MİLPA TİCARİ VE SINAİ ÜRÜNLER PAZARLAMA SANAYİ VE TİCARET A.Ş. | MIPAZ | | | | |
| ARENA BİLGİSAYAR SANAYİ VE TİCARET A.Ş. | ARENA | Dogus | Dogus family | 1951 | 3 |
| DOĞUŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | DGGYO | | | | |
| DOĞUŞ OTOMOTİV SERVİS VE TİCARET A.Ş. | DOAS | | | | |
| EİS ECZACIBAŞI İLAÇ, SINAİ VE FİNANSAL YATIRIMLAR SANAYİ VE TİCARET A.Ş. | ECILC | Eczacibasi | Eczacibasi Family | 1942 | 3 |
| ECZACIBAŞI YATIRIM HOLDİNG ORTAKLIĞI A.Ş. | ECZYT | | | | |
| İNTEMA İNŞAAT VE TESİSAT MALZEMELERİ YATIRIM VE PAZARLAMA A.Ş. | INTEM | | | | |
| TRAKYA CAM SANAYİİ A.Ş. | TRKCM | Is Bank | Isbank's own pension fund | 1924 | 4 |
| SODA SANAYİİ A.Ş. | SODA | | | | |

| Company Name | ID | Group | controller | Founded | No of Public Companies |
|---|---|---|---|---|---|
| İHLAS EV ALETLERİ İMALAT SANAYİ VE TİCARET A.Ş. | IHEVA | Ihlas | Ören Family | 1970 | 5 |
| IHLAS GAZETECILIK A.Ş. | IHGZT | | | | |
| İHLAS HOLDİNG A.Ş. | IHLAS | | | | |
| İHLAS GAYRİMENKUL PROJE GELİŞTİRME VE TİCARET A.Ş. | IHLGM | | | | |
| İHLAS YAYIN HOLDİNG A.Ş. | IHYAY | | | | |
| AFYON ÇİMENTO SANAYİ T.A.Ş. | AFYON | Sabanci | Sabanci family | 1943 | 10 |
| AKÇANSA ÇİMENTO SANAYİ VE TİCARET A.Ş. | AKCNS | | | | |
| AKSİGORTA A.Ş. | AKGRT | | | | |
| AVİVASA EMEKLİLİK VE HAYAT A.Ş. | AVISA | | | | |
| BRİSA BRIDGESTONE SABANCI LASTİK SANAYİ VE TİCARET A.Ş. | BRISA | | | | |
| ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş. | CIMSA | | | | |
| CARREFOURSA CARREFOUR SABANCI TİCARET MERKEZİ A.Ş. | CRFSA | | | | |
| KORDSA TEKNİK TEKSTİL A.Ş. | KORDS | | | | |
| HACI ÖMER SABANCI HOLDİNG A.Ş. | SAHOL | | | | |
| TEKNOSA İÇ VE DIŞ TİCARET A.Ş. | TKNSA | | | | |
| ENKA İNŞAAT VE SANAYİ A.Ş. | ENKAI | Enka | Tara & Gülcelik Families | 1957 | 1 |
| ADANA ÇİMENTO SANAYİİ T.A.Ş. | ADANA | Oyak | Turkish Armed Forces | 1961 | 10 |
| ADANA ÇİMENTO SANAYİİ T.A.Ş. | ADBGR | | | | |
| ADANA ÇİMENTO SANAYİİ T.A.Ş. | ADNAC | | | | |
| ASLAN ÇİMENTO A.Ş. | ASLAN | | | | |
| BOLU ÇİMENTO SANAYİİ A.Ş. | BOLUC | | | | |
| EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş. | EREGL | | | | |
| HEKTAŞ TİCARET T.A.Ş. | HEKTS | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ANADOLU CAM SANAYİİ A.Ş. | ANACM | | | | |
| TÜRKİYE İŞ BANKASI A.Ş. | ISCTR | | | | |
| KAPLAMİN AMBALAJ SANAYİ VE TİCARET A.Ş. | KAPLM | Cukurova | Karamehmet Family | 1935 | 2 |
| TURKCELL İLETİŞİM HİZMETLERİ A.Ş. | TCELL | | | | |
| ARÇELİK A.Ş. | ARCLK | Koc | Koc Family | 1926 | 11 |
| AYGAZ A.Ş. | AYGAZ | | | | |
| FORD OTOMOTİV SANAYİ A.Ş. | FROTO | | | | |
| İZMİR DEMİR ÇELİK SANAYİ A.Ş. | IZMDC | | | | |
| KOÇ HOLDİNG A.Ş. | KCHOL | | | | |
| MARMARİS ALTINYUNUS TURİSTİK TESİSLER A.Ş. | MAALT | | | | |
| OTOKAR OTOMOTİV VE SAVUNMA SANAYİ A.Ş. | OTKAR | | | | |
| TAT GIDA SANAYİ A.Ş. | TATGD | | | | |
| TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş. | TOASO | | | | |
| TÜRK TRAKTÖR VE ZİRAAT MAKİNELERİ A.Ş. | TTRAK | | | | |
| TÜPRAŞ-TÜRKİYE PETROL RAFİNERİLERİ A.Ş. | TUPRS | | | | |
| BORUSAN MANNESMANN BORU SANAYİ VE TİCARET A.Ş. | BRSAN | Borusan | Kocabıyık Family | 1944 | 2 |
| BORUSAN YATIRIM VE PAZARLAMA A.Ş. | BRYAT | | | | |
| VESTEL BEYAZ EŞYA SANAYİ VE TİCARET A.Ş. | VESBE | Zorlu | Zorlu family | 1953 | 3 |
| VESTEL ELEKTRONİK SANAYİ VE TİCARET A.Ş. | VESTL | | | | |
| ZORLU ENERJİ ELEKTRİK ÜRETİM A.Ş. | ZOREN | | | | |

| | | | | | |
|---|---|---|---|---|---|
| İSKENDERUN DEMİR VE ÇELİK A.Ş. | ISDMR | | | | |
| MARDİN ÇİMENTO SANAYİİ VE TİCARET A.Ş. | MRDIN | | | | |
| ÜNYE ÇİMENTO SANAYİ VE TİCARET A.Ş. | UNYEC | | | | |
| BİZİM TOPTAN SATIŞ MAĞAZALARI A.Ş. | BIZIM | Yildiz | Ülker Family | 1944 | 4 |
| KEREVİTAŞ GIDA SANAYİ VE TİCARET A.Ş. | KERVT | | | | |
| ŞOK MARKETLER TİCARET A.Ş. | SOKM | | | | |
| ÜLKER BİSKÜVİ SANAYİ A.Ş. | ULKER | | | | |
| DYO BOYA FABRİKALARI SANAYİ VE TİCARET A.Ş. | DYOBY | Yasar | Yasar Family | 1945 | 4 |
| PINAR ENTEGRE ET VE UN SANAYİİ A.Ş. | PETUN | | | | |
| PINAR SU VE İÇECEK SANAYİ VE TİCARET A.Ş. | PINSU | | | | |
| PINAR SÜT MAMULLERI SANAYİİ A.Ş. | PNSUT | | | | |
| ADEL KALEMCİLİK TİCARET VE SANAYİ A.Ş. | ADEL | Anadolu | Yazıcı &Özilhan Families | 1949 | 7 |
| ANADOLU EFES BİRACILIK VE MALT SANAYİİ A.Ş. | AEFES | | | | |
| AG ANADOLU GRUBU HOLDİNG A.Ş. | AGHOL | | | | |
| ANADOLU ISUZU OTOMOTİV SANAYİ VE TİCARET A.Ş. | ASUZU | | | | |
| BATISÖKE SÖKE ÇİMENTO SANAYİİ T.A.Ş. | BSOKE | | | | |
| BATIÇİM BATI ANADOLU ÇİMENTO SANAYİİ A.Ş. | BTCIM | | | | |
| COCA-COLA İÇECEK A.Ş. | CCOLA | | | | |

# APPENDIX D

firms listed on the Bursa Istanbul, collected from Public Disclosure Platform (PDP) www.kap.org, the family firms identification by the percent of the ownership they hold either 20% or 50%

| Ticker | Company Name | 50% family control | 20% family control | Ticker | Company Name | 50% family control | 20% family control |
|---|---|---|---|---|---|---|---|
| ACSEL | ACISELSAN ACIPAYAM SELÜLOZ SANAYİ VE TİCARET A.Ş. | | | ISGSY | İŞ GİRİŞİM SERMAYESİ YATIRIM ORTAKLIĞI A.Ş. | | |
| ADANA | ADANA ÇİMENTO SANAYİİ T.A.Ş. | Not | Not | ISGYO | İŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| ADBGR | ADANA ÇİMENTO SANAYİİ T.A.Ş. | Not | Not | ISMEN | İŞ YATIRIM MENKUL DEĞERLER A.Ş. | | |
| ADEL | ADEL KALEMCİLİK TİCARET VE SANAYİ A.Ş. | Yes | Yes | ITTFH | İTTİFAK HOLDİNG A.Ş. | | |
| ADESE | ADESE ALIŞVERİŞ MERKEZLERİ TİCARET A.Ş. | | | IZFAS | İZMİR FIRÇA SANAYİ VE TİCARET A.Ş. | | |
| ADNAC | ADANA ÇİMENTO SANAYİİ T.A.Ş. | Not | Not | IZMDC | İZMİR DEMİR ÇELİK SANAYİ A.Ş. | Yes | Yes |
| AEFES | ANADOLU EFES BİRACILIK VE MALT SANAYİİ A.Ş. | Yes | Yes | IZOCM | İZOCAM TİCARET VE SANAYİ A.Ş. | Not | Not |
| AFYON | AFYON ÇİMENTO SANAYİ T.A.Ş. | Not | Not | IZTAR | İZ HAYVANCILIK TARIM VE GIDA SANAYİ TİCARET A.Ş. | | |
| AGHOL | AG ANADOLU GRUBU HOLDİNG A.Ş. | | | JANTS | JANTSA JANT SANAYİ VE TİCARET A.Ş. | | |
| AGYO | ATAKULE GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | KAPLM | KAPLAMİN AMBALAJ SANAYİ VE TİCARET A.Ş. | Not | Not |
| AKBNK | AKBANK T.A.Ş. | | | KAREL | KAREL ELEKTRONİK SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| AKCNS | AKÇANSA ÇİMENTO SANAYİ VE TİCARET A.Ş. | not | Yes | KARSN | KARSAN OTOMOTİV SANAYİİ VE TİCARET A.Ş. | Yes | Yes |
| AKENR | AKENERJİ ELEKTRİK ÜRETİM A.Ş. | not | Yes | KARTN | KARTONSAN KARTON SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| AKFGY | AKFEN GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | KATMR | KATMERCİLER ARAÇ ÜSTÜ EKİPMAN SANAYİ VE TİCARET A.Ş. | | |
| AKGRT | AKSİGORTA A.Ş. | | | KCHOL | KOÇ HOLDİNG A.Ş. | | |
| AKGUV | AKDENİZ GÜVENLİK HİZMETLERİ A.Ş. | | | KENT | KENT GIDA MADDELERİ SANAYİİ VE TİCARET A.Ş. | Not | Not |
| AKMGY | AKMERKEZ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | KERVT | KEREVİTAŞ GIDA SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| AKSA | AKSA AKRİLİK KİMYA SANAYİİ A.Ş. | Yes | Yes | KFEIN | KAFEİN YAZILIM HİZMETLERİ TİCARET A.Ş. | | |
| AKSEN | AKSA ENERJİ ÜRETİM A.Ş. | | | KLGYO | KİLER GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| AKSGY | AKİŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | KLMSN | KLİMASAN KLİMA SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| AKSUE | AKSU ENERJİ VE TİCARET A.Ş. | Not | Not | KLNMA | TÜRKİYE KALKINMA VE YATIRIM BANKASI A.Ş. | | |
| ALARK | ALARKO HOLDİNG A.Ş. | | | KNFRT | KONFRUT GIDA SANAYİ VE TİCARET A.Ş. | Not | Not |
| ALBRK | ALBARAKA TÜRK KATILIM BANKASI A.Ş. | | | KONYA | KONYA ÇİMENTO SANAYİİ A.Ş. | Not | Not |
| ALCAR | ALARKO CARRIER SANAYİ VE TİCARET A.Ş. | Not | Not | KORDS | KORDSA TEKNİK TEKSTİL A.Ş. | Yes | Yes |
| ALCTL | ALCATEL LUCENT TELETAŞ TELEKOMÜNİKASYON A.Ş. | Not | Not | KOZAA | KOZA ANADOLU METAL MADENCİLİK İŞLETMELERİ A.Ş. | Yes | Yes |
| ALGYO | ALARKO GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | KOZAL | KOZA ALTIN İŞLETMELERİ A.Ş. | Yes | Yes |
| ALKA | ALKİM KAĞIT SANAYİ VE TİCARET A.Ş. | Yes | Yes | KRDMA | KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş. | not | Yes |
| ALKIM | ALKİM ALKALİ KİMYA A.Ş. | Yes | Yes | KRDMB | KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| ANACM | ANADOLU CAM SANAYİİ A.Ş. | Not | Not | KRDMD | KARDEMİR KARABÜK DEMİR ÇELİK SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| ANELE | ANEL ELEKTRİK PROJE TAAHHÜT VE TİCARET A.Ş. | | | KRONT | KRON TELEKOMÜNİKASYON HİZMETLERİ A.Ş. | | |
| ANHYT | ANADOLU HAYAT EMEKLİLİK A.Ş. | | | KRSTL | KRİSTAL KOLA VE MEŞRUBAT SANAYİ TİCARET A.Ş. | Yes | Yes |
| ANSGR | ANADOLU ANONİM TÜRK SİGORTA ŞİRKETİ | | | KRTEK | KARSU TEKSTİL SANAYİİ VE TİCARET A.Ş. | Yes | Yes |
| ARCLK | ARÇELİK A.Ş. | Yes | Yes | KUTPO | KÜTAHYA PORSELEN SANAYİ A.Ş. | not | Yes |
| ARENA | ARENA BİLGİSAYAR SANAYİ VE TİCARET A.Ş. | not | Yes | KUYAS | KUYUMCUKENT GAYRİMENKUL YATIRIMLARI A.Ş. | | |
| ARMDA | ARMADA BİLGİSAYAR SİSTEMLERİ SANAYİ VE TİCARET A.Ş. | not | Yes | LINK | LİNK BİLGİSAYAR SİSTEMLERİ YAZILIMI VE DONANIMI SANAYİ VE TİCARET A.Ş. | Yes | Yes |

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| ARSAN | ARSAN TEKSTİL TİCARET VE SANAYİ A.Ş. | not | Yes | LKMNH | LOKMAN HEKİM ENGÜRÜSAĞ SAĞLIK, TURİZM, EĞİTİM HİZMETLERİ VE İNŞAAT TAAHHÜT A.Ş. | | |
| ASELS | ASELSAN ELEKTRONİK SANAYİ VE TİCARET A.Ş. | Not | Not | LOGO | LOGO YAZILIM SANAYİ VE TİCARET A.Ş. | Not | Not |
| ASLAN | ASLAN ÇİMENTO A.Ş. | Not | Not | MAALT | MARMARİS ALTINYUNUS TURİSTİK TESİSLER A.Ş. | Yes | Yes |
| ASUZU | ANADOLU ISUZU OTOMOTİV SANAYİ VE TİCARET A.Ş. | Not | Yes | MAKTK | MAKİNA TAKIM ENDÜSTRİSİ A.Ş. | Yes | Yes |
| ATAGY | ATA GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | MARKA | MARKA YATIRIM HOLDİNG A.Ş. | | |
| ATEKS | AKIN TEKSTİL A.Ş. | Yes | Yes | MARTI | MARTI OTEL İŞLETMELERİ A.Ş. | not | Yes |
| AVGYO | AVRASYA GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | MAVI | MAVİ GİYİM SANAYİ VE TİCARET A.Ş. | | |
| AVHOL | AVRUPA YATIRIM HOLDİNG A.Ş. | | | MEGAP | MEGA POLİETİLEN KÖPÜK SANAYİ VE TİCARET A.Ş. | | |
| AVISA | AVİVASA EMEKLİLİK VE HAYAT A.Ş. | | | MEPET | MEPET METRO PETROL VE TESİSLERİ SANAYİ TİCARET A.Ş. | | |
| AVOD | A.V.O.D. KURUTULMUŞ GIDA VE TARIM ÜRÜNLERİ A.Ş. | not | Yes | MERKO | MERKO GIDA SANAYİ VE TİCARET A.Ş. | Not | Not |
| AVTUR | AVRASYA PETROL VE TURİSTİK TESİSLER YATIRIMLAR A.Ş. | | | METRO | METRO TİCARİ VE MALİ YATIRIMLAR HOLDİNG A.Ş. | | |
| AYEN | AYEN ENERJİ A.Ş. | Yes | Yes | METUR | METEMTUR OTELCİLİK VE TURİZM İŞLETMELERİ A.Ş. | Not | Yes |
| AYGAZ | AYGAZ A.Ş. | Yes | Yes | MGROS | MİGROS TİCARET A.Ş. | Not | Not |
| BAGFS | BAGFAŞ BANDIRMA GÜBRE FABRİKALARI A.Ş. | not | Yes | MIPAZ | MİLPA TİCARİ VE SINAİ ÜRÜNLER PAZARLAMA SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| BAKAB | BAK AMBALAJ SANAYİ VE TİCARET A.Ş. | Yes | Yes | MNDRS | MENDERES TEKSTİL SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| BANVT | BANVİT BANDIRMA VİTAMİNLİ YEM SANAYİİ A.Ş. | not | Yes | MPARK | MLP SAĞLIK HİZMETLERİ A.Ş. | | |
| BERA | BERA HOLDİNG A.Ş. | | | MRDIN | MARDİN ÇİMENTO SANAYİİ VE TİCARET A.Ş. | Not | Not |
| BEYAZ | BEYAZ FİLO OTO KİRALAMA A.Ş. | | | MRGYO | MARTI GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| BFREN | BOSCH FREN SİSTEMLERİ SANAYİ VE TİCARET A.Ş. | Yes | Yes | MRSHL | MARSHALL BOYA VE VERNİK SANAYİİ A.Ş. | not | Yes |
| BIMAS | BİM BİRLEŞİK MAĞAZALAR A.Ş. | not | Yes | MSGYO | MİSTRAL GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| BIZIM | BİZİM TOPTAN SATIŞ MAĞAZALARI A.Ş. | | | NATEN | NATUREL YENİLENEBİLİR ENERJİ TİCARET A.Ş. | | |
| BJKAS | BEŞİKTAŞ FUTBOL YATIRIMLARI SANAYİ VE TİCARET A.Ş. | Not | Not | NETAS | NETAŞ TELEKOMÜNİKASYON A.Ş. | Not | Not |
| BLCYT | BİLİCİ YATIRIM SANAYİ VE TİCARET A.Ş. | | | NIBAS | NİĞBAŞ NİĞDE BETON SANAYİ VE TİCARET A.Ş. | | |
| BNTAS | BANTAŞ BANDIRMA AMBALAJ SANAYİ TİCARET A.Ş. | not | Yes | NTHOL | NET HOLDİNG A.Ş. | | |
| BOLUC | BOLU ÇİMENTO SANAYİİ A.Ş. | Not | Not | NUGYO | NUROL GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| BOSSA | BOSSA TİCARET VE SANAYİ İŞLETMELERİ T.A.Ş. | Not | Not | NUHCM | NUH ÇİMENTO SANAYİ A.Ş. | not | Yes |
| BOYP | BEYMEN PERAKENDE VE TEKSTİL YATIRIMLARI A.Ş. | | | ODAS | ODAŞ ELEKTRİK ÜRETİM SANAYİ TİCARET A.Ş. | | |
| BRISA | BRİSA BRIDGESTONE SABANCI LASTİK SANAYİ VE TİCARET A.Ş. | not | Yes | OLMIP | OLMUKSAN INTERNATIONAL PAPER AMBALAJ SANAYİ VE TİCARET A.Ş. | not | Yes |
| BRKSN | BERKOSAN YALITIM VE TECRİT MADDELERİ ÜRETİM VE TİCARET A.Ş. | | | ORGE | ORGE ENERJİ ELEKTRİK TAAHHÜT A.Ş. | | |
| BRSAN | BORUSAN MANNESMANN BORU SANAYİ VE TİCARET A.Ş. | Not | Not | OSTIM | OSTİM ENDÜSTRİYEL YATIRIMLAR VE İŞLETME A.Ş. | | |
| BRYAT | BORUSAN YATIRIM VE PAZARLAMA A.Ş. | | | OTKAR | OTOKAR OTOMOTİV VE SAVUNMA SANAYİ A.Ş. | not | Yes |
| BSOKE | BATISÖKE SÖKE ÇİMENTO SANAYİİ T.A.Ş. | Not | Not | OYLUM | OYLUM SINAİ YATIRIMLAR A.Ş. | | |
| BTCIM | BATIÇİM BATI ANADOLU ÇİMENTO SANAYİİ A.Ş. | Not | Yes | OZBAL | ÖZBAL ÇELİK BORU SANAYİ TİCARET VE TAAHHÜT A.Ş. | | |
| BUCIM | BURSA ÇİMENTO FABRİKASI A.Ş. | Not | Not | OZGYO | ÖZDERİCİ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| BURCE | BURÇELİK BURSA ÇELİK DÖKÜM SANAYİİ A.Ş. | Yes | Yes | OZKGY | ÖZAK GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| CCOLA | COCA-COLA İÇECEK A.Ş. | not | Yes | PAGYO | PANORA GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| CELHA | ÇELİK HALAT VE TEL SANAYİİ A.Ş. | Yes | Yes | PARSN | PARSAN MAKİNA PARÇALARI SANAYİİ A.Ş. | Yes | Yes |
| CEMAS | ÇEMAŞ DÖKÜM SANAYİ A.Ş. | | | PEGYO | PERA GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| CEMTS | ÇEMTAŞ ÇELİK MAKİNA SANAYİ VE TİCARET A.Ş. | not | Yes | PEKGY | PEKER GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| CEOEM | CEO EVENT MEDYA A.Ş. | Yes | Yes | PENGD | PENGUEN GIDA SANAYİ A.Ş. | Yes | Yes |
| CIMSA | ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş. | Yes | Yes | PETKM | PETKİM PETROKİMYA HOLDİNG A.Ş. | Yes | Yes |
| CLEBI | ÇELEBİ HAVA SERVİSİ A.Ş. | Yes | Yes | PETUN | PINAR ENTEGRE ET VE UN SANAYİİ A.Ş. | Yes | Yes |
| CMBTN | ÇİMBETON HAZIRBETON VE PREFABRİK YAPI ELEMANLARI SANAYİ VE TİCARET A.Ş. | Not | Not | PGSUS | PEGASUS HAVA TAŞIMACILIĞI A.Ş. | | |
| CMENT | ÇİMENTAŞ İZMİR ÇİMENTO FABRİKASI T.A.Ş. | Not | Not | PINSU | PINAR SU VE İÇECEK SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| CRDFA | CREDITWEST FAKTORİNG A.Ş. | | | PKART | PLASTİKKART AKILLI KART İLETİŞİM SİSTEMLERİ SANAYİ VE TİCARET A.Ş. | not | Yes |
| CRFSA | CARREFOURSA CARREFOUR SABANCI TİCARET MERKEZİ A.Ş. | Yes | Yes | PNSUT | PINAR SÜT MAMULLERİ SANAYİİ A.Ş. | Yes | Yes |
| CUSAN | ÇUHADAROĞLU METAL SANAYİ VE PAZARLAMA A.Ş. | | | POLHO | POLİSAN HOLDİNG A.Ş. | | |

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| DAGI | DAGİ GİYİM SANAYİ VE TİCARET A.Ş. | | | POLTK | POLİTEKNİK METAL SANAYİ VE TİCARET A.Ş. | | |
| DENCM | DENİZLİ CAM SANAYİİ VE TİCARET A.Ş. | Not | Not | PRKAB | TÜRK PRYSMİAN KABLO VE SİSTEMLERİ A.Ş. | Not | Not |
| DENGE | DENGE YATIRIM HOLDİNG A.Ş. | | | PRKME | PARK ELEKTRİK ÜRETİM MADENCİLİK SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| DENIZ | DENİZBANK A.Ş. | | | PRZMA | PRİZMA PRES MATBAACILIK YAYINCILIK SANAYİ VE TİCARET A.Ş. | | |
| DERAS | DERLÜKS DERİ SANAYİ VE TİCARET A.Ş. | | | PSDTC | PERGAMON STATUS DIŞ TİCARET A.Ş. | | |
| DERIM | DERİMOD KONFEKSİYON AYAKKABI DERİ SANAYİ VE TİCARET A.Ş. | Yes | Yes | QNBFB | QNB FİNANSBANK A.Ş. | | |
| DESA | DESA DERİ SANAYİ VE TİCARET A.Ş. | Yes | Yes | RALYH | RAL YATIRIM HOLDİNG A.Ş. | | |
| DESPC | DESPEC BİLGİSAYAR PAZARLAMA VE TİCARET A.Ş. | | | RAYSG | RAY SİGORTA A.Ş. | | |
| DEVA | DEVA HOLDİNG A.Ş. | Not | Not | RHEAG | RHEA GİRİŞİM SERMAYESİ YATIRIM ORTAKLIĞI A.Ş. | | |
| DGATE | DATAGATE BİLGİSAYAR MALZEMELERİ TİCARET A.Ş. | Yes | Yes | RTALB | RTA LABORATUVARLARI BİYOLOJİK ÜRÜNLER İLAÇ VE MAKİNA SANAYİ TİCARET A.Ş. | | |
| DGGYO | DOĞUŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | RYGYO | REYSAŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| DGKLB | DOĞTAŞ KELEBEK MOBİLYA SANAYİ VE TİCARET A.Ş. | Yes | Yes | RYSAS | REYSAŞ TAŞIMACILIK VE LOJİSTİK TİCARET A.Ş. | not | Yes |
| DITAS | DİTAŞ DOĞAN YEDEK PARÇA İMALAT VE TEKNİK A.Ş. | Yes | Yes | SAFKR | SAFKAR EGE SOĞUTMACILIK KLİMA SOĞUK HAVA TESİSLERİ İHRACAT İTHALAT SANAYİ VE TİCARET A.Ş. | | |
| DMSAS | DEMİSAŞ DÖKÜM EMAYE MAMÜLLERİ SANAYİ A.Ş. | Not | Not | SAHOL | HACI ÖMER SABANCI HOLDİNG A.Ş. | | |
| DOAS | DOĞUŞ OTOMOTİV SERVİS VE TİCARET A.Ş. | Yes | Yes | SAMAT | SARAY MATBAACILIK KAĞITÇILIK KIRTASİYECİLİK TİCARET VE SANAYİ A.Ş. | | |
| DOCO | DO & CO AKTIENGESELLSCHAFT | Yes | Yes | SANEL | SAN-EL MÜHENDİSLİK ELEKTRİK TAAHHÜT SANAYİ VE TİCARET A.Ş. | | |
| DOGUB | DOĞUSAN BORU SANAYİİ VE TİCARET A.Ş. | Not | Not | SANKO | SANKO PAZARLAMA İTHALAT İHRACAT A.Ş. | Yes | Yes |
| DOHOL | DOĞAN ŞİRKETLER GRUBU HOLDİNG A.Ş. | | | SARKY | SARKUYSAN ELEKTROLİTİK BAKIR SANAYİ VE TİCARET A.Ş. | Not | Not |
| DOKTA | DÖKTAŞ DÖKÜMCÜLÜK TİCARET VE SANAYİ A.Ş. | Not | Not | SEKFK | ŞEKER FİNANSAL KİRALAMA A.Ş. | | |
| DURDO | DURAN DOĞAN BASIM VE AMBALAJ SANAYİ A.Ş. | Not | Not | SEKUR | SEKURO PLASTİK AMBALAJ SANAYİ A.Ş. | Yes | Yes |
| DYOBY | DYO BOYA FABRİKALARI SANAYİ VE TİCARET A.Ş. | Yes | Yes | SELEC | SELÇUK ECZA DEPOSU TİCARET VE SANAYİ A.Ş. | | |
| DZGYO | DENİZ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | SEYKM | SEYİTLER KİMYA SANAYİ A.Ş. | not | Yes |
| ECILC | EİS ECZACIBAŞI İLAÇ, SINAİ VE FİNANSAL YATIRIMLAR SANAYİ VE TİCARET A.Ş. | | | SILVR | SİLVERLİNE ENDÜSTRİ VE TİCARET A.Ş. | | |
| ECZYT | ECZACIBAŞI YATIRIM HOLDİNG ORTAKLIĞI A.Ş. | | | SISE | TÜRKİYE ŞİŞE VE CAM FABRİKALARI A.Ş. | | |
| EDIP | EDİP GAYRİMENKUL YATIRIM SANAYİ VE TİCARET A.Ş. | not | Yes | SKBNK | ŞEKERBANK T.A.Ş. | not | Yes |
| EGEEN | EGE ENDÜSTRİ VE TİCARET A.Ş. | Yes | Yes | SKTAS | SÖKTAŞ TEKSTİL SANAYİ VE TİCARET A.Ş. | | |
| EGGUB | EGE GÜBRE SANAYİİ A.Ş. | Yes | Yes | SMART | SMARTİKS YAZILIM A.Ş. | | |
| EGPRO | EGE PROFİL TİCARET VE SANAYİ A.Ş. | Not | Not | SNGYO | SİNPAŞ GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| EGSER | EGE SERAMİK SANAYİ VE TİCARET A.Ş. | Yes | Yes | SNKRN | SENKRON GÜVENLİK VE İLETİŞİM SİSTEMLERİ A.Ş. | Not | Not |
| EKGYO | EMLAK KONUT GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | SODA | SODA SANAYİİ A.Ş. | | |
| EMKEL | EMEK ELEKTRİK ENDÜSTRİSİ A.Ş. | not | Yes | SOKM | ŞOK MARKETLER TİCARET A.Ş. | Yes | Yes |
| ENJSA | ENERJİSA ENERJİ A.Ş. | | | SONME | SÖNMEZ FİLAMENT SENTETİK İPLİK VE ELYAF SANAYİ A.Ş. | | |
| ENKAI | ENKA İNŞAAT VE SANAYİ A.Ş. | not | Yes | SRVGY | SERVET GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| ERBOS | ERBOSAN ERCİYAS BORU SANAYİİ VE TİCARET A.Ş. | not | Yes | TACTR | TAÇ TARIM ÜRÜNLERİ HAYVANCILIK GIDA SANAYİ VE TİCARET A.Ş. | not | Yes |
| EREGL | EREĞLİ DEMİR VE ÇELİK FABRİKALARI T.A.Ş. | Not | Not | TATGD | TAT GIDA SANAYİ A.Ş. | | |
| ERSU | ERSU MEYVE VE GIDA SANAYİ A.Ş. | Not | Yes | TAVHL | TAV HAVALİMANLARI HOLDİNG A.Ş. | Not | Not |
| ESCOM | ESCORT TEKNOLOJİ YATIRIM A.Ş. | Yes | Yes | TBORG | TÜRK TUBORG BİRA VE MALT SANAYİİ A.Ş. | Yes | Yes |
| EUHOL | EURO YATIRIM HOLDİNG A.Ş. | | | TCELL | TURKCELL İLETİŞİM HİZMETLERİ A.Ş. | Not | Yes |
| FENER | FENERBAHÇE FUTBOL A.Ş. | Not | Not | TEKTU | TEK-ART İNŞAAT TİCARET TURİZM SANAYİ VE YATIRIMLAR A.Ş. | | |
| FLAP | FLAP KONGRE TOPLANTI HİZMETLERİ OTOMOTİV VE TURİZM A.Ş. | | | TGSAS | TGS DIŞ TİCARET A.Ş. | Not | Not |
| FMIZP | FEDERAL-MOGUL İZMİT PİSTON VE PİM ÜRETİM TESİSLERİ A.Ş. | Not | Not | THYAO | TÜRK HAVA YOLLARI A.O. | Not | Not |
| FONET | FONET BİLGİ TEKNOLOJİLERİ A.Ş. | | | TIRE | MONDİ TİRE KUTSAN KAĞIT VE AMBALAJ SANAYİ A.Ş. | | |
| FORMT | FORMET ÇELİK KAPI SANAYİ VE TİCARET A.Ş. | | | TKFEN | TEKFEN HOLDİNG A.Ş. | | |
| FROTO | FORD OTOMOTİV SANAYİ A.Ş. | not | Yes | TKNSA | TEKNOSA İÇ VE DIŞ TİCARET A.Ş. | | |
| GARAN | TÜRKİYE GARANTİ BANKASI A.Ş. | | | TLMAN | TRABZON LİMAN İŞLETMECİLİĞİ A.Ş. | | |
| GARFA | GARANTİ FAKTORİNG A.Ş. | | | TMPOL | TEMAPOL POLİMER PLASTİK VE İNŞAAT SANAYİ TİCARET A.Ş. | | |

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|---|---|---|---|---|---|---|---|
| GEDIK | GEDİK YATIRIM MENKUL DEĞERLER A.Ş. | | | TMSN | TÜMOSAN MOTOR VE TRAKTÖR SANAYİ A.Ş. | not | Yes |
| GEDZA | GEDİZ AMBALAJ SANAYİ VE TİCARET A.Ş. | | | TOASO | TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş. | | |
| GENTS | GENTAŞ GENEL METAL SANAYİ VE TİCARET A.Ş. | not | Yes | TRCAS | TURCAS PETROL A.Ş. | | |
| GEREL | GERSAN ELEKTRİK TİCARET VE SANAYİ A.Ş. | not | Yes | TRGYO | TORUNLAR GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | Not | Not |
| GLRYH | GÜLER YATIRIM HOLDİNG A.Ş. | | | TRKCM | TRAKYA CAM SANAYİİ A.Ş. | | |
| GLYHO | GLOBAL YATIRIM HOLDİNG A.Ş. | | | TSGYO | TSKB GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| GOLTS | GÖLTAŞ GÖLLER BÖLGESİ ÇİMENTO SANAYİ VE TİCARET A.Ş. | Not | Not | TSKB | TÜRKİYE SINAİ KALKINMA BANKASI A.Ş. | Not | Not |
| GOODY | GOODYEAR LASTİKLERİ T.A.Ş. | Not | Not | TSPOR | TRABZONSPOR SPORTİF YATIRIM VE FUTBOL İŞLETMECİLİĞİ TİCARET A.Ş. | Not | Not |
| GOZDE | GÖZDE GİRİŞİM SERMAYESİ YATIRIM ORTAKLIĞI A.Ş. | | | TTKOM | TÜRK TELEKOMÜNİKASYON A.Ş. | Not | Yes |
| GSDDE | GSD DENİZCİLİK GAYRİMENKUL İNŞAAT SANAYİ VE TİCARET A.Ş. | Yes | Yes | TTRAK | TÜRK TRAKTÖR VE ZİRAAT MAKİNELERİ A.Ş. | | |
| GSDHO | GSD HOLDİNG A.Ş. | | | TUCLK | TUĞÇELİK ALÜMİNYUM VE METAL MAMÜLLERİ SANAYİ VE TİCARET A.Ş. | Not | Not |
| GSRAY | GALATASARAY SPORTİF SINAİ VE TİCARİ YATIRIMLAR A.Ş. | Not | Not | TUKAS | TUKAŞ GIDA SANAYİ VE TİCARET A.Ş. | Not | Not |
| GUBRF | GÜBRE FABRİKALARI T.A.Ş. | Not | Not | TUPRS | TÜPRAŞ-TÜRKİYE PETROL RAFİNERİLERİ A.Ş. | | |
| GUSGR | GÜNEŞ SİGORTA A.Ş. | | | TURGG | TÜRKER PROJE GAYRİMENKUL VE YATIRIM GELİŞTİRME A.Ş. | not | Yes |
| HALKB | TÜRKİYE HALK BANKASI A.Ş. | | | ULKER | ÜLKER BİSKÜVİ SANAYİ A.Ş. | | |
| HATEK | HATEKS HATAY TEKSTİL İŞLETMELERİ A.Ş. | | | ULUSE | ULUSOY ELEKTRİK İMALAT TAAHHÜT VE TİCARET A.Ş. | | |
| HDFGS | HEDEF GİRİŞİM SERMAYESİ YATIRIM ORTAKLIĞI A.Ş. | | | ULUUN | ULUSOY UN SANAYİ VE TİCARET A.Ş. | Not | Not |
| HEKTS | HEKTAŞ TİCARET T.A.Ş. | Not | Not | UNYEC | ÜNYE ÇİMENTO SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| HLGYO | HALK GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | | USAK | UŞAK SERAMİK SANAYİ A.Ş. | | |
| HURGZ | HÜRRİYET GAZETECİLİK VE MATBAACILIK A.Ş. | Yes | Yes | UTPYA | UTOPYA TURİZM İNŞAAT İŞLETMECİLİK TİCARET A.Ş. | | |
| ICBCT | ICBC TURKEY BANK A.Ş. | | | VAKBN | TÜRKİYE VAKIFLAR BANKASI T.A.O. | | |
| IDEAS | İDEALİST DANIŞMANLIK A.Ş. | | | VAKFN | VAKIF FİNANSAL KİRALAMA A.Ş. | Yes | Yes |
| IEYHO | IŞIKLAR ENERJİ VE YAPI HOLDİNG A.Ş. | | | VAKKO | VAKKO TEKSTİL VE HAZIR GİYİM SANAYİ İŞLETMELERİ A.Ş. | | |
| IHEVA | İHLAS EV ALETLERİ İMALAT SANAYİ VE TİCARET A.Ş. | not | Yes | VANGD | VANET GIDA SANAYİ İÇ VE DIŞ TİCARET A.Ş. | | |
| IHGZT | İHLAS GAZETECİLİK A.Ş. | | | VERTU | VERUSATURK GİRİŞİM SERMAYESİ YATIRIM ORTAKLIĞI A.Ş. | | |
| IHLAS | İHLAS HOLDİNG A.Ş. | | | VERUS | VERUSA HOLDİNG A.Ş. | Yes | Yes |
| IHLGM | İHLAS GAYRİMENKUL PROJE GELİŞTİRME VE TİCARET A.Ş. | Not | Not | VESBE | VESTEL BEYAZ EŞYA SANAYİ VE TİCARET A.Ş. | Yes | Yes |
| IHYAY | İHLAS YAYIN HOLDİNG A.Ş. | | | VESTL | VESTEL ELEKTRONİK SANAYİ VE TİCARET A.Ş. | | |
| INDES | İNDEKS BİLGİSAYAR SİSTEMLERİ MÜHENDİSLİK SANAYİ VE TİCARET A.Ş. | not | Yes | VKGYO | VAKIF GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | not | Yes |
| INFO | İNFO YATIRIM MENKUL DEĞERLER A.Ş. | | | YATAS | YATAŞ YATAK VE YORGAN SANAYİ VE TİCARET A.Ş. | | |
| INTEM | İNTEMA İNŞAAT VE TESİSAT MALZEMELERİ YATIRIM VE PAZARLAMA A.Ş. | Yes | Yes | YAYLA | YAYLA ENERJİ ÜRETİM TURİZM VE İNŞAAT TİCARET A.Ş. | | |
| IPEKE | İPEK DOĞAL ENERJİ KAYNAKLARI ARAŞTIRMA VE ÜRETİM A.Ş. | Not | Not | YESIL | YEŞİL YATIRIM HOLDİNG A.Ş. | | |
| ISCTR | TÜRKİYE İŞ BANKASI A.Ş. | | | YGGYO | YENİ GİMAT GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| ISDMR | İSKENDERUN DEMİR VE ÇELİK A.Ş. | | | YGYO | YEŞİL GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | | |
| ISFIN | İŞ FİNANSAL KİRALAMA A.Ş. | | | YKBNK | YAPI VE KREDİ BANKASI A.Ş. | | |
| | | | | YKGYO | YAPI KREDİ KORAY GAYRİMENKUL YATIRIM ORTAKLIĞI A.Ş. | Yes | Yes |
| | | | | YUNSA | YÜNSA YÜNLÜ SANAYİ VE TİCARET A.Ş. | Not | Not |
| | | | | YYAPI | YEŞİL YAPI ENDÜSTRİSİ A.Ş. | Yes | Yes |
| | | | | ZOREN | ZORLU ENERJİ ELEKTRİK ÜRETİM A.Ş. | | |