Master Thesis

The Influence of Family and Institutional Ownership on Merger & Acquisition Investments and the Role of Corporate Entrepreneurship

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Abstract

This study draws on a sample of 108 private and publicly listed German companies that completed at least one M&A deal in 2007-2015. Thereby it investigates the difference between the degree of family and institutional ownership and its respective influence on corporate strategic investment decisions, specifically focusing on merger and acquisition (M&A) investments. Furthermore, based on previous research, revealing similar innovative characteristics and benefits of corporate entrepreneurship and M&As, this study investigates how corporate entrepreneurship moderates the aforementioned relationships respectively. Thereby the study strives to ascertain whether both corporate entrepreneurship and M&As are either mutually exclusive or co-existing in corporations. Eventually, the results suggest no significant relationship between family ownership and the degree of M&A investments. Additional investigations further reveal that a family's supplementary involvement in the corporate management board neither constitutes a significant negative moderation. In other words, this means that the relationship is not negatively amplified when family members have a majority ownership stake in the company while simultaneously operating in the corporate management board likewise. Contrary to the generally assumed paradigm of institutional investors' passive behavior in strategic decision matters, their increasing ownership stakes negatively influence the degree of M&A investments. Furthermore, corporate entrepreneurship, measured in terms of R&D intensity and patents, reveals incoherent but significant findings and thereby illustrates its widespread influencing components in different corporate settings. In particular, R&D intensity negatively moderates the relationship between family ownership and M&A investments but constitutes no significant moderation on the relationship with institutional ownership. Patents, however, moderate the relationship with family ownership positively, while having a negative moderating effect on the relationship between institutional ownership and the degree of M&A investments.

Keywords: Family Ownership, Institutional Ownership, Merger & Acquisition (M&A), Corporate Entrepreneurship, Research & Development (R&D), Patents, Family Management

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1. Introduction

For decades, the existence of family businesses constitutes an essential contribution to the global economy. Almost two-thirds of the worldwide business organizations are identified as family firms, emphasizing its considerable economic importance (Family Firm Institute, 2016). Most notably, Europe is characterized by a large fraction of family firms accounting for 14 million businesses of this organizational type (European Family Businesses, 2016) and encompassing 50 percent of the world's 500 largest family businesses (EY, 2015). Nowadays, family firms employ 60 million people in the European private sector and contribute about 50 percent to the European gross domestic product (European Family Businesses, 2016). Remarkably, three German corporations, in particular Volkswagen AG, Bayerische Motorenwerke (BMW) AG and the Schwarz Group are among the top five largest family businesses in Europe in terms of revenue (EY, 2015).

Family firms are characterized by a substantial influence of families or individuals on the corporations and its strategic decisions by means of their ownership stakes and/or management positions (König, Kammerlander, & Enders, 2013). Despite the lack and yet ambiguous definition of family firms (Benavides-Velasco, Quintana-García, & Guzmán-Parra, 2013), scholars acknowledged increasing attention on the research in this academic field and identified differences with non-family firms (Chrisman J. J., Kellermanns, Chan, & Liano, 2010), specifically with respect to their corporate strategies, objectives (Tagiuri, 1992) and organizational cultures (Dertouzos, Lester, & Solow, 1989). Moreover, studies particularly demonstrated families' preference for non-economic and non-financial objectives over the sole corporate profit-maximization (Gómez-Mejia, Haynes, Nuñez-Nickel, Jacobson, & Moyano-Fuentes, 2007). This phenomenon is referred to as socioemotional wealth (SEW) preservation, which involved attributes such as the exercise of power, the continuity of the family dynasty and influences on the corporate strategic direction (Gómez-Mejia et al., 2007; Miller, Le Breton-Miller, & Lester, 2013; Zellweger, Kellermanns, Chrisman, & Chua, 2012).

Corroborating the theory of SEW preservation, family businesses are often regarded as risk-averse compared to their non-family corporation counterparts (Cabrera-Suárez, De Sará-Pérez, & García-Almeida, 2001). Nonetheless, just recently the Volkswagen AG, whereof the Piech/Porsche family owns 53 percent of the corporation, astonished with its 300 million dollar investment in the start-up company Gett (Financial Times, 2016) and highlights the

regularly trending disclosures about investments in new external corporations and start-ups as well as merger and acquisitions (M&A). The strategic management literature generally investigates the importance of external corporate investments in terms of M&As and considers those as an important driver of corporate performance (Yen & André, 2007). Starting in the mid-1990s and reaching a major peak in 2000, M&A activities were remarkably on the rise among global corporations (Gugler, Mueller, Yurtoglu, & Zulehner, 2003). Since then, the extent of M&A activities remained constant and notably Germany is still a leading country in terms of its investments in M&As (Corporate Finance Europe, 2016). Yet, scholars claim that family firms tend to be reluctant to invest in new corporations (Naldi, Nordqvist, Sjöberg & Wiklund, 2007) and consequently may miss to draw upon the benefits of complementing and diversifying the corporate portfolio (Porter, 1990). An underlying reason for the families' conservative approach towards such investments is the avoidance of potential value destruction when acquiring other companies (Caprio, Croci & del Giudica, 2010).

In line with the differences of risk-taking behavior between family firms and non-family firms, an ongoing field of research in the strategic management is corporate entrepreneurship. According to Zahra (1995), corporate entrepreneurship is a company's activity to revitalize its current business and remain sustainably competitive through diversified products, innovations and entering new markets that yield increased growth and profitability (Kuratko, Ireland, & Hornsby, 2001). However, similar to the assumption of family firms' conservative investment behavior in M&As, the implementation and success of corporate entrepreneurship depends on the families' attitude towards risk-taking to induce corporate change and pro-activeness (Levinson, 1971; Covin & Selvin, 1991).

In the context of high corporate family ownership, M&A investments and corporate entrepreneurship are considered to be dependent on family members exerting their power and voice in the corporation to meet their own interests (Anderson, Mansi, & Reeb, 2003). Thereby, families rather prefer the continuity to control their business (Gómez-Mejia, Haynes, Nuñez-Nickel, Jacobson, & Moyano-Fuentes, 2007) and thus are reluctant to sell controlling stakes to outsiders, which consequently can trigger fewer M&As compared to non-family firms (Bauguess & Stegemoller, 2008). Even though scholars identified a positive relationship between corporate entrepreneurship and firms' financial performance (Bierwerth, Schwens, Isidor, & Kabst, 2015; Karacaoglu, Bayrakdaroglu, & Firat Botan, 2012), the topic is still

fairly unexplored in association with family involvement and M&As (Kellermanns & Eddleston, 2006). Previous research was mainly limited on the influence of M&As and corporate entrepreneurship on firm performance. However, the influence of corporate entrepreneurship and M&A investments have never been simultaneously investigated in the context of varying ownership degrees, thus leading to the following research question:

"How does the degree of family ownership, in comparison to institutional ownership, influence M&A investments and to what extend does corporate entrepreneurship affect this relationship respectively?"

This study has several theoretical contributions to the existing literature of family firms and ownership structures. Firstly, scholars previously identified risk-taking and pro-activeness as the overlapping influences that nurture corporate entrepreneurship and external corporate investments, such as M&As (Covin & Selvin, 1991). Nonetheless, both concepts essentially differ regarding the value creation benefits. Whereas corporate entrepreneurship is internally focused through the generation of innovations and idea within the corporation, M&A investments are externally focused to gain new resources by means of acquisitions of related or unrelated companies. Despite its overlapping characteristics and underlying intentions, previous research missed to investigate its concurrent existence in a corporation and to reveal whether both are co-existing or mutually exclusive in a corporation.

Secondly, previous literature on family firms and ownership predominantly considered family involvement in a more general manner (Claessens et al., 2002). However, recognizing the varying effect that could evolve through different degrees of involvement in a company, this study specifically distinguishes between family ownership and family management to investigate its individual and combined effect respectively. Thereby it can be ascertained whether the families' say in a corporation through their ownership stakes is enforced when family members are additionally represented in a management position. Hence, more profound insights with regard to M&A investments in family-controlled firms are revealed.

Thirdly, previous studies focused on publicly listed companies in the context of family ownership. Yet, it is important to note that Germany consists of a large fraction of unlisted, private corporations. Consequently, the sample of this study contains both organizational types as the Orbis database provides the key figures necessary for this research.

The thesis is structured as follows. At first, the literature review investigates ownership structures, M&As and corporate entrepreneurship in the context of previously compiled literature. Secondly, in order to advance previous research, hypotheses are developed that jointly yield the guiding research model of the thesis. Thirdly, the research methodology, the operationalized measures and the statistical regression analysis are introduced. Thereafter, the regression results are discussed and set against previous research findings, while also mentioning the study's limitations and suggestions for future research. Lastly, the important findings are summarized in the conclusion.

2. Literature Review & Hypotheses Development

The following literature review introduces the reader to the general context of the topic, referring to previous researches by specifically focusing on family firms, family ownership as well as M&A investments and corporate entrepreneurship. During the course of the following paragraphs, the review reveals gaps and contradicting insights that lead to several hypotheses investigating the influence of family ownership on M&A activities. To broaden the perspective on the topic, the influence of institutional ownership is further considered to compare firms with higher family ownership to those with higher institutional ownership.

2.1. Definition of Family Firms

In today's economy, family firms make up a large fraction of global corporations and their key importance is emphasized by the substantial contribution to the world economy (Astrachan & Shanker, 2003; Villalonga & Amit, 2006). According to the Family Firm Institute (2016), family firms represent two-thirds of all global business organizations and thereby contribute at least 70 but up to 90 percent to the global gross domestic product (GDP). Moreover, the economy largely benefits from family firms through the creation of employment and new innovations (Astrachan, 2003). Despite the topic's global importance, the literature yet lacks to clearly define the organizational type of family firms in order to achieve a clear distinction from non-family organizations (Benavides-Velasco, Quintana-García, & Guzmán-Parra, 2013). Nonetheless, the literature generally often refers to family firms as the unit of analysis. Consequently, the underlying reasons for the varying findings among different researches might be attributed to the diverse definitions of family firms being employed by the respective scholars. However, previous literature convenes by means of two

coherently applied criterions to define family firms: (1) family ownership and (2) family's involvement in management boards (Chua, Chrisman, & Sharma, 1999). Hereof, some scholars apply a rather liberal definition and consider corporations as family firms when the families are either involved solely by means of their ownership stakes or active operation in the corporate management (Villalonga & Amit, 2006). Other studies claim a more precise definition, specifically requiring the exclusive substantial presence of families in management positions (Miller, Le Breton-Miller, Lester, & Cannella Jr, 2007), whereas others exclusively require a substantial stake of ownership through voting rights and cash flows that enable them to influence the strategic direction of the company (Peng & Jiang, 2010). A more constrained definition is applied by Gómez-Mejia et al. (2014) and Arregle et al. (2007), requiring both aforementioned conditions to apply plus a minimum ownership stake held by a single family in the company, ranging from 10 percent (Gómez-Mejía, Makri, & Kintana, 2010; Pindado, Requejo, & de la Torre, 2011) to more than 50 percent (Graves & Thomas, 2006; Leach, et al., 1990) or above 60 percent (Donckels & Frohlich, 1991).

2.2. Family Ownership

Empirical studies about corporate ownership structures revealed increasing interest in the topic within the last years. Thereby, scholars focused specifically on the costs and benefits of concentrated ownerships and the unique characteristics (Faccio, Lang, & Young, 2001; Bebchuk, Kraakman, & Triantis, 2000). Most notably, family firms are identified with a high degree of ownership concentration (Shim & Okamuro, 2011) and characterize the corporate landscape in Western Europe. Furthermore, patterns of previous studies confirm the continuity of the family control over generations, after the retirement of founding families and individuals (Faccio & Lang, 2002; Burkhart & Panunzi, 2003).

The concentration of family ownership is often associated with corporate benefits. Research frequently focuses on the families' intangible benefits of having full control over a company, such as "amenity potential", which are non-pecuniary private benefits to optimize the families' utility (Demsetz & Lehn, 1985; Burkhart & Panunzi, 2003). Moreover, Burkhart & Panunzi (2003) empirically emphasize the family's name as an important facilitator of the company's reputation that gives rise to an enhanced corporate performance. Beyond, by means of a more quantitative study based on performance metrics, further scholars investigate the influence of agency costs in companies with increased ownership concentration. Thereby, the findings of Lemmon & Lins (2003) do not acknowledge any optimization of shareholders'

interests for companies with concentrated rather than diffused ownership structures. Moreover, a growing body of empirical research focuses on how ownership structures influence firm performance (Chrisman J. , Kellermanns, Chan, & Liano, 2010; Anderson & Reeb, 2003). Scholars suggest prevalently increased firm value if corporations have concentrated rather than dispersed ownership structures in place (Jensen & Meckling, 1976; McConaughy, Walker, Henderson, & Mishra, 1998; Claessens, Djankov, Fan, & Lang, 2002). Focusing more specifically on family ownership, further research streams intensified previous studies on ownership concentration but ascertained diverging implications. Therein, Holderness & Sheehan (1988) determine the negative relationship between families' controlling ownership and performance when comparing it to corporations with a more diffused ownership structure. Contrarily, other studies observe that family firms are outperforming non-family firms, emphasizing the value of highly concentrated ownership stakes through families to reduce the classical agency problem among shareholders (Anderson, Mansi, & Reeb, 2003; Villalonga & Amit, 2006; Sraer & Thesmar, 2007). Nonetheless, in particular the scholars also admit a declining positive effect on performance when families reach a 30 percent ownership stake in a company. The underlying reason for this effect originates from the fact that higher ownership allows families to exert their voice and power to influence the firms' strategies and meet their own interest (Anderson, Mansi, & Reeb, 2003). As a consequence, families can prevent firms from investing in valuable innovation, which eventually could enhance the corporate performance (Chen & Hsu, 2009).

As aforementioned, central in the family firm literature is the predominant investigation of the effect of ownership exclusively on performance metrics. Instead of investigating its direct effect, the article compiled by Cho (1988) takes on another approach, suggesting a two-stage process. Thereby, the author claims the priority to first investigate the impact of ownership structures on corporate investments (Stage 1) before focusing on the relationship between corporate investments and performance metrics (Stage 2). Hereof, the research regarding the first stage is yet only rudimentarily developed (Cho, 1998) and consequently raises the underlying motivation to direct the scope and purpose of this research study specifically on the aforementioned first stage to investigate how ownership influences corporate investments.

2.3. Merger & Acquisitions in the Corporate Landscape

The involvement of German corporations often characterized the European corporate landscape of M&A deals. Especially in the 1990s around 30,000 take-over deals included the

involvement of a German firm, intending to acquire complementary resources to advance their businesses (Rodríguez-Pose & Zademach, 2006; Granata & Chirico, 2010). To reach clarification, mergers are defined as the combination of two entities into a single company. Instead, an acquisition is the process of one company taking over another by acquiring a majority stake through cash or stock equity and consequently being identified as the new owner (Khan, 2011).

2.3.1. Benefits of Merger & Acquisition Investments

Besides the vast academic interests in alliances and joint ventures, M&As are further corporate activities that can accelerate corporate growth and development (Bauer & Matzler, 2013). Except for the expectedly decline during the financial and economic crises, M&A investments are still of primary interest in corporations. This development and continuous pattern of M&As was mainly triggered through the ongoing rapid changes in the business environment and the companies' increasing need for new resources, innovations and markets which they cannot necessarily accomplish internally (Makri, Hitt, & Lane, 2010). Moreover, the globalization and global corporate connectivity hampers the company's sustainable competitive position with its own resources, thus driving the need for merging and acquiring corporate resources with complementing partners (Granata & Chirico, 2010; Sirmon & Hitt, 2003; Vermeulen & Barkema, 2001). Underlying motivations that trigger M&A activities in the corporate landscape are identified. Generally, both mergers and acquisitions are strategic approaches to achieve larger size, increased market share and power as well as faster growth to remain competitive in the market (Khan, 2011; Granata & Chirico, 2010). Moreover, companies improve efficiency and get easier access to strategic assets, such as patents, brands, licenses or management skills that can help the acquirer to reinforce its market position and corporate performance (Berkovitch & Narayanan, 1993; Dunning, 1997).

2.3.2. Costs of Merger & Acquisition Investments

Contradictory to the aforementioned benefits, further studies reveal diverging insights, implying value destructions that occur though M&As. Already in earlier studies, Porter (1987) and Young (1981) claimed a high failure rate and a declining value of target companies after the completion of the acquisitions. More quantitatively validated, further scholars support Porter and Young and reveal post-acquisition failure rates ranging from 40 to 60 percent (Bower, 2001) or even 70 to 90 percent (Christensen, Alton, Rising, & Waldeck, 2011). The strategic and organizational misfit between acquirer and the target company is

often the principal reason for the high failure rate. Generally, scholars suggest a positive relationship of companies' strategic fit and the post-acquisition value creation and success (Datta, 1991; Homburg & Bucerius, 2006; King, Dalton, Daily, & Covin, 2004). However, corporations are often rather solely incentivized by future profitability and competitive advantage and thereby neglect the importance of the strategic fit with its corporate partner. Moreover, organizational fit considers the similar characteristics of management styles of corporations that eventually constitute influencing aspects on the value creation and performance in the post-acquisition time period (Datta, 1991). Consequently, in this regard family ownership and their dominant control can be an underlying reason for firms to refrain from M&As caused by the diverging corporate perspectives and strategic intentions between family and non-family firms and their respective managements.

2.4. The Influence of Family Ownership on M&A Investments

A growing body of empirical research investigates the company's ownership structures as a fundamental determinant of corporate investment decisions (Fahlenbrach, 2009; Caprio et al., 2011). Yet, earlier studies in this field considered ownership structures more generally and neglect the differentiation between different ownership types and their varying impacts on strategic investments respectively. A relatively new research stream on ownership structures developed, specifically focusing on aspects of family control and ownership. Therein, family-controlled companies are considered as corporations pursuing conservative strategic investment decisions compared to firms with less family influence (Gómez-Meji et al., 2007; Carney, 2005; Schulze, Lubatkin, & Dino, 2003). Further empirical studies confirm the families' conservatism towards investments by ascertaining statistically significant levels of risk-aversion in family dominated firms (Naldi et al., 2007; Gómez-Mejiaet al., 2007).

Contrary to the general implication of Lemmon et al. (2003), who states that the majority of shareholders predominantly has a profit-maximizing interest, families pursue other objectives, which are not purely economically motivated (Fernando, Schneible Jr, & Suh, 2014). Hereby, socioemotional wealth (SEW) preservation influences the families' attitudes towards corporate strategic decisions. By means of SEW preservation, families primarily value non-financial and affective values instead of being financially motivated in the first place (Gómez-Mejia et al., 2007; Miller et al., 2013; Zellweger et al., 2012). Thereby, major concerns of family owners focus on the retention of their business control and guarantee the corporate longevity among future family generations (Arrègle, Hitt, Sirmon, & Véry, 2007; Fiss &

Zajac, 2004; Gómez-Mejia et al., 2007). Consequently, being majorly concerned with the firm's continuity, dominating families tend to reduce corporate risk and discourage acquisitions in order to primarily avoid disruption of the close-knit social system (Miller, Lee, Chang, & Le Breton-Miller, 2009; Friedland, Palmer, & Stenbeck, 1990). The fact that M&A deals are associated with substantial financial equity, which may require increased debt from external parties, leads to the families' fear to lose control in the corporations (Dreux, 1990; Jungwook & Hiroyuki, 2011). Additionally, M&As are generally associated with high risk and uncertainty regarding its post-acquisition performance. However, instead of purely focusing on the risks and costs associated with M&As, other researches acknowledge the increased value that can be achieved in the post-acquisition period. Accordingly, Sirmon & Hitt (2003) find that acquiring family firms can advance the corporate performance by "gaining access to and learning new resource configuration skills". Furthermore, Caprio et al. (2011) show evidence that European family firms destroy no value when they acquire other companies.

Despite the growing body of family firm literature, the relationship between family ownership and M&A activities is yet rudimentarily explored and just recently received increasing attention in the U.S (Holderness & Sheehan, 1988; Basu, Dimitrova, & Paeglis, 2009; Bauguess & Stegemoller, 2008; Klasa, 2007) and Canadian market (Ben-Amar & André, 2006). Furthermore, empirical studies in this research field predominantly focus on the differentiation between family and non-family businesses. However, considering the ambiguity of family firm definitions mentioned in Section 2.1, diverging applications of definitions among empirical studies prevent the generalization and comparison of the findings and implications respectively. Consequently, by solely focusing on the differentiation between family and non-family firms, scholars neglect the influence of the varying *degree* of family ownership in companies. Furthermore, most studies are broadly focused on the relationship between ownership structures and corporate performance (Goergen & Renneboog, 2004; Andrade, Mitchell, & Stafford, 2001) but disregard the investigation of M&A investments as a potential driver as a step before the actual improved corporate performance. Due to the aforementioned contradicting research streams and yet unexplored topic of family ownership and M&A acquisitions, the following hypothesis is posed:

Hypothesis 1: *The degree of family ownership is negatively related to the deal value of corporate M&A investments.*

2.5. Family Ownership vs. Institutional Ownership

Institutional investors are entities such as banks, insurance companies, financial institutions and mutual funds (Bushee, 1998). In comparison to family individuals, institutional investors are often more informed through their expertise and professional analysts and have more explicit focus and attention dedicated to complex corporate financial information (Hirshleifer & Teoh, 2003; Utama & Cready, 1997). Whereas institutional investors with a relatively small stake in a company are more motivated to buy and sell stocks in the short-term (Barber, 2008), increasing institutional ownership stakes are associated with higher incentives for improved corporate performance in the long-term (Kochhar & David, 1996; Shleifer & Vishny, 1986). However, even though both family owners and institutional owners tend to be incentivized by long-term performance, the underlying motivations are different. As noted above, whereas family owners prefer non-financial, socioemotional wealth (Zellweger et al., 2012; Gómez-Mejia et al., 2007), institutions primarily only seek high financial returns on their investments in the corporation (Berrone, Cruz, & Gómez-Mejía, 2012; Kellermanns, Eddleston, & Zellweger, 2012). Moreover, compared to institutional investors, possessing highly diversified corporate portfolios, families' risk aversion often derives from their undiversified portfolios and investment stake in only one company and therefore triggers the reluctance to invest (Zhang, 1998; Pindado et al., 2011; Anderson & Reeb, 2003). Whereas the SEW preservation in firms with higher family control triggers less acquisitions in order to avoid putting the company at risk, despite the investments' positive net present value, institutional investors tend to make rather rational and quantitative-based decisions (Anderson & Reeb, 2003; Bauguess & Stegemoller, 2008; Sraer & Thesmar, 2007; Caprio et al., 2011; Wei & Zhang, 2008). In order to investigate how the degree of ownership between both types differs with regard to M&A investments, the following hypothesis is being posed:

Hypothesis 2: *The degree of institutional ownership is positively related to the deal value of corporate M&A investments.*

2.6. Corporate Entrepreneurship

Generally, corporations are not necessarily only dependent on M&As in order to access new resources and knowledge. In fact, the value of internal entrepreneurial activities is strikingly omnipresent. Transforming new opportunities with its limited resources, corporations can achieve a leading competitive edge relative to their competitors (Zahra & Dess, 2001; Shane & Venkataraman, 2000). Corporate entrepreneurship is defined as the "process of

organizational renewal that has distinct but related dimensions: innovation, strategic renewal and venturing" (Zahra S., 1993) and is considered as an important factor that contributes to the firm's success (Zahra S., 1996; Zahra, Hayton, & Salvato, 2004). Based on the initial definition of corporate entrepreneurship through Zahra (1993), further scholars revealed broader insights about the individual components of corporate entrepreneurship. Therein, a coherent strand of studies converges to a set of corporate behavior that facilitates corporate entrepreneurship, in particular referring to pro-activeness, risk-taking and innovativeness (Covin & Slevin, 1990; Dean, Meyer, & DeCastro, 1993; Lumpkin & Dess, 1996). Therein, the aforementioned entrepreneurial components are considered to be mutually reinforcing. Whereas innovation is the ability to create and introduce new products (Zahra S. , 1993; Lumpkin & Dess, 1996; Covin & Slevin, 1991), pro-activeness represents the corporations' entrepreneurial tendency to support activities for new market opportunities and achieve a first-mover advantage in its industry (Zahra & Garvis, 2000). Moreover, companies characterized by its risk-taking tendency, support the previously mentioned engagements of innovation and pro-activeness and thus support innovative projects despite its uncertainty and the limited level of available resources. (Zahra & Garvis, 2000; Ireland et al., 2006).

Another strand of empirical studies reveal improved financial results, growth and profitability for companies adopting corporate entrepreneurship (Kuratko, Ireland, & Hornsby, 2001; Zahra & Covin, 1995; Zahra & Garvis, 2000). Therein, the underlying reasons often differentiate among studies. On the one hand, corporate entrepreneurship brings about benefits of newly developed, tangible resources (Borch, Huse, & Senneseth, 1999), whereas on the other hand further studies point out the benefits of intangible benefits, in particular knowledge creation and skill development, which eventually again facilitate internal innovation (Zahra, Nielsen, & Bogner, 1999).

2.6.1. Family Ownership and the Role of Corporate Entrepreneurship

The high risk-aversion and conservatism of family firms is not necessarily limited to investments in M&As (Bauguess & Stegemoller, 2008; Sraer & Thesmar, 2007). In fact, scholars investigated innovation in family firms but results are yet inconclusive (Duran, Kammerlander, van Essen, & Zellweger, 2016). Whereas some empirical studies imply a negative relationship between family firms and innovation (Chen & Hsu, 2009; Chrisman & Patel, 2012; Munari, Oriani, & Sobrero, 2010), other scholars provide evidence for a positive relationship (Gudmundson, Tower, & Hartman, 2003; Kim, Kim, & Lee, 2008; Llach &

Nordqvist, 2010). Moreover, Kellermanns and Eddleston (2006) determine a general pattern of low risk- and change-seeking behavior in family firms.

Even though research provides evidence for a positive effect of entrepreneurship on performance in family firms (McCann, Leon-Guerrero, & Haley, 2001), the available literature majorly disregards the focus on how a changing degree of family ownership may influence the generally positive effect (Kellermanns & Eddleston, 2006). Moreover, there are yet diverging findings and implications. Whereas Caprio et al. (2011) claim uncertainty avoidance and conservatism investment behavior of family firms compared to non-family firms, current economic insights show contrary results. Therein, families control more than 50 percent of the most innovative, large European companies (Duran et al., 2016), whereof a large number of family-controlled, small-medium enterprises are even innovation leaders in their specific markets (Fiss & Zajac, 2004; Simon, 1996). Consequently, similar innovation-seeking incentives of M&As and corporate entrepreneurship, diverging findings in previous studies, and the fact that Hitt, Hoskission and Ireland (1990) generally consider M&As as substitutes for innovation, yield the question whether the existence of both is mutually exclusive in a corporation. Thus, the question arises, whether corporations that support internal entrepreneurial activities are less prone to invest in M&As and vice versa. Therefore, the following hypotheses are being developed:

Hypothesis 3: *Corporate entrepreneurship negatively moderates the relationship between family ownership and the deal value of corporate M&A investments.*

Hypothesis 4*:* *Corporate entrepreneurship negatively moderates the relationship between institutional ownership and the deal value of corporate M&A investments.*

Unlike M&A investments that entail new stakeholders, corporate structures and ownership distributions, corporate entrepreneurship does not directly affect families' socioemotional wealth, despite its association with uncertain and risky financial investments. Consequently, particularly in firms with higher family ownership, corporate entrepreneurship activities are assumed to substitute M&A investments. Therefore, the following hypothesis is being posed:

Hypothesis 5*:* *The moderating effect of corporate entrepreneurship is significantly more negative for firms with higher family rather than institutional ownership.*

2.7. Family Members in Management Positions

High ownership stakes and the involvement in management positions are the principal patterns how families tend to maintain control in a company (La Porta, Lopez-de-Silanes, & Shleifer, 1999). However, management boards in family firms do not necessarily consist of family members, who can exert a say on the corporate strategic decision-making (Corbetta & Montemerlo, 1999). Whereas some family firms decide to hire external professional managers, other firms rely on the competences of their family members, whereof management positions often derive from the family's high ownership stakes (Lemmon, Lins, & Davidson, 2003). Generally, in firms with high family ownership stakes, a bias to prefer family members to external professionals in management teams may exist. This could lead to unfavorable selections, due to their limited pool of available individuals and consequently may forfeit the competences of qualified external managers (Cerrato & Piva, 2012; Van den Berghe & Carchon, 2003; Bennedsen, Nielson, Pérez-Gonzàlez, & Wolfenzon, 2007).

With regard to the differences of management teams with family members and external professionals, diverging findings and implications indicate that neither configuration is ultimately optimal and both have their shortcomings. Family managers are often personally more affected by the risk of failure due to their combined responsibility of ownership and management in the corporation (Cerrato & Piva, 2012). This implies that management teams consisting of family members exhibit less strategic change (Brunninge, Nordqvist, & Wiklund, 2007), are less likely to export (Cerrato & Piva, 2012) and avoid strategic investment decisions in uncertain innovation projects or internationalization. This enforces the aforementioned implications of sole ownership stakes on the risk-averse behavior and the avoidance of complex acquisitions (Ward, 2004). Similar results are derived from researches that take on the opposite perspective, investigating the effect of non-family professional managers in management teams. Those are considered to exert more productivity (Maury, 2006), profitability (Anderson & Reeb, 2003) and management's tendency to support company's innovation activities by creating supportive conditions for implementation (Burgelman, 1991; West, et al., 2003; Crossan & Apaydin, 2010).

Despite the negative implication on the combination of family ownership and management, the separation neither achieves positive conclusions and rather fosters unfavorable misalignments of interests (Burkart et al., 2003) and shared strategic visions (Ensley & Pearson, 2005). Consequently, this nurtures the principal-agent problem favoring suboptimal

investments (Kirchmaier & Grant, 2005). Furthermore, a coherence of implications among scholars indicate higher value, greater efficiency as well as higher return on investments for companies with combined ownership and management (Villalonga & Amit, 2006; Castillo & Wakefield, 2006; McConaughy, Matthews, & Fialko, 2001).

Recent studies in the family business context mainly focus on the general involvement of families in companies but disregard the differentiation between ownership and management (Claessens et al., 2002; Anderson & Reeb, 2003; Cronqvist & Nilsson, 2003; Chua et al., 1999; Dyer, 2006) Recently, only a few studies, such as Chrisman et al. (2004), focus on the separate investigation of family involvement. A clear differentiation, however, can reveal new implications on companies' strategic decisions, which can be more predominant with families' involvement in the management rather than just exerting control through their ownership stakes (Caprio et al., 2011). Furthermore, Block et al. (2013) find out that the family firm effect is more driven by family management than ownership, while Chu (2011) considers the effect more pervasive when ownership and management is combined. The incoherent conclusions about the combination and separation of ownership and management as well as its possibly differentiating implications, lead to the following hypothesis:

Hypothesis 6: *The relationship between family ownership and the deal value of corporate M&A investments is negatively moderated if the families jointly possess controlling ownership stakes and management positions.*

3. The Research Model

Instead of focusing on the differentiation between family and non-family firms, the scope of this research investigates the relationship between the *degree of ownership,* held by families and institutions, and M&A investments. Throughout the literature review, the identical characters and intentions of corporate entrepreneurship and M&A activities became apparent. Consequently, corporate entrepreneurship is considered as a moderating effect in order to investigate whether both M&As and corporate entrepreneurship are mutually exclusive or co-existing in the corporate setting. Moreover, previous researches only rudimentarily focused on the differentiating effects of ownership and management, whereas some implied that the combination of both has a more pervasive effect on strategic decisions. Therefore, family

members in top management teams are integrated in the research model as an additional moderation. Ultimately, the research model can be visualized as in the following:

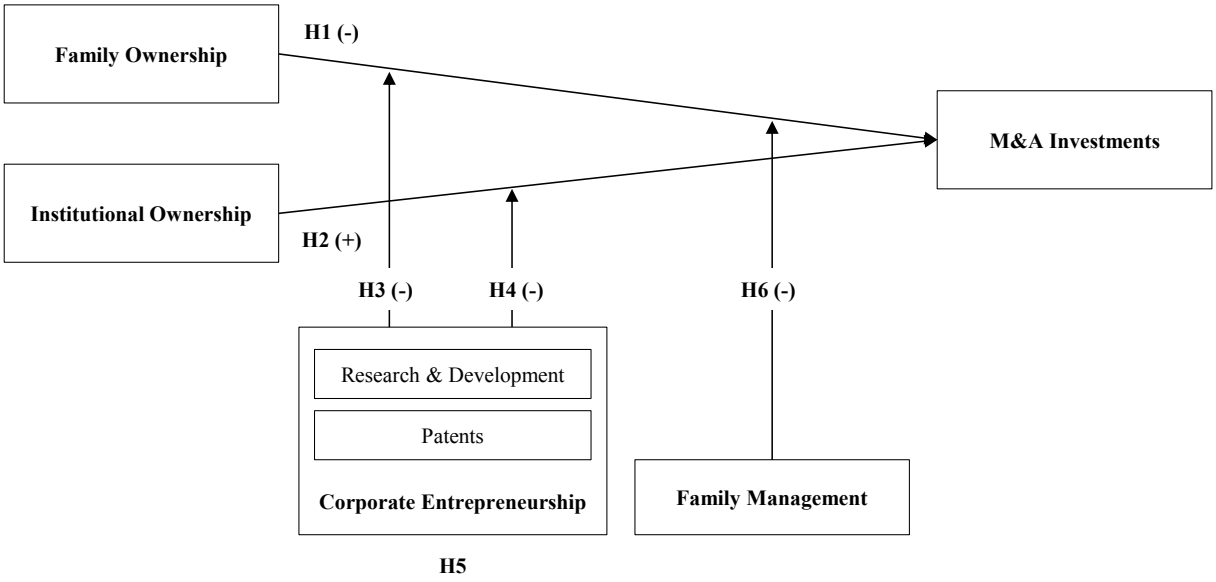

Figure 1 *- Research Model*

4. Methodology

The methodology comprises a detailed introduction of the applied research method, substantiating the underlying research approach to investigate the proposed hypotheses. Initially, this section describes the sampling method and operationalized measures for the statistical analysis, followed by the examination of the regression assumptions.

4.1. Context of the Study

Since the scope of this study specifically focuses on corporations in Germany, the unit of analysis is the German public and private organization and frames the level on which the research builds on. Contrary to previous empirical studies, the context of this research does not focus on the distinction between family and non-family firms but specifically examines the effects of varying degrees of family and institutional ownership on the intensity of M&A investments.

4.2. Sample

4.2.1. The German Corporation as the Unit of Analysis

Traditionally, family ownership is omnipresent in various European countries, whereof Germany is well known for the so-called German “Mittelstand”, which dominantly comprises

small and medium-sized enterprises (SME). The German "Mittelstand" accounts for the majority of all German businesses and is often associated with a high degree of family involvement, whether by means of their acquired ownership stakes or because they initially founded the business (Institut für Mittelstandsforschung, 2016). Furthermore, a report by Germany Trade & Invest (2013) revealed growing R&D endeavors of German corporations as part of their growth strategy. Apart from this, three German corporations are represented among the top five largest family business in Europe, such as Volkswagen" AG, Bayrische Motorenwerke (BMW) AG and the Schwarz Group (EY, 2015). Consequently, the current developments in the German corporate landscape, characterized by high corporate family ownership stakes, constitute favorable circumstances for the scope of this study.

4.2.2. Sampling Procedure

For the scope of this empirical study, the data sample is primarily derived from the two databases Orbis and Zephyr. Both databases are provided by Bureau van Dijk (BvD) and contain ownership structures and detailed financial information of more than 200 million companies, while also comprising an archive of global M&A deals and their respective deal values (Bureau van Dijk, 2016). Since both databases are derived from the same provider, the disfavor to combine two different databases is diminished. Therefore, the risk of incoherent and unreliable data combinations that influence the statistical analysis is no major concern. Since both databases assign a unique BvD identification number to each company, the M&A data records from Zephyr can be reliably matched with the ownership and financial data from Orbis to compile one complete dataset for the statistical analysis. In addition, unavailable data about ownership information, financial measures, R&D and patents is complemented with information derived from corporate websites and company's latest annual reports.

An initial sample consisting of 562 private and publicly listed German companies is drawn from the Orbis database. This sample guarantees the availability of all necessary data measures, which are introduced in Section 4.3, in order to conduct the statistical analysis.

Within the Orbis database, ownership stakes are clustered according to controlling shareholders and all general major shareholders of the corporation. A controlling shareholder is defined as an individual, a family or a corporation that has the power to control another corporation and monitor its corporate managers (La Porta et al., 2002). Adapting to the specific focus of this research on family ownership, the distinction is important, because

corporate majority shareholders are often categorized as industrial holding companies, which in turn are ultimately 100 percent owned by a family or individual. Hence, as a consequence, those families or individuals act indirectly but ultimately as the majority shareholder through their holding company. However, Orbis does not categorize those special cases as family ownership ("one or more named individuals or families") and consequently the primary focus of this research study would be diminished. The example of Volkswagen AG illustrates the necessity to complement the dataset accordingly: The majority shareholder of Volkswagen AG is Porsche Automobil Holding SE, owning 53.09 percent of the corporation and being identified as an "industrial company" shareholder type. However, as noted in Orbis, the ultimate controlling shareholder is the Porsche / Piech family, as they in turn fully own the Porsche Automobil Holding SE and consequently have a direct and ultimate influence on Volkswagen AG. Thus, being incentivized to achieve a complete and distinct investigation of family ownership in companies, the dataset is adapted accordingly. Consequently, if the majority shareholder of a company is not considered as "one or more named individuals or families" but as a company, which in turn is fully owned by an individual or family, the research considers the majority shareholder as "one or more named individuals or families".

In order to investigate the reliability of the Orbis database and the aforementioned adaption of the data, the HSG Global Family Index (GFI) serves as another source to cross-check the family ownership data in the sample. The GFI is composed by the Center for Family Business at the University of St. Gallen in corporation with the EY Global Family Business Center of Excellence and provides family ownership information of the 500 largest private and publicly listed family firms globally. The index comprises 87 German companies, which are considered as family firm, but not all are also contained in the Orbis sample. Since 70 out of the 87 companies in the GFI are privately held, the complete necessary information about patents, R&D expenditures and financial measures could not be retrieved from Orbis and thus are not included in the initial sample. However, considering the overlapping companies in both databases, a 100 percent match of family ownership information is validated. Additionally, corporate websites, shareholder information and annual reports are cross-checked to ensure the reliability of the complemented sample.

Next, a sample of 9,343 M&A deals, completed in 2007 – 2015 and with the involvement of a German acquirer is retrieved from Zephyr. The individual BvD identification numbers allows matching both databases and yields a match with 108 companies from the Orbis sample. 454

companies (81%) of the initial Orbis sample did not close any M&A deal within the specified time period and are assigned a zero as a measure of deal values respectively. However, in order to avoid a predominant effect in the dependent variable as well as problems with regard to the sample skewness and the violation of normal distribution, the companies without any M&A investments are excluded from the final sample. Consequently, the completion of the final step in the sampling procedure yields a complete sample of 108 private and publicly listed German companies matched with their respective M&A investments.

4.3. Measures

4.3.1. Dependent Variable

Deal value of M&A Investments (lnInvestMA). A firm's degree of M&A investment is measured as a totalized continuous variable indicating the total amount spent on M&A deals in the period from 2007 – 2015. Since all M&As include a German acquirer, the deal values are uniformly provided in Euro and thus currency conversions are avoided. To provide a better relative comparison of investment deals in the sample and to avoid a strong skewness, the dependent variable is transformed by means of the natural logarithm and is labeled *lnInvestMA*.

4.3.2. Independent Variable

Family Ownership (FamOwn). Family ownership is a continuous variable measuring the degree of ownership a family or an individual person holds in the corporation. The measure is represented as a percentage of the total outstanding shares owned by a family or individual. It is labeled as *FamOwn* and can take on the value from 0 to 100 percent. In order to endorse the reliability of the ownership stakes, the Orbis data is cross-checked with the HSG Global Family Index as well as shareholder structures on corporate websites and reports. The data for family ownership is retrieved from Orbis for the latest available year 2015.

Institutional Ownership (InsOwn). Institutional ownership is the second independent variable influencing M&A investments and moreover serves as a reference to observe differentiating effects compared to the influence of family ownership. Banks, insurance companies, financial institutions and mutual funds are considered as institutional owners (Bushee, 1998). In order to represent the degree of ownership held by institutions, the respective ownership stakes in the sample are summed together. Consequently, the degree of ownership stake is represented as one continuous variable and operationalized as the percentage of the total outstanding

shares owned by institutions ranging from 0 to 100 percent. The data for institutional ownership is also retrieved from Orbis for the latest available year 2015.

4.3.3. Moderation

Corporate Entrepreneurship. Research consistently describes the characteristics of corporate entrepreneurship as pro-activeness, risk-taking and innovativeness (see Section 2.6). Consequently, in order to comprehensively capture the moderating influence, two complementary variables are introduced as a measure of corporate entrepreneurship: (1) patents and (2) research and development (R&D). Patents and R&D are frequently applied as a measure of a company's innovativeness (Duran et al., 2016). Whereas R&D represents a proxy for innovation input to generate product and process innovation, patents are considered as a measure for the actual innovation output (Duran et al., 2016). Consequently, R&D is operationalized as the ratio of average R&D expenditure between 2012-2015 to the average total monetary value of sales respectively. The R&D ratio is labeled as *RD* and allows capturing the firm's relative commitment to internal innovation. Patents are operationalized as the total number of patents granted to the company and are labeled as *Patent*. Consequently, to test for the moderating effect, two-way interaction terms for *RD* and *Patent* with the independent variables are generated separately and labeled as *CEFam_Patent (FamOwn*Patent)*, *CEFam_RD (FamOwn*RD)*, *CEIns_Patent (InsOwn*Patent), CEIns_RD (InsOwn*RD)*. This allows investigating the measures of corporate entrepreneurship also in separate regression analysis in order to observe the moderating effect for each variable individually.

Family Management (FamMgmt). As indicated by Block et al. (2013), the effect on strategic decisions may be more driven when families are represented in management teams rather than only through the ownership stakes in the company per se. In order to examine the moderating effect of family management, the interaction variable *FamMgmt* is introduced, computed by multiplying the independent variable *FamOwn* and the dummy variable *FamMgmt*. For each individual corporate shareholder, Orbis reveals a record whether the shareholder is additionally represented in the management board of the company respectively. Hence, if a shareholder is classified both as "one or more named individuals or families" and as a "Manager", the dummy variable attains the value $FamMgmt = 1$, otherwise $FamMgmt = 0$.

4.3.4. Control Variables

To control for unintended effects that may bias the regression of the proposed conceptual model, several control variables are introduced to the regression model. Thereby, the company size, leverage ratio, total amount of M&A deals as well as possible industry effects are considered. The data for all control variables is retrieved from Orbis for the latest available year 2015.

Company Size (lnSize). The difference between large corporations, such as the Robert Bosch GmbH employing about 375,000 employees, compared to smaller entities such as the 3U Holding AG with only 150 employees, could be an indication for the companies' diverse access to resources in order to finance M&A investments. The size of the sample companies is measured in terms of the total number of employees. In order to allow for comparison of the firm sizes as well as to account for the high disparity in the sample, it is measured as the natural logarithm of the total number of employees and labeled as *lnSize*.

Leverage Ratio (Leverage). The leverage ratio serves as a financial measure to indicate how much capital a corporation derives from debt with respect to its total corporate assets. Since previous studies predominantly indicate a negative relationship between the company's leverage and its investments (Aivazian et al., 2005; Ahn et al., 2006) the effect is controlled for in the regression model. Since a measure of leverage is not readily available in the Orbis database, it is computed manually as the ratio of long-term debt over total assets.

Industry effects. Since different industries may vary with regard to their investment intensity, the regression model controls for industry effects. The NACE Rev. 2 categorization in Orbis, which represents the statistical classification of economic activities in the European Community (Eurostat, 2008), allows to create dummy variables for each industry respectively. In the final sample, 4 out of the total 18 different industries are predominantly represented, hence each of the 4 industries accounts for an individual dummy variable, while the other industries are represented as an aggregated variable. Consequently, the following dummy variables are introduced: "Manufacturing" as *IndustryM*, "Information and Communication" as *IndustryI*, "Electricity, Gas, Steam and Air Conditioning Supply" as *IndustryE*, "Transportation and Storage" as *IndustryT* and the grouped residual industries are labeled as *IndustryOther*.

Count of M&A Investments (CountInvestMA). Since Orbis does not provide yearly ownership data but only for 2015, only a single totalized measure for the dependent variable *lnInvestMA* is considered in the analysis with all M&As until 2015. Consequently, if companies engage in more M&As within the defined time period, the respective M&A deal value may be higher compared to companies that only closed one M&A deal in total. In order to account for the amount of M&A deals that generates the totalized measure of *lnInvestMA*, the regression model controls for this effect accordingly. The variable is labeled as *CountInvestMA*

4.4. Statistical Method

In order to analyze the proposed hypotheses, a study on cross-sectional data is conducted. Since both independent variables and the dependent variable are continuous, an ordinary least square (OLS) linear regression appropriately serves as the statistical method to test the relationships. At first, a control model is regressed, including the respective control variables considered in this research. Subsequently, each hypothesis is investigated separately by means of individual regression models and thereupon compared to the control model. The comparison with the control model allows to assess whether the model with the respective variables under investigation explains more of the variance in the dependent variable (R^2). Hence, the independent variables *FamOwn* and *InsOwn* as well as the respective moderating variables are investigated individually through separate regressions.

4.4.1. OLS Regression Assumptions

Before conducting the regression analysis, the required assumptions of OLS regressions are tested to assure that the data is suitable for the intended statistical analysis: (1) multicollinearity, (2) normal distribution, (3) linearity and (4) homoscedasticity.

Multicollinearity. The assumption of multicollinearity is violated if the independent variables are highly correlated and consequently limit the research conclusions of the intended conceptual model, as it weakens its statistical power (Landau & Everitt, 2004). *Table 2* illustrates the correlation table and allows to check whether the independent variables show a significantly high correlation. Moreover, the investigation of the Variance Inflation Factor (VIF) explains whether the correlations actually influence the test statistics of the regression outputs. According to Landau and Everitt (2004), values above 10 constitute a concern for multicollinearity in the regression. However, the VIF values in the regression outputs do not exceed the critical VIF value, thus the assumption of multicollinearity is not violated.

Normal distribution. *Appendix A* contains the overview of all histograms for each regression model and illustrates a relatively normal bell-shaped curve for the frequency of the standardized residuals. Moreover, by means of the Kolmogorov-Smirnov statistic, the normality can be assessed quantitatively. The test statistic indicates an insignificant result (Sig. > 0.05) and emphasizes the validation of the normal distribution assumption.

Linearity. *Appendix B* depicts the regression scatterplots for each regression model, showing the standardized predicted values (x-axis) against the standardized residuals (y-axis) without any indication of a curvilinear pattern. Instead, the approximation of the residuals locates around a horizontal line at the value of 0. Therefore, the assumption of linearity for each model is satisfied.

Homoscedasticity. To assess the violation of the homoscedasticity assumption, the shape of the scatterplot cluster should not funnel out, as this would indicate that the variance of errors increases with an increase in the predicted value (*Appendix B*). The scatterplots of each regression model illustrates an equal distribution of standardized residuals along a horizontal line at zero, indicating that the assumption of homoscedasticity is not violated.

5. Statistical Analysis and Results

The following section describes the statistical analysis. First, the descriptive statistics of the sample and the variables' correlations are interpreted by means of a Pearson correlation matrix. Thereafter, the regression analysis investigates the relationship between the independent and dependent variables, while also considering the influence of the moderation of corporate entrepreneurship and family management.

5.1. Descriptive Statistics

The descriptive statistics in *Table 1* provides an initial overview and understanding about the employed variables in the data sample. Considering the corporate ownership structures, families hold on average a higher ownership stake of 18.14 percent compared to institutions with an average of 10.74 percent. Consequently, even though it is not specified in *Table 1*, the residual corporate shareholders jointly hold on average 71.12 percent of ownership. Interestingly, only 3 percent of the sample companies have a family member being

represented in the corporate management board in addition to their majority ownership stake in the company. In particular, the corporations with combined family involvement are 3U Holding AG, 7C Solarparken AG and Axel Springer SE. Generally, the sample represents a broad variety of firms by means of company size, ranging from 9 employees at Pyrolyx AG to 610,076 employees at the globally operating corporation Volkswagen AG.

Variable	n	Minimum	Maximum	Mean	SD
InvestMA	108	341	17156499	1539524	3594247
FamOwn	108	0	100.00	18,14	27.38
InsOwn	108	0	93.88	10,74	16.65
Patent	108	1	188975	4970	21679
RDIntensity	108	0	2.21	0.075	0.228
Size	108	9	610076	39993	97430
Leverage	108	0	0.7590	0.1667	0.1657
CountInvestMA	108	1	13	2.4	2.2
FamMgmt	108	0	1	0.03	0.17
IndustryM	108	0	1	0.57	0.50
IndustryI	108	0	1	0.14	0.35
IndustryE	108	0	1	0.06	0.23
IndustryT	108	0	1	0.06	0.23
IndustryOther	108	0	1	0.18	0.38
Valid N (listwise)	*108*				

Table 1 *- Descriptive Statistics*

In the period of 2007 – 2015, German corporations invested on average 1,539,524,000 Euro to strike up M&A deals with a corporate partner. In this time period, Bio-Gate AG represents the company with the least undertaken investments of 341,000 Euro, whereas E.ON SE invested in total 17,156,499,000 Euro in M&As. Generally, the deal values may be inflated by the fact that companies forged varying numbers of M&A deals in the mentioned time period. To be precise, companies stroke up on average between 2 and 3 M&A deals. However, even though E.ON SE is represented with the highest investment deal value in the sample, the corporation undertook only 4 M&A deals in total. Contrarily, Siemens AG with the second largest investment deal value of 16,697,147,000 Euro stroke up 13 M&A deals.

Furthermore, an average leverage ratio of 0.1667 indicates that the sample of German companies investing in M&As generally prefer equity based capital structures over debt,

which makes them less vulnerable during economic downturns. The low mean leverage ratio is supporting the socioemotional wealth preservation and families' high risk-adversity as mentioned in Section 2.4 (Gómez-Mejia et al., 2007; Miller et al., 2013; Zellweger et al., 2012). Moreover, the descriptive statistics illustrates the distribution of industries the companies operate in. More than half of the sample largely represents companies in the manufacturing industry (57%) whereas another dominant group of companies belongs to the information and communication sector (14%). The electricity, gas, steam and air conditioning supply industry as well as transportation and storage industry is only marginally represented (6%). The remaining sectors with only one or two represented companies in the sample respectively, are illustrated jointly as *IndustryOther* and represent 18 percent of the sample.

The operationalized measures of corporate entrepreneurship generally illustrate a high tendency of corporate internal innovativeness, considering the high amount of 4,970 patents on average. Moreover, the risk-adversity attitude towards uncertain investments in R&D is observable, indicating a R&D intensity of only 7.5%. This means that companies invest 7.5% of the revenues from total sales in R&D. The underlying reason for the low average ratio could lie in the fact that the majority of companies in the sample represent the manufacturing sector, which is not necessarily investing as much in R&D compared to the pharmaceutical industry, which is not notably represented in the sample

5.2. Pearson Correlation

Table 2 represents the Pearson Correlation Matrix and illustrates the strength of the linear relationship between the defined variables of this study. Considering the dependent variable *lnInvestMA* of the proposed research model, the degree of M&A investments is strongly positively correlated with *lnPatent* ($r = 0.503$, Sig. < 0.01), *lnSize* ($r = 0.661$, Sig. < 0.01) and *CountInvestMA* ($r = 0.493$, Sig. < 0.05) and shows a moderate positive correlation with IndustryE ($r = 0.165$, Sig. < 0.10). Moreover, R&D intense companies ($r = -0.181$; Sig. < 0.10) and companies in the information and communication industry, ($r = -0.187$, Sig. < 0.10) generally spend less on M&A investments. Family ($r = 0.065$, Sig. $= 0.506$) and institutional ownership ($r = -0.072$, Sig. $= 456$) indicates no significant correlation with *lnInvestMA*.

Further considering the main independent variables of the research Model (*Figure 1,* p. 20), family ownership shows a significant negative correlation with institutional ownership ($r = -0.195$, Sig < 0.05). The correlation is reasonable as both variables are mutually dependent.

Pearson Correlation	lnInvestMA	FamOwn	InsOwn	lnPatent	RDIntensity	FamMgmt	lnSize	CountInvestMA	Leverage	IndustryM	IndustryI	IndustryE	IndustryT	IndustryOther
lnInvestMA	1.000													
FamOwn	0.065	1.000												
InsOwn	-0.072	**-0.195****	1.000											
lnPatent	**0.503*****	**0.165***	-0.026	1.000										
RDIntensity	**-0.181***	-0.090	0.010	0.062	1.000									
FamMgmt	-0.053	**0.167***	-0.037	**-0.184***	-0.053	1.000								
lnSize	**0.661*****	-0.012	0.022	**0.574*****	**-0.225****	**-0.181***	1.000							
CountInvestMA	**0.493****	-0.003	0.016	**0.361*****	-0.089	0.070	**0.384*****	1.000						
Leverage	0.123	-0.102	0.117	-0.035	-0.085	**0.216****	-0.031	0.078	1.000					
IndustryM	0.036	**0.220****	-0.134	**0.364*****	0.132	0.032	0.056	0.065	**-0.169***	1.000				
IndustryI	**-0.187***	-0.040	-0.107	**-0.291*****	-0.040	0.095	**-0.175***	0.041	0.061	**-0.466*****	1.000			
IndustryE	**0.165***	-0.060	-0.042	-0.155	-0.070	-0.041	0.082	0.006	0.012	**-0.282*****	-0.097	1.000		
IndustryT	0.151	-0.118	0.033	-0.076	-0.075	-0.041	**0.196****	-0.106	**0.225****	**-0.282*****	-0.097	-0.059	1.000	
IndustryOther	-0.067	-0.142	**0.276***	-0.069	-0.047	-0.078	-0.081	-0.061	0.021	**-0.536*****	**-0.186***	-0.112	-0.112	1.000

*** Sig. < 0.01; ** Sig. < 0.05; * Sig. < 0.10

n = 108

Table 2 *– Pearson Correlation Matrix*

Thus, companies with a high family ownership are associated with less institutional corporate shareholders and vice versa. Moreover, *FamOwn* indicates a significant positive correlation with *IndustryM* (r = 0.220, Sig. < 0.05) and a marginally significant positive correlation with *lnPatent* (r = 0.165, Sig. < 0.10) and *FamMgmt* (r = 0.167, Sig. < 0.10). Institutional ownership, however, does not indicate any significant relationship with any other variable of interest, except for the correlation with *IndustryOther* (r = 0.276, Sig. < 0.10).

The operationalized measures of corporate entrepreneurship indicate that larger companies spend less on R&D relative to their sales, but achieve to register more patents generally. This relationship is indicated by the significant negative correlation between *lnSize* and *RD* (r = -0.225, Sig. < 0.01) and the positive correlation between *lnSize* and *lnPatent* (r = 0.574, Sig. < 0.01). Moreover, companies that close more M&A deals possess more patents (r = 0.361, Sig. < 0.01). With regard to the corporate entrepreneurship measures, manufacturing companies tend to have more approved patents (r = 0.364, Sig. < 0.01) unlike companies in the information and communication industry, showing a negative significant correlation between *IndustryI* and *lnPatent* (r = -0.291, Sig. < 0.01). Lastly, in line with previous assumptions explained in Section 4.3.4, larger companies are associated with more M&A deals (r = 0.384, Sig. < 0.01).

5.3. Regression Analysis - Hypothesis Testing

By means of the OLS regression, the proposed hypotheses are tested and the results are presented in *Table 4* and *Table 5*. First the main effect of the independent variable, family ownership (*FamOwn*), on the degree of M&A investments (*InvestMA*) is investigated. Subsequently, similar investigations about the influence of institutional ownership (*InsOwn*) are realized. Since corporate entrepreneurship is measured with two variables, both the moderation of *lnPatent* and *RD* is tested separately as well as jointly in one model. This approach allows to investigate the moderation of corporate entrepreneurship as a whole, while also examining the differing effect of both underlying variables respectively.

At first, *Model 1* contains all control variables in order to investigate their jointly predicting power of M&A investments. The model is statistically significant (F(7,100) = 17.098, Sig. < 0.001) and explains 54.5% of the total variance in the dependent variable (R^2 = 0.545). The coefficients *lnSize* (β = 0.512, Sig. < 0.01) and *CountInvestMA* (β = 0.297, Sig. < 0.01) are significant positive predictors of M&A deal investments (*lnInvestMA*) and thus significantly

contribute to the high explanatory power of *Model 1*. Notably, the coefficients of *lnSize* and *CountInvestMA* are constantly significantly positive in all further regression models. *Model 1* serves as the reference model for all further regression analyses to examine the change in the models' explanatory power by including further variables

5.3.1. The Effect of Family Ownership on M&A Investments

Model 2 to Model 5 in *Table 4* illustrate the regression outputs for the relationship between the main effect of family ownership and the degree of M&A investments (see *Figure 1*, p. 20). Therein *Hypothesis 1* predicts a negative relationship between the degree of family ownership stakes in a corporation and M&A investments. Moreover, *Hypothesis 3* assumes that corporate entrepreneurship has a moderating effect on the aforementioned negative relationship.

In order to test *Hypothesis 1*, the independent variable *FamOwn* is introduced in *Model 2*, while controlling for the same variables as in *Model 1*. *Model 2* is statistically significant ($F(8,99) = 15.336$, Sig. < 0.001) and explains 55.3% of the total variance in *lnInvestMA*. However, the change of explanatory power is only marginally higher and insignificant (R^2 Change = 0.009, F Change (1,99) = 1.911, Sig. = 0.170). Contrary to the proposed direction of *Hypothesis 1*, the slightly positive coefficient of *FamOwn* ($\beta = 0.096$, Sig. = 0.170) suggests that higher family ownership leads to higher M&A investments, however, the coefficient is insignificant and consequently there is no support for *Hypothesis 1*.

Next, *Hypothesis 3* is being tested, introducing the complementary variables of corporate entrepreneurship, *CEFam_Patent* and *CEFam_RD*, in *Model 3* and *Model 4* to investigate their effects individually. Moreover, *Model 5* allows to investigate their joint predictive effect. *Model 3* is statistically significant, comprising the interaction variable *CEFam_Patent* ($F(10,97 = 13.602$, Sig. < 0.001) and indicates a significant change in the explanatory power compared to *Model 2* (R^2 Change = 0.030, F Change (2,97) = 3.531, Sig. < 0.05). Although the coefficient of *CEFam_Patent* is marginally significant ($\beta = 0.377$, Sig. < 0.10), the positive direction is not in line with the prediction in *Hypothesis 3* (*Figure 2*). This means that if companies possess a high amount of patents, the relationship between family ownership and M&A investments is positive. Completing the analysis of the moderation effect, *Model 4* interestingly reveals inconsistent regression outputs for *CEFam_RD*. The Model is statistically significant ($F(10,97) = 12.705$, Sig. < 0.001), explaining 56.7% of the total

variance of *lnInvestMA*. The coefficient of *CEFam_RD* indicates a marginally significant negative direction (β = -0.152, Sig. < 0.10), implying a negative moderating effect (*Figure 3*). In other words, higher family ownership leads to less M&A investments the more R&D intense companies are. In order to observe the joint effect of Patent and RD, *Model 5* includes both interaction variables and is statistically significant (F(12,95 = 11.473, Sig. < 0.001) explaining 59.2% of the total variance in *lnInvestMA*. Moreover, the change in its R^2 compared to *Model 2* is marginally significant at a 10% significance level (R^2 Change = 0.038, F Change (4,95) = 2.226, Sig. < 0.10). The coefficients indicate similar directions as in *Model 3* and *Model 4*, but are not statistically significant. Hence, taken together, the analysis provides partial support for *Hypothesis 3*, whereof only *RD* constitutes a significantly negative moderating effect on the relationship between *FamOwn* and *lnInvestMA*.

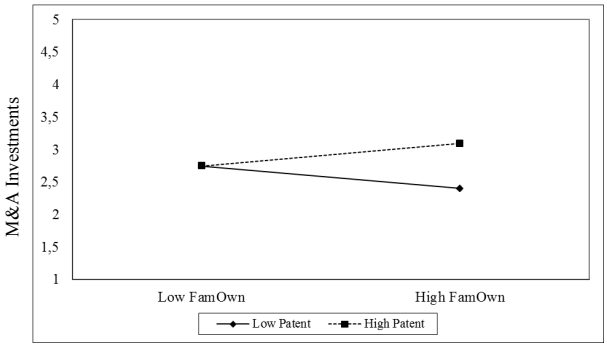

Figure 2 *–Moderation of Patents on Family Ownership*

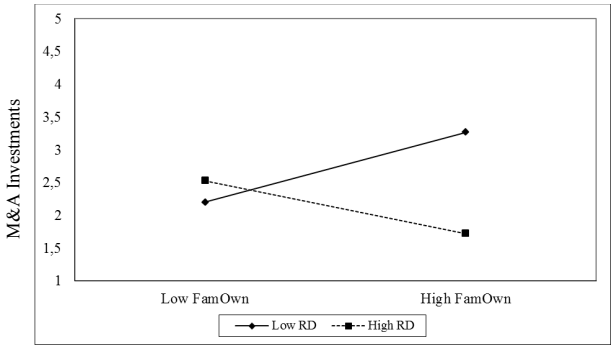

Figure 3 *– Moderation of R&D on Family Ownership*

5.3.2. The Effect of Institutional Ownership on M&A Investments

In the similar manner as the previous approach, the second main effect is being tested. To briefly recap, *Hypothesis 2* assumes a positive relationship between the degree of institutional ownership and M&A investments. As previously, however, *Hypothesis 4* similarly predicts a negative moderating effect of corporate entrepreneurship on the aforementioned main relationship.

To test *Hypothesis 2*, *Model 7* contains the independent variable *InsOwn*. The model is statistically significant (F(8,99) = 15.583, Sig. < 0.001) and explains almost the similar total variance of *lnInvestMA* as with the previous inclusion of *FamOwn* (*Model 2*), in particular 55.7%. Furthermore the change of explanatory power compared to the control model (*Model 1*) increased marginally but significantly (R^2 Change = 0.013, F Change (1,99) = 2.811, Sig. < 0.10). The coefficient of *InsOwn* shows a marginally significant negative impact on

lnInvestMA at the 10% significance level (β = -0.118, Sig. < 0.10). However, the negative coefficient is contrary to the hypothesized prediction and thus *Hypothesis 2* is rejected.

The statistical analysis of *Hypothesis 4* is based on the outcomes of *Model 8* to *Model 10* in *Table 5*. Thereof, *Model 8* investigates the moderating effect of corporate entrepreneurship on the relationship between institutional ownership and M&A investments by primarily including the interaction variable *CEIns_Patent*. Notably, contrary to the moderating effect on the previously investigated main relationship between family ownership and M&A investments (see Section 5.3.1), the coefficient indicates a significant and strongly negative moderating effect (β = -0.419, Sig. < 0.05). This means that a higher amount of approved patents reduces the corporations' investments in M&As with increasing institutional ownership. The inclusion of *CEIns_Patent* leads brings about a significant model (F(10,97) = 14.189, Sig. < 0.001) as well as a statistically significant change of the explanatory power compared to *Model 7* (R^2 Change = 0.037, F Change (2,97) = 4.369, Sig. < 0.05), explaining 59.4% of the total variance. On the contrary, the inclusion of *CEIns_RD* in *Model 9* does not indicate a statistically significant change of R^2 (R^2 Change = 0.010, F Change (2,97) = 1.101, Sig. = 0.337), and even though the coefficient indicates a negative direction, the variable is not significantly moderating the relationship (β = -0.126, Sig. = 0.148). *Model 10* jointly comprises both interaction variables, indicating similar directions of the coefficients, represented in a statistically significant model (F(12,95) = 11.736, Sig. < 0.001). Nonetheless, both coefficients are insignificant. Conclusively, *Hypothesis 4* is only partially supported, whereof patents indicate a strongly negative effect on the relationship between institutional ownership and M&A investments.

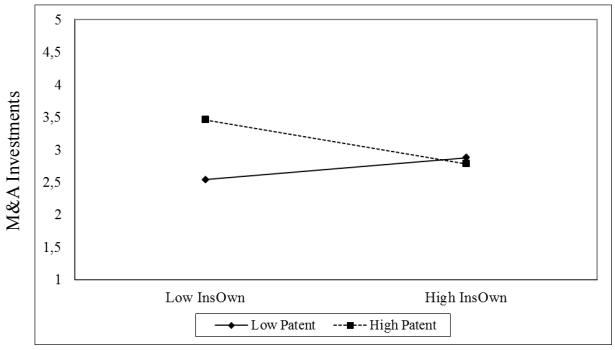

Figure 4
Moderation of Patents on Institutional Ownership

Comparing the respective models of each main effect in *Table 4* and *Table 5* reveals insights about the different moderating effects of corporate entrepreneurship on both main effect illustrated in the research model (*Figure 1,* p. 20). To quickly recap, *Hypothesis 5* predicts

that the moderation of corporate entrepreneurship is more statistically negative on the relationship between family ownership and M&A investments compared to the relationship with institutional ownership. Considering the coefficients of the interaction variables, only the coefficient of *CEFam_RD* (*Model 4*) indicates a statistically significant and more negative result compared to *CEIns_RD* (*Model 9*). Contrarily, the regression outcomes show inconsistent results for the moderation of patents, more specifically *CEFam_Patent* and *CEIns_Patent*. Whereas the interaction variable *CEFam_Patent* (*Model 3*) shows a positive and moderately significant coefficient, *CEIns_Patent* (*Model 8*) is negatively moderating effect on the relationship between *InsOwn* and *lnInvestMA*. Consequently, *Hypothesis 5* is only partially supported, considering the increased negatively moderating effect of *CEFam_RD* compared to *CEIns_RD*.

5.3.3. The combined effect of Ownership and Management in Families

Hypothesis 6 assumes a negative moderating effect on the relationship between family ownership and M&A investment when families jointly possess major ownership stakes and management positions in the company. *Model 6* in *Table 4* introduces the interaction variable *FamMgmt*. However, the variable only contributes marginally to an increased explanatory power of the model, leading to an insignificant change of explained total variances (R^2 Change = 0.001, F Change (2,97) = 0.068, Sig. = 0.935). Furthermore, the coefficient of *FamMgmt* is confirming the predicted negative direction, but is yet far from significant (β = -0.127, Sig. = 0.719) and thus do not provide support for *Hypothesis 6*. The respective findings are illustrated in *Table 3*.

Hypothesis	Model	Statistical Result
H1: *The degree of family ownership is negatively related to the deal value of corporate M&A investments.*	Model 2	Hypothesis **rejected**
H2: *The degree of institutional ownership is positively related to the deal value of corporate M&A investments*	Model 7	Hypothesis **rejected**
H3: *Corporate Entrepreneurship negatively moderates the relationship between family ownership and the deal value of corporate M&A investments.*	Model 3 - 5	Hypothesis **partially supported**
H4: *Corporate Entrepreneurship negatively moderates the relationship between institutional ownership and the deal value of corporate M&A investments.*	Model 8 - 10	Hypothesis **partially supported**
H5: *The moderating effect of corporate entrepreneurship is significantly more negative for firms with higher family rather than institutional ownership*	Model 3, 4, 8 and 9	Hypothesis **partially supported**
H6: *The relationship between family ownership and the deal value of corporate M&A investments is negatively moderated if the families jointly possess a controlling ownership stakes and management positions.*	Model 6	Hypothesis **rejected**

***Table 3** - Overview of the Regression Outcomes*

	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Complete Model		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Constant	**2.517*****	0.315		2.414***	0.322		**2.653*****	0.331		**2.382*****	0.343		**2.647*****	0.358		**2.405*****	0.329		**2.559*****	0.380	
lnSize	0.557	0.085	**0.512*****	0.557	0.084	**0.513*****	0.461	0.099	**0.424*****	0.568	0.086	**0.523*****	0.455	0.104	**0.419*****	0.558	0.087	**0.514*****	0.451	0.106	**0.415*****
Leverage	0.769	0.497	0.109	0.807	0.496	0.115	1.028	0.508	**0.146****	0.746	0.496	0.106	0.906	0.517	**0.129***	0.789	0.519	0.112	0.933	0.527	**0.133***
CountInvestMA	0.160	0.041	**0.297*****	0.161	0.041	**0.299*****	0.159	0.041	**0.296*****	0.155	0.041	**0.289*****	0.152	0.041	**0.283*****	0.164	0.042	**0.304*****	0.137	0.043	**0.254*****
IndustryI	-0.342	0.239	-0.102	-0.312	0.239	-0.093	-0.196	0.249	-0.058	-0.305	0.240	-0.091	-0.188	0.249	-0.056	-0.321	0.243	-0.096	-0.167	0.255	-0.050
IndustryE	0.566	0.349	0.112	0.613	0.350	**0.121***	0.760	0.362	**0.150****	0.594	0.349	**0.117***	0.756	0.362	**0.149****	0.611	0.353	**0.121***	0.771	0.363	**0.152****
IndustryT	0.266	0.375	0.053	0.336	0.377	0.066	0.447	0.384	0.088	0.324	0.375	0.064	0.454	0.384	0.090	0.339	0.381	0.067	0.409	0.386	0.081
IndustryOther	-0.030	0.215	-0.010	0.025	0.217	0.008	0.035	0.216	0.011	0.023	0.218	0.007	0.033	0.217	0.011	0.025	0.220	0.008	0.037	0.226	0.012
FamOwn				0.004	0.003	0.096	-0.010	0.008	-0.241	0.008	0.004	**0.191****	-0.005	0.009	-0.115	0.004	0.003	0.098	-0.006	0.010	-0.136
InsOwn																			0.010	0.015	0.137
lnPatent							0.046	0.106	0.050				0.076	0.109	0.083				0.162	0.134	0.176
RD										0.024	0.361	0.005	-0.138	0.366	-0.027				0.100	0.415	0.020
FamMgmt																0.848	2.499	0.120	0.388	2.428	0.055
CEFam_Patent							0.005	0.003	**0.377***				0.004	0.003	0.303				0.004	0.003	0.278
CEFam_RD										-0.075	0.043	**-0.152***	-0.055	0.044	-0.111				-0.050	0.046	-0.100
CEIns_Patent																			-0.006	0.007	-0.197
CEIns_RD																			-0.026	0.028	-0.101
FamOwnMgmt																-0.019	0.054	-0.127	-0.003	0.053	-0.017
Rsquare		0.545			0.553			0.584			0.567			0.592			0.554			0.616	
Adjusted Rsquare		0.513			0.517			0.541			0.522			0.540			0.508			0.544	
Rsquare Change		0.545			0.009			0.030			0.014			0.038			0.001			0.071	
F Change		**17.098*****			1.911(a)			**3.531****(b)			1.528(b)			**2.226***(b)			0.068(b)			1.671(a)	
Model Sig. (F)		< 0.001			< 0.001			< 0.001			< 0.001			< 0.001			< 0.001			< 0.001	
Hypothesis		**-**			**Hypothesis 1**			**Hypothesis 3**			**Hypothesis 3**			**Hypothesis 3**			**Hypothesis 6**			**-**	

*** Sig. < 0.01; ** Sig. < 0.05; * Sig. < 0.10

(a) compared to Model 1; (b) compared to Model 2; (c) compared to Model 7

Table 4 *– Results of the Regression Analysis, FamOwn (n = 108)*

	Model 1			Model 7			Model 8			Model 9			Model 10			Complete Model		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Constant	**2.517*****	0.315		**2.562*****	0.313		**2.382*****	0.317		**2.564*****	0.331		**2.487*****	0.347		**2.559*****	0.380	
lnSize	0.557	0.085	**0.512*****	0.560	0.084	**0.515*****	0.437	0.097	**0.403*****	0.560	0.086	**0.515*****	0.420	0.102	**0.387*****	0.451	0.106	**0.415*****
Leverage	0.769	0.497	0.109	0.859	0.496	**0.122***	0.886	0.483	**0.126***	0.854	0.497	**0.121***	0.833	0.490	**0.118***	0.933	0.527	**0.133***
CountInvestMA	0.160	0.041	**0.297*****	0.161	0.041	**0.299*****	0.131	0.040	**0.244*****	0.155	0.041	**0.289*****	0.131	0.041	**0.243*****	0.137	0.043	**0.254*****
IndustryI	-0.342	0.239	-0.102	-0.365	0.237	-0.109	-0.119	0.248	-0.036	-0.379	0.239	-0.113	-0.136	0.250	-0.040	-0.167	0.255	-0.050
IndustryE	0.566	0.349	0.112	0.554	0.346	0.109	0.810	0.356	**0.160****	0.533	0.347	0.105	0.813	0.358	**0.160****	0.771	0.363	**0.152****
IndustryT	0.266	0.375	0.053	0.283	0.372	0.056	0.412	0.377	0.081	0.235	0.373	0.046	0.429	0.380	0.085	0.409	0.386	0.081
IndustryOther	-0.030	0.215	-0.010	0.066	0.220	0.022	0.076	0.217	0.025	-0.006	0.226	-0.002	0.046	0.221	0.015	0.037	0.226	0.012
FamOwn																-0.006	0.010	-0.136
InsOwn				-0.008	0.005	**-0.118***	0.019	0.013	0.278	-0.004	0.006	-0.057	0.015	0.015	0.212	0.010	0.015	0.137
lnPatent							0.292	0.102	**0.317*****				0.280	0.106	**0.305****	0.162	0.134	0.176
RD										0.167	0.399	0.033	-0.049	0.400	-0.010	0.100	0.415	0.020
FamMgmt																0.388	2.428	0.055
CEFam_Patent																0.004	0.003	0.278
CEFam_RD																-0.050	0.046	-0.100
CEIns_Patent							-0.012	0.005	**-0.419****				-0.009	0.007	-0.306	-0.006	0.007	-0.197
CEIns_RD										-0.032	0.022	-0.126	-0.019	0.027	-0.076	-0.026	0.028	-0.101
FamOwnMgmt																-0.003	0.053	-0.017
Rsquare		0.545			0.557			0.594			0.567			0.597			0.616	
Adjusted Rsquare		0.513			0.522			0.552			0.523			0.546			0.544	
Rsquare Change		0.545			0.013			0.037			0.010			0.040			0.071	
F Change		**17.098*****			**2.811***(a)			**4.369****(c)			1.101(c)			**2.347***(c)			1.671(a)	
Model Sig. (F)		< 0.001			< 0.001			< 0.001			< 0.001			< 0.001			< 0.001	
Hypothesis		**-**			**Hypothesis 2**			**Hypothesis 4**			**Hypothesis 4**			**Hypothesis 4**			**-**	

*** Sig. < 0.01; ** Sig. < 0.05; * Sig. < 0.10

(a) compared to Model 1; (b) compared to Model 2; (c) compared to Model 7

Table 5 *– Results of the Regression Analysis, InsOwn (n = 108)*

6. Discussion

In the following, the findings of the regression analysis are discussed in a broader context. The objective is to enhance the complete understanding of the findings and complement those with theoretical insights from previous scholars. Furthermore, practical implications are presented, while also acknowledging relevant limitations of this research study.

6.1. Ownership and M&A Investments

Previous research streams usually addressed the sensitivity and decision-making of corporate capital allocation decisions rather generally. The combined consideration of ownership structures and M&As as well as the distinct influence of families, has been neglected for a long period of time, but recently gained growing attention, especially focusing on the U.S and Canadian market (Basu et al., 2009; Ben-Amar & André, 2006). This study builds on the cornerstones of previous researches that only generally investigated the influence of ownership concentration on corporate strategic choices (Zahra, 2009) and corporate investment decision-making (Fahlenbrach, 2009). Thereby, the scope of this study specifically focuses on M&A investments as a distinct type of strategic choice and the influencing role of families and institutions by means of their respective ownership stakes.

As revealed in this research study, the distinction between family and institutional ownership in companies appears to be reasonable, considering its differential effect on M&A investments. Contrary to the expectations of *Hypothesis 1* and *Hypothesis 2*, a higher degree of family ownership has no influence on the degree of M&A investments per se, whereas the association with institutional ownership is significantly negative. Moreover, inconsistent with the assumption of *Hypothesis 6*, neither the joint possession of ownership stakes and the presence of family members in the corporate management constitute a catalyst to influence M&A decisions essentially, which is discusses in more detail in the following.

6.1.1. Family Ownership, Management and the Influence on M&A Investments.

The current research findings on family ownership do not provide further evidence for previous studies that acknowledge higher risk-aversion and constrained strategic investments with increasing family control (e.g. Pinando et al., 2011; Caprio et al., 2010; Bauguess & Stegemoller, 2008; Sraer & Thesmar, 2007). Moreover, neither previous findings on families' conservative attitudes towards investments in European firms (e.g. Caprio et al., 2011;

Pinando et al., 2011) nor the theory of socioemotional wealth (SEW) preservation (e.g. Gómez-Mejia et al., 2007; Miller et al. 2013) are supported by means of this research study and consequently it cannot be ascertained whether families act in a way to maximize their utility through non-financial rather than financial preferences. Furthermore, in previous studies, agency theorist assume that increasing family shareholder stakes lead to a misuse of their increasing controlling position at the expense of minority shareholders (Bertrand, Mehta, & Mullainathan, 2002). However, also the assumption of agency theory cannot be statistically supported within the scope of this research. In other words, the insignificant results indicate that the extent to which a family possesses ownership stakes in a corporation does not influence corporate M&A investments. There are several underlying reasons that can explain the insignificant results. Firstly, the average of only 20 percent family ownership in the sample corporations indicates that most of the families do not possess a majority ownership stake (above 50 percent) in the company. This implies that families cannot necessarily take dominant action to benefit their own interests by actively influencing corporate strategic investment decisions such as M&As. Secondly, the sample consists mainly of large corporations with 40,000 employees on average. Thus, despite large fractions of ownership stakes possessed by families, larger corporations often come with increased bureaucratic structures as well as rules and regulations, hindering families to dominantly enforce or impede their preferred strategic actions with regard to M&A investments. Additionally, in comparison to smaller companies, large corporations are increasingly commissioned to align a high variety of stakeholders' interest, which can essentially surpass the sole predominant say of a family in the company, especially in strategic matters that require high financial investments. This assumption is further enforced as the coefficient of size (*lnSize*) shows a significant positive relation to M&A investments in all regression models, whereas the coefficient of family ownership reveals no significant influence in any model. Eventually, unlike the previous assumptions, the insignificance of family ownership can also imply that families do not consider M&A investments as a risky and uncertain endeavor but rather consider it as a mechanism to reinforce their dominance in the company and thus neglect to impede the corporate undertaking.

Apart from the sole influence of family ownership, findings about the joint effect of family ownership and management on corporate strategic decisions are inconsistent among various studies of scholars. Whereas Block et al. (2013) conclude that families enforce their corporate dominance through their management positions, Pinando et al. (2011) reveal contrary results

indicating a more pervasive influence through ownership stakes per se. Despite the current study's indication of a negative influence on M&A investments when family ownership and management is combined, the result does not provide statistical significance. The underrepresentation of companies with combined corporate family involvement could be one reason to explain these findings. Only in 3 percent of all sample companies the majority family shareholder is also represented in the management board. Thus, this may imply that the results cannot extrapolate from the sample to the whole population and consequently do not provide any statistical evidence. Furthermore, families may behave altruistically and consider the interests of various stakeholders despite their opportunity to dominantly influence decisions. Consequently, not only the family ownership and management by itself but the interest of various stakeholders are considered in the decision-making process of M&A investments, explaining the insignificant outcome of the moderation of family management. All things considered, for the scope of this study, neither an increasing family ownership concentration does affect the degree of M&A investments in a corporation, nor is the relationship significantly moderated if family members take on a position in the management board.

6.1.2. The Influence of Institutional Ownership on M&A Investments

Despite the significant coefficient, the reverse finding to the proposed *Hypothesis 2* indicates a negative association between a higher degree of institutional ownership and M&A investments. In other words, higher degrees of institutional ownership stakes in the company cause less extreme investments in M&As and thus institutional shareholders impede such investments. The finding provides further empirical evidence for the study of Pinando et al. (2011), indicating a tendency for increased investments auditing in firms with higher ownership concentration and therefore a diminishing probability of M&A deals. Furthermore, the investment preference of institutional shareholders and their expected time span for their investment return can further substantiate the finding of the negative association. Whereas some scholars suggest that investors prefer investments' long-term value maximizations instead of short-term earnings (Monks & Minow, 1995; Dobrzynski, 1993), this study does not provide further evidence accordingly. The results rather support the findings of Bushee (1998), suggesting institutional investors' short-term focus due to their frequent trading behavior. However, M&As are usually associated both with high costs and financial as well as organizational integration uncertainties in the post-acquisition time period. Consequently, those investments need time until the implementation eventually pays off, but the short-term

focus of institutional shareholders may hinder these endeavors in order to protect their financial claims and the expected short-term return on their investments. Nonetheless, the isolated consideration of institutional ownership as the independent variable and its respective findings and conclusions should be treated with caution. Previous scholars suggest that the separation of corporate ownership and control in companies leads to principal-agents problems, which may lead to sub-optimal investments of capital, specifically in connection with institutional investors (Stiglitz and Edlin, 1995, Shleifer and Vishny, 1998). Thereby, managers are incentivized to neglect promising investments in order to prevent the disappointment of short-term focused institutional investors, which may eventually sell their stakes in reaction to M&A investments and thereby cause the firm's stock price undervaluation (e.g. Graves, 1990; Waddock 1990). Consequently, even though institutions possess a majority ownership stake in the corporation, this may not be the only reason leading to the negative association with M&A investments. More precisely, the interaction between institutional investors and the corporate management board can lead to the decreasing tendency of M&A investments. Even though institutions often behave passively, they may have an indirect but dominant influence on the corporate management through their high corporate ownership stakes. Thereby the management board rather realizes corporate investments that pay off in the short term in order to serve the interest of short-term institutional shareholders and thereby avoid the divestment of institutions, causing the aforementioned corporate undervaluation. Lastly, banks, insurance companies, financial institutions and mutual funds often represent a large variety of stakeholders itself and deal with others money. Consequently, institutional investors may face a growing internal conflict of interest among the stakeholders that refrain the institutions to encourage investing large amounts in possibly uncertain M&As and thereby put their own stakeholders capital at risk.

6.2. Corporate Entrepreneurship as a partial Substitute for M&A Investments

Hitt et al. (1990) considered M&As as substitutes for corporate innovation. Therefore, *Hypothesis 3* and *Hypothesis 4* recognize corporate entrepreneurship as a moderation in order to ascertain whether M&As and corporate entrepreneurship are mutually exclusive or co-existing in the corporate setting due to their similar characteristics and benefits for a company. Measuring corporate entrepreneurship by means of R&D intensity and the amount of patents a company possesses, the regression outcome shows no moderating influence when considering both aspects simultaneously in one model. However, the individual analysis of R&D and patents reveal different moderating effects on family and institutional ownership

respectively and reveals only partial support for each hypothesis. Whereas a high corporate R&D intensity negatively moderates the relationship between family ownership and M&A investments, it does not significantly influence the main relationship with institutional ownership. More contradicting outcomes are revealed when investigating the moderating effect of patents. In particular, the higher the amount of patents, while also being largely owned by institutions, the less the corporation invests in M&As. Contrarily, in case of high family ownership, a higher amount of patents nurtures higher M&A investments.

Generally, several scholars previously addressed R&D expenditures as the most fundamental investment decision entailing a risky and costly endeavor (Lin et al., 2011, Barker & Mueller, 2002). The findings of this study are in line with Blonigen and Taylor (2000), who ascertained a strong negative correlation between R&D intensity and M&A activities, but are inconsistent with the study of Lehto and Lehtoranata (2002), who reveal a positive correlation instead. The differentiation between the "make" and "take" strategies can reason the negative moderation of R&D on the relationship between family ownership and M&A investments. Thereby, corporations with high family ownership prefer a strategy that preserves their ownership stakes by pursuing a strategy of internal growth ("make") by means of R&D intense investments. In this regard, R&D intense corporations engage in those investments to substitute the sourcing of resources externally. Consequently, this implies that family owners, who predominantly rely on their own internal competences and resources, neglect M&A investments to prevent the risk of organizational misfit and associated post-acquisition and –merger costs and failures. Furthermore, this indicates that families intend to substitute the risk of their diminishing ownership positions in the corporations, which can be possibly brought about through a M&A deal as increased debt requirements and new corporate shareholders are entailed with a M&A. At last, the finding of the moderating effect partially implies the families' conservative behavior towards investments (e.g. Caprio et al., 2011; Pinando et al., 2011). Thus, if corporations with high family ownership stakes heavily dedicate financial resources to R&D, further investment of equity, dedicated to M&As, is neglected. Evidence for a similar pattern in companies with higher institutional ownership cannot be significantly validated within the scope of this study. To be exact, higher R&D investments do not influence the relationship with M&A investments. Generally, an underlying reason for the different moderation on each main effect of the research model can lie in the distinct portfolio diversification of both families and institutions. Whereas family members often restrict their investments in a single firm, especially if they founded the company, institutional investors

tend to diversify their portfolio through investments in various corporations (e.g., Wiseman and Gomez-Mejia, 1998; Balkin et al., 2000). This can also provide a reason for the amplified negative moderating effect of R&D in case of higher family ownership compared to institutional ownership and thus provides partial support for *Hypothesis 5*.

Interestingly, the moderating effect of patents indicates an adverse moderating effect on the relationship with family ownership. More precisely, the higher the amount of patents a company possesses, the more this corporation invests in M&As. Consequently, patents can be considered as a complement rather than a substitution of the corporate strategy when investing in M&As. On the one hand, an implication of this result is that firms with more patents tend to be fundamentally more innovative and risk-seeking and thus more open to further advance their company by means of M&As without restraining from financial and organizational risks. Furthermore, the introduction of new patents is often associated with increased revenues and a potential leading competitive advantage in the industry. Therefore, especially firms with a high degree of family ownership are not restricted by means of their invested equity and can additionally invest capital in M&As. This further indicates that companies both rely on internal competencies in terms of their developed patents, while complementing those with resources acquired through M&As. A contrary moderating effect of patents is illustrated in association with the independent variable of institutional ownership. Thereby, it becomes apparent that patents are not necessarily only associated with increased revenues but also potential costs in the progress of the patent development until its final confirmation. Furthermore, newly confirmed patents may require new plants and equipment to implement and transform the intellectual property to make it either usable in the existing value chain or marketable for the final consumer in order to benefit from new revenue streams. The associated costs of patents in the development phase could hinder companies with higher institutional ownership to further invest in M&As due to financial restrictions.

Generally, statistical evidence from the regression analysis highlights the importance to differentiate between different types of corporate shareholders, in particular family and institutional corporate shareholders. Thereby, further evidence is provided by the theoretical implications of Fernando, Schneible and Suh (2013), who suggest that family motivations are not similar to those of purely economically motivated institutions. Thus, this study achieves to advance previous studies that primarily focused on the impact of concentrated ownership structures in corporations, neglecting the difference between shareholder types.

6.3. Practical Implication

The findings suggest that higher institutional ownership concentration negatively influences strategic investments in a corporation. Generally institutional investors are often considered as passive shareholders in a company, nonetheless their influence becomes distinctly important when corporations separate ownership and management. By that, management may solely act in the interest of institutional majority shareholders and neglect long-term investments that contradict with the short-term intentions of institutional investors. Consequently, management should disavow from the limited perspective to consider institutions as sole passive investors in a corporation, as those seem to have a say in how the money is being invested. Furthermore, management boards of corporations with majority institutional shareholders need to be aware that varying interests within the organization can lead to agency problems and conflicts, which may eventually restrict the management strategic investment intentions and operations. Consequently, the sole focus on satisfying solely institutional shareholders' interest may not necessarily benefit all corporate stakeholders and consequently may harm the welfare of the organization due to the divestment of other unsatisfied minority shareholders. Thus, performance-based management remuneration packages that specifically focus on the long-term corporate profitability are supportive to align the shareholders' intentions with those of the management and stimulate overall long-term corporate welfare. Contrarily, when intending to invest in a corporation, new external shareholders do not have to be concerned about a predominant family influence in a corporation, neither by means of their ownership nor management positions. Consequently, despite their dominant ownership stake in the company, family may still consider aligning the overall interest of stakeholders in the company instead of being primarily self-focused and impede investments that benefit the corporation by mean of its positive net present value.

Moreover, the significantly negative moderating effect of R&D intensity on the relationship between family ownership and M&A investments indicates the corporations' increasing preference for a "make" strategy in order to primarily achieve corporate growth internally. Thus, this reveals that companies with increased family ownership and R&D investments neglect the potential benefits of acquiring resources externally by means of M&As with corporate partners. Nonetheless, the findings of this research should not motivate such corporations to fundamentally eliminate the potential engaging in both R&D and M&A investments simultaneously. The reason for this recommendation lies in the fact that

companies often engage in M&As in order to join the corporate partners' mutual forces in their R&D competences and resources respectively. Thereby the business partnering can achieve increased scalability and speed in the R&D progress and accomplish their respective objectives and results but with lower financial investments for both business partners. Consequently, even though companies invest heavily in R&D, it should not fundamentally impede M&A investments as those are not only associated with high investments but also with potential corporate benefits and lower costs in the long term.

Furthermore, the diverse influences of the operationalized measures of corporate entrepreneurship in this research study illustrate its various facets. Consequently, solely being a highly R&D intensive corporation and obtaining a high degree of patent confirmations does not necessarily indicate a high internal entrepreneurial orientation of the corporation per se. This means that corporations should not solely rely on both measures as the sole indication of corporate entrepreneurship, but should also regard rather intangible internal competences and resources that facilitate entrepreneurship within the corporation, such as the corporate culture and management attitudes. This being said, since the research study does not indicate how corporate entrepreneurship and M&A investments eventually influence the corporate performance, companies should not regard both as separate but rather complementary aspects within a company that can advance the competitive position within the market. Future studies should complement the research model (*Figure 1*, p. 20) with another variable, which measures the corporate financial performance after the M&A completion in order to investigate how both concepts of M&A and corporate entrepreneurship bring about value and consequently benefit the corporation. If significant results are being found, companies can weigh the value of both corporate entrepreneurship and M&A engagements respectively, always considering their unique corporate setting that differentiate the corporations uniquely from each other.

6.4. Limitations

In order to estimate the reliability of research findings, the study acknowledges several limitations. Firstly, the study exclusively investigates German corporations, whereof only 108 different companies are represented in the sample, which may not be necessarily an accurate representation for the population of other national and international corporations. Moreover, more than half of the corporations in the sample operate in the manufacturing sector, whereas other industries are underrepresented. This may question the generalizability of the results not only among corporations cross-geographically but also among different industries.

Furthermore, the sample size of 108 companies is not conforming to the minimum required size of N > 50 + 8m introduced by Tabachnick and Fidell (2007). Considering m as the number of independent variables, the sample size should consist of 186 companies, since 17 independent variables are operationalized in the statistical analysis. This can also explain that the coefficients are often only marginally significant at the lowest statistical significance level of 10 percent, which is generally still statistically accepted.

Secondly, with respect to the sampling procedure, the initial sample from Orbis consisted of 562 German corporations but was narrowed down to only 108 companies after matching it with the available M&A deals reported in the Zephyr database. Consequently, exclusively companies that closed at least one M&A deal are considered in the scope of this research, whereas companies without any M&A investment are excluded. The exclusion of those companies limits further significant findings on the topic and may lead to inconclusive outcomes. Thereby, the research is limited as it cannot be ascertained whether the degree of ownership eventually leads to the fact that companies completely restrain from M&As at all instead of just influencing the respective degree of M&A investments. Nonetheless, this approach was consciously chosen to avoid the violation of the normality assumption in the data sample and prevent a high positive skewness, as 454 companies of the initial sample (81%) do not have a M&A record in the Zephyr database.

Thirdly, even though the study ultimately investigates M&As as a corporate strategic investments with respect to varying ownership types, the outcomes should not be generalized to corporate investments in general. M&As are often associated with high integration costs in the post-acquisition and –merger period to guarantee organizational and strategic fit. Consequently, M&As should be considered as unique corporate investment engagements, which are not necessarily comparable to other investments. As such, foreign direct investments or investments in plants and equipment have a different situational context. Whereas plant and equipment investments need to be decided within short period of time, conditional to a tremendous corporate growth rate and increasing sales, M&A deals can take on longer decision horizons until the investment is eventually undertaken.

Fourthly, even though the statistical regression analysis controlled for various influences on M&A investments, measurable aspects such as the corporate ownership structure might only constitute a limited conclusive measure for the degree of M&A investments. Invisible and

intangible influences such as the corporate culture or management attitudes, which cannot be quantified by means of the Orbis database, may reveal further insights leading to M&A investments. In order to advance the understanding of M&A investments, future studies should consider case studies, personal interviews and questionnaires in order to obtain a more conclusive and complete comprehension of incentives for companies with varying ownership stakes. An equal approach could investigate corporate entrepreneurship more extensively. Even though this research followed measures of previous studies, such as R&D as innovation input and patents as an innovation output measure, the contrary outcomes and directions of coefficients in the regression illustrate the various facets of corporate entrepreneurship. Therefore, through interviews and questionnaires, future studies can reveal more detailed insights about corporate entrepreneurship, not only focusing on quantitative but also qualitative data. Furthermore, the implementation of a common measure or index for corporate entrepreneurship could further advance future research and would allow comparing various studies that intent to investigate corporate entrepreneurship.

Lastly, due to limited data availability, this study follows a cross-sectional analysis and considers M&A investments as an aggregated measure from 2007-2015, whereas ownership data and the other control variables are retrieved for the year 2015. Even though ownership structures are considered to be relatively stable over time and only change marginally from year to year (La Porta et al, 1999, Zhou, 2001), causality cannot be determined. Consequently, if future studies follow panel regression analysis, causality between ownership and M&A investments can be ascertained, considering the respective year when the M&A investment took place. Furthermore, causality with regard to corporate entrepreneurship and M&A investments are also limited. Thus, it cannot be specifically ascertained whether patents and R&D trigger M&A investments or whether M&As take place as a matter to acquire intellectual property rights or merge R&D capabilities to share the investment endeavors and safe costs with the corporate partner.

6.5. Future Research

In addition to the overcoming of the aforementioned limitations, future researches can achieve more conclusive and complete outcomes with respect to the proposed research model. Firstly, according to the two-stage model of Cho (1998), future research should investigate the post-acquisition and post-merger performance of companies. Even though the study indicates that higher institutional ownership is associated with lower M&A investment deals, it remains unacknowledged whether those companies ultimately still outperform other companies that

complete deals of higher value. Consequently, the integration of a corporate performance measure in future studies can provide a more complete conclusion about the successful implementation of M&As and whether companies can make up for the increased costs that are associated with the post-acquisition and –merger integration.

Secondly, future studies should consider the varying implications associated with the dual-share system. A differentiation between cash flow and voting right may reveal varying outcomes with respect to the influence that families and institutions have in the strategic decision making of a corporation. In this regard, the database "Wer gehört zu wem" is particularly helpful especially for a number of German small-medium enterprises. However, for the scope of this study it is not considered as only a limited number of companies could be identified.

Moreover, there is a growing body of news concerning venture investments and M&As in the start-up scene. The continuous trend arouses the potential for future research to investigate ownership structures and M&A engagements with respect to different types of corporations, such as Start-ups, small-medium enterprises, large corporations or conglomerates. This may increase the complexity of the sampling procedure as further databases need to be considered, but could advance the scope of this study with regard to more conclusive and significant outcomes. Furthermore, it allows for comparison between the corporate types respectively and to observe varying incentives and influences of each with regard to M&As.

Lastly, the relationship between ownership structures and M&As can be investigated more precisely by means of the respective financing models. In other words, future study should differentiate between stock and cash financing of M&As. Both are associated with a varying degree of risks and could influence the intention to engage in M&A. However, this may limit the sample size even further, especially if future studies focus only on German corporations, as only limited data is available in this regard.

Conclusion

The objective of this study was to investigate the influence of the degree of family ownership in comparison to institutional ownership on the degree of M&A investments respectively. While previous studies exclusively focus either on M&A investments or corporate

entrepreneurship individually, this study recognizes similar characteristics of both and thus investigates the mutual existence in the corporate setting. Inconsistent with the initially developed hypotheses, the influence of family ownership on the degree of M&A investments cannot be proven as statistically significant. Furthermore, there is no evidence for a moderating effect of family management, in particular when family members hold a position in the management board in addition to their ownership stakes. Interestingly, even though contrary to the hypothesized relationship, the statistically significant results provide evidence that the degree of institutional rather than family ownership impedes M&A investments. By means of the operationalized measures R&D intensity and patents, corporate entrepreneurship is not fully supported to moderate the relationship between the degree of ownership and M&A investments. However, a closer look at the measures individually reveals more insights on the different moderating effects respectively. R&D intensity negatively moderates exclusively the relationship between family ownership and the degree of M&A investments. Furthermore, patents have a significant, but differing moderating effect on both relationships in the research model (*Figure 1*). Whereas the relationship between family ownership and M&A is positively moderated, the moderating effect is negative with respect to institutional ownership. The varying outcomes of the moderating measures illustrate the lack of a standardized and yet ambiguous measure for corporate entrepreneurship. Consequently, this study should lay an impulse for future studies to adopt a measure for corporate entrepreneurship that can be generally applied in future studies and thereby allow for enhanced comparison among studies to draw general conclusions.

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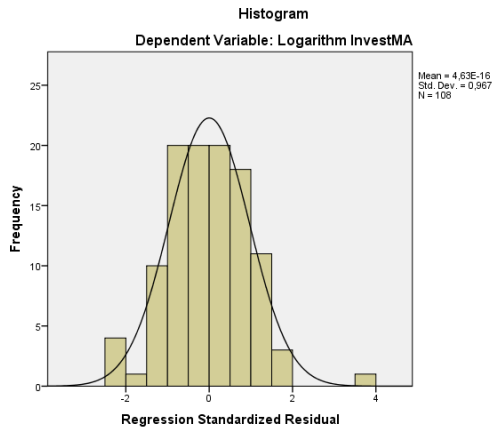
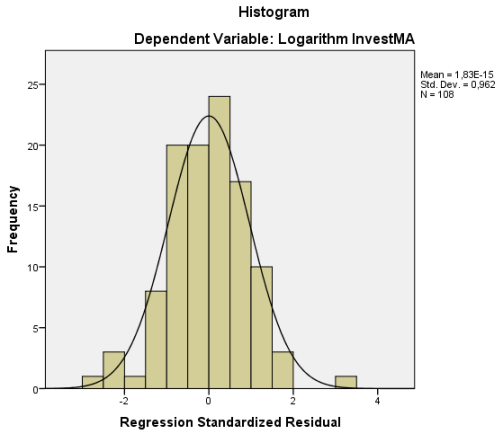
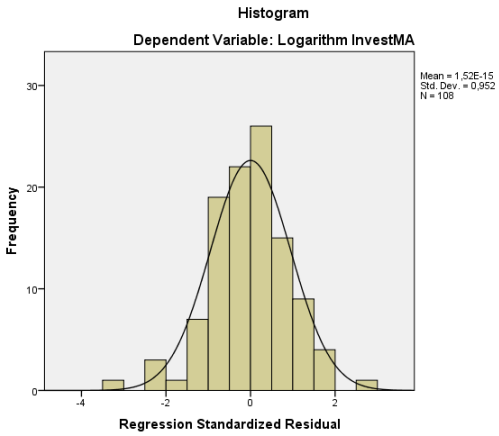
Appendix A – Histograms



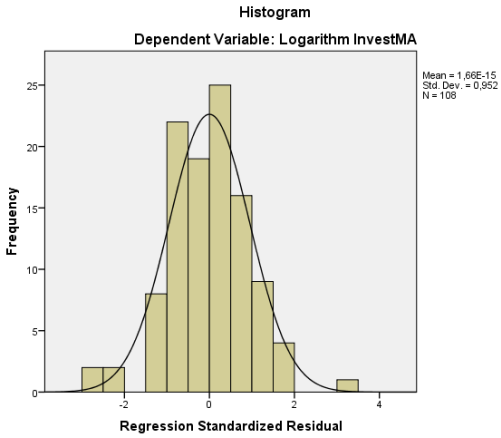
Regression Model 1 *– Histogram*



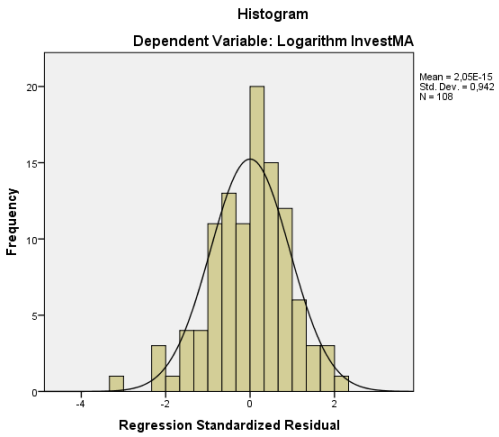
Regression Model 2 *– Histogram*



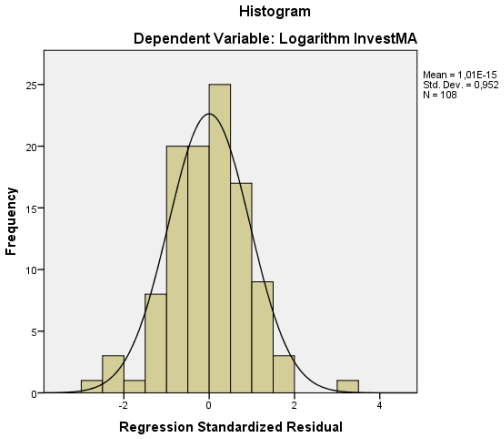
Regression Model 3 *– Histogram*



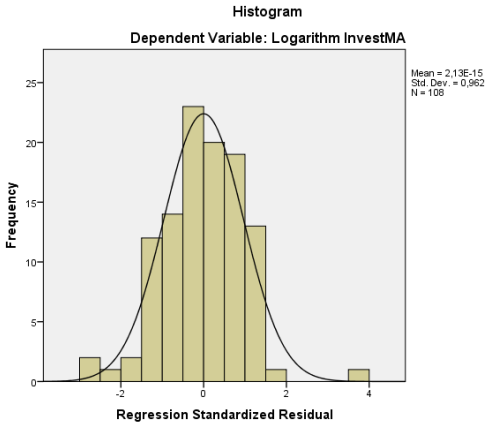
Regression Model 4 *– Histogram*



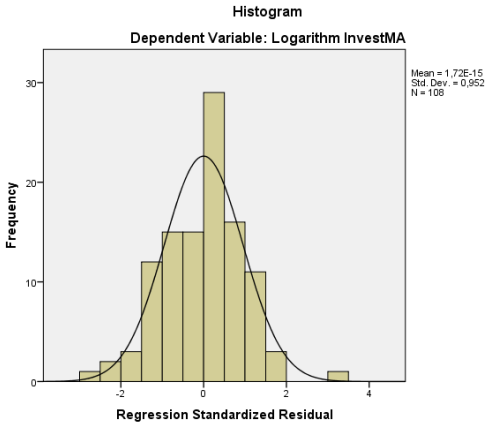
Regression Model 5 *– Histogram*



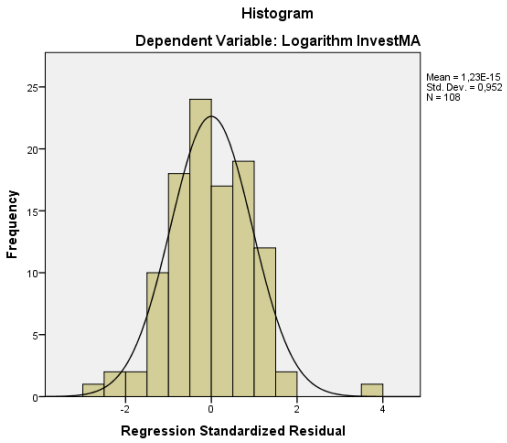
Regression Model 6 *– Histogram*



Regression Model 7 – *Histogram*



Regression Model 8 *– Histogram*



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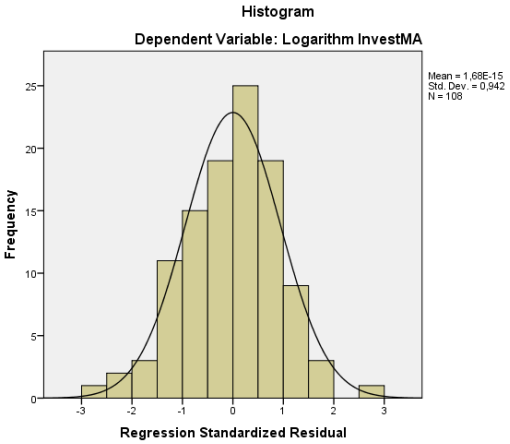
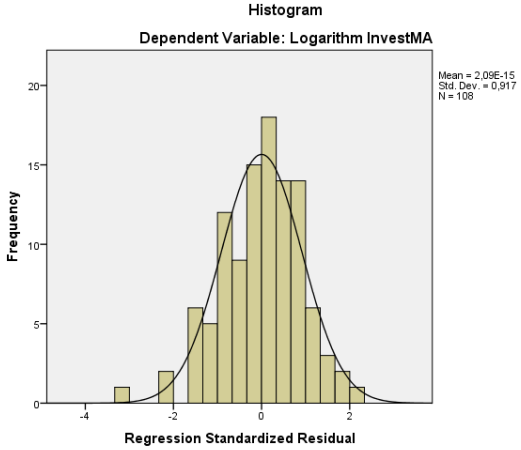
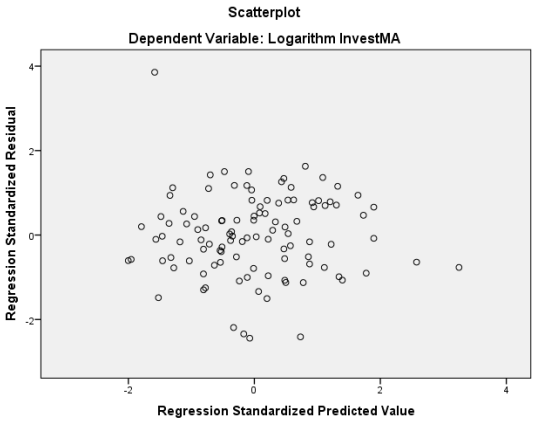


Regression Model 10 *– Histogram*

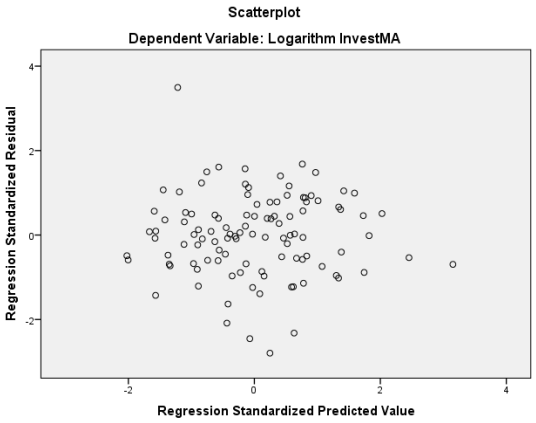


Complete Model – *Histogram*

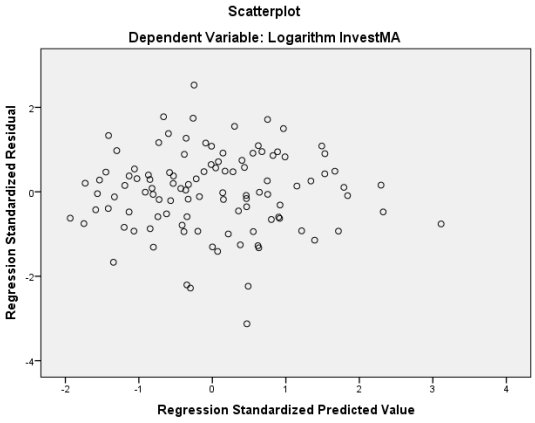
Appendix B – Scatterplots



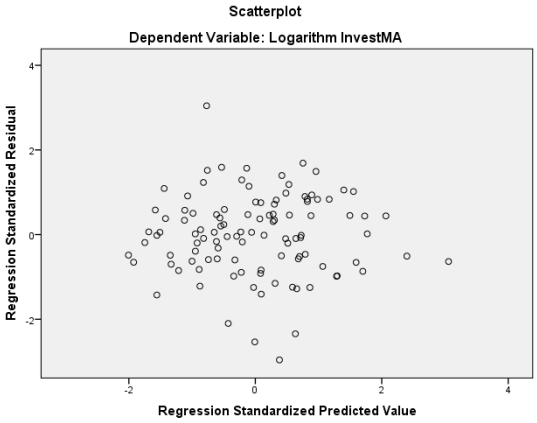
Regression Model 1 – *Scatterplot*



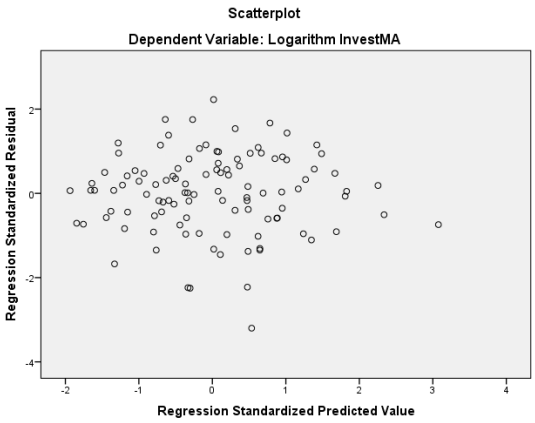
Regression Model 2 *– Scatterplot*



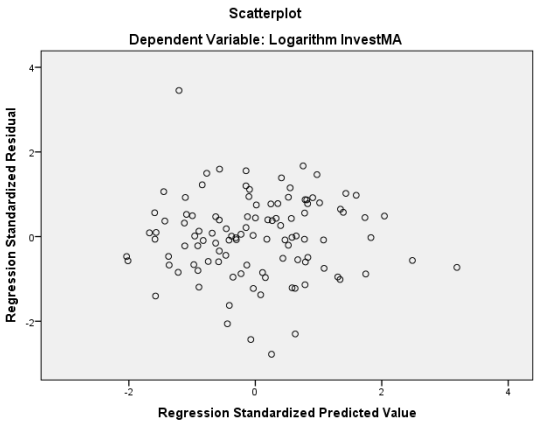
Regression Model 3 – *Scatterplot*



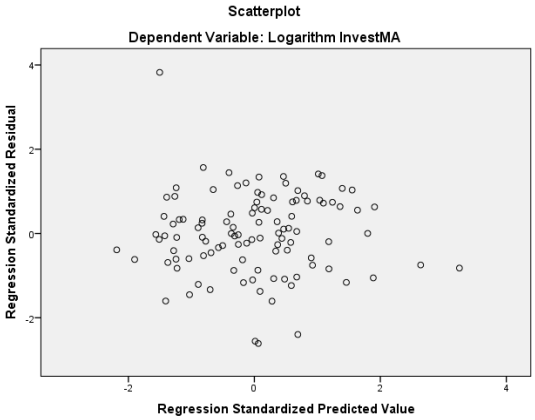
Regression Model 4 *– Scatterplot*



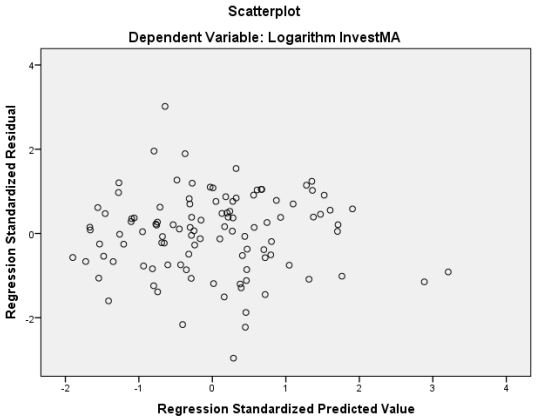
Regression Model 5 – *Scatterplot*



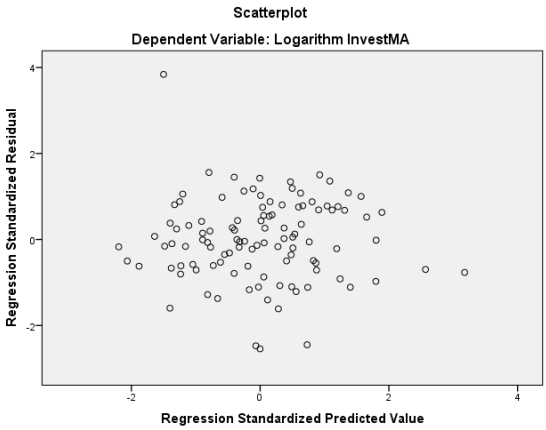
Regression Model 6 *– Scatterplot*



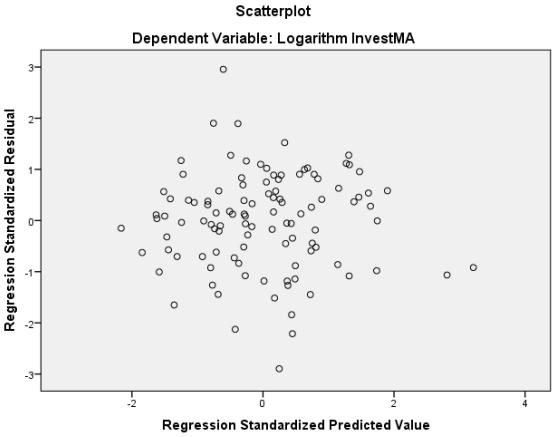
Regression Model 7 – *Scatterplot*



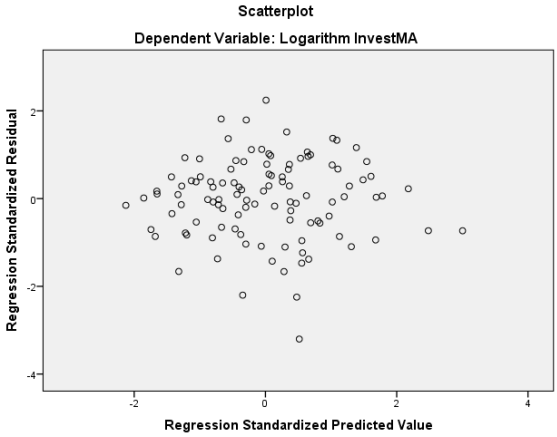
Regression Model 8 *– Scatterplot*



Regression Model 9 – *Scatterplot*



Regression Model 10 *– Scatterplot*



Complete Model – *Scatterplot*