The Impact of Family Ownership on Firm Performance

An Empirical Study based on Indian Publicly Listed Firms

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Master Thesis in Finance

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Abstract

There have been several studies in developed markets which state that the long-term stock performance of family owned firms is far superior to that of non-family owned firms. The reasons often cited for this phenomenon are that family owners have a long-term horizon, a goal of building a legacy company and prudent investments in projects which are not biased by short term incentives. However, India is a very unique market. Family businesses in India are often perceived to have weak corporate governance, lack of competency and a history of corruption. These characteristics and the fact that India is becoming an increasingly important destination for equity investments make it particularly interesting to study how such publicly listed family businesses perform vis-à-vis non-family owned businesses. Moreover, we deepened this study by investigating how family firms with a family member as the CEO performed vis-à-vis family owned firms with externally recruited CEO's. For our study, we have measured firm performance based on stock price performance between 2006-2016 as well as return ratios such as ROE, ROA and ROIC. We used a sample of the 350 largest listed firms on Indian Stock Exchanges (NSE or BSE) and our results indicate that stock returns of family owned firms outperform non-family firms. However, we did not obtain statistically significant results when evaluating the impact of family ownership on the return ratios. For the impact of family members being CEO's, our results indicate that firms with family-member CEO's outperform firms with externally recruited CEO's. In terms of return ratios, the ROA, ROIC and ROE are superior for family-member CEO firms however the ROE relationship is statistically insignificant. Contrary to popular opinion that family businesses in India are inferior to professionally managed firms, the empirical evidence in this thesis shows that owning a portfolio of stocks of family owned businesses can in-fact result in superior performance as compared to a portfolio of stocks in non-family owned businesses.

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1. INTRODUCTION

On March, 2014 an article in The Economist titled "Fighting Corruption in India- A bad boom" made a bold claim stating that out of the 10 largest family owned companies in India, 7 have faced controversies of corruption. In another case, in 2009, Ramalinga Raju, the founder and chairman of Satyam Computers had confessed that the companies' accounts were fraudulent to the tune of 14,000 crores (Approximately $2B). The fraud was executed by making fake invoices and bank statements to show higher revenues. Persistently showing higher revenues drastically pushed up the stock price year after year and attracted naïve investors who eventually lost large sums of money. Moreover, the promoter made several related party transactions to siphon cash from Satyam to other companies owned by the family. This scandal has been one of the largest ones in India and this period is often referred to the turning point of Indian Corporate Governance. Reading such news might make investors fearful about investing in Indian markets which have predominantly family owned companies. However, participation in Indian Equity Markets is rapidly increasing due to its strong growth potential. As such, this thesis would provide empirical evidence on the impacts of family-controlled stocks on an investor's portfolio and hence facilitate a more informed and unbiased decision which is backed by data and not merely media sensationalism.

One of the most important pieces of research on family ownership was conducted by Anderson and Reeb (2003). They tested if there was any impact of family ownership on the company performance. For this study, they used a data sample from S&P 500 through periods 1992-1999. The initial hypothesis for their research was that family ownership had a detrimental effect on firm performance & minority stockholders were negatively impacted by family ownership. However, having concluded their research they got exactly the opposite results than they had expected and showed that family owned stocks performed better than non-family owned stocks. The variables that were measure in this analysis were ROA to capture an accounting measure and Tobins Q to capture a market measure.

Similar studies have been performed on other exchanges in the world and have produced similar results to Anderson and Reeb. However, India is a market where the impact of family ownership on stock performance has not been explored through previous research. India is a particularly interesting market to investigate as the direction of impact if any is not obvious. In the Indian

context there are several issues such as lack of competency and corruption which results in family-businesses depleting shareholder value. To cite a classic example of corruption, the Indian real estate market has a notorious reputation of transacting using illegal cash. Sale of properties in cash do not yield any benefit to the shareholders of the company as the promoters merely siphon the cash into their own pockets.

The goal of our paper was to identify whether publicly listed family run companies performed better than non-family companies in India. Our motivation to research this topic stems from the fact that emerging markets such as India are becoming an increasingly important part of the global economy. As such, this thesis would provide empirical evidence on the impacts of family-controlled stocks on an investor's portfolio and hence facilitate a more informed decision. Our measures of performance are broken down into 2 parts: Long term stock price performance as measured by a 10-year excess holding period return (including dividends) and operating performance as measured by a 3-year average Return on Assets (ROA), Return on Equity (ROE) and Return on Invested Capital (ROIC). We then dig deeper into this theme and test if family companies where the CEO/Executive Chairman also belongs to the family outperforms family companies where the CEO/Executive chairman is recruited externally. The total number of companies listed in India are around 5000. However, a majority of them have a very small market cap with virtually no traded volume. To test the above hypothesis, we have used a sample of the largest 350 companies listed on the Indian Stock Exchanges. These companies represent more than 80% of the total market capitalization of the Indian stock market. Moreover, the number of family owned companies in our sample is 174 and non-family owned companies is 176.

In contrast to the pre-determined view that family-owned stocks underperform non-family owned stocks, our results showed that the stock-returns of family owned firm's outperformed non-family owned firms by 13.9% per annum at a 1% significance level. However, while measuring operational performance through return ratios, we did not find any statistically significant relationship between operating performance and firm ownership. In the second part of our analysis where we evaluated the impact of the CEO/Executive chairman being a family member, we learned that Family firms outperformed by 10.2% (at a 1% significance level) when a family member was also the CEO vis-à-vis when an external CEO was recruited. Moreover, in terms of the operational performance family CEO companies had a better ROA by 2% & better ROIC of 3% (at a 5%

significance level) compared to companies with an external CEO, however, we had no statistically significant result for ROE.

2. BACKGROUND

Though the Indian stock market is broadly classified as an emerging market, there are certain nuances that are unique to India. All through history until now, Indian investors have been shying away from the Indian stock markets. To empirically justify this, less than 3.5% of Indians invest in stock market, compared to 10% in China and 26% in the U.S[1]. Moreover, only 2% of India's household savings are exposed to equity; in the U.S., the long-term average is 45%.

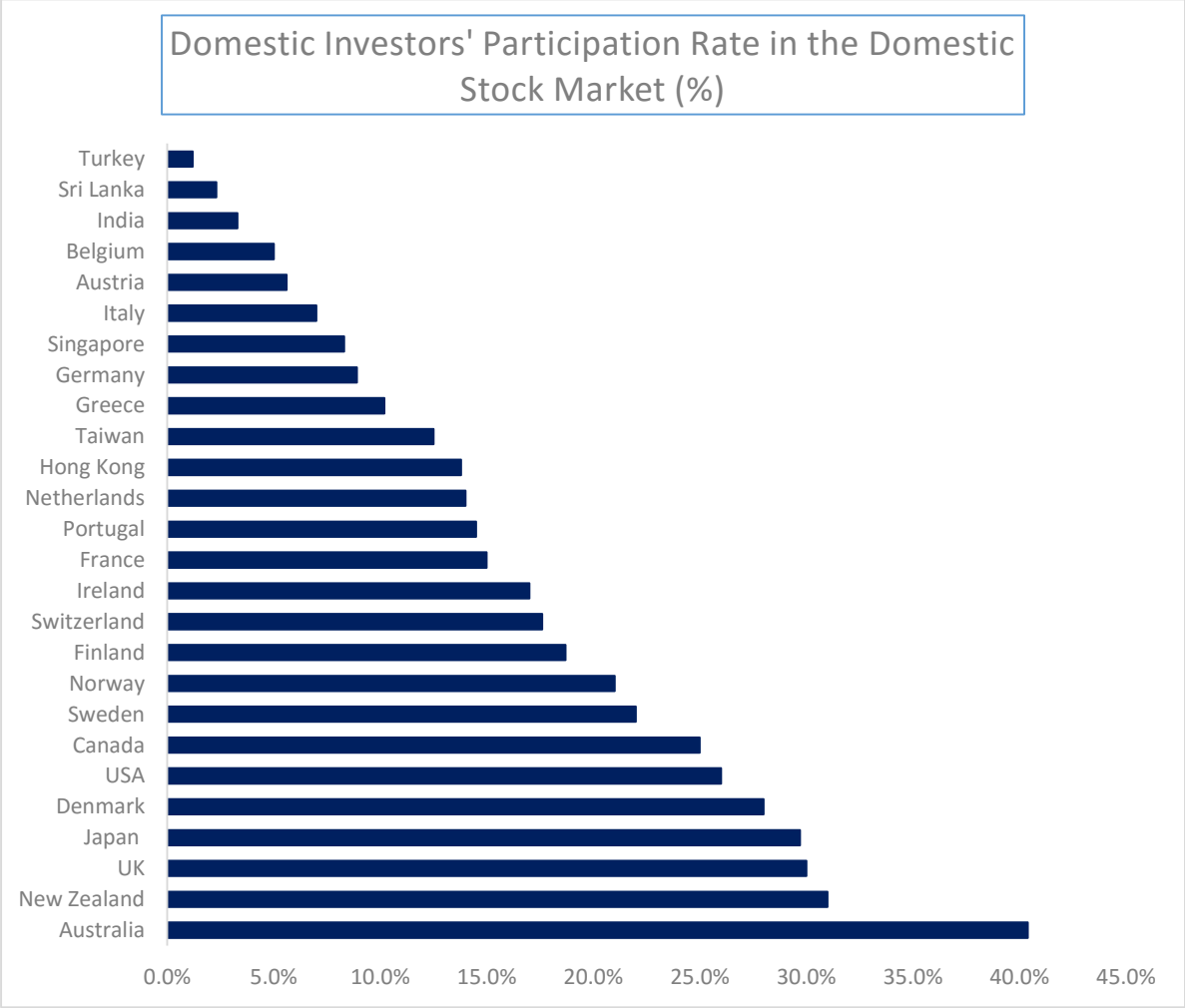

Figure 1: Domestic Investors' participation in the domestic stock market[2]

[1] http://www.bloombergview.com/articles/2015-04-09/india-stock-rally-needs-more-domestic-retail-investors
[2] http://www2.hhs.se/personal/giannetti/jfqa_homebias.pdf

This reluctance to invest in the stock market is essentially bad for the economy as savings into equities are important for corporates to raise capital. Instead, investors are saving into unproductive assets such as gold and often even real estate which may not even generate rental income. At this point, 70% of the market is dominated by the foreign institutional investors. This reluctance however, is not fully justified. In spite of the usual swings in the stock market, the Sensex gave a return of 17% CAGR between 2004 and 2014. That's double as much as what an Indian would make on a fixed deposit, the most popular saving mode for Indians. While there are several reasons or perceived reasons why investors are afraid to invest in Indian markets, one reason that is related to this topic is to do with company disclosures and integrity in family businesses. Family businesses must adopt an element of professionalism and investor relations practices to attract capital. Stock price manipulation is another deterring factor for retail investors. Often, family held businesses have a very small proportion of their stock offered the public and this lower float makes the stock very vulnerable to manipulation. The last decade has had several stocks being suspended from trading due to this. Even though the regulators require at least quarter of the shares to be held publicly, many listed companies do not comply with that.

Much like most places around the world, a majority of businesses in India are family businesses. Economic liberalization and the recent growth of the industrial base have facilitated new growth prospects for many, but they have simultaneously also put to test businesses' resource capabilities to adapt to them—and how businesses do so varies. While some decide to pursue the trajectory of preserving their wealth, others venture for more entrepreneurial pursuits seeking to capitalize on opportunities, irrespective of their resource capabilities and with different degrees of success. A key resource in this context is the family and a vital priority for many of these businesses is consequently the welfare—financially and otherwise—of their families. This in turn compels companies to address a dilemma, which has become particularly salient over the last decade with the development of economic liberalization: the choice between the inherent risks and returns of growing their business on one hand, and safeguarding the wealth of their families on the other. This issue is inherently connected to the missions of the businesses and the associated families.

3. LITERATURE REVIEW

The analysis of ownership on company and stock performance has often been contradictory in nature. On one hand, there are papers that claim that family owned companies deplete shareholder value for minority holders as the owners may have different incentives compared to minority shareholders. (Fama & Jensen 1985) reflects this conflict using an example of a dividend pay-out. Family promoters of a listed company may recommend a dividend pay-out to cater to their consumption needs even though it might not be an optimal decision for the firm's operational position and thereby impact minority shareholders negatively. Other ways that controlling owners exploit minority shareholders is through related party transactions & unrealistically high compensation (DeAngelo & DeAngelo, 2000). A classic example of fraudulent related party transactions in India is the Satyam Scam. The promoting family of Satyam, siphoned cash from the parent company into another private company which was also owned by the family. Another study (Faccio, Lang, & Young, 2001) claims that dividends provides evidence of wealth appropriation of minority shareholders by the controlling shareholders." According to Faccio, M., Lang, L.P.H., & L.Young (2001), European companies pay higher dividends than Asian companies resulting in a lower expropriation by insiders. Some theories also attribute poor performance of family run companies Vis-a-Vis non-family companies to the fact that the management positions are taken by family members who may lack core competency and skills that are required to lead an organization. A Spanish study (Gómez-Mejía, Nuñez-Nickel, & Gutiérrez, 2001) that reflects this idea evaluates agency contracts between a principal and an agent when there are family ties between them. One of the results from the study states that the organizational impact of replacing a CEO is more positive when the CEO that has been dismissed was a family member. Based on a similar hypothesis, Villalonga and Amit (2004) found that family ownership creates value only when the founder serves as the CEO or chairman of the company. Once the heir takes over the company, value is depleted. Finally, Morck, Strangeland, & Yeung (2000) capture all these issues and state that corporate control by heirs results in weak growth because of inefficiency due to entrenched corporate control, capital market power, high barriers against outside investment, and possibly low investments in innovation.

While the above researchers have highlighted the weaknesses arising from family ownership, many researchers have shown that that family owned companies can in fact out-perform non-

family owned companies. The most prominent argument to defend this hypothesis is that family owned companies have strong incentives to monitor their managers closely. In the event where the founding family is also the CEO/chairman, principal-agent conflicts are entirely eradicated. These arguments are presented by Demsetz & Lehn (1985). Another argument in favour of family firms was provided by Stein (1988, 1989). He demonstrates that family ownership tends to have a longer time horizon, as families usually have longer investment perspectives than other shareholders. Firms with longer horizons are not incentivized by short term earnings and are willing to let go of short term gains for a significantly more profitable future. In relation to this idea, James (1999) claims that family firms are concerned with building legacies and are driven by the desire to build institutions that last several generations. This ethos plays a role in the decision making process at the firm level and thereby contributes to its performance. Another interesting reason why family firms outperform non-family firms is presented by Anderson, Mansi & Reeb, 2003. They state that the reputation and the presence of a family for the long-term rather than non-family firms where management shuffling is commonplace results in the family firm having a lower cost of debt financing which essentially increases firm value. Anderson and Reeb, 2003 are the most widely cited defendants of family ownership. A wider analysis by Thomson Financial captured data from the 6 main stock indices in Europe, from London´s FTSE to Madrid´s IBEX and showed that family companies outperformed non-family firms. McConaughy, Walker, Henderson, & Chandra (1998), and McConaughy, Matthews & Fialko (2001), found that family controlled firms were more efficient and valuable than non-family firms. These authors only included family controlled firms who's CEOs were either the founder or a descendant of the founder, and contrary to Villalonga & Amit (2004), they discovered that descendant-controlled firms were more efficient than founder-controlled firms.

Interestingly, the choice of using both private and public companies in the data set or just public companies plays an important role in the outcome of the research. The following examples show that using public companies in the data set tends to bias towards a favourable result for family owned companies. While Gallo & Estapé (1992) found that family firms had a higher ROE than non-family ones among the top 1,000 Spanish companies, the same author (Gallo, Tapies & Cappuyns, 2004) discovered the opposite in another study with a sample of 305 Spanish companies, a great majority of them private firms. However, again, the difference in performance was not significant.

These contradictions in outcomes clearly indicate that there is no rule of thumb to identify the impact of ownership on firm performance. Firstly, the definition of "family owned" is different for different researchers. Secondly, each country has different minority shareholder protection laws which would have a significant impact on the results. Thirdly, the variables used to measure performance are slightly different across researchers.

Theories

At the crux of it, the theories that we deal with through this topic are that of corporate governance. More specifically, we are dealing with the issue of ownership through the research question "Do family firms perform better than non-family firms" and the issue of management through the research question "Do family firms with family member CEO's perform better than family firms with external CEO's?"

One of the most profound theories related to corporate governance is the agency theory. The most renowned researchers of this theory are Berly and Means (1932) and Thomsen (2008). What this theory says is that owners or principals recruit managers or agents to run their companies for them in return of a remuneration. The conflict between the principal and the agent is that each might act in their own interests and these interests may not be aligned with each other. This conflict thus gives rise to the importance of corporate governance. A legal requirement on the agent could make sure that the agent acts in the best interest of the principal and takes charge for his actions. The extreme case where there is absolutely no conflict of interest is when the owner or a significantly large shareholder also manages the company. This eradicates the need to monitor and the sheer extent of ownership makes the owner to act in the best interest of the company. However in the real world, there are obviously cases where owners have to recruit principals and provide incentives such as variable salary in addition to a base salary or stock options to ensure that the agent acts in the best interest of the principal.

Agency theory, one of the cornerstone approaches to corporate governance, thus seeks solutions to resolve the agency problem in scenarios where both the manager and the owner are rational and pursue their self-interest. While some may posit that people may not always act rationally or make decisions in their best interest and that decision-making is a culmination of various psychological factors, this paper assesses only rational decision makers within its scope.

The application of the agency theory in a real world setting is far more complex. Firstly, there are several stakeholders involved, not just a principal and an agent. In a company setting, the board of directors act as a channel between the owners and the actual managers of the company. It is however, difficult to classify the shareholder group as a "principal" because owners vary. They could be retail investors, founding family members, mutual funds etc. depending on their stake, investment horizon & involvement with the company. While some may have a more active level of involvement in the company's management, others might be want to 'free ride'.

The owner-management agency problem starts with the extrication of ownership from management. Owners who manage their company are naturally prone to be more diligent and hardworking and less likely to use the firm's resources for their personal gain, given that the company's performance is a determinant of their personal wealth consumption. Should they however find themselves utilizing the firm's resources for their private benefit, it would be because the costs of consuming the resources at work would be lower than doing so at home due to better tax advantages, for example. Professional managers, on the other hand, are more susceptible to draw personal benefits from company resources since they derive additional value beyond their determined salaries by doing so. In contrast to owners who are also managers, professional managers do not have the personal connection with the company's wealth and thus do not find it problematic to consume its resources. That being said however, they will put in the requisite amount of effort to ensure job security.

Corporate ownership

Ownership refers to a collection of rights relating to assets including user rights, profit rights, control rights, and transfer rights. Ownership is associated with the concomitantly inherent responsibility it brings with itself. It is possible to combine and de-combine these rights in numerous ways to create value. (Thomsen, 2008)

Ownership of the firm

Building upon the idea of corporate ownership, even though shareholders of a public company cannot consume the firm's assets, they do however retain the rights to claim profits (through dividends, for instance); the rights to transfer (by buying and selling their shares, for example);

and the rights to control (for example, by deciding who will manage their companies). They are however neither obligated to manage the firm on a consistent basis nor be held responsible for repayment of debt should the firm go bankrupt. Jensen and Meckling (1976) contend that precisely this attribute of limited liability provides for dispersed ownership. The limited liability is arguably one of the founding stones of capitalism. The permutations of the rights to which an owner has access might depend on the type of company. Firms can issue varying classes of shares, with voting and non-voting rights. In cooperatives, it is possible to have both control and profits rights, but not necessarily transfer rights.

Ownership structure

For widely held firms, ownership structure has two key aspects—who the owners are and how much they own. The ownership stakes, in turn, determine the extent of control an owner has over the managers and the identity of the owners is crucial to determining the capital structure, strategy and growth rates based on their goals and how they wield their influence.

Agency theory contends that the ownership stake of an individual shareholder is the trade-off between risk and incentive efficiency. Since large owners have a greater amount of wealth invested in a company, and consequently greater exposure to risk, their motivation to observe the manager's behavior is greater than that of smaller shareholders (Schleifer and Vishny, 1997). Companies in less regulated industries usually have less concentrated ownership structures a result of lower uncertainty and on the opposite end of the spectrum, uncertain environments result in concentrated ownership mechanisms. As such, one can surmise that the largest stake of ownership varies by firm given this firm specific risk.

According to Fama and Jensen (1983) and Shleifer and Vishny (1997), the relationship between ownership concentration and firm performance is not necessarily uniform, but more bell shaped instead. They propose that after a certain threshold, the large owner assumes too much power and starts to pursue personal benefits. Up until this threshold is reached however, large shareholders are effective in monitoring the management and maximizing the firm's value. Furthermore, in a situation where full control is reached, the curve might increase again since the owner would shoulder the responsibility of the consequences of an aberration from the company's goal to maximize its value.

4. DATA

Data Collection Process:

We have used S&P Capital IQ screening function to find relevant data for each listed company. The total number of companies listed in India are around 5000, however, a majority of them have a very small market cap with virtually no traded volume and would hence not be representative. Hence we will examine the largest 350 companies listed on Indian Stock exchanges since the largest 350 companies represent more than 80% of the total market capitalization of the Indian stock market. To provide perspective, the next 350 companies would only cover an additional 7% market cap. Moreover, companies after the 350th were fairly illiquid and hence could skew the observed prices. The classification of each listed company as family owned or non-family in India is somewhat tricky and requires a certain extent of judgement and knowledge of the specific companies. % of stake owned alone does not indicate family ownership. To understand family ownership, let's first understand the definition of a "promoter".

Definition of Promoter[3]:

As per the Companies Act 2013, Promoter is a person or a group of people:

- who is named in the public offering prospectus or is identified by the firm in its annual report referred to in section 92; or
- who has control over the affairs of the company, directly or indirectly whether as a shareholder, director or otherwise; or
- in accordance with whose advice, directions or instructions the Board of Directors of the company is accustomed to act.

SEBI Issue of Capital and Disclosure (ICDR) Regulations has a far more elaborate definition applicable to publicly listed companies. In the ICDR 'promoter' is defined as:[4]

- the person or persons who are in control of the issuer;
- the person or persons who are instrumental in the formulation of a plan or programme pursuant to which specified securities are offered to public;

[3] http://www.icsi.edu/portals/0/INCORPORATION%20OF%20COMPANIES.pdf
[4] http://iepf.gov.in/IEPF/Other_Aspects.html

- the person or persons named in the offer document as promoters:

Provided that a director or officer of the issuer or a person, if acting as such merely in his professional capacity, shall not be deemed as a promoter:

'Promoter group' includes:

- the promoter;
- an immediate relative of the promoter (i.e., any spouse of that person, or any parent, brother, sister or child of the person or of the spouse);
- in case promoter is a body corporate:
- a subsidiary or holding company of such body corporate;
- any body corporate in which the promoter holds 10% or more of the equity share capital or which holds 10% or more of the equity share capital of the promoter;
- anybody corporate in which a group of individuals or companies or combinations thereof which hold 20% or more of the equity share capital in that body corporate also holds 20% or more of the equity share capital of the issuer;

A financial institution, scheduled bank, foreign institutional investor and mutual fund shall not be deemed to be a promoter merely by virtue of the fact that 10 % or more of the equity share capital of the issuer is held by such person.

Differentiation between family and non-family

This step had to be done manually for the 350 companies in the data set. The website used to collect this information was www.moneycontrol.com. Through this website, the members of the "promoter group" were analysed and if all the members had the same last name, it was obvious that it is a family owned company. Often, the "promoter group" contains private companies in the list. In such a case, we use www.zaubacorp.com to ascertain who the main owners of the private company are. In almost all cases, the private company on the "promoter group" list was owned by the promoter family itself. Most of the non-family owned companies were foreign companies listed in India, public sector units, or joint ventures with foreign companies. If the promoter group contains only 2 families, we have also considered those as family owned as similar characteristics are expected when 2 families run a company. However, any families in the promoter list greater

than 2 were considered non-family. It is important to note that % owned is not as important as who the promoters are as a company can be controlled by owning less than 50% stake.

For the second part of the thesis, where we had to identify whether the CEO of the company is a family member, we have used www.moneycontrol.com again. Here, we only used family businesses in the dataset which he populated for the first part of the thesis. We populated the list of the members in the promoter group and checked if the CEO or executive chairman belonged to the promoter group. When a CEO or Executive chairman belonged to the promoter group, it is safe to say that the CEO is a family member since we had already established the firm to be family-firm in the first step of the research.

5. METHODOLOGY

All regressions were performed with the Ordinary Least Squares method, taking inspiration from the seminal paper by Fama & French (1993).

Research Question 1: Do family-owned firms have significantly different excess return from non-family firms in the Indian equities Market?

The methodologies for analyzing the three research questions vary slightly. For the first research question, we created a Fama-French 3-Factor Model (Fama & French, 1993). The details of the construction are mentioned below. After creating a Fama-French 3-Factor Model (FF3F model), we tested if the model adequately explained the variation of excess stock returns in the 6 portfolios that were created. Taking inspiration from the seminal paper by Fama & French (1993), we created the factors and regressed them on excess portfolio returns as per the regression specification below.

$$\boldsymbol{Rp - Rf = \alpha + \beta_1(Rm\text{-}Rf) + \beta_2 SMB + \beta_3 HML} \qquad \text{(Regression 1)}$$

where R_p represents the monthly return of the portfolio of firms, R_f the average annualized Risk-free rate of the 3-month Indian government bond, α the constant, $\beta_1 \ldots \beta_3$ are the Fama-French coefficients of the Excess Market Return, Small-Minus-Big and High-Minus-Low Factors, also known as the Fama-French industry factors.

Next, a zero-cost equal-weighted portfolio that consisted on going long on the non-family-firm portfolio and short on the family-firm portfolio was created and the FF3F model was used to explain the variations in the portfolio. We then regressed this zero-cost portfolio on the 3 identified factors as per the below regression specification – which is identical to Regression 1.

$$\boldsymbol{Rp - Rf = \alpha + \beta_1(Rm\text{-}Rf) + \beta_2 SMB + \beta_3 HML} \qquad \text{(Regression 2)}$$

If a significant alpha was detected, this meant that there was some factors other than the 3 Fama-French factors that significantly affected the returns of the zero-cost portfolio.

Inspired by the methodology of Villalonga and Amit (2006), we decided to use a fixed effects model that consisted of both time fixed effects and sector fixed effects. As the portfolio was rebalanced on a yearly basis, we decided to use yearly dummy variables that corresponded to the past 10 years. Another reason we felt the need to control for sector was because we noted that the percentage of family firms in different sectors in our sample varied from 0% to 80%. It could be

that the result obtained in Regression 2 was due to the over-weighting of the portfolio in a particular sector that had abnormal growth over the sample time period. In this way, we attempted to control for a potential omitted variable bias by taking a confounding factor into account when coming up with the regression specification. Thus, we were curious about the impact of sector controls on our results. Therefore, we created sector dummy variables that corresponded to the relevant SIC codes. These sectors were based on SIC Industry codes listed below:

SIC Codes	Industry	All	Family Firms	Non-Family firms	Family Firms in Industry (%)
01-09	Agriculture, Forestry, Fishing	3	2	1	67%
10-14	Mining	7	0	7	0%
15-17	Construction	8	5	3	63%
20-39	Manufacturing	179	106	73	59%
40-49	Transportation and Public Utilities	44	20	24	45%
50-51	Wholesale Trade	5	1	4	20%
52-59	Retail Trade	5	4	1	80%
60-67	Finance, Insurance & Real Estate	70	22	48	31%
70-89	Services	30	15	15	50%
	Total	350	175	176	50%

We also included an explanatory binary variable of whether the firm was family-owned or not. As the dependent variable, we used the excess stock returns of the firms on a monthly basis and compounded it to give an annualized return. We thus had 10 observations for each company - one for each year. A panel data regression was performed with a binary explanatory variable of family ownership (1 = non-family, and 0 = family) and 8 dummy variables for the sectors and 9 dummy variables for the time dummy variables as per the following regression equation. Services sector and the most recent year were used as the reference dummy variables. The specification for the fixed effects model is stated below.

$$\boldsymbol{R^* - R_f = \alpha + \sum_{n=1}^{7} \beta_n S' + \sum_{n=8}^{16} \beta_n T' + \beta_{17} F} \qquad \text{(Regression 3)}$$

where R^* represents the annualized excess return of the firm over the past 10 years, R_f is the average annualized Risk-free rate of the 3-month Indian government bond, α the constant, $\beta_1 \ldots \beta_7$ are the coefficients of the sector dummy variables , S' is the vector of the sector control variables, $\beta_8 \ldots \beta_{16}$ are the coefficients of the time dummy variables and β_{17} is the coefficient of the binary explanatory variable, T' is the vector of the time dummy variables and F is the binary explanatory variable of family ownership (1 = non-family, and 0 = family).

Construction of Fama-French Portfolios

During our data collection process, we realized that we did not have a complete (10-Years) data set of return series for all 350 firms in our sample. Therefore, we decided to construct Fama-French portfolios based on a subsample of the 210 firms that we had reliable data for the entire 10 year period that we were analysing. We created 6 different equal-weighted portfolios according to the following methods:

Portfolio 1: Small Value

Portfolio 2: Small Neutral

Portfolio 3: Small Growth

Portfolio 4: Big Value

Portfolio 5: Big Neutral

Portfolio 6: Big Growth

Stocks were categorized Small and Big according to the median Market Capitalization. If a stock's Market Cap was less than the median, it was categorized as Small and conversely if it was larger than the median, it was categorized as Big.

Stocks were also categorized as Value, Neutral and Growth according to their Book Value of Equity to Market Value of Equity ratio. All the companies were ranked according to their BV-E / MV-E Ratio. If a company was in the 70th – 100th percentile, it was categorized as Value stock. If it was below 30th percentile, it was categorized as Growth stock. If it was between 31st to 69th percentiles, it was categorized as Neutral stock.

These portfolios are constructed, rebalanced on yearly basis every April for 10 years and the returns are calculated as per the categorization rules mentioned above.

After collecting previous 10-year data on the monthly returns of the selected stocks, we then proceeded to calculate the monthly portfolio returns on an equal-weighted basis.

We then created the Small-Minus-Big (SMB), High-Minus-Low (HML) and Excess Market Return (Rm-Rf) Factors according to the following equations:

SMB = (SmallVal+SmallNeut+SmallGrow)/3 – (BigVal+BigNeut+BigGrow)/3

HML = (SmallVal+BigVal)/2 – (SmallGrow+BigGrow)/2

Rm-Rf = Monthly return of the BSE (Bombay Stock Exchange) Sensex – the monthly risk-rate calculated from the government bond yield traded on the National Stock Exchange of India.

(The relevant government bond yield that we decided to use was the shortest period available – the 3 month yield. We decided to use it as a proxy for the risk-free rate in this case)

We then created 3 more equal-weighted portfolios as defined below:

Portfolio 7: Non-Family Firms

Portfolio 8: Family Firms

Portfolio 9: Non-family firms – Family Firms

Portfolio 9 is a zero-cost equal-weighted portfolio that we wish to test where we went long on non-family firms and short on family firms.

Research Question 2: Do family-owned firms have better profitability ratios (ROA, ROE, ROIC) than non-family-owned firms?

We see that family ownership has a positive effect on firm return even after controlling for sector fixed effects. To build on that point, we hypothesize that family firms would have better profitability ratios than non-family firms as well. We do a similar model as per the sector fixed effects shown above and perform regressions according to the following equations[5].

ROE Regression:

$$ROE = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 F + \beta_{10} L \qquad \text{(Regression 4)}$$

where ROE represents the average ROE of the firm over the past 3 years, α the constant, $\beta_1 \ldots \beta_8$ are the coefficients of the control variables such as sectors, S′ is the vector of the sector control

[5] For ROA and ROIC, all financial firms were removed from the sample as these ratios are either unreported or do not provide useful information about the company.
For ROE, we added a leverage ratio explanatory factor as we felt that it could be an important variable to take into account.

variables, β_9 is the coefficient of the binary explanatory variable, F is the binary explanatory variable of family ownership (1 = non-family, and 0 = family), β_{10} is the coefficient of the Leverage Ratio explanatory variable and L represents the Leverage Ratio explanatory variable.

ROA Regression

$$\boldsymbol{ROA = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 T} \qquad \text{(Regression 5)}$$

where ROA represents the average ROA of the firm over the past 3 years, α the constant, β_1 ..... β_8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β_9 is the coefficient of the binary explanatory variable and T is the binary explanatory variable of family ownership (1 = non-family, and 0 = family).

ROIC Regression

$$\boldsymbol{ROIC = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 T} \qquad \text{(Regression 6)}$$

where ROIC represents the average ROIC of the firm over the past 3 years, α the constant, β_1 ..... β_8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β_9 is the coefficient of the binary explanatory variable and T is the binary explanatory variable of family ownership (1 = non-family, and 0 = family).

Research Question 3: Do family firms with a family member as the CEO perform better than family firms with external CEOs?

Our third research question that we wish to investigate is to determine if family firms with a family member as the CEO perform better in terms of excess stock market return and profitability ratios as compared to family firms with external CEOs.

Our methodology for this research question was similar to the ones used in research questions 1 and 2 with the change of the binary explanatory variable. We ran regressions on excess annualized returns and profitability ratios against the binary explanatory variable of family CEO (Yes = 1) while controlling for confounding factors such as sectors and time with a fixed effects model as per the regression specification below.

$$R^* - R_f = \alpha + \sum_{n=1}^{5} \beta_n S' + \sum_{n=6}^{14} \beta_n T' + \beta_{15} C \qquad \text{(Regression 7)}$$

where R^* represents the annualized excess return of the firm over the past 10 years on a per-year basis, R_f is the average annualized Risk-free rate of the 3-month Indian government bond, α the constant, $\beta_1 \ldots \beta_5$ are the coefficients of the sector dummy variables, S′ is the vector of the sector control variables, $\beta_6 \ldots \beta_{14}$ are the coefficients of the time dummy variables and β_{15} is the coefficient of the binary explanatory variable, T′ is the vector of the time dummy variables and C is the binary explanatory variable of family CEO (1 = Family CEO, and 0 = non-family CEO). Agriculture, Fishing, Forestry, Wholesale Trade and Mining sectors were removed from the sector variables as we did not have any family owned companies present in the sample.

In addition to regression above, we regressed the profitability ratios on the binary explanatory variable of Family CEO (Yes = 1) while controlling for confounding factors such as sectors and time by creating a fixed effects model as per the equations below.

$$ROE = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 C + \beta_{10} L \qquad \text{(Regression 8)}$$

$$ROA = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 C \qquad \text{(Regression 9)}$$

$$ROIC = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 C \qquad \text{(Regression 10)}$$

where ROE, ROA, ROIC represents the average ROE, ROA and ROIC respectively of the firm over the past 3 years, α the constant, $\beta_1 \ldots \beta_8$ are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β_9 is the coefficient of the binary explanatory variable, C is the binary explanatory variable of family CEO (Yes = 1), β_{10} is the coefficient of the Leverage Ratio explanatory variable and L represents the Leverage Ratio explanatory variable.

6. RESULTS

Table 1: Summary of regression coefficients for Regression Specification 1 and 2

$$Rp - Rf = \alpha + \beta_1(Rm-Rf) + \beta_2 SMB + \beta_3 HML \quad \text{(Regression 1 and 2)}$$

where R_p represents the monthly return of the portfolio of firms, R_f the average annualized Risk-free rate of the 3-month Indian government bond, α the constant, $\beta_1 \ldots \beta_3$ are the Fama-French coefficients of the Excess Market Return, Small-Minus-Big and High-Minus-Low Factors, also known as the Fama-French industry factors. 9 different portfolios were created and regressed according to the above specification in order to test the Fama-French model. Portfolios 1 to 6 were the Fama-french portfolios created based on a combination of Growth, Value, Neutral and Big/Small classification as detailed in the Portfolio construction section in Methodology. Portfolio 7 was the equal weighted portfolio containing all Non-family firms. Portfolio 8 was the equal weighted portfolio containing all Family firms. Portfolio 9 was the zero-cost equal weighted portfolio that was Long on Non-family firm portfolio and short on Family firm portfolios. T-stat values for the results are given in brackets. The sample comprises of 210 firms with monthly data over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression 1 Coefficients								Regression 2
	Portfolios								Portfolios
	1	2	3	4	5	6	7	8	9
Intercept	0.02***	0.02***	0.03***	0.03***	0.02***	0.02***	0.02***	0.02***	-0.006***
	(3.54)	(3.76)	(4.58)	(4.98)	(3.09)	(3.90)	(4.06)	(3.89)	(-2.69)
SMB	1.18***	1.21***	1.26***	0.27*	0.18	0.20	0.58***	0.86***	-0.29***
	(7.95)	(9.11)	(7.80)	(1.78)	(1.23)	(1.39)	(4.10)	(6.00)	(-5.13)
HML	0.96***	0.37***	0.06	1.10***	0.29***	0.00	0.53***	0.34***	0.19***
	(8.90)	(3.87)	(0.51)	(9.91)	(2.71)	(0.03)	(5.25)	(3.30)	(4.54)
Rm-Rf	0.98***	0.96***	1.00***	0.94***	1.09***	0.92***	0.94***	1.03***	-0.08***
	(13.46)	(14.82)	(12.62)	(12.47)	(15.25)	(13.30)	(13.71)	(14.59)	(-3.04)
Adjusted R-Squared	0.83	0.80	0.71	0.80	0.75	0.65	0.76	0.77	0.27

Regression 1: We observed Adjusted R-squared from 0.65 to 0.83 for all 8 portfolios. We also note that for most of the portfolios, the 3 factors were economically and statistically significant. This suggests that the Fama-French model and the factors identified explain the variations in the excess stock market return to a large extent.

Regression 2: As we can see above, we observe a monthly alpha of -0.6% per month, and an annualized alpha of -6.81% for the portfolio. This suggests that the strategy of investing in the portfolio of family firms creates an annualized alpha of 6.81% as compared to non-family firms.

We also note that the 3 factors are significant. However, the large negative alpha and the Adjusted r-squared of 0.27 leads us to believe that there might be other fixed effects affecting the return profile.

Table 2: Summary of regression coefficients for Regression Specification 3

$$R^{*} - R_f = \alpha + \sum_{n=1}^{7} \beta_n S' + \sum_{n=8}^{16} \beta_n T' + \beta_{17} F \qquad \text{(Regression 3)}$$

where R* represents the annualized excess return of the firm over the past 10 years, Rf is the average annualized Risk-free rate of the 3-month Indian government bond, α the constant, β1 ….. β7 are the coefficients of the sector dummy variables, S′ is the vector of the sector control variables, β8 ….. β16 are the coefficients of the time dummy variables and β17 is the coefficient of the binary explanatory variable, T′ is the vector of the time dummy variables and F is the binary explanatory variable of family ownership (1 = non-family, and 0 = family). T-stat values for the results are given in brackets. The sample comprises of 210 firms with monthly data over 10 years from 2006-2016. Monthly returns were compounded to yearly returns in order to create 10 observations for each firm. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression 3
(Intercept)	0.071
	(1.073)
Family (0) vs Non-Family (1)	-0.139***
	(-4.603)
Year (t - 9)	0.077
	(1.196)
Year (t - 8)	0.317***
	(4.904)
Year (t - 7)	-0.500***
	(-7.736)
Year (t - 6)	2.190***
	(33.865)
Year (t - 5)	0.211***
	(3.267)
Year (t - 4)	-0.116*
	(-1.799)
Year (t - 3)	0.039
	(0.595)
Year (t - 2)	0.153**
	(2.360)
Year (t - 1)	0.658***
	(10.178)
Mining	-0.243
	(-1.585)
Construction	-0.198
	(-1.557)
Manufacturing	-0.060
	(-1.194)
Transportation and Public Utilities	-0.192***
	(-2.744)
Wholesale Trade	0.132
	(0.861)
Retail Trade	-0.174
	(-0.823)
Finance, Insurance & Real Estate	-0.131**
	(-2.216)
Adjusted R-Squared	0.534

The baseline for firms was taken as services and as such was omitted from the regression. Baseline for time was taken as the most recent year. We can see that the beta for family ownership is significantly different from zero. Furthermore, a beta of –0.139 means that on an annual basis, controlling for sector and time fixed effects, we expect non-family firms to have an excess return of -13.9% as compared to family firms.

After controlling for sectors and time fixed effects, we note that family firms provide an excess annual return of 13.9 % as compared to non-family firms with our model having an adjusted r-squared value of 0.534. This is also broadly in line with results observed in the FF3F model in Regression 2 where we see the zero-cost equal-weighted portfolio 9 also gives similar results of an annualized excess return of 6.81% for family firms over non-family firms in our sample.

Table 3: Summary of regression coefficients for Regression Specification 4

$$ROE = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 F + \beta_{10} L \qquad \text{(Regression 4)}$$

where ROE represents the average ROE of the firm over the past 3 years, α the constant, β1 ….. β8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β9 is the coefficient of the binary explanatory variable, F is the binary explanatory variable of family ownership (1 = non-family, and 0 = family), β10 is the coefficient of the Leverage Ratio explanatory variable and L represents the Leverage Ratio explanatory variable. T-stat values for the results are given in brackets. The sample comprises of 350 firms over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively.

	Regression		
	4 (ROE)	5 (ROA)	6 (ROIC)
Intercept	22.07***	11.49***	14.67***
	(6.70)	(11.08)	(7.11)
Total Debt/Equity %	-0.02***	-	-
	(-4.44)	-	-
Binary Family vs Non-Family	-2.63	-1.15*	1.05
	(-1.36)	(-1.91)	(0.81)
Agriculture, Forestry,Fishing	7.19	-0.90	2.86
	(0.69)	(-0.27)	(0.44)
Mining	1.01	-0.66	-2.81
	(0.14)	(-0.29)	(-0.62)
Construction	-7.80	-7.02***	-7.21
	(-1.13)	(-3.25)	(-1.69)
Manufacturing	-1.87	-2.93**	-2.27
	(-0.55)	(-2.73)	(-1.07)
Transportation and Public Utilities	-11.51**	-6.38***	-10.14***
	(-2.74)	(-4.96)	(-3.99)
Wholesale Trade	-6.99	-5.57**	-8.18
	(-0.84)	(-2.12)	(-1.57)
Retail Trade	-14.41*	-6.81**	-8.33
	(-1.73)	(-2.59)	(-1.60)
Finance, Insurance & Real Estate	-3.62	-8.49***	-7.82**
	(-0.93)	(-7.13)	(-2.24)
Adjusted R-Squared	0.1	0.2	0.06

We performed a regression with Services sector taken as the baseline dummy variable. We see some significant results here for the leverage ratio confirming that it plays an important part in determining ROE but we also note that the beta might not be economically significant as it is quite

small (-0.02%). We see that the relationship between leverage ratio and ROE is negative. This suggests that for a 1% increase in leverage, the ROE of the firm decreases by 0.02%.

However, our binary variable for family ownership is not significantly different from zero. We are unable to conclude if family ownership status confers higher ROE for the firm.

Table 4: Summary of regression coefficients for Regression Specification 5

$$ROA = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 T \qquad \text{(Regression 5)}$$

where ROA represents the average ROA of the firm over the past 3 years, α the constant, β1 ….. β8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β9 is the coefficient of the binary explanatory variable and T is the binary explanatory variable of family ownership (1 = non-family, and 0 = family). T-stat values for the results are given in brackets. The sample comprises of 350 firms over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression		
	4 (ROE)	5 (ROA)	6 (ROIC)
Intercept	22.07***	11.49***	14.67***
	(6.70)	(11.08)	(7.11)
Total Debt/Equity %	-0.02***	-	-
	(-4.44)	-	-
Binary Family vs Non-Family	-2.63	-1.15*	1.05
	(-1.36)	(-1.91)	(0.81)
Agriculture, Forestry,Fishing	7.19	-0.90	2.86
	(0.69)	(-0.27)	(0.44)
Mining	1.01	-0.66	-2.81
	(0.14)	(-0.29)	(-0.62)
Construction	-7.80	-7.02***	-7.21
	(-1.13)	(-3.25)	(-1.69)
Manufacturing	-1.87	-2.93**	-2.27
	(-0.55)	(-2.73)	(-1.07)
Transportation and Public Utilities	-11.51**	-6.38***	-10.14***
	(-2.74)	(-4.96)	(-3.99)
Wholesale Trade	-6.99	-5.57**	-8.18
	(-0.84)	(-2.12)	(-1.57)
Retail Trade	-14.41*	-6.81**	-8.33
	(-1.73)	(-2.59)	(-1.60)
Finance, Insurance & Real Estate	-3.62	-8.49***	-7.82**
	(-0.93)	(-7.13)	(-2.24)
Adjusted R-Squared	0.1	0.2	0.06

We performed a regression with Services sector taken as the baseline dummy variable. In this regression, we do not see that our binary variable for family ownership is significantly different from zero at the 95% confidence level. However, at the 90% confidence level, one can say that family firms enjoy higher ROA as compared to non-family firms.

Table 5: Summary of regression coefficients for Regression Specification 6

$$\boldsymbol{ROIC = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 T} \qquad \text{(Regression 6)}$$

where ROIC represents the average ROIC of the firm over the past 3 years, α the constant, β1 ….. β8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β9 is the coefficient of the binary explanatory variable and T is the binary explanatory variable of family ownership (1 = non-family, and 0 = family). T-stat values for the results are given in brackets. The sample comprises of 350 firms over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression		
	4 (ROE)	5 (ROA)	6 (ROIC)
Intercept	22.07***	11.49***	14.67***
	(6.70)	(11.08)	(7.11)
Total Debt/Equity %	-0.02***	-	-
	(-4.44)	-	-
Binary Family vs Non-Family	-2.63	-1.15*	1.05
	(-1.36)	(-1.91)	(0.81)
Agriculture, Forestry,Fishing	7.19	-0.90	2.86
	(0.69)	(-0.27)	(0.44)
Mining	1.01	-0.66	-2.81
	(0.14)	(-0.29)	(-0.62)
Construction	-7.80	-7.02***	-7.21
	(-1.13)	(-3.25)	(-1.69)
Manufacturing	-1.87	-2.93**	-2.27
	(-0.55)	(-2.73)	(-1.07)
Transportation and Public Utilities	-11.51**	-6.38***	-10.14***
	(-2.74)	(-4.96)	(-3.99)
Wholesale Trade	-6.99	-5.57**	-8.18
	(-0.84)	(-2.12)	(-1.57)
Retail Trade	-14.41*	-6.81**	-8.33
	(-1.73)	(-2.59)	(-1.60)
Finance, Insurance & Real Estate	-3.62	-8.49***	-7.82**
	(-0.93)	(-7.13)	(-2.24)
Adjusted R-Squared	0.1	0.2	0.06

We performed a regression with Services sector taken as the baseline dummy variable. In this regression, we do not see that our binary variable for family ownership is significantly different from zero at the 5% confidence level.

Looking at the profitability return ratios as a whole, at the 5% confidence level, we do not see that family firms enjoy higher profitability ratios as compared to non-family firms. However, at the 10% confidence level, we can say that family firms enjoy a higher ROA of 1.15% as compared to non-family firms. However, the statistical significance of this ROA can be debated as other ratios fail to provide proof of the relationship.

Table 6: Summary of regression coefficients for Regression 7

$$R^* - R_f = \alpha + \sum_{n=1}^{5} \beta_n S' + \sum_{n=6}^{14} \beta_n T' + \beta_{15} C \qquad \text{(Regression 7)}$$

where R* represents the annualized excess return of the firm of the firm over the past 10 years on a per-year basis, Rf is the average annualized Risk-free rate of the 3-month Indian government bond, α the constant, β1 ….. β5 are the coefficients of the sector dummy variables, S′ is the vector of the sector control variables, β6 ….. β14 are the coefficients of the time dummy variables and β15 is the coefficient of the binary explanatory variable, T′ is the vector of the time dummy variables and C is the binary explanatory variable of family CEO (1 = Family CEO, and 0 = non-family CEO). Agriculture, Fishing, Forestry, Wholesale Trade and Mining sectors were removed from the sector variables as we did not have any family owned companies present in the sample. T-stat values for the results are given in brackets The sample comprises of 210 firms with monthly data over 10 years from 2006-2016. Monthly returns were compounded to yearly returns in order to create 10 observations for each firm. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively.

	Regression 7
(Intercept)	0.071
	(1.073)
Family (0) vs Non-Family (1)	0.102**
	(1.973)
Year (t - 9)	0.006
	(0.053)
Year (t - 8)	0.184*
	(1.732)
Year (t - 7)	-0.655***
	(-6.173)
Year (t - 6)	2.549***
	(24.020)
Year (t - 5)	0.067
	(0.627)
Year (t - 4)	-0.197*
	(-1.858)
Year (t - 3)	0.042
	(0.391)
Year (t - 2)	0.139
	(1.307)
Year (t - 1)	0.600***
	(5.657)
Construction	-0.286
	(-1.595)
Manufacturing	-0.097
	(-1.193)
Transportation and Public Utilities	-0.215
	(-1.558)
Retail Trade	-0.141
	(-0.589)
Finance, Insurance & Real Estate	-0.060
	(-0.561)
Adjusted R-Squared	0.563

We performed an OLS Regression with the Services Sector and the most recent year taken as the baseline dummy variables. In this regression, we see that the explanatory variable is significantly different from zero at the 5% level with an adjusted r-squared for the model at 0.563. Controlling for sector and time fixed effects, family firms with family members as CEOs achieve 10.2% higher annual return than family firms with external CEOs.

Table 7: Summary of regression coefficients for Regression Specification 8

$$ROE = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 C + \beta_{10} L \qquad \text{(Regression 8)}$$

where ROE represents the average ROE of the firm over the past 3 years, α the constant, β1 ….. β8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β9 is the coefficient of the binary explanatory variable, C is the binary explanatory variable of family CEO (1 = family, and 0 = external), β10 is the coefficient of the Leverage Ratio explanatory variable and L represents the Leverage Ratio explanatory variable. T-stat values for the results are given in brackets. The sample comprises of 350 firms over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression		
	8 (ROE)	9 (ROA)	10 (ROIC)
Intercept	18.60***	9.49***	13.08***
	(5.43)	(6.66)	(5.47)
Total Debt/Equity %	-0.03***	-	-
	(-3.46)	-	-
Binary Family vs Non-Family	3.52*	2.04**	2.04**
	(1.76)	(2.47)	(2.47)
Agriculture, Forestry,Fishing	9.44	-0.55	-0.55
	(0.98)	(-0.14)	(-0.14)
Construction	-10.16	-6.75**	-6.75**
	(-1.51)	(-2.46)	(-2.46)
Manufacturing	1.15	-1.82	-1.82
	(0.32)	(-1.24)	(-1.24)
Transportation and Public Utilities	-9.28**	-6.54***	-6.54***
	(-2.03)	(-3.61)	(-3.61)
Wholesale Trade	-7.61	-7.88	-7.88
	(-0.57)	(-1.43)	(-1.43)
Retail Trade	-11.63	-4.88	-4.88
	(-1.62)	(-1.63)	(-1.63)
Finance, Insurance & Real Estate	-3.21	-7.39***	-7.39***
	(-0.71)	(-4.16)	(-4.16)
Adjusted R-Squared	0.18	0.18	0.14

We performed an OLS Regression with the Services Sector taken as the baseline dummy variable. We excluded the Mining Sector as no family firms were found to be in the mining sector in our sample. In this regression, we see that the explanatory variable of Leverage Ratio is significant at the 1% level. In addition, we note that the sign of the leverage ratio variable is negative, suggesting that a 1% increase in Leverage Ratio decreased ROE of the firm by 0.03%. According to the

regression results, we also see that the binary explanatory variable of Family CEO is significant only at the 10% level. A positive coefficient suggests that a family firm with a family CEO earns 3.52% higher ROE than a family firm without a family CEO after controlling for sector fixed effects.

Table 8: Summary of regression coefficients for Regression Specification 9

$$ROA = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 C \qquad \text{(Regression 9)}$$

where ROA represents the average ROA of the firm over the past 3 years, α the constant, β1 ….. β8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β9 is the coefficient of the binary explanatory variable, C is the binary explanatory variable of family CEO (1 = family, and 0 = external). T-stat values for the results are given in brackets. The sample comprises of 350 firms over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression		
	8 (ROE)	9 (ROA)	10 (ROIC)
Intercept	18.60***	9.49***	13.08***
	(5.43)	(6.66)	(5.47)
Total Debt/Equity %	-0.03***	-	-
	(-3.46)	-	-
Binary Family vs Non-Family	3.52*	2.04**	2.04**
	(1.76)	(2.47)	(2.47)
Agriculture, Forestry, Fishing	9.44	-0.55	-0.55
	(0.98)	(-0.14)	(-0.14)
Construction	-10.16	-6.75**	-6.75**
	(-1.51)	(-2.46)	(-2.46)
Manufacturing	1.15	-1.82	-1.82
	(0.32)	(-1.24)	(-1.24)
Transportation and Public Utilities	-9.28**	-6.54***	-6.54***
	(-2.03)	(-3.61)	(-3.61)
Wholesale Trade	-7.61	-7.88	-7.88
	(-0.57)	(-1.43)	(-1.43)
Retail Trade	-11.63	-4.88	-4.88
	(-1.62)	(-1.63)	(-1.63)
Finance, Insurance & Real Estate	-3.21	-7.39***	-7.39***
	(-0.71)	(-4.16)	(-4.16)
Adjusted R-Squared	0.18	0.18	0.14

We performed an OLS Regression with the Services Sector taken as the baseline dummy variable. We excluded the Mining Sector as no family firms were found to be in the mining sector in our sample. According to the regression results, we also see that the binary explanatory variable of Family CEO is significant at the 5% level. A positive coefficient suggests that a family firm with a family CEO earns 2.04% higher ROA than a family firm without a family CEO after controlling for sector fixed effects.

Table 9: Summary of regression coefficients for Regression Specification 10

$$ROIC = \alpha + \sum_{n=1}^{8} \beta_n S' + \beta_9 C \qquad \text{(Regression 10)}$$

where ROIC represents the average ROIC of the firm over the past 3 years, α the constant, β1 ….. β8 are the coefficients of the control variables such as sectors, S′ is the vector of the sector control variables, β9 is the coefficient of the binary explanatory variable, C is the binary explanatory variable of family CEO (1 = family, and 0 = external). T-stat values for the results are given in brackets. The sample comprises of 350 firms over 10 years from 2006-2016. Asterisks denote statistical significance at the 1% (***), 5%(**), or 10% (*) level, respectively

	Regression		
	8 (ROE)	9 (ROA)	10 (ROIC)
Intercept	18.60***	9.49***	13.08***
	(5.43)	(6.66)	(5.47)
Total Debt/Equity %	-0.03***	-	-
	(-3.46)	-	-
Binary Family vs Non-Family	3.52*	2.04**	2.04**
	(1.76)	(2.47)	(2.47)
Agriculture, Forestry, Fishing	9.44	-0.55	-0.55
	(0.98)	(-0.14)	(-0.14)
Construction	-10.16	-6.75**	-6.75**
	(-1.51)	(-2.46)	(-2.46)
Manufacturing	1.15	-1.82	-1.82
	(0.32)	(-1.24)	(-1.24)
Transportation and Public Utilities	-9.28**	-6.54***	-6.54***
	(-2.03)	(-3.61)	(-3.61)
Wholesale Trade	-7.61	-7.88	-7.88
	(-0.57)	(-1.43)	(-1.43)
Retail Trade	-11.63	-4.88	-4.88
	(-1.62)	(-1.63)	(-1.63)
Finance, Insurance & Real Estate	-3.21	-7.39***	-7.39***
	(-0.71)	(-4.16)	(-4.16)
Adjusted R-Squared	0.18	0.18	0.14

We performed an OLS Regression with the Services Sector taken as the baseline dummy variable. We excluded the Mining Sector as no family firms were found to be in the mining sector in our sample. According to the regression results, we also see that the binary explanatory variable of Family CEO is significant at the 5% level. A positive coefficient suggests that a family firm with a family CEO earns 3.07% higher ROIC than a family firm without a family CEO after controlling for sector fixed effects.

7. ANALYSIS OF RESULTS AND POTENTIAL ISSUES

Research Question 1

Research Question 1 aimed to answer if there were clear differences between family-owned firms and non-family owned firms in terms of long-run equity returns. As per regression 3, we see a significant alpha for investing in the portfolio of family firms in the Indian stock market of 13.9% in our sample over the sample period of past 10 years. As mentioned by Demsetz & Lehn (1985), family owned firms have a strong incentive to monitor their managers closely. When the founding chairman/CEO is also part of the family, principal-agent conflicts are a non-issue. As the main hypothesis that we wished to answer in this paper, we do find a significant difference in the long-run equity returns for family firm and non-family firms after controlling for sectors.

Anderson, Mansi & Reeb (2003) found similar results where they showed family firms outperforming non-family firms and they suggested that a good reputation and the presence of a family for the long-term rather than non-family firms where management shuffling is commonplace, results in the family firm having a lower cost of debt financing which essentially increases firm value. This could be a valid reason in India as we see that the Indian financial market is not fully matured and thus frictions in the lending market might contribute to higher borrowing costs for firms that do not have a good reputation as compared to family firms.

Another thing to take note is the absence of private firms in our sample. Gallo & Estapé (1992) found that family firms had a higher ROE than non-family ones among the top public 1,000 Spanish companies. However, a similar study by the same author (Gallo, Tapies & Cappuyns, 2004) found that when private firms were included in the sample, they saw an opposite result i.e. non-family firm outperforming family firms.

Since our sample only consisted of family firms due to the methodology we are employing, this could mean that we are possibly finding a result for a sub-sample of the Indian stock market, albeit a large portion of it. It could be possible that the trend of family ownership being beneficial for the performance of a public listed company might not hold true for a privately held company but that is a study that other researchers can take up in the future.

The reason we controlled for sectors is that it is possible that some sectors with a large number of family firms could be doing particularly well and our regression could be subject to an omitted

variable bias if we didn't take sectors into account. We controlled for time fixed effects as well due to the fact that we were testing results on an annualized basis and the Fama-French model was rebalanced yearly as well. As seen in regression 2, we obtained an alpha of 6.81% in favour of family firms over non-family firms when regressing the equal-weighted long-short portfolio on the 3 different Fama-French factors that we had shown to be significant in regression 1 without controlling for sectors or time as fixed effects. Therefore, taking the results of regression 1, 2 and 3 into account, we can say that family-owned firms perform better than non-family-owned firms in the Indian stock market by 13.9% in terms of long-run excess equity returns over the past 10 years after controlling for sector effects.

Research Question 2

Another measure of performance is profitability ratios (ROE, ROA & ROIC). We were curious to see if the significant alpha for family firms was reflected in the profitability ratios as well. Return ratios in general capture core profitability of the company as well as capital efficiency. For example, ROA=Net Income/Total Assets. This can also be broken down into ROA= (Net Income/Revenue) x (Revenue/Total Assets) which is essentially ROA= Net Income Margin x Asset Turnover. Size, invariably plays a very important role in asset turnover. A larger company due to significant economies of scale would be able to utilize per $ of asset to produce more revenue compared to its peers. A classic example of this is Hindustan Unilever which has an asset turnover of around 2.2x compared to its peers who have an average asset turnover of around 1.8x. This superior asset turnover is clearly a result of size since Hindustan Unilevers revenue is 3x its closest peer's revenue. As a result, other things equal, size would play a significant role in a company's return ratio (ROE, ROA & ROIC). However, for the purpose of this thesis, we are trying to identify the impact of family ownership on return ratios.

As seen in regressions 4, 5 and 6, at the 5% level, we are unable to see any significant differences between family and non-family firms. Even after controlling for sector effects to take into account a potential omitted variable bias, we are unable to say if family-owned firms have better profitability ratios than non-family owned firms in our sample of the Indian stock market. From the descriptive statistics we can see that the average market capitalization of family companies is about 28% smaller than that of non-family. Therefore it is possible that the benefits of family

ownership towards better return ratios is offset by the larger size of non-family firms in this sample, which essentially leads to an inconclusive result.

The descriptive statistics below gives a fairly clear indication of the results we obtained through econometrics. We can see that the average CAGR returns of family firms is far superior to Non-Family firms. Moreover, the average return ratios are more or less similar between family and non-family firms which is what our results indicated. Now the obvious question is that, why are family-firm stocks performing significantly better when operationally they are similar? While it is difficult to pin-point exactly what factors the stock price has factored, top-line growth definitely explains some of it. Family firms have historically grown much faster than non-family firms and the stock price has followed. In case of family firms, family CEO's have much better return ratios indicating better operational abilities. Therefore, in this case, even though the growth is only marginally higher, the better return ratios could be a reason for the outperformance.

	Family	**Non-Family**
Number of Firms	174	176
Average 5 yr CAGR (Stock Price)	34.9%	16.3%
Average ROE	13.2%	13.5%
Average ROA	7.51%	5.61%
Average ROIC	11.00%	11.80%
5-Year Rev CAGR	18.58%	11.82%
Average Market Cap ($M)	2970.98	4084.14
	Family CEO	**External CEO**
Number of Firms	100	74
Average CAGR (Stock Price)	41.0%	25.0%
Average ROE	18.86%	14.23%
Average ROA	8.59%	6.08%
Average ROIC	12.56%	8.86%
5-Year Rev CAGR	19.40%	17.60%
Average Market Cap ($M)	2879.19	3145.62

Research Question 3

The theory behind research question 3 is that of agency theory. This particular theory has been best expounded in paper by Berly and Means (1932) and Thomsen (2008). In family owned firms with an external manager, there is a mismatch in goals between the owner and the manager and owners attempt to mitigate this through a variety of methods such as aligning incentives amongst others. The conflict between the principal and the agent is that each might act in their own interests and these interests may not be aligned with each other. This conflict thus gives rise to the importance of corporate governance. A legal requirement on the agent could make sure that the agent acts in the best interest of the principal and takes charge for his actions. The extreme case where there is absolutely no conflict of interest is when the owner or a significantly large shareholder also manages the company. This eradicates the need to monitor and the sheer amount of ownership makes the owner to act in the best interest of the company. As such, in family owned firms with a family CEO, we do not see this particular issue as the owner and the manager are the same. Moreover, externally recruited managements have a significant part of their variable salary coming from Income statement items such as sales, EBIT and Net Income. However, this does not ensure that the management is allocating capital efficiently. For example, lets say that the CEO of a retail company is incentivized on revenue growth. He or she would likely focus on rapidly opening new stores (which will obviously result in top line growth), however, might completely ignore efficiency in capital allocation. Had the owner of the company been the CEO, he or she would likely be more prudent in allocating capital to new stores and implicitly maintain stronger return ratios (ROE, ROA & ROIC).

In a study performed by Gómez-Mejía, Nuñez-Nickel, & Gutiérrez (2001), they found that the organizational impact of replacing a family member CEO is more positive than a non-family member CEO. On the other hand, James (1999) claims that family firms are concerned with building legacies and are driven by the desire to build institutions that last several generations. This ethos plays a role in the decision making process at the firm level and thereby contributes to its performance.

As seen by the results of regression 7, 9 and 10, we see a positive and significant impact of family CEOs in long-run equity returns, ROA and ROIC at the 5% level. In the case of regression 8, we see a significant positive impact of family CEOs at the 10% level. This suggests that after

controlling for sectors and time fixed effects, family CEOs are likely to lead their firms to greater performance than non-family CEOs in the Indian stock market. Thus, we can say that family firms with a family member as a CEO perform better than family firms with non-family CEOs in Indian stock market after controlling for sector and time fixed effects.

Potential Issues

The total number of companies listed in India are around 5000, however, a majority of them have a very small market cap with virtually no traded volume and would hence not be representative. Hence we will examine the largest 350 companies listed on Indian Stock exchanges since the largest 350 companies represent more than 80% of the total market capitalization of the Indian stock market. To provide perspective, the next 350 companies would only cover an additional 7% market cap. Moreover, companies after the 350^{th} were fairly illiquid and hence could skew the observed prices. One potential issue is that we might have omitted some factors that could better explain the variation we see in the long-run equity return of the stocks in the Indian stock market.

Another potential issue is that of incorrect assumptions of family ownership. In the regressions that we performed, we didn't into account the possibility that a company might switch from being family owned to non-family owned during the time period that we were conducting our research on. This was because we measured each company as March 2016 and assigned them to family or non-family based on a single observation. We then assumed that this particular classification was time-invariant and applied to all the previous 10 years. I.e. if a firm is a family owned firm now, it has been a family owned firm for the past 10 years as well and vice versa. This could be a potential issue if there are many firms that have changed classification over the years from family to non-family and vice versa. However, in our opinion, this is probably not the case in the Indian stock market as most of the firms in our sample have either remained in family hands and non-family owned firms have not been taken over by a family. Thus, we are comfortable with proceeding with our method of ignoring time fixed-effects and rejecting the possibility that companies might switch classification over the time horizon that we investigated.

8. CONCLUSION AND FUTURE RESEARCH

Family firms play a crucial role in providing goods and services to the world economy as a whole. Although there has not been much research in this area in Indian markets, partly due to the difficulty of obtaining accurate data on these firms, we feel there is a lot to learn from these firms. We collected data on the largest and most liquid 350 firms in the Indian Stock Market over the time period of 2006 -2016. Using this data, we analysed the impact of family ownership on firm performance. Specifically, we defined firm performance to mean excess total shareholder returns and return ratios such as Return on Equity (ROE), Return on Assets (ROA) and Return on Invested Capital (ROIC). In addition, we deepened our analysis by considering a related question of Family CEO vs External CEO in Family firms. We tested the impact of having a Family CEO on excess total shareholder returns and return ratios.

Our results highlight the impact that family ownership has on firm performance according to the definition we have stated. We show family ownership is correlated to higher excess total shareholder return as compared to firms with no family ownership. This result is significant and it mirrors studies conducted in other countries. However, this relationship is not borne out when we analyse the three different return ratios. We do not see any evidence to support our hypothesis that family ownership is correlated to better return ratios according to our analysis and results.

Additionally, we explore the related question of the impact of having a Family CEO vs an External CEO on Family firm performance as measured by excess total shareholder return and return ratios. Our results show conclusively that having a Family CEO is correlated to higher excess total shareholder returns as compared to Family firms that employ an External CEO. This relationship holds when we analyse the return ratios as well. Our results show that having a Family CEO is correlated to better return ratios except ROE, as compared to the case of External CEOs. This suggests that return ratios are correlated to the variable of family management as suggested by Agency Theory.

Furthermore, we would like to note that our estimates of the impact of family ownership on firm performance are likely to be conservative. This is due to the fact that the firms in our sample are the largest 350 firms in the Indian Stock Market. In addition, these firms are highly liquid, sensitive to news and constantly monitored by investors. Thus, one can expect the firms in our sample to be

more difficult to maintain under family control. Yet, it is unclear whether the impact of family ownership observed in this study would hold true if evaluated in different samples.

So far, we have established a broad relationship between family ownership and firm performance, however, the underlying mechanics through which family firms outperform non-family firms is far more complex. As such, it would be interesting to perform on empirical study on the characteristics of family businesses that impact the firm performance. For example, one could test whether a larger proportion of independent directors on the board led to superior performance or whether the number of generations of family members in the firm impacted performance.

Moreover, one could also branch out into the realm of corporate finance and evaluate how family ownership has an impact on a firm's choice to grow organically versus growing through acquisitions and essentially evaluate how that impacts the firm performance. Another potential extension of this study would be to investigate the impact of family ownership in private firms as well.

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10. APPENDIX

Details of Regression

Regression 1:

Portfolio 1

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.020	0.006	3.54	0.001
SMB	1.181	0.149	7.95	0.000
HML	0.960	0.108	8.90	0.000
Rm - Rf	0.980	0.073	13.46	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0494
R-Squared	0.831
Adjusted r-squared	0.827
F-Stat vs constant model	189
p-value	0

Portfolio 2

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.019	0.005	3.76	0.000
SMB	1.209	0.133	9.11	0.000
HML	0.373	0.096	3.87	0.000
Rm - Rf	0.965	0.065	14.82	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0441
R-Squared	0.808
Adjusted r-squared	0.803
F-Stat vs constant model	162
p-value	0

Portfolio 3

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.03	0.006	4.58	0.000
SMB	1.26	0.161	7.80	0.000
HML	0.06	0.117	0.51	0.614
Rm - Rf	1.00	0.079	12.62	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0536
R-Squared	0.72
Adjusted r-squared	0.712
F-Stat vs constant model	98.4
p-value	0

Portfolio 4

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.03	0.006	4.98	0.000
SMB	0.27	0.153	1.78	0.077
HML	1.10	0.111	9.91	0.000
Rm - Rf	0.94	0.075	12.47	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.051
R-Squared	0.8
Adjusted r-squared	0.795
F-Stat vs constant model	153
p-value	0

Portfolio 5

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.017	0.005	3.09	0.002
SMB	0.178	0.145	1.23	0.222
HML	0.286	0.106	2.71	0.008
Rm - Rf	1.087	0.071	15.25	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0483
R-Squared	0.751
Adjusted r-squared	0.745
F-Stat vs constant model	116
p-value	0

Portfolio 6

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.02	0.005	3.90	0.000
SMB	0.20	0.141	1.39	0.167
HML	0.00	0.102	0.03	0.976
Rm - Rf	0.92	0.069	13.30	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0468
R-Squared	0.662
Adjusted r-squared	0.65
F-Stat vs constant model	75.1
p-value	0

Portfolio 7

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.021	0.005	4.06	0.000
SMB	0.575	0.140	4.10	0.000
HML	0.534	0.102	5.25	0.000
Rm - Rf	0.941	0.069	13.71	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0466
R-Squared	0.769
Adjusted r-squared	0.76
F-Stat vs constant model	127
p-value	0

Portfolio 8

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	0.02	0.005	3.89	0.000
SMB	0.86	0.144	6.00	0.000
HML	0.34	0.104	3.30	0.001
Rm - Rf	1.03	0.070	14.59	0.000

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0478
R-Squared	0.775
Adjusted r-squared	0.77
F-Stat vs constant model	132
p-value	0

Regression 2:

Portfolio 9

Estimated Coefficients

	Estimate	SE	t-stat	p-value
(Intercept)	-0.006	0.002	-2.69	0.008
SMB	-0.29	0.057	-5.13	0.000
HML	0.19	0.041	4.54	0.000
Rm - Rf	-0.08	0.028	-3.04	0.003

Number of Observations	119
Error Degrees of Freedom	115
Root Mean Squared Error	0.0188
R-Squared	0.286
Adjusted r-squared	0.27
F-Stat vs constant model	15.3
p-value	0

Regression 3:

Estimated Coefficients

	Estimate	t-stat	p-value
(Intercept)	0.071	1.073	0.283
Family (0) vs Non-Family (1)	-0.139***	-4.603	0.000
Year (t - 9)	0.077	1.196	0.232
Year (t - 8)	0.317***	4.904	0.000
Year (t - 7)	-0.500***	-7.736	0.000
Year (t - 6)	2.190***	33.865	0.000
Year (t - 5)	0.211***	3.267	0.001
Year (t - 4)	-0.116*	-1.799	0.072
Year (t - 3)	0.039	0.595	0.552
Year (t - 2)	0.153**	2.360	0.018
Year (t - 1)	0.658***	10.178	0.000
Mining	-0.243	-1.585	0.113
Construction	-0.198	-1.557	0.120
Manufacturing	-0.060	-1.194	0.233
Transportation and Public Utilities	-0.192***	-2.744	0.006
Wholesale Trade	0.132	0.861	0.389
Retail Trade	-0.174	-0.823	0.411
Finance, Insurance & Real Estate	-0.131**	-2.216	0.027

Number of Observations	2010
Error Degrees of Freedom	1992
Root Mean Squared Error	0.648
R-Squared	0.538
Adjusted r-squared	0.534
F-Stat vs constant model	136
p-value	0

Regression 4:

ROE Regression

Estimated Coefficients

	Estimate	t-stat	p-value
Intercept	22.069	6.6982	8.96E-11
Total Debt/Equity %	-0.0186	-4.4418	1.21E-05
Binary Family vs Non-Family	-2.6345	-1.362	0.17411
Agriculture, Forestry,Fishing	7.1857	0.68801	0.49193
Mining	1.0074	0.13798	0.89034
Construction	-7.7999	-1.1333	0.2579
Manufacturing	-1.8668	-0.54668	0.58496
Transportation and Public Utilities	-11.511	-2.7376	0.006521
Wholesale Trade	-6.9869	-0.83658	0.40342
Retail Trade	-14.414	-1.7264	0.085203
Finance, Insurance & Real Estate	-3.6186	-0.93396	0.351

Number of Observations	345
Error Degrees of Freedom	334
Root Mean Squared Error	17.2
R-Squared	0.124
Adjusted r-squared	0.0975
F-Stat vs constant model	4.72
p-value	0

Regression 5:

ROA Regression

Estimated Coefficients

	Estimate	t-stat	p-value
Intercept	11.487	11.081	1E-24
Binary Family vs Non-Family	-1.152	-1.9074	0.0573
Agriculture, Forestry,Fishing	-0.89934	-0.27333	0.7848
Mining	-0.65608	-0.28529	0.7756
Construction	-7.0184	-3.2455	0.0013
Manufacturing	-2.9336	-2.7342	0.0066
Transportation and Public Utilities	-6.3834	-4.9628	1E-06
Wholesale Trade	-5.5717	-2.1187	0.0348
Retail Trade	-6.8115	-2.5901	0.01
Finance, Insurance & Real Estate	-8.4931	-7.1341	6E-12

Number of Observations	350
Error Degrees of Freedom	341
Root Mean Squared Error	5.43
R-Squared	0.218
Adjusted r-squared	0.197
F-Stat vs constant model	10.6
p-value	0

Regression 6:

ROIC Regression

Estimated Coefficients

	Estimate	t-stat	p-value
Intercept	14.674	7.1053	9.7E-12
Binary Family vs Non-Family	1.0501	0.80546	0.42123
Agriculture, Forestry,Fishing	2.8593	0.43968	0.6605
Mining	-2.8141	-0.61818	0.53695
Construction	-7.2141	-1.6879	0.092533
Manufacturing	-2.2686	-1.0691	0.28594
Transportation and Public Utilities	-10.14	-3.9888	8.45E-05
Wholesale Trade	-8.1821	-1.5736	0.11668
Retail Trade	-8.327	-1.6015	0.11037
Finance, Insurance & Real Estate	-7.8219	-2.2387	0.025952

Number of Observations	294
Error Degrees of Freedom	284
Root Mean Squared Error	10.7
R-Squared	0.0921
Adjusted r-squared	0.0633
F-Stat vs constant model	3.2
p-value	0.001

Regression 7:

Estimated Coefficients

	Estimate	t-stat	p-value
(Intercept)	0.068	0.640	0.522
Family CEO (1) vs Non-Family CEO (0)	0.102**	1.973	0.049
Year (t - 9)	0.006	0.053	0.958
Year (t - 8)	0.184*	1.732	0.084
Year (t - 7)	-0.655***	-6.173	0.000
Year (t - 6)	2.549***	24.020	0.000
Year (t - 5)	0.067	0.627	0.531
Year (t - 4)	-0.197*	-1.858	0.064
Year (t - 3)	0.042	0.391	0.696
Year (t - 2)	0.139	1.307	0.192
Year (t - 1)	0.600***	5.657	0.000
Construction	-0.286	-1.595	0.111
Manufacturing	-0.097	-1.193	0.233
Transportation and Public Utilities	-0.215	-1.558	0.120
Retail Trade	-0.141	-0.589	0.556
Finance, Insurance & Real Estate	-0.060	-0.561	0.575

Number of Observations	910
Error Degrees of Freedom	894
Root Mean Squared Error	0.716
R-Squared	0.571
Adjusted r-squared	0.563
F-Stat vs constant model	79.2
p-value	0

Regression 8:

ROE Regression

Estimated Coefficients

	Estimate	t-stat	p-value
Intercept	18.604	5.4303	2.03E-07
Debt/Equity	-0.02554	-3.4563	0.000699
Family CEO (Yes=1)	3.5223	1.7573	0.080757
Agriculture, Forestry,Fishing	9.4444	0.98483	0.32618
Construction	-10.159	-1.5059	0.13403
Manufacturing	1.15	0.32336	0.74684
Transportation and Public Utilities	-9.2759	-2.0324	0.043746
Wholesale Trade	-7.6142	-0.57126	0.56861
Retail Trade	-11.634	-1.6214	0.10688
Finance, Insurance & Real Estate	-3.2132	-0.7086	0.47959

Number of Observations	172
Error Degrees of Freedom	162
Root Mean Squared Error	12.7
R-Squared	0.228
Adjusted r-squared	0.185
F-Stat vs constant model	5.3
p-value	0

Regression 9:

ROA Regression

Estimated Coefficients

	Estimate	t-stat	p-value
Intercept	9.4867	6.6597	3.84E-10
Family CEO (Yes=1)	2.0357	2.4685	0.014582
Agriculture, Forestry,Fishing	-0.54952	-0.13742	0.89086
Construction	-6.7521	-2.4596	0.014936
Manufacturing	-1.8212	-1.2375	0.21764
Transportation and Public Utilities	-6.5422	-3.6057	0.000411
Wholesale Trade	-7.8824	-1.4322	0.15397
Retail Trade	-4.8753	-1.6309	0.1048
Finance, Insurance & Real Estate	-7.3918	-4.1558	5.18E-05

Number of Observations	175
Error Degrees of Freedom	166
Root Mean Squared Error	5.31
R-Squared	0.222
Adjusted r-squared	0.184
F-Stat vs constant model	5.91
p-value	0

Regression 10:

ROIC Regression

Estimated Coefficients

	Estimate	t-stat	p-value
Intercept	13.076	5.4729	1.74E-07
Family CEO (Yes=1)	3.0716	2.1519	0.03295
Agriculture, Forestry, Fishing	3.7131	0.55505	0.57966
Construction	-8.561	-1.8639	0.064223
Manufacturing	-2.1829	-0.88632	0.37682
Transportation and Public Utilities	-11.267	-3.7119	0.000286
Wholesale Trade	-11.878	-1.2897	0.19907
Retail Trade	-6.3111	-1.262	0.20886
Finance, Insurance & Real Estate	-9.2413	-2.6197	0.009676

Number of Observations	164
Error Degrees of Freedom	155
Root Mean Squared Error	8.89
R-Squared	0.185
Adjusted r-squared	0.143
F-Stat vs constant model	4.4
p-value	0